

# ECN230 SRP sessions 10-13. Trade Policy Analysis

## TRADE POLICY

Trade policy instruments are intended to directly affect trade (import and/or export) volumes and values. They can serve either a microeconomic or a macroeconomic policy objective. A trade policy is more microeconomic when the government's intervention is to target a specific sector (or market) for some purpose. The goal can be macroeconomic if, for example, a combination of trade policies are aimed at affecting the country's overall balance of trade (i.e., the total value of all exports relative to the total value of all imports).

For the purposes of ECN230, the focus on trade is at the sectoral level (the partial equilibrium effect and its relative effect in general equilibrium terms) and does not stress situations where the trade sector is imbalanced (e.g., a surplus or deficit in the balance of trade). In reality, of course, trade imbalances exist and government intervention, in some cases, have aimed at creating and sustaining macroeconomic imbalances (e.g., export-led growth strategies that encourage industrial production, value creation, employment, and marketing the surplus in foreign markets). The role of trade policy in the growth and/or development strategies of a government is a topic to follow up after the economics of sectoral trade policy has been analyzed.

Sectoral trade policies include measures that either increase or decrease imports or exports. These measures applied on imports or exports include taxes (i.e., duties or tariffs), quantitative restrictions (quotas), and subsidies. Of course, there are other regulatory measures that have similar effects as trade policy, but their objective is not directly to affect import or export. For example, a tax on nicotine-containing tobacco products, e.g., cigarettes, is intended to reduce consumption of all cigarettes, locally produced or imported products, on health grounds. The consumption tax is a domestic regulatory measure and not trade policy because the objective is not to reduce imports, even though it may have that effect. Thus, for economists, the analysis and assessment of a policy depends on what its objective is and how effective it is at meeting its stated objective.

### Trade Policy Analysis

For a partial equilibrium trade model, the excess demand (ED) – excess supply (ES) framework, is useful for analyzing the economic, trade and welfare effects of a trade policy instrument. Typically, the benchmark situation (i.e., the initial equilibrium) to consider is free trade under the assumptions necessary for the law of one price to hold (i.e., identical goods, competitive markets, no transactions or transportation costs, and no government intervention). There is one price, the world price ( $P_w^*$ ), at which the value exported equals the value imported.  $P_w^*$ , then, is also the domestic market signal for consumption (quantity demanded) and production (quantity supplied) with imports covering a deficit and exports disposing a surplus.

Relaxing the assumption of no trade policy implies that the intervening government intends to affect the country's willingness to trade. If the policy is to restrict the import of a good, then the government is essentially reducing the willingness to import. This affects the ED curve. On the other hand, if the policy is to affect the country's exports, then the government's intention is to affect the country's willingness export. This affects the ES curve instead. The change in either ED or ES will affect the domestic market equilibrium, changing trade flows, and affecting the country's welfare.

### Policy measures that restrict imports

Trade measures aimed at reducing the willingness to import come in the form of a tax on imports (import tariff) or a quantitative restriction (import quota). That is, the government's intent is to limit imports to protect domestic producers and support domestic production and the import-competing sector. The case of an import subsidy is dismissed for now as it is not a typical policy tool.

An import tariff is clearly aimed at limiting imports, rather than overall consumption, because the tax is only applied to the foreign good, raising the cost of the foreign good relative to the domestic good. This, in effect, discriminates in favor of the local good. To see the effect of a tariff by a small country, figure 1 depicts the market of the importing country and the world market at its border under free trade (FT). The unrestricted trade implies that the world price sets the domestic price at  $P_w$ . The quantity demanded in the domestic market is  $[Q_D]_{FT}$  and the quantity supplied by local firms is  $[Q_S]_{FT}$ . The deficit is made up by imports equal to  $[Q_M]_{FT}$ .

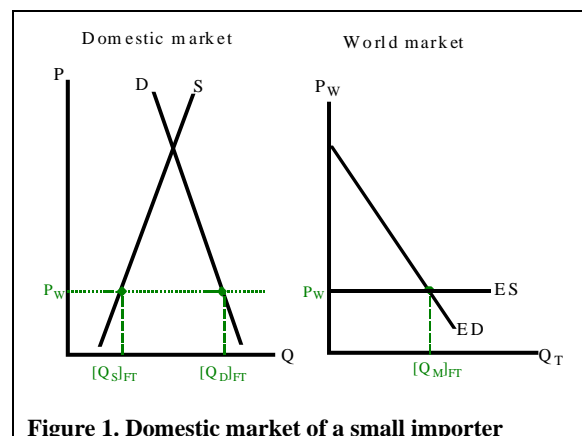


Figure 1. Domestic market of a small importer

Now, for some reason the government decides to take action to limit imports through a tariff. This could be that producers complain that the domestic price is too low and that too many imported units enter the domestic market hurting the import-competing sector. Or perhaps wider society is concerned that the level of production is too low and too dependent on foreign supplies (i.e.,  $[Q_S]_{FT}$  makes up too small a share of  $[Q_D]_{FT}$ ). Whatever is the argument in favor of intervention, the policy comes in the form of a tax on imports.

The import tariff is the government's means of changing the country's willingness to import, i.e., a shift of the ED curve to the left. Suppose the tax is a specific (per unit) tax and the initial ED is of the form

$$ED = a - b \cdot P$$

where  $a$  is a constant and  $b$  is related to the degree to which a change in price affects the quantity imported. The specific tax rate,  $\tau_0$ , is added to the price of the imported good once the good enters the customs point at the border. The new ED,  $ED'$ , must now reflect that  $\tau_0$  is applied on each unit imported. This results in

$$ED' = a - b \cdot [P + \tau_0].$$

The constant would be affected by the amount of the tariff ( $a - b \cdot \tau_0$ ) but  $b \cdot P$  is unaffected, resulting in the following expression

$$ED' = a' - b \cdot P$$

where  $a' = (a - b \cdot \tau_0)$ .

In figure 2, the shift in ED to ED' is a downward parallel shift, reflecting that everywhere the difference between the curves is the amount of the tax,  $\tau_0$ . Note that the shift in ED does not affect the world price. This is the case of a small country, i.e., that its market is incapable of affecting  $P_w$ , and the country is a price taker on the international market. (This is why the ES curve is shown as horizontal because that any change in ED leaves  $P_w$  unchanged.) Thus, the goods arrive at the port with a customs invoice showing the price of the good of  $P_w$ . The custom's official is instructed to apply a tax of  $\tau_0$  on each unit, raising the cost of each imported unit to  $P_D$ , the domestic price (i.e.,  $P_D = P_w + \tau_0$ ).

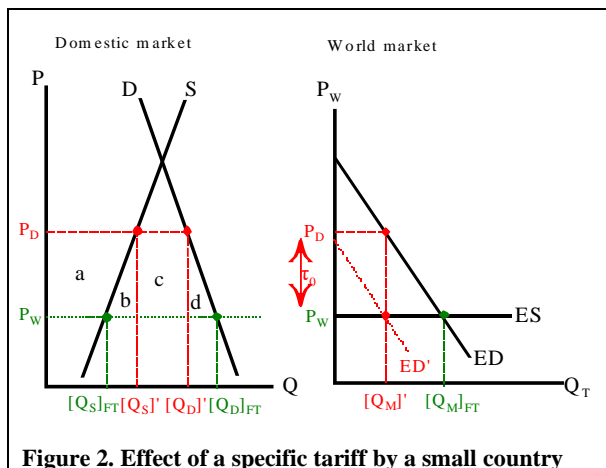


Figure 2. Effect of a specific tariff by a small country

The policy action by a small country, by definition, leaves the world market unaffected. The government, changing the country's willingness to import, can only affect the domestic market, but its share of the world trade being so small leaves the world market price unchanged. Thus,  $ES = ED'$  at  $P_w$  but  $[Q_M]'$  is the volume imported because the domestic price rises, encouraging more production at  $[Q_S]'$  but lowers consumption to  $[Q_D]'$ . The deficit is now smaller as fewer units are imported. The dependency on imports decreases as the self-sufficiency ratio of domestic production increases (i.e.,  $[Q_S]'$  makes up a larger share of  $[Q_D]'$  than before).

The welfare effects of the tariff are presented in table 1. The increase in the domestic price makes consumers worse off. The change in consumer surplus ( $\Delta CS$ ) is negative illustrating that consumers are taxed. By contrast, the increase in domestic price makes producers better off. The positive change in producer surplus ( $\Delta PS$ ) suggests that the policy supports producers and domestic production. The government collects a tax on each unit imported, allowing it to collect revenue, i.e., area (c) =  $\tau_0 \cdot [Q_M]'$  or  $(P_D - P_w) \cdot ([Q_D]' - [Q_S]')$ .

Table 1. Welfare effects of a small country tariff

Welfare change	Area reflecting change
$\Delta CS =$	- (a + b + c + d)
$\Delta PS =$	+ (a)
$\Delta G =$	+ (c)
$\Delta NSW =$	- (b + d)

The negative change in net social welfare,  $\Delta NSW$ , reflects that the policy makes the country worse off on account of inefficiencies. In effect, the tariff results in losses to domestic consumers who are asked to transfer the value of area (a) to producers in support, and the value of area (c) to government in the form of a tax. Areas (b + d) are losses of income from consumers that are not redistributed to anyone in society. Economists refer to this as dead-weight losses (DWL).

Area (b) is an efficiency loss related to the higher domestic price and the increased production. The inefficiency comes

from allocating resources to increase production in a sector in which the country has a comparative disadvantage because  $P_D$  is a less efficient price signal than  $P_w$ . Area (d) is an efficiency loss related to lower consumption of the good because consumers are forced to pay  $P_D$  rather than the more efficient price signal,  $P_w$ .

This was the case of a specific tariff of rate  $\tau_0$ . Another means to tax imports is to apply an *ad valorem* tax, a tax as a percentage of the price of the good, e.g., 20%, rather than as a per unit, NOK20/unit. An *ad valorem* tariff is more commonly applied because it is easier for trading partners to understand the effect of the tax. A 20% tariff on the imported good should make the good cost about 20% higher on the domestic market.

Consider an *ad valorem* tariff of rate  $\tau\%$  that is applied instead of a specific tariff of rate  $\tau_0$ . Economists say that the *ad valorem* tariff has an equivalent effect to the specific tariff if the economic, trade and welfare effects of the two tariffs are identical.

The case of an equivalent *ad valorem* and specific tariff is illustrated in figure 3. The ED under the specific tariff is denoted as  $ED_{\tau_0}$  and the equilibrium is as presented previously. The ED under the *ad valorem* tariff is denoted as  $ED_{\tau\%}$ .  $ED_{\tau\%}$  rotates downward along the  $Q_T$  axis because a tariff of rate 20%, for example, applied to a price of zero is still zero and the import volume would continue to be at the intercept. Consider, again, that the initial ED is of the form

$$ED = a - b \cdot P.$$

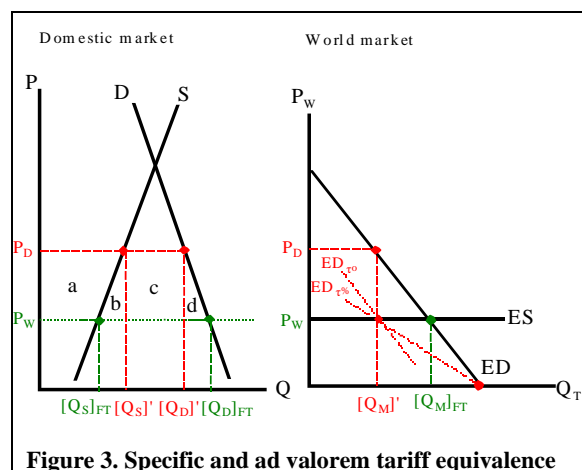


Figure 3. Specific and ad valorem tariff equivalence

The *ad valorem* tariff is applied to the price of the imported good. So,  $ED_{\tau\%}$  becomes

$$ED_{\tau\%} = a - b \cdot P \cdot (1 + \tau\%)$$

where  $\tau\% = 0,2$  if the tariff were 20%. In this case the value of the coefficient on price, b, increases as  $b' = b \cdot (1,2)$  resulting in

$$ED_{\tau\%} = a - b' \cdot P.$$

As the world price increases, the *ad valorem* tariff magnifies the price on the domestic market.

What ensures that the tariffs are equivalent is their effect on prices. In both cases the tariffs leave  $P_w$  unchanged because the tariff is by a small country.  $P_D$  can only be the same if/when  $P_D = P_w + \tau_0 = P_w \cdot (1 + \tau\%)$ . In such cases, the tax has the same effect on the domestic price.

In the situation presented in figure 3, both tariffs have the same effect on trade,  $P_w$  is unaffected, and the import volume is reduced to  $[Q_M]'$ . The economic effects are the

same as the tariff increases the domestic price to  $P_D$ , which results in the same production and consumption levels. This ensures that the welfare effects would be the same too as presented in table 1.

Historically, tariffs have tended to be the most commonly applied measure by governments to restrict imports. They are politically appealing because they are relatively easy to apply administratively and they protect local producers, support domestic production while providing the government tax revenue. However, the large-country case of a tariff, covered in exercise three, illustrates the more serious implications of such intervention and why international rules have imposed disciplines on their use.

A more direct means of restricting imports is through a quota which sets the upper limit on the volume of imports. Policymakers need to specify the allowable import volume. In addition, since the intent is to limit the volume entering, there needs to be an administrative method to control that only the specified volume of imports enters the country. If there are many source countries that supply imports, then a system of licensing is necessary to allocate the access to the domestic market by country and possibly by firm.

There are several ways in which a quota can be administered, and the licenses allocated. This ranges from the importing government giving away the license to market participants (importers or exporters) for free (or selling them for a nominal fee), or selling the licenses through an annual auction in a competitive market. In the latter case, the government would act as the auctioneer and the right to import would result in quota rents to the government.

In figure 4, the mechanics of a quota are presented. First, the government must specify the allowable volume that can be imported, i.e.,  $[Q_M]'$ . The ED under a quota,  $ED_q$ , is vertical at the allowable import volume,  $[Q_M]'$ , before it kinks at the point where it hits the initial ED curve. If fewer units than  $[Q_M]'$  enter the domestic market, then any government intervention would be unnecessary and  $ED_q$  would follow ED curve.

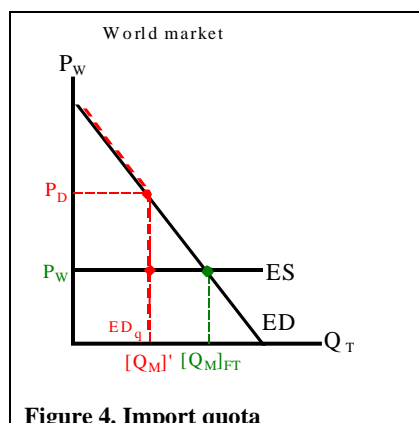


Figure 4. Import quota

Second, the government must announce the method by which the quota will be administered (and ensure that no more than  $[Q_M]'$  enters. Suppose that the right to import the quota volume is to be auctioned by the government competitively to all interested market participants. The maximum price that  $[Q_M]'$  could be sold for on the domestic market is the price that corresponds with the original ED curve,  $P_D$ . If the auction were truly competitive, then market participants would be willing to pay  $(P_D - P_W)$  for each unit imported, and the total quota rents would equal the bid value,  $(P_D - P_W) \cdot [Q_M]'$ .

Once again economists can consider the policy equivalence of a tariff and quota. If the quantity imported in figure 4 is the same as the right-hand side graph of the world market

in figure 3, then the quota would have exactly the same economic and trade effect on the domestic market in the left-hand side graph of the domestic market, and the welfare implications would be the same as in table 1. The only major difference is that the quota is more administratively challenging to apply because a licensing system is required and who gets the quota rents will also depend on how the quota is administered. In the example of a competitive auction by the government, the government would get the rents but this need not always be the case.

Finally, the case of an import subsidy is ignored because the import policy considered here is an import restriction. An import subsidy does the opposite, increasing the willingness of the country to import and shifting the ED curve outward, resulting in more imports. In reality, the import subsidy is rarely used. It requires government resources (to provide the subsidy). If the world price of a staple food crop was too high, then market access is limited and poor consumers could go hungry. An import subsidy, increasing the willingness and ability to import, would be a means to alleviate the problem. However, increasing access to imported food by lowering the cost of the good to domestic consumers, can be very expensive and beyond the government's budget. Thus, we normally associate addressing that economic problem with provision of food aid or with a rich exporting country subsidizing food exports instead.

The profile of such a country could be a developing country such as Egypt, where wheat for bread is an important staple food item. A program to subsidize wheat imports could result in large budgetary outlay for the government. Instead of an import subsidy, where the government's budgetary constraint prohibits this policy option, the country might seek food aid.

### Policy measures that affect exports

Trade measures aimed at affecting the willingness to export normally come in the form of promoting exports but can also involve restricting exports. Once one understands the economic implications of the measure, the objectives of the measure become clearer. Consider first an objective whose aim is to increase exports. This might be related to a government's export-led growth strategy. The government promote exports in a sector in which the country has a comparative advantage. The intention is to grow a sector by increasing foreign demand for the country's product(s). One means of doing this is through an export subsidy.

First, a definition. A subsidy involves a transfer from the government that results in a benefit to the recipient. In the case of an export subsidy, then, the transfer is from the government that is linked to some export performance measure and results in a benefit to the producer/exporter.

An export subsidy is a means to promote exports. To see the effect of a specific export subsidy (per unit) by a small country, figure 5 depicts the market of the exporting country and the world market at its border under free trade (FT). The world price sets the domestic price at  $P_W$ , and the quantity demanded in the domestic market is  $[Q_D]_{FT}$  and the quantity supplied by local firms is  $[Q_S]_{FT}$ . The surplus volume on the domestic market is disposed on the world market as exports equal to  $[Q_X]_{FT}$ .

The government intervention increases the willingness of the country to export, shifting out the ES curve to  $ES'$ . A per unit subsidy of  $s_0$  is transferred by the government to the exporter. In this small-country case, the world price is unaffected, but the only way to export more is by the subsidy given per unit exported. This effectively raises the domestic price equal to the amount of the per unit subsidy.

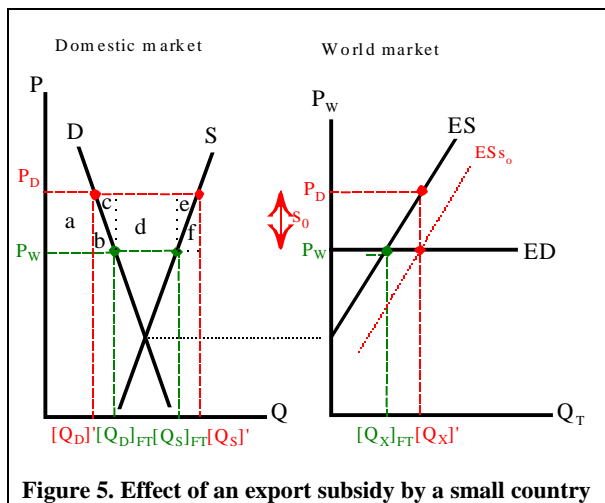


Figure 5. Effect of an export subsidy by a small country

The export subsidy is the government's means of increasing the country's willingness to export, i.e., a shift of the ES curve to the right. The subsidy is specific (per unit) and the initial ES is of the form

$$ES = c + d \cdot P$$

where  $c$  is a constant and  $d$  is related to the degree to which a change in price affects the quantity exported. The specific subsidy rate,  $s_0$ , is added to the price of the exported good once the good leaves the customs point at the border. The new ES,  $ES'$ , must now reflect that  $s_0$  is given to each unit exported. This results in

$$ES' = c + d \cdot [P + s_0]$$

The constant would be affected by the amount of the subsidy ( $c + d \cdot s_0$ ) but  $d \cdot P$  is unaffected, resulting in the following expression

$$ES' = c' + d \cdot P$$

where  $c' = (c + d \cdot s_0)$ .

In figure 5, the shift in ES to  $ES'$  is a downward parallel shift, reflecting that everywhere the difference between the curves is the amount of the subsidy,  $s_0$ . Note that the shift in ES does not affect the world price. This is the case of a small country, i.e., that its market is incapable of affecting  $P_w$ , and the country is a price taker on the international market. (This is why the ED curve is shown as horizontal because any change in ES leaves  $P_w$  unchanged.) Thus, the good leaves the port with a customs invoice showing the price of the good of  $P_w$ . The custom's official is instructed to provide a subsidy of  $s_0$  on each unit, raising the cost of each imported unit to  $P_D$ , the domestic price (i.e.,  $P_D = P_w + s_0$ ).

The welfare effects of the export subsidy are presented in table 2. The increase in the domestic price makes consumers worse off. The change in consumer surplus ( $\Delta CS$ ) is negative illustrating that consumers are taxed. By contrast, the increase in domestic price makes producers better off. The increased production allows for a larger surplus volume that is taken to the world market as exports. But this is only possible by the subsidy, a reward for those who export. The policy change in producer surplus ( $\Delta PS$ ) suggests that the policy supports producers and domestic production. The area  $(a+b)$  is the value that is lost by consumers but gained by producers. This is a redistribution of income from consumers to producers. The export subsidy implies a government outlay on each unit exported. The government bears the cost of the subsidy program which amounts to area  $(b+c+d+e+f) = s_0 \cdot [Q_x]'$  or  $(P_D - P_w) \cdot ([Q_s]' - [Q_D])$ .

Table 2. Welfare effects of a small country export subsidy

Welfare change	Area reflecting change
$\Delta CS =$	$-(a + b)$
$\Delta PS =$	$+(a + b + c + d + e)$
$\Delta G =$	$-(b + c + d + e + f)$
$\Delta NSW =$	$-(b + f)$

The negative change in net social welfare,  $\Delta NSW$ , reflects that the policy makes the country worse off on account of inefficiencies. In effect, the subsidy results in losses to domestic consumers who are asked to transfer the value of area  $(a+b)$  to producers in support, and the value of area  $(c+d+e)$  is transferred from government to producer-exporters. Areas  $(b + f)$  are the efficiency losses. The area  $(b)$  represents the DWL in consumption from distorting the domestic price to consumers and the area  $(f)$  is the DWL in production, representing the efficiency loss from allocating more resources to production in the export sector despite the increased costs relative to the world market.

Just as with the case of specific and *ad valorem* tariff equivalence, there is equivalence in specific and *ad valorem* export subsidies. In figure 6, the *ad valorem* export subsidy equivalent to the specific export subsidy presented in figure 5 is shown.

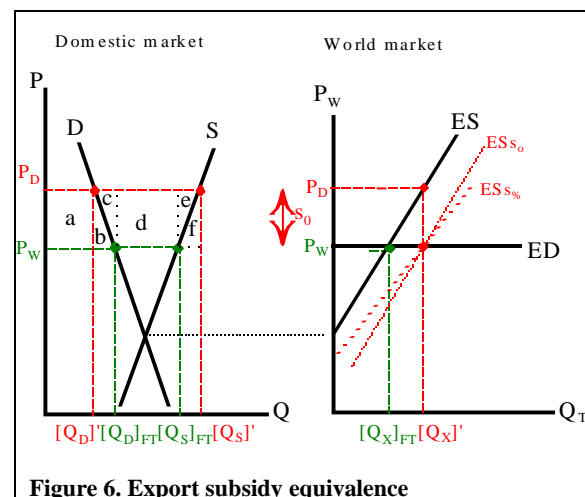


Figure 6. Export subsidy equivalence

The *ad valorem* export subsidy is applied to the price of the exported good. So,  $ES_{\tau\%}$  becomes

$$ES_{\tau\%} = c + d \cdot P \cdot (1 + s_{\%})$$

where  $s_{\%} = 0,2$  if the subsidy were 20% of the export price. In this case the value of the coefficient on price,  $d$ , increases as  $d' = d \cdot (1,2)$  resulting in

$$ES_{s_{\%}} = c + d' \cdot P.$$

As the world price increases, the *ad valorem* export subsidy magnifies the price on the domestic market.

What ensures that the export subsidy programs are equivalent is their effect on prices. In both cases the export subsidy leaves  $P_w$  unchanged because the export subsidy is by a small country.  $P_D$  can only be the same if/when  $P_D = P_w + s_0 = P_w \cdot (1 + s_{\%})$ . In such cases, the subsidy has the same effect on the domestic price.

In the situation presented in figure 6, both subsidies have the same effect on trade,  $P_w$  is unaffected, and the export volume is increased to  $[Q_x]'$ . The economic effects are the same as the subsidy increases the domestic price to  $P_D$ , which results in the same production and consumption levels. This ensures that the welfare effects would be the same too as presented in table 2.

In some cases, countries choose to restrict exports. This seems counterintuitive as many see trade as a game won by the player that exports the most and imports the least. So, in this light, restricting exports is seen as self-defeating. Again, understanding the economics sheds light on the strategic motivation of the policy. Rather than subsidizing exports, the policy is aimed at taxing exports.

In figure 7, the leftward shift in ES to ES' reflects a reduction in the country's willingness to export a good in which it has a comparative advantage. Taking fewer units to the world market means there is relatively more of the good on the domestic market, lowering the price of good at home relative to the world market. The small country case again implies that a change in ES leaves  $P_w$  unchanged. Thus, being a price taker, the country's exporters must deduct the specific tax from  $P_w$ , resulting in a lower domestic price, i.e.,  $P_w - \tau_0 = P_D$ .

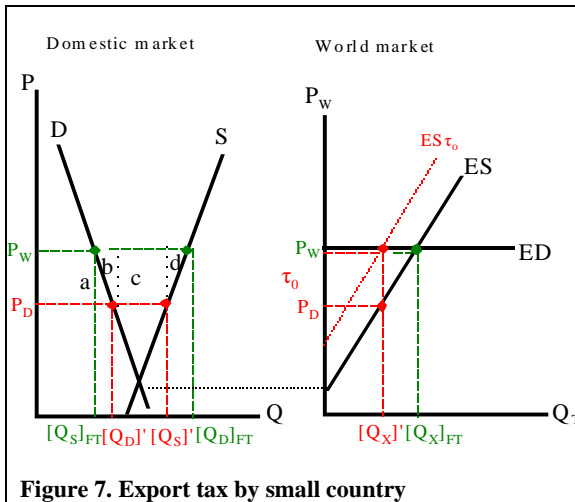


Figure 7. Export tax by small country

In this case the export tax is subtracted from the world price so that ES' is derived as

$$ES' = c + b \cdot [P - \tau_0].$$

The constant would be affected by the amount of the tax ( $c - d \cdot \tau_0$ ) but  $d \cdot P$  is unaffected, resulting in the following expression

$$ES' = c' + d \cdot P$$

where  $c' = (c - d \cdot \tau_0)$ . Because  $c'$  is less than  $c$ , the ES curve is a parallel shift to the left. The domestic price falls and producers respond by producing fewer units (a decrease in quantity supplied) while the lower price encourages consumption (an increase in quantity demanded). The exportable surplus is reduced. The welfare analysis will illustrate the winners and losers of this policy.

The welfare effects of the export tax are presented in table 3. The decrease in the domestic price makes consumers better off. The  $\Delta CS$  is positive, area (a), implying that consumers are supported. By contrast, the decrease in domestic price makes producers worse off and they respond by reducing production. The  $\Delta PS$  shows a loss of income equal to area (a+b+c+d). The area (a) is a transfer from producers to consumers.

Because the policy involves a tax, the government collects the value of area (c). The tax revenue to the government amounts to  $\tau_0 \cdot [Q_x]'$  or  $(P_w - P_D) \cdot ([Q_s]' - [Q_D]')$ . Thus, area (c) is a transfer from producers to the government and  $\Delta G$  is positive. However, the loss to producers is bigger than the gains to consumers and the government. The  $\Delta NSW$  is equal to area (b+d), the DWLs in consumption and production, respectively.

Table 3. Welfare effects of a small country export subsidy

Welfare change	Area reflecting change
$\Delta CS =$	+ (a)
$\Delta PS =$	- (a + b + c + d)
$\Delta G =$	+ (c)
$\Delta NSW =$	- (b + d)

This begs the question as to the government's motivation for the policy. The redistribution of income is from producers to consumers and society overall (i.e., government). Suppose this good was a staple food product. If the world price is high and a large share of production is exported, then food prices for poorer members of society will have less access to food. By taxing exports, government discourages exports, leaving relatively more of the product at home and lowers the domestic price, increasing access to food by poor members of society. While this sounds like an appropriate policy action, it also discourages production, potentially compounding the problem in the future as producers can shift production to other products.

Normally, income is redistributed from the wealthy to the poor. In the absence of an effective income tax scheme, a government might instead choose to tax exports, the income of the wealthy, and redistribute to the poor. In the welfare analysis of table 3, the producer-exporters might be the wealthier members of society and the beneficiaries of the program are the consumers who are poorer members of society. If production of cash crops are the source of wealth in the economy, then taxing the agricultural sector to support the urban areas of society could also be the motivation behind the redistribution of income.

An export quota restricting the volume of exports could have an equivalent effect as an export tax. Again, the quota is administratively more complex because the government sets the legal maximum volume that can be exported,  $Q_x'$ , and some licensing system must be arranged to allocate the right to export. The  $ES_q$  curve in figure 8 is ES under an export quota. It turns vertical at the legal maximum. For any volumes exported less than the legal limit, the new ES follows along the initial ES curve. If the quota is binding at  $P_D$ , then the difference ( $P_w - P_D$ ) would be the specific export tax equivalent of the quota. The *ad valorem* export tax equivalent, in percentage terms, would be equivalent to  $[(P_D - P_w)/P_w] \cdot 100\%$ .

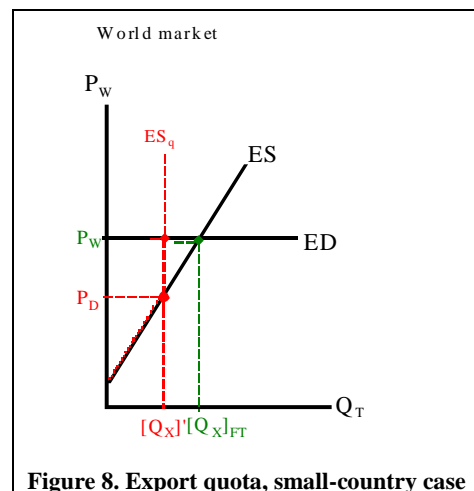


Figure 8. Export quota, small-country case

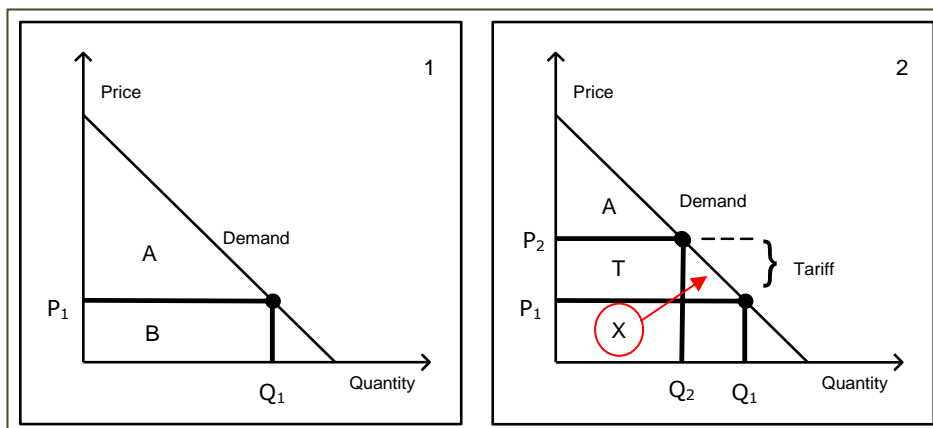
The articles that follow provide some additional theory on the costs and benefits of free trade. Other articles provide evidence of the effects of trade policy and country-specific motivations for the use of trade policy tools.

## WELFARE ANALYSIS: THE EFFECT OF PROTECTIONISM

Economists favouring free trade feel embarrassed when asked to quantify its benefits: the gains can look small. Perhaps they are missing something. The gains from trade nearly always look surprisingly small when you try to calculate them – too small, you might say, to justify the fuss that economists make about free trade. Paul Romer, of the University of California at Berkeley, suggests an interesting reason why all such calculations may be wrong – and why free trade may be even more important than economists’ instincts tell them it is.<sup>1</sup> To understand a simplified version of Mr Romer’s argument, it is unfortunately necessary to look closely at the two panels in the diagram [1].

Chart 1 shows a simple demand line for a hypothetical good, with price plotted on the vertical axis and quantity on the horizontal. The line slopes down: that is, the quantity demanded rises as the price falls. The point of equilibrium is at a price of  $P_1$  and a quantity of  $Q_1$ . What matters is the interpretation one gives to the area under the demand line. The area marked B is simply price multiplied by quantity – the producer’s revenue or, in other words, the market’s valuation of the goods sold. This is not the same as the value of  $Q_1$  to society. The demand line says that even at some very high price, a few people would have bought the good. For these people, the fact that they have to pay only  $P_1$  is a windfall gain: they enjoy a surplus equal to the difference between  $P_1$  and the price they would have been willing to pay. The area marked A, in effect, adds up all those gains. Economists call it the consumer or social surplus. It is the net gain to society from the sale of  $Q_1$  of the good [1].

Now suppose that the good is an import, and that the government slaps a tariff on it. This is shown in chart 2. The price rises by the amount of the tariff, from  $P_1$  to  $P_2$ ; the quantity demanded falls from  $Q_1$  to  $Q_2$ . More important, the social surplus A shrinks. That dwindling of the surplus comes in two parts. The larger part, area T, is the tariff multiplied by the quantity demanded – that is, the tariff revenue collected by the government. So some of the original surplus, once enjoyed by consumers, is captured by the government for use (one hopes) on their behalf. In that sense, the area T is not lost to the economy. The other part of the forgone surplus – the triangle marked X and indicated by the red arrow – has simply disappeared. Economists call X a “deadweight loss” (DWL). Sometimes it is also called a Harberger triangle (after Arnold Harberger, who did work in the 1950s on measuring this loss). The estimates of the costs of protection, or of the DWL due to taxation, are the estimates of the size of those little triangles [1].



What’s wrong with this method of calculating the loss? Mr Romer makes a simple but profound point. The conventional analysis implicitly assumes that the set of goods is both fixed and complete. Prices in an economy may be changed by government intervention, and quantities will change as a result – but the list of goods that are traded at some price, in some quantity, will not change. (In just the same way, orthodox economics implicitly thinks of economic growth as making more of the things we already make, not of making entirely new things.) On this assumption, charts 1 and 2 make sense. Small changes in prices and quantities – changes at the margin – are what matter, and the X-triangle captures all of the loss from import barriers. Once you relax that assumption, the calculation is overturned [1].

Suppose, as seems reasonable, that introducing a new good to a market entails a fixed cost. Then some substantial amount of revenue will be required for the good to be sold at all. Reducing demand a little, a tariff may cause the good never to appear. Modern economics has devoted a lot of effort to theorising about these and other “discontinuities.” However, the implications, Mr Romer argues, have not been properly taken on board. If a tariff (or other policy) prevents a new good ever appearing, the loss is not the X-triangle, but the entire social surplus, A in chart 1 [1].

To illustrate, the paper sets out a little model of an economy, which uses labour and many different kinds of imported capital to produce goods. With fixed costs of the sort just described, tariffs reduce the variety of capital available to domestic producers. After making some not-wildly-implausible guesses for the parameters in his model (the elasticity of demand for capital, and what have you), Mr Romer compares the cost of protection in a world with a fixed list of capital inputs and in a world with a changeable list of capital inputs. In the first (orthodox) case, a tariff of 10% reduces national income by 1%: hardly earth-shattering. In the second case the same tariff reduces national income by 20% [1].

For developing countries especially, the implicit assumption of a fixed list of goods (including capital goods) is plainly wrong. Developing countries do not use smaller amounts of the full range of goods available in the rich countries; they use smaller amounts of a much smaller range. According to Mr Romer, “a rough guide to the welfare losses in any country will ... be the difference between the range of productive inputs that are available there and the range of productive inputs that could be put to use there” [1].

Seen this way, the costs of bad government in the third world – meaning not just high tariffs, but distortions and implicit taxes of every kind – look vast. So, economists have been right, without really knowing why, to care so passionately about trade.

<sup>1</sup> “New Goods, Old Theory, and the Welfare Costs of Trade Restrictions”. *Journal of Development Economics*. 1994

## CASES OF TRADE POLICY

WTO Agreements spell out the rules and disciplines on the use of trade policy tools (mostly tariffs), and countries were required to commit to maximum tariff rates (i.e., bound rates) and to reduce the bound rates over time. Since developed economies have negotiated tariff reductions since the 1940s on industrial goods, the current bound rates average less than 5% in *ad valorem* terms. For agricultural goods, which were only subjected to disciplines since the creation of the WTO in 1995, there are still some tariff lines with rates that exceed 100%. These high rates only apply on very sensitive sub-sectors, and average bound rates across all agricultural goods average closer to 20%.

For developing countries, binding rates was also required, but not all countries were not pushed particularly hard. For example, Nigeria negotiated bound rates of 100% across all agricultural goods (despite not requiring that level of protection, rarely applying rates higher than 20%). For industrial goods, developing countries were allowed to choose whether to establish bound rates.

### Tariffs and sanctions: Trump administration's trade war

"We are in a trade war," said Wilbur Ross, US president Trump's commerce secretary, in 2017. Trading partners with which the US had a "significant" trade deficit in goods in 2016 were to be shamed if the reasons for that deficit were "unfair". Mr Trump promised to "take necessary and lawful action" [2].

In 2018, the US initiated a trade war on various fronts against US allies and rivals (i.e., China) alike. The fronts are summarized as restrictions on imports of: (1) solar panels and washing machines; (2) steel and aluminium; (3) products for which the US accused foreigners of unfair trade practices related to technology and intellectual property theft; (4) automobiles; and (5) semiconductors. Each front called for different trade measures, e.g., import tariffs and quotas and non-tariff measures and had different justifications such as national security, "unfair" trade practices by partners resulting in injury to US industry, or theft of intellectual property (www.piie.com).

Top of the naughty list was China, which accounted for almost half of the US's trade deficit in goods. Mr Ross had his eyes on its state-owned enterprises, excess supply of steel and aluminium, and its barriers to US car exports. More and more, the thinking was that Chinese imports were cutting the number of US manufacturing jobs [2].

Many in the Trump administration were veterans of trade battles with Japan in the 1980s. Then, surging car imports prompted union members to stage sledgehammer smashings of Japanese cars. US steelmakers complained about cheap steel imports, and the semiconductor industry moaned about an unfairly closed Japanese market. Then, as now, industry-wide tariffs and quotas violated international trade commitments but policy responses are allowed if the domestic industry could show it was being "unfairly injured". The Trump administration was keen to follow this course [2].

The biggest front was that with China. The US raised tariffs on Chinese goods above its bound rate. This resulted in tit-for-tat tariff escalation that increased or threatened to increase rates from 10% to up to 25% on up to \$200bn worth of goods imported from China (based on import values from 2017). China responded with tariff increases of 5 to 25% on US imports of up to \$60bn (based on values of 2017). A deal reached in 2019 between the US and China prevented further escalation over \$250bn in trade on rates of 30%. The "Phase One Deal" called for China importing

an additional \$200bn in US exports to avoid the further tariff increases (www.piie.com). By the end of 2021, China still had only managed to purchase 57% of the total commitment to import more from the US [3].

US tariffs on imports from China remain higher than when the trade war began in 2018. It is hard to overstate how big a shock this was to the world's biggest bilateral trading relationship. Pablo Fajgelbaum of Princeton University and Amit Khandelwal of Columbia University calculate that the tariffs were applied to even more trade as a share of US GDP than were the notorious Smoot-Hawley levies of 1930, which led to a spiral of international retaliation and may have worsened the Depression. The Sino-American trade war precipitated no such disaster, but other measures were designed to disrupt international supply chains, especially those with China at the center [3]. The Biden administration has kept the higher tariffs and continued with other non-tariff barriers.

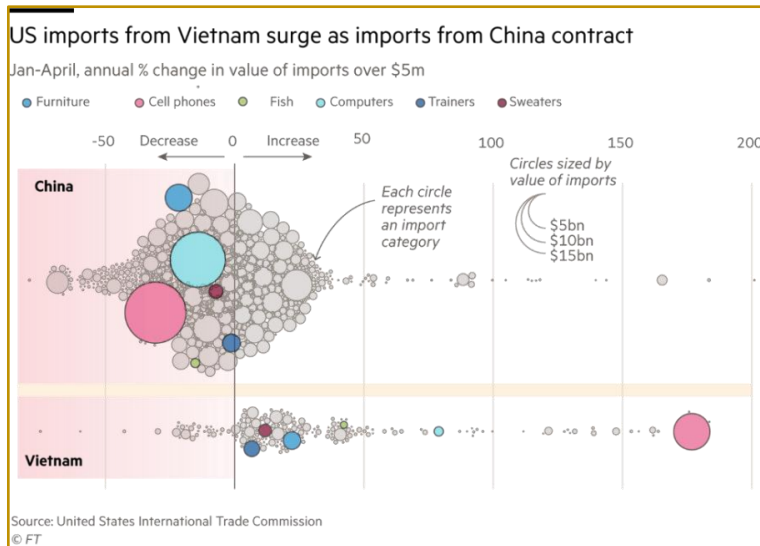
President Trump lived up to his claim of being a "tariff man", challenging allies in Europe and Canada with tariffs on their steel and aluminium, both in the name of US national security. His team succeeded at bullying to secure concessions, and using threats to push along some deals, securing narrow agreements with S. Korean and Japan, as well as the broader USMCA with Mexico and Canada. However, the administration did not seek to solve any of the structural problems afflicting the global trading system, including the distorting effects of China's industrial subsidies on international markets [4].

US tariffs were also intended to encourage "reshoring", the relocation of manufacturing back home. Yet trade friction depressed business investment in the US, suggests research by Mary Amiti of the Federal Reserve Bank of New York and others. The share prices of companies trading with China fared especially badly after tariff announcements. This reflected lower returns to capital and, by extension, weaker incentives to invest. Aaron Flaaen and Justin Pierce of the Federal Reserve Board estimate that exposure to higher tariffs was associated with a decline in US manufacturing employment of 1.4%. The burden of higher import costs and retaliatory levies outweighed the benefits of being sheltered from foreign competition [3].

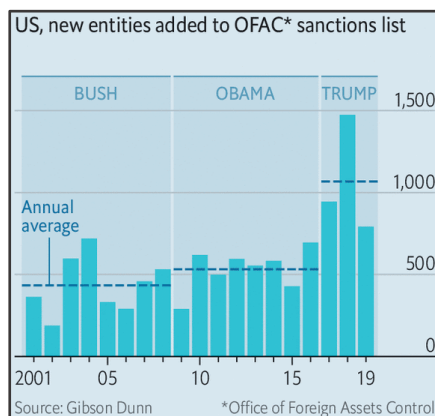
The trade war has been constructive in one respect, however. The US's imports from China were fractionally lower than before it implemented tariffs. By contrast, its imports from Vietnam have doubled (see chart, US imports from Vietnam [5]), and those from Mexico have risen by 20% [3]. Vietnam benefits because it sells many of the products hit by the tariffs on China's exports [5]. Viewed narrowly, this may be a sign that trade is being diverted from more efficient producers in China to slightly less efficient ones. But as a matter of business strategy, one of the lessons of the supply-chain snarls of the during covid (and Russia's invasion of Ukraine) is the danger of over-reliance on a single source. US firms can thank the trade war for getting them started on the messy business of rethinking their supply chains. The trajectory of Sino-American relations suggests they have every reason to hasten the shift [3].

The Biden administration instead talks of "friend-shoring", strengthening trade with allies to steer it away from China. However, this strategy tends to clash with other aspects of US policy that affects trade, e.g., "buy-America" programs, or industrial policy that offers production subsidies for any firms that locate and produce in the US.

"Maximum pressure", as Mr Trump called it, included the use of sanctions. In the administration's first three years, the Treasury Department added an average of 1,070 names a year to its main sanctions list (see chart, sanctions list),



compared with 533 under Barack Obama and 435 under George Bush. More than 20% of the 8,600 entries on the list were linked to Iran and the four Arab countries where it wields the most influence: Iraq, Lebanon, Syria and Yemen [6].



Sanctions may be an alluring tool for presidents. They are inexpensive, bloodless and largely up to executive discretion. But they often do not work. Sanctions can be effective when they have broad international support, achievable demands and are targeted at firms and people that need to trade and travel [6].

Mr Trump's maximum-pressure campaign, however, fulfilled none of these criteria. For a start, many of his sanctions were unilateral, and some began to fray [6]. Under the Biden administration, sanctions are coordinated with allies and aim at containing China through decoupling supply chains, including applying export restrictions on technology and products that contain US intellectual property.

#### Export restrictions: Argentine taxes and bans

In 2005, Argentina's farm products accounted for 80% of the country's foreign-exchange earnings and export taxes equalled to 6% of government revenue. Two products in particular, soyabeans and beef, are the main contributors. The farmers complain that interfering governments risk killing the golden goose [7].

Argentine farming commands formidable competitive advantages: the Pampas contain some of the world's best farmland; the Paraná river provides low-cost transport; and for entrepreneurial reasons. Take soyabeans: in the 1990s, farmers were quick to innovate, adopting genetically modified seeds and no-till planting. Partly by allowing the use of cheaper, poorer land, such methods cut average costs by half in a decade. Some \$700m was invested in efficient,

modern processing mills to turn soyabeans into flour and oil. The investment was well-timed. Chinese and Indian demand for animal feed boosted the price of soyabeans. According to Pablo Adreani of AgriPAC, a consultancy, a typical hectare's worth of soya costs around \$300, and sold for about \$625 in 2006. The government took a hefty 23.5% of soya revenues in export taxes—a total of \$1.9 billion in 2005. Yet even after taxes, profit margins approached 40% [7].

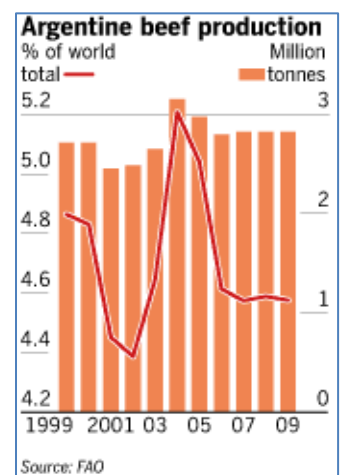
Beef farmers hoped for a similar bonanza. Farmers switched 7m hectares of land from cattle to soyabeans during 1995-2005, but beef production still rose from 2.5m tonnes in 2001 to 3.1m tonnes in 2005 (see chart, beef production) [8]. An outbreak of foot-and-mouth disease in

Brazil in 2005 disabled a rival exporter, winning Argentine exports new markets [7]. Exports doubled. Argentine beef exports hit a record in 2005 of 771,427 tonnes [8].

That in turn caused beef prices to rise at home in 2005 (see chart, beef industry). No Argentine meal is complete without meat, so then President Néstor Kirchner ordered "voluntary" price controls, taking aim at beef producers. After tripling the export tax on beef to 15%, he later imposed a near-total ban on exports [7].

Prices rose again in 2006 and to shield consumers from higher prices, Argentina banned beef exports in March 2006 for 180 days and enforced restrictions.

Farmers responded with a strike, briefly withholding their animals from Liniers, the vast cattle market in Buenos Aires. The export ban cut prices at Liniers by 30%. But butchers and supermarkets only cut theirs by about 7.5%, pocketing the difference [7].



A national dispute was triggered by the government's decision in March 2008 to introduce a new sliding scale of export taxes: the levy on soyabeans rose to 40%, from 27% in 2007, slashing profit margins. Moreover, the scheme set a virtual price ceiling: if the price went over \$600 a tonne (which was at \$495), the government would pocket 95% of the proceeds thereafter. That brought trading in agricultural futures to a halt. The farmers responded with strikes and roadblocks. In subsequent talks, the government offered sweeteners for small-scale farmers, but refused to reverse the increase [9].



In 2018 China opened its market to Argentine beef, giving the green light to export beef to the world's most populous nation, where meat consumption is taking off as the country becomes richer. Trade boomed. However, in 2021 Argentina again slapped a beef-export ban on itself. The logic was the same, if domestic meat prices rise, exports must be stopped to allow more for Argentine consumers. The ban did little to curb inflation, which in 2023 was nearly 100% year on year, mostly caused by the government's money-printing. But the export ban gored Argentine farmers and infuriated their Chinese customers. In 2023 the total ban on beef exports has gone, but bans remain on several popular cuts of beef, such as short ribs. Crops were still whacked with export taxes ranging from 7% (for sunflower oil) to a crushing 33% for soya [10].

#### Export restrictions: India's cotton sector

India's cotton industry is integrated with global production chains. Thus, a decision in March 2012 by the country's commerce ministry to ban exports sent markets around the world into a tizzy. Derivative prices leapt on New York's trading floors. Panicky Y-front makers the world over worried if their contracts were void. Excited stockbrokers in Thailand told their clients to buy the shares of polyester firms. India, after all, is the world's second-largest exporter of cotton, after the US [11].

The commerce ministry worried that short-term export commitments were more than India could comfortably meet. It feared a spike in domestic cotton prices, followed by hoarding. This would hurt India's textiles industry, a huge employer. The industry uses cotton as a raw material, a sector not in the best financial health. India had temporarily banned cotton exports in 2010 in response to similar concerns [11].

The world cotton market rocked in 2011, with supply blips in some countries and high demand (partly from China) pushing global prices to their highest since the US civil war. After years of declining raw-material prices, clothes firms such as Gap announced profit warnings and saw their shares whacked. [11].

Prices collapsed in mid-2011, but after a roller-coaster ride everyone was jittery. China stockpiled a mountain of cotton, presumably to insulate its textile makers from shocks. India in turn worried that its own surplus was being whisked away to create a safety buffer for the Middle Kingdom. Hence the ban [11].

A vicious circle of price rises, stockpiling and export bans does not make sense in the medium term for any commodity, whether cotton, onions or iron ore. It erodes confidence in supply chains and may dent overall production. Behaviour that may be rational for individual actors can cause chaos if everyone copies it. No one expects a nation to act for the common good, but the ban was unlikely to be in India's own narrow interests [11].

Trying to keep prices low favours textile makers but is bad for farmers who grow the stuff. India's agriculture minister says he was not consulted about the ban. Narendra Modi, the powerful chief minister of Gujarat, a state in west India, wrote to the then prime minister, Manmohan Singh, that the ban was anti-farmer [11].

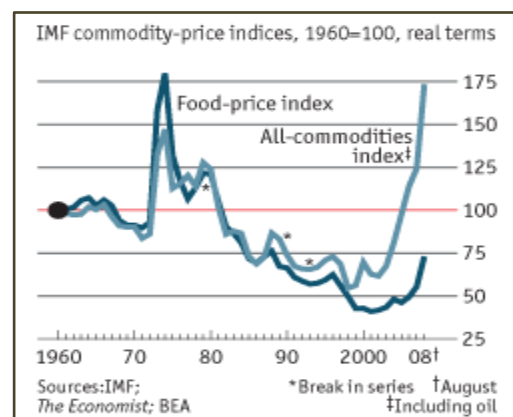
However, there may be damage to India's reputation as a reliable supplier. As the news of the ban came out Australia's agriculture minister had just launched a report predicting that Australia would double its cotton exports between 2010 and 2013. His view on India's ban? "It's an opportunity" [11].

#### Export bans in response to commodity price volatility

In agriculture emerging governments restricted supply, aggravating the problems caused by demand in the rich world. Panicked by rising food prices in 2007, more than 30 governments, from Ukraine to China, introduced export restrictions for farm produce. This cut the supply of food on world markets, sending prices even higher [12].

Rice was worst hit because only 4% of its global crop is traded across borders, compared with 13% for maize and 19% for wheat. On news of bans in China, Vietnam, Cambodia, India and Egypt (which between them grew 40% of world rice exports in 2007), the price tripled within a few weeks [12].

In this panicked environment, futures prices for all food commodities shot up (see chart, price indices). At times investment funds may have exacerbated fears about scarcity. For food, as for fuel, the main reason for the price rises of the 2000s was unexpected demand growth, often compounded by government distortions [12].



Contrary to what the critics of speculation suppose, the main task of futures markets is to signal these fundamentals to firms and households, speeding up their adjustment to the changing balance of supply and demand for physical commodities. In the absence of such signals, it would take even bigger and more extended swings in the prices of physical commodities to bring supply and demand into balance [12].

#### Export restrictions: Russia, Ukraine and Indonesia

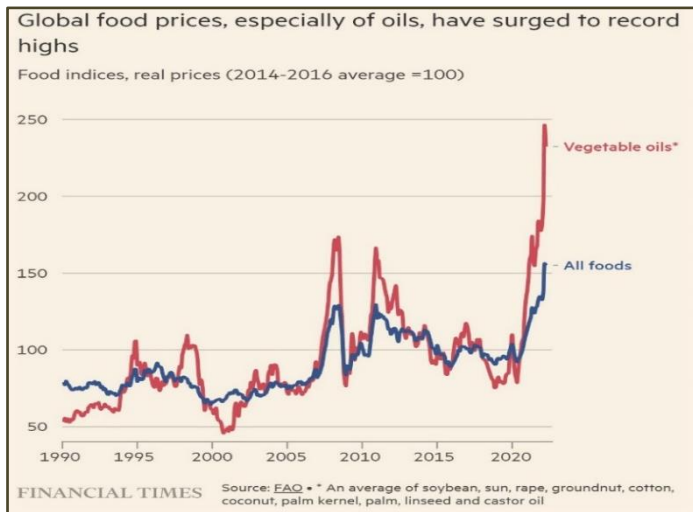
Rising protectionism exacerbated the chaos in global food markets brought on by the war in Ukraine, with governments clamping down on exports of staples including grains, cooking oil and pulses. Soaring food prices and, in some cases, the threat of social unrest have led to an increase in exporters banning overseas sales or putting in place other restrictions such as taxes or quotas (see chart, export restrictions). These protectionist steps have only driven up the food import bill further for countries dependent on international markets for important food commodities, hitting some of the poorest in the world [13].

Beata Javorcik, chief economist at the European Bank for Reconstruction and Development, warned protectionism would only artificially boost prices, already at record levels, fuelling global food insecurity and increasing global poverty rates. Before the invasion of Ukraine, droughts and Covid-19 labour restrictions drove international food prices higher. The war led to 23 countries turning to food protectionism, according to the US think-tank International Food Policy Research Institute (IFPRI). The share of restricted products in the world food trade measured in calories was 17%, the same level seen during the 2007-08

food and energy crisis, said the IFPRI. Indonesia in April 2022 announced an export ban, stopping overseas sales of palm oil. The commodity is the most traded vegetable oil in the world, used in everything from cakes to cosmetics [13].



Jakarta's decision was another blow for consumers already struggling with a jump in cooking prices because of the invasion of Ukraine, a leading sunflower oil supplier (see chart, global food prices). The move by the leading palm oil exporter meant that, together with Ukrainian and Russian sunflower oil, more than 40% of supplies on the international vegetable oil market became difficult to access. Supermarkets in the EU and UK even rationed cooking oil as shoppers rushed to stockpile [13].



Jakarta's first-ever blanket ban on exports of the edible oil, implemented as the country prepared for feasting at the end of Ramadan, appears to have paid off politically. After a rapid decline, approval ratings for President Joko Widodo climbed 4 percentage points to 64% in a survey by pollster Indikator. But as the ban staved off discontent in Indonesia, it stoked chaos elsewhere. Pakistan, already contending with an inflation crisis, formed an official task force to address its palm oil supplies. Islamabad sought to reassure the public by seeking guarantees from Indonesian officials that Jakarta would resume shipments [13].

Although agricultural commodity traders do not expect the ban to last long, some warned that the unexpected move affected Indonesia's reputation as a place to do business. One palm oil trader in Singapore said: "I will diversify my exposure [away from Indonesia] a bit more going forward [13]."

David Laborde, a senior research fellow at IFPRI, said the export restrictions had created a domino effect, reducing world supply to those who needed it. "You end up undermining the world trade system," he said, adding that by limiting access to international markets, restrictions also reduced incentives for farmers to grow crops. "You hurt your own farming system and your own food supplies [13]."

China's export quotas on rare earth elements: large-country case

In March 2012 the US, EU and Japan filed a complaint at the WTO against China over its export restrictions on rare earths [14]. Rare earths are used in manufacturing sophisticated products including electronic devices, flat-screen monitors, electric car batteries, catalytic converters, wind turbines and aerospace alloys and other high-tech products ranging from computer chips, phones and televisions to the lasers that guide missiles and sophisticated radar systems [15][16][17]. Wind turbines and electric vehicles, for example, use two rare earth elements, dysprosium and neodymium, to make the magnets that are essential to their generators and motors [18].

China was (and remains) the world's largest producer (and for some of the elements such as dysprosium its market share was nearly 100%) of rare earths at the time of the dispute [19]. Although plentiful in nature, extracting them is difficult, costly and time-consuming and dirty, i.e., extraction produces highly toxic by-products [16][19]. Fears were growing about the political effects of the clout that China's government had over production and export.

In 2003 some 85,000 tonnes were shipped globally, valued at \$500m. By 2010 world sales totaled about 125,000 tonnes, worth nearly \$2 billion, and demand was forecast to increase by around two-thirds by 2015 [19]. However, in September 2010 Japan claimed that China blocked shipments of rare earths to Japan as a move linked to a bitter diplomatic dispute over contested islands in the East China Sea (when a Chinese fisherman was arrested in disputed territorial waters) [20].

In 2007, China had an export quota set at 60,000 tonnes, about half of its production (see chart, "Rare earths") [14]. The quota volume was decreased in each year thereafter, until arriving at a volume of 30,258 tonnes in 2010, 15,000-20,000 tonnes less than the consumption by non-Chinese



producers said Judith Chegwiddden of Roskill Information Services, a consultancy [17].

China's position on the world market, in world production and trade, during 2007-12, is clearly depicted. Production levels decreased as the export quota volumes tightened, and international prices soared, peaking in 2011. Global rare-earth prices increased sharply—tenfold in some cases—as the export quota was cut by 40% from 2009 to 2010 [14].

China cited environmental concerns as the reason for the export quotas. There is a strong environmental argument for restricting the supply of rare earths. Rare earths are dangerous and costly to extract responsibly; China's techniques were anything but. It had deposits in two regions: Inner Mongolia, where rare earths are a by-product of iron-ore production, and in the south of the country, where they are found in various clays. Although the extraction process in each location differed, they shared a need for highly toxic chemicals [17][21].

However, because the spike in rare-earth prices seemed not to have taken hold within China, many saw another, more nefarious calculation behind the export quotas. It restricted exports to induce foreign technology firms to locate manufacturing operations inside China before non-Chinese mines were on stream and its market controls ebbed [16][19].

China also had other means of retaining control of the market besides the export quotas. Controlling the supply of rare earths meant that China could also control their processing and use in finished goods, which would fit a broader effort to drive its manufacturers from low- to high-value goods. It had the capacity to refine rare earths, whereas most rich countries did not, so it could exercise control downstream [17][21]. China translated its control of the raw materials into dominance of the valuable next steps: turning oxides into metals and metals into products [22].

After 2012, China eased the quota restrictions, but after the WTO case was lost in 2013 China dropped its decade-old quotas limiting exports of strategically important minerals, which led some countries to reduce their reliance on Chinese supplies. Hence, the policy proved to be of little value for Beijing as many countries found other sources of rare earths [23].

#### TRADE IMPLICATIONS OF CONSUMERS' DECISIONS AND TRANSPORT COSTS

##### Consumer decisions

There is mounting evidence that in the West, the government is not the only force capable of shaping trade policy. Increasingly, key decisions are being made by the companies that import products – and by the consumers on whom all trade ultimately depends. When consumers base purchase decisions on a human rights record, for example, there's nothing a presidential veto can do to stop them [24].

What is new are not the almost limitless permutations of terrible conditions in which people are forced to work in many developing countries. What's changed is that human rights concerns are a major marketing issue and tool for manufacturers. In an era when firms must work harder to sell their products, anything turning a consumer off has to be avoided at all costs. Public awareness that poorly clothed, undernourished children in semi-slavery produced a toy will not help sales [24].

To survive, a firm has to develop a social conscience. There have always been a few companies, such as Levi Strauss and the UK's Marks & Spencer, which operated on the belief that better working conditions produce better products. They understood that contented developing-country workers work more efficiently long before the phrase "social conscience" came about. I first noticed the trend when Levi Strauss announced that it would stop doing business in China. Levi's gave up not only a good source of quality production, but potentially the most important sales market in Asia. China lost the orders of the largest garment manufacturer in the US [24].

Or take Burma, where orders for exported garments produced by Burmese factories had fallen by two-thirds in the early 1990s. Companies like Eddie Bauer, Liz Clairborne and Federated Department Stores, which in the past found some of their best bargains in Burma, discovered that in today's socially conscious marketplace these products are less competitive. You may ask, "What does Aung San Suu Kyi have to do with fashion?" The latest answer is, "A lot" [24].

For years human rights groups lobbied Congress to tie US trade policy to social conditions in exporting countries. In almost every instance they were defeated by a chorus of large US companies engaged in buying products from and investing capital in the targeted countries. These included mass-market importers, which consistently claimed that cancellation of China's "Most Favored Nation" status would lead to higher retail prices and a loss of US jobs [24].

The human rights groups' mistake was not the fight, but its venue. Ultimately, decisions of whether to buy and whom to buy from are made by the consumer. And as long as consumers remain indifferent to the plight of children in India, of Buddhists in Tibet, or everyone in Burma, importers are free to omit these factors from their purchasing decisions. This is no longer true [24].

More and more importers now consider safety and other conditions in Asian factories. Few can afford not to, because all it takes is one disaster to damage a label's reputation. Manufacturers in countries where human rights activists are known and internationally respected are the most vulnerable [24].

It is only natural that importers of younger fashion should have been the first to make adjustments. They more aware of trends in social attitudes, and sufficiently fickle and product disloyal to allow human rights in Tibet or in Burma to influence their choice of blue jeans brands. Furthermore, the international garment industry is very flexible. If one source country becomes a public relations headache, production can be shifted to another site in a matter of weeks [24].

Importers of durable goods do not have these advantages. Moreover, compared with importers of fashion goods, they are far less in touch with their customers. As a result, the auto makers now vying with each other for production facilities in China may not see what's coming around the next turn [24].

##### Infrastructure and transport costs

Trucking beer in Africa is a lesson in development economics. Developing country infrastructure can truly be ghastly. People who live and work in countries with rotten infrastructure must cope with the consequences every day. These are as profound as they are malign. To investigate how bad roads make life harder, this correspondent hitched a ride on a beer truck in Cameroon [25].

The plan was to carry 1,600 crates of drinks from the factory in Douala where they were brewed to Bertoua, a small town in Cameroon's southeastern rainforest (see chart, map of Cameroon). As the crow flies, this is less than 500km (313 miles). On an optimistic schedule, it should have taken 20 hours, including an overnight rest. It took four days. We were stopped at 47 roadblocks (police checks to enforce real and imagined regulations, and from expected and unexpected delays). When the truck did arrive, it was carrying only two-thirds of its original load [25].



Even without the roadblocks, the journey would have been a slog. Most Cameroonian roads are unpaved: long stretches of rutty red soil with sheer ditches on either side. Dirt roads are fine so long as it does not rain, but the country is largely rainforest, where it rains often and hard. Our road was rendered impassable by rain three times, causing delays of up to four hours [25].

Cameroonian roads have wasted away. In 1980, there were 7.2km of roads per 1,000 people; by 1995, the figure had shrunk to only 2.6km per 1,000. By one estimate, less than a tenth are paved, and most of these are in a foul condition. Aided by a splurge of World Bank money, things have improved a bit. Douala's port was once considered one of the worst on earth before being substantially rehabilitated since 2000, and much was done to improve the roads around Douala in the early 2000s, says Brian Johnson, the managing director of Guinness Cameroon. The Cameroonian government no longer takes three years to approve plans for roadworks [25].

In all, bad infrastructure adds about 15% to costs, reckons Mr Johnson. The big losers from lousy infrastructure are ordinary Cameroonians. "Just-in-time" delivery is, for obvious reasons, impossible. Whereas its factories in Europe can turn some raw materials into beer within hours of delivery, Guinness Cameroon has to keep 40 days of inventory in the factory: crates and drums of malt, hops and bottle tops. Wholesalers out in the bush have to carry as much as five months' stock at the start of the rainy season, when roads are at their swampiest. Since they tend to have shallow pockets, Guinness often gives them exceptionally easy credit terms [25].

Roads in rainforests are a bad thing, argue many environmentalists. They facilitate illegal logging and destroy indigenous cultures by bringing them into contact with aggressive, disease-carrying, rum-swilling outsiders. But the absence of roads probably hurts the poor far more [25].

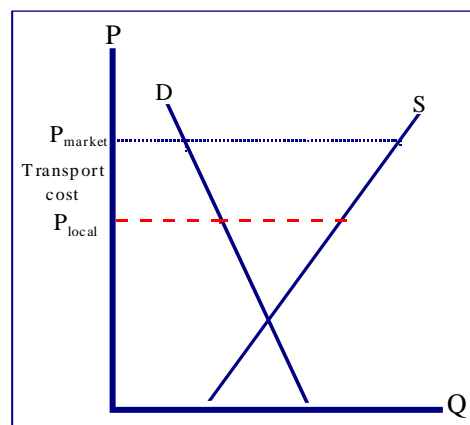
The simplest way to measure the harm caused by bad infrastructure is to look at how prices change as one leaves big cities. A bottle of Coca-Cola, for example, costs 300CFA in Yaoundé, where it is bottled. A mere 125km down the road, in the small town of Ayos, it is 315CFA, and at a smaller village 100km further on, it is 350CFA.

Once one leaves the main road, prices rise sharply. A Guinness that costs 350CFA in Douala will cost 450CFA in an eastern village that can be reached only on foot [25].

What is true of bottled drinks is also true of more or less any other manufactured good. Soap, axe-heads and kerosene are all much more expensive in remote hamlets than in the big cities. Even lighter goods, which do not cost so much to transport, such as matches and malaria pills, are significantly dearer [25].

At the same time, the stuff that the poor have to sell—yams, cassava, mangoes—fetch less in the villages than they do in the towns. Yet, thanks to poor roads, it is hard and costly to get such perishable, heavy items to market. So, peasant farmers are doubly squeezed by bad roads. They pay more for what they buy (e.g., inputs), and receive less for what they sell [25]. The effect on the price to producers located more remotely from central markets is illustrated in the graph (transport costs). The market price,  $P_{\text{market}}$ , excludes the cost of transport. The greater is the transport margin, the lower is the price

to the local producer,  $P_{\text{local}}$ .



Small wonder that the African Development Bank finds "a strong link between poverty and remoteness". The UN's International Fund for Agricultural Development estimates that African villages with better physical infrastructure produce one-third more crops per hectare than those with poor infrastructure, enjoy wages 12% higher, and pay 14% less for fertiliser. Moreover, no country with good roads has ever suffered famine [25].

Where roads improve, incomes tend to rise in parallel. One study estimated that each dollar put into road maintenance in Africa would lower vehicle maintenance costs by \$2-3 a year. In Cameroon, where the soil is wondrously fertile, farmers start growing cash crops as soon as nearby roads are repaired. Big commercial farmers benefit too. Along the highway to Douala lie great plantations of sugar cane, and banana trees whose fruit is wrapped in blue plastic bags, to keep at bay the birds and bugs that might mar the visual perfection demanded by European consumers [25].

Where roads are left to deteriorate, women bear the heaviest burden. According to the World Bank, a typical Ugandan woman carries the equivalent of a 10-litre (21-pint) jug of water for 10km every day, while her husband humps only a fifth as much. With better roads, both men and women can, if nothing else, hitch rides on lorries, thereby sparing their feet and getting their goods more swiftly to market [25].

In short, the governments of poor countries ought to pay more attention to their roads. A good first step in Cameroon would be to lift those road-blocks and put the police to work repairing potholes [25].

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