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Country of Origin in the Global Economy

by

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1. Introduction

The determination of the country of origin of imports of goods into a country is required now for a variety of purposes. It is required for the administration of duties, quantitative restraints and other restrictions on imports when import restrictions of a good are differentiated according to the source of the imports. It is required too for the measurement of cross-border flows of imports in statistics of international trade and in entries into national accounts.

The origin of an import is unambiguous when the production process is fully integrated in one country and all of the primary (non-produced) factors are owned by residents of the producing country. This condition is satisfied in the traditional Classical and Heckscher-Ohlin models of international trade in goods. These models made the joint assumptions that all trade was trade in final products and there was no international mobility of primary factors. In such cases the country of origin is simply the country from which the good was shipped. This convention is followed in the compilation of statistics of international trade in goods. The one exception is that goods that are subject to transshipment and involve only minor processing or packaging are classified as “re-exports” and separated from “direct” exports.

However, in reality both of these assumptions are frequently violated. That is, some goods are produced in stages with different stages located in different countries, and some goods use primary factors owned by residents of countries other than that in which the good or stage is produced. The first of these phenomena has become known in the last decade as “fragmentation”, though it is also known by other names such as offshore assembly, outsourcing and production sharing. (For a review of the increasing fragmentation of international goods trade, see Feenstra, 1998 and Ng and Yeats, 2001). The second of these phenomena is largely associated with foreign direct investment, though the international movement of labour has also increased in recent years. (Patterns of FDI are reviewed in the *World Investment Report* produced each year by UNCTAD.) Indeed, these two phenomena are frequently linked as much production sharing is undertaken by multinational corporations as a part of a global chain of production managed by the corporation. These developments are part of the more general phenomenon of “globalisation” which may be taken to mean the increasing linkage of markets across national economies.

When international production of final goods is fragmented across countries and/or there is international movement of primary factors, the origin of traded goods becomes ambiguous as the value added in the production of the traded goods accrues to factors owned by residents of more than one country. This has numerous implications for the nature of trade and trade policy. In his recent Ohlin Lectures, Jones (2000) notes that the international movement of factors and the international sale of intermediate inputs are both cases of international trade in inputs. When factors are internationally mobile, the location of production is determined by absolute advantage rather than comparative

advantage. This in turn increases the importance of government policies towards trade taxes, FDI, business regulation, the provision of infrastructure, business taxation and other policies that affect the profitability of production in each location. Governments have increasingly developed new policies to attract FDI and internationally mobile stages of production.

This paper reviews the implications of growing international trade in inputs as a major part of the trend to globalisation. After a brief history of origin problems in Section 2, Section 3 considers how national tariff policies might be amended to overcome origin problems. A change in valuation from the gross price to value added is proposed. There are three possible applications. The first is to rules of origin within preferential regional trading arrangements. The second is to developing country exports. A new type of non-reciprocal preference scheme based on value added in developing countries is proposed. The third is to offshore assembly type provisions. All three adjustments can be combined in one tariff rate. Section 4 is a conclusion.

2. Piecemeal Recognition of Origin Problems

The significance of input trade has been recognised for a long time in particular contexts.

Perhaps the earliest recognition of fragmentation outside rules of origin was in the structure of protection in national economies. Tariff escalation was observed early in the life of the GATT. A general feature of the structure of tariffs in most developed countries was that tariffs were escalated by the stage of production, that is, within tariff items groups or “industries”, tariff rates rose from low rates applied to raw materials to higher rates for semi-manufactures and to even higher for processing of semi-manufactures to finished goods. Tariff escalation was based on the realisation that protection of some producers who used traded intermediate inputs depended on the tariffs on these inputs as well as on the tariffs on the outputs. The tariffs of most developed countries are still highly escalated, despite successive rounds of tariff liberalisation.

The general equilibrium analysis of the structure of protection to industries led to the concept of effective protection. This was defined as the percentage increase in the value added per unit of output. Effective rates of protection for a product group are determined by the nominal tariff (or tariff equivalent) rates for the inputs and outputs of the group and on the percentage of value added in the gross value of the production. From the mid-Sixties estimates of effective rates of protection became available in selected developed countries for industries and, in some cases, for sub-groups corresponding to stages of production within these industries. It was found that effective rates of protection of domestic value added were generally higher than the nominal rates and these effective rates too were escalated within industries. The emphasis in these early studies was on the costs of these distortions to the tariff-imposing countries, though some international economists drew attention to the implication that the barriers to exports from developing countries increased with the degree of processing (for example, Johnson, 1967, chapter III).

A second recognition of the importance of input trade was the development of sub-national zones to promote trade and investment. These are variously known as export processing zones, free trade zones, special economic zones, duty free zones and other names. The first sub-national international-trade-related zone was the Shannon Free Zone established in Ireland in 1959. In the present context, the essential feature of zones is the admission duty-free of imports of intermediate inputs for processing and subsequent export. They also frequently offer financial incentives to foreign investors. Thus, these zones promote international trade in both intermediate inputs and factors. Export processing zones and other local zones began in East Asia in the 1970s as a way of attracting foreign investment and technology transfers to take advantage of the low labour costs in these countries and to boost exports of manufactures (See World Bank (1992)). Production in these zones has been concentrated in a few industries, chiefly textiles and garments and electronics where there are many stages of production and much international trade in intermediate inputs. They are a device to make a particular location for processing intermediate inputs more attractive.

Baldwin (2001) makes the point that the WTO rules relating to the application of safeguard measures and anti-dumping actions are flawed because they ignore the fact that much of the imports subject to administered protection are imports of intermediate inputs. In this case, the concern is with the downstream domestic users of these imports, whether or not the output is exported or sold on the domestic markets. The definitions of injury take account only of injury to the domestic producers of like products, ignoring the injury to downstream users of imported intermediate inputs when the duties are applied or the actions taken. "The conclusion to be drawn from the preceding analysis is that administered protection rules of the WTO are seriously flawed in a world trading system characterized by extensive vertical and horizontal fragmentation of production, even judging by the mercantilistic objectives of typical trade negotiators." (Baldwin, 2001, p. 257).

These aspects of fragmentation do not pose problems in determining origin of imports as such. The most obvious case of a problem in determining the origin is in rules of origin for imports. There are two distinct sets of rules, those relating to preferential rules of origin and those relating to non-preferential rules of origin.

Rules of origin have existed since the introduction of trade laws that discriminated among countries. Bourgeois, Vermulst and Waer (1992) give some examples of US, Canadian and Australian rules before World War II but rules of origin have only received much attention since fragmentation increased in the Post-World War II economy. Preferential rules of origin are becoming hugely important as more and more international goods are traded on preferential terms because of the spread of regional trading arrangements and preferences for imports from developing countries.

The International Convention on the Simplification and Harmonization of Customs Procedures, known as the Kyoto Convention, was agreed in 1973. This Convention was made under the auspices of the Customs Cooperation Council, an inter-governmental organisation. It laid down that the origin of goods should be determined by the last/final

country in which “substantial transformation” of the goods took place. But it did not impose rules to determine the choice of method and it was non-binding.

Amazingly, there is nothing in Article XXIV of GATT (1947) or in the 1979 Enabling Clause that lays down rules relating to rules of origin for the formation of free trade areas and customs unions. In the WTO preferential rules of origin are covered by a non-binding Common Declaration with regard to Preferential Rules of Origin which was annexed to the WTO Agreement.

Although attempts had been made previously in the GATT, OECD and UNCTAD, the Uruguay Round Agreement on Rules of Origin was the first binding multilateral agreement. This Agreement relates to non-preferential rules of origin. It imposes some discipline on these rules in terms of transparency and consistency of application of the rules and laid down the objective of harmonisation of rules of origin for all non-preferential policy instruments. Negotiations under the joint auspices of the World Trade Organisation (WTO) and the World Customs Organisation (WCO) were not concluded by the deadline of 20 July 1998 and are still continuing.

Consequently, members of the WTO are free to determine which rules of origin will be applied to both preferential and non-preferential trade. APEC (1997) sets out the preferential and non-preferential rules of origin used by member economies. There is general agreement that the plethora of rules poses many problems; all rules based on selecting one country are arbitrary, they lead to major changes in applied tariffs when there are small changes in sourcing or input prices or exchange rates, and they are easily manipulated to give high levels of protection to some industries.

A second instance of origin problems relates to the treatment of the domestic content of imported goods. The US has provisions in its tariff structure for remission of tariff duties on that part of the value of goods processed abroad that embodies intermediate inputs produced at an earlier stage in the US. These are known as the Offshore Assembly Provisions and they date back to the 1930 US Tariff. These features have been copied by the EU, Australia and some other developed countries in recent years. Much of this offshore processing or assembly involves foreign direct investment by developed country firms which have relocated their production to take advantage of cheaper costs of production or assembly.¹ In contrast to the *re-exports* involved in export processing zones, this feature takes account of *re-imports* of goods. Article VII of GATT (1947) defined value for duty in terms of the gross price, not excluding the domestic content of the imported good. As I noted in a previous paper (Lloyd, 1994, p. 724), “Evidently, the conventions of customs valuation do not recognise in general the existence of domestic content of internationally traded goods. They are based on the anachronistic presumption that all national production takes place within national borders.”

The history of these developments shows that they all emerged or re-emerged at about the same time, the mid-Sixties and early Seventies. They were piecemeal *ad hoc* responses to the recognition that the growth of international sourcing of tradeable intermediate

inputs and trade in primary factors had created a number of problems for domestic and international trade policymakers which had not been anticipated when the rules of the GATT were laid down in 1947.

A third area in which origin is needed is in labelling of goods. Again the attribution of origin to one country for labelling purposes is palpably false and is the cause of many allegations about mislabelling.

3. A Systematic Approach to Origin in Trade Policy

A determination of origin is required when the restriction on imports of some good i discriminates between two set of countries. Traditional rules of origin assign origin to one country. Origin is treated as an all-or-nothing concept. Imports originating in one of these sets of countries faces a lower rate. The tariff on imports of good i , when it is assessed as originating from country k , is

$$\begin{aligned} t_{ik} &= t_i^H \text{ if imports from country } k \text{ are not eligible for the low rate} \\ &= t_i^L \text{ if imports from country } k \text{ are eligible for the low rate} \end{aligned} \quad (1)$$

Three distinct applications of rules of origin have been made. They relate to rules in free trade areas, preferences to developing countries and the treatment of imports that have some domestic content. Each has traditionally used all-or-nothing rules of origin.

(i) Rules of origin in free trade areas

These rules have been discussed most fully in the context of preferential rules of origin. Take a country that is a member of some regional free trade area. Let t_i^{MFN} ($= t_i^H$) be the applied MFN tariff rate and t_i^P ($= t_i^L$) be the preferential rate on good i , with $t_i^P < t_i^{MFN}$. Both rates are assumed to be *ad valorem* rates.

Under tradition rules of origin, the problem is to determine which country is the source or origin of the imported good. However, as noted in Section 1, the origin of goods traded across borders becomes ambiguous when there is international trade in intermediate inputs or in primary factors. In such cases, multiple countries contribute to the cost of production of the final good and, therefore, to the value added in its production. This is the source of problems with the rules of origin. As Lloyd (1993, p. 708) noted “the essential problem is that, with international trade in intermediate inputs and the splitting of the value added in traded goods between two or more independent countries, countries produce the value added components but trade the product in which the value added is embodied. The proportions of value added in a single member and in the area collectively can vary all the way from just over zero to 100 per cent.”

This led Lloyd to recommend a tariff whose base is not the price of the imported article but rather the proportion of the value added outside the area. For good i , let v_i^P and

v_i^{MFN} denote the proportions of the value added which are added by factors inside and outside the area respectively². Then the tariff rate that is actually levied on a dollar of imports of the commodity by a member country would be simply

$$\bar{t}_i = v_i^P t_i^P + v_i^{MFN} t_i^{MFN} \quad v_i^P + v_i^{MFN} = 1 \quad (2)$$

Given t_i , the duty payable increases continuously with the proportion of non-area value added. This tariff adjusts the ordinary applied MFN rate. The method changes the valuation of imports for duty purposes.

Typically $t_i^P = 0$. In this case, the tariff reduces to

$$\bar{t}_i = v_i^{MFN} t_i^{MFN} \quad (3)$$

This is the form used by Lloyd (1993). He called this tariff rate the *value added* tariff rate. This change reduces the duty payable in all cases where $v_i^{MFN} < 1$, that is, in all cases where some value has been added in the area. For example, if 50 per cent of the value added is added in the member country and 50 per cent in a third country or third countries outside the free trade area, the adjusted tariff rate on imports from the member country would be only 50 per cent of the MFN rate.

This approach to rules of origin was endorsed by Ho (1998), who called it multiple country rules of origin, and by the Pacific Economic Cooperation Council (PECC) Task Force on Rules of Origin (PECC, 1998). Ho (1998) declared "the idea of one single country of origin is becoming increasingly out of date and out of touch with reality." Ho (1998) noted that one could define the tariff rate on some tariff item as the sum of the tariff rates levied on each country component of the value added. The Task Force concluded "...the time has probably not yet come for a system of multi-country ROO [Rules of Origin] to replace the current system of single country ROO." They saw the main disadvantages of the method as the difficulty of accepting an entirely new concept and the administrative difficulties.

Such a value added tariff or multi-country rule of origin is the natural device to handle multiple-country production processes. It has a number of advantages over traditional rules of origin for preferential trade. The method of valuation is uniform among goods and therefore cannot be manipulated by governments to give more protection to selected goods. It does not assign origin to one country arbitrarily and origin does not therefore change dramatically with small changes in costs or exchange rates. It allows for changes in the mix of countries in the chain of production and their relative contributions to value added. And it can also allow for the fact that part of the value added in a foreign country may be a payment to capital owners resident in the home country or to workers from the home country who are temporarily resident in a foreign country working for multinational corporation.

One needs to consider the efficiency properties of the value added tariff compared to traditional (single country) rules of origin. Rules of origin are of concern to economists, as distinct from tariff administrators, because they are essentially protective and

encourage trade diversion. When a new regional trading arrangement is formed, discrimination is introduced from two sources. First, for goods where value is added wholly in one member country with a nationally integrated production process, new preferences give suppliers of final goods from within the region a preference over suppliers from outside the region. Second, for goods where value is added partly in one member country, the rules of origin determine when such fragmented production will receive the protection of the importing country's applied tariff rate. In some regional trading agreements, rules of origin have been used deliberately to give high protection to regional producers in particular industries. Moreover, Rodriguez (2001) shows that standard rules lead to a distortion of production within the area, a phenomenon that is distinct from trade diversion. He calls this trade regression.

The efficiency effects of alternative rules of origin have been considered by (Lloyd, 2001), using the model of Rodriguez (2001). In general, a change in the rules of origin will affect the price and quantity of goods exported, and the degree of processing (that is, the value added by the exporting country in each unit). The analysis of rules of origin focuses on the second margin. One cannot state that in general the value added tariff or multiple country rule of origin is preferable to a single country rule of origin which use change of tariff headings or percentage rules, or *vice versa*. The value added tariff rule will be less protective than a standard rule, say a rule based on the percentage of value added in the import price, in some situations and more protective in others. It is generally less protective than standard rules of origin. Moreover, multiple country rules of origin will eliminate the distortion due to trade regression. However, in circumstances where standard rules of origin encourage greater value adding in the region to qualify for origin within the region - which are the cases of concern to economists under the existing rules - it would have a lesser protective effect than standard rules. This difference arises from the continuous marginal effect of the value added tariff compared to the all-or-nothing flip-flop effect of standard rules. For those imports from one member country into another which satisfy a standard rule of origin, there will be a 100 per cent elimination of the duty whereas under the multiple country rule of origin, there is a fractional reduction in the duty.

We should adopt multiple country rules of origin. They do precisely what rules of origin are intended to do, namely, tax foreign factor owners and not domestic factor owners. Multiple country rules of origin are still protective in some instances but a complaint against these protective effects is really a complaint that legislators are not prepared to move to free trade.

So far preferential rules of origin have been viewed from the point of view of one region adopting a new rule. There is also an advantage to the world trading system in adopting a multiple country rule of origin. There is currently a debate about the direction of reform of rules of origin. If a multiple country rule of origin system were adopted for preferential trade, it would replace a hotch-potch of rules with a single rule that is uniform across all goods in all regional agreements.

There are still problems with the administration of a multiple origin rule for preferential trade as it is more complex to administer than a CTH rule and, to a lesser extent, the percentage rule. These problems will be considered, I expect, by subsequent speakers. I want to comment on the generality of the problems of origin of goods traded internationally as they go beyond preferential rules of origin as they are traditionally defined.

(ii) Rules of origin applied to imports from developing countries

There is a second important application of this multiple country form of the rule of origin that has not previously been noted to my knowledge. This is the possibility of a new rule of origin for imports from developing countries which are admitted at some preferential rate under schemes such as the EU's Lomé Convention or the GSP schemes operated by the US and some other developed countries.

At present developing countries receive non-reciprocal preferences in most developed country markets for some goods at least but these preferences are based on traditional rules of origin. When imports of good i are assessed as originating from a developing country (DC), the tariff rate is $t_i^L = t_i^{DC}$ and when imports are assessed as originating in a country which is not an eligible developing country, a non-developing country³ (NDC), the tariff rate is $t_i^H = t_i^{NDC} = t_i^{MFN}$.

These rules do little to overcome the problem of escalation in MFN rates and the associated increase in duties on imports from developing countries as the goods in progress move down the production chain. Escalation still discourages developing countries from exporting more processed forms of manufactures. This is partly because some developed countries do not extend the preferences to more processed goods and partly because later stage processing of developing country outputs in some cases takes place in developed countries which are not eligible for the preferences under Kyoto Convention designating the last country in which substantial transformation took place as the country of origin. Market access for exports from developing countries was one of the hotly debated issues in the recent Ministerial Meeting of the WTO.

In place of existing GSP schemes that give preference to products deemed to have originated in a developing country under existing rules of origin, preferences granted by developed countries to developing countries could be based on *value added* by developing countries. That is, for goods subject to a developing country preference, value added by a developing country could receive a preference when imports that embodied their stage of production entered a developed country. For good i , let v_i^{DC} and v_i^{NDC} denote the proportions of the value added which are added by factors in developing countries eligible for these preferences and in non-developing countries respectively. Let t_i^{DC} be the preferential rate on good i and t_i^{MFN} again be the applied MFN tariff rate which now applies to non-developing countries, with $t_i^{DC} < t_i^{MFN}$. (For the moment, it is assumed that the importing country is not also a member of some reciprocal preferential area.) Then the tariff levied on an import of good i would be

$$\tilde{t}_i = v_i^{DC} t_i^{DC} + v_i^{NDC} t_i^{MFN} \quad v_i^{DC} + v_i^{NDC} = 1 \quad (4)$$

If $t_i^{DC} = 0$, the tariff levied on an import of good i reduces to

$$\tilde{t}_i = v_i^{NDC} t_i^{MFN} \quad (5)$$

Value added by different developing countries could be cumulated under this scheme.

This change in valuation could hold for all imports from developing countries into developed countries that are currently subject to developing country preferences. To give the maximum concession to developing countries and to make the scheme administratively simple, I suggest that the preferential tariff determined in this manner be zero for all imports from developing countries. A variant of the scheme would be to restrict the eligible value added to value added by least developed countries.

The effect of substituting this method of valuation for the present GSP-type scheme with standard rules of origin can be analysed in much the same way as the comparison between standard preferential rules of origin and the value added tax for trade within a regional agreement discussed above. There may be an increase in the quantity sold of the product and possibly in the export price as the demand for the raw materials or semi-processed exports from the developing countries would increase. However, the focus is again on the extent of processing under different rules of origin.

One needs to distinguish several cases. First, suppose a good is produced wholly in a developing country and is eligible for the GSP preference when sold directly to a developed country. In this case, there would be no change as the good would enter at the preferential rate under both a GSP preference and a developing country value added tariff.

Suppose now that the good is only partly processed in a developing country and exported directly to a developed country. Assume that the developed country has a GSP scheme but the GSP only applies to less processed goods. The developing country may still produce the good and receive some benefit from a preference scheme but the degree of processing in the developing country would be limited. In this case, the shift to a developing country value added tariff would increase the value added per unit of output as all value added in the developing country would receive the preference. In fact, the degree of processing in the developing country would equal that under a free trade regime. The value added tariff or multiple country of origin rule overcomes the problem of tariff escalation. A proof of this result is provided in the Appendix.

A third case arises where a raw material or a good which is lightly processed is produced in a developing country and then exported to one developed country for further processing and then exported to a final destination in a third developed country. Imports from the second country are not eligible for a GSP preference under a single country rule of origin. However, under a multiple country rule of origin, the imports of a developing country would enter at a preferential rate. Hence, it would not matter if a

developed country were the country in which the last substantial transformation occurred or not. Value added at later stages by any developing country would not be discouraged by tariff escalation in developed country markets as the value added by developing countries would enter duty-free, irrespective of where the later stage processing occurred.

By comparison with the present GSP schemes, more goods exported from developing countries would enter developing countries at zero or reduced tariff rates and in some cases there would be more processing and value adding in the developing countries. Under this multiple country method of valuation, the tariff on all imports from developing countries would be zero in the genuine sense that all of the production using factors supplied by developing countries would be exempt from duty.

(iii) Imported goods with a domestic content

A third related problem arises when imported goods have a domestic content, as noted in Section 2. In such cases Lloyd (1994) recommended a tariff that is again based on the foreign value added rather than on the landed price. For good i , let v_i and v_i^F denote the proportions of the value added which are added by factors resident inside and outside the country's custom area respectively, and t_i^{MFN} be the applied MFN tariff rate. Then the tariff rate that is actually levied on a dollar of imports of the commodity will be

$$\hat{t}_i = \frac{v_i^F}{v_i} t_i^{MFN} \quad v_i + v_i^F = 1$$

(6)

\hat{t}_i is an adjusted tariff rate. Given t_i , the duty payable varies continuously with the proportion of non-area value added. As with a value added tariff for preferential imports, the domestic content due to the use of domestic factors in production processes located abroad can be included in v_i along with upstream intermediate inputs produced domestically and re-imported. With $v_i > 0$, $\hat{t}_i < t_i^{MFN}$. That is, the rate of duty is less than under a standard tariff.

This is in essence the method of taxation used by the US and other countries which have offshore assembly provisions, though these provisions are limited to selected goods and do not make an adjustment for primary inputs supplied by residents of the home country to overseas manufacturers. This tax removes a distortion in the structure of import taxation which otherwise discriminates against that part of domestic production which takes place offshore. The method is again a change in the valuation of imports for duty purposes. It could be applied to all imports.

A single border tax

It is obvious from Equations (2), (4) and (6) that these three import taxation problems are closely related. They are all parts of a larger tax problem due to international trade in inputs. In the case of the reciprocal preferential rule, the "foreign" countries are those

outside the regional trading arrangement. In the case of the non-reciprocal preferential rule, the “foreign” countries are the countries not eligible for the developing country preferences. In the case of the tax on non-preferential imports, “foreign” refers to residents of all other countries in the ordinary sense of the word.

The three taxes could be combined into a single border tax that is based on multiple country origin of goods. To be general, there should be allowance for non-zero preferential tariff rates. With full generality a value added tariff can now be defined as:

$$\tau_i = v_{i1} t_{i1} + \left(\sum_{k \in K_2} v_{ik} \right) t_i^P + \left(\sum_{k \in K_3} v_{ik} \right) t_i^{DC} + \left(\sum_{k \in K_4} v_{ik} \right) t_i^{MFN}, \quad \sum_k v_{ik} = 1 \quad (7)$$

Allowance is made for four different kinds of value added imports; value added by factors resident in the home country itself, value added by countries which are members of some regional trading agreement, value added by developing countries whose content is eligible for entry at a preferential rate and value added by foreign countries that are not developing and not participants in regional trading agreements. There are four corresponding sets of countries. The first comprises a single country, the home country. It is convenient here to number the home (importing) country as country 1. K_2 and K_3 are the sets of countries who are eligible for preferences because of membership in a regional trading agreement that includes the home country and being classified as developing countries respectively. (One could allow the home country to be a member of more than one regional agreement and to have different tariffs on imports from countries that are members of different blocs, if desired.) K_4 is the set of countries that are not developing and not participants in the regional trading agreements. At all times $t_{i1} = 0$ but for countries in regional trading agreements or developing countries the tariff rates need not be reduced to zero. Value added by different countries that qualified for either the free trade area or the developing country concession could be cumulated under this scheme.

For some imported goods, two or more of these adjustments could apply to one shipment. In the case of a final good where the initial stages were produced in a developing country and some or all later stages were produced in a second developed country that is a member of a free trade area with the importing country, the value added component from the developing country would enter at a concessional rate under the developing country preference scheme and the value added component produced in the member could enter at another concessional rate under the free trade area rules. Another combination would apply when the value adding that occurred physically in a country that is a member of a free trade area (or in a developing country) included some inputs owned by residents of a developing country (or a member of a free trade area). Value added by each country should be interpreted as the value added by factors owned by residents of the country.⁴

The tariff rate can be rewritten as

$$\tau_i = \sum_k v_{ik} t_{ik} \quad \sum_k v_{ik} = 1 \quad (8)$$

where t_{ik} is the tariff rate applied to value added in the production of good i by country k . Evidently, the value added tariff is a weighted average of the tariff rates applying to imports from each country, with the weights being the value added proportions of each country.

In the case where all preferential tax rates are zero, this term reduces to

$$\begin{aligned} \tau_i &= \sum_{k \in K_4} v_{ik} t_{ik} \\ &= v_i^* t_i^{MFN} \quad v_i + v_i^* = 1 \end{aligned} \quad (9)$$

where v_i^* is interpreted as “foreign” value added in the sense of countries not eligible for any preferential rate. This tariff taxes only value added by “foreign” residents.

4. Conclusions

This is a simple scheme conceptually that has many attractions. It would tax foreign factors and not domestic factors, and it would remove a number of distortions in the choice of domestic and foreign factors used to produce final products. A single method of valuation would apply to all preferential and non-preferential imports. On the other hand, it may be more complex administratively than existing tariffs. However, this would replace all existing regional trading agreements rules of origin, developing country preferences and offshore assembly type provisions. The administrative complexity could, moreover, be made quite manageable by the device of allowing importers to pay the applied MFN tariff rate if they did not want to receive a lower rate by supplying the requisite details of value added proportions.

If these adjustments to preferential and non-preferential tariff rates are not made, the mistreatment of origin in the valuation of internationally traded goods due to single country rules of origin will continue to distort national and global production and consumption allocations. Equation (7) shows that the distortions in single country rules of origin stem from being forced to choose only one of the tariff rates when origin from different countries should be taxed differentially. For example, in a free trade area, the origin may be assigned to a fellow member country when in fact value added is split between this country and one or more countries outside the area that should be taxed at the MFN rate or the developing country preference rate.

Finally, one can note that in any country, as long as $t_i^{MFN} > 0$ for some i and some k , there will still be a distortion of production involving domestically-owned factors *vis-à-vis* production involving foreign-owned factors because of border protection. Free trade will remove these distortions. All of the four tariff rates in Equation (7) are then equal to zero. Using the perspective of multiple countries of origin, one can view free trade as the declaration that factors owned by foreigners from all other countries will be treated equally with domestically-owned factors. Under free trade, origin does not matter.

FOOTNOTES

- 1 In the case of the US most of the products are processed in Mexico or Canada. These imports are covered now by the reductions in duty under NAFTA.
2. An adjustment can be made for value added by factors owned by residents of a country different than that in which the production takes place. This is discussed below.

In principle, this method could also include indirect as well as direct inputs from domestic residents but this adjustment would not be worth the additional administrative complexity.

3. Non-eligible countries might include some countries which are developing countries in terms of per capita incomes but have been declared non-eligible or graduated.
4. In calculating the value added from developing countries in the developing country preferences, this would exclude value added physically in developing countries by foreign investors and executive and skilled labour from developed countries. The effect of this would be to lower the duty adjustment but, on the other hand, it would give an incentive for more of the value adding in developing countries to be done by local residents.

Appendix: Analysis of Developing Country Preferences

One model is particularly suited to the analysis of rules of origin. This is an adaptation of the Rodriguez (2001) version of the continuum of stages model constructed by Dixit and Grossman (1982).

Consider that the production of some good takes place in a continuum of stages that can be arrayed on the unit line, with 0 representing the first stage and 1 the production of the final good. For each stage, z , there is a unit cost function $c(z)$. These unit costs of producing each stage vary across countries. It is not necessary to retain the Dixit and Norman assumption that technologies of producing stages are identical across countries, nor their assumption that there are only two factors and stages can be arrayed in order of capital intensity. However, the assumption of constant returns to scale is retained.

Suppose there are two countries, countries 1 and 2. The unit costs of producing each stage in each country are $c_1(z)$ and $c_2(z)$ respectively. The unit costs of producing the final good in country k by a fully integrated process are then

$$C_k = \int_0^1 c_k(z) dz \quad k = 1, 2,$$

(A.1)

For country k , the unit cost of that stage, $c_k(z)$, is the gradient of the function C_k . Comparing the gradients gives the comparative costs of production for each stage z in country k .

Competition and international trade in the goods in process at each stage ensures that the global costs of production of the final product are minimised. Under a regime of free trade in all stages and both countries, the stages are allocated among countries from the solution to

$$\text{Min } \left\{ \int_{R_1} c_1(z) dz + \int_{R_2} c_1(z) dz \right\} \quad (\text{A.2})$$

where R_k are the ranges of stages produced in each country. With different gradients, the production of stages will be broken up between the countries. That is, there will be

fragmentation. Both countries will produce some stages under free trade if their costs are strictly less than those of the other two for some stages. Under a regime of non-free trade, the stages are allocated between the countries from the solution to

$$\text{Min} \left\{ \int_{R_1} d_1(z) dz + \int_{R_2} d_1(z) dz \right\} \quad (\text{A.3})$$

where d_k are the costs including tariffs paid on imported goods in process. If there are positive tariffs on some goods at least in each country the choice of stages will be distorted. The effects of changes in trade policy can now be modelled.

The precise effects of each rule of origin will depend on the costs of substituting sources or processes between countries for each good. Rodriguez made the assumption that the $c_k(z)$ functions lie on a line, that is, the unit costs of a stage increase continuously down the chain of production in each country. Figure 1 reproduces these functions. It is assumed one country, country 1, is a developing country, and one, country 2, a developed country.

Suppose there is fragmentation and free trade in all stage outputs. The limits of integration, which determine which stages will be produced in which country, are identifiable. The stages are allocated between the countries from the solution to

$$\text{Min} \left\{ \int_0^{z_{12}} c_1(z) dz + \int_{z_{12}}^1 c_2(z) dz \right\} \quad (\text{A.4})$$

Country 1, the developing country, will produce all stages from 0 to $\frac{FT}{z_{12}}$ and then export the good in process at stage $\frac{FT}{z_{12}}$ to country 2. It is the upstream producer, producing the early stages of the goods in process. Country 2 produces all stages downstream from $\frac{FT}{z_{12}}$ to 1. The subscripts FT denote values in the “free trade” equilibrium to distinguish them explicitly from values in other situations that are examined below. The stage $\frac{FT}{z_{12}}$ is the borderline stage (good) that determines the division of stages between countries 1 and 2. It partitions the continuum into two segments. The borderline commodity itself may be produced in one or both countries, depending on demand.

Now consider a distorted trade situation in which country 2, the downstream producer, imposes a uniform tariff on all goods in the industry, that is, on goods in process at all stages. In this situation, the stages are allocated between the two countries from the solution to

$$\text{Min} \left\{ \int_0^{z_{12}} (1 + t_2) c_1(z) dz + \int_{z_{12}}^1 c_2(z) dz \right\} \quad (\text{A.5})$$

This situation is represented in Figure 2. The solid lines represent the free trade cost functions and the dotted line the distorted trade situation costs in country 2. The borderline stage is now z_{12}^{DT} where DT denotes values in the distorted trade situation. All stages continue to be traded internationally but the borderline stage shifts upstream. Country 1 produces less in terms of the stages but country 2 produce more. Thus, a uniform tariff reduces processing in the developing country.

Now consider that the developing country grants duty free entry to all or some imports from the developing country and that standard single country rules of origin apply. If the duty free entry applies to imports at any stage, the effect will be to restore the efficient free trade allocation of stages between the two countries. If, however, the developed country extends the developing country preference only to lower stages, this introduces an escalation into the tariff structure for the developing country. The value added by the developing country will be less than in the free trade situation.

Suppose, instead, that the MFN tariff structure of the developed country is escalated with higher tariffs on more processed goods. Figure 3 illustrates one example. In this example, there are two stages at which the tariff rate jumps. The distorted trade cost line is now a step function with two jumps. The borderline commodity is z_{12}^{ET} . And suppose now that the developing country grants a preference in the form of duty free entry on some imports from the developing country. If the preference covers the imports admitted at the lower MFN rate only, or the imports at the lower two rates only,

it has no effect on the extent of processing in the developing country. The escalation prevents the developing country from higher processing, even though it is the least cost processor up to $\frac{FT}{Z_{12}}$.

Finally, suppose that the single country rule of origin is replaced by a value added developing country tariff. Then the degree of processing by the developing country would increase beyond that under the single country rule of origin. In fact, the degree of processing would return to that under a free trade regime.

Figure 1
Free Trade

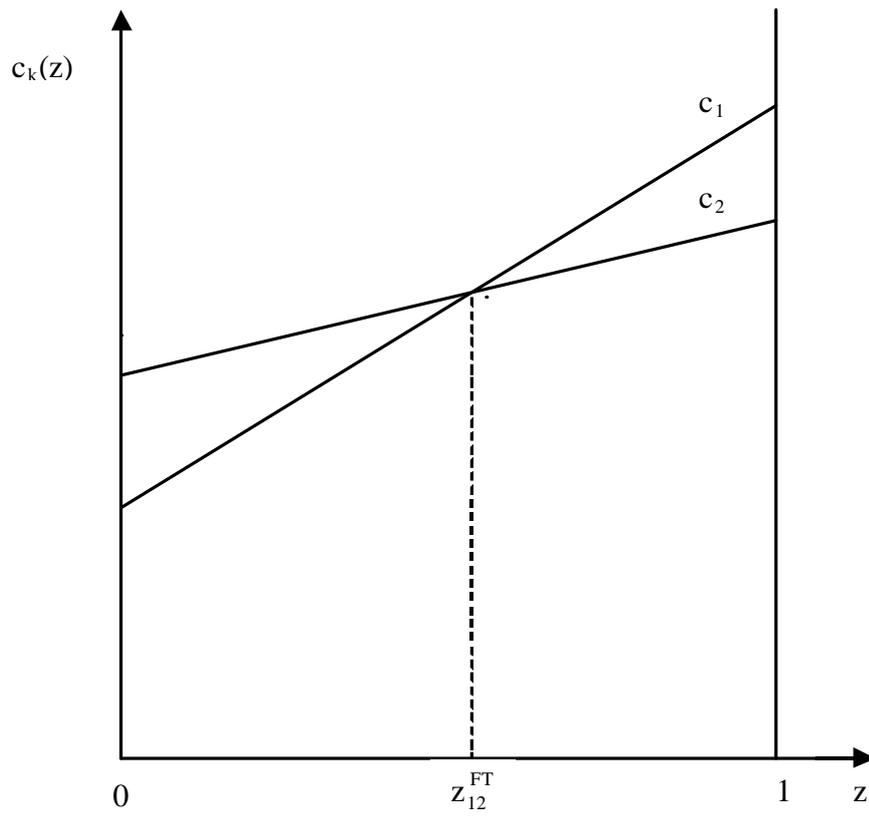


Figure 2
A Uniform Tariff

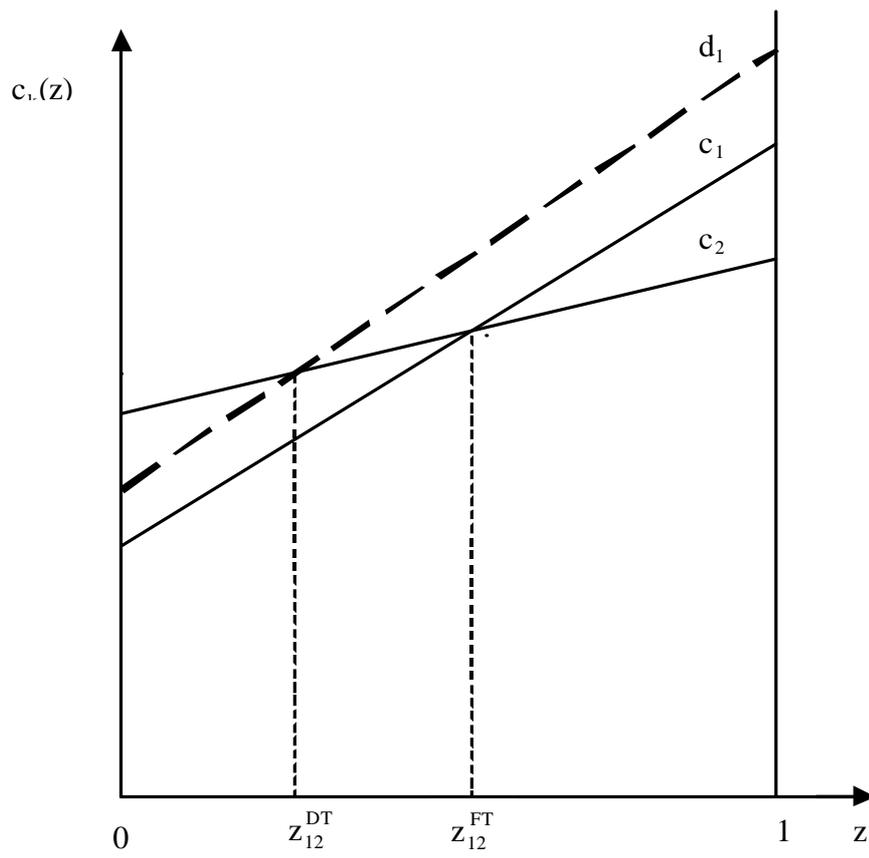
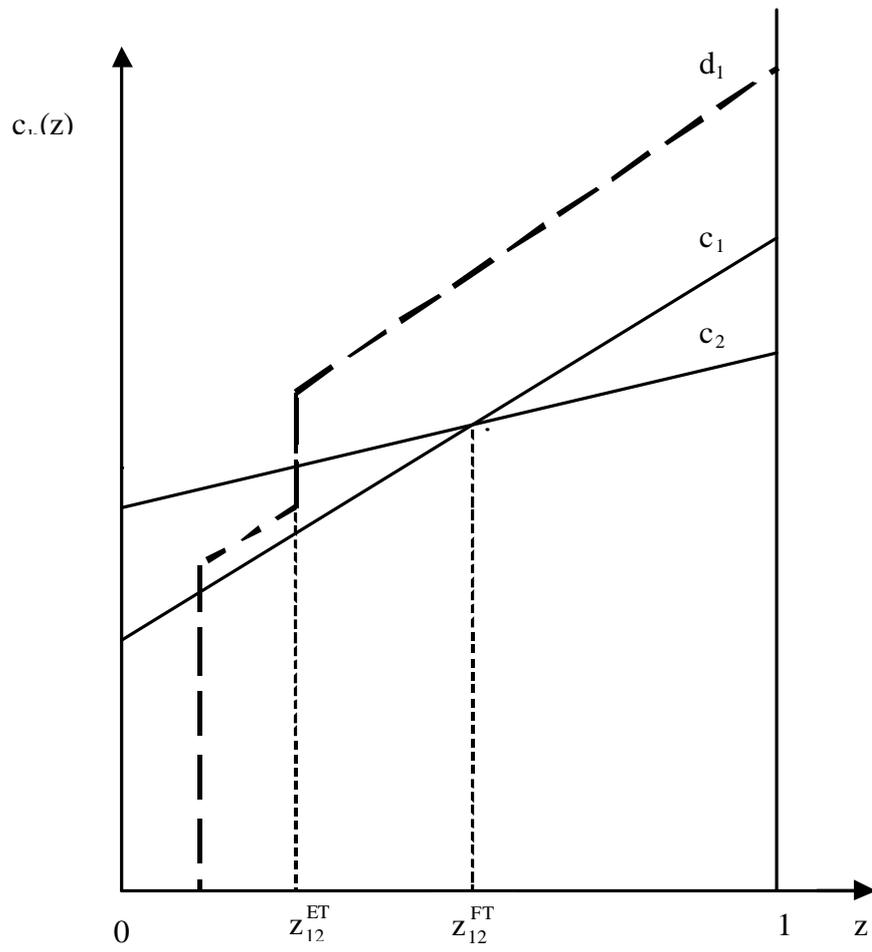


Fig eu 3
A Esc late Tdriff



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