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## Economic issues in tariffication: an overview

Giancarlo Moschini

*Department of Economics, Iowa State University, Ames, IA 50011, USA*

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### ABSTRACT

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The agricultural trade liberalization proposal known as ‘tariffication’ aims at converting all existing non-tariff barriers (NTBs) to trade into bound tariffs, and to reduce these tariffs over time. This is in tune with the original philosophy of the General Agreement on Tariffs and Trade (GATT) and it calls for a dramatic overhaul of existing agricultural policies in many developed countries. The main economic issues that arise with tariffication stem from the non-equivalence of tariffs and NTBs in a number of scenarios. This paper analyzes non-equivalence arising from the existence of: imperfect competition in importing countries; price instability in importing and exporting countries; and, inefficient allocation of quantitative restrictions. It is shown that in all these cases the definition of an appropriate ‘equivalent tariff’ to be used in tariffication is not straightforward, and that in general this equivalent tariff cannot be computed on the basis of only observed price differences between countries. Tariff-rate quotas, which are meant to be the main tool of implementation of tariffication according to the existing proposal, are analyzed in some detail. Concerning the relationship between tariffication and the other elements of the trade liberalization package, it is shown that tariffication would limit the scope of export subsidy policies. It is also shown that the existence of production and export subsidies makes observed price gaps between countries of questionable value in setting equivalent tariff levels. Finally, it is argued that the main focus of tariffication should be the conversion of NTBs to acceptable long-run (bound) tariffs rates, and considerable flexibility in this conversion process could be exercised in the transition period.

### INTRODUCTION

A fundamental principle underlying the General Agreement on Tariffs and Trade (GATT) is that commercial policies should be achieved through

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bound tariffs (Dam, 1970). The intent of this principle is to make the extent of protection 'transparent'. Reductions in this type of protection are obviously easier to negotiate, and indeed the previous rounds of GATT negotiations have been most successful in liberalizing tariff protection. Parallel to the specification of a bound tariff as the preferred protective instrument, GATT contains a general prohibition on the use of quantitative restrictions, such as import quotas. There are, however, three exceptions to this rule that relate to agriculture: (1) temporary export restrictions may be used to deal with food shortages; (2) import restrictions may be used to implement domestic agricultural programs entailing marketing and production restrictions (such as supply management schemes); and (3) import and export restrictions may be used if necessary for the application of standards for classification, grading, and marketing.

The distinctive status of agriculture in GATT, as it relates to the use of Non-Tariff Barriers (NTBs), was further amplified with the granting in 1955 of a waiver to the U.S. which permits the application of quantitative restrictions on a wide range of agricultural products under price support programs (Hanrahan et al., 1984). Also relevant is the widespread adoption by the Economic Community (EC) of variable levies as border restrictions. Because variable levies are best understood as unbounded tariffs, they can be considered a type of NTB. This state of affairs has led, in recent years, to a system of international agricultural trade characterized by the pervasive effects of NTBs.

Finding a solution to NTBs in agricultural products has been perceived, from the beginning, as one of the crucial aspects for a successful conclusion of the current round of negotiations. The most ambitious approach to the solution of this problem is contained in the U.S. 'tariffication' proposal. The main feature of this proposal is the conversion of all NTBs into bound tariffs which would then be reduced over time. The objective of this paper is to review and discuss some conceptual issues that arise in the context of tariffication. The emphasis is on the analysis of the (non)equivalence of tariffs and NTBs in terms of price and trade volume effects. However, because of the broad range of cases considered, no efforts is made to analyze the welfare implications of specific tariffication situations.

The paper is organized as follows. First, a brief description of the U.S. tariffication proposal is given, followed by a consideration of the issues associated with the conversion of NTBs into tariffs. Particular attention is given to the problems arising in the presence of imperfect competition, price uncertainty, and inefficient allocation of quantitative restrictions. Next, the paper deals with trade liberalization under tariffication, with emphasis on the analysis of the tariff-rate quota system. This is followed by an analysis of the relationship of tariffication to the other elements of the tariffication

package, especially the proposal to phase out export subsidies and production subsidies. The main conclusions of the paper are summarized in the final section.

#### TARIFFICATION PROPOSAL

The concept of tariffication represents a relatively new addition to the growing body of proposals that has been put forward to deal with agricultural NTBs in the ongoing multilateral trade negotiations (MTN) being held under the GATT. The idea of tariffication was first introduced by the U.S.A. on November 1988 as a means of improving market access (USTR, 1988), and a role for this concept in the current MTN is explicitly recognized in the midterm review of the Uruguay round. The final agreement reached in Geneva on April 1989 outlines the long-term elements and guidelines for reform of agricultural trade. For the important chapter of import access, this document calls for

“...strengthened and more operationally effective GATT rules and disciplines...” able to deal with “...quantitative and other non-tariff access restrictions, whether maintained under waivers, protocols of accession or other derogations and exceptions, and all measures not explicitly provided for in the General Agreement, and the matter of conversion the measures listed above into tariffs.” (GATT, 1989)

Also, the work programme for the achievement of these long-term objectives calls for specific detailed proposals, to be advanced by December 1989, on six broad areas, one of which is “tariffication, decoupled income support, and other ways to adapt support and protection.” (GATT, 1989).

As a result, the U.S. tabled a tariffication proposal on July 1989 (USTR, 1989a). This proposal aimed at improving market access by:

- converting non-tariff barriers to trade into bound tariffs;
- establishing a schedule for the phased reduction, and eventual elimination, of all tariffs.

This tariffication program was further elaborated in the U.S. submission on comprehensive agricultural trade reform (USTR, 1989b). In this document, four interrelated areas of trade reform were identified as: (1) import access; (2) export competition; (3) internal support; and (4) sanitary and phytosanitary measures. Tariffication is put forward as the main tool to deal with import access, but it is meant to be only a part of a comprehensive package that must include fundamental reform in all other policy areas.

Specifically, the U.S. proposal calls for a replacement of NTBs, including EC variable levies, with tariff-rate quotas, along with the elimination of all waivers, protocols of accessions, and grandfather clauses that restrict import for agricultural products. It is also suggested that GATT article XI:2(c) be

eliminated (this is the section of article XI which allows import restrictions of agricultural products to implement domestic marketing and production restrictions). Quotas will be set to the level of imports for 1990 or some recent period, or a negotiated minimum level of imports; the tariff levied on imports within this quota would be bound at agreed-upon rates. Imports above the quota level will be permitted, subject only to a bound tariff. This over-quota tariff is to be calculated based on the price gap between the domestic and world price for some recent period.

According to the U.S. proposal, liberalization is to be achieved over a 10-year transition period by: progressive annual reduction of the over-quota tariff to a final bound rate; and, expansion of the initial quota by agreed minimum amounts during the transition period. At the end of the transition period, the residual quota would be eliminated, and the only protection will be offered by bound tariffs.

To analyze the tariffication proposal, it is useful to distinguish between the two essential features of this proposal: conversion of non-tariff barriers into tariffs; and reduction of trade barriers. The first of these two features is usually associated with the tariffication idea, and was given more prominence in earlier U.S. documents. The second, however, could turn out to be the dominant feature if the long-run tariff protection level was chosen close to the free trade solution. These two aspects will be considered below.

#### CONVERSION OF NTBS INTO TARIFFS

The rationale for converting NTBs to tariffs has a solid base in both the economic theory of trade distortions, and the working of international institutions dealing with trade liberalization. From an economic point of view, in many instances quantitative restrictions are a source of avoidable inefficiencies, as they limit the operation of markets more than tariffs and adversely affect the efficiency of a competitive price system (Anderson, 1988). Whereas NTBs tend to insulate markets, tariffs provide an explicit link between trading countries which allows the transmission of market signals. Thus, the use of tariffs instead of NTBs should result in more efficient and stable world markets.

At the institutional level, we have mentioned GATT's predilection for the use of tariffs. This is because tariffs provide a transparent mode of protection whose level is easy to assess and to negotiate. Early GATT negotiations focused on the conversion of trade barriers into bound tariffs, and the same procedure could bring agriculture more fully under GATT rules. The elimination of existing waivers, protocols of accessions, and other derogations that underlie the existing pattern of NTBs would make it easier to deal with agricultural trade restrictions within existing GATT rules.

On the other hand, it must be realized that NTBs are usually in place for very specific reasons, and are intimately related to the working of domestic agricultural policies. U.S. quotas on sugar, Canadian quotas on dairy products, and the EC variable levy on grains are all examples of such relationships. Doing away with NTBs means doing away with the set of existing policies. While countries may be willing to reduce the extent of protection offered to the domestic producers by NTBs, it is debatable whether a dramatic change of protection system is equally likely to be acceptable.

The crucial issue here is the non-equivalence of tariffs and non-tariff barriers under a number of scenarios. It is this non-equivalence which makes tariffication appealing to those that are advocating this solution to trade liberalization. On the other hand, it can be argued that it is this non-equivalence that explains why NTBs have come into existence in the first place, which suggests that some countries or groups may find reasons to deem tariffication undesirable.

The issue of (non)equivalence of tariffs and NTBs can be cast in terms of the (non)existence of an 'equivalent' tariff, that is a tariff that would leave all relevant economic variables unchanged. The U.S. tariffication proposal contains a specific suggestion on how to determine equivalent tariffs, at least as a component of the temporary tariff-rate quota system. The proposed method is based on the price gap between the domestic market (with price  $P_d$ ) and the world market (with price  $P_w$ , adjusted presumably for transfer costs). Specifically, the ad valorem equivalent tariff  $t$  is then defined as  $t = (P_d - P_w)/P_w$ .

This method, which basically defines the equivalent tariff in terms of the nominal rate of protection (Schwartz and Parker, 1988), has the obvious attraction of simplicity, a quality not to be discounted in the intricate framework of multilateral trade negotiations. On the other hand, this method will work properly only when the price gap reflects all the effects (and only those effects) of the NTB under examination. Limitations of the price gap method arise in all cases where NTBs and tariffs are not equivalent.

Under perfectly competitive conditions, tariffs and import quotas (the most obvious NTB) are equivalent if import quota licenses are auctioned. [Actually, even when the perfectly competitive assumptions are satisfied, quotas and tariffs may not be fully equivalent in a general equilibrium framework (Melvin, 1986)]. Cases in which the two instruments are not equivalent include: economic growth; imperfect competition; price uncertainty/instability; and inefficient allocation of quotas, such as may arise from the use of voluntary export restraints (VERs). The case of non-equivalence arising when domestic demand and supply have different growth rates over time is reviewed in Zietz and Valdes (1988). Below we discuss in

some detail the other three main cases of non-equivalence between tariff and quantitative restrictions.

*1. Imperfect competition.* When the domestic producers have market power, trade restrictions allow non-competitive pricing behavior. In this situation, import quotas have generally a different effect than tariffs, a situation originally analyzed by Bhagwati (1965). A typical example is offered by the case of monopolistic structure in the importing country production sector. A partial equilibrium illustration of this case is offered by Fig. 1.  $D$  represents the demand curve of the importing country, and  $S$  its supply curve.  $ED$  is the importing country excess demand,  $ES$  is the excess supply of the rest of the world, and  $Q$  represents the level of the import quota (for simplicity, here we are assuming the small country case; for a large country all relevant qualitative results are unchanged, although their illustration is less clear-cut). Taking this restriction into account, the residual domestic demand facing the monopolist is the broken line  $D_d$ .

Under perfect competition, the market equilibrium solution is found at the intersection of  $S$  and  $D_d$ , or alternatively of  $ED$  and  $Q$ , with a domestic price of  $P'_d$ . The relative difference  $(P'_d - P_w)/P_w$  would be the ad valorem tariff equivalent of the import quota. In other words, replacing the quota by an ad valorem tariff of  $(P'_d - P_w)/P_w$  would result in an import volume equal to  $Q$  and in a domestic price of  $P'_d$ .

If the monopolist can exercise its market power, on the other hand, market equilibrium will be found at the intersection of the marginal revenue  $MR$  and the marginal cost  $S$ , resulting in a domestic price of  $P_d$ . The observed relative price gap  $(P_d - P_w)/P_w$ , however, is the equivalent tariff of quotas only from the point of view of preserving the domestic price at the level  $P_d$ . If a tariff replaced the existing quota, monopolistic pricing behavior would be rendered impossible by foreign competition because of the small

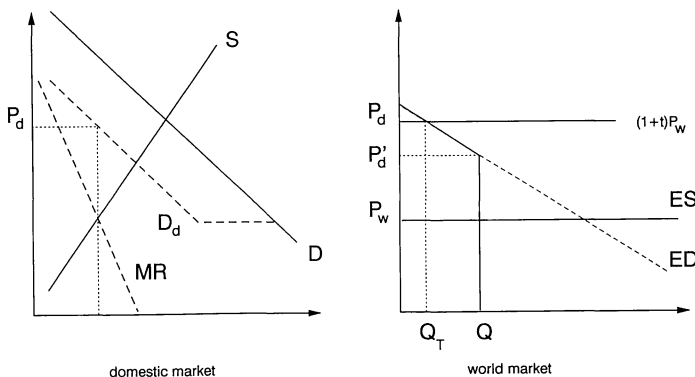


Fig. 1. Tariffication and imperfect competition: Small country with domestic monopoly.

country assumption [as long as  $(1+t)P_w$  is less than the competitive autarkic price, as in Fig. 1]. Hence, the domestic price  $P_d$  would in this case be sustainable only if imports declined to  $Q_T$ , below the original quota level. Indeed, the equivalent tariff that preserves imports at the quota level is  $(P'_d - P_w)/P_w$ . If the observed price gap  $(P_d - P_w)$  was used to compute the equivalent tariff, the importing country would be provided with more protection than is needed to preserve import volumes at the quota level. In the large country case the analysis requires some changes because market power can be exercised even under tariff protection. The solution, however, will be different than under a quota system that would result in the same level of imports. The general result is that the implicit tariff rate under the quota exceeds the explicit tariff rate of the tariff case (Bhagwati, 1965).

An example that can fit the case described above is that of the Canadian industries under supply management (dairy, poultry, and eggs). Import quotas are used to insulate domestic demand, and marketing boards charge prices above the competitive level by restricting domestic production through supply management schemes. Whether or not these industries are achieving a monopolistic pricing solution is perhaps a debatable point. What appears certain is that the domestic prices are set above competitive levels, as farmers actively bid for the right to produce, and production quotas have a high market value (Schmitz, 1983; Moschini and Meilke, 1988). Moschini and Meilke (1991) analyze the case of the Canadian chicken market in some detail, and show that the equivalent tariff implied by the observed price gap is roughly three times the equivalent tariff which preserves imports at the current import quota level.

The imperfect competition case of the (non)equivalence of tariffs and quotas can be extended to include monopolistic elements in the holding of import quotas and/or in foreign production [see also Shibata, 1968; and Bhagwati, 1968b)]. The general conclusion is that with imperfect competition the observed price gap will always overstate the truly equivalent tariff, a conclusion that offers useful qualitative guidance for tariffication negotiations.

*2. Price uncertainty.* It is known that under uncertainty quotas and tariffs are not equivalent. The main point to note is that under uncertainty a tariff results in a distribution of import volumes, while a quota results in a distribution of implicit tariffs. Fishelson and Flatters (1975) have compared quotas and tariffs as welfare maximizing policy instruments from a large country point of view, and show that which instrument is better depends on the precise source of uncertainty and on the properties of the relevant demand and supply functions. Pelcovits (1976) examines the non-equivalence of tariffs and quotas when the objective is to achieve a pre-specified



level of expected imports. Dasgupta and Stiglitz (1977) and Young (1980) contrast tariffs and quotas when they have to raise a fixed expected tariff revenue. Young and Anderson (1980) emphasize the interpretation of a tariff as a set of state-contingent quotas arbitrated across states of nature, and argue for the general superiority of tariffs over quotas. Young and Anderson (1982) also analyze the role of risk aversion in the ranking of quotas and tariffs. They draw attention to the similarity with the problem of price versus quantity instruments for planners (Weitzman, 1974), and discuss the critical role of the sources of uncertainty.

The role of the source of uncertainty has been studied in the related field of commodity price stabilization (Turnovsky, 1978), and has long been a motive of interest in agricultural economics. Of specific concern has been the effect of trade restrictions on the transmission of instability that normally arises from natural random factors, such as weather, disease, and income shocks. Bale and Lutz (1979) and Zwart and Blandford (1989) have shown that different policies can have a markedly different impact. In particular, instability is shared among trading countries when tariffs are used, very much like the free trade scenario, whereas NTBs tend to insulate importing countries' markets so that instability is in general not transmitted. Hence, one of the main issues of converting NTBs into tariffs under instability concerns the changes that this brings about in terms of adjustments to demand and supply shocks.

This issue is crucial to the assessment of variable import levies (VILs), which represent the cornerstone of the EC common agricultural policy. VILs not only insulate the domestic market from external instability, but can also transfer the burden of adjustment of domestic instability to the world market. Consider first the case of instability in the world market but not in the domestic market as illustrated in Fig. 2. Instability in the world market is represented by the excess supply curve fluctuating between  $ES'$  and  $ES''$ . The (stable) excess demand of the importing country is represented by  $ED$ . Because a VIL sets a threshold price for imports, the domestic price  $P_d$  cannot fall below this level. This means that the effective excess demand for import prices below  $P_d$  is perfectly rigid, and this is indicated by the solid line that is kinked at  $P_d$ . In other words, given a stable domestic market with perfect competition, a VIL is equivalent to an import quota system where the rent associated with the trade restriction is fully captured by the government of the domestic country. If the threshold price is set high enough, the domestic price will not be affected by the instability in the world market, while the world price will fluctuate between  $P'_w$  and  $P''_w$ . If the import quota or VIL is replaced by an ad valorem tariff equal to  $(P_d - \bar{P}_w)/\bar{P}_w$ , where  $\bar{P}_w$  is the average of  $P'_w$  and  $P''_w$ , then the domestic price will fluctuate from  $P'_d$  and  $P''_d$  while the world price will now fluctuate between

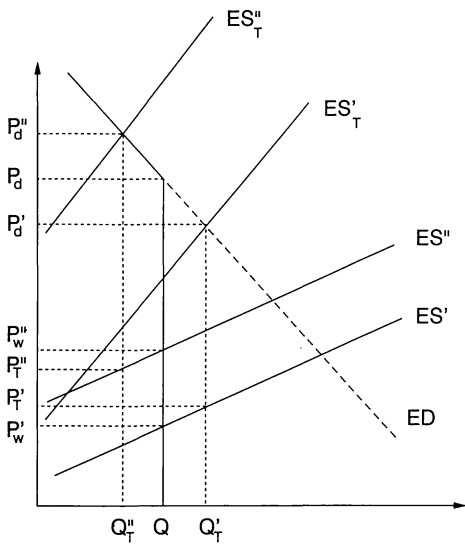


Fig. 2. Tariffication of an import quota: External instability case.

$P_T'$  and  $P_T''$ . Correspondingly, whereas the import quantity is constant at  $Q$  with the VIL or the import quota, the import quantity will fluctuate between  $Q_T'$  and  $Q_T''$  after tariffication.

A VIL will differ from an import quota when the instability arises in the domestic market. Tariffication of a VIL for this case is represented in Fig. 3 where  $ED'$  and  $ED''$  represent the fluctuating excess demand of the domestic country (due to either domestic supply or demand shocks). Again,

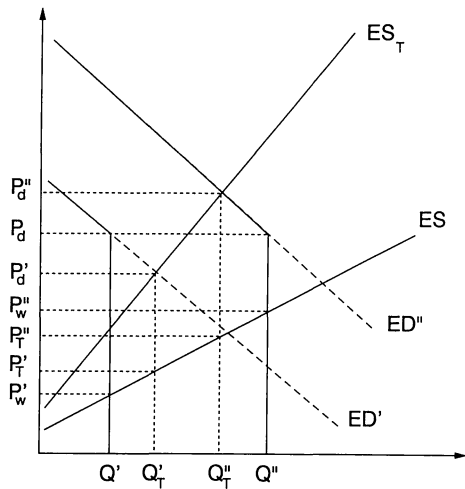


Fig. 3. Tariffication of a variable import levy: Domestic instability case.

these effective excess demands are perfectly rigid for prices below the threshold price  $P_d$ . Given a stable world excess supply ES, the world price will fluctuate between  $P'_w$  and  $P''_w$ , while the domestic price is stable at  $P_d$  despite the fact that the source of instability is domestic. If the variable levy is replaced by an ad valorem tariff defined again as  $(P_d - \bar{P}_w)/\bar{P}_w$ , then the domestic market will absorb some of the adjustment and the domestic price will fluctuate between  $P'_d$  and  $P''_d$  while the world price will now fluctuate between  $P'_T$  and  $P''_T$ . Also, while with a VIL the import quantities are  $Q'$  and  $Q''$ , after tariffication the import quantity will fluctuate between  $Q'_T$  and  $Q''_T$ .

From these illustrations it is clear that a change from NTBs to tariffs is likely to cause an increased price variability for importing countries and a decrease in price variability for exporting countries, and supports one of the stated justifications for the U.S. tariffication proposal:

“Most non-tariff measures are designed to stabilize internal prices by shifting to external markets the burden of adjusting to changes in supply or demand. Exclusive reliance on tariffs would ensure that the burden of adjustment is spread over all markets, thereby making world market prices more stable and predictable.” (USTR, 1989a)

If we allow for supply response to this changing risk level under the assumption that farmers are characterized by risk-averse behavior, then the reduced risk in exporting countries will tend to stimulate production whereas the increased risk in importing countries will tend to decrease production. Hence, relying on the (average) price differences between domestic and world market observed under the NTB system may understate the level of protection required to ensure the same level of imports under the new stochastic conditions. Using an equivalent tariff based on observed (average) price gaps in general will also not preserve the expected price in the importing country and/or in the exporting country if risk aversion is allowed (note that risk neutrality, and linearity, preserve expected prices in Figs. 2 and 3). This raises the issue of whether tariffication should be coupled with price stabilization measures, a concern emphasized in the EC position (EC, 1989), and the extent to which the possible trade distorting effects of these measures may affect the overall desirability of tariffication.

*3. Inefficient allocation of quantitative restrictions.* The administration of NTBs can introduce inefficiencies in the international trading market that, if eliminated in the process of tariffication, could affect the equilibrium of volume traded and prices in a way that needs to be taken into account when designing equivalent tariffs. For example, VERs are typically negotiated bilaterally between countries, and the resulting trade flows may not reflect the comparative advantages of countries. Import quotas may also be subject

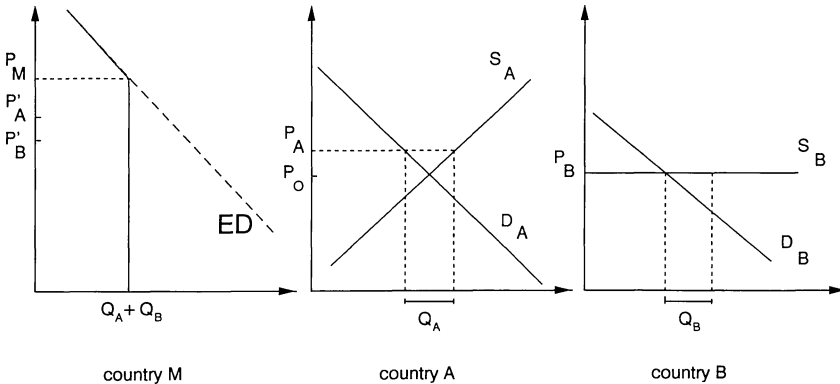


Fig. 4. Tariffication and VERs.

to the same problem, because they are often allocated to specific countries. This is the case, for example, of U.S. import quotas on sugar and cheese. [U.S. import quotas for sugar in the past have been used as a tool of foreign policy, with political considerations overriding the notion of competitiveness of the receiving country (Bergsten et al., 1987)]. When these quantitative restrictions are substituted by a non-discriminatory tariff, the ensuing competitive pressure may modify bilateral trade flows, and prices as well.

As emphasized by Dinopoulos and Kreinin (1989), because VERs are inherently discriminatory their analysis requires a multi-country framework. This case is illustrated in Fig. 4 where three countries are assumed: an importing country (country M), and two exporting countries (countries A and B). Through VER or country-specific quotas, countries A and B are both allocated the same share of country M's import quota ( $Q_A = Q_B$ ). However, country A and B have different production and demand conditions. In particular, country A displays an increasing cost supply, while country B displays a constant cost supply. Also, assume that the three countries face a unit transport cost of  $T$  for their bilateral trade flows.

Under these types of quantitative restrictions, the importing country market clears where the demand for import ED intersects the total import quota constraint  $Q_A + Q_B$ , and the equilibrium price in the importing country is  $P_M$ . Because countries A and B have the same transport cost but different production conditions, we would now observe two landed prices  $P'_A$  and  $P'_B$ , in the importing market, where  $P'_A = P_A + T$  and  $P'_B = P_B + T$ . What price gap should be used to compute the implicit tariff of quotas? A possible solution would be to use the difference between the price in the importing country  $P_M$  and the average of the landed prices  $P'_A$  and  $P'_B$ . However, this would understate the protection necessary to preserve prices and import level in the importing country because country B, in virtue of its relatively

low constant marginal costs, will be the sole supplier to market M under a tariff scheme. Thus, the ad valorem tariff level that will preserve import volumes and prices in the country M is given by  $(P_M - P'_B)/P'_B$ .

The tariff level  $(P_M - P'_B)/P'_B$ , however, is equivalent only from the point of view of country M. Because a relatively inefficient supplier under the quota system (country A) has been displaced by a more efficient supplier under the tariff system (country B), the efficiency of the system is increased. This is reflected by the fact that the domestic price in country A now declines to the autarkic price  $P_0$ . Indeed, the case illustrated above admits a fully equivalent tariff system only if the importing country was allowed to levy two different tariffs, one for country A and one for country B. Essentially the same framework can be used to analyze the general inefficiency of allocation of quotas to specific (heterogeneous) components within a product class (Anderson, 1985).

It is apparent that replacing a discriminatory quota or VER with a non-discriminatory tariff affects exporting countries in different ways, and this should be kept in mind in assessing the desirability of tariffication. For example, the suggestion has been made that Japan in the past has managed beef import quotas to favor U.S. exports. If this is true, the tariffication of Japanese beef import quotas, agreed to in 1988 and to take effect in 1991, may produce net benefits to Australia and not to the U.S. (Alston et al., 1989).

#### TRADE LIBERALIZATION WITH TARIFF-RATE QUOTAS

As recalled above, the U.S. proposal calls for trade liberalization to take place in two steps: first, a conversion of existing NTBs into tariff-rate quotas; and second, a gradual relaxation of the constraints of tariffs and quotas in this system over a 10-year transition period. Tariff-rate quotas are not a very common tool of commercial policy, possibly due to the increased administrative burden of having to enforce both the quota monitoring and tariff payments [the adoption of the Generalized System of Preference, however, amounted to a tariff-rate quota system for many countries (Rom, 1979)].

A useful way of looking at a tariff-rate quota is to consider it as a variable tariff, where the tariff varies in discrete amounts triggered by specific import (quota) levels, i.e. the tariff schedule is a step function. The tariff-rate system being suggested by the U.S. involves only a quota level and two tariff levels: an in-quota tariff and an over-quota tariff. This system is illustrated in a partial equilibrium framework in Fig. 5, where ES is the excess supply facing the importing country, ES' is the excess supply with the in-quota tariff, and ES'' is the excess supply with the over-quota tariff (both tariffs are ad

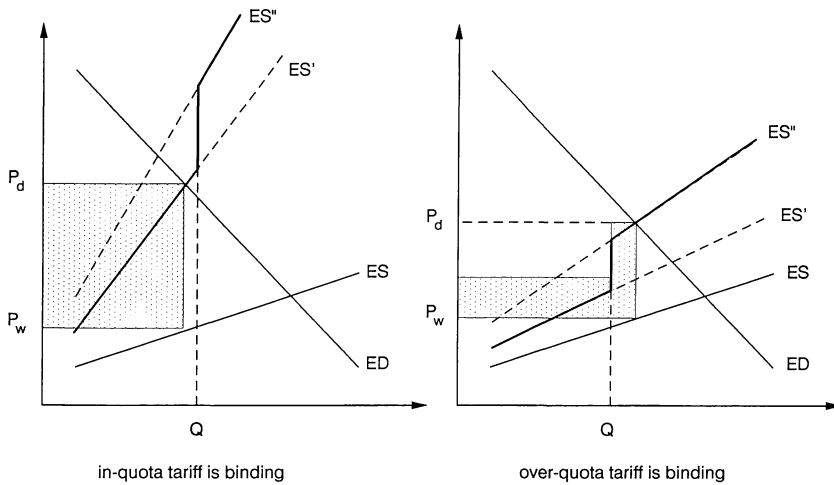


Fig. 5. Tariff-Rate quotas.

valorem). The effective excess supply schedule is therefore given by the portion of  $ES'$  for import volumes below the quota level  $Q$ , and by the portion of  $ES''$  for import volumes above  $Q$ . How the tariff-rate quota works will depend on where the excess demand  $ED$  of the importing country intersects this effective excess supply curve.

A first possibility is described by the first panel of Fig. 5. Here it is the in-quota tariff which is binding, so that the quantity imported is below the quota level  $Q$ . The shaded area represents the tariff revenue. Thus, this case is equivalent to an ad valorem tariff. A second possibility is illustrated by the second panel of Fig. 5 where it is the over-quota tariff which is binding. In this case the imported quantity exceeds the quota level, emphasizing that with a tariff-rate quota there is no absolute ceiling on import volumes. Although at the margin the difference  $(P_d - P_w)$  is the shadow value of the import restriction, this rent is levied only on quantities in excess of the quota level  $Q$  so that some of the rent may be captured by domestic importers/foreign exporters. A third possibility, not explicitly illustrated here, arises when the excess demand intersects the effective excess supply in the vertical portion between  $ES'$  and  $ES''$ , so that it is the quota level which is effectively binding. This case is equivalent to a quota system, except that the economic rent of trade distortion is captured in part by the government of the importing country [this is more or less than the case of pure quota depending on whether or not the quota is auctioned; auctioning quotas, in any case, is not a common practice (Bergsten et al., 1987)].

The first step in the U.S. trade liberalization proposal is the conversion of NTBs into tariff-rate quotas. Which of the three cases described above is

relevant will depend on how the quota and the tariff rate are set. The U.S. suggests to fix the quota at the observed level of imports for some recent time period, and to compute the over-quota tariff based on the observed price gap for a recent period. If the price gap overstates the protection given by the quantitative restrictions, as in our discussion of the imperfect competitive case, then the quota or the in-quota tariff will be binding. If the price gap understates the protection given by the NTB, as in the case of price uncertainty and of inefficient allocation of VERs that was discussed, then the over-quota tariff is likely to be binding.

The second step of the U.S. trade liberalization proposal is the gradual reduction of the over-quota tariff to a final bound rate (possibly zero), and the enlargement of the quota level, over the 10-year transition period. At the end of the period the only remaining protection will be a tariff, say the (possibly reduced) in-quota tariff, as the remaining quota is eliminated. Assuming that the in-quota tariff is below the over-quota tariff at any time period, we have a situation in which any of the three scenarios discussed above may hold at the beginning of the transition period, and the requirement that the (remaining) tariff restriction holds at the end of this period. A relevant question is when the tariff becomes the binding constraint. This could be at any point during the transition period, and may actually happen more than once depending on the paths of tariff reduction and quota enlargement. It is apparent that the tariff-rate quota system for trade liberalization may introduce a considerable degree of uncertainty about the level of protection during the transition period; specifically, it may be unclear which constraint will be the binding one at any point in time, which in turns affects the amount and the distribution of rents associated with the trade restrictions.

On the other hand, the tariff-rate quota system may be viewed as an improvement over a previous version of the tariffication proposal, which called for tariffication to be the first logical step towards trade liberalization. This approach was very sensitive to the choice of an appropriate 'equivalent tariff' for a given NTB, a difficult task as discussed earlier. Because an 'equivalent quota' is more easily defined for most NTBs (and trivially so when the NTB in question is a quota), the quota part of the tariff-rate quota may be viewed as a short-term insurance policy against the possibility of getting the 'equivalent tariff' wrong. A relatively large over-quota tariff could protect importers from a rapid surge in imports, and a relatively low in-quota tariff would ensure market access to exporters up to the quota level. At the same time, the gradual enlargement of the quota together with a gradual reduction of the over-quota tariff to the long-run rate to be bound will ensure some degree of smoothness in the adjustment towards freer trade.

## RELATIONSHIP WITH OTHER ASPECTS OF TRADE LIBERALIZATION

Tariffication is only one of four main areas of reform covered by the U.S. agricultural trade liberalization proposal. The EC position also suggests linking the implementation of tariffication to the rebalancing of protection rates (EC, 1989). [For a discussion of 'rebalancing' and its relationship to the tariffication idea see IATRC (1989)]. In particular, two sets of important trade distorting measures not explicitly dealt with by tariffication are export subsidies and domestic subsidies. It must be recognized that the working of these distortions not only warrants a serious attempt to their reduction, but it also has bearings on the potential implementation of the tariffication idea. To clarify this, it is useful to analyze in some detail the relationship between tariffication and production and export subsidies.

*1. Export subsidies.* Tariffication has direct bearings on the use of export subsidies because it limits the scope of these policies. When the only import restriction is provided by tariffs, arbitrage implies that export subsidies cannot be set above the tariff level (ignoring transportation and other transaction costs). As tariffs are bound and reduced according to the tariffication proposal, the implied ceiling on export subsidies would be also reduced. Thus, tariffication provides an indirect and appealing way of limiting export subsidies.

In turn, the existence of export subsidies has some relevance to the implementation of tariffication. Consider first the case of tariffication of an import quota for an importer when exporters are subsidizing their exports. The essence of the argument is captured in the two-country case of Fig. 6. Here ED represents the excess demand of the importing country, and ES represents the excess supply of the exporting country. Given a quota  $Q$  the price gap here that would be observed is  $(P_d - P_w)$ , and the equivalent tariff of this quota would be  $(P_d - P_w)/P_w$ . This equivalence is conditional on the continuing existence of export subsidies in exporting countries. However, if export subsidies were to be reduced, the price gap  $(P_d - P_w)$  will overstate the amount of protection needed to preserve prices and import volumes in the importing country. With total elimination of export subsidies, as called for in the U.S. proposal, the relevant supply of exports of the exporting countries could be  $ES'$ , which would imply a equivalent tariff of the quota of  $(P_d - P'_w)/P'_w$ .

The relevance of export subsidies for the tariffication concept is further emphasized when export subsidies are directly linked to measures limiting imports in a complex system of commercial policy. This is the case of the European Community, where internal price support is achieved by the joint application of a variable levy defined by a threshold price, and of an export



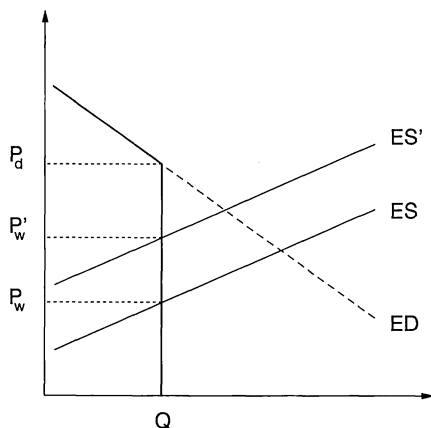


Fig. 6. Tariffication and export subsidies.

subsidy (restitution) if domestic production exceeds domestic demand at the price support level. If the country is a net exporter of the commodity, as the EC is for most cereals, there would seem to be no need for tariffication as the apparent policy in effect is the export subsidy. Yet, if the export subsidy were to be reduced or removed, the threshold price would work as a prohibitive tariff, insulating the domestic market from the international market. This emphasizes the need for tariffication even for some countries that are net exporters. This is consistent with the U.S. proposal, which calls for a negotiated initial minimum quota where the NTB in question is deemed to have provided absolute protection to the domestic industry.

*2. Production Subsidies.* Developed countries engage in a variety of support policies for their agricultural sector that have an indirect, albeit not trivial, trade effect. These include output subsidies, input subsidies, credit subsidies, free provision of extension and marketing help, etc. For example, the EC has used an output subsidy to boost soybean production in recent years. Also, the U.S. grain policy has long relied on acreage reduction, set aside, and land diversion programs that have a production reduction effect (clearly, this is a *ceteris paribus* effect, as these restrictions are associated with price support and deficiency payments programs that, in the whole, may still boost production).

Because of the growing recognition of the trade distorting effects of these measures, efforts are being made to account for them in the GATT framework. [For example, the EC has long championed the use of an aggregate measure of support whose calculation would also include, at least partly, measures other than border measures]. In particular, the U.S. proposal calls

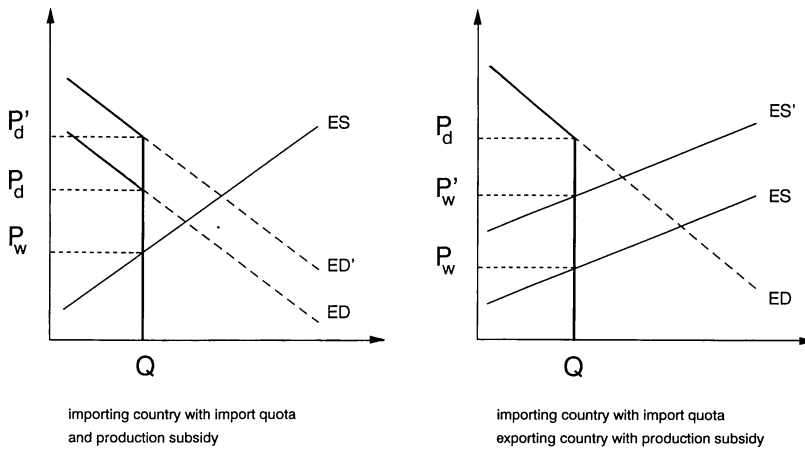


Fig. 7. Tariffication and production subsidies.

for the phasing out of a number of domestic subsidies in a three-tiered approach that would permit only a small set of measures (USTR, 1989b).

Two cases of tariffication under the existence of non-border trade distorting policies are illustrated in Fig. 7. Production subsidies have the effect of increasing domestic supply for any given level of market price. If it is the importing country which uses production or input subsidies, such as the case depicted in the first panel of Fig. 7, the result is that the excess demand curve is shifted downward from  $ED'$  to  $ED$ . Given a quantitative restriction of  $Q$ , the domestic price is  $P_d$  and the world price is  $P_w$ . The ad valorem tariff equivalent of this quota is  $(P_d - P_w)/P_w$  if the domestic subsidies are continued at the pre-liberalization level. On the other hand, if domestic subsidies were to be discontinued, this level of equivalent tariff would not generate the same level of domestic prices and import volumes. If it is the exporting country which uses the production subsidies, such as the case depicted in the second panel of Fig. 7, this results in a downward shift of the excess supply curve. Given an import quota of  $Q$  by the importing country, equilibrium requires a price  $P_d$  for the importing country, and a price  $P_w$  for the exporting country. However, if production subsidies were to be discontinued, the price gap generated by the quota would be  $(P_d - P'_w)$ . Thus, the outcome of this case is opposite to the one generated by the importing country production subsidies.

The U.S. proposal suggests phasing out all export subsidies over a 5-year transition period, and phasing out all domestic subsidies directly tied to production and prices over a 10-year transition period. On the other hand, NTBs are to be converted to (reduced) tariffs. The asymmetric treatment of these trade distorting measures that is envisaged has some important impli-

cations. As it has been illustrated above, domestic subsidies and export subsidies affect the observed price wedge between domestic and world markets. Insofar as these price differences are used to compute the long-run (bound) tariff, the distortions caused by these measures could become a permanent feature of the international trading environment. This will happen, for example, if the long-run bound tariff rates were based on a fixed proportion of the equivalent tariff of NTBs, and these equivalent tariffs were based on the observed price gap for some recent period as the proposal suggests.

In a sense, therefore, tariffication could turn out to be a tariffication not only of NTBs, but also of other trade distorting measures. While one could find reasons to prefer tariffs as the only permitted trade distorting measure, especially if the eventual goal is the reduction of these tariffs to zero, in a second-best world with large bound tariff rates the economic rationale for tariffication may be diminished. Having convinced the contracting parties to rely on tariffs exclusively, the danger would be in seeking tariff rates that allow the achievement of some non-economic goal, such as income transfer to the agricultural sector. These tariffs could result in a more distorted economic environment than that resulting from the use of production subsidies, because tariffs would (needlessly) distort price at the consumption level in addition to prices at the production level (Bhagwati, 1968a).

## CONCLUSIONS

Tariffication is an important part of a comprehensive proposal for long-term agricultural trade liberalization. Its main features are the conversion of NTBs into bound tariffs, and the reduction of these tariffs over a transition period. Thus, there are two essential and distinct features to this proposal: conversion of NTBs into tariffs; and, reduction of trade barriers. Each of these two features is justifiable, based on economic considerations.

Tariffs are generally more efficient than other trade restrictions, and the conversion of NTBs into tariffs may improve efficiency and be a desirable goal in its own right. Crucial to this, however, is the notion of an 'equivalent tariff' for a specific NTB. Under a number of conditions, some of which are reviewed in this paper, the definition of an equivalent tariff is problematic, and may bear little resemblance to the price gaps observed under existing quantitative restrictions. The existence of export subsidies and production subsidies may also affect the appropriateness of using observed price gaps to determine the tariff equivalent of specific NTBs.

If tariffication were successful in reducing tariff rates to long-run low values, say similar to those of many industrial products, then the issue of the equivalent tariff of NTBs may lose importance because the gains from

reduced protection are likely to dominate the efficiency gains of changing protection instrument. In this case, attention should be focused on achieving acceptable long-run tariff rates. In any event, it may be undesirable to base long-run bound tariff rates on the price gaps observed under the present configuration of NTBs.

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