

tariff versus quota

Bhagwati (1965) first demonstrated that if perfect competition prevails in all markets, a tariff and import quota are equivalent in the sense that an explicit tariff reproduces an import level that, if set alternatively as a quota, produces an implicit tariff equal to the explicit tariff, and vice versa. This equivalence breaks down, for example, if the domestic production is monopolized. In this case, replacing an explicit tariff by an import quota set at the level equal to the imports under the explicit leads to a higher implicit tariff. Many other cases of the breakdown of the equivalence also arise.

The 'tariffs versus quota' literature was stimulated by the seminal contribution by Bhagwati (1965). Bhagwati defined the two instruments as equivalent if an explicit tariff reproduces an import level that, if set *alternatively* as a quota, produces an implicit tariff equal to the explicit tariff and vice versa.

Equivalence and its breakdown

Bhagwati (1965) demonstrated that the tariff–quota equivalence necessarily obtains when perfect competition prevails in all markets. This is shown most simply in the small-country context. By definition, the small country faces a perfectly elastic supply at a given price in the world market. In Figure 1, DD and SS represent the demand and supply curves in this (small) country and P^* fixed world prices. Under free trade, that country produces Q_0 , consumes C_0 and imports Q_0C_0 . The imposition of an explicit tariff t per unit raises the internal price in the country to $P = P^* + t$ and the output and consumption move to Q_1 and C_1 , respectively. Imports decline to Q_1C_1 . The consumer surplus declines by the trapezium formed by the sum of the areas marked b , e , R and f . Of this, area b is recovered by producers as extra surplus and area R by the government as tariff revenue. Areas e and f are lost entirely and called deadweight losses. Area e is lost because the marginal cost of production of Q_0Q_1 exceeds the world price. Area f is lost because the tariff forces the consumers to stop before the marginal benefit at P exceeds the marginal social cost of obtaining the goods at P^* .

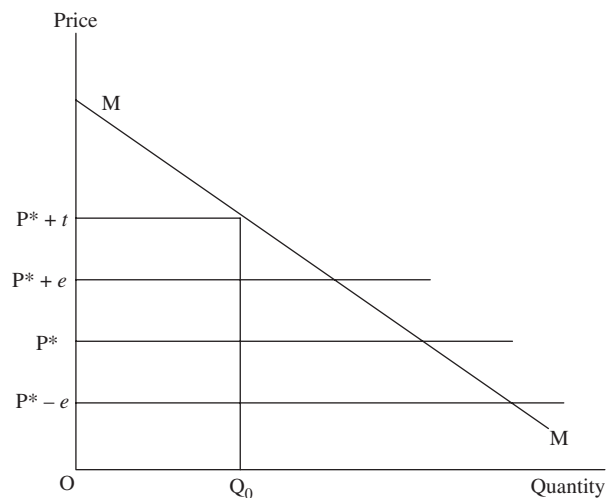


Figure 1 Equivalence under perfect competition and non-equivalence under monopoly

If we now replace the tariff by the import Q_1C_1 and auction the quota licences competitively, imports would equal the quota. Subtracting these imports from DD at each price, we obtain $D'D'$ as the demand facing domestic producers. The internal price now obtains at the intersection of SS and $D'D'$. But by construction, this is $P = P^* + t$, with t now representing the implicit tariff. Explicitly, t is now the price of the licence per unit of imports. The total revenue from the auction of the licences equals R . The outcome is identical to that under a tariff in every way.

Suppose now that a monopoly producer supplies the domestic output with SS representing his marginal cost curve. Under the tariff t , the monopolist cannot raise the price above $P^* + t$ so that the outcome is no different from under perfect competition. But if we replace the tariff by import quota Q_1C_1 , with the quota licences auctioned competitively, the monopolist faces the demand curve $D'D'$. Associated with $D'D'$ is a marginal revenue curve (which, for the sake of simplicity, is not shown in Figure. 1) whose intersection with SS gives the monopoly output Q_M . The price the monopolist changes at this quantity is P_M , which is higher than $P^* + t$. The equivalence breaks down. Non-equivalence also obtains if we replace domestic competitive suppliers by an oligopoly rather than a monopoly (Helpman and Krugman, 1992). All these results can be generalized to the large-country case. Alternatively, non-equivalence obtains if we assume perfect competition in demand and supply but not the allocation of quota. For example, if the holder of the quota licence is a monopolist, he would maximize the quota rents. The solution in this case may involve leaving some licences, thereby raising the domestic price above $P^* + t$.

Retaining perfect competition in all markets, non-equivalence also arises if the quota takes the form of a voluntary export restraint (VER). Under the VER, enforcement of the quota is the responsibility of the exporting country. In this case, the exporting country captures the quota rent, and the welfare loss from the quota to the importing country is larger than under the tariff or direct import quota.

A further case of non-equivalence arises in the presence of uncertainty. This is shown in a simple manner using a construction from Pelcovits (1976). In Figure. 2, suppose the import demand by home country is MM and the world price can be either $P^* + e$ or $P^* - e$, each with a probability of one half. Suppose further that we want to restrict expected imports to OQ_0 . Regardless of which world price is realized, an import quota will hit the target exactly with the domestic price given by the height of MM at Q_0 and denoted $P^* + t$. If a tariff is to be used to achieve the same objective, assuming risk-neutral behaviour, we would set the tariff at t . The domestic price in this case could be either $P^* + t + e$ or $P^* + t - e$, each with a probability of one half. The reader can verify that the expected welfare losses under the quota and tariff would be different, which implies non-equivalence.

Panagariya (1980) considers the equivalence of optimal tariff and quota structures in a small-country model with two or more imports. He considers a government wishing to restrict the value (at the world prices) of two or more imports to a pre-specified level. If perfect competition prevails in all markets, the optimal policy is either an explicit uniform tariff on the restricted set of goods or import quotas on them at levels that imply a uniform implicit tariff at the same rate. If domestic production of these goods is monopolized, however, optimal tariffs are still uniform, but optimal import quotas are characterized by implicit tariffs that are generally non-uniform.

In two companion papers, Panagariya (1981; 1982) brings out yet another aspect of tariff-quota non-equivalence in the presence of domestic monopoly. He considers a large-country, general-equilibrium model in which do-

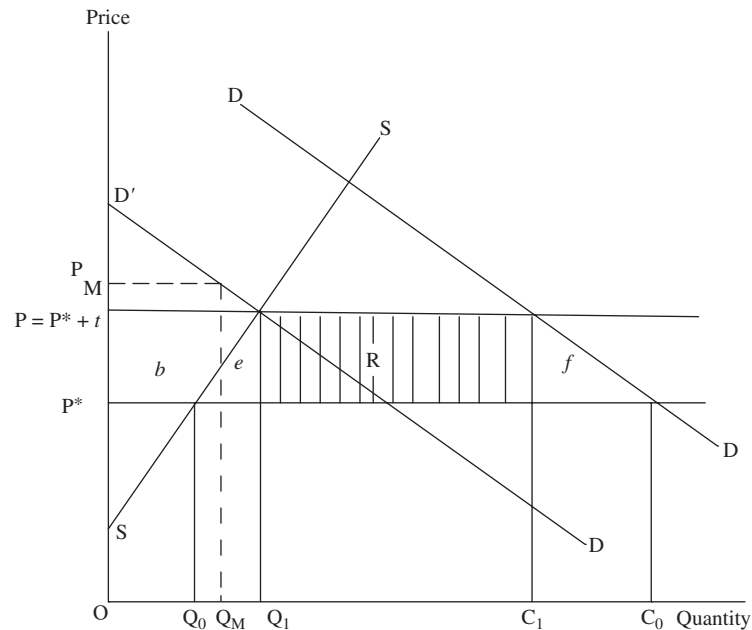


Figure 2 Non-equivalence under uncertainty

mestic industry is monopolized. He shows that in such a model, exogenous changes in quotas and tariffs lead to qualitatively different outcomes. For example, if quota is the instrument, tightening it always improves the terms of trade. But if tariff is the instrument, raising it may lead to deterioration in the terms of trade.

Finally, Rodriguez (1974) and Tower (1975) have independently considered the outcomes when two countries optimally choose trade interventions in a Nash non-cooperative game within a two-good general-equilibrium model. They show that if the countries choose tariff as the instrument, an equilibrium characterized by finite positive trade between them generally exists. But if the countries employ quotas, such equilibrium does not exist.

Welfare ranking of tariffs and quotas

When tariffs and quotas are not equivalent and we use them to target some variable in the economy, a natural question concerns the welfare ranking of the two instruments. For example, if we assume that the domestic production is monopolized but perfect competition prevails everywhere else and the objective is to restrict imports to a specified level at the lowest cost, tariff is superior to quota. This is readily seen in the small-country case in which the tariff forces the monopolist to behave like a competitor whereas the quota allows him to earn positive monopoly rents. Similarly, on the assumption that there is perfect competition on all sides in the product market, if the quota holder is a monopolist, tariff would once again be the superior instrument.

Two additional ranking results are due to Panagariya (1980) and Pelcovits (1976). The former considers the ranking of tariffs and quotas when a small country aims to restrict the value of a subset of imports (at world prices) to a fixed level and these goods are subject to the monopoly distortion. He finds tariffs to be an instrument superior to quotas. Pelcovits considers the welfare ranking in the presence of uncertainty. In the small-country context, on the

assumption that the world price is stochastic and the country wishes to constrain the expected imports at a pre-specified level, he asks whether quotas yield higher expected welfare or tariffs. Using a construction similar to that in Figure. 2, he shows that the answer is ambiguous.

Welfare outcomes with pre-existing tariffs and quotas

A final question of interest is how the welfare outcomes differ when a parameter is altered in the presence of tariffs versus quotas. The first set of contributions in this category comes from the so-called piecemeal trade reforms literature that asks how welfare changes as we relax one trade barrier at a time. Corden and Falvey (1985) demonstrate that in a small country with many imports, if the country restricts trade by quotas only, the relaxation of any quota necessarily improves welfare. Intuitively, the relaxation of the quota reduces the distortion in that that good has no effect on the distortion in the other goods since their imports face the same quota as before. Therefore, the net effect of the change on welfare is positive. This is not true if imports are restricted by tariffs. A reduction in any one tariff directly improves welfare by expanding the imports of that good. But it may indirectly lower welfare by reducing the imports of substitute goods subject to tariff distortions. If the latter effect dominates, the net effect is a reduction in welfare.

Building on the work of Johnson (1967) and Kemp and Negishi (1970), Eaton and Panagariya (1979; 1982) derive conditions under the presence of tariffs on a subset of imports that can lead to an improvement in the terms of trade or growth in a small open economy to result in a loss of welfare. It is readily shown, however, that if import quotas restrict imports instead, improvement in the terms of trade or growth cannot lead to a decline in welfare. Just as in Corden and Falvey, when quotas are in place, their distortionary effect remains unchanged when the terms of trade improve or growth takes place. Therefore, the direct benefits from improved terms of trade or growth determine the final outcome. In the presence of tariffs, tariff distortion worsens if the improvement in the terms of trade or growth is accompanied by a contraction of imports of one or more tariff-ridden goods.

Finally, Bhagwati and Srinivasan (1982) alternatively consider the effect of directly unproductive profit-seeking (DUP) activities in the presence of tariffs and quotas. They show that in the former case the DUP activity may paradoxically raise welfare if it draws resources out of the import-competing good and therefore leads to an expansion of imports of the tariff-ridden good. This cannot happen in the latter case, however, since the imports of the quota-ridden good cannot rise beyond the fixed import quota.

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See also

< xref = xyyyyyy > tariffs;

< xref = xyyyyyy > trade policy, political economy of.

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Index terms

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Index terms not found:

voluntary export restraints