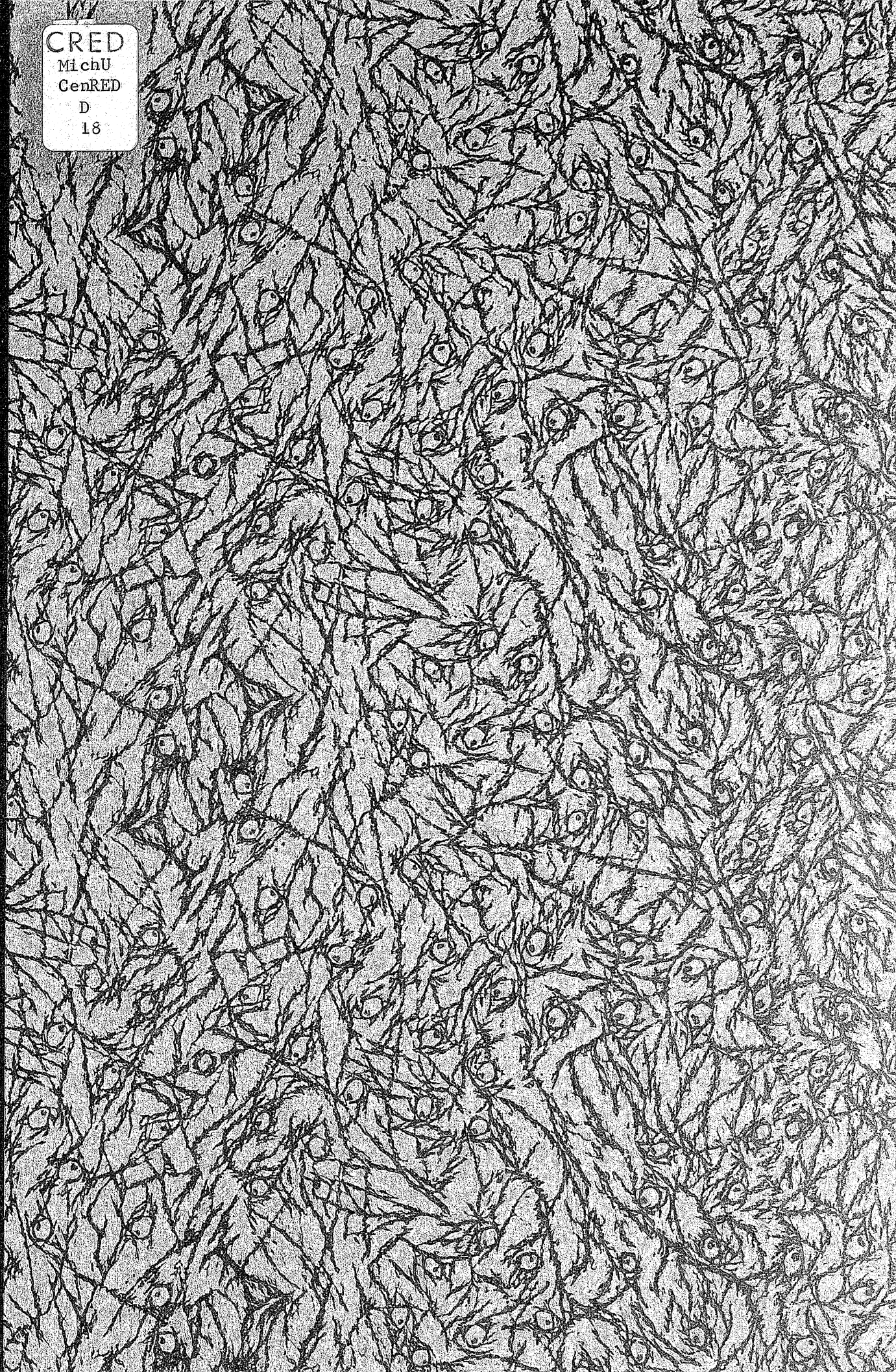
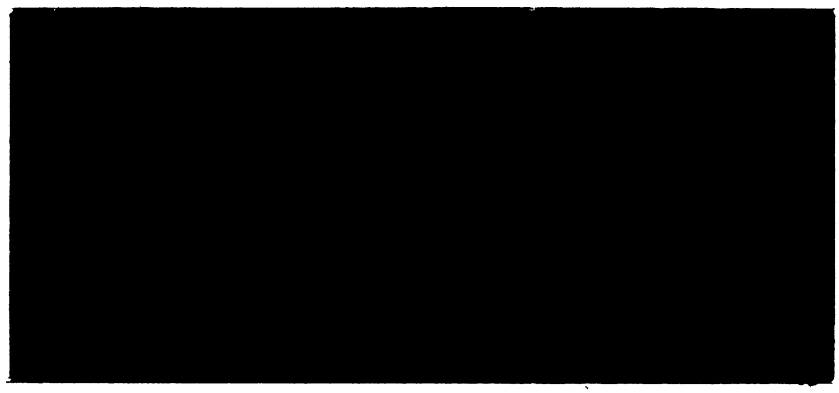




Center for Research on Economic Development

University of Michigan
Ann Arbor, Michigan 48104

The Impact of the Commonwealth Preference System on the Exports of Latin America to the United Kingdom

by

John Naranjo
Richard C. Porter

18

Discussion Paper No. 18

March 1972

Center for Research on Economic Development
University of Michigan
Ann Arbor, Michigan 48104

THE IMPACT OF THE COMMONWEALTH PREFERENCE SYSTEM ON THE EXPORTS OF LATIN AMERICA TO THE UNITED KINGDOM

John Naranjo
Richard C. Porter *

In a recent issue of the Journal of Development Studies, David Wall asks whether the Commonwealth Preference System has not only reduced the aggregate level of Latin American (LA) exports to the United Kingdom (UK), but also distorted the composition, away from manufactures and toward primary products (Wall, 1971). Though he agrees that aggregate LA exports to the UK are damaged,[1] Wall concludes that "there is no evidence which can be drawn from the available data" of distortion of the composition of UK imports from LA (Wall, 1971, p. 139).

We find Wall's analysis inappropriate, since his techniques rest heavily on the twin assumptions of homogeneity of products (within trade classifications) and the absence of non-tariff aspects of Commonwealth Preferences, both of which are unwarranted. But this does not mean, as Wall claims, that valid techniques cannot be found. This paper develops such a technique, one which incorporates heterogeneity and, in principle, permits the evaluation of both the tariff and non-tariff impacts of preference systems like the Commonwealth. In our (admittedly rough) application of this technique to the UK import data of 1968, we tentatively conclude that 1) the tariff aspects of the Commonwealth deflect[2] to the poorer nations of the Commonwealth more potential LA exports to the UK of manufactures

than of primary products, and 2) the overall (tariff and non-tariff) aspects show the same pattern of deflections. Although the numbers can at best be considered suggestive, we find that manufactures, which actually comprised 22% of total LA exports to the UK (in 1968), would have comprised 29-37% of the total were it not for the operation and heritage of the Commonwealth.

The organization of the paper is as follows. In section I, we detail our objections to Wall's approach. In Section II, we develop a more appropriate analytical framework. In Sections III and IV, we offer empirical evidence on the impact of the tariff aspects and overall operation, respectively, of Commonwealth Preferences on the composition of LA exports to the UK.

I. Wall's Analysis

Wall is quite correct to criticize simple comparisons of the composition of UK imports from LA and the underdeveloped Commonwealth (UC)[3]; the fact that UK imports from the UC contain a larger fraction of manufactures than do UK imports from LA may indicate no more than "that the UC countries have an export structure which embodies a competitive advantage, vis-a-vis LA, in semi-manufactured and manufactured products" (Wall, 1971, p. 134). Our complaint is with the two alternative tests that he performs.

In the first test, Wall calculates the ratio of UK imports from the UC to UK imports from LA for 166 products (as defined by tariff classification) and finds this ratio to be higher for those products with positive Commonwealth Preferences than for those with zero Preferences.[4] Since Commonwealth Preferences, essentially the

obverse side of the British tariff structure, tend to be cascaded by degree of processing, the hypothesis seems corroborated: the higher Commonwealth Preferences on the more processed goods distort the composition of LA exports to the UK toward the less processed commodities.

The ratios for particular ranges of preferential margins, however, suggest that the problem is not so simple. For classes of Commonwealth Preferences, the ratios average 1.9 for 0.4-8.0% Preferences, 13.8 for 10-14% Preferences, and only 3.8 for Preferences of 15% and higher. Wall's explanation of the absence of a monotonic relationship is that "we know from the theory of effective protection that the degree of protection afforded by a tariff to a preferred trade flow is not proportional to the size of the tariff (or preference margin in this case)" (Wall, 1971, p. 137). But this is irrelevant; effective protection has nothing to do with the determination of the sources of imports, only with the determination of the relative size of imports and domestic production. The failure of the average ratios to rise consistently with the size of the Preference margin must be attributed, if not to statistical abberation, to the idiosyncracies of comparative advantage--the very failing of the naive tests which Wall had earlier criticized--or to the importance of non-tariff factors in the determination of these trade flows--despite Wall's elimination of products for which "non-tariff distortions are known to predominate" (Wall, 1971,p. 136).[5]

Wall's second test relies on the discovery of truly homogeneous products, i.e., those for which "imports . . . will be drawn from

the cheapest supplier after tariffs have been imposed" (Wall, 1971, p. 137). But the products he selects for his sample are "those items which the UK imports from both the UC and from LA in significant . . . values" (Wall, 1971, p. 137) -- but these latter are patently not homogeneous.[6] The later comparison of unit-values shows up this contradiction, ratios of unit-values between UC and LA imports ranging from 0.21 (for BTN 4414D) to 4.00 (for BTN 3301A4). The simple comparison of unit-values, with and without Preferences, is clearly illegitimate when the sample has been chosen in such a way as to preclude homogeneity of the products.[7]

Belatedly, Wall realizes the basic difficulty with products defined from even the most detailed tariff classifications:

> . . . even at this level of disaggregation the data are potentially non-homogeneous. Thus BTN number 4809 . . . covers all "Building board of wood pulp or of vegetable fibre, whether or not bonded with natural or artificial resins or with similar binders. (Wall, 1971, p. 139, his italics)

To Wall, the omnipresence of heterogeneity is "sufficient to demonstrate . . . that there is insufficient evidence to support the hypothesis" (Wall, 1971, p. 138). In fact, all it means is that an approach which presumes homogeneity is inappropriate in a world of heterogeneity. In Section II, we assume that the varieties of products that the UK imports from different regions are heterogeneous and are therefore able to develop a more appropriate analytical framework for the analysis.

Wall's techniques are also based on the assumption "that all distortions other than tariffs are neutral in effect between sources of import supplies" (Wall, 1971, p. 139). Again belatedly, he

recognizes that his efforts to omit products for which this assumption fails were inadequate. And his conclusion is that, owing to the ubiquity of non-tariff distortions, "we cannot validly test the original hypothesis" (Wall, 1971, p. 139). In Section II, we suggest a technique which, in principle, permits such a test; we advance it tentatively since, in fact, it requires the discovery of a "control" region which exhibits no differential tariff or non-tariff distortions in the composition of its imports (with respect to LA and the UC) and which is comparable to the UK in its underlying import demands.

Thus, in Section II, we are able to show that the impact of a preference system can be evaluated in a world of heterogeneous products and non-tariff distortions. In Sections III and IV, we offer a rough empirical application of the technique.

II. Analytical Framework

The demand function of British users for an imported product--and by product is meant a highly disaggregated SITC classification--would involve a number of variables. But the function determining the relative quantities of Latin American (LA) and underdeveloped Commonwealth (UC) "varieties" of this product is probably not so complex. Since the products which the UK imports from both LA and its UC are rarely very heterogeneous, it is likely that the UK demand function for the LA variety of a product and the UK demand function for the UC variety of that product display very similar income elasticities and cross-price elasticities (with respect to the prices of the various varieties of other products and of other

regions' varieties of this product). To the extent that this is so, we may assume that the relative quantities (demanded by the UK) of LA and UC varieties of a product are essentially explained by their relative prices to British consumers, i.e.,

$$(1) \qquad \frac{Q_{la}}{Q_{uc}} = f\left[\frac{P_{la}\,(1+t)}{P_{uc}}\right],$$

where Q_i is the import into the UK of the $i^{\underline{th}}$ region's variety of a particular product, f [. . .] represents a function, P_i is the CIF price to the UK of the $i^{\underline{th}}$ region's variety,[8] and t is the rate of Commonwealth Preference on this product.[9] Although general considerations require only that the function, f [. . .], be downward-sloping for positive values of the Q's and P's, we assume further that it can be adequately portrayed by a constant-elasticity-of-substitution (CES) formulation:

$$(2) \qquad \frac{Q_{la}}{Q_{uc}} = \alpha \left(\frac{P_{la}}{P_{uc}}\right)^{-\beta} (1+t)^{-\beta}.$$

While this CES function is properly downward-sloping, requires the minimal two parameters, and is the traditional choice of trade analysts,[10] its superiority would need to be verified in any precise econometric exercise. For our methodological and rough empirical purposes, however, the adequacy of the CES function is, for convenience, assumed. Equation (2) may readily be written in value terms:

$$(3) \qquad \frac{V_{la}}{V_{uc}} = \frac{P_{la}\,Q_{la}}{P_{uc}\,Q_{uc}} = \alpha \left(\frac{P_{la}}{P_{uc}}\right)^{1-\beta} (1+t)^{-\beta}.$$

Equation (3), the final formulation of the variety-ratio demand, in short, assumes 1) that the ratio of the import values (CIF) of the two regions' varieties of a particular product (as defined from the tariff classification) is largely determined by the ratio of the prices (i.e., CIF plus tariff) of the varieties to UK users, and 2) that a two-parameter (α and β) CES function adequately depicts this demand.[11] Although the methods developed in the remainder of this section could be readily generalized, it is this CES formulation, equation (3), that provides the basis for the empirical work of Sections III and IV.

In Section III, we examine the impact on potential LA exports to the UK of the Commonwealth Preference System on the assumption that this impact is entirely achieved through preferential tariff rates. Write V^A_{la} / V^A_{uc} for the statistically observed (i.e., actual) variety-ratio of a particular product in a particular year; and write V^0_{la} / V^0_{uc} for the variety-ratio which would have materialized in the absence of Commonwealth Preference tariff rates (i.e., if t had been zero). Then, from equation (3),

$$(4) \qquad \frac{V^0_{la}}{V^0_{uc}} = (1 + t)^{\beta} \left[\frac{V^A_{la}}{V^A_{uc}}\right]$$

Thus, with knowledge of the actual variety-ratio and the rate of Commonwealth Preference (for a product), information about β is sufficient to permit an estimate of the extent to which the variety-ratio was reduced by the tariff preference.

Equation (4) gives information about relative losses; in order to estimate the absolute losses due to the tariff preference, it is necessary to know something about the value of total trade (of the two regions, LA and UC) in this product--i.e., about the sum, $V_{la} + V_{uc}$. We would expect this total to rise if LA were granted equivalent preferences,[12] and to fall if the UC preferential treatment were withdrawn. We could make an assumption about the manner in which the preferential tariffs might be withdrawn and proceed to estimate the effect on the trade total (i.e., $V_{la} + V_{uc}$); but this latter task is not easy and the resulting estimate would at best be tenuous. We prefer a different procedure--to assume that the preferential treatment of UC varieties (with respect to LA varieties) is withdrawn in such a way that the total exports of the product (from LA and UC to the UK i.e., the sum, $V_{la} + V_{uc}$) are not altered. This assumption is arbitrary and not aimed at realism; what it provides is an interpretable benchmark from which to measure LA trade losses. Throughout, our measures of losses are in effect saying, "Compared to a no-preference situation in which the total exports (from LA and UC to the UK) were equal to the actually observed value . . ." To the extent that the removal of these preferences would increase (or decrease) this trade total, the dollar figures we offer of LA export losses due to preferences are understated (or overstated). Furthermore, to the extent that any exports to the UK which LA "loses" due to preferences are in fact sent to other countries, consumed at home, inefficiently produced, or

transformed into other products (through resource reallocation), then ignoring these general equilibrium ramifications--as this paper does--means 1) that our figures may overstate the net LA export losses, and 2) that no welfare inferences should be drawn.

A formula can then be derived, from equation (4), for the hypothetical absolute level of LA exports to the UK which would have been attained in the absence of Commonwealth tariff preferences,

$$(5) \qquad V_{la}^{0} = \frac{(V_{la}^{A} + V_{uc}^{A})}{(1 + t)^{-\beta} V_{uc}^{A} + V_{la}^{A}} V_{la}^{A} .$$

We use equation (5) to calculate the fraction of this potential trade that was lost due to Commonwealth tariff preferences--what we call the Latin American Loss Ratio (LALR):

$$(6) \qquad LALR = \frac{V_{la}^{0} - V_{la}^{A}}{V_{la}^{0}} = (1 - s)(1 - [1 + t]^{-\beta}),$$

where s is the actual LA share of the two regions' (LA and UC) total exports of the product to the UK.[13] It can be seen that calculation of LALR involves three parameters, s, t, and β. Two of these, s and t, are observable, but the third, β, is not susceptible to easy estimation. In Section III, we estimate the absolute LA losses (i.e., $V_{la}^{0} - V_{la}^{A}$) and the values of LALR for particular products, and groups of products, for different assumed values of β.

In Section IV, we turn to the larger problem of estimating the overall (i.e., not just tariff) impact of the Commonwealth Preference

System on LA exports to the UK. The Commonwealth--a web so subtle, air is comparatively crude--is much more than a list of tariff preferences. Discrimination occurs, to some extent, through quantitative restrictions that favor Commonwealth suppliers. Far more important, if less tangible, are the ties of consumer preferences and business trade channels which became firmly established during the years of extensive government regulation of British trade, in the 1930's and 1940's.[14]

To measure directly the magnitude by which UK imports are "deflected"[15] from the LA to the UC countries by means of these multifarious influences would of course be extremely difficult. But an indirect technique is suggested in Wall's article, namely a comparison between the exports of LA and UC to the UK and to the other OECD countries of Europe (hereafter OE for "other Europe"). For the evaluation of the overall impact of Commonwealth ties on the geographical composition of UK imports, these OE countries provide an obvious "control group" since they grant no preferences to either the LA or UC countries and they are at a stage of development and industrialization comparable to the UK. Equally obviously, the OE countries do not provide a perfect control group--there are many differences between them and the UK, as concerns their (LA versus UC) import composition, that have little or nothing to do with the Commonwealth, past or present. As long, however, as the non-Commonwealth differences are random in their influence on the composition of imports (between LA and UC varieties), the OE will still,

"on the average," provide such a control. We proceed, in this section, to develop the method for assessing the overall impact of a preferential arrangement by comparison with the trade data of a control group; in the empirical work of Section IV, we use the OE countries as such a control group.

Making the same assumption for the OE control group as earlier for the UK with respect to the variety-ratio aspect of import demands, we can rewrite equation (3) for the OE countries,

$$(7) \qquad \frac{V_{la\rightarrow oe}}{V_{uc\rightarrow oe}} = \alpha' \left(\frac{P_{la\rightarrow oe}}{P_{uc\rightarrow oe}}\right)^{1-\beta'},$$

where the V and P subscripts, i→j, now indicate the export of the $i^{\underline{th}}$ region's variety to the $j^{\underline{th}}$ region,[16] and the primes (') to the α and β indicate that the demand parameters for OE are not necessarily identical to those for the UK. We are assuming that, in the absence of the UK Commonwealth ties, there would be no systematic differences between the variety-ratio demands of OE and the UK; therefore, knowledge of the values of α' and β', in equation (7), would provide a point-estimate of what the UK variety-ratio would have been if there had been no Commonwealth influences on its trade. In fact, the Commonwealth influence will show up as an α different from α' and/or as a β different from β'; where the differences appear is an empirical question that we here skirt (on the intuitive feeling that the error involved is probably small) by assuming that Commonwealth effects entirely emerge in a divergence of α from α' (i.e., that $\beta = \beta'$). In equation (7), observed trade data and knowledge about β provide an

estimate of α' :

$$(8) \qquad \alpha' = \left[\frac{V^A_{la\to oe}}{V^A_{uc\to oe}}\right] \left[\frac{P^A_{la\to oe}}{P^A_{uc\to oe}}\right]^{\beta-1} .$$

In the absence of Commonwealth influences, the UK variety-ratio for any product would be that given by equation (3) with t equal to zero and the value of α' (found from equation (8)) substituted for α:

$$(9) \qquad \frac{V^O_{la\to uk}}{V^O_{uc\to uk}} = \left[\frac{V^A_{la\to oe}}{V^A_{uc\to oe}}\right] \left[\frac{P^A_{la\to uk} \;/\; P^A_{uc\to uk}}{P^A_{la\to oe} \;/\; P^A_{uc\to oe}}\right]^{1-\beta} ,$$

where the O superscript again indicates the hypothetical variety-ratio that would have emerged in the absence of Commonwealth influences. In this manner, if a satisfactory control group can be located, an estimate of the overall trade impact of a preferential arrangement can be made. It is equation (9) that forms the basis of the empirical work of Section IV.

We there estimate the <u>overall</u> Commonwealth trade "deflection" in two ways. First, the "equivalent tariff" implicit in the Commonwealth deflections is calculated for each product. By the equivalent tariff (ε) is meant that UK preference rate which, in the <u>absence of any other</u> differences between UK and OE, would have generated the observed UK variety-ratio. The procedure is that developed for equation (4); the actual UK variety-ratio equals the hypothetical no-preference ratio adjusted by the "equivalent tariff", i.e.,

$$(10) \qquad \frac{V^A_{la}}{V^A_{uc}} = (1 + \varepsilon)^{-\beta} \left[\frac{V^O_{la}}{V^O_{uc}}\right] ,$$

where the superscripts A and O again refer to the actual and hypothetical ratios. Removing V^O_{la}/V^O_{uc} from equation (10) by substitution from equation (9), we reach the estimating equation for the "equivalent tariff":

$$(11) \qquad \varepsilon = \left[\frac{V^A_{la\to uk} \;/\; V^A_{uc\to uk}}{V^A_{la\to oe} \;/\; V^A_{uc\to oe}}\right]^{\frac{-1}{\beta}} \left[\frac{P^A_{la\to uk} \;/\; P^A_{uc\to uk}}{P^A_{la\to oe} \qquad P^A_{uc\to oe}}\right]^{\frac{1-\beta}{\beta}} - 1,$$

where all of the elements on the right-hand side of equation (11) are observable (with the exception of β, for which various values will be assumed).

The second measure of trade "deflection" involves direct use of equation (9). Calculation of the no-preference, hypothetical UK variety-ratio, coupled with the benchmark of an unchanged total UK trade in the product (from the two regions, i.e., $V_{la} + V_{uc}$), permits estimates of the Latin American Loss Ratios due to the <u>overall</u> impact of the Commonwealth deflections (called LALR*).[17]

This completes the development of the analytical technique. We have shown in principle, 1) that heterogeneity of varieties can be incorporated into the analysis, 2) that the tariff effects of preferences can be evaluated in a world of heterogeneity of varieties, and 3) that, through discovery of an adequate control group, the overall impact of a preferential milieu can also be uncovered.

We make fewer claims for the rest of the paper. It is small effort to draw empirical blood with this analytical weapon. We have taken shortcuts that no full econometric study could defend-- especially, 1) the use of assumed, rather than estimated, values for β, 2) exploiting the data of only one year, 3) failing to examine alternative (or disaggregated) control groups, 4) the overly facile acceptance of the CES form for the variety-ratio demand functions, and 5) the unquestioned assumption that $\beta = \beta'$. Nevertheless, the crude and incomplete results of Sections III and IV are highly suggestive.

III. Losses due to Commonwealth Tariff Preferences

For particular products and groups of products, the Latin American Loss Ratio (LALR) due to the Commonwealth Preference System can now be examined. For each product, this ratio represents the fraction of the estimated potential value of LA exports to the UK that are "deflected" to the UC countries through the operation of the tariff aspects of the Commonwealth Preference System.[18] The sample, on which these calculations are based, consists of 54 products,[19] 36 "primary products" (i.e., those in the SITC 0-3 groups) and 18 "manufactures" (i.e., those in the SITC 4-9 groups).[20]

It is almost inevitable that the LALR will differ between these two broad groupings of products since there is an obvious ceteris paribus relationship between the LALR and the rate of tariff preference (which can be seen in equation (6)) and the preference rates are, on average, much lower for primary products than for manufactures. Indeed,the preference rate is zero for 15 of the 36

primary products in the sample and is 10% or higher for 11 of the 18 manufactures. But a higher preference rate does not necessarily imply a higher LALR. This can be most easily seen in an approximation to equation (6), legitimate for modest values of t,

$$(12) \qquad LALR = (1 - s)\beta t \ .$$

For equation (12), it is clear that LALR will rise with increases in t unless there is a sufficient offsetting 1) fall in β and/or 2) rise in s. With respect to s, the LA share of total (LA and UC) exports to the UK was (in 1968) .37 for all primary products and only .15 for the usually higher-t manufactures, so no such compensatory movements can be generally expected for particular products. With respect to β, while we present no evidence, one could make a case that the elasticity of substitution would be typically lower for the more differentiated higher-t manufactures. Rather than rely on such a case, however, we calculate a range of values of LALR for all products for assumed values of β. The lowest assumed value, 1, is chosen because we believe there are no products for which LA can increase its share of the combined LA and UC earnings (on exports to the UK) by raising its relative price (see equation (3)); the highest value, 8, is totally arbitrary but, we believe, reflects a quite high degree of substitutability between the varieties.[21]

Table 1 shows the distribution of the estimated values of LALR in the assumed range of β. Depending on the value of β assumed, the median LALR for primary products falls in the range of 0% to 4%, and for manufactures in the range of 9% to 51%. For any value of β (in

Table 1

Distribution of Estimated Latin American Loss Ratios

Product Group	Number of Products	Estimated LALR				
		0 - 5%	5 - 10%	10 - 15%	Above 15%	Median
Primary Products:	36					
for $\beta = 1$		30	5	1	0	0.5%
for $\beta = 2$		24	6	2	4	1.0%
for $\beta = 8$		21	2	1	12	3.8%
Manufactures:	18					
for $\beta = 1$		5	8	5	0	8.9%
for $\beta = 2$		2	3	3	10	17.0%
for $\beta = 8$		0	1	0	17	51.1%

Table 2

Estimate of Losses of LA Exports to the UK Due to Commonwealth Tariff Preferences

	Primary Products (SITC 0-3)			Manufactures (SITC 4-9)		
	$\beta = 1$	$\beta = 2$	$\beta = 8$	$\beta = 1$	$\beta = 2$	$\beta = 8$
1. Sample, V_{1a}^{O}	415,847	418,124	433,000	5,057	5,489	9,021
2. Sample, V_{1a}^{A}	----------413,734----------			----------4,661----------		
3. Sample, $(V_{1a}^{O} - V_{1a}^{A})$	2,113	4,390	19,266	396	828	4,360
4. Average Sample Loss Ratio, LALR (Row 3/ Row 1)	0.51%	1.05%	4.45%	7.83%	15.08%	48.33%

NOTES:

1. Values in US $1,000s.
2. Data for 1968.

the range, 1 through 8), well over half the primary products exhibit a LALR less than 5%, and more than two thirds the manufactures a LALR greater than 5%. Shifts in β and s do not offset the ceteris paribus tendency for LALR to rise with t.

Calculation of the average LALR for each group of products further supports this conclusion. We calculate V^0_{la} for each product; the difference, $V^0_{la} - V^A_{la}$, is then summed over the relevant group of products and divided by the sum of the values of V^0_{la}.[22] The calculations are shown in Table 2. For any values of β (from 1 to 8)[23], the average LALR is always above 7% for manufactures and always below 5% for primary products. Though significance tests are not warranted, the differences between the average LALR of primary products and manufactures seem large enough to conclude that, for the sample products at least, Commonwealth tariffs more forcibly deflect trade (from LA to the UC) in manufactures than in primary products.

IV. Overall Losses Due to Commonwealth Preferences

We turn now to the overall losses of potential LA exports to the UK due to the operation of the Commonwealth, under the assumption that Commonwealth effects account for all (non-price) differences between the UK and OE pattern of imports (from LA and UC). The first step is the calculation of the "equivalent tariff" (ε) for each of the 75 products in the sample.[24] Again, products in the SITC 0-3 groups are called "primary products" and in the SITC 4-9 group "manufactures". Table 3 shows the estimated distribution of ε for the various assumed values of β.

Table 3

Distribution of "Equivalent Tariffs"

Product Group	Number of Products	Estimated Equivalent Tariff (ε)					
		Negative	0 - 50%	50 - 100%	100 - 200%	Above 200%	Median
Primary Products:	42						
for β = 1		7	6	3	5	21	204%
for β = 2		9	10	2	10	11	105%
for β = 8		17	11	7	6	1	10%
Manufactures:	33						
for β = 1		7	1	0	4	21	499%
for β = 2		7	1	5	5	15	145%
for β = 8		7	17	5	3	1	24%

The range of estimated values of ε is immense, some of the values listed as "above 200%" in Table 3 reaching above 10,000%. There are also a number of negative estimates of ε; such values indicate a counter-Commonwealth preference, on the part of the UK, toward the import of LA varieties of the product.[25] What this wide range of ε values partly shows is the large incidence of "noise" in the data--engineered to no small degree by our insistance that the OE and UK import patterns would be identical for every product in the absence of Commonwealth deflections. The general picture remains, however: if the UK import pattern were to be achieved by tariff preferences alone, tariffs of hundreds or even thousands of percents would often be involved. As an extreme but penetrating example, almost all the UK banana imports come from the UC although UC banana exports are negligible elsewhere.[26]

Because of the large range of ε values, the medians must be considered no more than suggestive. What is interesting is not their levels, so highly dependent on the value of β assumed, but the general differences between primary products and manufactures. If the true values for β are comparable between the two groups,[27] then the "equivalent tariff" implicit in the Commonwealth relationship seems generally larger for manufactures than for primary products. Though the nominal UK tariff preferences on the products studied are rarely large, even for manufactures, the "equivalent tariffs" weigh more heavily against LA manufactures than LA primary products.

This overall impact of the Commonwealth Preference System is more clearly seen in the calculation of the average Latin American

Loss Ratio (LALR*) for the two samples. Five different estimates of the average LALR* are calculated in Table 4 (row 4). Three are made on the assumption that for all products, β equals, in turn 1,2, or 8. Since LALR* for particular products does not necessarily rise or fall with changes in the assumed value of β,[28] the highest and lowest possible losses (for values of β between 1 and 8) for each product are also summed. The average LALR* does not change much with β for manufactures, but is fairly sensitive to β for primary products. Nevertheless, for ranges of β between 1 and 8, the average LALR* cannot be above 34% for primary products and cannot be less than 53% for manufactures. Thus, on average for this sample of products, we estimate that the Commonwealth Preference System, in the totality of its impact, deflects to the UC one eighth to one third of the potential LA primary product exports to the UK and slightly more than one half of the potential LA manufactured exports to the UK.[29]

Since the sample used in this section is much more representative of the population in question,[30] it is reasonable to extend these results to the entire population. This is shown in row 7 of Table 4, where the sample averages of LALR* are applied to total LA exports to the UK in each of primary products and manufactures.[31] As expected, the estimates are less certain (without precise knowledge of the true values of β involved) for primary products than for manufactures (see row 3 of Table 4). Total lost exports in 1968--that is, those deflected from LA to the UC--for manufactures, are in the US $200-240 million range, and for primary products, are in the US $80-330 million range, for values of β between 1 and 8.

Table 4

Estimates of Overall Losses of LA Exports to the UK Due to the Commonwealth Preference System

	Primary Products (SITC 0-3)					Manufactures (SITC 4-9)				
	Highest Loss	β = 1	β = 2	β = 8	Lowest Loss	Highest Loss	β = 1	β = 2	β = 8	Lowest Loss
1. Sample, V_{la}^{O}	632,092	602,850	591,678	505,399	476,187	366,518	354,596	354,413	352,021	340,099
2. Sample, V_{la}^{A}	----------	----------	418,601	----------	----------	----------	----------	159,061	----------	----------
3. Sample, $(V_{la}^{O}-V_{la}^{A})$	213,491	184,249	173,077	86,798	57,586	207,457	195,535	195,352	192,960	181,038
a. (Negative Components)	(-16,614)	(-18,665)	(-24,244)	(-104,279)	(-106,330)	(-17,219)	(-17,266)	(-18,615)	(-26,411)	(-26,458)
b. (Positive Components)	(+230,105)	(+202,914)	(+197,321)	(+191,077)	(+163,916)	(+224,676)	(+212,801)	(+213,967)	(+219,371)	(+207,49
4. Average Sample Loss Ratio, LALR* (i.e., Row 3/Row 1)	33.78%	30.56%	29.25%	17.17%	12.09%	56.60%	55.14%	55.12%	54.81%	53.23%
5. Trade Total, V_{la}^{A}	----------	----------	634,078	----------	----------	----------	----------	181,946	----------	----------
6. Sample Coverage (i.e., Row 2/Row5)	----------	----------	.6602	----------	----------	----------	----------	.8742	----------	----------
7. Estimated Overall Trade Loss (i.e., Row 3/Row 6)	323,373	279,080	262,158	131,472	87,225	237,311	223,673	223,464	220,728	207,090

Notes: 1. The β = 1 columns would also apply if $P_{la \to uk} / P_{uc \to uk}$ and $P_{la \to oe} / P_{uc \to oe}$ were assumed always equal.

2. Values in US $1,000s.

3. Data for 1968.

The extent of these deflections, as to total LA exports to the UK and the composition, must not be minimized. In 1968, total LA exports to the UK were US $816 million; without the Commonwealth deflections, we estimate that such exports would have been US $280-570 million higher. As to composition, manufactures actually comprised 22% of total LA exports to the UK (in 1968);[32] without Commonwealth deflections, manufactures would have comprised from 29% to 37% of total LA exports to the UK.[33] Thus, these estimates, crude and inconclusive as they are, strongly suggest that the existence of the British Commonwealth had indeed caused the very "bias against imports into the UK of processed and manufactured goods from LA" (Wall, 1971, p. 134) which Wall was unable to show.

Appendix A: Samples and Data

The samples from which the empirical evidence of the text derives consist of "products" as defined by SITC classification (at the 3-digit, 4-digit, and sometimes 5-digit levels). The quantity and value data, for LA and UC exports to the UK and OE, were obtained from (OECD,1968).

The samples are not random, since specific criteria were applied in selecting each product. First, in order that a sample of not-too-heterogeneous products be attained, only the most detailed SITC breakdowns available were examined--e.g., we would not include "product" SITC 631 if data for 631.2 were available, nor 631.2 if data for 631.21 were available. Thus, the sample should contain only products for which the various "varieties" are close, though imperfect, substitutes for each other, and hence for which the ratio of value to quantity imported should usually yield a meaningful unit-value. Second, we sought products where the "varieties" of both LA and the UC were indeed demanded by the UK--and by the "control group", the OE countries. Potential demand may not become actual trade if the force of the Commonwealth deflections is sufficiently strong; nevertheless, as an operational measure of potential demand, we included all products for which the value of trade in each of the following four categories was larger than US $10,000:

i) UK imports from LA

ii) UK imports from UC

iii) OE imports from LA

iv) OE imports from UC

This criterion should insure that no truly homogeneous products--if such exist--intrude.

Complete sampling of products that fulfilled these criteria (of those for which the OECD published trade information) yielded the original sample of 75 products used in Section IV; these were distributed (at the 1-digit level) as shown in the first column of Table A-1.

Table A-1

Distribution by SITC Group of Sample Products

SITC Group	Number of Products	
	Original Sample (used in Section IV)	Tariff Sample (used in Section III)
0	16	14
1	3	3
2	17	13
3	6	6
4	2	2
5	5	2
6	11	6
7	10	7
8	5	1
9	0	0
Total	75	54

With this sample of 75, we proceeded to the 1968 UK tariff schedule (Statutory Instruments, 1968). The discovery of relevant tariffs, however, is not straightforward. First, the original sample was obtained from SITC classification, while the UK customs schedule follows the Brussels Tariff Nomenclature; since definitions of products are not the same under these classifications, a precise, one-to-one mapping between the two may be impossible. Second, some tariffs are

varied seasonally. And, third, some products are defined in such a way that persons ignorant of technical processes cannot determine the actual tariff.

Although all the above problems abound, we were able to derive a tariff rate for: i) 25 products for which there was a precise tariff rate; ii) 21 products for which we calculated a weighted average of the different tariff rates on various sub-products of the product; and iii) 8 products for which the range of variation of tariff rates among various sub-products was less than 8% (i.e., 8 percentage points) and, without obvious criteria for assessing "the" tariff rate, the mid-point of the range was used. In the process, 21 products disappeared from the original sample of 75. The distribution of this sample, used in Section III, is shown in the second column of Table A-1. Nearly two thirds of the "primary product" (i.e., SITC groups 0-3) exports of LA to UK are covered in both samples,[34] and nearly seven eighths of the "manufactures" (i.e., SITC groups 4-9) exports of LA to UK are covered in the original (i.e., Section IV) sample. The tremendous loss of coverage in manufactures for the Section III sample is due to the fact that the tariff classifications provided much tackier problems for manufactures than for primary products--a rose tends to be a rose, but not so rose cutters, rose reamers, and rose engines. As a result, 15 of the 21 products expelled from the original sample were in the SITC 4-9 groups, and the coverage of manufactures drops to less than 3%.

The calculation of the relative-price variable, used in Section IV,[35] also requires explanation. First, quantity data are not available for some of the products included in the samples and hence unit-values

could not be calculated; in these cases, the ratio of the relative unit-values (i.e., p) was assumed to be unity. Second, where the quantity from one of the source-regions to one of the destination-regions was small, the resulting unit-value was sensitive to the rounding errors involved in the data;[36] arbitrarily, where the calculated ratio of relative unit-values (i.e., p) was less than 0.6 or greater than 3.1, p was put at unity. (This cavalier handling of recalcitrant unit-values represents another of the shortcuts which would not be justified in a full econometric assault.) The overall result is that, for 25 of the products in the Section IV sample, p equals unity be definition.[37]

A final problem with the coverage of the samples is that the variety-ratios (between LA and UC exports to the UK) of the sample are quite different from those of the total UK trade.[38] For the primary products, LA exports to the UK (relative to the UC exports to the UK) are somewhat higher for both samples than for total UK trade; but for manufactures, the sample variety-ratio is notably lower (in the Section III sample) and somewhat higher (in the Section IV). Since the samples do not pretend to be random, these differences are not surprising. But in the case of the Section III sample, this manifestation for manufactures of non-randomness together with low coverage, discourages attempts to go beyond the sample in the generalizations of Section III. In Section IV, we do dare to make estimates of the population from the sample statistics--the justification is not based on randomness of the sample but on high coverage of the population.

Table A-2

Coverage of the Samples

Item		SITC Group			
		0 - 3		4 - 9	
		Sample for Section III	Sample for Section IV	Sample for Section III	Sample for Section IV
1.	No. of Products	36	42	18	33
2.	Sample, V_{1a}	413,734	418,601	4,661	159,061
3.	Total, V_{1a}	------634,078----------		------181,946---------	
4.	Sample Coverage (i.e., Row 2/Row 3)	65.25%	66.02%	2.56%	87.42%
5.	Sample, V_{uc}	576,613	583,419	279,448	608,296
6.	Total, V_{uc}	------1,084,433--------		-------1,037,326------	
7.	Sample variety-ratio (i.e., Row 2/Row 5)	.718	.718	.017	.261
8.	Total variety-ratio (i.e., Row 3/Row 6)	--------.585----------		--------.175----------	

Notes: 1. Values in US $1,000s.
2. Data for 1968.

Appendix B: Relationship between Calculated LALR* and Assumed β

The formula for the LA Loss Ratio due to the overall influence of the Commonwealth (i.e., LALR*) may be written (see equation (6)).

(A-1) $$LALR^* = (1 - s)[1 - (1 + \varepsilon)^{-\beta}] ,$$

or, using only β and observable variables (see equation (11)),

(A-2) $$LALR^* = (1 - s)\,[1 - zp^{\beta-1}] ,$$

where p and z are defined as follows:[35]

(A-3) $$p = \left[\frac{P_{la\to uk} / P_{uc\to uk}}{P_{la\to oe} / P_{uc\to oe}}\right] ,$$

and

(A-4) $$z = \left[\frac{V_{la\to uk} / V_{uc\to uk}}{V_{la\to oe} / V_{uc\to oe}}\right] .$$

It is clear from equation (A-2) that LALR* is independent of the value assumed for β only if p exactly equals one. Thus, for the 25 products for which p was assumed equal to one (for lack of satisfactory quantity data), the calculated LALR* is 1) positive or negative as z is less or greater than one, and 2) unaffected by variation in β.[36]

For the other 50 of the 75 products in the Section IV sample, however, the relationship between LALR* and β is not simple. The form of this relation, for each product considered, depends upon the values of p and z. Figure B-1 shows the four critical regions in terms of values of p and z, and Table B-1 shows the distribution of the 50 products among these regions. The shape of the relation between LALR* and β is shown, for each of these regions in Figures B-2 through B-5. Since the vast majority of the products appear in Region A or B (or its interface, where p is arbitrarily set at unity and $z<1$), it becomes clear

Table B-1

Distribution of Products Among Regions

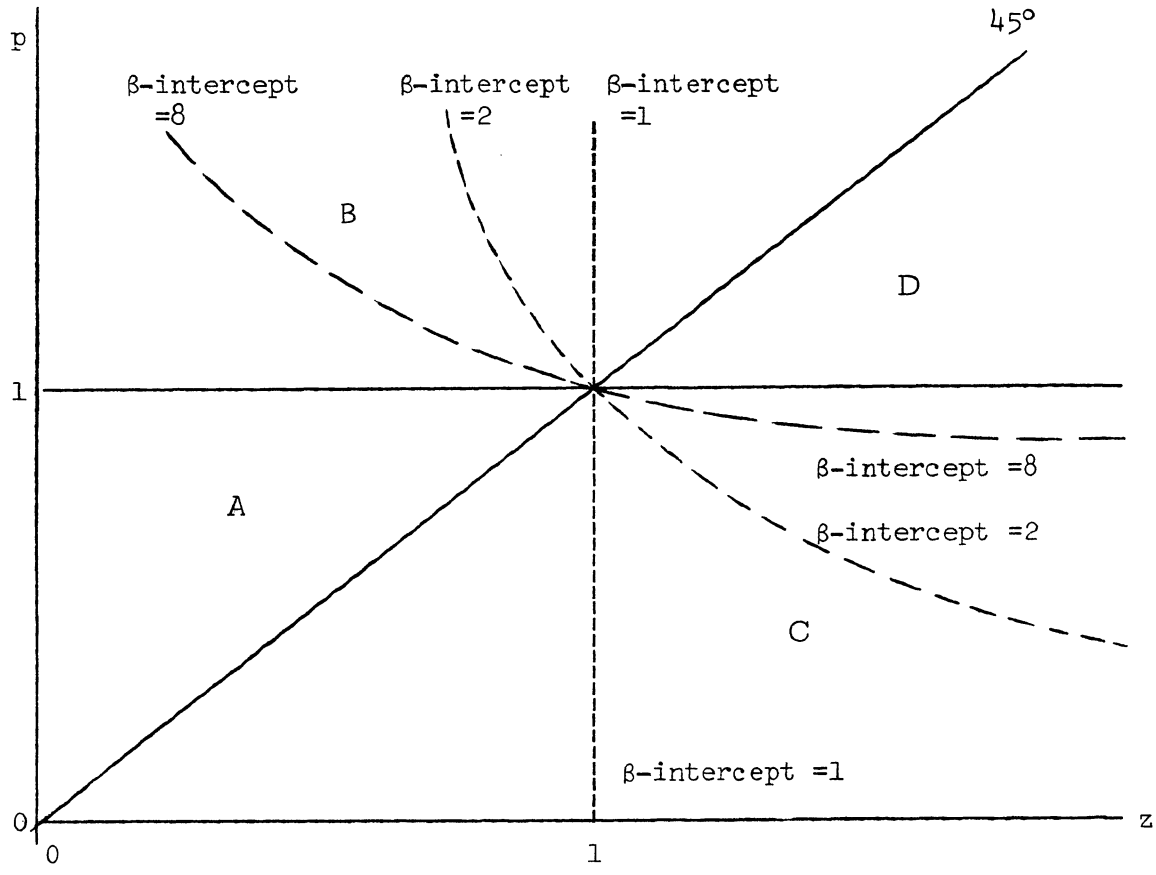
Region	Number of Products		
	SITC 0-3	SITC 4-9	Total
A	14	5	19
B	18	4	22
C	3	1	4
D	4	1	5
Sub-Total	39	11	50
p = 1 (for lack of quantity data)	3	22	25
Total	42	33	75

why the average LALR* (calculated in Section IV) tends to decline as higher values of β are assumed. The rate of decline of the calculated LALR* (as β rises) is much greater for B-region products than is the rate of increase of LALR* for A-region products.[37] There is nothing in the Loss-Ratio concept itself that produces higher or lower values of LALR* as β rises. It is, however, true that LALR* must rise at a decreasing rate or fall at an increasing rate as β rises (i.e., the second derivative of LALR* with respect to β is always negative if $p \neq 1$).

In Regions B and C, LALR* moves from positive to negative (or the reverse) as the assumed value of β rises. The precise value of β at which LALR* changes sign depends on p and z. The dashed lines on Figure B-1 show the iso-β-intercept values of p and z for three values of β (equal to 1, 2, and 8).[38]

Figure B-1

Critical Regions of LALR* in Terms of p and z



Notes: 1. Solid lines delineate regions:

Region A: $z < p < 1$
Region B: $z. \ 1 < p$
Region C: $p < z, \ 1$
Region D: $1 < p < z$

2. Dashed lines indicate iso-β-intercept curves (for β=1,2,8)

Figure B-2
LALR* in Region A

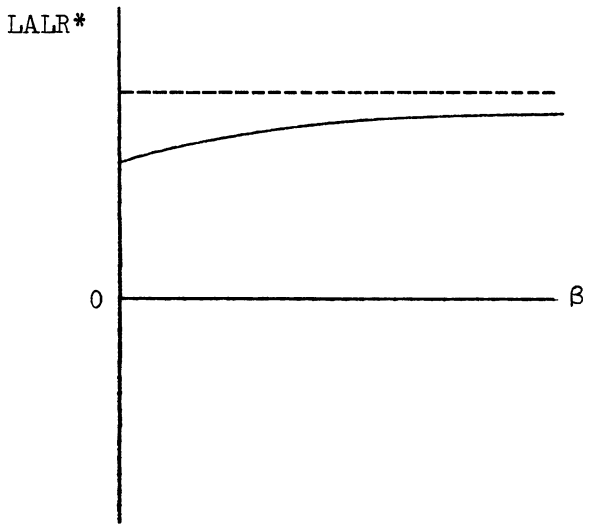


Figure B-3
LALR* in Region B

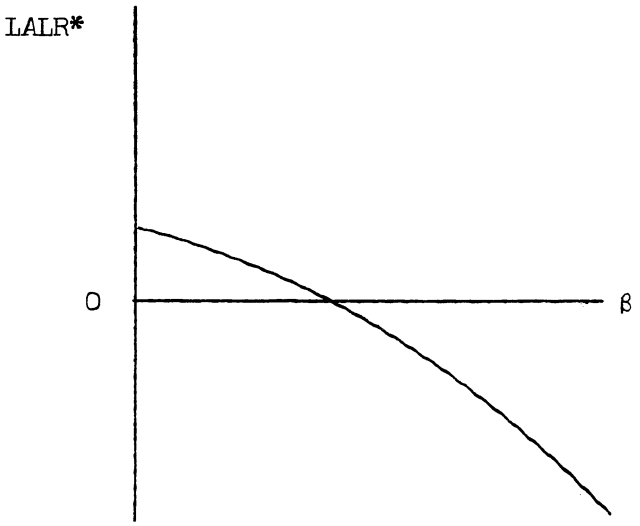


Figure B-4
LALR* in Region C

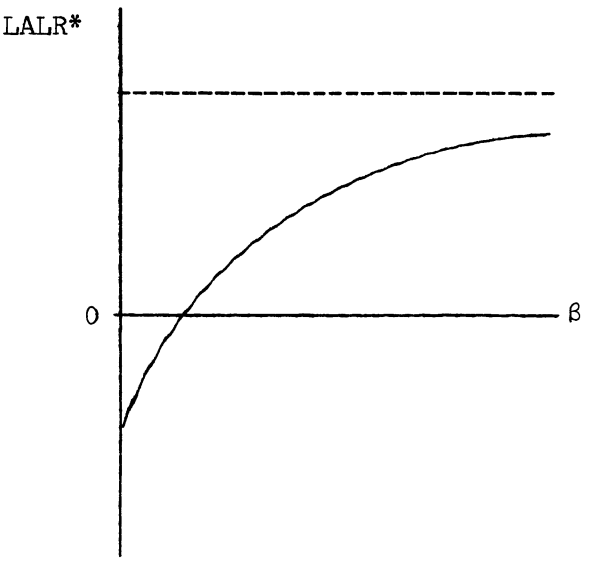
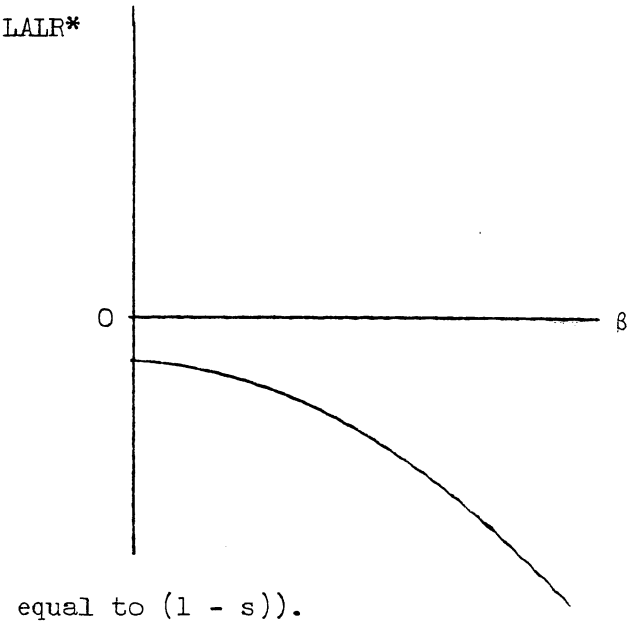


Figure B-5
LALR* in Region D



Notes: 1. Asymptotes are dashed (and equal to (1 - s)).
2. LALR* intercept in each case is: (1 - s)(1 - z/p).
3. The β-axis intercept (where relevant) is: log (p/z)/log p.

FOOTNOTES

*Both of the Department of Economics and the Center for Research on Economic Development at the University of Michigan.

1. Such damage has been long and generally acknowledged. See, for example, (UNCTAD, 1964) pp. 54-63 and (UNCTAD, 1969) pp. 6-7.

2. The word is given precise meaning later.

3. Throughout, UC refers to the entire British Commonwealth excluding Australia, Canada, Ireland and New Zealand. (Wall uses the symbol LDC for "less developed Commonwealth" and his definition may differ.) LA here refers to the Western Hemisphere excluding the United States and Commonwealth countries.

4. The average ratio is 5.6 for the former and 2.2 for the latter. The sample consisted only of those "semi-manufactured" goods for which "non-tariff distortions" do not "predominate" and for which "LA already had in 1967 either a share of the UK market or a potential interest." "Manufactured" goods are omitted "on the grounds that it is in this group of goods that the non-homogeneity of goods in the tariff items is most serious." (Wall, 1971, p. 136)

5. As we shall suggest in Section IV, such "distortions" may be of overwhelming importance, throughout the product spectrum, in the determination of UK imports from the Commonwealth.

6. Unless a differential seasonal pattern of LA and UC prices accounts for the existence of imports from both sources. But then comparison of the unit-value of actual imports is meaningless.

7. In sympathy, one must note that if a truly homogeneous product were found the imports would come entirely from a single source, and no unit-value for other sources could be derived from the importing country's statistics. So, in one case, unit-value comparisons are inappropriate, and in the other case, impossible (without the use of possibly incomparable price data gathered elsewhere).

8. Throughout the paper, we shall assume that these prices are elsewhere determined, and hence are not responsive to the volume of exports (by LA or the UC) to the UK (or, later, to Western Europe). This is justified only if the relevant LA and UC supply curves are infinitely elastic or if the exports to Europe (of the products with which we will be concerned) are marginal with respect to the total output (of LA or the UC). The latter seems generally close enough to reality to permit the simplification--which spares us a perhaps hopeless divagation into the conditions of supply in LA and the UC.

9. More precisely, the rate of Commonwealth Preference is that part of the tariff on the product which applies to imports from LA but not to

9. (cont'd) imports from the UC. Note that if there is a tariff on both varieties (but owing to the Commonwealth Preference, a lower tariff on the UC variety), then the rate of Commonwealth Preference, t, is approximately equal to the absolute difference between the two rates. Specific tariffs are throughout converted to ad valorem rates, and the resulting error of formulation in equation (1) neglected.

10. On the general theoretical and empirical issues surrounding the use of the concept of the elasticity of substitution in international trade, see (Leamer and Stern, 1970) Chapter 3.

11. Equation (1) can be derived from a community indifference function that is 1) separable and 2) homothetic in the LA and UC varieties of each product. Equations (2) and (3) also follow if the branch of the indifference map concerned with the LA and UC varieties of each product is itself a CES function. See (Hutcheson and Porter, 1972). But the possible welfare foundations are not critical here since we will make no welfare judgments.

12. Since the (weighted) average price of the product would fall to British buyers, both income and substitution effects suggest increased demand.

13. I.e.,

$$s = \frac{V^A_{1a}}{V^A_{1a} + V^A_{uc}} \quad .$$

14. Especially the 1930's; the proportion of British imports coming from the Empire rose from 29% in 1930 to 40% in 1938 (Benham, 1941, p. 102). Some formal preferences began before 1930, and, to the extent that colonial connections, established credit relations and longstanding overseas branches of British firms are responsible, the subtleties of the Commonwealth may trace back a century.

15. Note the care with which the words "distorted" and "diverted" are avoided. Unusual taste preferences are not considered distortions, and the increased UC exports may as well represent trade "creation" as diversion.

16. Whenever the $\rightarrow j$ part of the $i \rightarrow j$ subscript is omitted hereafter, the destination is understood to be the UK.

17. The same result would follow from direct calculation of the LALR of equation (6), using the estimated ε in place of t.

18. See equation (6) in Section II.

19. The criteria of selection are spelled out in Appendix A.

20. The classification suggested by Wall.

21. Especially since all of the products considered are in fact sold to the UK by both LA and UC countries (see Appendix A).

22. This is, of course, simply the weighted average of the LALRs, where each product's weight is $V^0_{la} / \Sigma V^0_{la}$, the summation being made over the relevant group of products.

23. It should be noted that the LALR rises as the assumed value of β increases, so that, for values of β in the range, 1 to 8, the $\beta = 1$ column in Table 2 estimates the lowest possible loss and the $\beta = 8$ column the highest possible loss. It is not necessary to assume that the β-values of different products are identical.

24. See Appendix A. For products where adequate quantity data are lacking, the unit-value ratios, $P_{la \to uk} / P_{uc \to uk}$ and $P_{la \to oe} / P_{uc \to oe}$, are assumed equal.

25. Some of the negative ε estimates yield to obvious ad hoc explanations--for example, four of the values are in the SITC 332 (petroleum products) group, for which Commonwealth ties have proved largely irrelevant.

26. In 1968, the UK imported 338 thousand metric tons of bananas from the Sterling Area, only 9 thousand tons from the rest of the world. One of its principal suppliers, Jamaica, supplied 152 thousand tons to the UK, only 4 thousand tons to the rest of the world.

27. In fact, to the extent that β is higher for the relatively more homogeneous primary products than for the often quite heterogeneous manufactures, the statement of the text is conservative.

28. See Appendix B.

29. The sum of the negative and the positive components of the absolute losses, $V^0_{la} - V^A_{la}$, are given in Rows 3a and 3b of Table 4. To understand why the sum of the positive components is less sensitive to the assumed levels of β, and more generally for a discussion of the relationship (for particular products) between LALR* and β, see Appendix B. The negative components of LALR* are the same products for which a negative ε was estimated; such products, even if reflective only of "noise" in the data, obviously must be included for unbiased estimates of the average LALR*.

30. Because such a large fraction of the LA exports to the UK are now covered; the change from the Section III sample is especially notable for manufactures. The sample, of course, is still not random (see Appendix A).

31. The procedure is perhaps conservative. The LA share of total (LA and UC) exports to the UK is lower, on average, for the goods excluded from the sample than for those included (see rows 7 and 8 of Table A-1 in Appendix A). Thus, ceteris paribus, we would expect there to have been greater losses on the excluded products.

32. See Appendix A, Table A-2, row 3.

33. See Table 4. 29% = (181,946 + 207,090)/(181,946 + 207,090 + 634,078 + 323,373); 37% = (181,946 + 237,311)/(181,946 + 237,311 + 634,078 + 87,225).

34. See Row 4 of Table A-2.

35. I.e., $\frac{P_{la \to uk} / P_{uc \to uk}}{P_{la \to oe} / P_{uc \to oe}}$; this is written as p here and in Appendix B.

36. Ejection from the sample of products whose trade value (from any source-region to any destination-region) was less than US $10,000 reduced this problem but did not eliminate it.

37. Most of these are manufactures (see Table B-1). Fourteen of the 25 products are also in the Section III sample, but no use is made of p there.

38. See Table A-2, rows 7 and 8.

39. s (as defined in the text) is the LA share of total (LA and UC) exports to the UK.

40. z is less than one (and hence LALR* is positive) for 20 of these 25 products.

41. And, though of much less importance, there are slightly more B-region than A-region products (and more D-region than C-region products as well).

42. The 45° line is the limit of the iso-β-intercept line as β approaches 0; and the p=1 line is the limit of the iso-β-intercept line as β approaches ∞.

References

F. Benham, 1941, Great Britain under Protection, Macmillan.

T. Hutcheson and R. Porter, 1972, The Cost of Tying Aid: A Method and Some Colombian Estimates, Princeton Studies in International Finance, No. 30.

E. Leamer and R. Stern, 1970, Quantitative International Economics, Allyn and Bacon.

OECD, 1968, Statistics of Foreign Trade Series C, Trade by Commodities: Imports, January-December 1968.

Statutory Instruments, 1968, Her Majesty's Stationery Office, London.

UNCTAD, 1969, The Performance of Developing Countries as Exporters of Manufactures to the Developed Market Economies, Mimeo, 22 Dec. 1969.

UNCTAD, 1964, Implications for Trade and Development of Developing Countries of Economic Groupings of Developed Countries and/or Preferential Trading Arrangements, Vol. 1, Mimeo, 3 Feb. 1964.

D. Wall, 1971, "The Commonwealth Preference System and its Effects on the United Kingdom's Imports from Latin America", Journal of Development Studies, Jan. 1971.

Center for Research on Economic Development
CRED Discussion Papers

No. 1 ELLIOT J. BERG, *"Wage Structure in Less Developed Countries,"* January 1968

No. 2 PETER ECKSTEIN, *"Accounting Prices as a Tool of Development Planning,"* February 1968

No. 3 WOLFGANG F. STOLPER, *"Economic Growth and Political Instability in Nigeria: On Growing Together Again,"* November 1968

No. 4 ELLIOT J. BERG, *"Industrial Relations Systems in Colonial West Africa: A Comparative Analysis of French West Africa and the Gold Coast,"* December 1968

No. 5 ELLIOT J. BERG, *"Trade Unions and Wage Levels—The Nigerian Case,"* January 1969

No. 6 RICHARD C. PORTER, *"Some Implications of Post-War Primary Product Trends,"* February 1969

No. 7 PETER ECKSTEIN, *"Quantitative Measurement of Development Performance: A Critique by Peter Eckstein and a Reply by Irma Adelman and Cynthia Taft Morris,"* April 1969

No. 8 RICHARD C. PORTER, *"The Effectiveness of Tax Exemption in Colombia,"* July 1969

No. 9 PETER ECKSTEIN, *"Toward an Integrated Theory of Tariffs,"* August 1969

No. 10 WOLFGANG F. STOLPER, *"Limitations of Comprehensive Planning in the Face of Comprehensive Uncertainty: Crisis of Planning or Crisis of Planners,"* October 1969

No. 11 RICHARD C. PORTER, *"Birth of a Bill Market,"* August 1970

No. 12 ISAAC AYINDE ADALEMO, *"Distribution of Market Centers, Market Periodicities, and Marketing in Northwestern Nigeria,"* August 1970

No. 13 ELLIOT J. BERG, *"Wages and Employment in Less-Developed Countries,"* December 1970

No. 14 THOMAS L. HUTCHESON and RICHARD C. PORTER, *"The Cost of Tying Aid: A Method and Some Colombian Estimates,"* January 1971

No. 15 RAJAONA ANDRIAMANANJARA, *"Labor Mobilization: The Moroccan Experience,"* April 1971

No. 16 C. MICHAEL AHO, *"The Use of Export Projections in Allocating Foreign Aid among and Domestic Resources within Developing Countries,"* July 1971

No. 17 MICHAEL KENNEDY, *"An Empirical Evaluation of the Two-Gap Model of Development,"* November 1971

No. 18 JOHN NARANJO and RICHARD C. PORTER, *"The Impact of the Commonwealth Preference System on the Exports of Latin America to the United Kingdom,"* March 1972

No. 19 GARY FIELDS, *"Private Returns to Investment in Higher Levels of Education in Kenya,"* April 1972


BRODART
MADE IN U.S.A.