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FOR
THE ANDEAN GROUP

by

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February 1972

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Abstract

Common External Tariff for the Andean Group

by David Morawetz

The Cartagena Agreement signed by the members of the Andean Group calls for member countries to agree by December 1975 on a common external tariff which they are to implement gradually from 1977 to 1980. This paper first discusses some historical and theoretical considerations underlying the design of a common external tariff structure, and then sets out two proposals for the common external tariff of the Andean Group. The proposed tariff structures are compared with prior Andean national tariff systems and the Andean Common Minimum External Tariff, and some implications are discussed for policy on export subsidies, exchange rates, and non-tariff restrictions.

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The Cartagena Agreement signed by the members of the Andean Group calls for member countries to agree by December 1975 on a common external tariff which they are to implement gradually from 1977 to 1980. This paper first discusses some historical and theoretical considerations underlying the design of a common external tariff structure, and then sets out two proposals for the common external tariff of the Andean Group. The proposed tariff structures are compared with prior Andean national tariff systems and the Andean Common Minimum External Tariff, and some implications are discussed for policy on export subsidies, exchange rates, and non-tariff restrictions.

Three points should be clarified at the outset. First it is assumed throughout this paper that it would be an improvement for the Andean Group countries to adopt a common external tariff rather than each country maintaining its own pre-union tariff structure for trade with the rest of the world. For a discussion of the conditions under which this assumption may reasonably be expected to hold, see Morawetz (1971). Second, it is assumed throughout the paper that policy-makers do not have the option of legislating Andean-wide production subsidies equal in all countries for the production of a particular good. While production subsidies are in general superior to tariffs as a means of affecting resource allocation (they involve no distortion of consumption patterns), such subsidies are not mentioned in the Cartagena Agreement and therefore they are ignored here. Third, the paper does not consider the practical and administrative problems in setting up a common external tariff. For a discussion of some of the major problems of this type (harmonization of

tariff nomenclature and tariff laws relating to samples without value, ad valorem versus specific tariffs etc.), see Opazo (1969).

Background: policies of protection and import substitution

Until the 1930's the Andean Group economies, like those of most Latin American countries, were largely based on the export of food and raw materials in exchange for manufactured goods. The decline in profitability of primary exports during and after the Depression and the danger of future economic disturbances emanating from the United States provided incentives for them to reduce their dependence on the world economy. These incentives were intensified during the Second World War, when manufactured goods became scarce on the world market, and further strengthened in the postwar period as a result of the increasing world-wide desire for full employment and economic independence, the agricultural protectionism of the richer countries and the pessimistic forecasts for the prospects for primary exports. The Andean countries, like most Latin American countries, sought the answer to this set of problems in import substitution behind walls of tariff protection. In deciding whether tariff protection should be granted "the criterion by which the choice was determined was based not on considerations of economy expediency but on immediate feasibility, whatever the cost of production" (Prebisch 1964, p.71). The application of this import substitution policy is excellently described by Santiago Macario in his classic paper (1964, p.61):

With very few exceptions, the Latin American countries cannot be said to apply a protectionist policy, if by this is to be understood a systematic body of measures

deliberately designed to permit and encourage the development of certain industries rationally selected within an over-all framework of objectives established under a given economic development policy. What did and still does exist is protectionism, but as the largely indirect result of ad hoc measures, often adopted, at least initially or during a first stage, as emergency procedures, either in order to solve balance-of-payments problems, or under the pressure of other exogenous factors. Such measures, temporary to begin with, became permanent in most cases and more general in their scope, giving rise to a form of protectionism which has been characterized by extemporaneousness, lack of autonomy (since it is primarily motivated by external causes), extremely high levels and indiscriminate application and whose basic objective is import substitution at any cost, regardless of which industries it is most expedient to develop and how far the process should be carried.

The policy of import substitution at any cost and the high and varied tariffs to which it gave rise had several important consequences. High tariffs, sometimes averaging over 300 percent in a given sector allowed inefficient firms and industries to begin production and grow. The huge variation in protection granted from sector to sector and even within sectors, which arose partly by historical accident, arbitrarily distorted the allocation of productive resources. Perhaps most important of all, especially from the employment viewpoint, exports, domestic agriculture and other primary production were all discriminated against. Studies by Mallon and Urdinola (1967), Sheahan and Clark (1967), Musalem (1970) and others all confirm that in the Colombian case "minor exports" (total exports less exports of coffee and petroleum products) do respond significantly to changes in the real exchange rate. The same is almost certainly true in other Andean countries, and the implication is clearly that the growth of Andean minor exports was hampered by the

overvalued exchange rates which resulted from policies of import substitution. The magnitude of the anti-export bias may be seen from the fact that in the late 1960's exports of manufactured goods from Taiwan and Korea were three times as great as exports of manufactured goods from all Latin American to non-Latin American countries, even though Latin American industrial output was eight times greater than that of Taiwan and Korea (Balassa 1970, p.3).

By the mid-1950's the "easy phase" of import substitution in labour intensive manufactures had been more or less completed in Chile and Colombia and to a lesser extent in Peru, Ecuador and Bolivia. Given the anti-export incentive structure facing private producers the next step was to move into more and more capital-intensive import substitution, which created few jobs and did little to advance economic development. The result was that, as was to be expected, the increase in employment in manufacturing industry in Andean Group countries was minimal during the 1960's. For example, employment in all manufacturing industry in Colombia increased at less than 0.3 per cent per year in 1962-69 while population grew at more than ten times that rate. The figures are similar for other Andean and other Latin American countries.¹ Further, the policy of import substitution did not solve the Andean countries' balance of payments problems as had been hoped, since each move into a new area of import substitution required increased imports of materials, machinery and equipment, often more than offsetting the decrease in required imports of the final product, and making the economy even more dependent on a steady flow of imports than when these imports were

composed mainly of consumer goods.

As a result of this Andean and other Latin American experience, it is now widely accepted that the solution to the unemployment and balance of payments problems lies in moving away from a strategy of import-substitution towards the promotion of exports, especially exports of labor-intensive manufactured goods.² Several Andean and other Latin American countries have already taken steps in this direction by introducing export subsidies and creating export-promotion organizations. The high and uneven tariff structures, which led to currency overvaluation and discrimination against exports, remain the greatest single barrier to attempts to increase exports of manufactured goods.³ As an illustration of the problem, take for instance a leading Colombian producer of agricultural implements who was exporting small quantities of his output successfully in the late 1960's in competition with European and North and South American firms, and was planning to invest in the production of automobile parts in 1971. When I asked why he chose to invest in an entirely new line (automobile parts) rather than expanding production and export of agricultural implements he replied:

I realize that it would be in Colombia's interests for me to use this new investment to increase production and export of agricultural implements. But I can make more money producing automobile parts inefficiently and at high cost with high tariff protection than I can exporting agricultural implements even after taking the export subsidy into account. So I am going into automobile parts.

The need to design a rational structure for the common external tariff of the Andean Group provides a great chance to overcome this problem.

Theoretical framework

Tariffs affect at least nine economic variables -- production, consumption, government tax revenue, the terms of trade, the balance of payments, employment, income distribution, aggregate demand and competition. It may be argued that an "optimal" Andean common external tariff structure should take all these factors into account, a hopeless task given the data and weighting problems involved. However, a counterargument goes as follows. In order to attain a given number of targets one needs at least as many instruments as there are targets (Tinbergen 1952). Furthermore, "the principle of effective market classification" indicates that each instrument should be assigned to the target on which it has most influence (Mundell 1960, 1962). Therefore, since probably the major impact of tariffs in the Andean Group is on the allocation of productive resources, the Andean common external tariff should be set with only production efficiency in mind. The position taken here lies somewhere between the two extreme points of view represented by this argument and counterargument. In designing two proposals for an Andean common external tariff major emphasis is placed on the achievement of production efficiency, but several other factors are also discussed and possible modifications are suggested.

It is well known from the theoretical literature that, in the absence of distortions, free trade is the welfare-maximizing policy. However, for a variety of reasons, few governments have felt able to remove all barriers to trade. It is therefore assumed here that

free trade is not a (politically) feasible alternative. The next best solution is to impose a low uniform tariff and export subsidy, equal for all commodities: Proposal 1 below. In case even this solution should prove to be politically impracticable a second proposal is derived and presented. Its basis is the granting of more or less equal effective protection to all activities while permitting nominal protection to differ for different goods or sectors.⁴ It cannot be stressed too strongly that, on economic grounds, Proposal 1 is superior to Proposal 2. Proposal 2 should only be considered for adoption if equal uniform tariffs on all goods are judged to be politically unacceptable.

Proposal 1

Proposal 1 is simple and straightforward. Tariffs and export subsidies should be low and equal for all goods, so that each and every activity receives the same nominal and effective protection. Such a tariff structure eliminates the key sources of bias inherent in prior Andean structures. The use of low and uniform tariffs eliminates the fostering of inefficient import-substituting activities. The granting of export subsidies equal to tariffs removes the anti-export bias. Beyond the general statement that they should be "low" the exact height of the tariffs and export subsidies in Proposal 1 is arbitrary.

Proposal 2

The aim in Proposal 2 is to derive a tariff structure with nominal tariffs differing for different goods or groups of goods,

which grants more or less equal effective protection to all activities. The mathematics of the solution are set out in Appendix A. The intuitively appealing result is that nominal tariffs and export subsidies should rise with direct and indirect national value added. That is, the higher the direct and indirect national value added in a particular good (or equivalently, the lower the direct and indirect import content) the higher the nominal protection. Proposal 2 may be regarded as taking into account in a more general way at least two arguments often heard in the Latin American context. It is often suggested that industries which use domestic resources relatively intensively, and/or those which have significant "backward linkages", should receive higher nominal protection. The decision rule which emerges for Proposal 2 (raise nominal tariffs and export subsidies with direct and indirect national value added) demonstrates that each of these arguments, while it is correct as far as it goes, is incomplete. The full decision rule takes both factors into account in an appropriately weighted fashion. Like Proposal 1, Proposal 2 avoids fostering inefficient import substituting industries by the use of low and relatively uniform tariffs, and eliminates the anti-export bias by the use of export subsidies equal to tariffs for all goods.

Proposal 2 and matters of strategy

Before continuing with the development and modification of the two Proposals two outstanding matters need to be cleared up. The first relates to a matter of strategy, the second to the concept of effective protection.

It may be argued that since on production efficiency grounds (other grounds are still to be discussed), the optimal policy for the Andean Group is to move to free trade, or at least to uniform tariffs and export subsidies, the economist ought to restrict himself to proposing these policies and nothing else. From this point of view Proposal 2 would be ruled "out of order". On the other hand, if it seems unlikely that free trade or uniform tariffs and export subsidies will become politically acceptable before the deadline for decision (in the present case, 1975) the economist may wish to follow a second alternative. He may recommend free trade or uniform tariffs and export subsidies, and then present in addition a "third-best" proposal which basically answers the question: if tariffs cannot be uniform for political reasons, what decision rule should be used to differentiate tariffs so as to cause as little harm as possible. Each of the two strategies has its attractions and its drawbacks. The first policy is probably preferable if there is a reasonably good possibility that free trade or uniform tariffs will be adopted in the foreseeable future. However, if such a move appears to be unlikely this strategy ensures that the economist's advice will be ignored. The second strategy leaves the economist open to misinterpretation by the careless reader who infers incorrectly that he prefers the third-best proposal to free trade or uniform tariffs and export subsidies. It has the advantage, however, that if tariffs were going to be differentiated anyway (and if the economist's advice is heeded) they may be differentiated in a more rational way than would otherwise have been the

case. The decision as to which of the two strategies to follow is a matter of judgment and will differ from case to case. Harry Johnson (1965a) adopts the second approach in analyzing the policy implications of countries having a preference for industrialization, making it clear at the same time that he does not necessarily support such a preference or consider it rational. As is by now apparent I have also opted for the second approach. I hope it is clear that I consider Proposal 1 to be superior to Proposal 2; the reason for presenting Proposal 2 is that if nominal tariffs must be unequal the decision rule of Proposal 2 provides a more rational way of differentiating them than any I have seen discussed.

The concept of effective protection

We come now to the debate over the concept of effective protection. The literature on effective protection has expanded rapidly since the concept first received concentrated attention in the journals (Barber 1955, Johnson 1965b, Balassa 1965, Corden 1966). Much of the more recent work, whether using a partial or a general equilibrium framework, has been critical.⁵ In particular it has been shown that the concept breaks down if certain assumptions do not hold (Ramaswami and Srinivasan 1971, Bhagwati and Srinivasan 1971 a,b). Balassa (1971c) recently attempted a comprehensive rebuttal of many of the criticisms using empirical as well as theoretical arguments. It is not my purpose here to enter in detail into the complicated debate on the merits and demerits of the concept of effective protection. Rather, I want to argue simply that the concept does seem to be of some use in the

present limited context, as the foundation for Proposal 2. The most comprehensive critics of effective protection, Bhagwati and Srinivasan (1971a, pp.25-6), come to two major conclusions. First,

Our analysis leads us to conclude, somewhat nihilistically, that a measure of ERP [the effective rate of protection] which will unfailingly predict the domestic resource shift consequent on a change in tariff structure does not exist in general. (emphasis in original)

It is certainly true that the concept of effective protection holds only under certain assumptions. The question then is, how closely do these assumptions accord with reality? Unfortunately, the evidence so far is fragmentary and relatively inconclusive. On the partial-equilibrium substitution issue Balassa (1971c, p.10) cites several studies indicating that substitutability between primary factors and intermediate inputs is relatively insignificant. Bhagwati-Srinivasan agree that this is probably the case (1971a, p.26) but point out that, on the other hand, substitutability between imported capital goods and domestic labour may be of some importance. Unfortunately little evidence is as yet available on this matter. The main general equilibrium issue is a relatively simple one: in a three-commodity model the effects of protection on particular industries may not be appropriately indicated by measured effective protection even if substitution elasticities among inputs are zero. Commodity A, with a lower effective rate than commodity B, may still enjoy greater protection than B if it is complementary in factor use with unprotected commodity C, and may therefore gain from a protection-induced decrease in the prices of the primary factors it uses. The evidence on this issue too is so

far only fragmentary. The critical question is whether factor price changes are empirically significant relative to changes in prices of final products and material inputs. Balassa (1971c, p.26) argues that in countries like Norway and Denmark, which have little tariff dispersion, the factor-price effects of protection could conceivably dominate the product-price effects; but that in less developed countries, which often have high and varied tariffs and other restrictions, the effects of protection on output and input prices probably tend to outweigh its effects on factor prices.

The second part of the Bhagwati-Srinivasan conclusion, which is elaborated on the pages following the above quotation, may be summarized as follows. If there are problems with the concept of effective protection, if the correlation between nominal and effective protection is fairly high, and if the most we can learn from effective rates of protection in a multi-commodity world is that the industry receiving highest(lowest) effective protection will have gained (lost) resources,⁶ the question is raised whether it is useful to spend vast sums calculating effective rates of protection when nominal tariffs seem to be adequate proxies for them. This question is indeed a proper one to raise in deciding whether to embark on a detailed and expensive study of the structure of effective protection in a particular country. However, it is less relevant in the present case of designing a new (common external) tariff structure, in which the expense involved is minimal. That is, even if the benefits from use of the concept should be discounted because of uncertainty as to its applicability, the costs of using it in the present

context are so low that the benefit-cost ratio for its use may still be favourable.

We may now summarize this discussion and its implications for the development of Proposal 2. First, while there are problems with the concept of effective protection it is not yet clear how important they are empirically.⁷ Second, given that uniform tariffs are assumed to be politically unfeasible, the theory of effective protection does provide a guide as to how nominal tariffs should be structured in Proposal 2, something which no other theory so far developed can do. At the same time the few theorems we have on the structure of nominal tariffs (Bruno 1971a, b, Bertrand and Vanek, 1971) are by and large consistent with the two Proposals. Bruno demonstrates that under certain conditions any across-the-board reduction in tariffs is an improvement, and under more restrictive conditions any reduction in tariff differentials is an improvement. Bertrand and Vanek show that under certain conditions if all distortions cannot be removed at the same time then extreme distortions should be eliminated first. Third, the inadequate knowledge we have of the resource-allocational impact of a tariff structure (both from nominal and effective protection theory) provides a strong argument for limiting nominal tariff dispersion to as small a range as possible. This advice is followed in the development of Proposal 2.

Elaboration of the two proposals

It will be recalled that Proposal 1 calls for low, uniform tariffs and export subsidies, equal on all goods. "Low" is defined here as 20 per cent, but there is no magic in the exact figure -- any number would do as

long as it is reasonably "low". Proposal 2, which should only be considered if Proposal 1 is politically unfeasible, is that all products should be divided into three broad categories (products with low, medium and high direct and indirect value added) and that nominal tariffs and export subsidies of 15, 20 and 25 per cent should be granted to products in the three categories respectively. Again, there is nothing magical in the division into three groups rather than two or four, in the exact cutoff points chosen between the groups, or in the numbers 15, 20 and 25. All we need is that tariffs should be low, that the differences between them should be relatively small, and that tariffs should rise according to direct and indirect national value added.

In order to fully specify Proposal 2 we need to decide which products fall into each of the three groups. This in turn means that we need data on direct and indirect national value added by product or sector for the Andean countries. This data may be obtained for Chile, Colombia, and Peru, the three Andean countries for which input-output tables are currently available, by multiplying the vector of direct value added in each country by the inverse of that country's input-output table. The resulting vectors of direct and indirect value added by sectors, together with an arithmetic average for the three countries, are presented in Table 1.⁸

The absolute magnitudes of the figures in Table 1 are less important than the rankings of sectors in the three countries. If a common external tariff proposal based on tariffs rising with direct and indirect national value added is to be meaningful, the rankings of the

Table 1

Direct and Indirect Value Added in Chile, Colombia and Peru

Sector	Ranking				Direct & Indirect Value Added			
	Average	Chile	Col.	Peru	Average	Chile	Col.	Peru
Agriculture	1.5	3	1	4	.95	.97	.98	.90
Fishing	1.5	1	2	2.5	.95	.98	.97	.91
Mining	3	6.5	3	2.5	.94	.95	.96	.91
Beverages	4	3	9	1	.93	.97	.90	.93
Furniture	5	5	6	7	.88	.96	.92	.77
Food products	6.5	17	12	5	.86	.87	.87	.84
Non-met.min.prods.	6.5	9	10.5	9.5	.86	.93	.88	.76
Clothing, shoes	8	10.5	7.5	13	.85	.92	.91	.72
Leather products	9.5	16	10.5	9.5	.84	.89	.88	.76
Petroleum prods.	9.5	20	4.5	9.5	.84	.82	.95	.76
Printing	11	6.5	15	6	.82	.95	.73	.79
Tobacco	12.5	18.5	4.5	15	.80	.84	.95	.60
Textiles	12.5	21	13	12	.80	.81	.86	.74
Wood products	14	3	7.5	19	.79	.97	.91	.48
Paper products	15.5	8	16	14	.75	.94	.70	.62
Basic metals	15.5	18.5	19.5	9.5	.75	.84	.66	.76
Metal products	17	13	18	18	.70	.91	.67	.52
Non-elec. mach.	18	10.5	14	22	.69	.92	.78	.36
Chemicals	19.5	22	21	16	.68	.80	.65	.58
Other industries	19.5	13	17	20	.68	.91	.69	.43
Electrical mach.	21	13	19.5	22	.64	.91	.66	.35
Rubber products	22	23	23	17	.63	.76	.58	.55
Motor vehicles	23	15	22	22	.62	.90	.61	.36

Sources: input-output tables of Chile, Colombia and Peru

different sectors by direct and indirect value added should be similar in the three countries. This is in fact the case. As shown in Table 2, the rank correlations between all direct and indirect value added vectors are significant at the 6 per cent level or better. Even more important, the rank correlations between the three national vectors and the average vector are all significant at the 1 per cent level. This means that the ordering of sectors in the average vector does not significantly differ from the three national orderings, and hence that using the average vector as the basis for the proposal does not significantly distort the results for any particular country. The average direct and indirect value added vector is now divided into three groups and nominal tariffs of 15, 20 and 25 per cent respectively are granted to industries in the three groups (Table 3).

Sensitivity analysis on the data used to develop Proposal 2

It was noted above that, in practice, raising nominal tariffs according to direct and indirect national value added (lowering them according to direct and indirect import content) can only approximately achieve the goal of giving exactly equal effective protection to all industries. There are at least three reasons for this: the aggregation problem, the changes-over-time problem and the price distortion problem. This section analyzes the extent to which Proposal 2 is sensitive to these three problems.

First, the aggregation problem arises because the input-output data that are available are aggregated at the sector level: more disaggregated data are unobtainable. The problem, then, as it affects

Table 2

Rank Correlations Between Direct and Indirect Value Added in
Chile, Colombia, Peru and An Average of the Three

	<u>Chile</u>	<u>Colombia</u>	<u>Peru</u>	<u>Average</u>
Chile	-	.5435 (2)	.3996 (6)	.5773 (1)
Colombia		-	.6297 (1)	.8678 (1)
Peru			-	.8972 (1)
Average				-

Note: The figures in parentheses represent the per cent level at which the rank correlation is significantly different from zero.

Source: Calculated from Table 1.

Table 3

Proposed Common External Tariff Structures

(per cent)

<u>Sector</u>	<u>Proposal 1*</u>	<u>Proposal 2*</u>
Agriculture	20	25
Fishing	20	25
Mining	20	25
Beverages	20	25
Furniture	20	25
Food products	20	25
Non-metallic mineral products	20	25
Clothing, shoes	20	25
Leather products	20	20
Petroleum, coal products	20	20
Printing	20	20
Tobacco	20	20
Textiles	20	20
Wood products	20	20
Paper products	20	20
Basic metals	20	20
Metal products	20	15
Non-electrical machinery	20	15
Chemicals	20	15
Other industries	20	15
Electrical machinery	20	15
Rubber products	20	15
Motor vehicles	20	15
Arithmetic average	20	20
Standard deviation	0	4

Source: see Table 1

* Figures refer to both tariffs and export subsidies.

Proposal 2, is that the direct and indirect import content of any particular individual product will not necessarily be exactly equal to that of its sector. As long as the differences are few and small the distortions introduced will be relatively unimportant. However, if such differences are many and large this could cause serious difficulties for Proposal 2, since each time a significant divergence occurs a product would be granted too little or too much protection using Proposal 2's decision rule. Unfortunately, since no data are available on the direct and indirect import content of goods at a sub-sector (three-digit) level, no direct test of the seriousness of the aggregation problem is possible. However, an indirect test is possible since data are available for Colombia at the sub-sector level on direct import content alone. Since at the sector level direct import content is highly correlated with direct and indirect import content, it is not unreasonable to assume that the same is true at the sub-sector level. An examination of direct import content at the three-digit (sub-sector) level for Colombia suggests that aggregation, at least at this level, is not too serious a problem (Appendix Table B1). Only three of the 109 three-digit sub-sectors have direct import coefficients which differ significantly at the five per cent level from their two-digit sector averages and in only three of the twenty sectors is the standard deviation of the import coefficients greater than the mean. This finding is encouraging, but at the same time it confirms that there will exist isolated cases in Proposal 2 where some products receive too little or too much protection. For example, where resource endowments differ

significantly between countries, direct and indirect import content in a particular good may also be expected to differ significantly. Such arbitrariness is inevitable in virtually any tariff system that diverges from uniform nominal tariffs, and serves to further underline the need to minimize such divergences.

Second, input-output coefficients in general, and direct and indirect value added in different sectors in particular, must be relatively stable over time for Proposal 2 (or any proposal differing from uniform tariffs) to yield a relatively stable pattern of effective protection over time. Fortunately we have input-output tables for Colombia for two years: 1960 and 1966. Comparing these two tables, sector rankings by direct and indirect value added are indeed relatively constant (Appendix Table B2). The rank correlation relating the direct and indirect value added vectors for 1960 and 1966 is significant at the 1 per cent level. Nevertheless, several significant changes occurred between 1960 and 1966. The import content in textiles increased as producers shifted emphasis from cotton to synthetic and mixed products. The import content in "transport products" increased as more complex transport goods and vehicles were produced. These and other technical and product mix changes cause problems for any static non-uniform tariff structure, and serve to underline still further the need to minimize differences in nominal tariffs between products.

Third, the Chilean, Colombian and Peruvian input-output coefficients are distorted by the fact that domestic prices diverge from world prices in many cases. It is theoretically possible to eliminate these distortions

using estimates of sectoral overpricing in each country. However, the relative price data which is currently available for this task is mostly unreliable and/or out of date. A second possibility would be to use the input-output coefficients of a country which has followed more "open" economic policies than the Andean countries, but this path has its own problems, since for various reasons the product mix and techniques of production may differ between the "model country" and Andean Group members. Fortunately, we do not have to resort to either of these stratagems. Since the Andean Group countries have followed similar import-substitution policies they tend to have similar sectoral patterns of overpricing -- lowest in simple consumer goods, next in intermediate goods, and highest in durable consumer goods. Given that direct and indirect value added in national prices basically follows an inverse pattern -- highest in simple consumer goods, next in intermediate goods, lowest in durable consumer goods -- and given the relatively low degree of Andean inter-industry interrelations, adjusting the input-output tables to world prices would probably not significantly change the rankings of the different sectors by direct and indirect national value added.

The Andean Common Minimum External Tariff

The Cartagena Agreement lays down that member countries must agree on a common minimum external tariff (CMET) five years before they finally agree on a common external tariff. In the interim period countries may maintain tariffs above but not below the CMET. It is

not clear exactly what function the drafters of the Agreement had in mind for the CMET, but in practice its negotiation in December 1970 seems to have been used as a "dry run" for the common external tariff negotiations. The discussion concerning the desired structure of the CMET sounded very much like discussion over the desired common external tariff (Junta 1970). Considerable awareness was shown of the need to correct past mistakes, not to penalize exports etc., and the CMET finally agreed upon (Table 4) represents a significant improvement over prior tariff structures (except possibly for Bolivia). It is on average much lower than prior structures and contains significantly less dispersion of nominal tariffs for different goods.⁹

Comparison of the two Proposals with five prior national tariff structures, the Andean Common Minimum External Tariff, and the common external tariff of the European Economic Community

At least four criteria may be used to compare the two Proposals, the Andean Common Minimum External Tariff, and the common external tariff of the European Economic Community: the average tariff level, tariff variation between sectors, tariff variation within sectors, and the possible range of effective protection yielded by the tariff structure.

The average tariff level should be low to avoid discrimination against exports. As shown in Table 4 the two Proposals have average tariff levels of 20 per cent, but since export subsidies also average 20 per cent the anti-export bias is zero. The European Economic Community has an average tariff level of 12 per cent, the CMET is higher

Table 4

Comparison of Proposals 1 and 2, the Andean Common Minimum External Tariff (CMET),

National Preunion Tariff Structures, and the Common External

Tariff of the European Economic Community

(Tariff sector averages, per cent)

<u>Sector</u>	<u>Propo- sal 1*</u>	<u>Propo- sal 2*</u>	<u>CMET</u>	<u>Boli- via</u>	<u>Chile</u>	<u>Colom- bia</u>	<u>Ecu- dor</u>	<u>Peru</u>	<u>European Economic Community</u>
Agriculture	20	25	29	77	133	45	125	57	
Fishing	20	25	27	25	150	52	102	86	
Mining	20	25	11	60	132	20	58	65	
Food products	20	25	50	49	268	52	192	92	
Beverages	20	25	64	95	388	75	291	208	
Tobacco	20	20	42	40	186	143	195	117	
Textiles	20	20	60	72	190	67	101	103	10
Clothing, shoes	20	25	80	76	283	183	184	210	20
Wood products	20	20	47	78	172	115	121	110	15
Furniture	20	25	52	53	152	77	116	85	15
Paper products	20	20	40	52	173	64	83	88	10
Printing	20	20	21	45	160	52	53	71	3
Leather products	20	20	45	76	250	86	124	115	11
Rubber products	20	15	58	62	170	98	98	78	15
Chemicals	20	15	32	34	101	32	52	56	14
Petroleum prods.	20	20	35	31	111	33	57	56	
Non-met.min.prods.	20	25	42	61	164	72	86	80	14
Basic metals	20	20	27	36	87	31	49	67	7
Metal products	20	15	46	52	149	56	79	76	14
Non-elec. mach.	20	15	43	27	79	35	45	48	7
Electrical mach.	20	15	55	42	110	40	56	60	15
Transport prods.	20	15	42	42	183	76	81	58	13
Other industries	20	15	50	47	164	69	93	90	16
Arithmetic average	20	20	43	54	172	70	106	90	12
Standard deviation	0	4	15	19	68	37	58	41	4

Sources: Andean Group: calculated from tariff schedules. Europe: Balassa (1965, p.1)

* Figures refer to both tariffs and export subsidies.

with 43 per cent, and the prior national tariff averages are higher still, ranging from 54 per cent in Bolivia to 172 per cent in Colombia.

Variation within the tariff structure both between and within sectors should be minimized to avoid creation of inefficient industries and to minimize arbitrarily different treatment of activities which should be treated similarly. Variation between sectors in each tariff structure may be measured by the standard deviation of the sector-by-sector tariff averages, that is, the standard deviation of each of the tariff vectors presented in Table 4. As shown in the last line of that table, Proposal 1 has the lowest standard deviation followed by Proposal 2 and the European Economic Community, the CMET, and the five national tariff structures in that order. Variation within sectors in each tariff structure may be measured by the standard deviation of the items within particular sectors. Standard deviations of tariffs within six industrial sectors are presented in Table 5. The results are again the same, with Proposals 1 and 2 having the lowest variation followed by the CMET and the five national tariff structures in that order. (Data on the EEC are not easily available.) The range of effective protection granted by each of the different systems yields the same ranking once again (Table 6). Proposal 1 presents the smallest range followed by Proposal 2, the CMET, and the five national structures in that order.

In summary, Proposal 1 is the best tariff structure of those examined here in all respects. Proposal 2 is a clear second-best while the AEMC and the five national tariff structures are considerably inferior to the two proposals in all respects.¹⁰

Table 5

Means (\bar{X}) and Standard Deviations (σ) of Tariffs Within Six Sectors
Under Proposals 1 and 2, the Andean Common Minimum External
and National Preunion Tariff Structures

<u>Sector</u>		<u>Propo- sal 1*</u>	<u>Propo- sal 2*</u>	<u>CMET</u>	<u>Boli- via</u>	<u>Chile</u>	<u>Colom- bia</u>	<u>Ecu- dor</u>	<u>Peru</u>
Tobacco	\bar{X}	20	20	42	40	186	143	195	117
	σ	0	0	17	13	93	81	197	66
Wood products	\bar{X}	20	20	47	78	172	115	121	110
	σ	0	0	29	100	135	139	131	79
Furniture	\bar{X}	20	25	52	53	152	77	116	85
	σ	0	0	15	7	83	33	73	41
Printing**	\bar{X}	20	20	21	45	160	52	53	71
	σ	0	0	28	49	138	56	52	66
Leather products	\bar{X}	20	20	45	76	250	86	124	115
	σ	0	0	22	45	184	57	59	73
Non-metallic mineral products	\bar{X}	20	25	42	61	164	72	86	80
	σ	0	0	15	26	108	53	26	36

Source: Calculated from tariff schedules

* Figures refer to both tariffs and export subsidies. Standard deviations within sectors are zero throughout for Proposals 1 and 2 because all items within a given sector are granted the same tariff (export subsidy).

** The standard deviation figures for the printing sector are distorted by the large number of items (textbooks, etc.) which have zero tariffs.

Table 6

The Possible Range of Effective Protection with Proposals 1 and 2,
the Andean Common Minimum External Tariff (CMET)
and National Preunion Tariff Structures

	<u>Maximum</u> <u>effective</u> <u>protection</u> <u>(per cent)</u>	<u>Minimum</u> <u>effective</u> <u>protection</u> <u>(per cent)</u>	<u>Range</u> <u>(percentage</u> <u>points)</u>
Proposal 1	+ 20	+ 20	0
Proposal 2	+ 65	- 25	90
CMET	+ 356	- 265	621
Bolivia	+ 375	- 255	630
Chile	+ 1624	- 1157	2781
Colombia	+ 835	- 632	1467
Ecuador	+ 1275	- 939	2214
Peru	+ 858	- 600	1458
EEC	+ 88	- 65	153

Source: Calculated from Table 4. See n.4 for the formula used to calculate effective protection.

Note: The use of maximum and minimum sector average tariffs in calculating effective protection rather than maximum and minimum rates on individual items implies that the possible range of effective protection is understated in the CMET, Andean and EEC structures. It is assumed throughout that no product has less than 20 per cent national value added.

Modifications to Proposals 1 and 2

Since tariffs affect not only resource allocation but other variables as well Proposals 1 and 2 would have to be modified in a number of ways before they could be applied in practice. First, government revenue is affected by tariffs and some compensation may have to be paid to countries which lose a significant amount of fiscal revenue in moving to a lower common external tariff. This compensation should perhaps be related to the fall in tariff revenues as a percentage of total government revenues rather than to the fall in tariffs as a percentage of the prior average tariff level. Otherwise Chile, with highest pre-union tariffs (Table 4) but lowest pre-union reliance on tariffs as a source of government revenue (tariffs provide only ten per cent of government revenues) would receive more compensation than Bolivia, with lowest pre-union tariffs but highest pre-union reliance on tariffs as a source of government revenue (fifty per cent).

Second, tariffs affect the level of employment (Stolper-Samuelson, 1941). In the late 1950's and 60's Andean tariff and licensing structures contained an anti-employment bias because they penalized exporters (generally producers of labour-intensive goods) and stimulated more and more capital-intensive import-substitution. For example, it takes from twenty to five-hundred times more capital to employ a man directly in the production of (import-substituting) petrochemicals than it does in production of shoes, clothing or wooden furniture. Taking indirect employment into account accentuates this imbalance rather than redressing it, and the same is true if value added and foreign exchange earned and

saved are considered.¹¹ Since one of the key effects of the adoption of a lower, more uniform tariff structure should be to stimulate exports of labour-intensive manufactures, industrial employment should at the same time be increased. It is true that some jobs may be lost in inefficient import-substituting industries which may be forced to shut down, but this should be more than offset by the rise in employment in labour-intensive exporting industries.

It may be argued that an alternative way of using tariffs to increase employment would be to raise tariffs on labour-intensive goods. However, at this stage of their development the Andean countries are importing very little in the way of labour intensive manufactures, so there is little scope for further import-substitution in these lines. The raising of tariffs on labour-intensive manufactures would simply expand the protective umbrella now covering labour-intensive industries and delay still further their being able to compete in world markets.

Third, the "infant industry" argument for tariff protection cannot be ignored despite its somewhat chequered image after considerable overuse. There may be some truly "infant industries" for which exceptions should be made in the form of slightly higher tariff protection than they would otherwise receive. However, to ensure that the infants grow up these "infant tariffs" should be clearly labelled as such, and should be scheduled for step-by-step reduction to their normal levels in a fixed (say five-year) period. The case for building infant industry protection into the Andean common external tariff is particularly weak because the tariff does not fully come into effect until 1980, thus allowing

governments to give special protection to their "infants" during the long interim period.

Fourth, the two Proposals need to be modified wherever there is monopoly power in trade. While it is likely that in most cases Andean countries are unable to affect the prices of their imports the same is not true on the export side. Appropriate export taxes should therefore be levied on the export of commodities (copper, coffee, tin etc.) in which monopoly power is held.

Fifth, tariffs act as a tax on consumers as well as a subsidy to producers, so the consumption side should also be examined. Where the aim is to reduce or increase consumption (for example, of luxury goods or essential food grains respectively) consumption taxes and subsidies should be used rather than tariffs since they avoid the production subsidy element of tariffs. The avoidance of unnecessary and undesired distortions in consumption choice provide a further reason for keeping tariffs as uniform as possible.

Last, but by no means least, tariffs affect the distribution of income, and a full examination of any tariff structure should take this into account. While this problem has many dimensions, in the context of the Andean common external tariff one point stands out. The more tariffs diverge from equality on all goods towards higher effective protection for more complex goods (as is the case in prior national tariff structures), the more the common external tariff structure is likely to favour Chile and Colombia (and maybe Peru) over Bolivia and Ecuador. For example, let us assume that Bolivia and Ecuador specialize in the production of simpler goods, which receive only t per cent protection, while Chile and

Colombia produce more complex goods which receive say 2t per cent protection. Bolivia and Ecuador would in this case be subsidizing Chile and Colombia since they would be paying a greater premium over world prices for their purchases. This is the reverse of the stated aim of the Cartagena Agreement, which is that the richer countries should subsidize the poorer and not vice versa. It provides a further argument against a wide spread of nominal tariffs if the tariff structure is of the usually observed type.¹²

The common external tariff and exchange rate policy

Given that the average level of the common external tariff should be considerably lower than that of the five national tariff structures, member countries should take advantage of the long pre-1980 "adjustment period" to gradually adjust tariffs downwards and remove import licenses, at the same time gradually raising real exchange rates so as to maintain balance of payments equilibrium. Although the change from existing high tariffs plus licensing to much lower tariffs without licensing will be a significant one, its dislocating effects can be minimized by making the adjustments as gradual and predictable (possibly using published timetables) as possible. The need to raise real exchange rates during the period of transition to the common external tariff is crucial. Naturally a common external tariff like Proposals 1 and 2, or even the CMET, would yield huge balance of payments deficits (especially in high tariff countries like Chile) if they were imposed without raises in real exchange rates. Such increases in real exchange rates should be regarded as an integral part of the process of moving towards a rational common external

tariff.¹³

The "common-ness" of the common external tariff

There are several ways in which a common external tariff could turn out to be not entirely "common". First, if import licenses, quotas, deposits etc. are not abolished the common external tariff cannot be "common", since it is not practically possible to co-ordinate the application of such measures between countries. Second, traded services ("invisibles"), which account for up to one-third of total Andean countries' trade¹⁴ are not normally subject to tariffs or export subsidies. One solution may be to impose tariffs and export subsidies on these items. Third, the discussion has so far ignored the very real possibility that large sections of the economy in Chile and Peru may be owned and operated by the state and that the Chilean government may nationalize a large part of Chile's foreign trade. This would not affect the analysis if governments and government enterprises were to pay tariffs or take tariffs into account in deciding what and where to purchase. If, however, one or more governments do not take tariffs into account in decision-making and/or if tariffs cannot be imposed on invisibles, the argument presented several times in this paper is still further strengthened. For any given degree of tariff dispersion the lower the average rate of tariff the better.

Summary and conclusions

The Cartagena Agreement signed by members of the Andean Group calls for member countries to agree by December 1975 on a common external tariff

which they are to implement gradually from 1977 to 1980. Past Andean policies of import substitution at any cost fostered the development of inefficient protected industries and discriminated against the agricultural and export sectors. Adoption of a more rational tariff and export subsidy structure by the Andean Group in 1975 could do much to redress these imbalances. Assuming that free trade is politically unacceptable at least in the near future, Proposal 1 suggests adoption of a low, uniform Andean tariff and export subsidy. In case even this should be politically unacceptable, Proposal 2 sets out a "third-best" tariff structure, which is designed to give approximately equal effective protection to all activities by raising nominal protection with direct and indirect national value added. The two Proposals need to be modified in cases of (genuine) infant industries and monopoly power in trade, and their implications for government revenue receipts, the level of employment, consumption choices and the distribution of welfare gains within the customs union all need to be considered. Andean exchange rates will need to be gradually adjusted upward during the transition to the (lower) common external tariff and non-tariff barriers to trade (quotas etc.) should be gradually eliminated. Many independent arguments which are discussed reinforce one of the key propositions of the paper; if tariffs must diverge from uniformity for political reasons the divergence should be as little as possible and the average tariff level should be as low as possible.

Appendix A

Derivation of a tariff structure which grants
equal effective protection to all activities

Aim: To derive a tariff structure which grants equal effective protection to all activities.

Assumptions:

1. Political considerations rule out the use of the simplest way of achieving equal effective protection for all goods, namely, granting equal nominal protection for all goods.
2. There are three goods i , j and k . (The analysis can easily be generalized to the n good case without altering the conclusions.)
3. All goods are both intermediate and final goods.
4. Goods i and j are domestically produced, good k is imported.
5. Production functions are of the fixed-coefficient Leontief type which means we can use input-output tables, effective protection formulas etc.

Definitions:

t_i, t_j, t_k are nominal tariffs on goods i, j, k .

a_{ij} is the value of product i necessary to produce one unit of product j .

In general $a_{ij} \neq a_{ji}$.

Z_i, Z_j are the levels of effective protection for products i, j .

Derivation:

Using the standard effective protection formula we have three equations:

$$Z_i = \frac{t_i - a_{ji}t_j - a_{ki}t_k}{1 - a_{ji} - a_{ki}} \quad (1)$$

$$Z_j = \frac{t_j - a_{ij}t_i - a_{kj}t_k}{1 - a_{ij} - a_{kj}} \quad (2)$$

$$Z_i = Z_j = Z \quad (3)$$

Substituting (3) into (1) and (2) we are left with two equations

(1)' and (2)' in the following variables: endogenous t_i, t_j, t_k, Z ; exogenous $a_{ij}, a_{ji}, a_{ki}, a_{kj}$. We can now set arbitrary values for t_k and Z and solve for t_i and t_j as functions of the other variables. Multiplying equation (1)' by a_{ij} adding (2)' and solving for t_j , after a little manipulation we obtain:

$$t_j = Z + \frac{(Z - t_k)(a_{kj} + a_{ij}a_{ki})}{a_{ij}a_{ji} - 1} \quad (4)$$

By symmetrical manipulation we can solve for t_i obtaining:

$$t_i = Z + \frac{(Z - t_k)(a_{ki} + a_{ji}a_{kj})}{a_{ji}a_{ij} - 1} \quad (5)$$

Given the input-output coefficients and arbitrarily set parameters for Z and t_k we now have the required tariff levels t_i and t_j .

Characteristics of the solution:

(a) If $t_k = Z$ the solution is $t_i = t_j = t_k = Z$.

This solution, equal nominal tariffs on all goods, is ruled out by assumption 1.

(b) Let us assume without loss of generality that $t_k < Z$.

(b1) If $t_k < Z$ then $t_j < Z$, $t_i < Z$.

That is, if the tariff on imported inputs is less than the desired rate of effective protection the tariff on goods i and j will also be less than the desired effective protective rate.

(c) Let us now examine the relationship between t_i and t_j .

(c1) If $a_{kj} = a_{ki} = 0$, then $t_i = t_j = t_k = Z$.

This is the uninteresting case of no imported inputs.

(c2) If $a_{kj} = a_{ki} > 0$ then

$$t_i \begin{matrix} > \\ < \end{matrix} t_j \text{ if } a_{ij} \begin{matrix} > \\ < \end{matrix} a_{ji}$$

In this case each domestically produced good uses directly the same (positive) proportion of imported inputs ($a_{kj} = a_{ki}$); therefore the good which uses less imported inputs indirectly needs to be given higher nominal tariff protection to give it the same degree of effective protection. For example, let good i be coal, j steel and k imported uranium. Coal and steel use the same proportion

of uranium directly in their production but steel uses more coal inputs than coal uses steel inputs. Therefore, directly and indirectly steel uses more of the imported good (or equivalently has lower direct and indirect national value added) than coal and so requires a lower minimal tariff to give it the same effective protection.

(c3) If $a_{kj} \neq a_{ki}$ and $a_{ij} \neq a_{ji}$ then

$$t_i \begin{matrix} > \\ < \end{matrix} t_j \text{ if } (a_{kj} + a_{ij}a_{ki}) \begin{matrix} > \\ < \end{matrix} (a_{ki} + a_{ji}a_{kj})$$

This is the general case. Since a_{kj} is the amount of the imported good directly used in good j and $a_{ij}a_{ki}$ is the amount of the imported good indirectly used in good j (and similarly for good i), this general inequality states that in order to achieve equal effective protection for all goods greater nominal protection must be given to goods with greater direct and indirect value added (lower direct and indirect import content).

Appendix B

The Chilean, Colombian and Peruvian Input-Output Tables

Appendix Tables B1 and B2 are discussed in the text. Appendix Tables B3 through B5 are presented to assist readers who wish to replicate and/or modify the computations (and the inferences derived from them) used in developing Proposal 2. Although the Chilean, Colombian and Peruvian input-output tables use basically similar sector classifications, a few minor reconciliations had to be made to render them completely comparable. These reconciliations are set out in Appendix Table B3. The number of NABALAI.C tariff items per input-output sector is presented in Appendix Table B4. Finally, the reconciliation between input-output sectors and tariff chapters and items is presented in Appendix Table B5.

Appendix Table B1

The Aggregation Problem: Direct Imports in Colombian Industry
at the Sector and Sub-sector (Two and Three Digit) Levels

<u>Industry</u>	<u>Direct import content (per cent)</u>	<u>Industry</u>	<u>Direct import content (per cent)</u>
20 - Food products		23 - Textiles	
201	4	231	10
202	3	232	3
203	4	233	2
204	0	234	7
205	9	235	17
206	8	236	6
207	1	237	15
208	25	239	7
209	13	Sector average	8
Sector average	9		
		24 - Clothing, shoes	
21 - Beverages		241	0
211	0	242	0
212	6	243	0
213	9	244	0
214	4	245	0
Sector average	6	246	18*
		247	0
22 - Tobacco		248	4
221	3	Sector average	0
Sector average	3		

Appendix Table B1 (cont'd)

<u>Industry</u>	<u>Direct import content (per cent)</u>	<u>Industry</u>	<u>Direct import content (per cent)</u>
25 - Wood products		29 - Leather products	
251	1	291	9
252	0	292	2
253	4	293	5
254	2	294	6
255	5	Sector average	8
256	54*		
Sector average	4	30 - Rubber products	
		301	43
26 - Furniture		302	21
261	0	303	26
262	4	304	20
Sector average	0	Sector average	38
27 - Paper products		31 - Chemicals	
271	28	311	33
272	10	312	49
273	11	313	22
Sector average	19	314	36
		315	40
28 - Printing		316	9
281	20	317	5
282	24	318	12
283	2	319	32
284	3	Sector average	29
Sector average	20		

<u>Industry</u>	<u>Direct import content (per cent)</u>	<u>Industry</u>	<u>Direct import content (per cent)</u>
32 - Petroleum, coal products			
321	4	354	25
323	0	355	27
329	0	356	12
Sector average	4	357	40
		358	13
33 - Non-metallic minerals		359	16
331	2	Sector average	25
332	11		
333	10	36 - Non-electrical machinery	
334	4	361	31
335	12	362	10
336	0	363	18
337	4	364	9
339	3	Sector average	14
Sector average	8		
		37 - Electrical machinery	
34 - Basic metals		371	22
341	4	372	25
342	28	373	18
343	0	374	52 *
344	35	375	22
Sector average	21	376	25
		Sector average	27
35 - Metal products		38 - Transport products	
351	45		
352	21	381	19
353	18	382	15

Appendix Table B1 (cont'd)

<u>Industry</u>	<u>Direct import content (per cent)</u>
383	45
384	10
385	30
386	33
Sector average	33
39 - Other industries	
391	23
392	21
394	6
395	2
396	5
397	7
398	30
Sector average	25

Source: Calculated from Departamento Administrativo de Estadísticas, Boletín Mensual de Estadística, Julio 1968, pp.26-33.

* Three digit direct import coefficient is significantly different from the average for its 2 digit sector at the 5 per cent level.

Appendix Table B2

The Time Problem: Direct and indirect import content
in twenty industrial sectors, Colombia, 1960 and 1966

<u>Sector</u>	Direct and indirect import content 1960 (per cent)	Direct and indirect import content 1966 (per cent)	Rank 1960	Rank 1966
20 - Food products	6	13	11 1/2	9
21 - Beverages	4	10	8	6
22 - Tobacco	2	5	1 1/2	1 1/2
23 - Textiles	4	14	8	10
24 - Clothing, shoes	3	9	4	4 1/2
25 - Wood products	4	9	8	4 1/2
26 - Furniture	4	8	8	3
27 - Paper products	13	30	16 1/2	13
28 - Printing	13	27	16 1/2	12
29 - Leather products	6	12	11 1/2	7 1/2
30 - Rubber products	4	42	8	20
31 - Chemicals	9	35	13	18
32 - Petroleum products	2	5	1 1/2	1 1/2
33 - Non-metallic minerals	3	12	4	7 1/2
34 - Basic metals	10	34	14	16 1/2
35 - Metal products	11	33	15	15
36 - Non-elec. machinery	19	22	20	11
37 - Elec. machinery	18	34	19	16 1/2
38 - Transport products	3	39	4	19
39 - Other industries	16	31	18	14

Source: Input-output tables for Colombia, 1960 and 1966.

Appendix Table B3

Sector reconciliations for the input-output tables
of Chile, Colombia and Peru

<u>CHILE</u>		<u>COLOMBIA</u>		<u>PERU</u>	
<u>National Sector Code</u>	<u>Sector</u>	<u>National Sector Code</u>	<u>Sector</u>	<u>National Sector Code</u>	<u>Sector</u>
1	Agriculture	{2	Agric. livestock	{1	Cattle
2	Fishing	{4	Forestry	{2	Agric., forestry
4	Iron ore	3	Fishing & hunting	3	Fishing
5	Copper	5	Mining	4	Mining
3,7,8	Other mining				
9	Food	6	Food	5	Food
10	Beverages	7	Beverages	6	Beverages
11	Tobacco	8	Tobacco	7	Tobacco
12	Textiles	9	Textiles	8	Textiles
13	Clothing	10	Clothing	9,10	Clothing, shoes
14	Wood	11	Wood	11	Wood
15	Furniture	12	Furniture	12	Furniture
16	Paper	13	Paper	13	Paper
17	Printing	14	Printing	14	Printing
18	Leather	15	Leather	15	Leather
19	Rubber	16	Rubber	16	Rubber
20	Chemicals	17	Chemicals	{17	Chemicals
				{23	Plastics
21	Petroleum&coal prod's	18	Petroleum&coal prod's	18	Petroleum prod's
22	Non-metallic min's	19	Non-metallic min's	19	Non-metallic min's
23	Basic metals	20	Basic metals	20	Basic metals
24	Metal products	21	Metal products	21	Metal products
25	Non-elec. mach.	22	Non-elec. mach.	22	Mach. & vehicles
26	Elec. machinery	23	Elec. machinery	22	Mach. & vehicles
27	Transp. prod's	24	Transp. prod's	22	Mach. & vehicles
28	Other industries	25	Other industries	24	Other industries

Note: Coffee in Colombia (code 1) and nitrate mining in Chile (6) were excluded. Their inclusion would not alter the results significantly.

Appendix Table B4

Number of NABALALC tariff items per input-output sector

Agriculture	448
Fishing	60
Mining	185
Food products	427
Beverages	63
Tobacco	10
Textiles	295
Clothing, shoes	223
Wood products	27
Furniture	10
Paper products	159
Printing	33
Leather products	62
Rubber products	53
Chemicals	1,276
Petroleum, coal products	382
Non-metallic mineral prods.	135
Basic metals	362
Metal products	227
Non-electrical machinery	896
Electrical machinery	311
Transport products	218
Other industries	379
<u>Total</u>	<u>6,241</u>

Source: Computed from Andean national tariff schedules

Appendix Table B5

Reconciliation Between Input-Output Sectors
and Tariff Chapters and Items

- 1 - Coffee Sector
(omitted - see note to Appendix Table B4)
- 2 - Agriculture and Livestock Sector
Chapters 1, 5 (less 5, 14.1 Pharmaceuticals), 7, 8, 9.04, 9.05,
9.06, 9.07, 9.08, 9.09, 9.10, 10, 11 (less 11.08, 11.09), 12 (less
12.17.099 - 12.08.0.01), 14, 40.01.
- 3 - Fishing and Hunting Sector
Chapter 3, 15.04 - 15.14.
- 4 - Forestry Sector
Chapter 6, 44.01, 44.02, 44.03, 44.04, 44.05, 44.06, 44.07, 44.08,
44.09, 44.10, 44.11, 44.12, 44.13, 44.14, 44.15.
- 5 - Mining Sector
Chapter 25, 26.
- 6 - Food Products Sector
Chapter 2, 4, 15.01, 15.02, 15.03, 15.07, 15.08, 15.09, 15.12, 15.13,
15.15, 15.15, 15.17, 21 (less coffee).
- 7 - Beverages Sector
Chapter 22.
- 8 - Tobacco Sector
Chapter 24.
- 9 - Textiles Sector
Chapter 50, 51, 52, 53, 54, 55, 56, 57, 58, 59.
- 10 - Clothing Sector
Chapter 60, 61, 62, 63, 64, 65, 66.
- 11 - Wood Products Sector
Chapter 44.16, 44.17, 44.18, 44.19, 44.20, 44.21, 44.22, 44.23, 44.24,
44.25, 44.26, 44.27, 44.28, 45.
- 12 - Furniture Sector
Chapter 94.01, 94.02, 94.03, 94.04.
- 13 - Paper Products Sector
Chapter 47, 48.
- 14 - Printing Sector
Chapter 49.

Appendix Table B5, cont'd

15 - Leather Products Sector

Chapter 41, 42, 43.

16 - Rubber Products Sector

Chapter 40.07, 40.08, 40.09, 40.10, 40.11, 40.12, 40.13, 40.14, 40.15, 40.16.

17 - Chemicals Sector

Chapter 05.14.1, 9.01, 9.99, 13.02.2, 13.02.3.02, 13.02.3.06, 13.02.3.06, 13.02.3.07, 13.02.3.99, 13.02.4.01, 13.02.4.99, 13.03.1.01, 13.03.2.99, 15.04, 15.05, 15.06, 15.10.1, 15.10.2, 15.10.3, 15.11.

Chapter 28 less 28.02, 28.03, 28.16, 28.43.1.01, 28.43.1.02, 28.49.1, 28.49.2.

Chapter 29 less 29.01, 29.02, 29.03, 29.04.2, 29.05.2, 29.05.3, 29.06.1, 29.07.2, 29.08.1, 29.08.2, 29.08.3, 29.08.4, 29.08.5, 29.09, 29.11.1, 29.11.2, 29.14.5, 29.15.2, 29.16.9, 29.22.

Chapter 30, 31, 32, 33, 34, 35, 36, 37, 39.04, 39.05, 39.06, 39.07.

18 - Petroleum and Coal Products Sector

Chapter 27, 28.49.1, 28.49.2, 28.16, 28.02, 28.03, 28.43.1.01, 28.43.1.02, 29.01, 29.02, 29.03, 29.04.2, 29.05.2, 29.05.3, 29.06.1, 29.07.2, 29.08.1, 29.08.2, 29.08.3, 29.08.4, 29.08.5, 29.09, 29.11.1, 29.11.2, 29.14.5, 29.15.2, 29.16.9, 29.22, 39.01, 39.02, 39.0, 40.02, 40.03, 40.04, 40.05, 40.06.

19 - Non-metallic Minerals Sector

Chapter 68, 69, 70.

20 - Basic Metals Sector

Chapter 71.05 to 71.11, 73. to 73.18
74.01 to 74.07, 75.01 to 75.05, 76.01 to 76.06, 77.01, 77.02, 77.04.0.01, 78.01 to 78.05.0.01, 79.01 to 79.04, 80.01 to 80.05.0.01, 81.01.1, 81.02.1, 81.03.1, 81.04.1.01, 81.04.1.02, 81.04.2.01, 81.04.2.02, 81.04.3.01, 81.04.3.02, 81.04.4.01, 81.04.4.02, 81.04.5.01, 81.04.5.02, 81.04.5.03, 81.04.5.04, 81.04.6.01, 81.04.6.02, 81.04.7.01, 81.04.7.02.

21 - Metal Products Sector

Chapter 73.19 to 73.40, 74.08 to 74.19, 75.06, 76.07 to 76.16, 77.03 to 77.04.0.02, 78.05.0.02 to 78.06, 79.05 to 79.06, 80.05.0.02, 81.01.2, 81.02.2, 81.03.2, 81.04.1.03, 81.04.2.03, 81.04.2.04, 81.04.3.03, 81.04.3.04, 81.04.4.03, 81.04.4.04, 81.04.5.06, 81.04.5.07, 81.04.5.08, 81.04.6.03, 81.04.6.04, 81.04.7.03, 81.04.7.04, 94.01.1.01, 94.01.8.01, 94.02.1.01, 94.02.8.1, 94.02.9.01, 94.02.9.02, 94.02.9.99, 94.04.0.01, 96.06.0.01, 97.01.8.01, 97.03.0.01, 97.03.9.99, 97.06.0.99, 97.07.0.01, 97.07.0.02, 97.08.0.01, 98.02.1.01, 98.02.8.01, 98.07.0.01.

Appendix Table B5, cont'd

- 22 - Non-electrical Machinery Sector
Chapter 82, 83, 84.
- 23 - Electrical Machinery Sector
Chapter 85.
- 24 - Transport Products Sector
Chapter 86, 87, 88, 89.
- 25 - Other Industries Sector
Chapter 90, 91, 92, 67, 71.01, 71.02, 71.03, 71.04, 71.12 to 71.16,
93, 94 (not included in metal products), 95, 96 (not included in
metal products), 97 (not included in metal products), 98 (not included
in metal products), and 99.

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1. Balassa (1971b, p.5). See also Schydrowsky (1970).
2. After an intensive three-year study of problems of industrial development in seven Latin American and Asian developing countries, Andre Philip, President of the OECD Development Center, summed up the findings as follows: "The conclusions of the six volumes are clear. Emphasis should be placed on the development of exports so as to earn the foreign currency required to pay for essential imports, whether of machines, material or food, which cannot be economically produced at home" (Little et al, 1970, p.xx). See also Balassa (1971a, 1971b).
3. The experience of the Central American Common Market (CACM) countries supports this argument. Although intra-Central American trade increased rapidly after the formation of the CACM, exports to the rest of the world did not, and in some cases they even declined significantly. This seems to have been due to the relatively high (60-100 per cent) and often increased tariff protection granted to local producers by the CACM's common external tariff, and to the lack of an export subsidy for extra-CACM exports, which have made it more profitable for producers to import-substitute within the extended CACM market than to export to the rest of the world.
4. Effective protection measures protection of value added in production. In the case of one input and one output, if t_i and t_j are the nominal tariffs on the input and the output respectively, a_{ij} is the value of the input i needed to produce one unit of output j , v_j and v_j' are value added in the no-tariff and tariff situations respectively, and Z_j is effective protection of good j , then:

$$Z_j = \frac{v_j' - v_j}{v_j}$$
$$= \frac{t_j - a_{ij}t_i}{1 - a_{ij}}$$

5. For the most comprehensive critical analysis, see Bhagwati and Srinivasan (1971a,b). Other important critical contributions are by Corden (1971), Tan (1970), Ramaswami and Srinivasan (1971), and, using a partial equilibrium approach, Leith (1968) and Anderson and Naya (1969).
6. The same multi-commodity problem arises of course if we look at nominal protection only.
7. Note that aggregate production functions continue to be used in empirical and policy-related work in spite of proof of their non-existence. See, for example, Fisher (1969).
8. If and when reasonably reliable input-output data become available for Bolivia and Ecuador the proposals could be reworked to include this data. However, the proposal is not likely to be changed significantly. For a detailed discussion of the input-output manipulations described in the text see any book on input-output analysis, for example, Dorfman, Samuelson and Solow (1958).
9. For a description of the way in which the CMET was derived, see Morawetz (1971, p.13).
10. This summary does not consider the common external tariff of the European Economic Community which was included in the discussion for comparative purposes only.
11. For more detail on this comparison, see Morawetz (1972a).
12. For a more detailed discussion of the problem of the distribution of benefits in customs unions, see Morawetz (1972b).
13. For a detailed analysis of exchange rate policies in customs unions with special reference to the Andean Group, see Morawetz (1971).
14. Morawetz (1971, p.14).

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