ESSAYS IN INTERNATIONAL ECONOMICS

by

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ABSTRACT

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Submitted to the Department of Economics on May , 1967 in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics.

This study treats several topics in the theory of international trade. Part I deals with questions relating to the positive and normative aspects of the theory of comparative advantage. Several propositions relating to the gains from trade are examined, qualified and deduced. The proofs of the Ricardian and Heckscher-Ohlin theorems relating to the pattern of trade are stated, with the sufficient assumptions clearly spelled out. Part II examines issues in the field of tariff theory. Theorems with respect to the effects of tariffs on internal and external terms of trade and income distribution are examined. The equivalence between tariffs and quotas is re-examined. The superiority of production subsidies over trade tariffs and subsidies, when domestic distortions are present, is demonstrated. Part III analyses the case of immiserizing growth, when growth makes a country worse off. Also, the applicability of trade theory to the efforts of less developed countries to liberalise trade among themselves is examined and a modified theory proposed.

Thesis Supervisor: Charles P. Kindleberger

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ACKNOWLEDGMENTS

I should like to express my thanks, for considerable stimulus and encouragement over many years, to Professors Charles P. Kindleberger and Paul A. Samuelson. Their interest has been paralleled by that of Professor Harry Johnson, my former teacher at Cambridge University; his incisive comments on most of what I have written in the past few years have invariably been helpful.

My thanks are also due to Mr. V. K. Ramaswami and Professor Murray Kemp for permission to use joint papers, with them, in this thesis.

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I would finally like to record my appreciation of the stimulating intellectual atmosphere at M. I. T.; Nuffield College, Oxford; the Indian Statistical Institute in Delhi; the Delhi School of Economics, Delhi University; and Columbia University, New York, where these papers were written.

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PART I

GAINS FROM TRADE AND COMPARATIVE ADVANTAGE

CHAPTER I

THE GAINS FROM TRADE ONCE AGAIN[1]

In a pair of brilliant, companion papers, Professors Paul Samuelson [6] and Murray Kemp [2] have carried the analysis of the gains from trade (derived by a single country) significantly beyond Samuelson's classic contribution [4] of 1939.

While the majority of the theorems stated in these papers are valid, including the significant extension of the theorem that free trade is superior to no trade to the case of countries enjoying monopoly power in trade, the analysis needs to be qualified and can be extended in respect of two important theorems stated (only) by Professor Kemp.

More specifically, the following theorem needs to be qualified: that, for a country with neither monopoly power in trade nor domestic distortions, a higher tariff is inferior to a lower tariff. Moreover, Kemp's remarkable theorem that restricted trade is superior to no trade is valid only if the restriction results from tariffs, quotas or exchange restrictions and cannot be sustained as a logically true proposition if taxes and subsidies on domestic production or consumption are introduced, quite legitimately, as possible methods of trade

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[1]I wish to thank Professors Murray Kemp and Paul Samuelson for valuable correspondence and Mr. V. K. Ramaswami for discussion of Section III.

restriction.

Section I begins with a restatement of the proof of Samuelson's classic theorem that free trade is superior to no trade, stating the proof in a way which brings out certain essential aspects with greater emphasis. Section II discusses Kemp's proposition that restricted trade is superior to no trade in relation to trade-restricting policies other than tariffs and (equivalent) quotas or exchange restrictions. Section III shows Kemp's contention that, for a small country, a higher tariff is inferior to a lower tariff, needs to be qualified unless inferiority of the exportable commodity in social consumption is ruled out.

I. Free Trade vs. No Trade

The proposition that free trade (in the sense of a policy resulting in the equalization of domestic and foreign prices, and hence excluding policies such as trade, production and consumption taxes, subsidies and quotas) is superior to no trade has been proved in Samuelson's 1939 [4] and recent [6] papers. The precise sense in which it is valid, and the conditions under which it can be interpreted as an efficiency rule by systems not using the price mechanism, are brought out clearly by recasting Samuelson's basic argument along the following lines where a sharp distinction is drawn between technical efficiency and utility improvement and emphasis is pointedly placed on the fact that the proposition that free trade is superior to no trade relates to a competitive price system whereas the fact that the opportunity to trade (i.e., the trade situation) is superior to the no trade situation holds regardless

of the institutional assumptions made.

For simplicity, assume that the productive factors are fixed in supply, that the country has no monopoly power in trade and that the technology is such as to result in a strictly convex production possibility set.[2] The following three propositions can then be established.

Proposition (1): The trade situation (i.e., the opportunity to trade) is superior to the no trade situation (i.e., the absence of trade opportunity), from the viewpoint of technical efficiency.

Proposition (2): Under perfect competition, free trade will enable the economy to operate with technical efficiency.

Proposition (3): Under perfect competition, free trade will enable the economy to maximize utility, subject to the given constraints, so that, from the viewpoint of utility-wise ranking as well, free trade is superior to no trade.

For Proposition (1), remember that technical efficiency is defined in the usual, Paretian sense. Hence Proposition (1) merely

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[2]The first assumption is not necessary for proving any of the three propositions that follow, as reference to Samuelson [6] and Kemp [2] will show. It is being introduced here merely to simplify the analysis and keep to a geometrical exposition without difficulty. On the other hand, note that the assumption of absence of monopoly power in trade is necessary for propositions (2) and (3), because they both refer to the optimality of free trade, which disappears where there is monopoly power in trade (as discussed in footnote 4). However, free trade, while not being the optimal policy when there is monopoly power in trade, is nonetheless a superior (though sub-optimal) policy to no trade, as Kemp [2] has shown.

states that it is possible to get more of one good and no less of the other when the opportunity to trade is available than when it is not.

This is readily seen in Figure (1), similar to Samuelson's illustration, where the price-line CD = EF represents the international prices and OAB the production possibility set. If production is set at P and trade is undertaken (as it must be) at the stated international prices, OEF becomes the availability set and EF the availability frontier, the Pareto-efficient locus of available combinations of the two commodities. But if production is set instead at P*, the availability set is the largest possible, at OCD, and CD represents the most efficient, Pareto-optimal availability line subject to the domestic and foreign transformation constraints.[3] On the other hand, AB, the production possibility frontier, represents the efficient, availability line in the absence of trade opportunity.

It is thus clear immediately, since CD lies uniformly outside AB (though touching it at P*), that any bundle of commodities which is available by production alone (i.e., in the no trade situation) can be improved upon (with one borderline case at P*) by production at P* and trade therefrom.

Hence, the opportunity to trade represents for the economy a superior situation than the absence thereof. In other words, the trade situation is superior to the no trade situation (in the sense of

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[3]Note that any shift of production from P*, and trade therefrom, to production at another point (such as P) and trade from that new point will only reduce the availability set open to the economy. Hence, production at P* represents the most efficient production point, from which trade can be conducted.

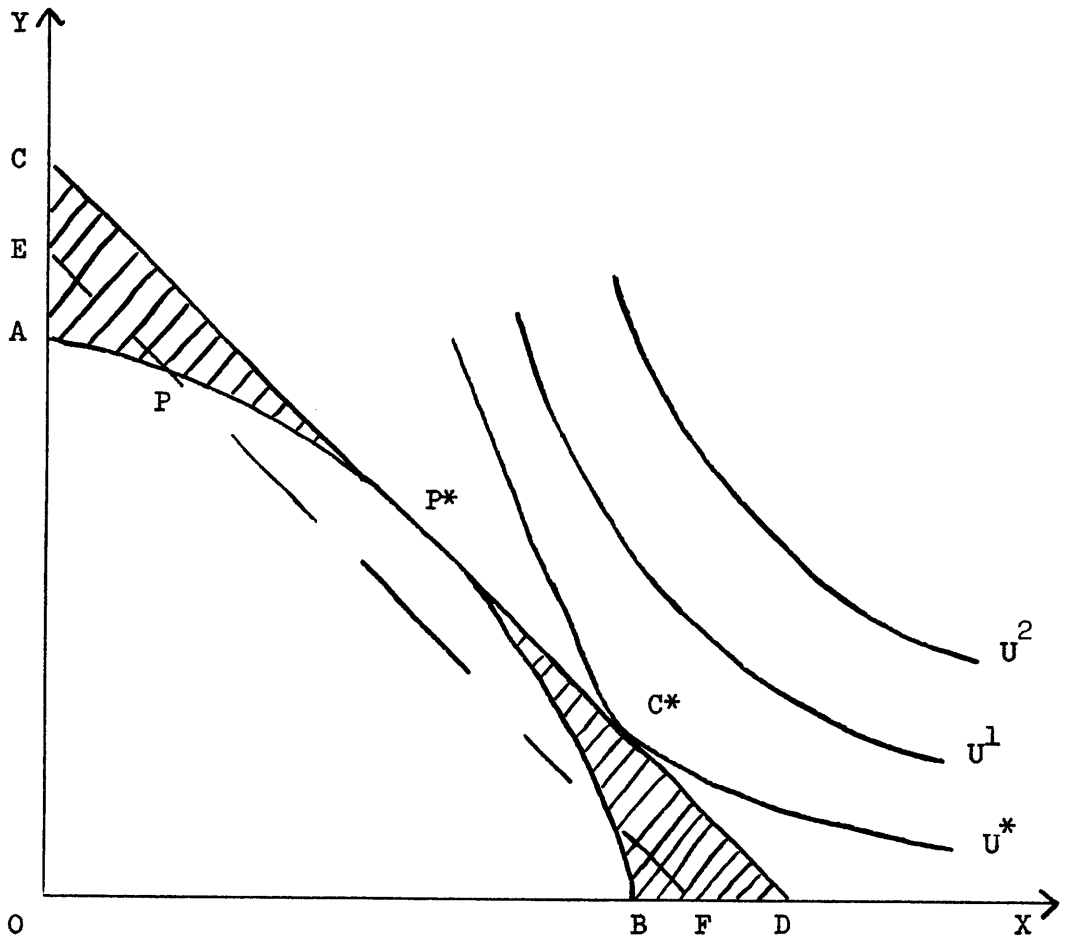

Figure 1*

* Without trade, APP*B represents the production possibility, and hence availability (or consumption possibility), frontier. If unlimited trade is possible at the world price ratio given by CD's slope, the new availability frontier is given by CP*D, the farthest-out line with slope CD that touches the domestic, production possibility frontier. Any domestic welfare function (of the standard, static variety) will be maximized at a point such as C*, which gives more welfare than any point within APP*B (save in the singular case where C* and P* happen to coincide).

Paretian, technical efficiency).

Note that this proposition merely states that it is possible, if the trade opportunity is exploited in a certain way, to have more of one good and no less of the other(s) under trade than under no trade. The proposition does not assert anything as to whether a specific, economic system will in fact manage to utilize the trade opportunity in this technically efficient manner. Of course the proposition that trade could expand the economy's availabilities is hardly surprising once one realizes that the possibility of trade really adds yet another "technological" process of transforming exportables into importables, and this cannot but improve (or, at worst, leave unchanged) the availabilities defined by the domestic resource and technological constraints.

On the other hand, Proposition (2) relates explicitly to whether an actual, institutional system will operate with technical efficiency. It states that, for a competitive price system, free trade will in fact enable the economy to exploit the trade opportunity most effectively and thus operate efficiently [i.e., bring production to P* and trade along CP*D in Figure (1)]. The proof of this proposition is straightforward and rests on the fact that with (i) free trade, constituting the equalization of foreign and domestic prices, and (ii) perfect competition, with the assumed technology, assuring the equalization of domestic prices with the marginal rate of transformation in production (on the production possibility frontier), the economy must necessarily end up producing and trading efficiently. To illustrate, under free trade at price CD = EF, the economy will produce at P* and trade along CD, thus operating with technical efficiency.

Note further that Proposition (2) can be readily adapted for institutional frameworks other than that of a competitive, price system. Thus, for an economic system which does not use (domestic) prices to guide production, it is conceivable that an alternative way of operating with efficiency would be for planners to follow the rule of equating foreign prices with the marginal rate of transformation of products in domestic production.[4] This efficiency rule would ensure the operation of the economy at technical efficiency; in Figure (1), the planners would be guided by the rule of producing at P* and thus trading along CP*D. Free trade merely happens to be the policy which enables a competitive, price system to implement this efficiency rule.[5]

It is now possible to go beyond questions of technical efficiency and raise the issue of utility-wise ranking of free trade and

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[4]For a country, however, which enjoys monopoly power in trade, the rule modifies to the well-known prescription to equate the marginal terms of trade with the marginal rate of transformation in domestic production. The rule can be obtained more directly by maximizing the availability of one commodity subject to specified level(s) of the other(s), subject further to the constraints imposed by the implicit, domestic transformation function and the foreign reciprocal demand function.

[5]Following on this, I have found it useful, in the classroom, to tell my Indian students that even a "Soviet-type" economic system, which may decide to avoid the use of prices to guide domestic allocation of resources, cannot afford to ignore international prices, the reason being that they really represent, from the welfare point of view, a "technological" datum. I may also add that the distinction between Propositions (2) and (3), based on the distinction between technical efficiency and utility maximization, is also very useful if one is teaching students living in a "planned" economy; Professor Bent Hansen, who has taught in Cairo for some years, told me sometime ago that he has also found it useful to teach free trade optimality in terms of Propositions (1) and (2) above.

no trade. If we take a well-ordered, social utility index, Proposition (3) follows immediately.[6] For those not anxious to raise questions about the incomparability of different persons' utilities and who are ready to accept a well-ordered social utility index, this procedure is entirely satisfactory.[7] But those who, reluctant to go beyond consideration of utility for each (incomparable) individual, wish to base utility-wise rankings on the superior-for-all-income-distributions criterion may prefer the approach of utility-possibility loci comparisons used by Samuelson [6] and Kemp [2]. They argue, quite correctly, that the fact that CD, the availability frontier under free trade, lies uniformly outside (though once touching) AB, the availability frontier under no trade, implies that the utility possibility locus for the free trade situation must also lie uniformly outside (though possibly touching) that for the no trade situation, as illustrated in Figure (2) for a two-person economy. This implies that, under free trade, for any

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[6]Formally, we would be maximizing a function such as $U = U(X,Y)$ where U stands for social welfare, X and Y for the available commodities and the function has the standard properties [5] such as

$$\frac{\partial U}{\partial X} > 0, \quad \frac{\partial U}{\partial Y} > 0, \quad \left(\frac{dX}{dY}\right)_{U=\text{constant}} < 0 \quad \text{and} \quad \left(\frac{d^2X}{dY^2}\right)_{U=\text{constant}} < 0$$

This function would be maximized subject to the implicit, domestic transformation function and the foreign reciprocal demand function. It would then be shown that, under free trade, a perfectly competitive system would satisfy the investigated maximizing conditions.

[7]For those unwilling to assume that laissez-faire can be counted on to provide the ethically proper income distribution and yet want to use a social utility index, Samuelson's [6] construction of "social indifference curves" is the appropriate reference.

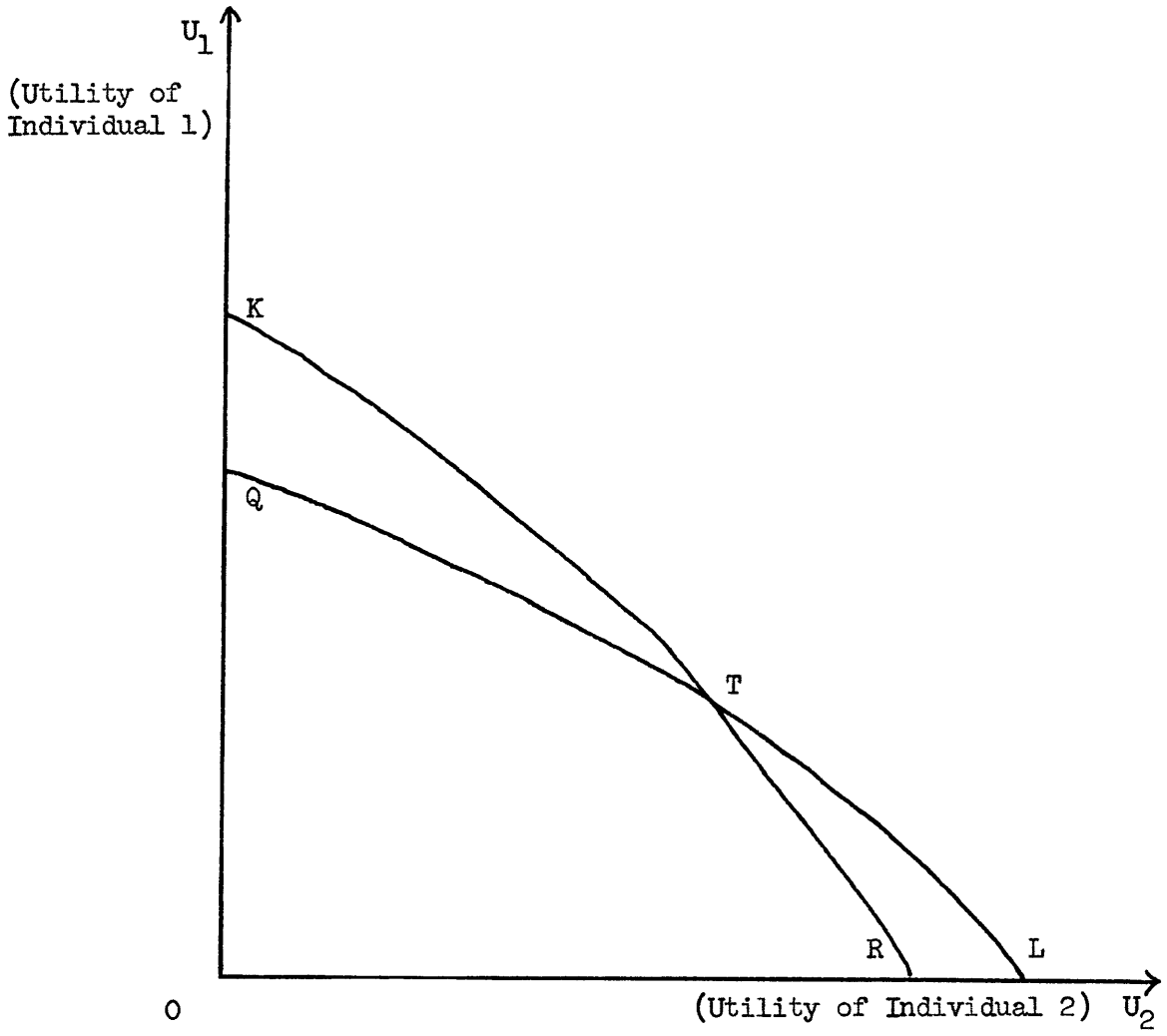

Figure 2*

* QTR represents the utility possibility curve, in a two-person economy, corresponding to the no trade situation. KTL represents the utility possibility curve corresponding to the free trade situation. KTL lies uniformly outside QTR (though touching it at T), indicating that the free trade situation is superior (or, at minimum, equivalent) to the no trade situation from the viewpoint of social welfare.

utility distribution (except at the point(s) where the two loci touch)[8] achieved under no trade, it is possible (via ideal lump sum taxes and subsidies) to achieve a higher level for both individuals. Hence, free trade is (unambiguously) superior (or, at minimum, equal) to no trade (for all income distributions).[9]

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[8] As Professor Samuelson has pointed out to me in correspondence, the free trade utility possibility locus may even coincide with the no trade utility possibility locus if all individuals are alike and have unitary income elasticities, and if C* in Figure (1) coincides with P*.

[9] Note, however, that while it is correct to argue that (utility-wise) free trade is superior to no trade, it is not true that any kind of trade is better than no trade.

Samuelson states, in his earlier 1939 paper [4, p. 239], that "free trade or some trade is to be preferred to no trade at all." In the later, 1962 paper in this Journal [6] as well, the argument is stated in terms of "some trade." "Some trade" however is not to be interpreted as equivalent to "any trade"; and it should be noted that Samuelson's method of proof indeed fully supports this presumption. In correspondence Professor Samuelson has pointed out that this is definitely the proper interpretation of his theorem.

It can be easily shown in fact that any kind of trade cannot be shown to be superior to no trade. Take, for example, Figure (3) in the text. It shows that, for an economy with no monopoly power in trade, a production subsidy (or, alternatively tax) on commodity Y (or, alternatively X) can bring domestic prices for producers to D_P and production to P_T, consumption (at international prices F_P) to C_T and social utility locus U_S ($> U_T$). Thus a policy of trade (involving specifically a production tax-cum-subsidy policy combined with otherwise-free trade) is inferior to that of no trade for the specific income distribution implicit in the social utility index employed, and hence it will be impossible, in this instance, for the gainers in the trade situation to compensate the losers without themselves becoming worse off than in the no trade situation. This conclusion is readily understandable because, as we know from the theory of Second Best, it is not possible in general to rank uniquely (for all income distributions) two sub-optimal policies: and, trade and no trade are both sub-optimal policies for a country with no monopoly power in trade (unless trade amounts specifically to free trade, which is the optimal policy).

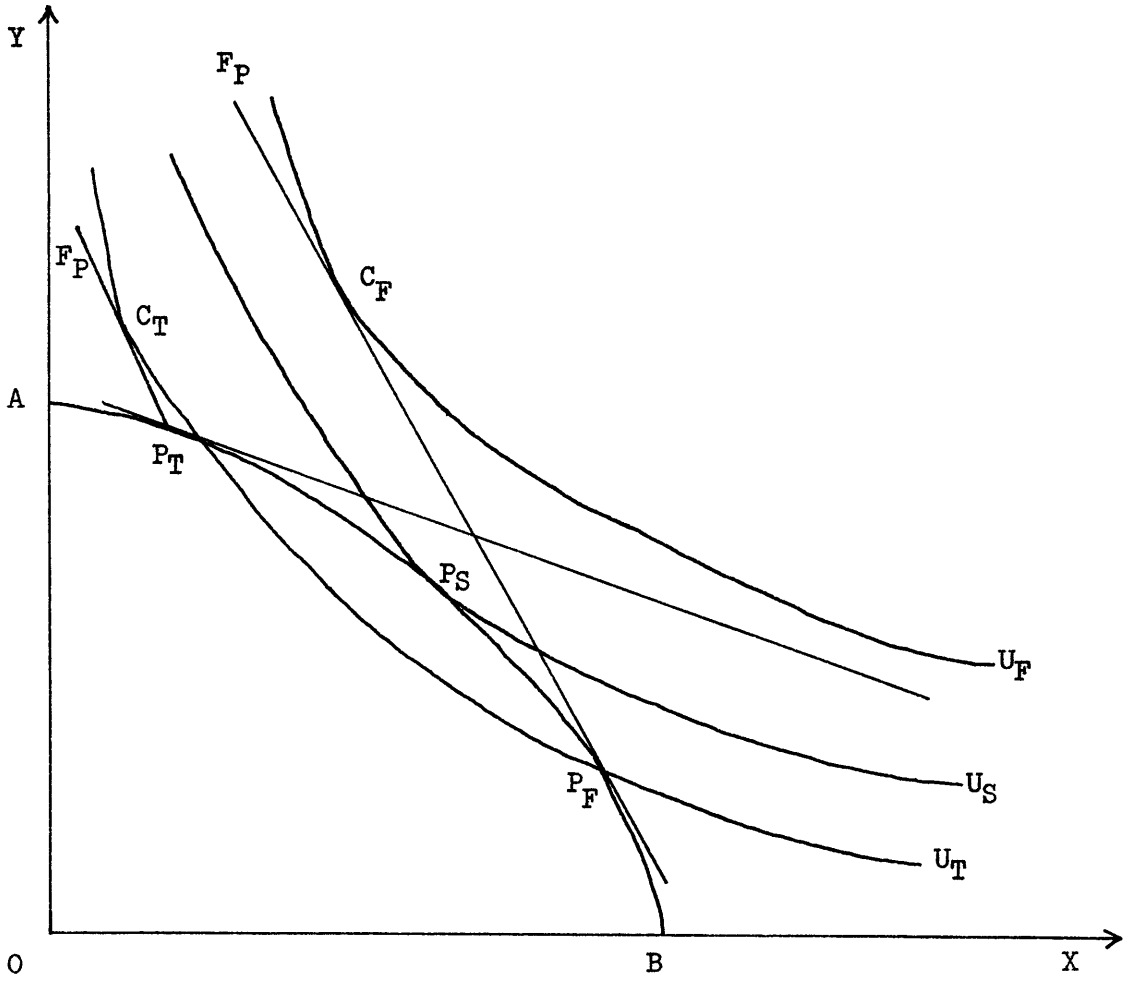

Figure 3*

* AP_SB represents the domestic, production possibility curve. In the absence of trade, the welfare level is at U_S. Under free trade at the given world price ratio measured by the slope of F_P, welfare will increase ($U_F > U_S$). If, however, an appropriate subsidy (or, alternatively tax) on the production of Y (or, alternatively X) is introduced along with otherwise-free trade, production will shift to P_T and consumption to C_T, the volume of trade will be reduced below the free-trade level, and the welfare level reduced below that under no trade ($U_T < U_S$), thus demonstrating that restricted trade would, in this instance, be inferior to no trade.

II. Restricted Trade vs. No Trade

Kemp [2] has further argued that, for utility-wise ranking, restricted trade is superior to no trade. While all forms of trade cannot be shown to be (always) superior to no trade,[10] can the classes of trade considered be narrowed down to "restricted trade" and this sub-set be shown to be superior to no trade?

Kemp is certainly right when the restriction is brought about by three classes of policies: tariffs, quotas and exchange restrictions. Each of these policies will restrict trade by introducing an inequality between foreign prices on the one hand and domestic prices faced by producers and consumers on the other hand. These are in fact the policies spelled out by Kemp in his statement of the theorem. Thus he argues [2]:

> In the present section I shall argue the more general proposition that compensated free trade or compensated restricted trade is better than no trade. (It is understood, of course, that the restrictions are not prohibitive). The manner in which trade is restricted is unimportant; the same conclusions hold for tariffs, quantitative commodity controls or exchange restrictions.

But suppose, however, that trade is restricted by a production subsidy (or, alternatively tax) on importables (or, alternatively exportables)--a method which is not merely a theoretical possibility but also frequently in vogue. Kemp's theorem cannot be extended to this case, as seen by reference to Figure (3) where a production subsidy (or, alternatively tax) on Y (or, alternatively X) has reduced trade below the free trade level but the welfare level at U_T is below the no

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[10] This has been shown in the preceding footnote.

trade welfare level at U_S. On the other hand, if productive resources are assumed to be given in supply and monopoly power in trade is absent, Kemp's theorem can be shown to be valid (for utility-wise ranking) even for a production subsidy (tax) on importables (exportables) as long as the subsidy is not so large as to increase the domestic production of importables above the no trade level. A larger subsidy (tax) than this would open up the possibility, illustrated by Figure (3), of subsidy (tax)--restricted trade being inferior (for the assumed, social utility index) to no trade, such that no lump sum transfers could compensate the losers in the restricted trade situation without leaving the gainers worse off.

Kemp's theorem is again invalid, in general, if we consider yet another way in which trade may be reduced below the level of free trade. Even a production subsidy (tax) on exportables (importables) may restrict the volume of trade below the free trade level provided importables are inferior in social consumption.[11] And, regardless of whether trade is reduced below or increased above the free trade level, a production subsidy (tax) on exportables (importables) can reduce social welfare below the no trade level so that it will, in this case, be impossible to compensate the losers in this restricted trade situation while keeping the gainers at their welfare level in the initial, no trade situation. This is illustrated in Figure (4) where the subsidy (tax) is assumed to shift production to P_T, reduce trade below the free trade level and produce welfare level below that under no trade ($U_T < U_S$).

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[11]Such a subsidy (tax) may, of course, reverse the trade pattern as well.

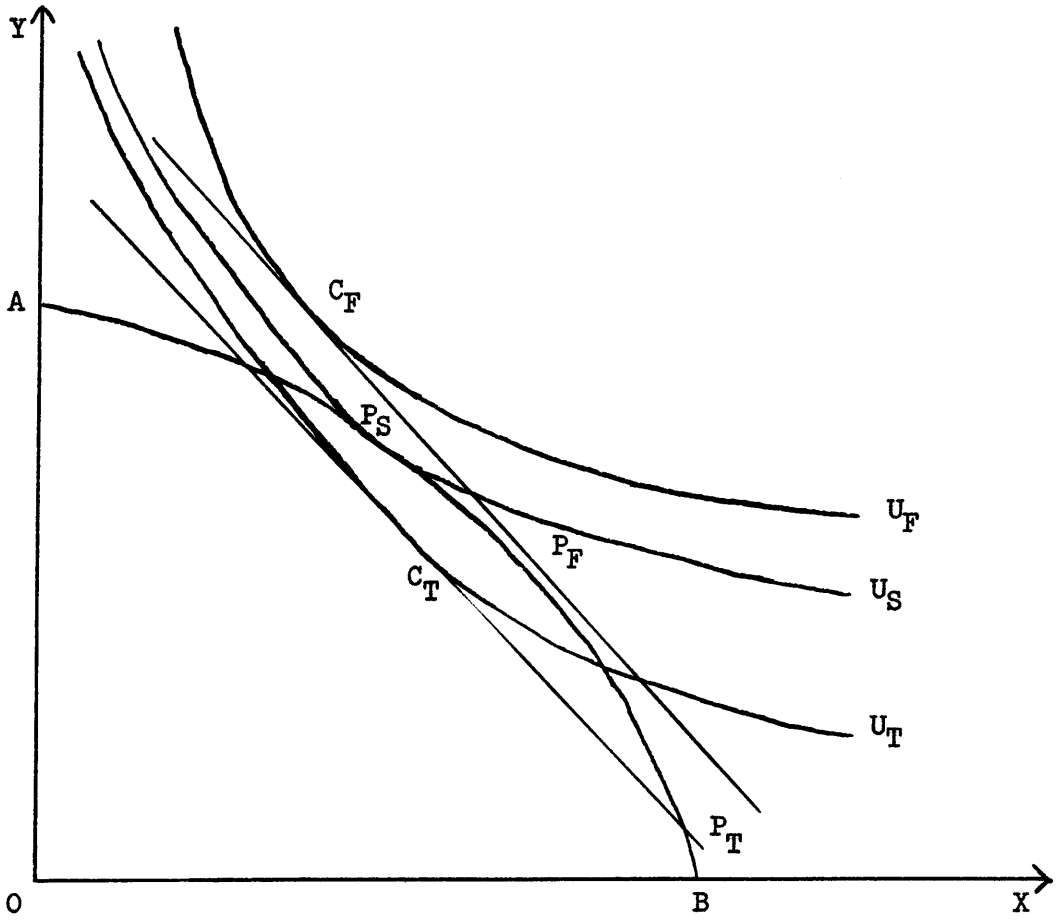

Figure 4*

* AP_SB represents the domestic, production possibility curve. Free trade at given, world prices measured by the slope of C_FP_F, would take production to P_F and consumption to C_F. Under no trade, the production and consumption would be at P_S and welfare at U_S would be below that under free trade at U_F. An appropriate production subsidy (or, alternatively tax) on the exportable good (or, alternatively on the importable good) would shift production from P_F to P_T, consumption to C_T, thus reducing the volume of trade below the free trade level and welfare below the no trade level ($U_T < U_S$), thus demonstrating that restricted trade would, in this instance, be inferior to no trade.

Hence, if subsidies (taxes) on importables and exportables are admitted as possible ways of restricting trade, the theorem that restricted trade is superior to no trade can no longer be considered valid.

Further, we have discussed so far only taxes and subsidies on production as methods by which trade may be restricted. We may, however, also consider taxes and subsidies on consumption as possible methods of restricting trade. If we do so, Kemp's theorem can be shown again to be invalid, in general, for this class of policy instruments.[12]

Take the case of tax (subsidy) on the consumption of importables (exportables). In this case, even when fixed resources and absence of monopoly power in trade are assumed to simplify the analysis, restricted trade may be inferior to no trade. This is illustrated in Figure (5) where the trade-reducing consumption subsidy (tax) on exportables (importables) is shown to result in welfare deterioration below the no trade level ($U_T < U_S$). Note that this possibility does not require any restriction on demand, such as inferiority of either good in social consumption, as in the case of production subsidy (tax) on importables (exportables).[13]

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[12] Note again that Kemp was implicitly considering restrictions of trade brought about by tariffs and equivalent restrictions. What has been demonstrated here is that the theorem is not capable of extension, in general, to restrictions of trade brought about by other policy instruments (except under restrictive assumptions).

[13] On the other hand, if a tax (subsidy) is levied on the consumption of exportables (importables), this can be shown to result invariably in a higher welfare level than under no trade when there is no monopoly power in trade and resources are fixed in supply.

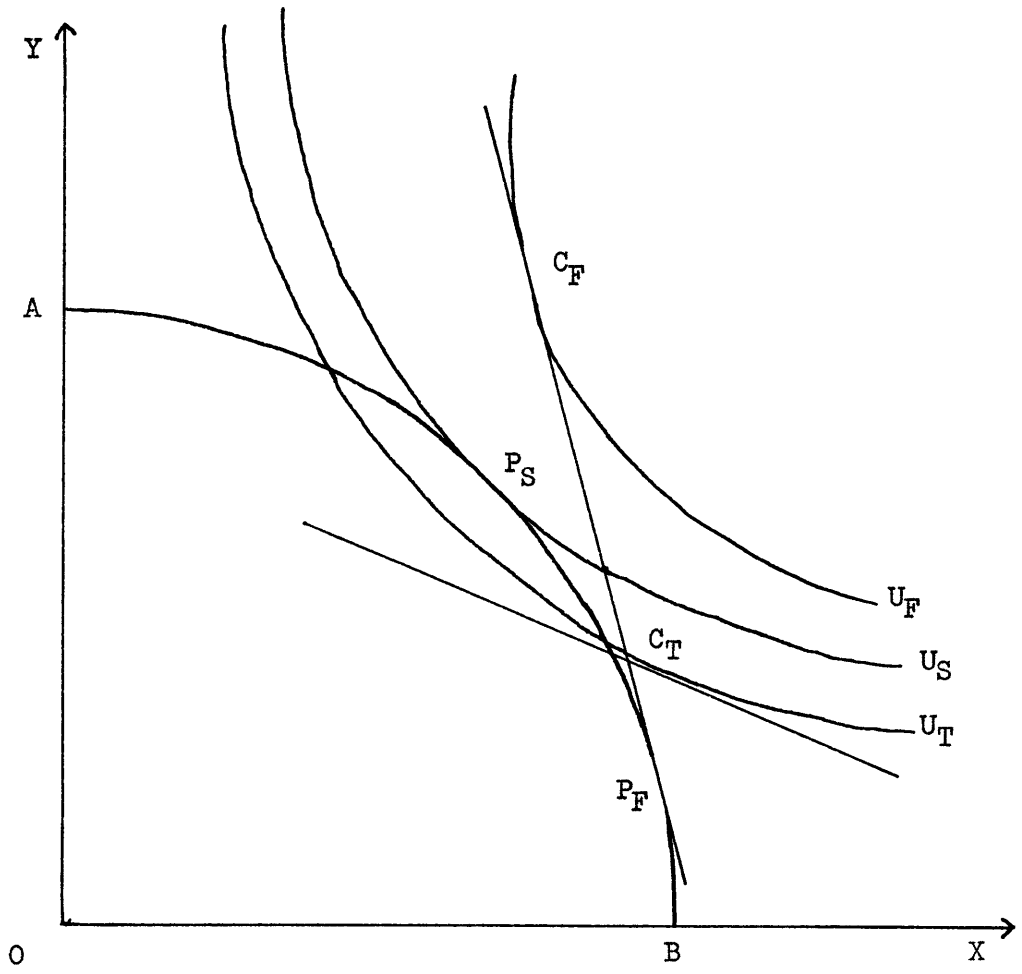

Figure 5*

* AP_SB is the domestic, production possibility frontier. Under no trade, production and consumption will be at P_S. Under free trade, at the given world price ratio measured by the slope of C_FP_F, production will be at P_F, consumption at C_F and social welfare at U_F. If, however, along with otherwise-free trade, an appropriate subsidy (or tax) on the consumption of the exportable good (or of the importable good) is introduced, production will continue at P_F and consumption shift to C_T, the volume of trade will have been reduced below the free trade level and welfare below the no trade level ($U_T < U_S$), thus demonstrating that, in this instance, restricted trade is inferior to no trade.

III. Higher Tariff vs. Lower Tariff

A further theorem, stated by Kemp, is that for a country with no monopoly power in trade, and without any domestic distortions, a higher tariff is inferior to a lower tariff. As Kemp [2, p. 814] states it:

> What can be said of the relative desirabilities of the free-trading situation, the trading situation characterized by a uniform 5% import duty, that characterized by a 10% duty, etc.?
>
> In the special case in which a country's terms of trade are independent of that country's offer a particularly simple answer can be given: the free-trade situation is superior to the 5% situation, which in turn is superior to the 10% situation, and so on. The reason is very simple: under free trade all the necessary marginal conditions of a Paretian national optimum are satisfied. In particular, the marginal rate of transformation between commodities in production is equal to the marginal rate of transformation between commodities in international trade (the marginal terms of trade) and to their marginal rate of substitution in consumption. A tariff destroys the equality between the marginal terms of trade and the other two marginal rates of transformation. And the greater the duty, the greater the resulting inequality.

While Kemp's argument seems valid at a superficial glance, and indeed was adopted as such in my own Survey [1], it turns out that it raises certain difficulties when inferiority of the exportable good in consumption is not ruled out.

Note that the argument is certainly valid if the ranking of tariffs is made on grounds of (what was earlier described as) technical efficiency. However, when the question of utility-wise rankings is considered, it can be shown, as in Figure (6), that a higher tariff rate could produce a higher level of welfare than a lower tariff rate. It is clear that this contradiction requires that the exportables be inferior

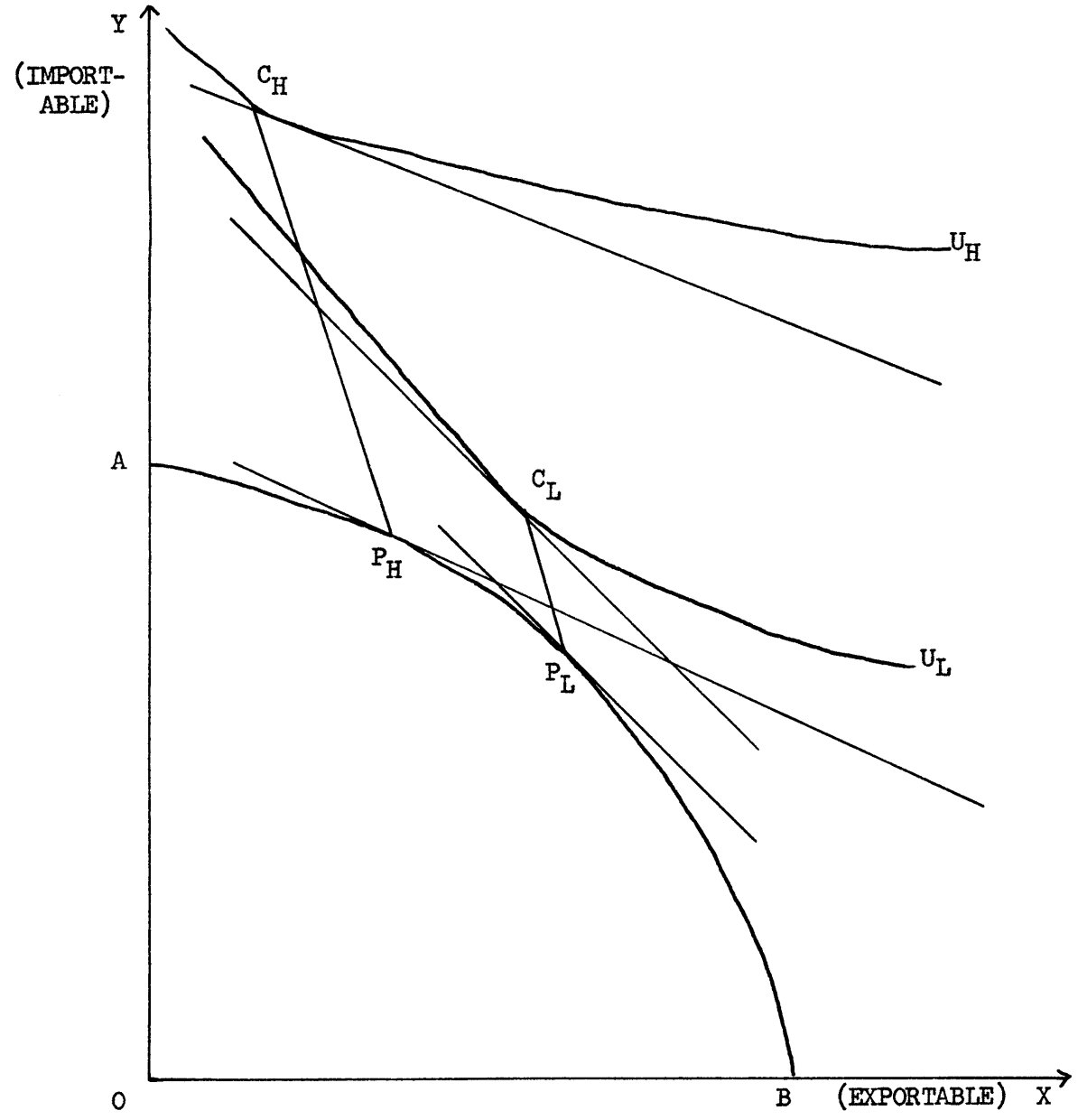

Figure 6*

* AP_HP_LB is the domestic, production possibility frontier. An appropriate tariff will lead to production at P_L, consumption at C_L, trade at the given world price ratio measured by the slope of P_LC_L and social welfare at U_L. An appropriate, higher tariff will shift production to P_H and consumption to C_H, while increasing social welfare ($U_H > U_L$), so that a higher tariff will be superior to a lower tariff in this instance. Note that this case requires the inferiority of the exportable good in social consumption; it is impossible to redraw the diagram, with the same conclusion, for the case where the exportable good is not inferior.

in social consumption. The volume of trade, in this instance, falls instead of increasing as a result of a reduction of the tariff. Readers familiar with Meade's [3] cardinalist method of evaluating the marginal changes in welfare will notice that the foregoing result can naturally be reached by Meade's method as well: a reduction in the volume of imports, when there is a tariff, will produce a deterioration of welfare.

While, however, the presence of an inferior exportable good can result in a higher tariff producing higher social welfare than a lower tariff, Professor Samuelson has pointed out to me that there will nonetheless exist other equilibrium position(s) under the lower tariff situation which produce a higher level of welfare than under the higher tariff, and that my qualification of Kemp's proposition is yet another instance of multiple equilibria with associated welfare paradoxes. Thus, if one draws a Hicksian income-consumption line at the domestic price ratio under the low tariff, it will go through C_L and to the left of C_H and must necessarily result in other equilibrium consumption point(s) further north, involving a higher welfare level than under U_H.[14]

The correct formulation of the valid position concerning the

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[14]Professor Harry Johnson has also pointed out to me, independently of Professor Samuelson, the fact that there would be multiple equilibria and hence the necessity to extend my argument in the penultimate draft of this paper. Professors Samuelson and Murray Kemp, in their accompanying notes, explore this problem further. The problems raised by inferior goods have been noted independently by J. Vanek [7] as well, although this contribution came to my notice only just as this paper was going to the press.

utility-wise ranking of higher and lower tariffs would then be that: the (best) utility possibility curve under a lower tariff will indeed lie outside that under a higher tariff, regardless of inferiority of the exportable good in social consumption; but a competitive price system could well result in equilibria involving a higher welfare level under a higher tariff, unless inferiority of the exportable good in social consumption were ruled out. Further, it does not seem possible to establish any stability conditions which would ensure that the competitive system would necessarily "choose" the equilibrium resulting in a lower welfare level under a higher tariff.

IV. Conclusion

We have thus established that:

(1) "restricted trade is superior to no trade" only if the restriction is brought about by tariffs, quotas or (equivalent) exchange restrictions but not if brought about by taxes or subsidies on domestic production or consumption; and

(2) "a higher tariff is (utility-wise) inferior to a lower tariff," for a country with neither monopoly power in trade nor domestic distortions, only when inferiority of exportables in societal consumption is ruled out; if this is not done, a competitive system may well lead a reduced tariff to result in a deterioration of economic welfare, even though the possibility of improved economic welfare, at a different equilibrium position with the same reduced tariff, will always exist.

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CHAPTER II

RANKING OF TARIFFS UNDER MONOPOLY POWER IN TRADE

For a country with no monopoly power in trade, Kemp [3] argued that a lower tariff is preferable to a higher tariff, in the sense that any distribution of individual utilities attainable with a higher tariff is attainable with a lower tariff, usually with something to spare. Subsequently, Vanek [6] and Bhagwati [1] showed that if exportables are inferior (a) competitive equilibrium may not be unique, (b) one of the low-tariff equilibria may be inferior to one of the high-tariff equilibria and, therefore, (c) a reduction in the tariff might leave a country worse off. As a result [1] [4] [5], the proposition has now been elaborated to read: "the (best) utility possibility curve under a lower tariff will indeed lie outside that under a higher tariff, regardless of the inferiority of the exportable good in social consumption; but a competitive price system could well result in equilibria involving a higher welfare level under a higher tariff, unless inferiority of the exportable good in social consumption were ruled out."[1]

Can anything be said about the ranking of tariffs when a country has monopoly power in trade? Or must one be content to know that an optimal tariff exists? This note shows that, under very modest restrictions on preferences and in spite of the necessity of ranking sub-optimal policies, it is possible to establish the following propositions. Let the determinate optimum tariff be t_w, the zero tariff t_o,

and the (just) prohibitive tariff t_p.

Proposition (1): Successive increases in the tariff from the level t_o will raise welfare until the level t_w is reached; successive increases in the tariff thereafter will reduce welfare until the level t_p is reached; increases in tariffs thereafter merely involve continuing autarky and hence are weakly ranked.

Proposition (2): For a country with monopoly power in trade, therefore, the choice of income distribution will merely determine the magnitudes of t_w and t_p; hence one could regard tariffs as continuously laid in a chain from zero to infinity, with the income distribution (for a specific country) serving, as it were, as a spike which lifts this chain up to the level of the optimal tariff and drops it to the floor at the level of the (appropriate) prohibitive tariff--as illustrated by Figure (1) for five hypothetical income distributions.

These propositions are not generally valid. To establish the conditions under which they are valid, consider Figure (2), which shows the trade-indifference curves U_w^I, U_o^I and U_p^I reached by country I successively under an optimum tariff, a zero tariff and a prohibitive tariff. It is clear that Proposition (1), and hence Proposition (2), will hold if and only if an increase in country I's tariff will necessarily reduce the demand for imports. For, in such a case, an increase in the tariff, starting from a zero tariff at R_o, will take the economy through higher and higher trade indifference curves until it reaches R* and then through successively lower trade-indifference curves to O and U_p^I.

Therefore, exceptions to Proposition (1), and hence Proposition

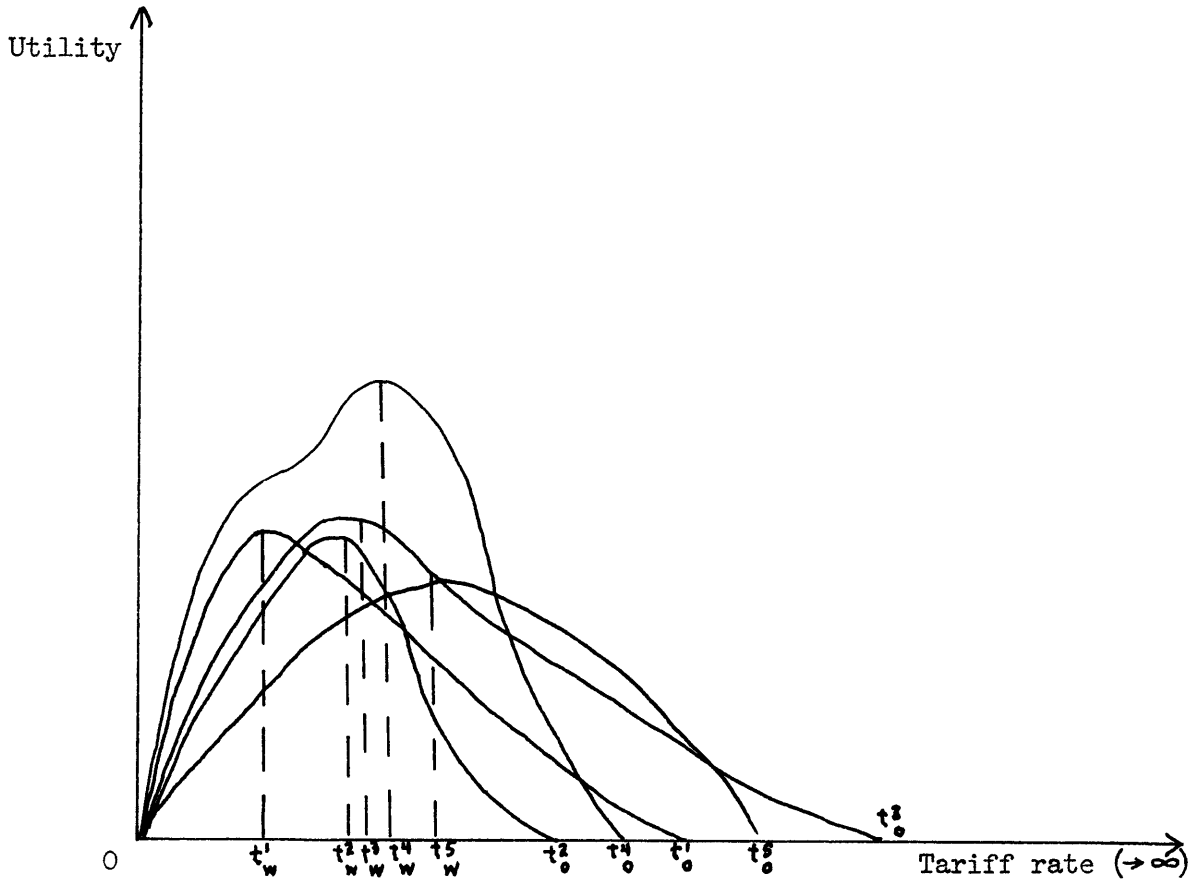

Figure (1)*

* Tariff-ranking for a given country, with monopoly power in trade, under five alternative income distributions. Note that no <u>cardinal</u> significance is to be attached to the utility-axis. The figure merely ranks, utility-wise, tariffs ranging from zero to infinity for <u>each</u> income distribution; it also shows the optimum tariffs for each of the five distributions, with $t_w^5 > t_w^4 > t_w^3 > t_w^2 > t_w^1$, and the corresponding prohibitive tariff levels t_o^5, t_o^4, t_o^3, t_o^2, and t_o^1.

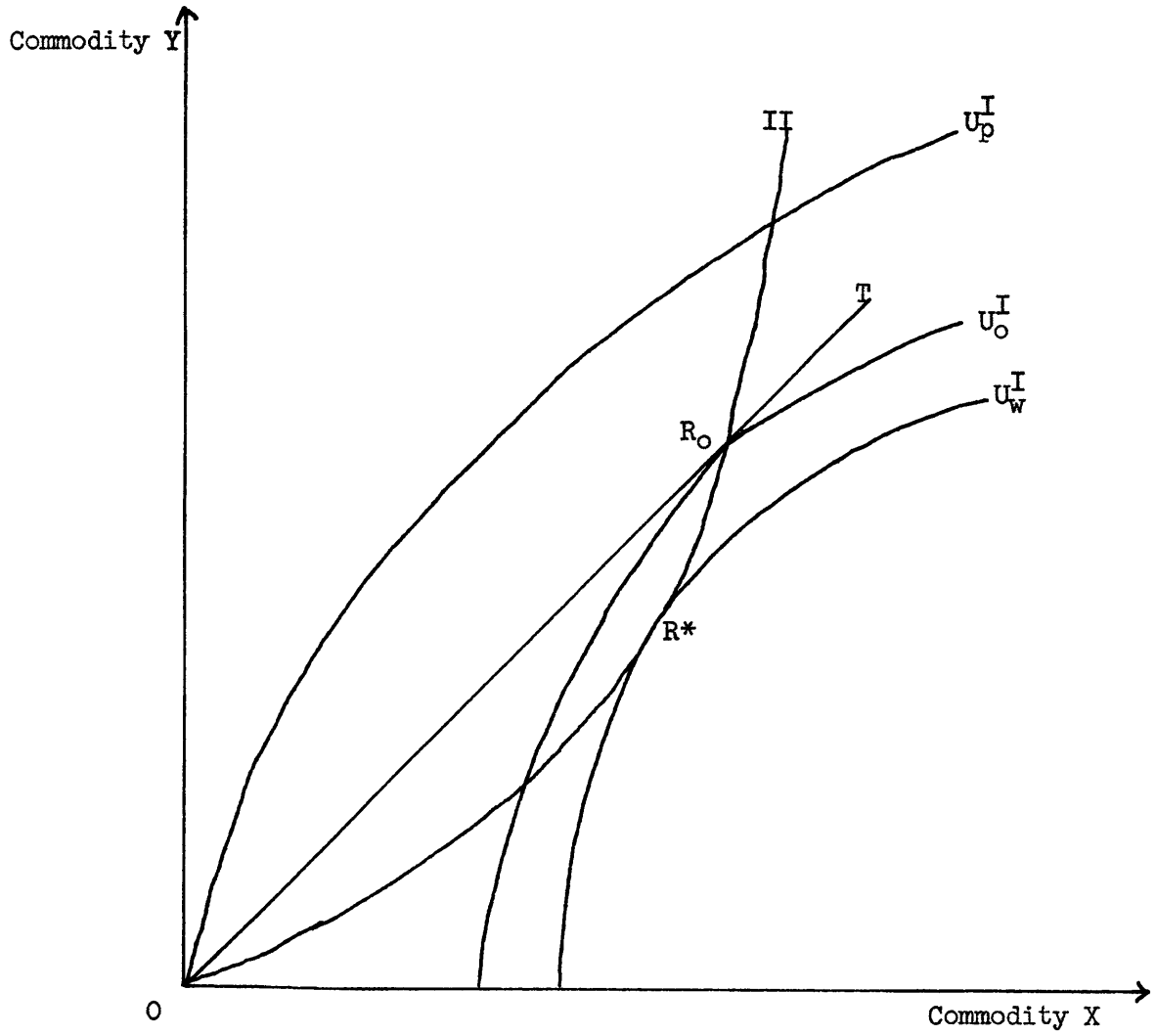

Figure (2)*

* The figure shows the optimum-tariff welfare level U_w^I, the zero-tariff welfare level U_o^I and the self-sufficiency welfare level U_p^I for country I, the free-trade terms of trade OT and country II's offer curve OII.

(2), must constitute exceptions to the rule that an increment in tariff will recude the demand for imports. It can then be shown that this rule admits of exceptions only when the exportable commodity is inferior.[1]

Hold the terms of trade constant at unity. Suppose that Commodity 1 is imported and that Commodity 2 is the numeraire. The internal price ratio is, therefore, $(1 + t)$ where t is the rate of duty. The demand for imports is $E_1(1 + t, I_2)$ where

$$I_2 = (1 + t)X_1 + X_2 + tE_1$$

is income in terms of the numeraire commodity, X_i is the output of good i and tE_1 is the tariff revenue. We have

$$\frac{dE_1}{dt} = \frac{\partial E_1}{\partial t} + \frac{\partial E_1}{\partial I_2}\frac{dI_2}{dt}$$

$$\frac{dI_2}{dt} = X_1 + E_1 + t\frac{dE_1}{dt}$$

Hence

$$\frac{dE_1}{dt} = \frac{\partial E_1}{\partial t} + \frac{m_1}{1+t}\left(X_1 + E_1 + t\frac{dE_1}{dt}\right)$$

$$= \frac{\frac{\partial E_1}{\partial t} + \frac{m_1}{1+t}D_1}{1 - \frac{t}{1+t}m_1}$$

where m_1 is the marginal propensity to consume the first or imported

---

[1] Note, therefore, that the assertion sometimes made in balance of payments theory, that tariffs must be preferred to devaluation until the optimum tariff is reached, as in Johnson [2], is valid only insofar as inferiority of the exportable good is ruled out.

commodity and D_1 is consumption of the first commodity. Introducing the Slutzky decomposition, $\frac{\partial E_1}{\partial t} = \left.\frac{\partial E_1}{\partial t}\right| - \frac{m_1}{1+t} D_1$, where $\left.\frac{\partial E_1}{\partial t}\right|$ is the pure substitution slope, we obtain, finally,

$$\frac{dE_1}{dt} = \frac{\left.\frac{\partial E_1}{\partial t}\right|}{1 - \frac{t}{1+t} m_1}$$

which is negative unless the export is very inferior.

Figure (3) illustrates the possibility, ruled out by our restrictions on consumption inferiority, that an increase in the rate of duty may give rise both to an increase in import demand and to a deterioration in the terms of trade of the tariff-imposing country. With the lower tariff, production takes place at P, consumption at C, and the terms of trade are indicated by the slope of PC'. With the higher rate of duty, production takes place at P', consumption at C'; and the (worsened) terms of trade are indicated by the slope of $P'C'$.

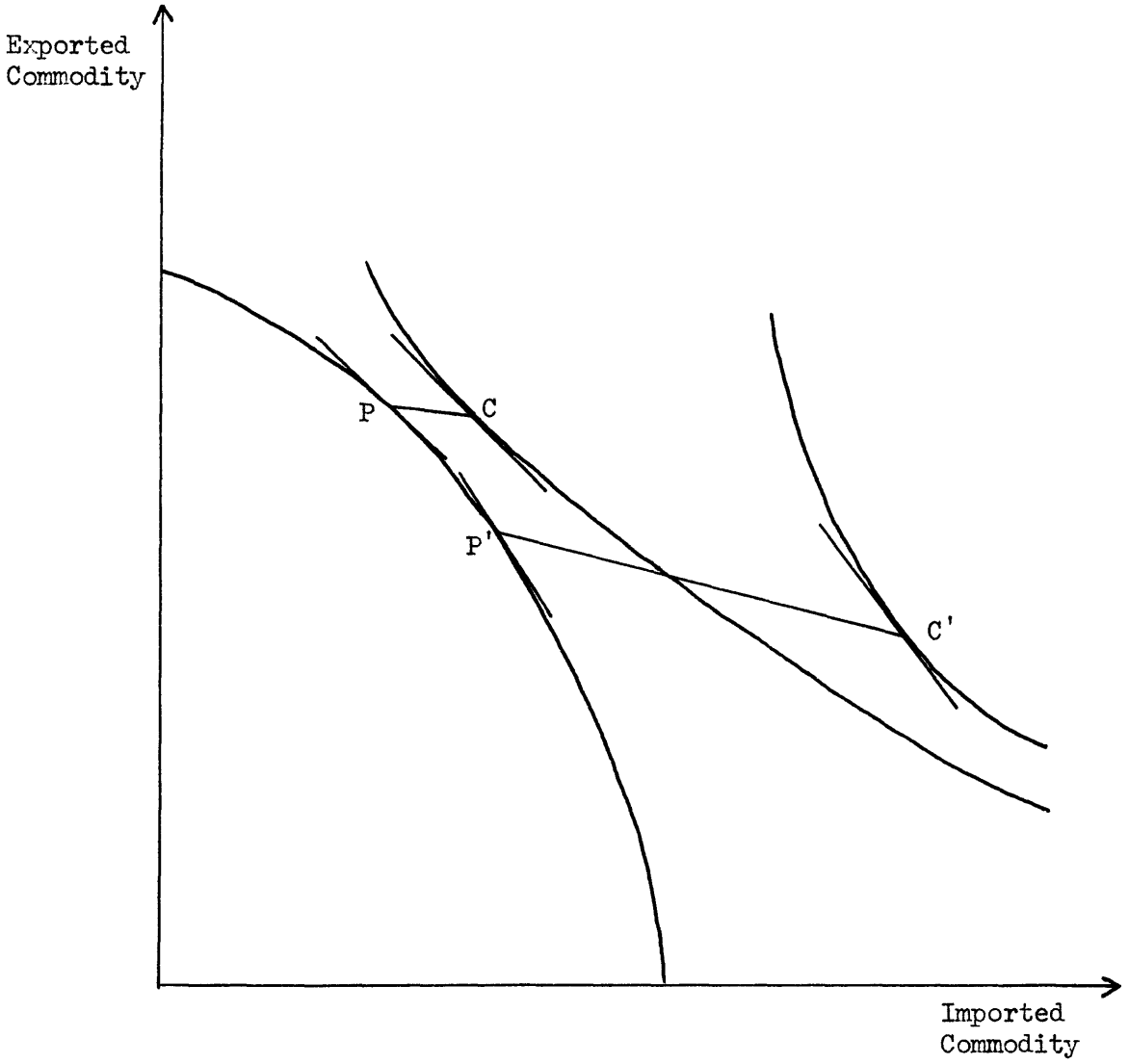

Figure (3)

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CHAPTER III

NON-ECONOMIC OBJECTIVES AND THE EFFICIENCY PROPERTIES OF TRADE[1]

It is well known [1] [5] [6] that, for a country with no monopoly power in trade (or domestic distortions), free trade (in the sense of a policy resulting in the equalization of domestic and foreign prices, and hence, excluding trade, production and consumption taxes, subsidies and quantitative restrictions) is the optimal policy. It follows therefore that free trade is superior to no trade.

It has also been argued recently, by Kemp [5], that even in the case where there is monopoly power in trade, so that both no trade and free trade are sub-optimal policies, it is possible to demonstrate that free trade is superior to no trade.

What of the case where the country has no monopoly power in trade but has a non-economic objective which consists in requiring production to be maintained at a certain level in a specific activity? In the standard, two-commodity case, this type of objective can be treated as requiring production to be necessarily at a particular position on the production possibility frontier: as has been done by earlier writers such as Corden [2] and Johnson [4]. Can we still rank trade as superior to autarky in this case? In the following analysis, we distinguish between two sets of possible trade policies: 1) trade with consumption at international prices and 2) trade with tariffs and (trade) subsidies.

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[1]The problems analysed in this paper arose from a stimulating question of my student, Harriet Zellner, when we were discussing my paper [1] on the gains from trade, in the International Economics Workshop Seminar at Columbia University.

I. Superiority of Trade (and consumption at International Prices) Over No Trade

It can be shown quite readily that the stated non-economic objective can be reached at lower cost under a policy of trade (and consumption at international prices) than under autarky or no trade. Thus, even in the case of non-economic objectives of this specific variety, trade continues to be superior to no trade.

Consider two alternative cases: (i) where the desired production bundle is different from the self-sufficiency bundle under any given income distribution; and (ii) where the desired bundle happens to coincide with the self-sufficiency bundle.

In the former case, analysed with the aid of Figure (1a), it will be necessary to adopt a tas-cum-subsidy-on-production policy to shift production under autarky to the desired bundle P*. Assume that the commodity price-ratio P_s then faces the consumers and the welfare level resulting is at U_{NT}. Now, there are three alternative positions for the given trade price-ratio, which must pass through P*, relative to P_s. If it happens to coincide with it, then equilibrium will again take the economy to welfare level at U_{NT}, and there will be de facto autarky. This is the borderline case. On the other hand, if the foreign price-ratio is at P_F^1 or P_F^2, the two remaining possibilities, the new welfare level can only be at a higher level than at U_{NT} (for the social indifference curves cannot intersect).

In the other case, where the desired production bundle happens to coincide with that under autarky, a similar conclusion holds. This case is analysed with the aid of Figure (1b) where autarky or no trade

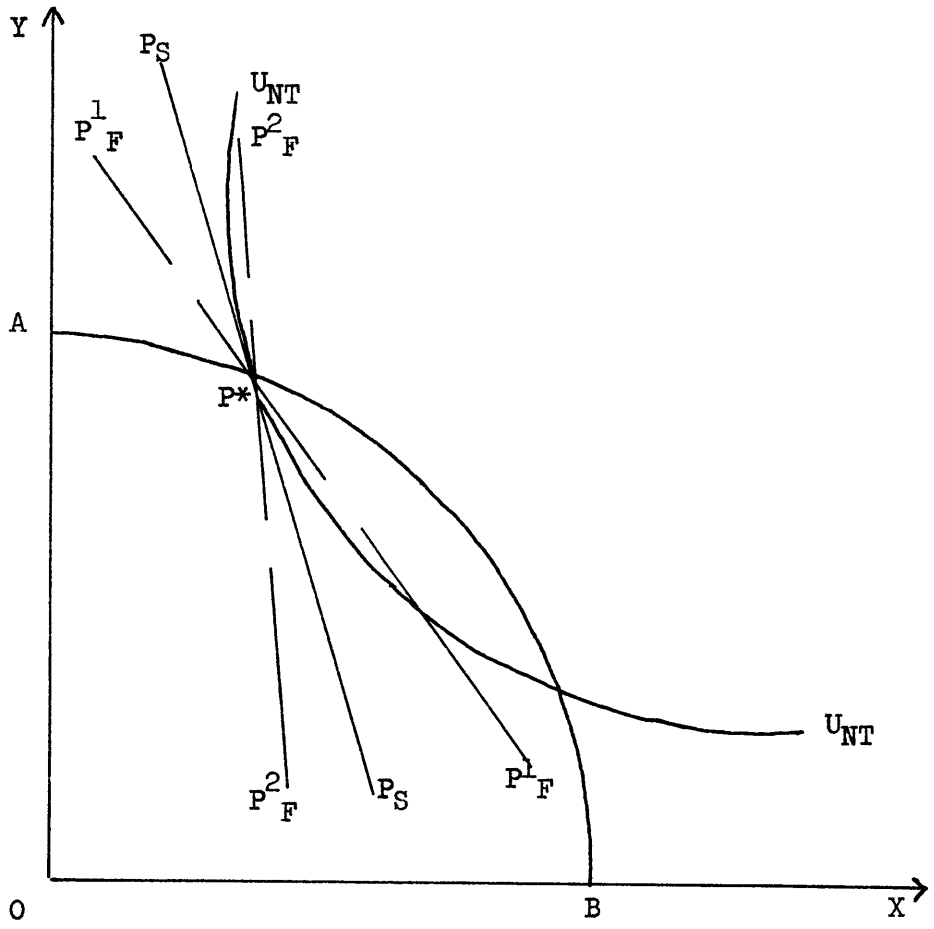

Figure (1a)

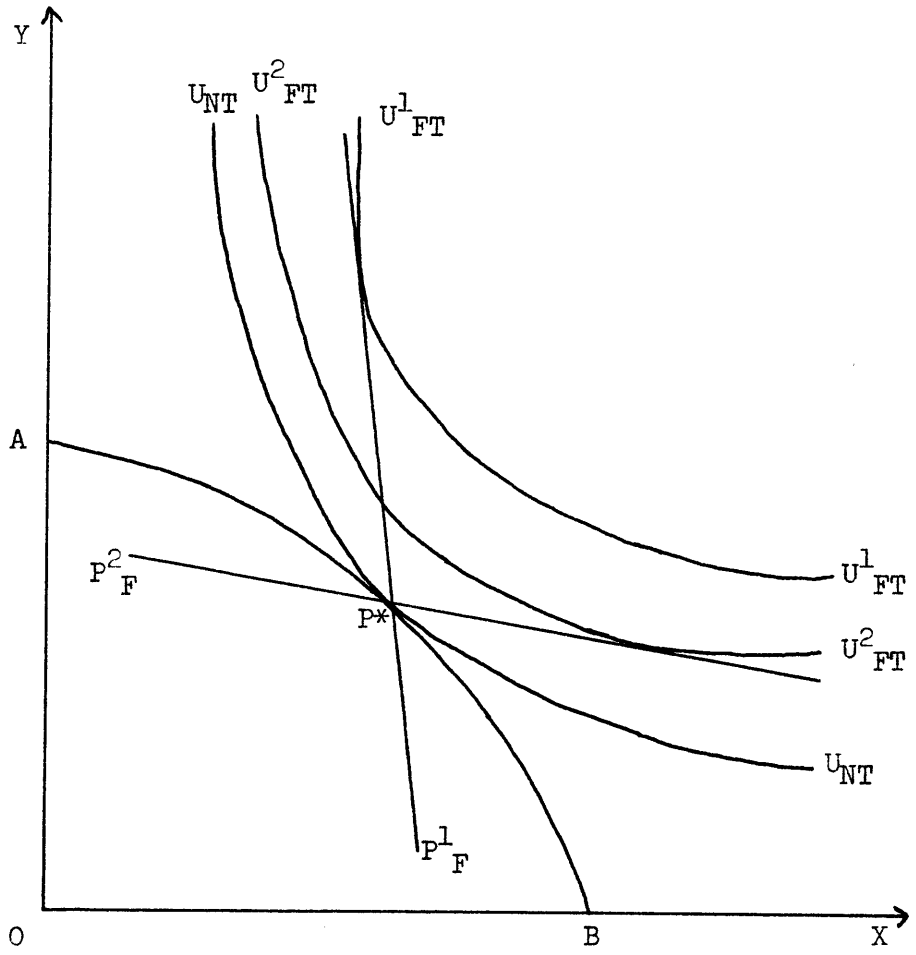

Figure (1b)

leads to production at P* and to welfare level U_{NT}. Maintaining production at P* with the aid of an appropriate tax-cum-subsidy-on-production policy under a situation of trade at international prices, the economy could achieve welfare level at U^1_{FT} or at U^2_{FT}. Alternatively, there would be the third, borderline case where the foreign price-ratio happens to coincide with the autarkic price-ratio P_s, in which case trade will not take place even though the trade opportunity exists.

Thus, the analysis shows that trade (and consumption at international prices) will be a superior policy to no trade even when there is a non-economic objective with respect to the production bundle.[2]

In fact, this proposition is readily understood when it is realised that, under the assumptions made, free trade is the optimal policy <u>if</u> there is no additional constraint on production. On the other hand, shifting production to a specific bundle other than the free trade bundle imposes a cost which can be <u>minimised</u> by adopting a tax-cum-subsidy-on-production policy which will get to the desired bundle of production without imposing any other (consumption) cost than that which is implicit in the shift to an "inefficient" production bundle itself. Thus, for example, as Corden [2] has shown, a tariff imposed with a view to shifting the production bundle to P* (when the production of importables desired is higher than under free trade) will be inefficient relative to a production tax-cum-subsidy policy which

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[2]Note the similarity of this conclusion with that reached by Haberler [3] in 1950 for the case of factor immobility. This is not surprising as, in the factor immobility situation, the production bundle is fixed in consequence, whereas in the present case it is fixed <u>directly</u> as a non-economic objective.

will permit consumption to be undertaken at international prices.

Thus, we can conclude this section as follows:

(1) free trade is the optimal policy in the absence of a non-economic objective relating to the production bundle;

(2) if there is a constraint in the form of a desired production bundle, a production tax-cum-subsidy policy, in conjunction with trade (and consumption at international prices), will be the second-best optimal policy: and <u>therefore</u>

(3) when there is such an additional constraint on production, trade (and consumption at international prices) will be superior to no trade (which will be a sub-optimal policy).

II. Trade with Tariff and Subsidy versus No Trade

What happens, however, if we assume that the stated non-economic objective of achieving a production bundle different from the free trade bundle is to be reached, <u>not</u> by a second-best production tax-cum-subsidy scheme combined with trade (and consumption at international prices), but by a sub-optimal trade policy involving the use of trade tariffs and subsidies? Is such a policy still superior to an autarkic, no trade policy?

The answer to this question depends on where the required production bundle is relative to the free trade and no trade bundles. In Figure (2), three relevant possibilities are distinguished, based on the free trade production bundle Q and the no trade bundle S. These three possibilities are that the required production bundle will lie in the ranges AS (excluding S), SQ and QB (excluding Q).

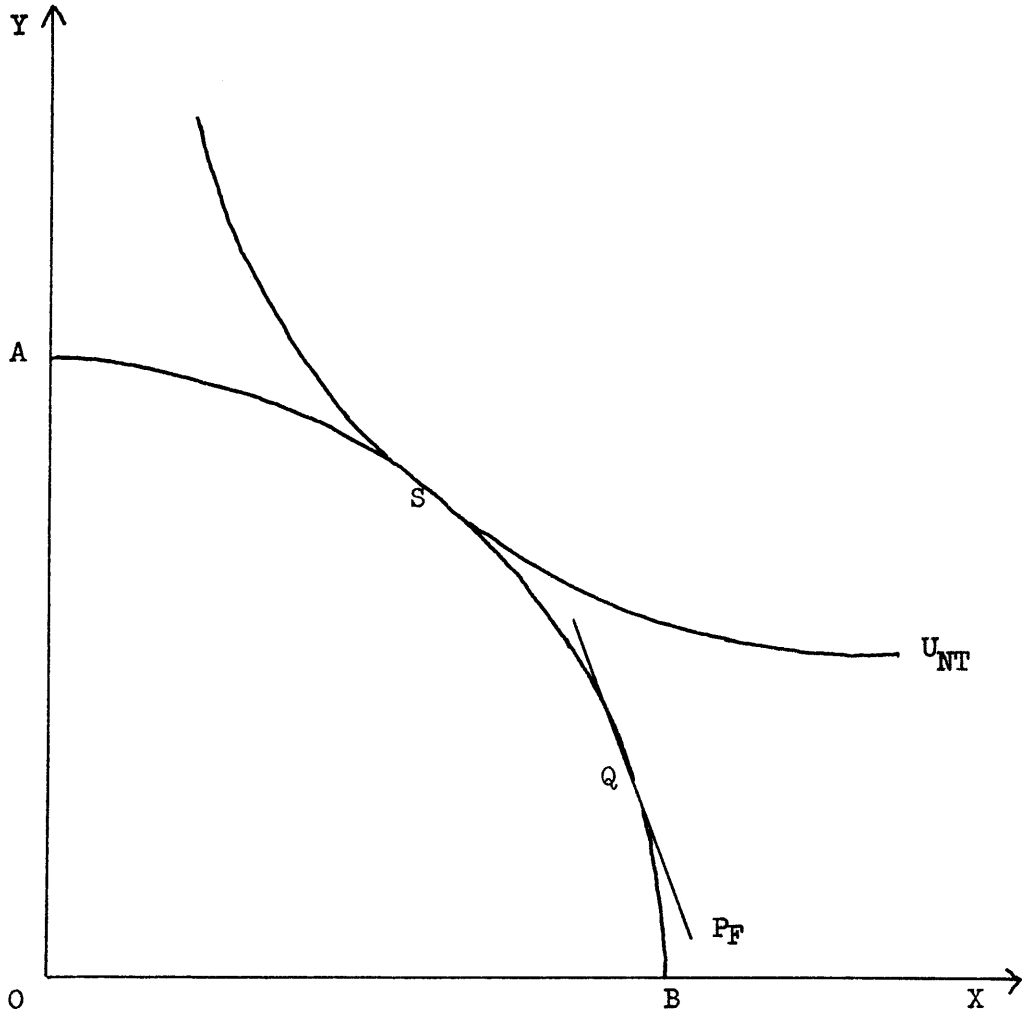

Figure (2)

(1) In the range SQ, it can be shown that a "tariff-restricted" trade policy will be superior to a no trade policy for achieving the required production objective.[3] (2) If, however, the required bundle is in the range QB (excluding Q), then it would require a trade subsidy policy, in a trade situation, to achieve it and it can be shown that, unlike the preceding case, such a trade (subsidy) policy is not necessarily superior to no trade (i.e. to an autarkic method of reaching the stated production objective). (3) And finally, in the range AS (excluding S), the trade policy required will involve an export subsidy (on the export of commodity Y now) or an equivalent import subsidy (on commodity X now) and once again, it cannot be shown that such a trade policy is necessarily superior to an autarkic way of achieving the production objective. Thus, while "tariff-restricted" trade can be shown to be superior to no trade, even when there is a non-economic objective relating to the desired production bundle, as this implicitly involves the location of the required production bundle within the range SQ, this is not the case with "trade-subsidy-assisted" trade vis-a-vis autarkic achievement of the required production objective, as such a comparison involves implicitly the location of the required production bundle on the range AS or QB. These propositions are demonstrated readily below.

In Figure (3a), it is shown that, if the desired production

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[3]This argument excludes the two borderline cases, where the objective is to produce at Q or at S. Where Q is the objective, the free trade policy, which is the first-best optimal policy, will naturally be superior to an autarkic policy of reaching Q. Where the objective instead is to reach S, the autarkic policy will become equivalent to the tariff policy since the latter, in any case, will have to be prohibitive.

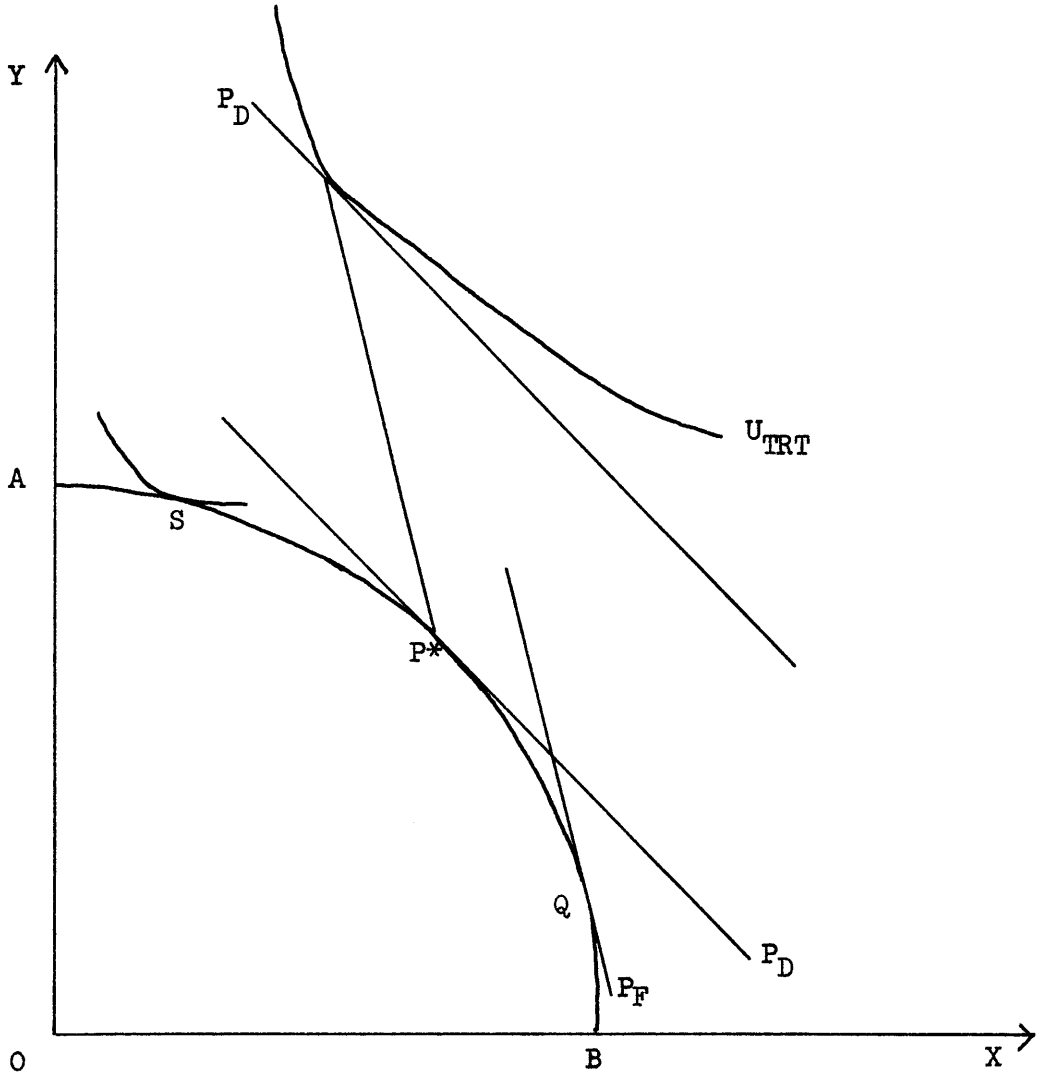

Figure (3a)

bundle is at P* which lies in the range SQ, and the foreign price ratio given to the economy is P_F and the tariff-inclusive domestic price ratio is P_D, then the utility level reached under this tariff-restricted policy will be indicated by the social welfare curve U_{TRT}. It is then easy to see that the social welfare curve going through P*, which will be the level attained under autarky by a suitable tax-cum-subsidy policy on consumption, must necessarily be inferior to U_{TRT}. Hence, we have demonstrated that the utility level achieved by a policy of tariff-restricted trade will be higher than that under an autarkic policy, when the production bundle desired lies in the range SQ.

In Figure (3b), we examine the case where the desired production bundle P* is in the range BQ. In this case, a suitable subsidy on the export of X (or import of Y) will bring production to the desired level, with domestic price ratio at P_D and the foreign price ratio at P_F. The utility level reached will be indicated by the social indifference curve U_{TST}. On the other hand, in Figure (3b), we have shown the case that the indifference curve passing through P*, which will indicate the welfare level under an autarkic policy, will show an improvement ($U_{NT} > U_{TST}$). Hence, this is a case where the trade-subsidy-assisted trade policy will be inferior to an autarkic policy. However, if the indifference curve U_{TST} had been drawn so as to pass above P*, this conclusion would have been reversed; whereas if it had been drawn so as to pass through P*, the welfare levels reached under the two policies would have been identical. Hence, we cannot establish that a trade-subsidy-assisted trade policy is necessarily superior to an autarkic policy, for achieving a stated production objective, when

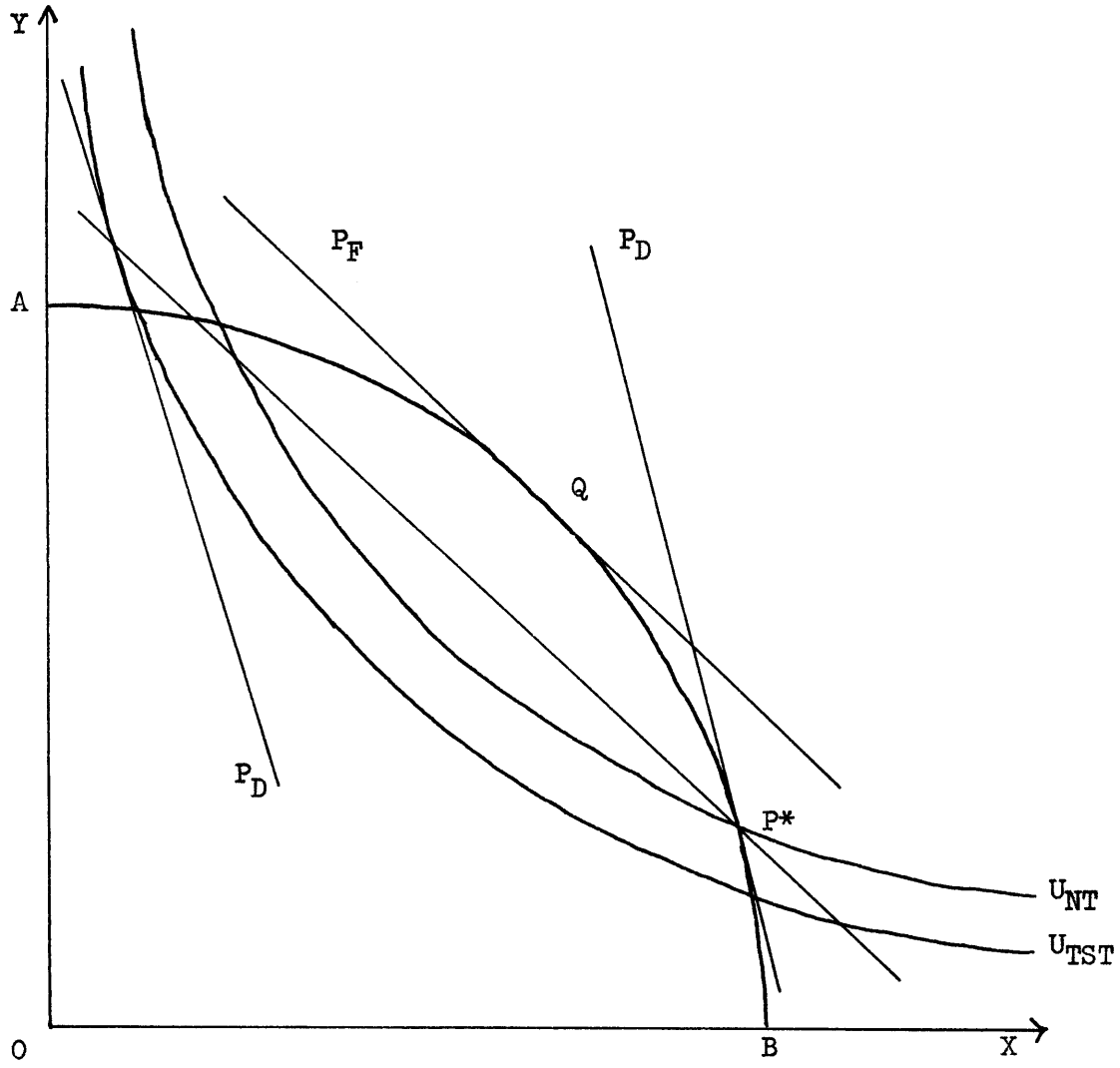

Figure (3b)

the required production bundle lies in the range BQ.

Finally, in Figure (3c), we examine the case where the required production bundle is in the range SA. In the diagram, P* is this bundle, with an export subsidy now on commodity Y (or an import subsidy, now on commodity X) bringing production to the required point P*, and utility level to U_{TST}. Assuming that the indifference curve passing through P* is U_{NT}, we thus illustrate a case where the trade-subsidy-assisted trade policy results in lower welfare than an autarkic policy for reaching the same, required production bundle. We could equally well have illustrated a specific case where the ranking was the reverse: $U_{TST} > U_{NT}$. So, again, we cannot establish that a trade-subsidy-assisted trade policy is necessarily superior to an autarkic policy, for achieving a stated production objective, when the required production bundle lies in the range SA.

We can then conclude with the following propositions:

(1) In the case where the desired production bundle can be reached by the use of a trade tariff, rather than a trade subsidy, autarky will still be an inferior policy, thus enabling us to rank in descending order the following three policies: (i) trade (and consumption at international prices); (ii) trade tariff; and (iii) no trade or autarky.

(2) Where the desired production bundle must be reached by the use of a trade subsidy, on the other hand, this strong ordering of policies will disappear, while trade (and consumption at international prices) continues naturally to be the optimal policy.

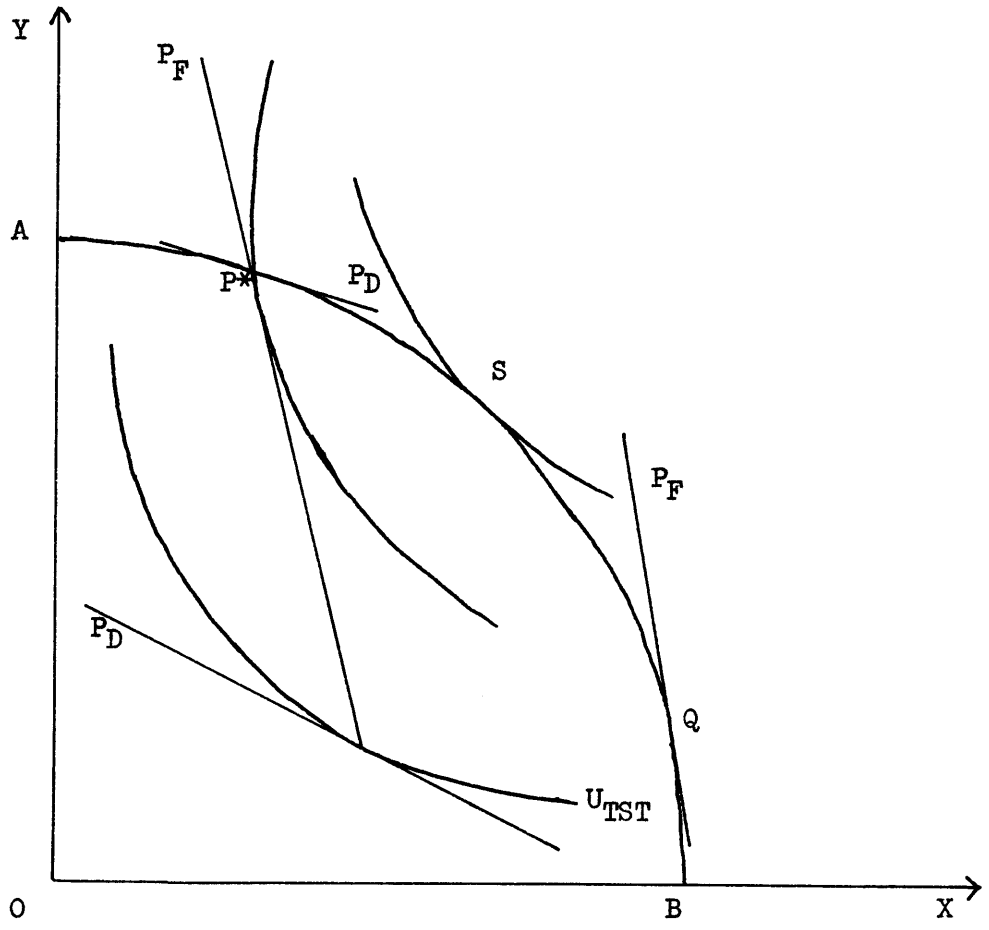

Figure (3c)

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CHAPTER IV

THE PROOFS OF THE THEOREMS ON COMPARATIVE ADVANTAGE

This note examines critically the usual statement and proofs of the two principal theories of comparative advantage: (i) Ricardian, and (ii) Heckscher-Ohlin. While none of the analysis offered here is intrinsically novel, it is presented in a manner which has fairly important implications for a full understanding--not evident in either oral or written tradition--of the postulates underlying these theories of comparative advantage. More significantly, it is shown that (contrary to what is thought) certain restrictions on demand conditions have to be specified even when the Ricardian theorem and the Heckscher-Ohlin theorem (using the price definition of factor abundance) are to be proved.

I

The proofs of the two-country, two-commodity theories of comparative advantage relating to the pattern of trade, whether one takes the Ricardian or the Heckscher-Ohlin version, depend on two successive arguments.

Argument I

Propositions are proven, relating to the determination of the pre-trade commodity price ratio: thus, in the Ricardian model, the pre-trade commodity price ratio is shown to be equal to the labour productivity ratio whereas, in the Heckscher-Ohlin model, it is

demonstrated that the relative, pre-trade price of the commodity using the country's abundant factor intensively will be lower than in the other country.

Argument II

(i) It is argued that a country will export that commodity whose relative, pre-trade price is lower than in the other country and will import the other commodity. (ii) Corollary: Also usually considered implicit is the proposition that if the pre-trade prices are identical between countries no trade will occur.

The successive Arguments I and II (i) lead to the well-known theorems of comparative advantages: (1) Ricardian Theorem, a country will export (import) that commodity in which her comparative factor productivity is higher (lower); and (2) Heckscher-Ohlin Theorem, a country will export (import) that commodity which uses her abundant (scarce) factor intensively.[1] Possible corollaries to these theorems,

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[1]That the traditional proofs of both Ricardian and Heckscher-Ohlin propositions rely explicitly on Argument I and implicitly on Argument II (ii) is evident not merely from oral traditions but also from the writings of various theorists.

Thus Ohlin [7, p. 29], for example, in his famous work on Interregional and International Trade, leads up, via Argument I, to an assertion of Argument II (ii) and consequently to the Heckscher-Ohlin theorem: "The first condition of trade is that some goods can be produced more cheaply in one region than in another. In each of them the cheap goods are those containing relatively great quantities of the factors cheaper than in the other regions" (Argument I). "These cheap goods make up exports, whereas goods which can be more cheaply produced in the other regions are imported" (Argument II (ii)). "We may say, therefore, that exports are in each region composed of articles into the production of which enter large quantities of cheap factors" (Heckscher-Ohlin theorem, with price definition of factor abundance).

Similarly, a modern author such as Jones [3] on the Heckscher-Ohlin theory terminates his analysis at the point at which Argument I is proven; and implicitly assuming Argument II (ii), proceeds to the

sometimes derived from Arguments I and II (ii), are: (1) Ricardian Corollary, where comparative factor productivities are identical between countries, no trade will occur; and (2) Heckscher-Ohlin Corollary, where factor endowments are identical between countries, no trade will take place.

In Section II, addressed to the Ricardian propositions, it is shown that the Ricardian theorem requires the specification of restrictions (albeit "reasonable") on demand in addition to the postulates always stated. Opportunity is also taken to note that the Ricardian corollary is invalid owing to the familiar multiplicity of production equilibria in the Ricardian model. Finally, in Section III, which discusses the Heckscher-Ohlin propositions, it is argued that while the assumption that the consumption pattern be identical between countries regardless of income levels is correctly held to be required only when the physical definition of factor abundance (to be discussed later) is used, it is incorrect to maintain that no restrictions at all need to be put on demand when the price definition is adopted.

II. Ricardian Propositions

A. Ricardian Corollary

The Ricardian corollary, stating that where factor productivity

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Heckscher-Ohlin theorem.

At a more general level, embracing all theories of comparative advantage, Kindleberger [4, p. 88] also assumes Argument II (ii) as valid and proceeds to discuss Argument I substantively by stating that "...the law of comparative costs says that a country exports those products which are comparatively cheap in price at home, and imports those which are comparatively expensive" (Argument II (ii)). "But economics can say more than this" (Argument I).

These examples could be readily multiplied but hardly need to be.

ratios are identical between the two countries no trade will take place, is not logically true. Indeed, not merely can trade take place but, in general, the pattern of trade will be reversible as well. This follows immediately from the well-known multiplicity of production equilibria corresponding to the commodity price ratio, which is equated, under perfect competition, with the identical factor productivity ratio in each country.

This is readily illustrated. In Figure (1a) the production possibility curves of countries I and II are depicted as R_IF_I and $R_{II}F_{II}$ respectively. Note that these show constant and identical rates of transformation at the margin, because of the one-factor, constant-returns technology and the assumption of identical factor productivity ratios.[2] Argument I holds in this model because the pre-trade commodity price ratio in each country will equal the factor productivity ratio. But the factor productivity ratios being identical in the two countries, the pre-trade price ratios in the two countries will also be equalised. Does Argument II (ii) then necessarily hold, leading to the Ricardian corollary?

It does not. In Figure (1a) the contrary possibility is

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[2]In the Ricardian model, if labour is the factor of production and x_I and x_{II} the labour productivity ratios in commodity X in countries I and II respectively and y_I and y_{II} in commodity Y, then $x_I/y_I = (P_x/P_y)I$ (the price of X in terms of Y) and $x_{II}/y_{II} = (P_x/P_y)II$ prior to trade. Therefore, any ranking of $(P_x/P_y)I$ and $(P_x/P_y)II$ prior to trade implies a corresponding, equivalent ranking of the factor productivity ratios as well. Therefore, when the factor productivity ratios x_I/y_I and x_{II}/y_{II} are identical, so will be the pre-trade commodity price ratios in the two countries.

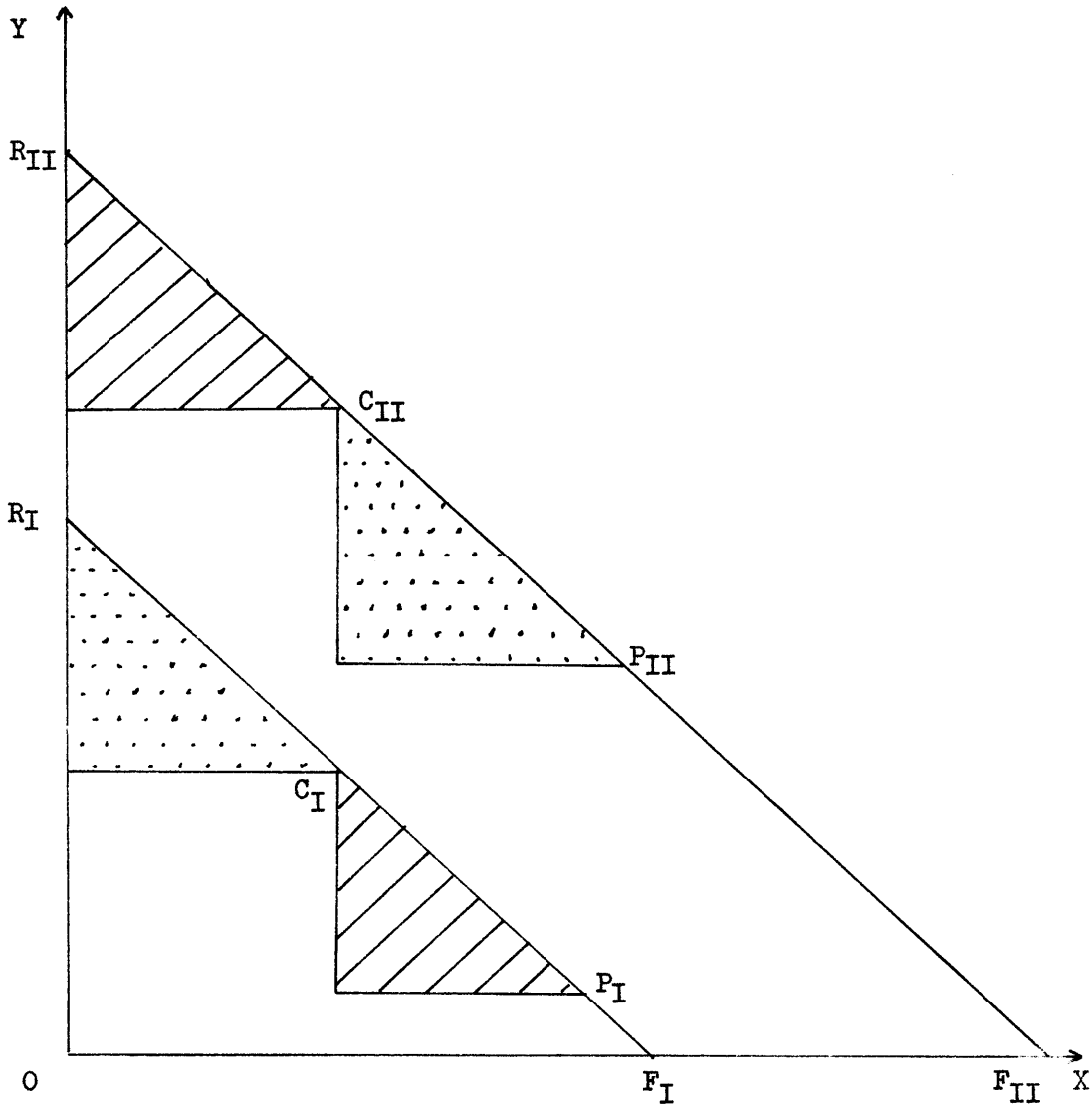

Figure (1a)

illustrated. Assuming that, at the commodity price ratio $R_{II}F_{II} = R_IF_I$, country II "chooses" consumption at C_{II} and country I at C_I, the production choice is still wide open for each country. Each country can have production at <u>any</u> point on its production possibility frontier. Suppose that the production then is at C_{II} in country II and at C_I in country I; in this case both Argument II (ii) and the Ricardian corollary will turn out to be valid. However, suppose that the choice of production is to the north-west of C_{II} in country II and (an identical distance, implying "matching offers" between both countries) to the south-east of C_I in country I, then trade <u>will</u> occur with II exporting Y and importing X. On the other hand, the choice of production occurring in contrary directions, trade will again occur, but with the trade-pattern reversed. The full range of possible trade equilibria is then defined by: (i) the two identical, dotted triangles which imply export of X and import of Y by II, and (ii) the two identical, striped triangles which imply export of Y and import of X by II. The counterpart of this, in the Marshallian offer curve diagram, is shown in Figure (1b), where the offer curves of countries I and II overlap in both quadrants, the overlap over OS (equal to $C_{II}P_{II}$ in length) representing the trade pattern involving export of X by II, and the overlap over OQ (equal to $C_{II}R_{II}$ in length) representing the opposite trade pattern.

Thus, both Argument II (ii) and, with it, the Ricardian corollary are invalid as logically true propositions. Note that this results from the multiplicity of production equilibria corresponding to the pre-trade commodity price ratio which is a direct consequence of the

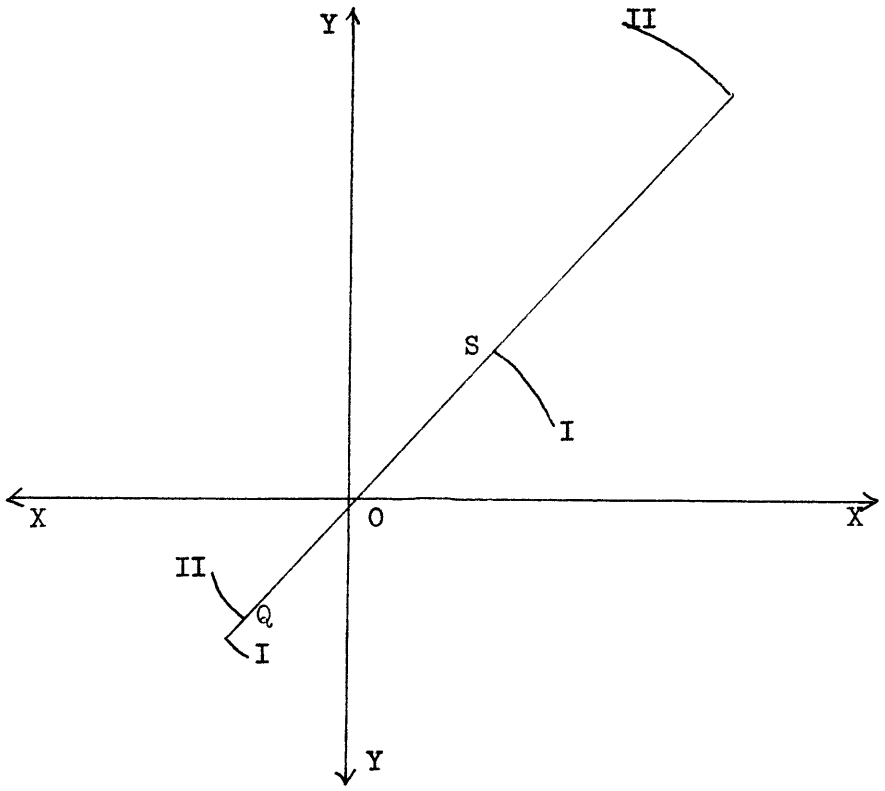

Figure (1b)

Ricardian one-factor, constant returns-to-scale assumption combined with perfect competition. The correct Ricardian corollary therefore is that, where comparative factor productivities are identical between countries, the volume and direction of trade are indeterminate.

B. Ricardian Theorem

However, what about the case where factor productivity ratios are different between countries? In this case again, in view of Argument I retaining its validity, the pre-trade commodity price ratios will differ between the two countries. Does Argument II (i) then necessarily hold, leading to the Ricardian theorem?

It does not. The reason is that demand conditions may be such as to lead to multiple self-sufficiency equilibria. Thus in Figure (2), $OQ_I O$ is the offer curve of country I and $OQ_{II} O$ of country II. Note that, under self-efficiency, each country has two possible price equilibria: OS_I and OT for country I, OS_{II} and OT for country II. If then the pre-trade equilibrium price ratios are at OS_I and OS_{II} the equilibrium price ratio will be at OT and no trade will occur, once free trade is possible. Argument II (i) thus collapses: although the pre-trade prices are different between the two countries, trade will not take place. With Argument II (i), the Ricardian theorem also collapses: the factor productivity ratio in country I equals OS_I, and thus differs from that in country II, which equals OS_{II}, and yet no trade occurs.

Suitable restrictions have to be placed therefore on demand conditions to eliminate this possibility. A sufficient restriction is to assume that societal tastes enjoy the properties of well-ordered

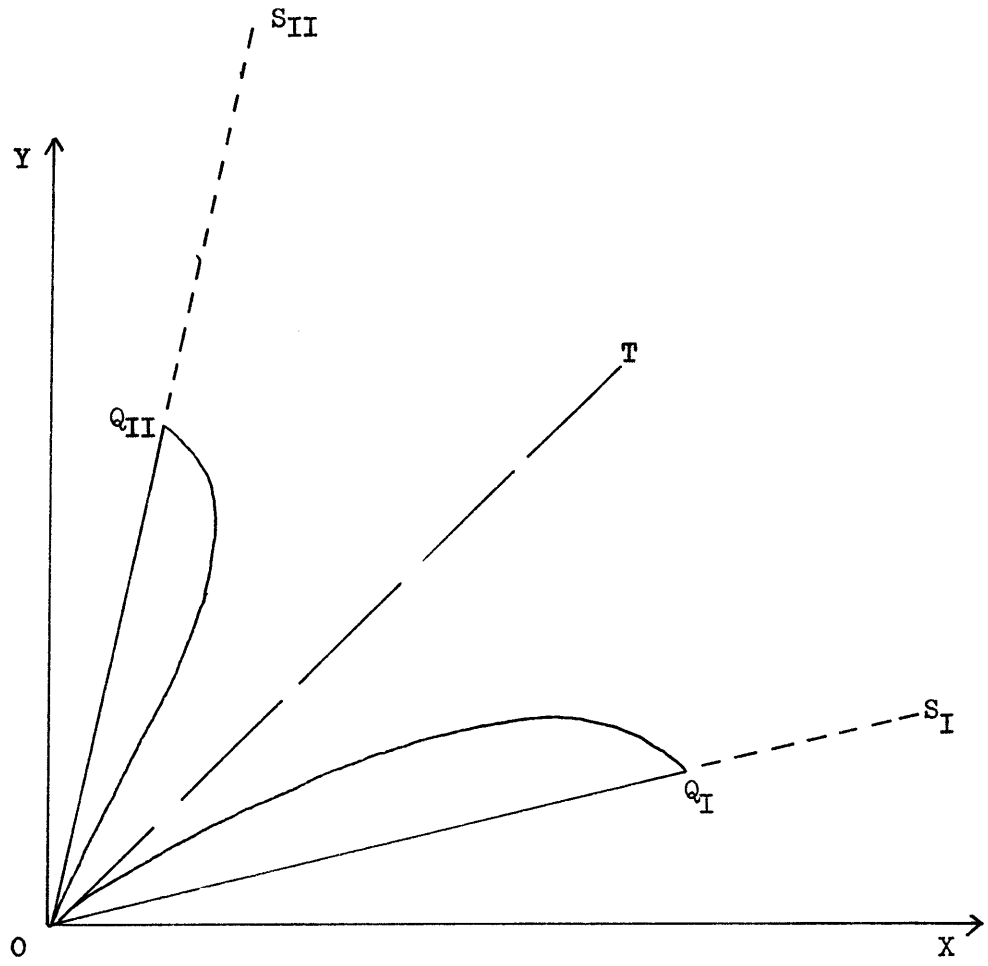

Figure (2)

individual taste maps--as with Samuelson's social indifference curves.[3] Since, in Ricardo's model, there is only one factor of production and (at points of complete specialisation) the marginal product is fixed in terms of the commodity produced, the social demands will be such as to rule out the possibility of a free-trade price equilibrium involving no trade even when the taste map of each factor-owner is alternatively assumed to be well ordered. Since the latter assumption is quite reasonable, the restriction that needs to be placed on demand conditions in Ricardian analysis is not at all "significant." But it is there in any case; and some such restriction must be specified, in addition to the postulates traditionally set out in Ricardian analysis, for the proof of the Ricardian theorem to be logically tight.[4] The role of demand, which is admitted in multi-commodity or multi-country Ricardian analysis, is thus not entirely absent, even in the two-country, two-commodity case.

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[3]Samuelson [10] proves the following theorem: "(a) If each group member's demand and indifference contours have the conventional 'regular' convexity, and (b) if the social welfare function is defined to have similar regular convexity properties, and (c) if within the group optimal lump-sum transfers are always made, then it follows: (1) there will result observable demand totals that are functions of market prices and total income alone, and (2) that these demand functions will have all the Slutsky-Hicks or revealed preference properties of any single consumer's demand, and (3) there will exist a set of indifference contours relating to the totals X, Y, . . . that has all the regular properties of any individual's contours and which we can pretend a single mind is engaged in maximising."

[4]As H. Johnson has pointed out to me in correspondence, an alternative restriction could be to assume that some of both goods is demanded in each country at all price ratios.

III. Heckscher-Ohlin Theory

The role that demand conditions can play in undermining the traditional proof of the Heckscher-Ohlin theory is rather more significant and not exactly parallel.

However, note first that neither Argument II (ii) nor the Heckscher-Ohlin corollary can be invalidated because of multiple production equilibria in the Heckscher-Ohlin model. This model leads to a strictly convex production possibilities set, and hence there is only one production equilibrium corresponding to any commodity price ratio. In this respect, therefore, the Heckscher-Ohlin model is at an advantage compared to the Ricardian model.

Demand conditions, however, do play a role. To discuss this role with clarity, it is necessary to distinguish between two alternative versions of the Heckscher-Ohlin propositions, stemming from alternative definitions of factor abundance. Under the physical definition of factor abundance, if $(K/L)_I > (K/L)_{II}$, where K and L refer to the overall endowments of these two factors, country I is defined as K-abundant or L-scarce. Under the price definition, if $(P_K/P_L)_I < (P_K/P_L)_{II}$, where P_K/P_L stands for the price of K in terms of the price of L in the pre-trade situation, then I is K-abundant or L-scarce.

Where the physical definition is used, the proof of the Heckscher-Ohlin theorem proceeds traditionally by: (1) showing that the K-abundant country I will have, at the same commodity price ratio, a higher (X/Y) ratio in production than country II, where X is the K-intensive commodity;[5]

---

[5]This proposition is valid for incomplete specialisation, of course. For proof, see Jones [3].

(2) assuming that the consumption pattern is identical between the two countries, in the sense that the (X/Y) ratio in consumption, at the same commodity price ratio, is identical between the two countries; (3) therewith deducing that, for self-sufficiency, $(P_X/P_Y)I < (P_X/P_Y)II$, thus completing Argument I, which requires that the K-abundant country will have its pre-trade relative price of the K-intensive commodity cheaper than the L-abundant country, and then (4) arguing, from Argument II (i), that the K-abundant country will export the K-intensive commodity and import the L-intensive commodity.

Where the price definition is used, the proof proceeds directly to Argument I, avoiding the three specific steps involved in the case of the physical definition. The assumed technology leads to a unique relationship between commodity and factor price ratios,[6] and hence $(P_X/P_Y)I < (P_X/P_Y)II$ follows immediately from $(P_K/P_L)I < (P_K/P_L)II$. Beyond that, only step (4), involving Argument II (i), is required. Note therefore that, in the case of the price definition, step (3) above does not have to be brought in. In view of this difference, we examine the two proofs, one for each definition, successively. Since the arguments are symmetrical for the theorem and the corollary, only the theorem is considered here to avoid tedious repetition.

1. Physical Definition

Whereas steps (3) and (4) are never explicitly stated and proved, they can be shown to be valid as soon as it is assumed (as in

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[6] This is the proposition well known to trade theorists and first proved by Samuelson [8, 9] for a two-factor, two-commodity model.

step (2)) that the consumption pattern is identical between countries, at identical commodity prices, regardless of income level. Note that this assumption implies non-intersecting, homothetic social market-demand curves, which, in conjunction with the assumption of convexity, rule out any possibility of contradicting steps (3) and (4).

Thus, for example, take step (3). P_s^{II} is the self-sufficiency price-ratio for country II in Figure (3a), and the equilibrium consumption and production points C_{II} and P_{II} coincide. C_I and C_{II} then lie on the same ray from the origin because of the assumption in step (2); and P_I lies to the right of P_{II} by virtue of the proposition in step (1). It is then easy to see that the self-sufficiency price-ratio $(P_x/P_y) = P_s^I$ for country I will be lower than P_s^{II}. This is because a contradiction, such as shown in Figure (1b), requires intersecting, social market-demand curves which are ruled out as soon as the assumption in step (2) is made. So also for step (4).

2. Price Definition

While, therefore, the assumption of international identity of consumption patterns at all income levels is indeed an adequate restriction on demand for the Heckscher-Ohlin theorem to be valid when the physical definition of factor abundance is used, the customary presumption that no restriction at all is necessary when the price definition of factor abundance is used is not correct.

When the price definition is used, we have seen that we by-pass steps (2) and (3) and, in fact, infer directly that the K-abundant economy will have the K-intensive commodity cheaper under self-sufficiency. But before we can infer from this that the K-intensive commodity

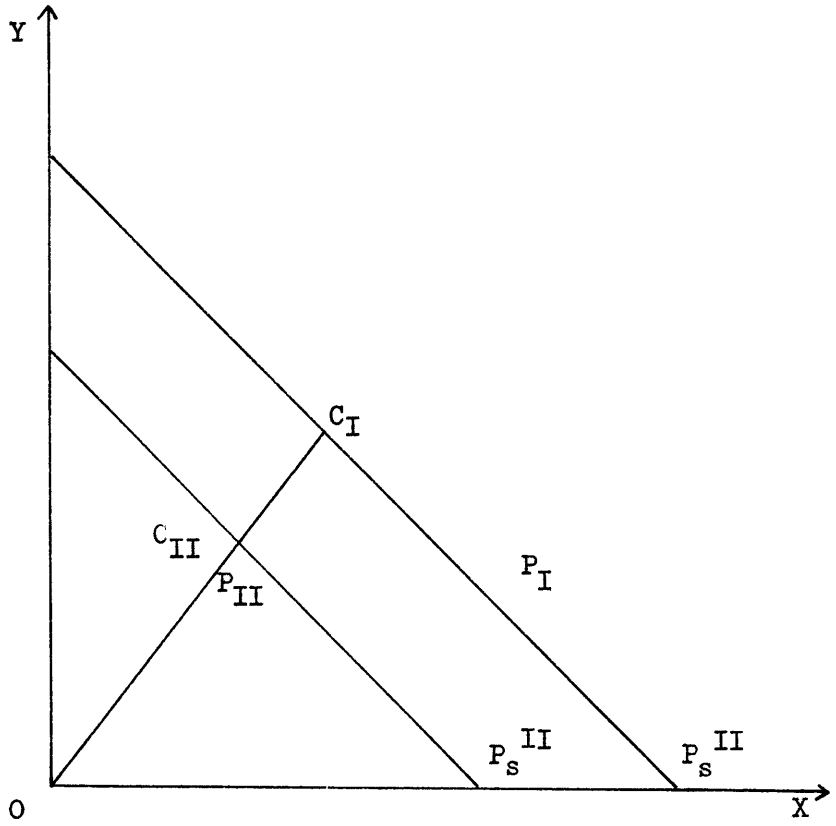

Figure (3a)

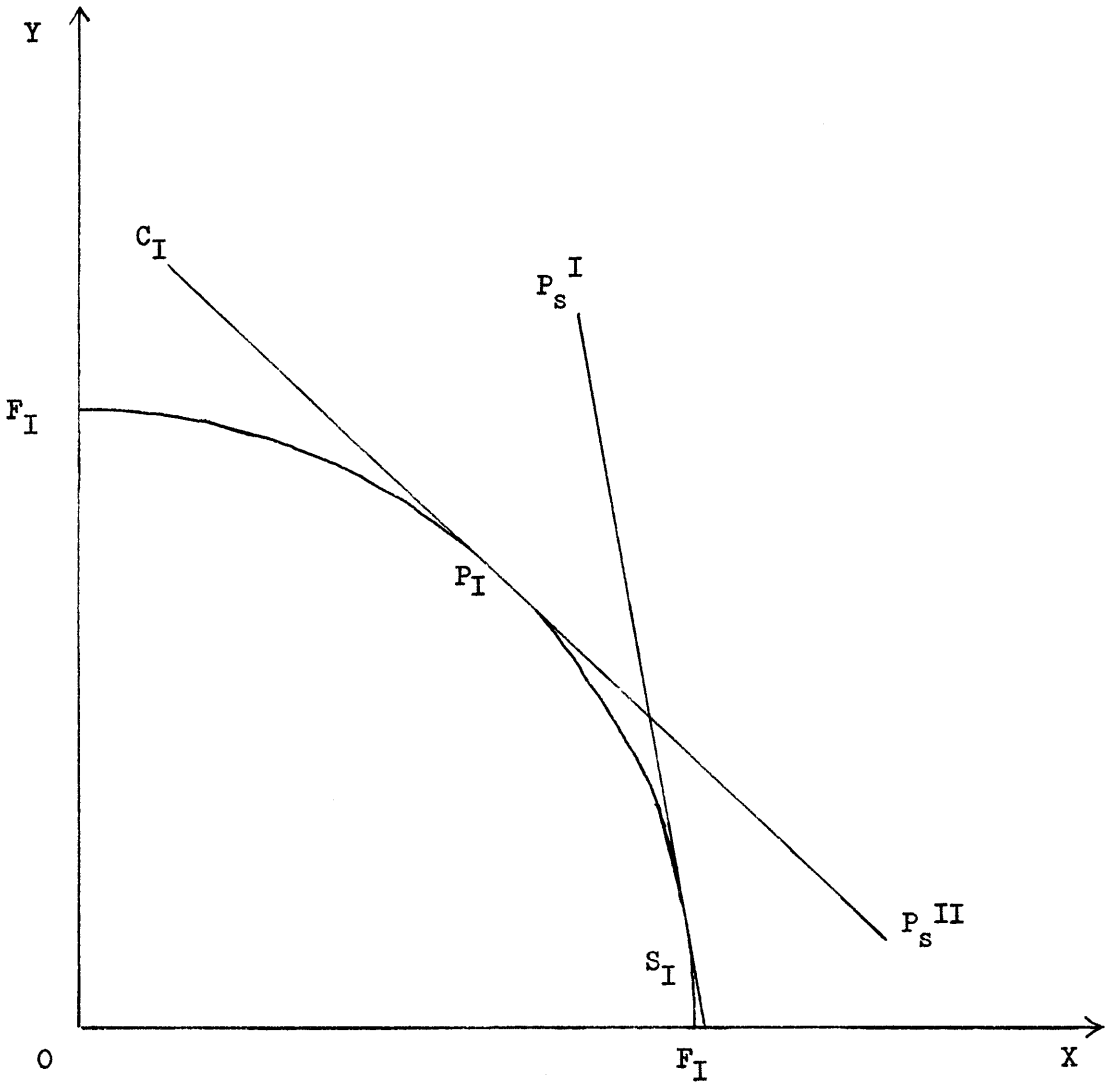

Figure (3b)

will be therefore exported (i.e., step (4)), we must again impose restrictions on demand.

What really happens is that the elimination of step (3) by virtue of the price definition still leaves step (4) intact in the chain of argument; and since each of the two steps (3) and (4) follows from the assumption of internationally identical, homothetic market-demand curves, some assumption with respect to demand continues to be necessary to sustain step (4), even when the price-definition of factor abundance is used.

Once again, the assumption (in step (2)) of internationally identical, homothetic demand curves can be made and will be sufficient to ensure step (4). However, this is an overly-strong assumption. It is sufficient to assume instead that the social market-demand curves, in each country, are well ordered. This is itself a "significant" restriction on demand because, in view of income-distribution being present in a two-factor model, well-ordered social market-demand curves do not follow immediately from well-ordered individual indifference curves and, as Samuelson [10] has shown, a policy of lump-sum income transfers has to be envisaged for the purpose.[7]

Hence, contrary to customary statements, demand conditions are not entirely irrelevant in the two-country, two-commodity theories of comparative advantage even when the Ricardian model or the Heckscher-Ohlin model (with price definition of factor abundance) is being

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[7]Note that the question of stability conditions has not been raised here. Further, the analysis has been confined to one country alone.

considered.[8]

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[8] The analysis in the text has accepted the framework of the Ricardian and Heckscher-Ohlin models. It is well known, however, that if either the technological or the institutional assumptions are relaxed, Arguments I and II can easily be jeopardised. For example, if increasing returns are assumed, it is known from Meade [6] and Matthews [5] that Argument II (ii) collapses: when the pre-trade prices are different between countries both patterns of trade may be possible.

Similarly, if there is a wage-differential between the two sectors it is no longer possible to sustain Argument I as logically true. This is because the equality of the commodity price-ratio with the domestic rate of transformation in production (at points of incomplete specialisation) disappears [2], so that the required ranking of the pre-trade commodity price ratios in the two countries will not necessarily emerge. On the other hand, if the wage differential operates identically in the two countries, this will be a sufficient condition for sustaining Argument I. As for Argument II (ii), it will continue to hold in the Ricardian case as also in the Heckscher-Ohlin model (with the assumption of internationally identical, homothetic market-demand curves), <u>despite</u> the wage-differential and the consequent divergence of the commodity price ratio from the (marginal) domestic rate of transformation in production.

Note finally that, although the assumption of identical wage differentials in the two countries will leave the comparative advantage theorems unscathed, it is <u>not</u> correct to argue, as Taussig [11] did, that the terms and volume of trade will also be the same as in the case where there is no wage differential at all.

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PART II

TARIFFS, QUANTITATIVE RESTRICTIONS AND SUBSIDIES

CHAPTER V

PROTECTION, REAL WAGES AND REAL INCOMES[1]

1. In a recent article [5], Mr. Lancaster re-examined the famous Stolper-Samuelson theorem and concluded:

> This paper does not deny that protection will raise the real wage of one of the factors, but shows that no general statement about which of the factors this will be can be deduced from the relative "scarcity" of the factors in the Stolper-Samuelson sense.
>
> Although the Stolper-Samuelson theorem "Protection raises the real wage of the scarce factor" is shown to be an incorrect generalisation, a restatement in the form "Protection raises the real wage of the factor in which the imported good is relatively more intensive" has general validity.

It is proposed in Section I of this paper to review systematically the original Stolper-Samuelson contribution, therewith to advance a critique (distinct from Mr. Lancaster's criticism, which is not accepted), of the Stolper-Samuelson formulation of the theorem and then to restate the theorem: this restatement being considered to be the only true and general statement about the effect of protection (prohibitive or otherwise) on real wages of factors in the context of the basic Stolper-Samuelson model. The logical truth of the restated theorem is briefly analysed then in the context of alternative models. Section II proceeds to extend the scope of the discussion with the argument that,

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[1]This paper was read to the Nuffield Economics Society. My thanks are due to Professor Hicks and J. Black for helpful suggestions. I am also happy to record my indebtedness to Professor Harry Johnson, whose suggestions have led to improvements in the paper.

with a non-prohibitive tariff, a sharp distinction must be drawn between the impact on the real wage of a factor and the effect on its real income; some implications of this distinction are then analysed.

I. Protection and Real Wages

2. In the following analysis, we shall take the basic Stolper-Samuelson [10] model to mean that the protecting country has two factors, two commodities enjoying different factor intensities, linear and homogeneous production functions subject to diminishing returns (along isoquants) and incomplete specialisation in production. Full employment of factors, pure competition and perfect mobility of factors are also assumed.

Founded on this model, we have three alternative formulations of the theorem concerning the impact of protection on the real wages of factors:

> (1) Restrictive Stolper-Samuelson Theorem. "International trade necessarily lowers the real wage of the scarce factor expressed in terms of any good." [10, p. 346]. This formulation restricts itself to the comparison of the free-trade real wage with the self-sufficiency real wage of the scarce factor. The comparison is confined to the case of a prohibitive tariff and excludes non-prohibitive protection. The theorem can be rewritten as follows: prohibitive protection necessarily raises the real wage of the scarce factor.
>
> (2) General Stolper-Samuelson Theorem. Protection raises the real wage of the scarce factor.[2] This formulation is clearly intended to be more general and includes

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[2]The actual formulation of the general Stolper-Samuelson theorem is from Lancaster [5, p. 199]. While the bulk of their analysis relates explicitly to the restrictive formulation, there are several indications that Stolper and Samuelson had in mind the general formulation as well: (1) a large number of quotations they cite from other authors

non-prohibitive tariffs as well. To emphasise this, we may rewrite it thus: protection (prohibitive or otherwise) necessarily raises the real wage of the scarce factor.

(3) Stolper-Samuelson-Metzler-Lancaster Theorem. "Protection [prohibitive or otherwise] raises the real wage of the factor in which the imported good is relatively more intensive."[3]

In the ensuing analysis any reference to "the Stolper-Samuelson theorems" should be taken to relate to the initial two formulations alone; reference to the last formulation will always be by its full title.

3. We can begin by setting out the basic elements in the argument leading to the twin formulations of the Stolper-Samuelson theorem:

(1) protection increases the internal relative price of the importable good;
(2) an increase in the relative price of a good increases the real wage of the factor used intensively in its production;
(3) the importable good is intensive in the use of the scarce factor.

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to outline the problem refer to tariffs in general rather than to tariffs of a prohibitive nature alone; (2) they feel it necessary to assume that "the country in question is relatively small and has no influence on the terms of trade. Thus any gain to the country through monopolistic or monopsonistic behaviour is excluded" [10, p. 344]; this assumption is quite superfluous, as we shall later see, if we wish to sustain only the restrictive formulation of the theorem; and (3) the title chosen for the article is not "International Trade and Real Wages" but "Protection and Real Wages." Lancaster [5, p. 201] also construes the Stolper-Samuelson theorem in its general form; thus witness his argument that "Protection will cause a movement in the general direction Q'Q, away from the free-trade point towards the self-sufficiency point" (my italics).

[3] Lancaster [5, p. 199]. This theorem has been given its stated name on grounds which are made explicit later.

Therefore,

(4) protection raises the real wage of the scarce factor.

These arguments must each be closely examined.

4. Concerning argument (1), we must distinguish between prohibitive and non-prohibitive protection:

(i) Protection will necessarily raise the relative price of the importable good when the tariff is prohibitive; the free-trade relative price of the importable good is lower than under self-sufficiency.[4]

(ii) Non-prohibitive protection may either raise, leave unchanged or lower the internal relative price of the importable good. Metzler [7] has demonstrated that this last "perverse" possibility will occur, in the context of our present model, when the elasticity of foreign demand for imports (n_x) is less than the domestic marginal propensity to consume exportable goods (c).[5] It follows, then, that if imports are not inferior goods in the protecting country's consumption this case requires inelastic foreign demand; and we can ensure that the internal relative price of the importable good always rises with the imposition of a tariff by assuming either elastic foreign demand (sometimes done in the form of assuming a small country) or a big enough tariff (in the limit, a prohibitive tariff) for demand to be elastic.

5. Argument (2) follows necessarily from the basic Stolper-

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[4]This is true except in a limiting case where the terms of trade will not change with trade. This case, however, can be ruled out, in the context of the model used here, by assuming that the community indifference curves (used here without any welfare connotation) are strictly convex. This limiting case will henceforward be ignored.

[5]It should be emphasised that the Metzler formula for determining the impact of protection on the internal commodity price-ratio relates to the case where the initial situation is that of free-trade. Where, however, the initial situation itself has a tariff and the impact of increased protection is the subject of analysis, the "perverse" possibility mentioned in the text will occur, as argued in Section II, when a slightly altered condition is fulfilled. The discussion in Section I, however, is confined to initial situations of free trade, as with Stolper and Samuelson, Metzler and Lancaster.

Samuelson model. To show this simply, we should recall the technological features of the model employed by Samuelson some years later [8] [9] to demonstrate factor-price equalisation: these features are identical with those of the Stolper-Samuelson model in all respects. We propose thus to avoid altogether the use of the box-diagram and work instead with the unique relationships that Samuelson derived in these later articles between commodity price-ratios, factor price-ratios and factor proportions in the two industries in a country, from the given assumptions concerning technology alone. These are summarised in Figure (1), which is reproduced, with slight changes, from Samuelson's 1949 article [9].

Let L_C and L_F represent the labour employed in producing clothing and food respectively; T_C and T_F being the quantities of land so employed. W/R represents the ratio of wages to rents; L/T the factor endowment ratio of the country; and P_F/P_C the price of food over the price of clothing. Clothing is the labour-intensive industry, food the land-intensive industry, at all relevant factor price ratios. ($L_C/T_C > L_F/T_F$ at all relevant W/R.)[6] As wages fall relatively to rents, the price of food is shown to rise relatively to that of clothing in a monotonic fashion. The factor endowment ratio of the country (L/T) fixes the range of the diagram which is relevant. This is a purely technology-determined diagram, and demand conditions are totally absent

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[6]Although the factor-intensities of the commodities may be reversible, they cannot reverse for a country with a given factor endowment. At the present stage of our argument, therefore, we do not need to make the strong assumption that factor-intensities are non-reversible at all factor price-ratios.

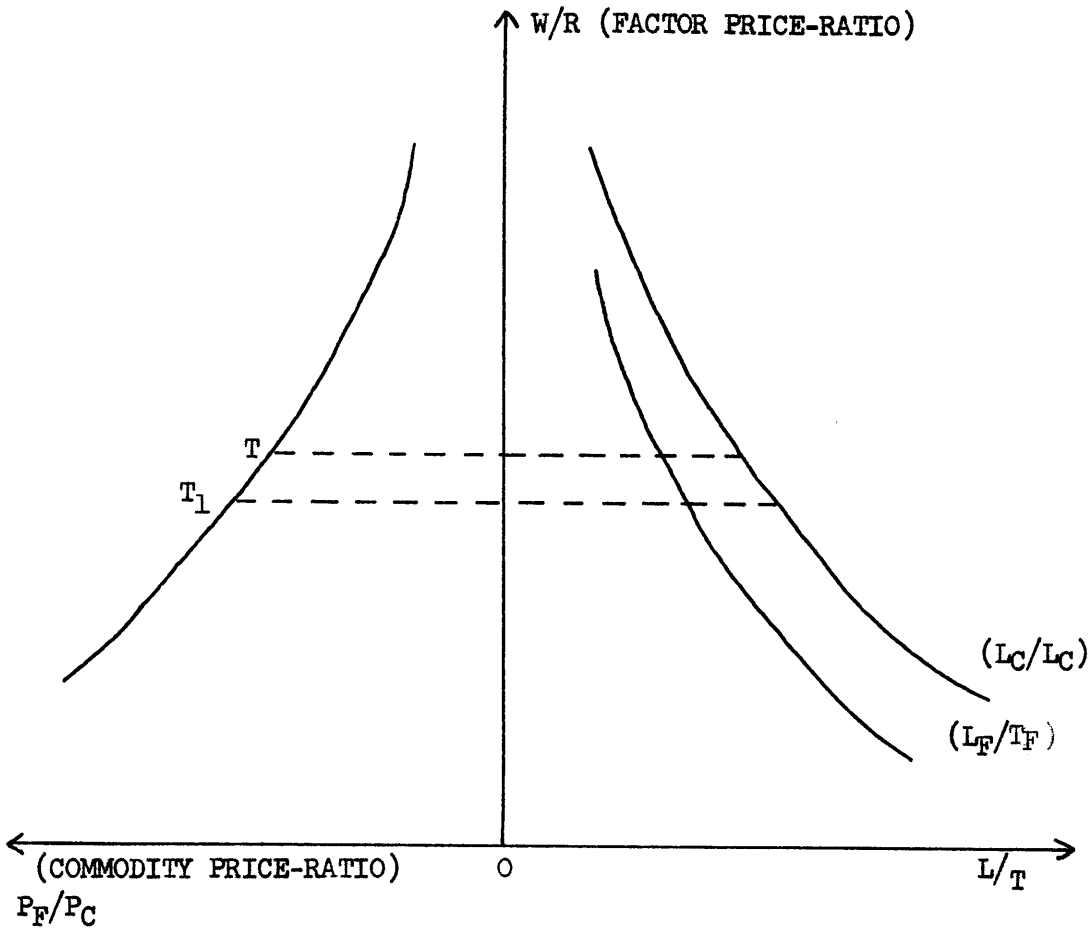
W/R (FACTOR PRICE-RATIO)
T
T_1
(L_C/L_C)
(L_F/T_F)
(COMMODITY PRICE-RATIO)
P_F/P_C
O
L/T

Figure (1)

from it.

T being any given commodity price-ratio (P_F/P_C), change it to T_1 such that the relative price of food rises. With it, the labour-to-land ratios in both food and clothing will rise. The marginal physical product of land in both products will thus rise and of labour fall, so that the real wage of land will be unambiguously increased and of labour decreased. Increase in the relative price of food thus increases the real wage of land, the factor intensively employed in its production; and reduces the real wage of labour, the factor intensively used in producing clothing (whose relative price has fallen).

This argument, it should be noted, rests on the assumption, part of the basic Stolper-Samuelson model, that the rise of the relative price of food does not go so far as to make the country specialise completely on food, in so far as the fall in the real wage of labour is concerned; for, once the country is specialised completely, further increases in the relative price of food will raise the real wage of <u>both</u> labour and land, which is destructive of the full validity of argument (2).

Given the basic Stolper-Samuelson model, therefore, an increase (decrease) in the relative price of a good will necessarily increase (decrease) the real wage of the factor intensively used in its production.

6. Argument (3) that the importable good is intensive in the use of the scarce factor is really the well-known Heckscher-Ohlin theorem. The crucial question that it raises is: does the Heckscher-Ohlin theorem follow from the basic Stolper-Samuelson model? To answer

this question, we should first have to define "factor scarcity." We may choose from three alternative definitions of factor scarcity:

> A. Lancaster Definition. A country's scarce factor is that which is used more intensively in the production of the importable good. This definition may be described as tautological, since it turns the Heckscher-Ohlin theorem into a valid proposition by definition. It may also be described as an internal definition, since it excludes any comparison with the foreign country. It has been suggested by Lancaster.[7]
>
> B. Heckscher-Ohlin Definition. A country's scarce factor is that whose relative price is higher than abroad under self-sufficiency. This may also be described as a price definition, since the country's scarce factor is that factor which is more expensive prior to trade than abroad. This definition has been used by Heckscher and Ohlin.[8]
>
> C. Leontief Definition. A country's scarce factor is that of which there are fewer physical units per unit of the other factor than abroad. This may also be described as a physical definition, since it defines scarcity with reference to the relative physical quantities of factors.[9]

Using each of these definitions in turn, let us analyse the Heckscher-Ohlin theorem.

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[7] Lancaster [5, p. 208] argues that "the only acceptable definition" of a scarce factor is that which defines it as the factor "which is used more intensively in the good of which more is produced in isolation than in trade." It is of some interest to note that tariffs designed to influence distribution are probably set with reference to such internal criteria: to raise the real wage of labour, for instance, tariffs are imposed on labour-intensive industries rather than on products of industries using a factor which is scarcer at home than abroad; with the possible exception of the pauper-labour argument for such tariffs.

[8] For a convincing attribution of the authorship of this definition of factor scarcity to Heckscher and Ohlin, see the masterly article by R. Jones [3]. The definition may be also illustrated in terms of Figure (1): country A is labour-abundant and country B land-abundant if, under self-sufficiency, $(W/R)_A < (W/R)_B$.

[9] W. Leontief [6]. Again, country A is labour-abundant and country B land-abundant if, under self-sufficiency, $(L/T)_A > (L/T)_B$.

A: If the Lancaster definition of factor scarcity is used, then the Heckscher-Ohlin theorem holds by definition.

B: If the Heckscher-Ohlin definition of factor scarcity is used then the further assumptions of international identity of production functions and non-reversibility of factor-intensities of commodities between the two countries will suffice to ensure the full validity of the Heckscher-Ohlin theorem.[10]

C: If the Leontief definition of factor scarcity is used, then the threefold assumptions of non-reversibilities of factor-intensities of commodities between the trading countries and the international identity of both production functions and tastes will ensure the validity of the Heckscher-Ohlin theorem.[11]

7. We can now sum up on the Stolper-Samuelson formulations

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[10] This can be seen readily from Figure (1). If $(W/R)_A < (W/R)_B$ and production functions with non-reversible factor-intensities are common between the countries, then we can see that $(P_F/P_C)_A > (P_F/P_C)_B$ under self-sufficiency and the labour-abundant country A will necessarily export the labour-intensive commodity, clothing. We could, of course, specify what appears to be a less restrictive condition than that set out in the text: for instance, we could sustain the Heckscher-Ohlin theorem by assuming merely that, instead of identical production functions between countries, the differences in the production functions are not large enough to outweigh the effect of differences in factor scarcity on the pre-trade commodity price-ratios. We have preferred to use the strong condition (identity of tastes) instead of the weak one on the ground that the use of the latter seems to be bad methodology, amounting to the argument that the Heckscher-Ohlin definition of factor scarcity will suffice to sustain the Heckscher-Ohlin theorem if other factors do not work to invalidate it.

[11] The Heckscher-Ohlin theorem would not hold as a logically true proposition in this case unless we also postulate now international identity of tastes (or the weak postulate that differences in tastes between countries do not affect the issue). This follows from the fact that while, with identical production functions, country A will show a bias towards the production of the labour-intensive commodity, clothing, by virtue of her physical abundance in labour, this bias in production may be more than offset by a bias in A towards the consumption of clothing: such that, in self-sufficiency, we find that $(P_F/P_C)_A < (P_F/P_C)_B$ and country A, although physically abundant in labour, would export the land-intensive commodity, food.

as follows:[12]

> A. (1) The restrictive Stolper-Samuelson theorem is logically true if we use: (a) the basic Stolper-Samuelson model, and (b) the Lancaster definition of factor scarcity.
>
> (2) The general Stolper-Samuelson theorem is logically true if we use the further assumption that the elasticity of foreign demand is greater than the marginal propensity to consume exportable goods ($n_x > c$).
>
> B. (1) The restrictive Stolper-Samuelson theorem is logically true if we use: (a) the basic Stolper-Samuelson model, (b) the Heckscher-Ohlin definition of factor scarcity, (c) the assumption of international identity of production functions, and (d) the assumption of non-reversibility of factor-intensities of commodities between the countries.
>
> (2) The general Stolper-Samuelson theorem is logically true if we use the further assumption that $n_x > c$.
>
> C. (1) The restrictive Stolper-Samuelson theorem is logically true if we use: (a) the basic Stolper-Samuelson model, (b) the Leontief definition of factor scarcity, (c) the assumption of international identity of production functions, (d) the assumption of non-reversibility of factor-intensities of commodities between countries, and (e) the assumption of international identity of tastes.
>
> (2) The general Stolper-Samuelson theorem is logically true if we use the further assumption that $n_x > c$.

A tree-diagram, based on this analysis, is presented in Table I.

8. We are now in a position to decide whether Stolper and Samuelson derived their theorems logically. Aside from their basic model:

> (1) they adopt, though without complete clarity, the Heckscher-Ohlin definition of factor scarcity and the postulate concerning the non-reversibility of factor-intensities; and, quite explicitly, the assumption of

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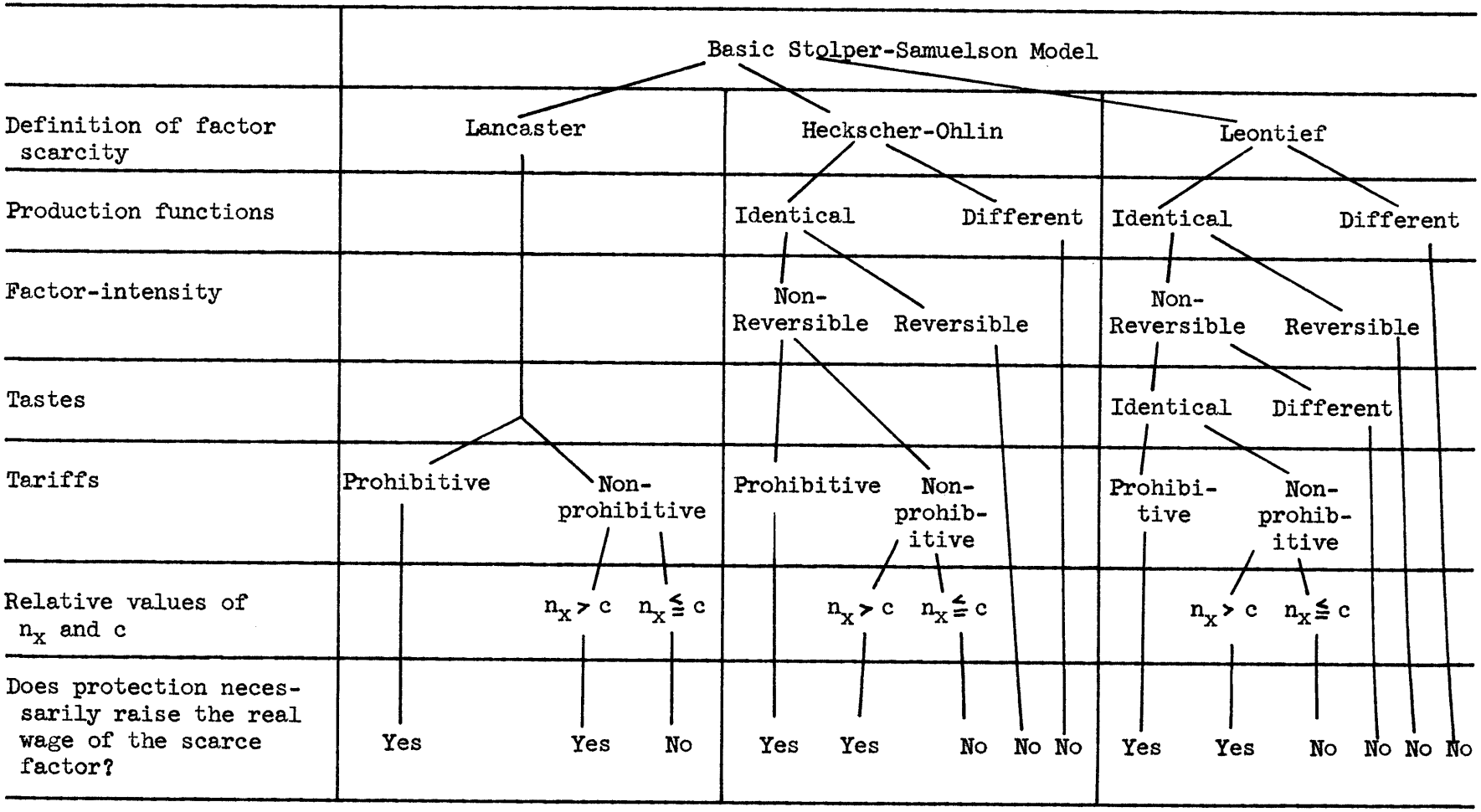
[12] The phrase "logically true" in the following statements is used in the strict mathematical sense: "A statement that is true in every logically possible case is said to be logically true" [4, p. 19].

TABLE I


Basic Stolper-Samuelson Model
Definition of factor scarcity
Lancaster
Heckscher-Ohlin
Leontief
Production functions
Identical
Different
Identical
Different
Factor-intensity
Non-Reversible
Reversible
Non-Reversible
Reversible
Tastes
Identical
Different
Tariffs
Prohibitive
Non-prohibitive
Prohibitive
Non-prohib-itive
Prohibi-tive
Non-prohib-itive
Relative values of n_x and c
$n_x > c$
$n_x \leqq c$
$n_x > c$
$n_x \leqq c$
$n_x > c$
$n_x \leqq c$
Does protection necessarily raise the real wage of the scarce factor?
Yes
Yes
No
Yes
Yes
No
No
No
Yes
Yes
No
No
No
No

international identity of production functions:[13] this establishes the restrictive Stolper-Samuelson theorem as logically true (B(1));

(2) they further assume that "the country in question is relatively small and has no influence on the terms of trade" [10, p. 346]; this establishes the general Stolper-Samuelson theorem as logically true (B(2)).

9. No critique of the Stolper-Samuelson formulations can thus be founded on the argument that they are not logically true, given the premises. What we could say, however, is that the theorem should be founded as closely as possible on the basic Stolper-Samuelson model alone; and

(1) that, if we use the Heckscher-Ohlin definition of factor scarcity, the assumptions that we find ourselves making about the international identity of production functions and the non-reversibility of factor-intensities to sustain the twin formulations of the Stolper-Samuelson theorem are, on this criterion, restrictive; and

(2) that, if we use the Leontief definition of factor scarcity (as we should probably want to since it is, in a sense, the most "objective" definition we could adopt in this context), we discover ourselves adopting the threefold restrictive assumptions (C(1)) of international identity of production functions and tastes plus the non-reversibility of factor-intensities of commodities, to sustain the Stolper-Samuelson formulations.[14]

10. It will be remembered, however, that these restrictive assumptions were made only because we wished to use argument (3)

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[13] Stolper and Samuelson [10, pp. 335-40]. Some of the argument is, of course, obscure in view of the pioneering nature of the article: a sympathetic interpretation, therefore, is called for. Metzler [7, p. 5] also adopts the Heckscher-Ohlin definition of factor scarcity in discussing the Stolper-Samuelson theorem.

[14] The additional restrictive assumption that $n_x > c$ has not been listed here because we wish at this stage to concentrate on only those restrictive assumptions which are made to sustain argument (3).

concerning the validity of the Heckscher-Ohlin theorem.[15] This may also be seen indirectly from the fact that, if we use the Lancaster definition of factor scarcity, no such restrictive assumptions are necessary (A(1)): for the Heckscher-Ohlin theorem has been rendered valid by definition!

The suggestion follows readily from these considerations that we should formulate our theorem in terms of arguments (1) and (2) alone, while eliminating the use of the troublesome argument (3). This can be done readily: protection (prohibitive or otherwise) raises the real wage of the factor intensively employed in the production of the importable good. This theorem is logically true if we use: (a) the basic Stolper-Samuelson model, and (b) the assumption that $n_x > c$.

This theorem has been described as the Stolper-Samuelson-Metzler-Lancaster theorem on the following grounds:

> (1) It is <u>implicit</u> in the Stolper-Samuelson argument, towards the end of their paper: "It does not follow that our results stand and fall with the Heckscher-Ohlin theorem. Our analysis neglected the other country completely. If factors of production are not comparable between countries, or if production functions differ, nevertheless, so long as the country has only two factors, international trade would necessarily affect the real wage of a factor in the same direction as its relative remuneration." [10, pp. 355-56].[16]
>
> (2) Metzler <u>explicitly</u> states it as "the Stolper-Samuelson conclusion that tariffs benefit the factors of

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[15] It is important to remember that these assumptions are restrictive only in so far as we wish to found our theorem exclusively on the basic Stolper-Samuelson model.

[16] Homogeneity of factors between countries has not been listed separately as an assumption in this paper because it is believed that this is implicit in both the Heckscher-Ohlin and the Leontief definitions of factor scarcity.

> production which are required in relatively large amounts in the industries competing with imports." [7, p. 13][17]
>
> (3) Lancaster advances this formulation directly as an alternative to the Stolper-Samuelson formulations considered above on the ground that it is more general than the latter.

11. Whereas, however, Lancaster's observation that the Stolper-Samuelson formulations are "non-universal" (restrictive) is well taken, the argument by which he supports it is erroneous and different from that set out in this paper. Lancaster proceeds by establishing, with the aid of a highly ingenious model, the proposition that, in the context of the basic Stolper-Samuelson model combined with the assumption of a small country facing fixed terms of trade, differences in demand conditions ("which good is the wage-good") will affect the composition of a country's foreign trade. On this proposition he founds the following critique:

> The non-universality of the [Stolper-Samuelson] theorem is due to incorrect formulation: if the scarce factor is defined as that which is used more intensively in the good of which more is produced in isolation than in trade (the only acceptable definition), then the previous analysis has shown that different wage-goods may make for different factor scarcities. In this sense, the Stolper-Samuelson formulation is meaningless, since the phrases "real wages . . . in terms of any good" and "scarce factor" represent incompatible concepts. [5, p. 208]

The following comments on Lancaster's critique seem warranted here, in view of our preceding analysis.

To begin with, it is difficult to understand what Lancaster means by the statement that "the previous analysis has shown that

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[17] Metzler, of course, does not state it as a rival formulation, but it is abundantly clear that he is aware that this formulation is implicit in the general Stolper-Samuelson theorem.

different wage-goods may make for different factor scarcities. In this sense, the Stolper-Samuelson formulation is meaningless, since the phrases 'real wages . . . in terms of any good' and 'scarce factor' represent incompatible concepts." Which good will be imported into a country will depend in our model on the pre-trade commodity price-ratios in the trading countries; these price-ratios are determined by domestic supply and demand; and domestic demand is affected by "which good is the wage-good." If the scarce factor is defined tautologously as that which is used intensively in the importable good it follows then, from elementary considerations, that "different wage-goods may make for different factor scarcities." But surely, how can this render the Stolper-Samuelson formulations meaningless or make 'real wages . . . in terms of any good' and 'scarce factor' incompatible concepts? And, more pertinently, why should this make the Stolper-Samuelson formulation "non-universal"?

Indeed, if the tautologous definition of factor scarcity is adopted, as Lancaster suggests, then the general Stolper-Samuelson theorem and the Stolper-Samuelson-Metzler-Lancaster theorem are identical: the phrases "scarce factor" and "factor intensively employed in the importable good" can be used interchangeably. Lancaster cannot, therefore, claim one formulation to be "non-universal" and the other to be "universally true": on his own definition of factor scarcity, the two formulations come to the same thing!

To be sure, Lancaster's critique would be valid (though, as we have shown, incomplete) only if the physical, Leontief definition of factor scarcity were proven to have been adopted by Stolper and

Samuelson, and were adopted by Lancaster as well; as formulated, however, the criticism is merely erroneous.[18] In failing to investigate precisely what Stolper and Samuelson assumed by way of their definition of factor scarcity, Lancaster has further by-passed the only legitimate critique that can be sustained against the actual formulation of the theorem by Stolper and Samuelson: namely, that advanced in this paper.

12. Our task is yet incomplete. Even the Stolper-Samuelson-Metzler-Lancaster formulation does not found the theorem completely and solely on the basic model. We must still make the restrictive assumption that $n_x > c$. We should, however, clearly want to go the whole way and remove all restrictive assumptions and restate the theorem to include the entire matrix of possibilities: such that the theorem is logically true, given only the basic Stolper-Samuelson model. This formulation is:[19]

> Protection (prohibitive or otherwise) will raise, reduce or leave unchanged the real wage of the factor intensively employed in the production of a good according as protection raises, lowers or leaves unchanged the internal relative price of that good.

This is really the fundamental theorem that Stolper and Samuelson contributed to our knowledge of the properties of the basic model they were using. Given the basic model, our formulation is logically true for all possible cases.

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[18] Lancaster has pointed out to me, in private communication, that he really had in mind the physical definition of factor scarcity, despite the printed commitment to the tautologous definition.

[19] This formulation stems directly from argument (2), which is founded exclusively, as the reader will remember, on the basic Stolper-Samuelson model.

13. It should perhaps be emphasised that the preceding analysis has been centered entirely on the problem of analysing the impact of protection on real wages of factors in the context of the basic model employed by Stolper and Samuelson. It should be possible, of course, to analyse the problem afresh in terms of models employing alternative assumptions. This, however, would be mostly destructive of the full validity of our theorem.

If we allow for complete specialisation with trade, for instance, we can claim only that protection will raise, lower or leave unchanged the real wage of the factor in which the exportable good is postulated to be intensive according as protection raises, lowers or leaves unchanged the internal relative price of the exportable good. But we cannot extend the theorem to the factor postulated to be used intensively in the production, if any, of the importable good because any increase in the internal relative price of the exportable good after complete specialisation must raise the real wage of both factors.

However, if we allow the optimum factor-proportions within industries, at given factor price-ratios, to change with scale, our theorem will continue to be logically true and the real wage of the factor intensively employed in a good will rise, fall or be unchanged according as the internal relative price of that good rises, falls or is unchanged with the imposition of protection.[20]

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[20]An apparent exception to this proposition may be investigated. Where the optimum factor-ratio changes with scale, at given factor price-ratios, it may happen, for instance, that if the production of labour-intensive importables expands, a higher proportion of labour is released than is needed in import-substitution, even though importables are on

On the other hand, if we allow for changing returns to scale in either or both of the two activities, clearly it becomes impossible to maintain that our theorem will be logically true.

II. Protection and Real Incomes

14. Our analysis has so far been concerned with the original Stolper-Samuelson problem of discovering the impact of protection on the real wage earned by factors in employment. It seems useful, however, to emphasise that if we are interested in finding out the net change in the real income of the factors it is only in the case of a prohibitive tariff that a complete identity obtains between change in real wage and change in the real income of a factor. Where the tariff is non-prohibitive, the complication arises from the revenue earned by the Government. If this revenue is assumed to be redistributed to the owners of factors according to some formula, factors will derive incomes both from the real wage in employment and from the redistributed proceeds of the tariff-revenue.

Hence arises the interesting possibility that the factor whose real wage has been damaged by protection may still find its real income improved if the formula for the redistribution of the tariff-revenue is heavily biased in its favour. Since this possibility constitutes a qualification to the generally accepted implication of the Stolper-

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average more labour-intensive. In this case, increase in the production of importables will lead to a rise in the labour-to-land ratios, and hence reduce the real wage of labour. This case, however, does not constitute an exception to our theorem, because such technology involves a concave production frontier, so that increase in the production of importables occurs when the price of importables falls (and not rises). Hence the logical truth of our proposition, even when we allow for changing optimum factor-ratios with scale.

Samuelson analysis, it should be of some interest to delimit the conditions under which it may occur.

To begin with, this possibility of over-compensating the damaged factor from the tariff-revenue clearly cannot arise unless the real income of the country as a whole is improved by protection. We know from the preceding analysis that where the real wage of one factor is reduced, that of the other necessarily rises; hence, if protection did not bring some gain to the country as a whole, it should be impossible to over-compensate the factor with the damaged real wage (from tariff-revenues). To rephrase the proposition, then, accrual of gain to the protecting country from the imposition of protection is a necessary, though not sufficient, condition for the possibility of over-compensating the factor with the damaged real wage.[21]

In the following brief analysis we seek to relate this proposition to Metzler's formula for determining the impact of protection on the internal commodity price-ratio: partly to establish link with Metzler's pioneering analysis in this field and largely because it enables us to define, and distinguish between, situations in which the factor with the damaged real wage will be export-intensive (intensively used in exportables) and those where it will be import-intensive. The discussion is then briefly extended to the case where the initial situation is that of a tariff instead of free-trade and the effect of an increase in protection is the subject of inquiry.

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[21]That is to day, whereas the country must have gained from protection before the damaged factor can be over-compensated from the tariff-revenues (necessary condition), this gain must be large enough to permit over-compensation (sufficient condition).

15. In Figure (2) let O_b be the foreign reciprocal demand curve facing country A. F is the free-trade point, OF yielding the corresponding terms of trade. I_a^1 is the trade-indifference curve of A passing through F at a tangent to OF and intersecting O_b at U. Its postulated curvature derives from the assumption of strict convexity of the production frontier and community indifference curves.

> (1) Assume that the tariff-added offer curve of country A intersects O_b at U. The internal relative price of the importable good is then given by the slope of the trade-indifference curve I_a^1 at U, which is clearly, by virtue of the postulated curvature of I_a^1, greater than at F. We can deduce, therefore, that protection can leave the real income of the country unchanged only if the internal relative price of the importable good rises from the free-trade level with the imposition of protection (in turn, only if $n_x > c$).
>
> (2) Similarly, by considering points on O_b to the left of U such as R, we can argue that protection can reduce the real income of the country only if the internal relative price of the importable good rises with protection (in turn, only if $n_x > c$).
>
> (3) However, protection can increase the real income of the country whether the internal relative price of the importable good rises, is unchanged (W) or falls with the imposition of protection (in turn, whether $n_x \gtreqless c$).

Thus, where $n_x \leqq c$, the real income of the country will necessarily improve with the imposition of a tariff; whereas if $n_x > c$, the real income may rise, fall or be unchanged.

16. Where the comparison is confined to the real income and real wage of the factors in an initial free-trade position and after the imposition of a tariff, we can then conclude as follows:

> (1) the export-intensive factor will necessarily become better off and it may be possible to over-compensate the import-intensive factor if $n_x < c$;[22]

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[22]When $n_x < c$ we know now that: (1) the internal relative price of the importable good falls, thus increasing the real wage of the export-

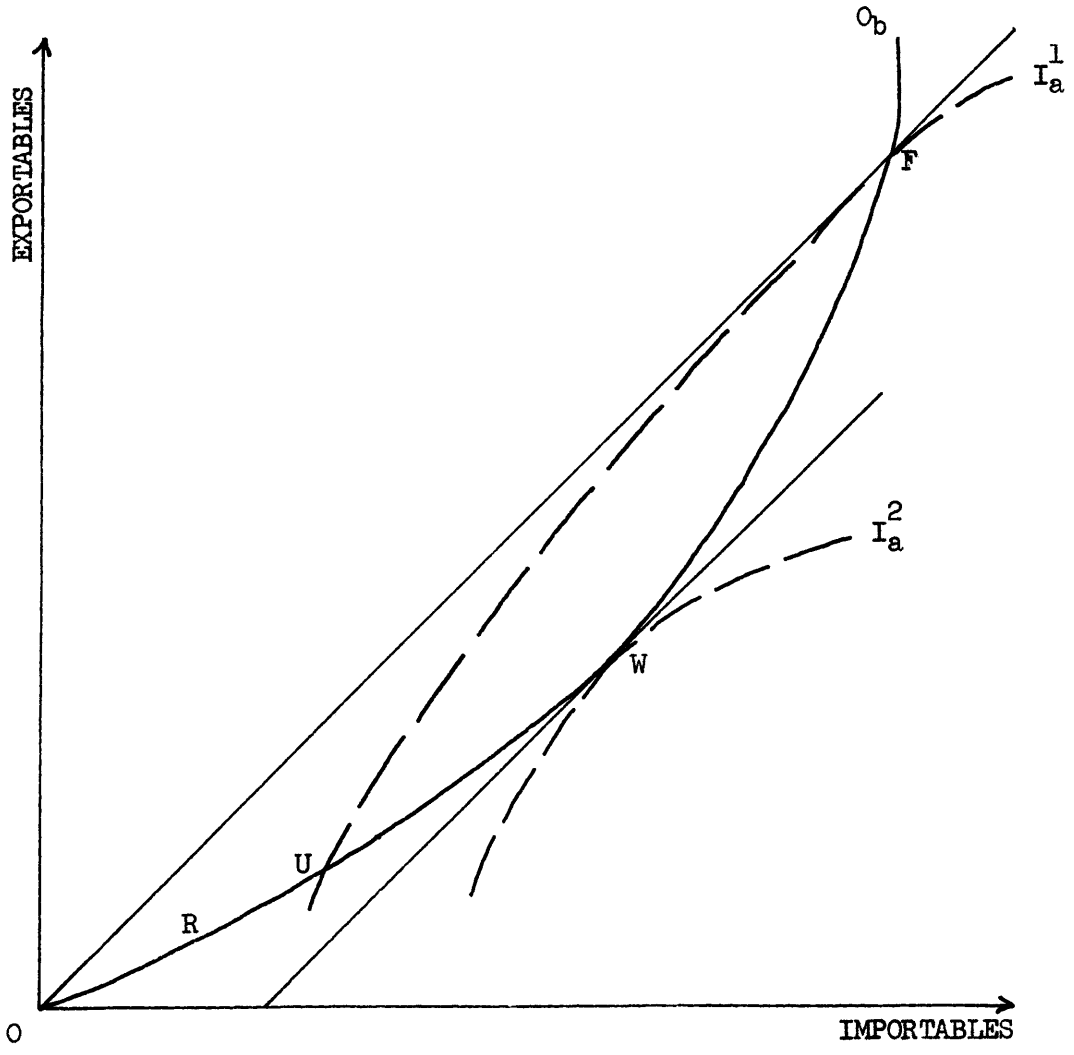

Figure (2)

(2) neither factor will become worse off and at least one better off if $n_x = c$;[23] and

(3) the import-intensive factor will necessarily become better off and it may be possible to over-compensate the export-intensive factor if two conditions obtain: (i) $n_x > c$, and (ii) the tariff is small enough to yield some gain to the country.

If we assume that importables are not inferior goods in the protecting country, it is clear, then, that inelastic foreign demand ($n_x < 1$) is a necessary, though not a sufficient, condition for the emergence of the possibility of over-compensating the import-intensive factor. Where, however, foreign demand is elastic and importables are not inferior goods, the export-intensive factor will necessarily find its real wage reduced by protection; and, for the possibility of over-compensating it to arise, it will be necessary, though not sufficient, that the tariff be small enough to make the country better off than under free-trade.

17. If, however, we wish to compare the real incomes and wages of factors in an initial situation of a tariff and after increase in the tariff, the analysis must be somewhat modified.

To begin with, the Metzler formula must be altered so as to read: the internal relative price of the importable good will rise, be unchanged or fall according as $n_x \gtreqless \frac{c}{1+ct}$ where t is the initial tariff-rate. It will be seen that where the initial situation is that of free-trade, t will be zero and the formula will reduce to the well-known

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intensive factor and reducing that of the import-intensive factor; and (2) the country must have become better off. Hence the proposition in the text.

[23]Where $n_x = c$, we know that: (1) the internal relative price of the importable good is unchanged, thus leaving unchanged the real wages of both factors; and (2) the real income of the country must increase. Hence the proposition in the text.

Metzler formula.

Secondly, the impact on the real income of the country will not bear the same relationship to the shifts in the internal commodity price-ratio as in the previous analysis with the free-trade initial situation. It can be demonstrated, by a geometrical argument analogous to that used earlier, that although the internal relative price of the importable good must still rise for the country to be as well off as prior to the increased tariff, both reduction and increase in the real income of the country are now consistent with any shift in this price.

Thirdly, arguing from the optimum tariff theory, we can claim that the real income of the country will improve with increased protection if two conditions obtain: (i) the pre-increase tariff rate is less than the optimum tariff rate $t < \frac{1}{n_x - 1}$; and (ii) <u>either</u> the post-increase tariff rate is also less than the optimum tariff rate <u>or</u>, if it exceeds the optimum tariff rate, it is small enough to leave some gain in real income to the country from the increase in tariff.

These considerations lead to the following conclusions:[24]

> (1) The export-intensive factor will necessarily become better off and it may be possible to over-compensate the import-intensive factor from <u>increased</u> tariff-revenues when three conditions obtain:

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[24] The first two propositions that follow assume that the factor stated to become necessarily better off continued to receive <u>at least</u> the same revenue as in the initial situation; this assumption being made explicit by the use of the phrase "from <u>increased</u> tariff-revenues." This assumption is needed because otherwise improvement merely in the real wage of a factor due to increased protection could be offset by an accompanying unfavourable distribution of tariff-revenues to the factor after the increase in the tariff.

(i) $n_x < \frac{c}{1+ct}$; (ii) $t < \frac{1}{n_x-1}$; and (iii) either the post-increase tariff rate is also less than the optimum tariff rate or, if it exceeds the optimum tariff, it is still small enough to leave some gain in real income to the country from the increase in the tariff.

(2) The import-intensive factor will necessarily become better off and it may be possible to over-compensate the export-intensive factor from increased tariff-revenues when three conditions obtain:

(i) $n_x > \frac{c}{1+ct}$; (ii) $t < \frac{1}{n_x-1}$; and (iii) either the post-increase tariff rate is also less than the optimum tariff or, if it exceeds the optimum tariff, it is still small enough to leave some gain in real income to the country from the increase in protection.

(3) Where, however, $n_x = \frac{c}{1+ct}$, the real wage of neither factor changes with the increase in protection. It follows, therefore, that the real income of both factors will increase, decrease or remain unchanged according as the increase in tariff raises, lowers or leaves unchanged the real income of the country: assuming, of course, that the tariff-revenues are divided among the factors in a given proportion.

18. In conclusion, it should be re-emphasised that the brief discussion presented here has been concerned only with the limited task of exploring some of the implications of the proposition that accrual of gain to the protecting country from the imposition of protection is a necessary, though not sufficient, condition for the emergence of the possibility of over-compensating, from tariff-revenues, the factor with the damaged real wage.[25]

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[25] A rigorous analysis of the sufficient conditions for the emergence of this possibility would call for an analysis of distribution and demand, so that factor earnings and income subsidies from tariff-revenues could be related to real incomes of factors. Such analysis would preclude us from taking as given, as we have done here, the set of community indifference curves: this practice has been adopted in the present paper for strictly pedagogic reasons.

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CHAPTER VI

ON THE EQUIVALENCE OF TARIFFS AND QUOTAS[1]

This paper examines the proposition that tariffs and quotas are equivalent in the sense that an explicit tariff rate will produce an import level which, if set alternatively as a quota, will produce an implicit tariff equal to the explicit tariff (and, pairwise, that a quota will produce an implicit tariff which, if set alternatively as an explicit tariff, will generate the same level of imports).

Such a notion of the equivalence between tariffs and quotas is widespread in the literature on trade theory--particularly in discussions relating to the protective effect of quantitative restrictions.[2] On the other hand, equivalence in the sense defined obtains as a logically true proposition only in a limited class of situations.

Indeed, it is easy to construct several possible situations where the equivalence breaks down. This paper demonstrates many such possibilities and then proceeds, in the light of this analysis, to

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[1]This revised version has profited as a result of a stimulating comment of Hirofumi Shibata [6]. The original version owed some improvements to Harry Johnson.

[2]C.P. Kindleberger [4], however, does explicitly analyse a case of non-equivalence. Kindleberger [4, pp. 621-23] concentrates on showing how a quota can create a monopoly domestically, and hence does not generalize the argument concerning non-equivalence in the way attempted here. Earlier, J.E. Meade [5, especially pp. 282-85] analysed various possibilities of monopoly arising from the administration of quota systems. The problem, as posed and analysed here, is mentioned in an earlier paper of mine [1].

correct some of the current misconceptions about tariffs and quotas which have their origin in the equivalence proposition.

I. Alternative possibilities

The traditional equivalence proposition is deduced in the context of a model which assumes (a) competitive foreign supply, (b) perfect competition in domestic production, and (c) a quota which is allocated so as to ensure perfect competition among the quota-holders, one consequence of which is that all quotas are used. This universal assumption of competitiveness ensures the equivalence which, as we shall soon see, generally breaks down with the introduction of monopoly elements in any one or more of the three listed areas.

We will begin the analysis with the case of universal perfect competition and then examine the following alternative cases: (a) perfect competition in (domestic) production replaced by pure monopoly in production; (b) perfect competition among quota-holders replaced by monopolist holding of quota; (c) simultaneous presence of monopoly in quota-holding and in domestic production; and (d) monopolistic supply of imports.

Throughout the analysis, we use the following notation:

P_F = foreign price

P_D = domestic price

t = tariff rate

S_D = domestic supply (production) of the commodity

S_F = foreign supply (production) of the commodity

D = total domestic demand for (consumption of) the commodity

D_D = net domestic demand for the commodity, available to the domestic suppliers

C = total cost of domestic production of the commodity

Case I Competitive supply from abroad, perfect competition in domestic production, and perfect competition among quota-holders.

We first set out the model for the case when a tariff, rather than a quota, is imposed.

$$S_D = S_D(P_D) \qquad (1)$$

$$S_F = S_F(P_F) \qquad (2)$$

$$P_F(1+t) = P_D \qquad (3)$$

$$S_P + S_F = D \qquad (4)$$

$$D = D(P_D). \qquad (5)$$

Equation (1) states that the domestic supply is a function of domestic price; equation (2) that the foreign supply is a function of foreign price; equation (3) that the domestic price exceeds the foreign price by the amount of the tariff; equation (4) that aggregate supply must equal domestic demand; and equation (5) that domestic demand is a function of domestic price.

We thus have five equations and six unknowns: S_D, S_F, D, P_D, P_F, and t. Thus, if t is given, the remaining unknowns are determined. Corresponding to every tariff rate (t), therefore, there will be some import level (S_F).

In the case where an import quota is set, the system is identical to that for the tariff case. Corresponding to every import level (S_F) chosen as the quota, therefore, there will be some (implicit) tariff rate, i.e., discrepancy between P_D and P_F. Moreover, the systems being identical, a tariff will generate an import level which, set

alternatively as a quota, will generate the same tariff rate.

Figure (1) shows graphically the equilibrium in this system. The tariff rate AV/VO shifts the S_F schedule upwards. The resulting total supply schedule S_T (aggregating S_F and S_D) cuts the D schedule to give the import level BC (= EH), foreign price OH, and domestic price OF. Conversely, with a quota of BC, the domestic price will turn out to be OF, the foreign price to be OH, and the (implicit) tariff rate therefore to be (FH/OH =) AV/VO. Equivalence thus obtains in this case.

Case II Competitive supply from abroad, monopoly in domestic production, and perfect competition among quota-holders.

Starting again with the case of tariffs, we find that the economic system is the following:

$$S_F = S_F(P_F) \qquad (1)$$

$$D = D(P_D) \qquad (2)$$

$$D_D = D(P_D) - S_F(P_F) \qquad (3)$$

$$D_D = S_D \qquad (4)$$

$$C = C(S_D) \qquad (5)$$

$$\frac{d(P_D S_D)}{dS_D} = \frac{dC}{dS_D} \qquad (6)$$

$$P_F(1+t) = P_D \qquad (7)$$

Equation (1) states that the foreign supply is a function of foreign price; equation (2) that total domestic demand is a function of domestic price; equation (3) that the net demand available to the domestic monopolist is the difference between total demand and foreign supply; equation (4) that net domestic demand equals domestic supply;

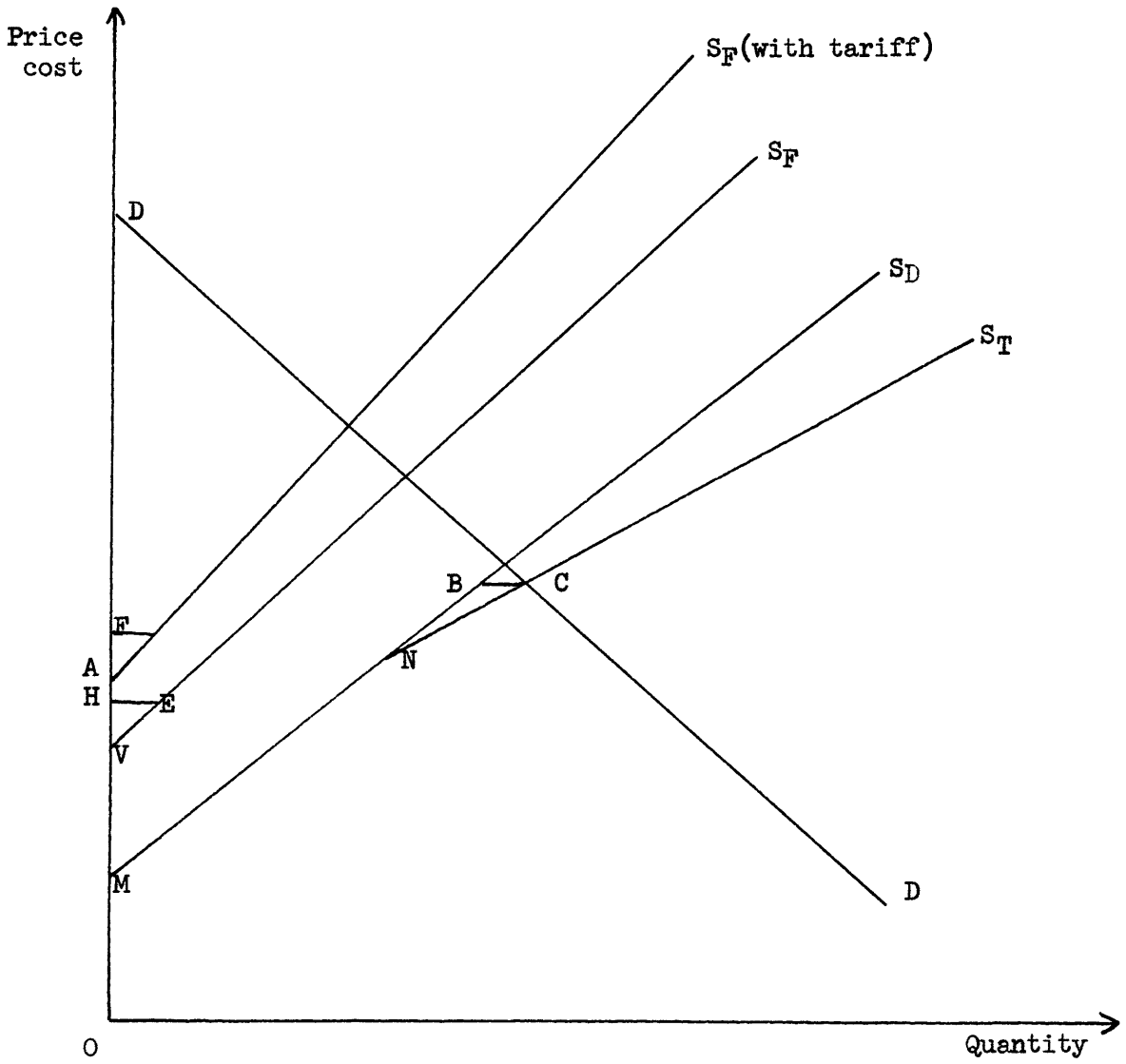

Figure (1)

equation (5) that total cost of domestic production (supply) is a function of the level of production; equation (6) that marginal revenue in domestic production is equated by the monopolist with his marginal cost; and equation (7) that the domestic price is higher than the foreign price by the amount of the tariff.

We have here seven equations and eight unknowns: D, D_D, S_F, S_D, P_D, P_F, C, and t. By choosing the tariff rate, t, therefore, we can determine the remaining values. Consequently, corresponding to every t there will be some level of imports, S_F.

But in contrast to Case I, the present system shows nonequivalence. For a quota, the system is the following:

$$D = D(P_D) \qquad (1)$$

$$S_F = S_F(P_F) \qquad (2)$$

$$D_D = D(P_D) - S_F(P_F) \qquad (3)$$

$$D_D = S_D \qquad (4)$$

$$C = C(S_D) \qquad (5)$$

$$\frac{d(P_D S_D)}{dS_D} = \frac{dC}{dS_D} \qquad (6)$$

$$\frac{P_D}{P_F} = 1 + t \qquad (7)$$

The system looks identical with that for a tariff.[3] However, the two systems are <u>not</u> identical, because the lefthand sides of equations (6), representing marginal revenue, are actually different.

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[3]Of course, equations (2) and (7) are now to be understood differently. In the present, quota case, equation (2) gives the foreign price corresponding to the import quota set; whereas in equation (7), t is the <u>implicit</u> tariff rate, obtained merely as $(P_D/P_F - 1)$. Neither of these differences, however, affects the equivalence proposition.

Under a tariff,

$$\frac{d(P_D S_D)}{dS_D} = P_D \frac{dD}{dS_D} + D\frac{dP_D}{dS_D} - P_D \frac{dS_F}{dS_D} - S_F \frac{dP_D}{dS_D};$$

whereas under a quota,

$$\frac{d(P_D S_D)}{dS_D} = P_D \frac{dD}{dS_D} + D\frac{dP_D}{dS_D} - S_F \frac{dP_D}{dS_D}$$

The difference of $-P_D(dS_F/dS_D)$ crucially divides the two systems, accounting for the nonequivalence of tariffs and quotas in this case. For, with this difference, a tariff rate will correspond to an import level which, if alternatively set as a quota, will not generate an identical (implicit) tariff rate. Indeed, the implicit tariff rate must be higher than the explicit one.

The difference is due to the fact that, with a tariff, the reduction in domestic price due to an increase in domestic output reduces the quantity of imports supplied, so that increased sales are effected partly by reducing imports, whereas with a quota imports are not reduced and the whole increase in sales must come from an increase in quantity demanded. Marginal revenue at any given output is therefore higher with the tariff than with a quota ($-P_D(dS_F/dS_D)$ is positive because (dS_F/dS_D) is negative). Hence output will be higher, and domestic price lower, under a tariff than it would be under a quota, for the same level of imports. This nonequivalence is easily illustrated graphically: Figures(2)and(3)show respectively the tariff and quota systems, two figures being employed instead of one to avoid confusion. In Figure (2), we set a tariff rate which generates an import level; in Figure (3), we set the same import level as a quota and show

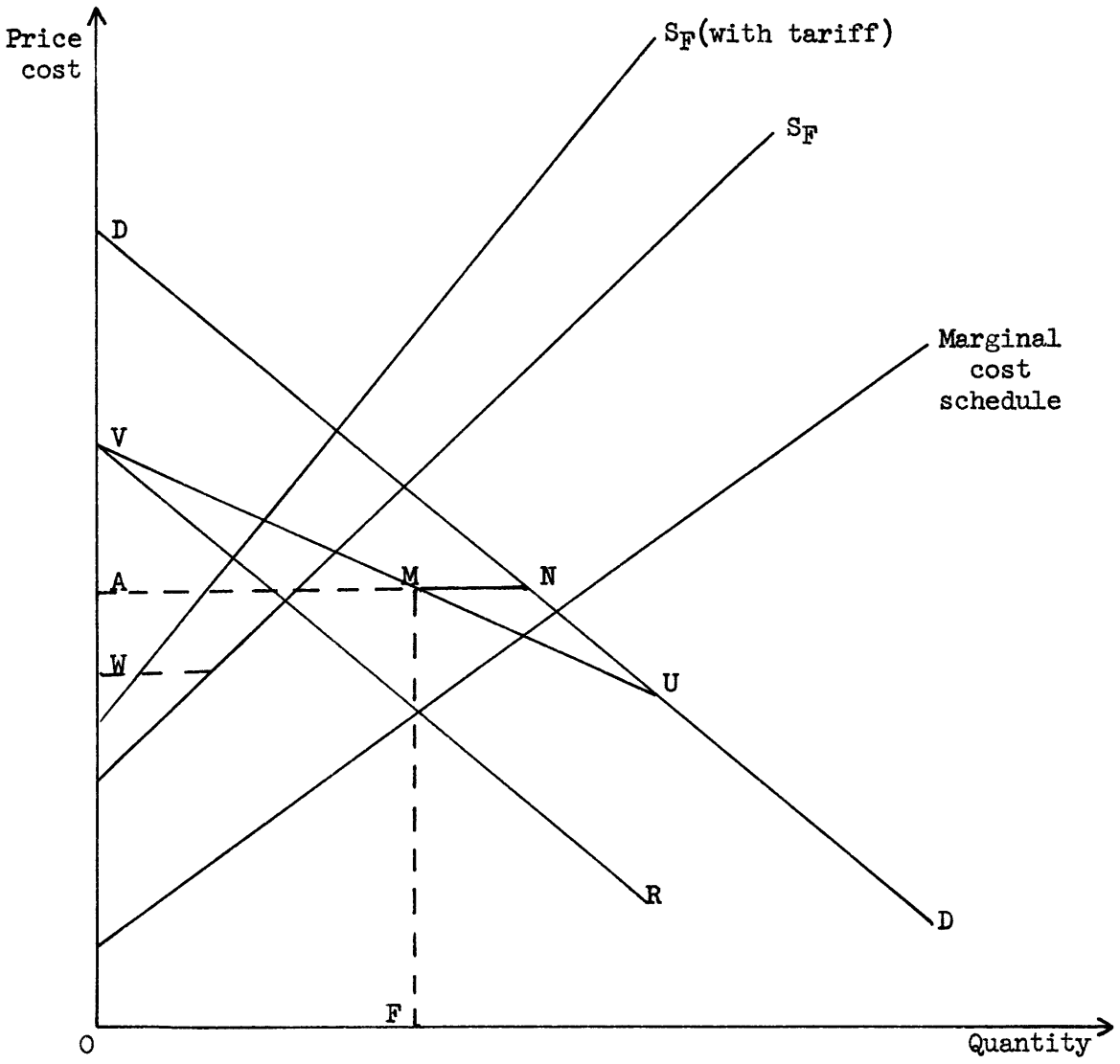
Price
cost
S_F(with tariff)
S_F
D
Marginal
cost
schedule
V
A
M
N
W
U
R
D
F
O
Quantity

Figure (2)

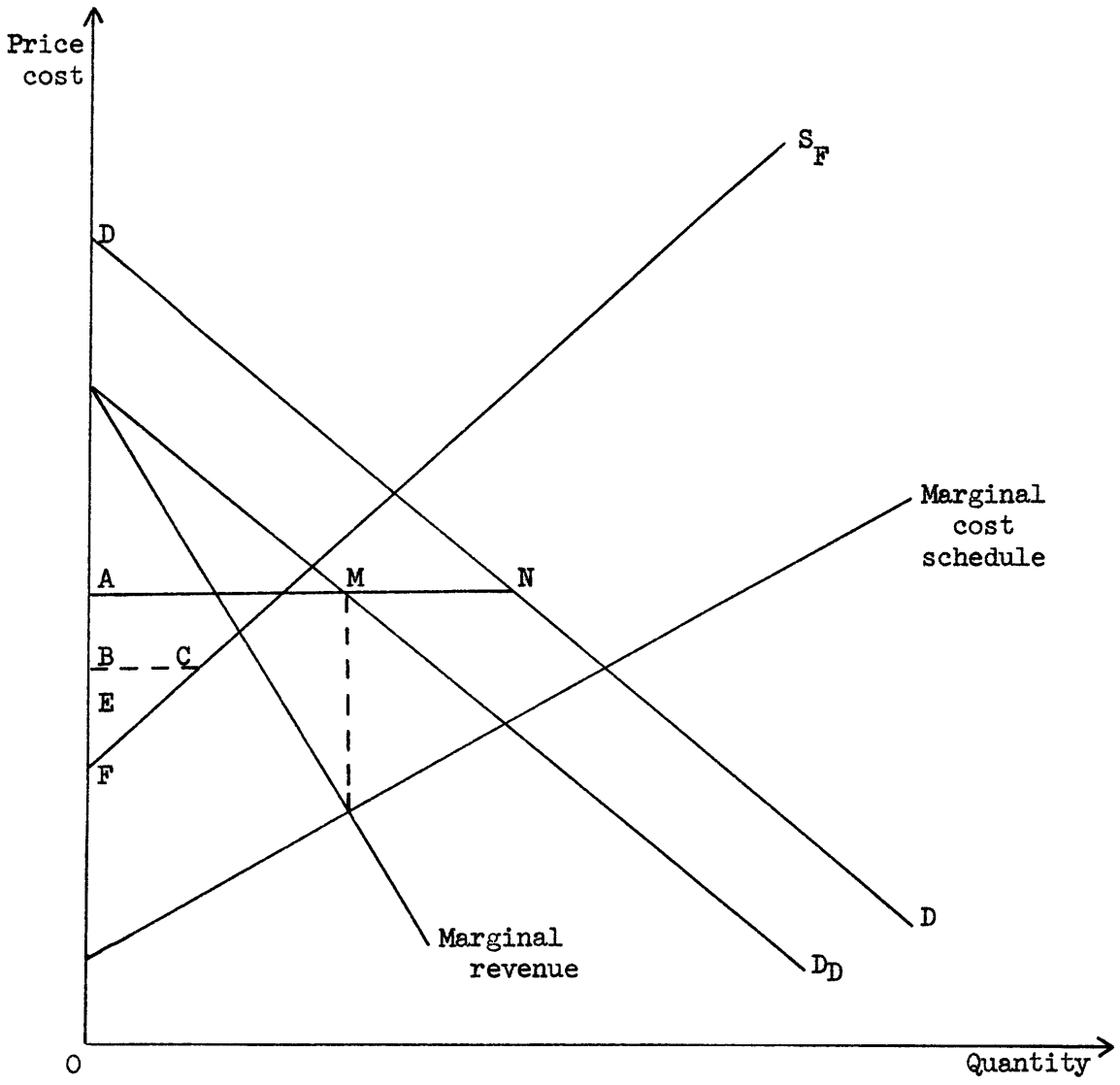
Price
cost
S_F
D
Marginal
cost
schedule
A
M
N
B
C
E
F
D
Marginal
revenue
D_D
O
Quantity

Figure (3)

that a different (and higher) implicit tariff rate is generated.

In Figure (2), the tariff rate (=AW/WO) shifts the supply schedule S_F upwards. The net demand schedule for the domestic monopolist then is VUD, while VR is the marginal revenue schedule for the monopolist. Equilibrium exists where the latter cuts the marginal cost schedule for the monopolist, so that the monopolist's production (S_D) is at OF, the domestic price at OA, the foreign price at OW, and the import level (S_F) at MN.

We then use the same import level MN as the quota in Figure (3). The net demand schedule for the domestic monopolist is now D_D; it is steeper than the net demand schedule segment VU in the previous diagram. The corresponding marginal revenue schedule must lie farther below M (in Figure (2)) than the previous marginal revenue schedule VR; it therefore cuts the monopolist's marginal cost schedule at a lower output than under the tariff, to yield OA as the domestic price and OB as the foreign price, the implicit tariff rate being AB/OB. Since OB in Figure (3) is equal to OW in Figure (2) (imports being the same in both cases), and OA in Figure (3) must be greater than OA in Figure (2), the implicit tariff rate under the quota must exceed the explicit tariff rate that would produce the same volume of imports. This demonstrates the nonequivalence between tariffs and quotas when there is monopoly in domestic production.

Case III Competitive supply from abroad, perfect competition in domestic production, and monopolist-holding of quotas.

Case A: Assume that the imports are competitively demanded under the tariff situation. The analysis of a tariff in this case is

identical with that in Case I. With a quota, however, the system is now different Since the quota-holder may be assumed to maximize his profits, he will vary his imports (within the quota set) so as to achieve this goal. The system then becomes the following:

$$D = D(P_D) \tag{1}$$

$$S_F = D(P_D) - S_D(P_D) \tag{2}$$

$$S_D = S_D(P_D) \tag{3}$$

$$S_F = S_F(P_F) \tag{4}$$

$$\frac{P_D}{P_F} = (1 + t) \tag{5}$$

$$\frac{d(P_D - P_F)S_F}{dS_F} \geq 0. \tag{6}$$

The first five equations are already familiar. The last merely states the first-order, maximizing (equilibrium) condition for the monopolist quota-holder; the equality sign holds if the monopolist uses less than his full quota, the inequality if he uses all of his quota. There are thus six equations and six unknowns: P_F, P_D, S_F, S_D, D, and t. The import level which will maximize the quota-holder's profits is thus determinate;[4] and it is obvious that if this import volume is less than would occur under the tariff, the implicit tariff rate must exceed the explicit tariff rate. Since the tariff system and the quota system are different in this case, the equivalence proposition breaks down. It will hold only in the special case when the shapes of the various schedules make it most profitable for the monopolist to use his full

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[4]This import level will, however, be subject to an upper bound set by the quota.

quota.

Equilibrium in the quota system is easily illustrated in the three-quadrant Figure (4). The righthand quadrant contains the usual S_D, S_F, and D schedules. The upper-lefthand quadrant contains two schedules, one depicting the domestic price and the other the foreign price, corresponding to different levels of utilization of the quota MN(=OR) by the quota-holder. The lower-lefthand quadrant shows the level of profits corresponding to every level of utilization of the quota. AB(=OE) then represents the level of quota utilization at which the profits of the quota-holder are at a maximum; and the corresponding (implicit) tariff rate is CD/DE.[5] This is necessarily greater than, or at least equal to, the tariff rate that would produce the level of imports OR.

Case B: Assume, however, that imports are effected by a monopoly, such as a state trading corporation, under the tariff situation. In this variation of Case III, monopolistic importation extends to both the quota and the tariff situation.[6]

This case is readily analysed in Figure (5). Here, imports are

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[5]The equilibrium value of S_F can easily be shown to be:

$$\frac{P_D - P_F}{P'_F - (1/D' - S'_D)},$$

where

$$P'_F = \frac{dP_F}{dS_F}, \qquad D' = \frac{dD}{dP_D},$$

and

$$S'_D = \frac{dS_D}{dP_D}.$$

[6]Case B was suggested by G. Yadav [7].

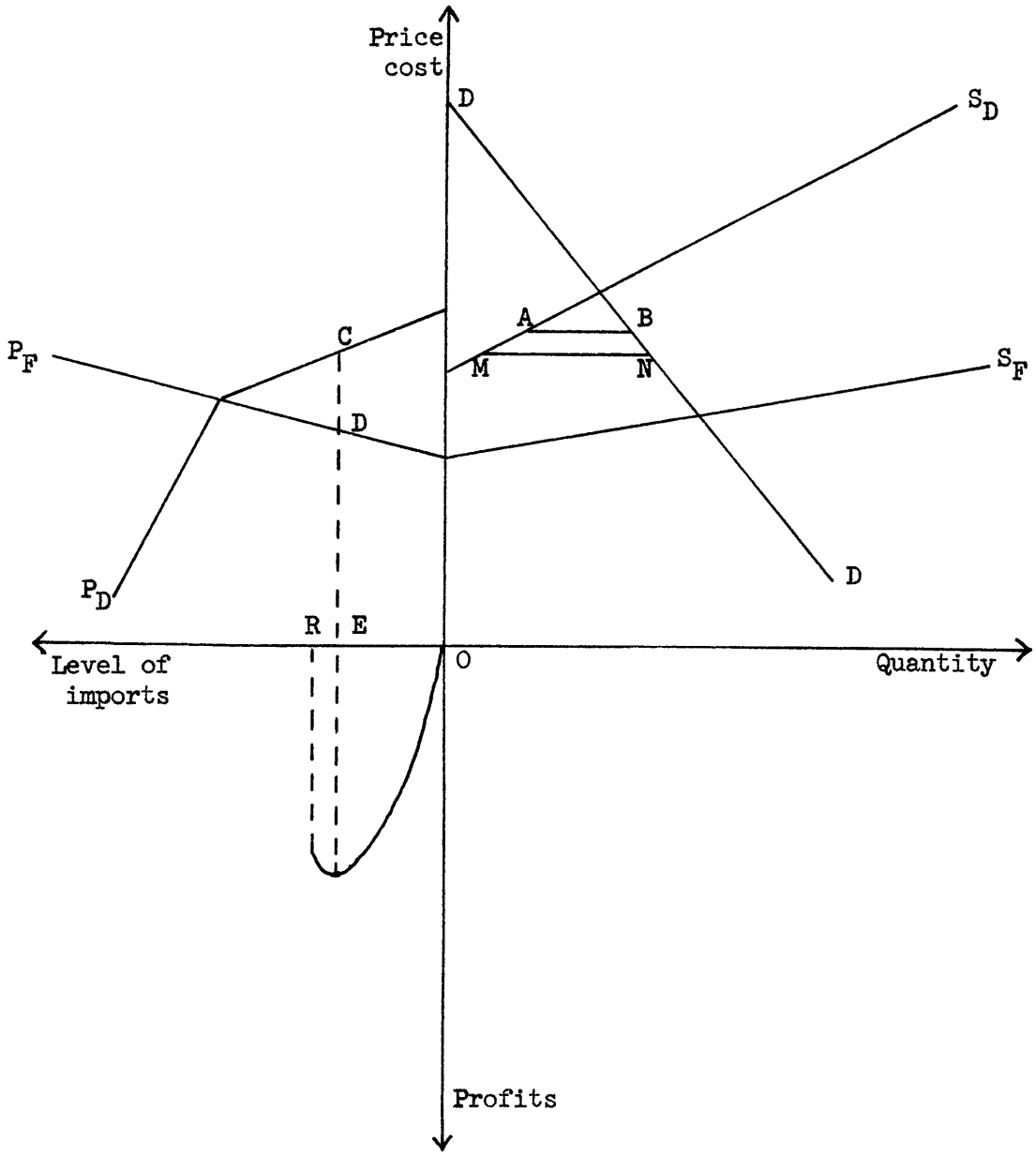
Price
cost
D
S_D
A
B
C
M
N
S_F
P_F
D
D
P_D
R
E
O
Level of
imports
Quantity
Profits

Figure (4)

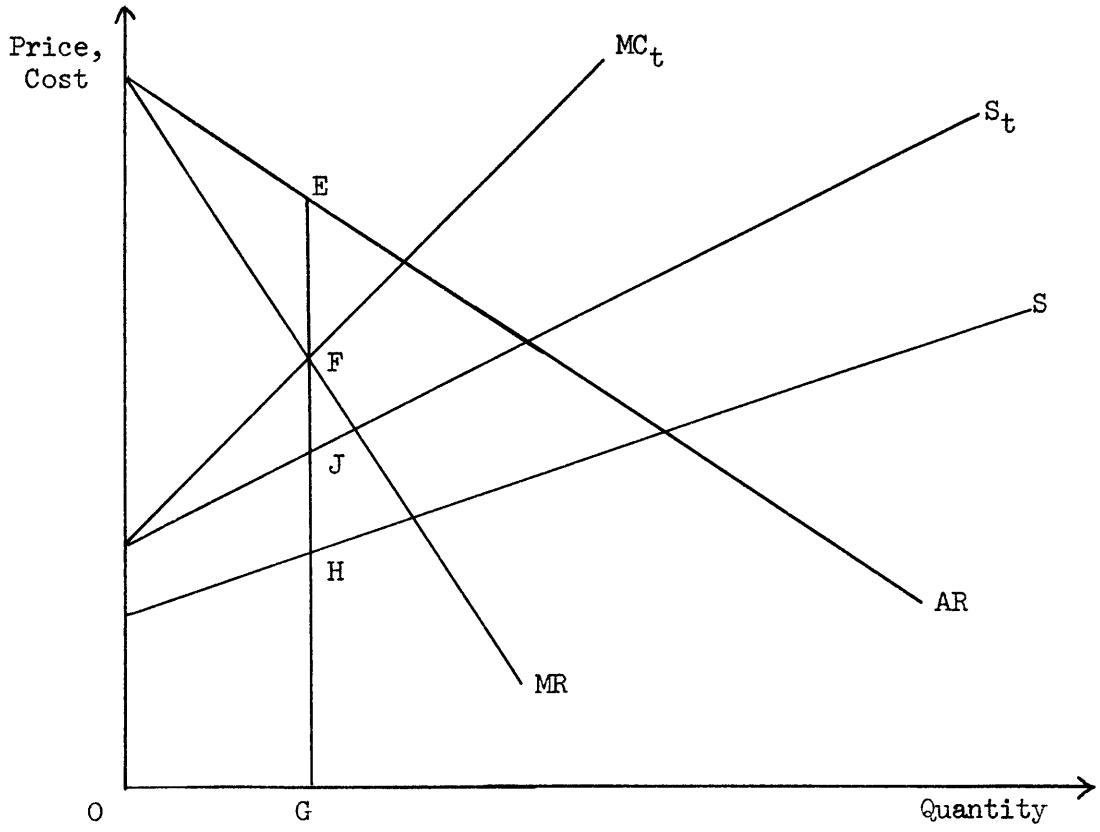

Figure (5)

made by a single importer, under both tariff and quota regimes, but competition holds everywhere else. Under tariff rate t, S_t is the foreign supply curve of imports; without the tariff, it is S. AR is the net demand curve for imports, the marginal revenue curve to it being MR. The intersection of the marginal cost curve MC_t, which is marginal to S_t, at F with MR, determines the maximum profit position for the monopolist importer under the tariff. The domestic price is EG, the foreign c.i.f. price is HG, the landed price is JG and hence the implicit tariff rate EH/HG exceeds the actual tariff rate JH/HG. When the quota is alternatively set at OG and the explicit tariff removed, equilibrium is again at domestic price EG, so that the implicit tariff rate is again EH/HG but this differs from, and exceeds, the implicit tariff rate JH/HG. Thus equivalence breaks down in this case as well.[7]

Case IV Competitive supply from abroad, monopoly in domestic production, and monopolist holding of quotas.

The tariff system in this case is identical to that in Case II (and Figure (2)). The quota system, however, will now differ - unless, of course, it is assumed that the quota-holder acts as a perfect competitor and fails to maximize his profits. Since the quota-holder may also be expected to maximize his profits, the problem becomes that of

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[7]If one takes the pair-wise definition of equivalence, that a quota will give rise to an implicit tariff rate which, if alternatively set as a tariff, will generate the same level of imports as the quota, it is again clear that equivalence breaks down when there is monopoly import under both tariff and quota: for, in this case, the quota OG will lead to an implicit tariff rate EH/HG which, then set alternatively as the tariff, will not lead to the same import level OG.

duopoly, and, as with that general class of problems, there are as many solutions as the behavioral assumptions one cares to make. We take only two simple cases here; they are sufficient for underlining the nonequivalence possibility.

Case A: Assume that the producer maximizes his profits at every level of imports chosen by the quota-holder, and that the quota-holder then chooses that level of imports which, given this assumption about the producer's behavior, yields him the maximum profit.

In this case, the system is the following:

$$D = D(P_D) \tag{1}$$

$$S_F = S_F(P_F) \tag{2}$$

$$S_F + S_D = D \tag{3}$$

$$C = C(S_D) \tag{4}$$

$$\frac{P_D}{P_F} = (1 + t) \tag{5}$$

$$\frac{d(P_D - P_F)S_F}{dS_F} \gtreqless 0 \tag{6}$$

$$\frac{d(S_D P_D)}{dS_D} = \frac{dC}{dS_D} . \tag{7}$$

The first five equations are familiar. Equation (6) is the profit-maximizing, equilibrium condition for the monopolist quota-holder, and equation (7) the corresponding condition for the monopolist producer. There are thus seven equations and seven unknowns: D, D_F, S_D, P_F, P_D, t, and C. The (implicit) tariff rate and the (actual) import level are thus determined simultaneously. Note further that the tariff and quota systems are again different so that nonequivalence will

obtain,[8] except where conditions lead the monopolist quota-holder to use all his quota. Where the quota is not entirely utilized, the implicit tariff rate must be higher than the explicit tariff rate.

Case B: Assume instead that the quota is allotted to the producer-monopolist himself.[9]

In this case, the producer becomes a pure monopolist, with two sources of supply - domestic and foreign. He will then use them in such a way as to maximize his profits. The system of equations is then the following:

$$D = D(P_D) \qquad (1)$$

$$S_F + S_D = D \qquad (2)$$

$$S_F = S_F(P_F) \qquad (3)$$

$$C = C(S_D) \qquad (4)$$

$$\frac{P_D}{P_F} = 1 + t \qquad (5)$$

$$\frac{d(P_F S_F)}{dS_F} \leq \frac{dC}{dS_D} = \frac{d(P_D D)}{dD} . \qquad (6) \text{ and } (7)$$

We thus have seven equations (allfamiliar by now) and seven unknowns: D, S_F, S_D, C, P_F, P_D and t. Thus, both the (implicit) tariff rate and

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[8]This case could also be illustrated by adapting the three-quadrant diagram in Figure (4) so as to introduce monopoly instead of competition in domestic production.

[9]This is not as fanciful an assumption as it appears. In countries such as India, considerable concentration of ownership and control obtains in economic activity, owing to a variety of reasons such as strictly controlled entry and economies of scale combined with limited markets. It is thus not merely possible, but also probable, for the case described in the text to obtain in practice.

the rate of quota utilization are determined. Note again the differences in the tariff and quota systems in this case, implying nonequivalence.

This case is easily illustrated in Figure (6), where MC is the marginal cost schedule for imports, and the aggregate marginal cost schedule, for both sources of supply, is SRA_{mc}. The latter's intersection with the marginal revenue schedule at R yields the domestic price as EO, the foreign price as UO, the (implicit) tariff rate as EU/UO, and the level of imports as GU.[10]

Case V Monopolistic supply of imports from abroad, and competition elsewhere.

Consider finally the case where the foreign supply of imports is monopolistic under <u>both</u> tariff and quota.[11] In Figure (7), the monopolist supplier of imports is faced with the net import demand schedule AR which, in case of a tariff at rate GF/FJ, will shift to AR'. The marginal revenue curve to AR' is MR'. The intersection of the monopolist's marginal cost curve MC with MR' at E determines his maximum-profit point, giving OJ as the volume of imports, JG as the domestic price and hence FJ as the c.i.f. price. The shift to the alternative situation where the tariff GF/FJ is removed and replaced by a quota of OJ, leads on the other hand to the same domestic price GJ, but the c.i.f. price now shifts also to GJ, so that the implicit tariff rate is <u>zero</u>, and hence is <u>below</u> the explicit tariff.

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[10]The reader who wishes to illustrate nonequivalence in a simple fashion can use the (derived) tariff rate EU/UO and the same S_F, D, and marginal cost schedules to show how, if this tariff rate is actually imposed, the resulting import level can be different from GU.

[11]This is the case analysed by Shibata [6].

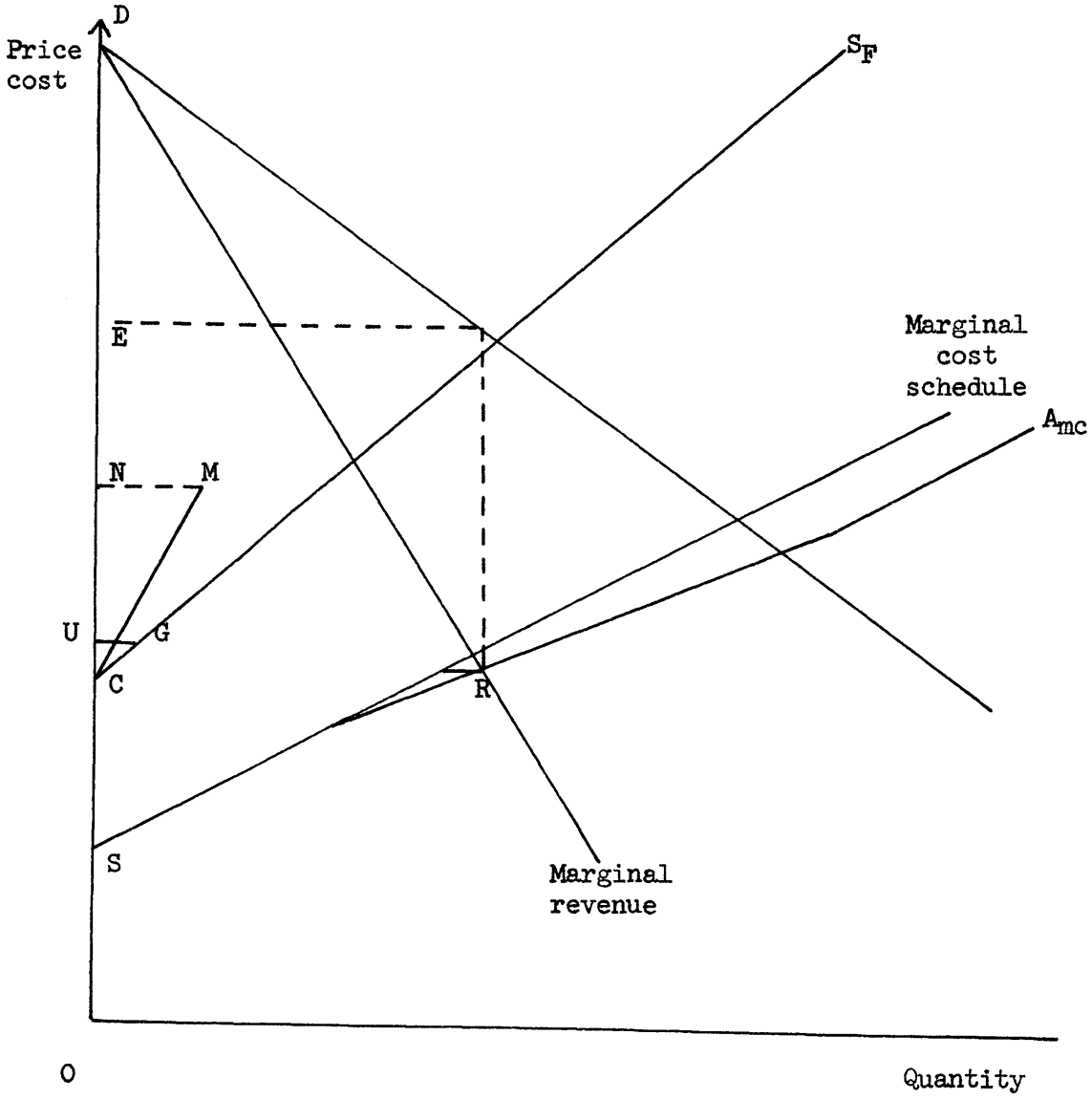
D
Price
cost
S_F
E
Marginal
cost
schedule
A_{mc}
N
M
U
G
C
R
S
Marginal
revenue
O
Quantity

Figure (6)

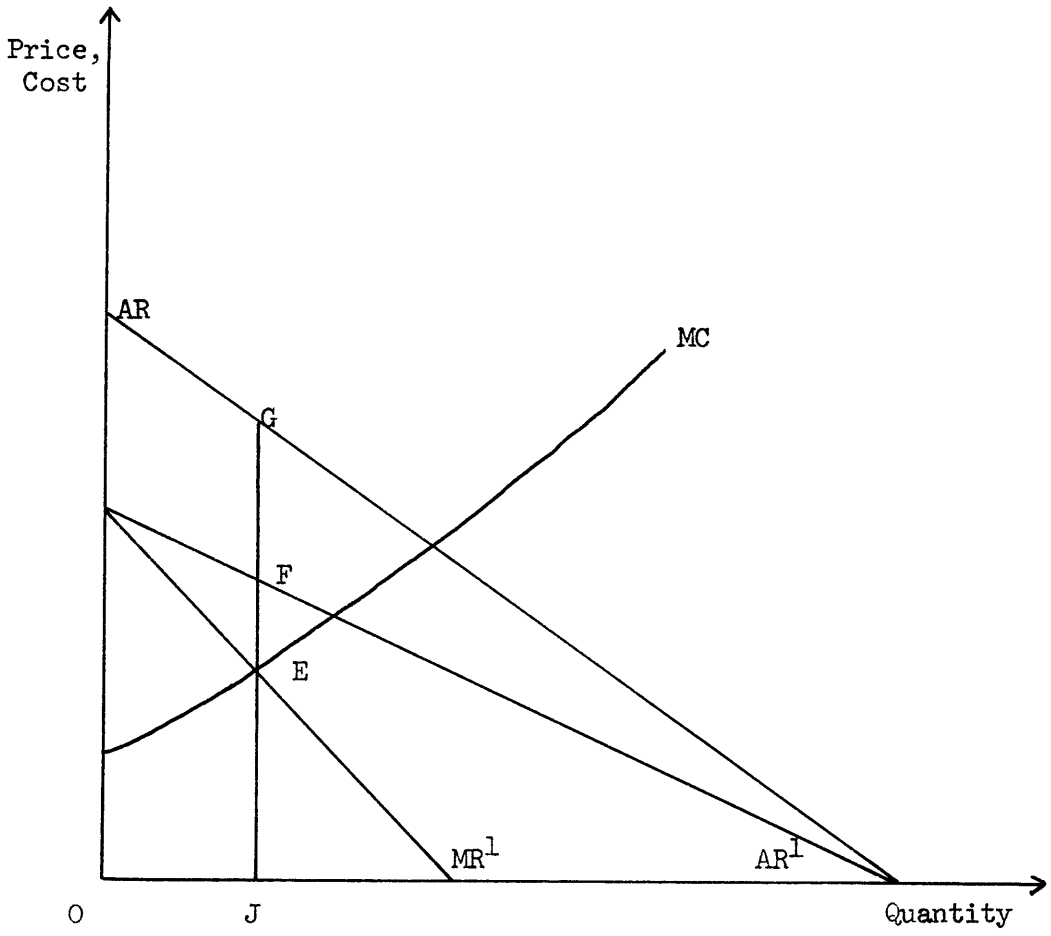

Figure (7)

The equivalence proposition thus breaks down unequivocally: an explicit tariff will not lead to an import level which, if set alternatively as a quota, will generate the same implicit tariff. (Nor will a quota lead to an implicit tariff which, if set alternatively as a tariff, will generate the same level of imports.) Hence, this case also is no exception to the presumption that equivalence will generally break down with the introduction of monopoly elements.

II. Implications of nonequivalence

The demonstration that the equivalence of tariffs and quotas can break down, once we move away from the universally competitive model, is not merely interesting in itself but also has important implications in several areas of analysis.

1. We can now answer directly the question whether under a quota regime the observed implicit tariff rates can be treated as equivalent to identical tariff rates (levied instead of the quota) in the sense of generating the same level of imports and domestic production. This is a question that comes up frequently and the general practice is indeed to treat the observed, implicit tariff rate under a QR regime as the "effective tariff rate." Examination of the equivalence proposition, in terms of the definition used here, throws up the limitations of these deductions when monopoly elements are present.

Thus, for example, in the case when foreign supply is monopolistic, the implicit tariff rate is zero under the quota - refer back to Figure (7) - but setting the actual tariff rate at zero and removing

the quota restriction will not yield the same level of imports and domestic production; the truly equivalent tariff rate is higher. Similarly, in the case where there is domestic, import-monopoly instead, the truly equivalent tariff is lower than the implicit tariff rate in the quota alternative - refer back to Figure (5). Similar conclusions apply to the other cases analysed here: (i) where there is monopolistic-holding of quotas, but competition elsewhere, again the implicit tariff rate will exceed the explicit tariff rate, thus overstating the truly equivalent tariff rate, when the quota is under-utilized; (ii) where there is monopoly in domestic production as well as in the holding of quotas, again the under-utilization of the quota would imply an implicit tariff rate that exceeds the explicit tariff rate and hence overstate the truly equivalent, effective tariff; and (iii) where there is monopoly in domestic production but competition everywhere else, the implicit tariff will exceed the explicit tariff, thus overstating again the truly equivalent, effective tariff that the quota represents.

2. Yet another inference from the equivalence proposition has been that when both tariffs and quotas are applied to an industry, and the discrepancy between the foreign and domestic prices exceeds the tariff rate, the tariff is redundant (except insofar as it cuts into the profits of the quota-holders and yields corresponding revenue to the state). This inference is not necessarily valid, of course, when nonequivalence obtains, and it is important to note this in view of the widespread, simultaneous use of tariffs and quotas in many

developing countries.[12]

The imposition of a tariff, even when the equilibrium solution with this tariff plus a specific quota shows a greater difference between P_f and P_D than the tariff would have produced, may still have a net supplementary protective effect, in the sense of increasing domestic production above what it would otherwise be. This can readily be illustrated in the framework of Case IV, assumption B, in which the domestic monopolist also has a monopoly of the quota. A tariff on imports (at less than the implicit tariff rate) would raise their marginal cost to the monopolist, inducing him to shift toward more domestic production while at the same time curtailing total sales. Similar inter-actions of quotas and tariffs could be demonstrated in other frameworks as well.

3. Note further that equivalence as defined in the present paper is <u>not</u> identical with equivalence defined as follows: that, corresponding to any tariff, there will exist <u>some</u> quota which will result in the same level of imports and importable production. And it is equivalence in the <u>latter</u> sense that is implied in the literature on

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[12]Firms frequently ask for tariff protection for their industries, even when the tariff may in fact be "redundant" (in the sense of the text) by virtue of import control, because import control is subject to frequent revision--semiannually in India--and hence its protective effect is "uncertain," whereas tariffs are revised in practice only after several years and hence can be "relied upon." Frequently also, there are built-in leakages, even in import control, which introduce uncertainty. Thus, for example, many countries now experiment with export-incentive schemes involving "import-replacement" licenses. Under these schemes, imports of a commodity earning a higher premium could well increase, thereby reducing the "protective" effect of import control for the domestic producers of this commodity. A tariff could then be very useful indeed in reducing such a leakage!

balance of payments theory, as in Johnson [3], Meade [5] and Fleming [2], for example, where it is customarily argued that the use of quantitative restrictions is identical with the use of some equivalent tariff, that the use of (further) tariffs is justified only insofar as the country is below the optimum tariff level, and that the use of quantitative restrictions to reduce an external deficit is therefore justified, from the welfare viewpoint, only when the country does not already have optimal restrictions. Equivalence in this latter sense also breaks down, generally speaking, with the introduction of monopoly elements, along with equivalence in the former sense used in this paper; but not always. For example, in Case III B and Case V, equivalence breaks down in the sense of this paper but not in the sense relevant to payments theory. As a general proposition, however, it remains correct to argue that the introduction of monopoly elements will invalidate, generally speaking, the equivalence of tariffs and quotas in either sense; and hence balance of payments literature which relies on equivalence must be generally qualified.

4. It is often stated that quotas are preferred to tariffs because their import-restricting effect, although in principle equivalent to that of tariffs, is certain, whereas that of tariffs is not. The reason cited is the difficulty of estimating the supply and demand schedules, both domestic and foreign. In point of fact, the possible differences in market structure (at the level of foreign supply and domestic production) under the two systems have also to be assessed accurately - and these, as well as their effects, can be far more difficult to judge.

Moreover, the impression that quotas necessarily produce certain predictions about the level of actual imports is incorrect. They frequently set only an upper bound to the level of imports--not merely because foreign or domestic supply and/or demand schedules have changed or because of administrative delays in allocations of exchange, but also because the market structure may depart from the universally competitive model (as in Case IV, for example).[13]

Before concluding, we may spell out briefly two other propositions, relating to quotas per se rather than to the equivalence proposition, which seem to be of some interest.

1. It is frequently thought that import-quota auctions would be equivalent to ordinary quotas, while the profits made by quota-holders would accrue to the state as auction premiums. On the other hand, it is clear from the preceding analysis that the issue depends on how the auctions are conducted. For example, if quotas are allocated to a "large" number of holders under the ordinary system, whereas the auction permits one buyer to bid highest, the latter will bid until the monopolist-profit is exhausted by way of premium, so that the resulting situation will become one of monopoly quota-holding instead of the original competition among quota-holders.[14] In this case,

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[13]Nonutilization due to administrative delays and changed supply or demand conditions is, of course, quite important. The time profile of utilization within the time horizon specified also can be interesting to analyze and would involve an inter-temporal, profit-maximizing solution.

[14]This argument, of course, presumes that the monopolistic buying-up occurs under auctions but that no monopoly is obtained by purchasing from the quota-holders under the nonauction system of allocation. These assumptions, however, may be realistic.

therefore, the auction would convert the situation from one system to another - from Case I to Case III (if we assume competition in domestic production). The equivalence of auctions and ordinary quotas would thus break down.

2. Another interesting policy proposition relates to the widely observed association of quantitative import restrictions with monopoly (or oligopoly) in domestic production and its consequently deleterious effects on both the level of output and the level of efficiency (with respect to minimizing the cost of producing a specified output).[15]

The restrictive effect on the level of output is implicit in the analysis of Case II. The effect on efficiency, however, is perhaps far more signigicant - and has been the concern of planners, using import control regimes, in many developing countries.

It is pertinent, therefore, to consider seriously whether the import control regime should not be modified so as to build into the system a threat of "liberalization" of imports when there is evidence of quality deterioration, inefficiency, or restrictive output policies. (This is, of course, similar to the traditional prescription with respect to removal of tariff protection.)

This prescription, however, runs counter to the present indiscriminate resort to quantitative restrictions and the tendency to

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[15]The absence of foreign competition, combined with a planning setup which rules out new entry and the driving out of inefficient producers, has resulted in considerable inefficiency in countries such as India. It is enough to be a consumer (or a producer using domestic intermediates) in India to see the force of this observation!

ignore the economic costs of import control analyzed here. But there is little doubt that it is imperative to experiment with this idea in practice if a way out of the current widespread "featherbedding" and inefficiency in sheltered markets is to be reduced to less gigantic proportions.[16]

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[16] Under balance-of-payments pressures, more countries may be expected to slide into such economic regimes. During a consulting assignment in Turkey in the summer of 1964, I found Turkey gradually moving into such a setup. There, as soon as a domestic industry is established, the imports of that commodity are practically automatically "deliberalized." Aside from the adverse effects on quality and costs which may confidently be expected from this policy, its operation has led to interesting destabilization in the short term. Thus, as soon as the industry comes into operation, there is an excessive import of the commodity in the expectation that it will be deliberalized: this happened with rubber tires, for example.

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CHAPTER VII

DOMESTIC DISTORTIONS, TARIFFS AND THE THEORY OF OPTIMUM SUBSIDY[1]

There is confusion of varying degrees in the current literature on trade theory concerning the desirable form of intervention in foreign trade when the economy is characterized by domestic distortions (divergences of the commodity price ratios from the corresponding marginal rates of transformation). For instance, the age-old debate over whether tariffs or subsidies should be used to protect an infant industry is still carried on in terms of the respective political and psychological merits of the two forms of protection while their relative economic advantages are assumed not to point in the direction of a definite choice.[2]

Three questions about the use of tariffs when domestic distortions exist need to be distinguished here. (1) Is a tariff necessarily superior to free trade (that is, can a tariff rate always be found that yields a welfare position not inferior to that produced by free trade)? (2) Is a tariff policy necessarily superior to any other form of trade policy? (3) If the choice can be made from the entire range of policy

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[1]An early draft of this paper was read to seminars at Massachusetts Institute of Technology, the University of Chicago, and Stanford University. C.P. Kindleberger and H.G. Johnson have made useful suggestions.

[2]For instance, C.P. Kindleberger [8], as does also G. Haberler [4], states the economic argument in favor of subsidies and tariffs without stating definitely that one is invariably superior to the other from the economic viewpoint.

instruments, which is the optimal economic policy?

In Section I we state the general theory that provides the answers to these three questions. In the light of this theory, we examine the propositions advanced in the two central contributions to trade theory in this field: Haberler's justly celebrated 1950 Economic Journal paper [5] and Hagen's recent analysis [6] of wage differentials. Sections II and III examine these two analyses. Section IV concludes with some observations concerning the relative advantages of tariffs and subsidies from the practical viewpoint.

I. General Theory

The three questions posed here can be effectively answered by analyzing the characteristics of an optimum solution. Thus, for instance, the optimum tariff argument can be stated elegantly in terms of these characteristics. The achievement of an optimum solution is characterized by the equality of the foreign rate of transformation (FRT), the domestic rate of transformation in production (DRT), and the domestic rate of substitution in consumption (DRS). If the country has monopoly power in trade, a competitive free trade solution will be characterized by DRS = DRT $\neq$ FRT. By introducing a suitable tariff, a country can achieve DRS = DRT = FRT. A subsidy (tax) on the domestic production of importables (exportables) could equalize DRT and FRT but would destroy the equality of DRS with DRT. Hence it is clear that a tax-cum-subsidy on domestic production is necessarily inferior to an optimum tariff. Moreover it may be impossible in any given empirical situation to devise a tax-cum-subsidy that would yield a solution superior to that arrived at under free trade.

By analogy we can argue that, in the case of domestic distortions, DRS = FRT ≠ DRT under free trade. A suitable tariff can equalize FRT and DRT but would destroy the equality between DRS and FRT. Hence it is clear that no tariff may exist that would yield a solution superior to that under free trade. A suitable tax-cum-subsidy on domestic production, however, would enable the policy-maker to secure DRS = FRT = DRT and hence is necessarily the optimum solution. Hence a tariff policy is also necessarily inferior to an optimum tax-cum-subsidy policy. And the same argument must hold true of trade subsidies as well since they also, like tariffs, are directed at foreign trade whereas the problem to be tackled is one of domestic distortion.

Three propositions, therefore, follow in the case of domestic distortions. (a) A tariff is not necessarily superior to free trade. (b) A tariff is not necessarily superior to an export (or import) subsidy. (c) A policy permitting the attainment of maximum welfare involves a tax-cum-subsidy on domestic production. Just as there exists an optimum tariff policy for a divergence between foreign prices and FRT, so there exists an optimum subsidy (or an equivalent tax-cum-subsidy) policy for a divergence between domestic prices and DRT.

II. Haberler on External Economies

A divergence between the domestic commodity price ratios and the marginal rates of transformation between commodities may arise from what are usually described as "external economies." These may

take various forms.[3] It is most fashionable at the moment to discuss the external economies arising from the interdependence of investment decisions.[4]

Haberler analyzes this problem in terms of the standard two-good, two-factor model of trade theory, using geometrical methods. Haberler is aware that a tariff is not necessarily superior to free trade. However, he is in error concerning the relative advantages of tariffs and trade subsidies. Further, he does not discuss the optimum economic policy under the circumstances.

Haberler distinguishes between two situations according to whether the domestic production of importables rises or falls (what he calls the direction of "specialization"). We shall analyze each case separately.

Case I: In the former case, illustrated here in Figure (1a), AB is the production possibility curve. The discrepancy between the domestic price ratio and the domestic rate of transformation (DRT) leads to self-sufficiency equilibrium at S. Free trade, at the given international price PF, leads to production at P, consumption at F, export of agricultural goods, and a deterioration in welfare.[5]

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[3]According to Haberler [5, p. 236], "there may be a deviation between social and private cost due to external economies or diseconomies, i.e. due to certain cost-raising or cost-reduction factors which would come into play if one industry expanded and the other contracted--factors which for some reason or other are not, or not sufficiently, allowed for in private cost calculations."

[4]This has been analyzed in the context of international trade by J. Bhagwati [1].

[5]Haberler wrongly seems to imply that the country must export agricultural goods in this case. There is no reason, once there is a

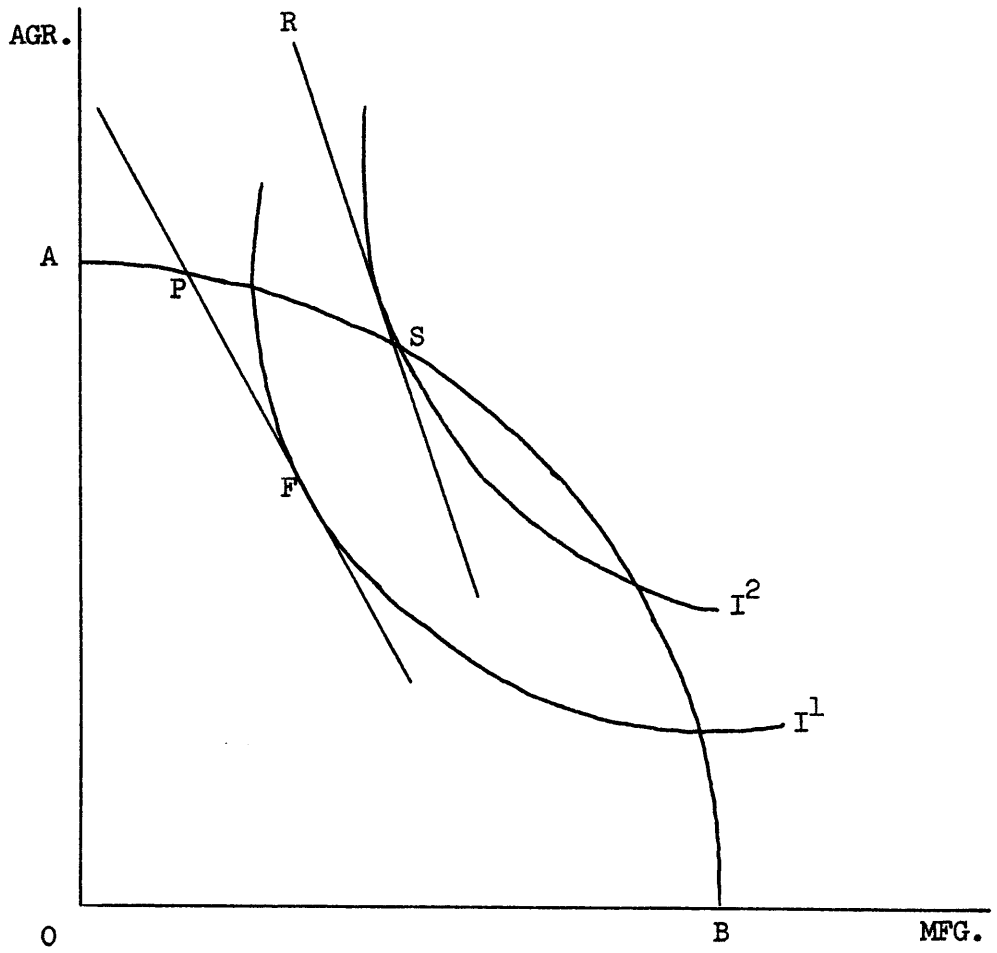

Figure (1a)

The following comments are warranted. First, although Haberler does not state this explicitly, it can be shown that prohibitive protection may make the country worse off (Figure (1b)). Second, it follows from Section I that no tariff may be superior to free trade (this is implicit, we think, in Haberler's statements elsewhere in his paper). Finally, the optimum result could be achieved by a policy of tax-cum-subsidy on domestic production. Such a policy is illustrated in Figure (1c) where the tax-cum-subsidy eliminates the divergence between commodity prices and DRT and brings production to P' and consumption to F'.

Case II: Haberler distinguishes the other case by arguing that the self-sufficiency price ratio RS may be less steep than the given foreign price ratio PF. Here the production point is shifted to the right by free trade.[6] In this case, Haberler argues that "the country would specialize in the 'right' direction but not sufficiently. It would after trade be better off than before, but it would not reach the optimum point. . . . In that case an export or import subsidy (rather than a tariff) would be indicated."[7]

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domestic distortion, why a country should necessarily export the commodity that is cheaper than abroad in the absence of trade.

[6]This, of course, is erroneous, as noted in n. 5. Haberler implies that under free trade manufactures will now become the exported good. Haberler also describes this case as characterized by specialization in the "right" direction. He is right if, by this, he means that the movement of the production point to the right of S, caused by free trade, will necessarily improve welfare. He is wrong, however, if he means that the commodity exported will be that which would have been exported if the divergence did not exist.

[7]Haberler [5, p. 237]. Our italics.

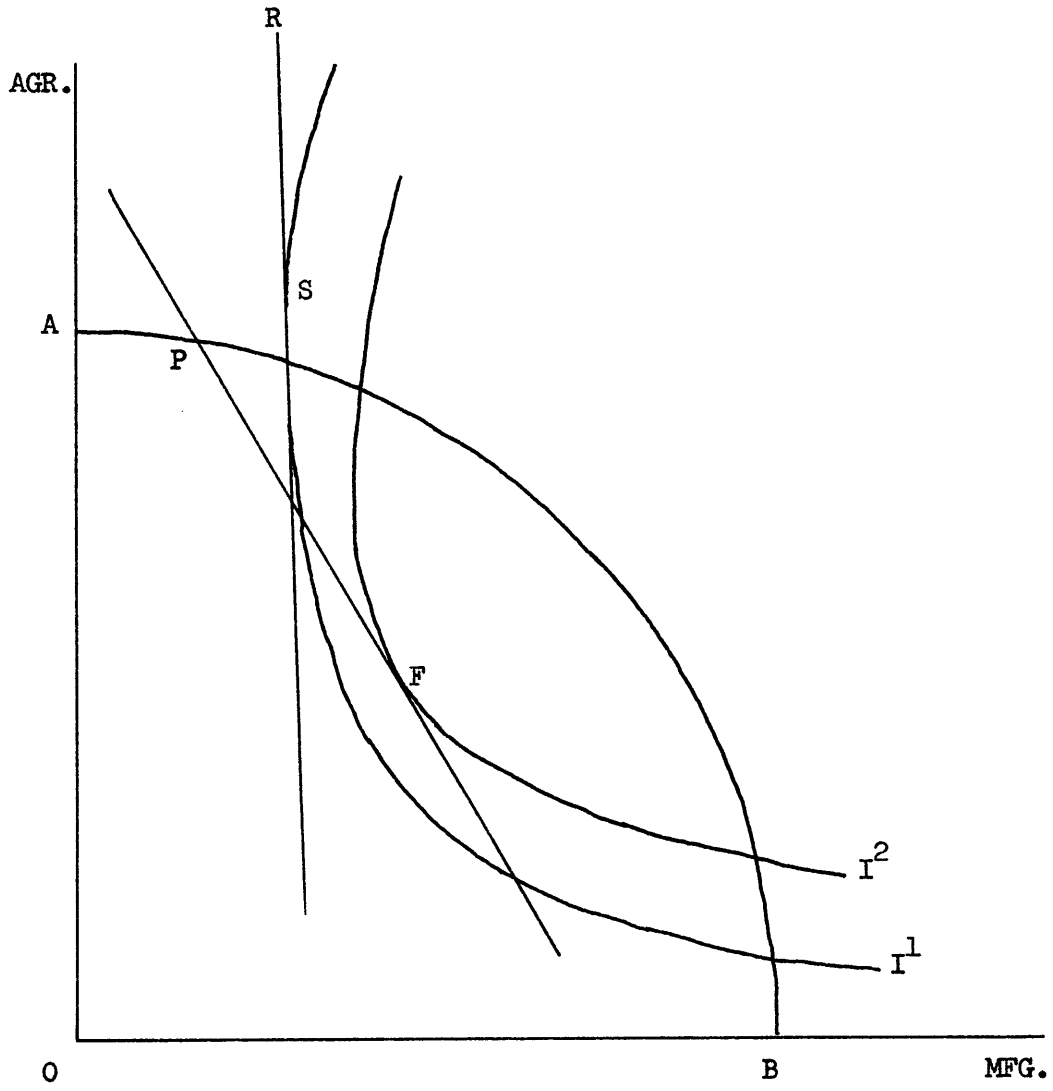

Figure (1b)

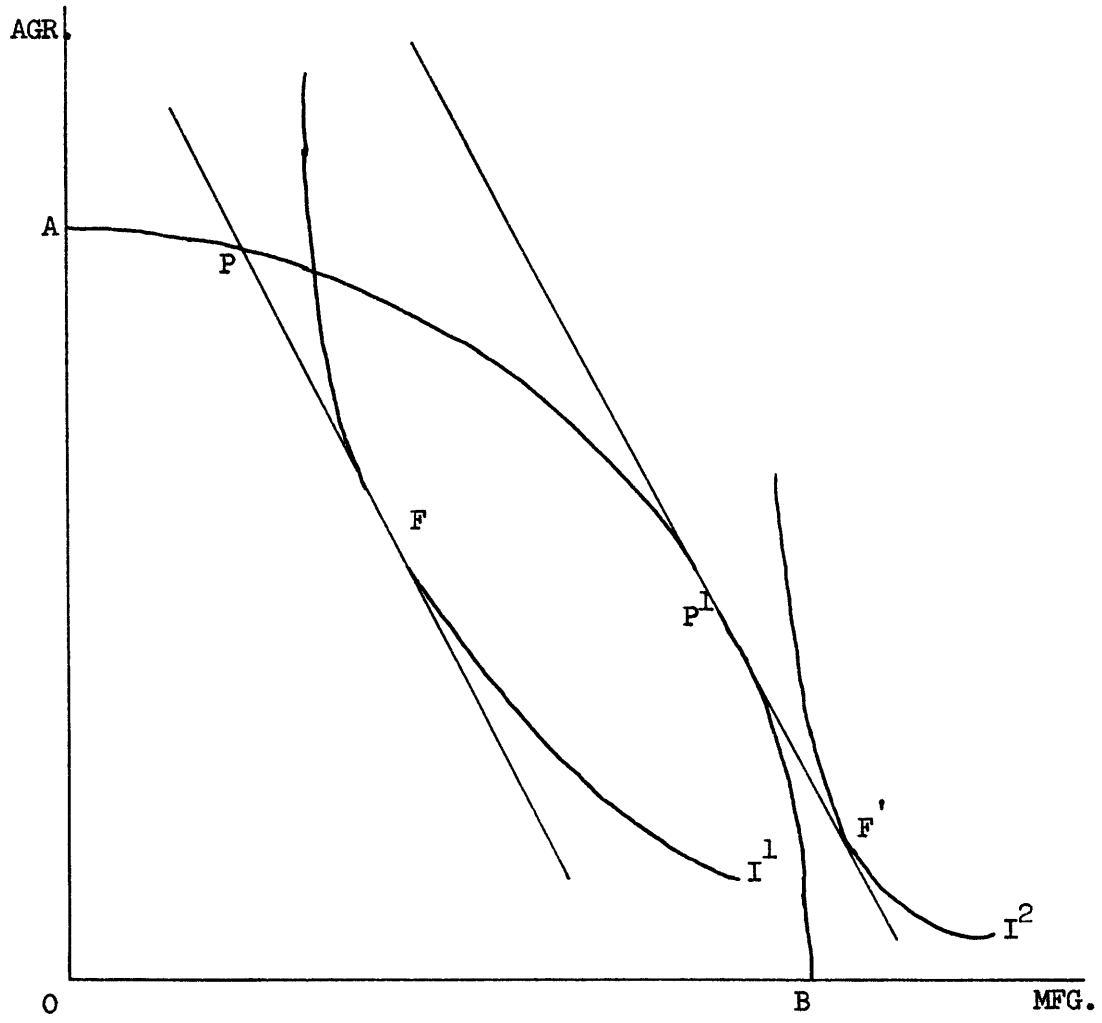

Figure (1c)

While Haberler is right in arguing that a movement to the right of S, when free trade is introduced, will necessarily be beneficial, his conclusion that an export (or import) subsidy is indicated and would be preferable to a tariff is erroneous in every rigorous sense in which it may be understood. First, it cannot be argued that the optimal solution when the policy used is an export (or import) subsidy will be necessarily superior to that when the policy used is a tariff. As argued in Section I, both policies are handicapped as they seek to affect foreign trade whereas the distortion is domestic; there is no reason why one should necessarily be better than the other. Second, nor can one maintain that an export (or import) subsidy will necessarily exist that will be superior to free trade, just as one cannot maintain that a tariff necessarily will be available that is superior to free trade. Third, the optimum solution again is to impose a tax-cum-subsidy on domestic production.

Case III: Hagen on wage differentials. A divergence between DRT and the domestic price ratio, arising from factor-market imperfections in the form of intersectoral wage differentials, has been discussed in relation to trade policy by Hagen. Before we proceed to Hagen's analysis, certain observations concerning the circumstances in which differential remuneration causes a distortion are in order.

The observed wage differentials between the urban and rural sector may not represent a genuine distortion. For instance, they may reflect (1) a utility preference between occupations on the part of the wage-earners, or (2) a rent (on scarce skills), or (3) a return on investment in human capital (by training), or (4) a return on investment

in the cost of movement (from the rural to the urban sector). There would be a distortion, however, where the differential is attributable to (5) trade-union intervention, or (6) prestige-cum-humanitarian grounds ("I must pay my man a decent wage") that fix wages at varying levels in different sectors. Two other types of explanations may also be discussed: (7) Hagen argues that the differential occurs in manufacture because this is the advancing sector and growing activities inevitably have to pay higher wages to draw labor away from other industries. While this "dynamic" argument appears to provide support for the distortionary character of the differential, there are difficulties with it. For instance, the fact that a differential has to be maintained to draw labor away may very well be due to the cost of movement.[8] (8) A more substantive argument is that the rural sector affords employment to non-adult members of the family whereas, in the urban sectory, the adult alone gets employment (owing to institutional reasons such as factory acts). Hence, to migrate, an adult would need to be compensated for the loss of employment by the non-adult members of his family.[9] If this is the case, there is certainly a market imperfection (assuming that individual preferences rather than collective preferences, expressed in legislation, are relevant) and hence distortion.[10]

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[8]Other difficulties also arise when the argument is used in conjunction with a static analysis. These will be discussed later.

[9]This hypothesis was suggested by D. Mazumdar.

[10]This "distortion," unlike the others, involves a contraction of the labor force as labor moves from one sector to another. Hence, the

In the following analysis, we shall assume that the wage differential represents a genuine distortion while remaining skeptical about the degree to which such distortions obtain in the actual world.[11] We will also adopt Hagen's analytical framework of a two-commodity, two-factor model and a constant wage differential. The assumption of constancy of the wage differential raises some difficulties, probably with reasons (3) and (6) but certainly with reason (7), on which Hagen mainly relies. As will be seen presently, Hagen's analysis involves the contraction of manufactures after the introduction of trade; if the wage differential is due to the fact that manufactures are expanding and drawing labor away, it should surely reverse itself during the transition from autarky to free trade. The difficulty is that Hagen, in relying upon reason (7) while using traditional trade analysis, is illegitimately superimposing a dynamic argument upon a comparative statics framework. To analyze the distortion arising from reason (8) one needs an explicitly dynamic analysis. Hence, the following analysis applies, strictly speaking, only to distortions produced by reasons (5) and (6).

Hagen concludes that a tariff is superior to free trade when the importable manufacturing activity has to pay the higher wage.

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following analysis does not apply and a fresh solution, incorporating a changing labor supply, is called for. Note here also that the wage differential variety of distortion is quite distinct from the distortion caused when, although the wage is identical between sectors, it differs from the "shadow" optimal wage. This distortion has been blurred by recent analysts, especially W. A. Lewis [9] and H. Myint [10]. Also see Bhagwati [1].

[11] A. Kafka [7].

> As a result of the wage disparity, manufacturing industry will be undersold by imports when the foreign exchanges are in equilibrium. Protection which permits such industry to exist will increase real income in the economy. However, a subsidy per unit of labour equal to the wage differential will increase real income further, and if combined with free trade will permit attaining an optimum optimorum.[12]

Hagen works successively with two models that differ only in the assumption concerning the number of factors of production. Since the first model has only one factor and is only a special case of the second, two-factor model, we shall concentrate here on the latter. It is assumed that all the standard Paretian conditions obtain except for the wage differential. We begin with Hagen's analysis and then comment on it.

In Figure (2a) AQB is the production possibility curve on the assumption of a wage uniform between the two sectors. APB is the production possibility curve, assuming the given wage differential.[13] The

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[12][6, p. 498]. Hagen himself does not state explicitly that he is confining the analysis to the case where the differential operates against the importable activity. If the differential were to work in the contrary direction, the results would naturally have to be modified radically.

[13]The reader can satisfy himself as to the "shrinking in" of the production possibility curve by manipulating the Edgeworth box diagram. The careful reader of Hagen's paper will note that Hagen draws the "shrunk-in" production possibility curve so that it is convex (in the mathematical sense). This, however, is a property that does not necessarily follow from the assumptions made, and it is possible to produce counter-examples of concavity, although we have not been able to produce a general mathematical proof. (When this paper was read at Stanford, Paul David drew attention to A. Fishlow and P. David [3] for a proof of this proposition. These writers have also anticipated our criticism concerning Hagen's confusion of statics and dynamics.) We shall use the convex curve, however, as it enables us to state our propositions in terms of equalities and without bothering about second-order conditions; the substance of the propositions that interest us here is unaffected

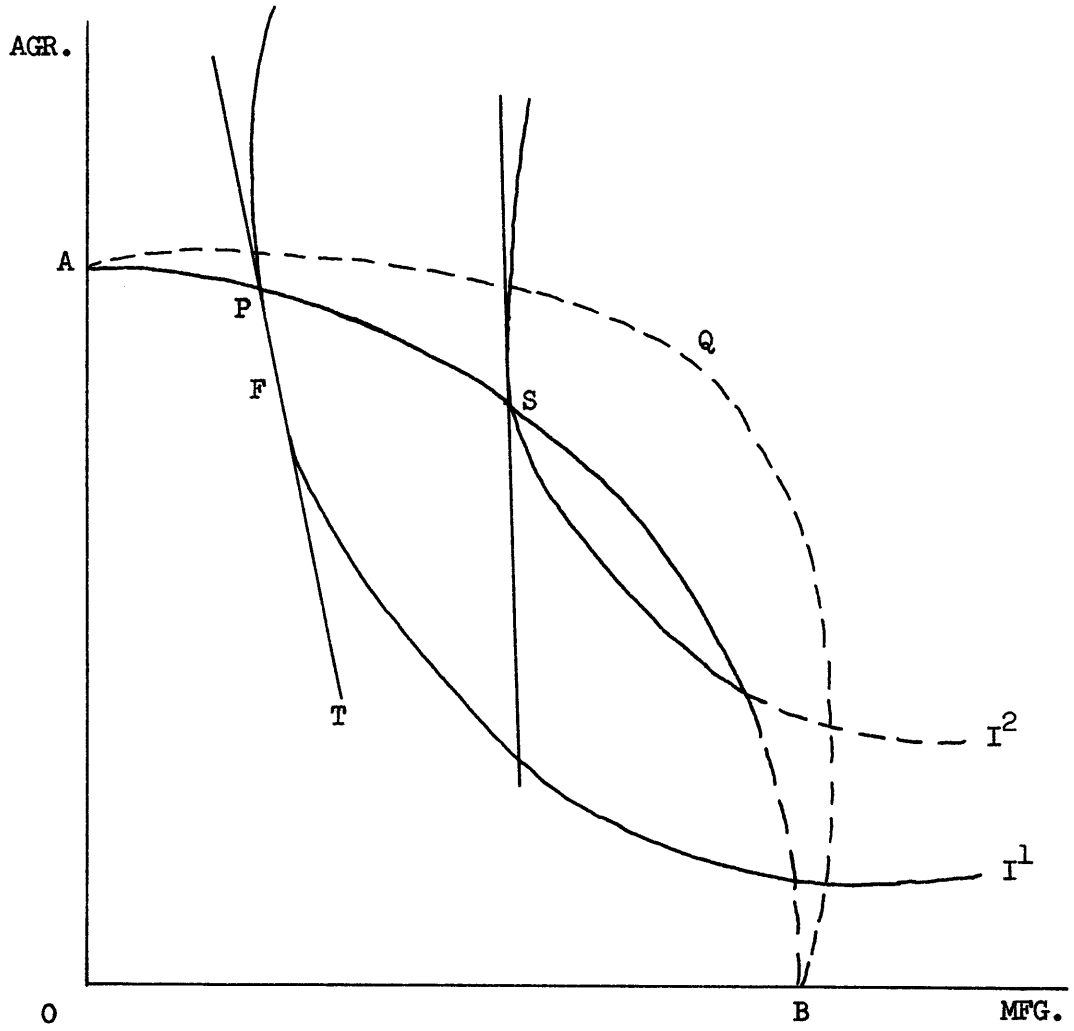

Figure (2a)

wage differential against manufactures, aside from reducing the production feasibilities, will make the commodity price ratio, at any production point on APB, steeper than the rate of transformation along APB so that the price ratio understates the profitability of transforming agriculture into manufactures. PT being the foreign price ratio, the economy produces at P and consumes at F under free trade. Under self-sufficiency, however, the relative price of manufactures being higher, the economy would produce and consume at S and be better off. From this, Hagen [6, p. 510] concludes: "Protection of manufacturing from foreign trade will increase real income."

However, the conclusion must be rectified. First, as illustrated in Figure (2b), where the contrary possibility is shown, prohibitive protection is not necessarily superior to free trade. Second, it may further be impossible as argued in Section I, to find any level of tariff (or trade subsidy) that is superior to free trade. Third, a tax-cum-subsidy on the domestic production of the commodities, which eliminates the divergence between the price ratio and DRT (along APB) would necessarily yield a better solution than protection. In Figure (2c), F' represents the consumption and P' the production reached by the pursuit of such a tax-cum-subsidy policy.[14] Finally, a policy

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by this complication. The divergence between the commodity price ratio and the domestic rate of transformation, which also results from the wage differential, needs a rigorous proof, which can be found by the reader in Hagen [6, pp. 507-8].

[14]In relation to this point, it is also worth noting that the standard procedure adopted by several tariff commissions, of choosing a tariff rate that just offsets the differential between the average domestic cost at some arbitrary, given production of the existing units

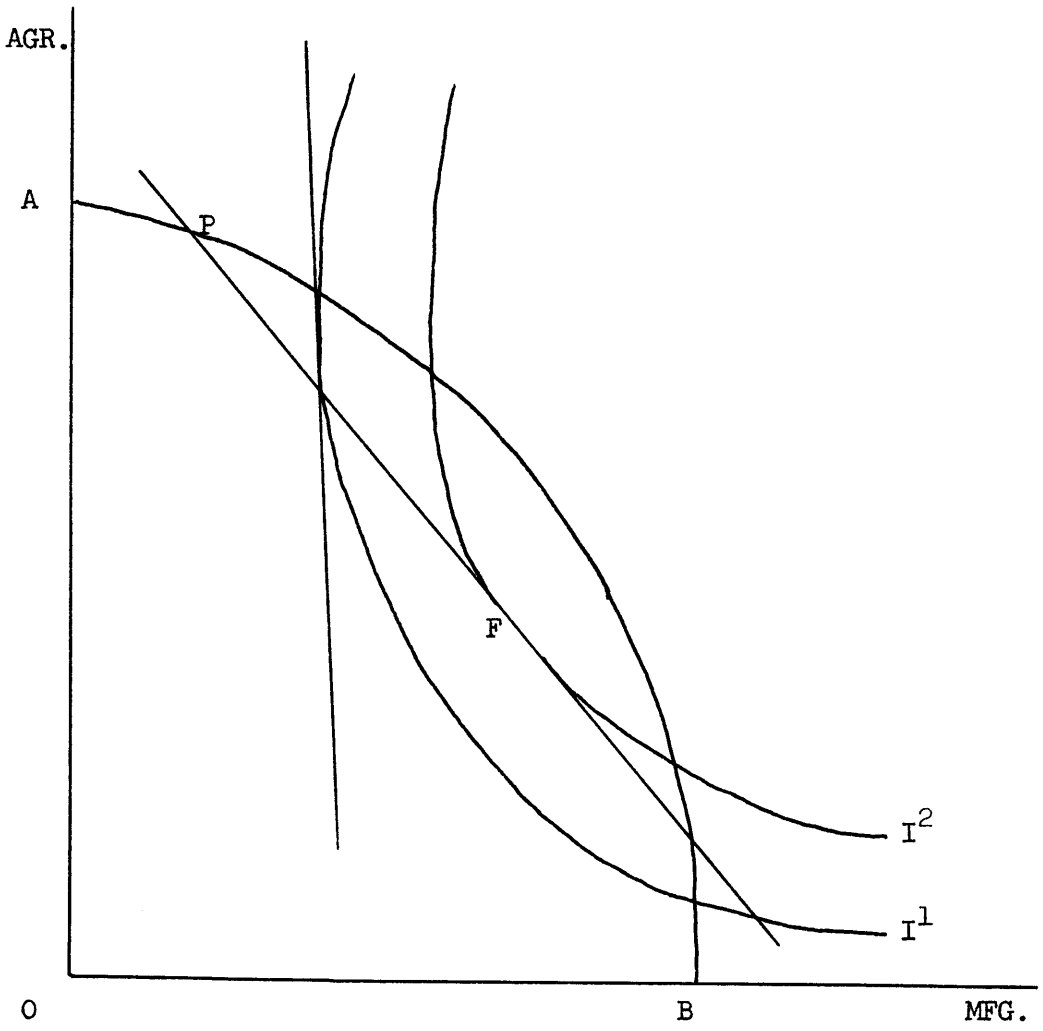

Figure (2b)

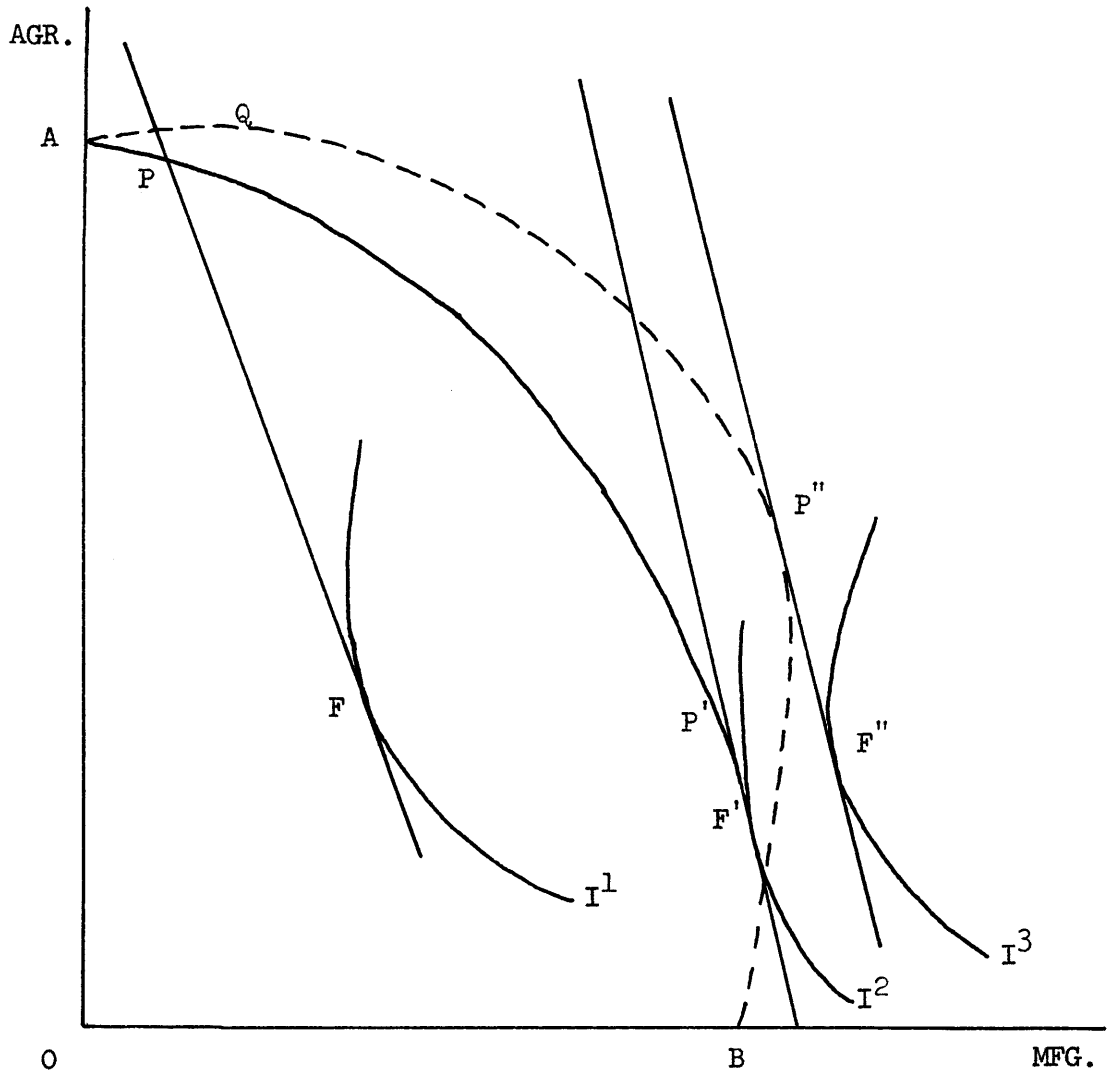

Figure (2c)

of tax-cum-subsidy on labor use would achieve equilibrium production at P" and consumption at F" in Figure (2c) and produce the "first-best" result, as recognized by Hagen.

Note that, in contrast to the case of external economies, the optimum tax-cum-subsidy on domestic production, while superior to protection or trade subsidy, does not yield the optimum optimorum in the wage-differential case. The reason is straightforward. The wage differential causes not merely a domestic distortion but also a restriction of the production possibility curve. A tax-cum-subsidy on domestic production measure will, therefore, merely eliminate the domestic distortion but not restore the economy to the Paretian production possibility curve (AQB). It will thus achieve the equality of FRT and DRS with DRT along the restricted production possibility curve (APB) and hence constitute the optimal solution when the wage differential cannot be directly eliminated. Where, however, a direct attack on the wage differential is permitted, the fully optimal, "first-best" solution can be achieved by a policy of tax-cum-subsidy on factor use.

III. Conclusion

We have argued here that an optimum subsidy (or a tax-cum-subsidy equivalent) is necessarily superior to any tariff when the distortion is domestic. It may be questioned, however, whether this advantage would obtain in practice. This question, of course, cannot be

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and the landed (c.i.f.) cost, is not necessarily correct. There is no reason why the tariff rate which just offsets this differential is necessarily the tariff rate which is optimum from the viewpoint of economic policy.

settled purely at the economic level. A fully satisfactory treatment of this issue would necessarily involve disciplines ranging from politics to psychology. However, by way of conclusion, we think it would be useful to consider a few arguments that are relevant to the final, realistic choice of policy.

1. The contention that the payment of subsidies would involve the collection of taxes which in practice cannot be levied in a non-distortionary fashion is fallacious. A tax-cum-subsidy scheme could always be devised that would both eliminate the estimated divergence and collect taxes sufficient to pay the subsidies.

2. The estimation problem is also easier with subsidies than with tariffs. The former involves estimating merely the divergence between the commodity price ratio and DRT (at the relevant production point). The latter must extend the exercises necessarily to the estimation of the relevant DRS (which involves locating both the right level of income and the relevant consumption point).

3. The political argument has usually been claimed by free traders to favor the payment of subsidies under external economy arguments like infant industries. It is thought that it would be difficult to pay a subsidy longer than strictly necessary whereas a tariff may be more difficult to abolish. It must be pointed out, however, that this argument also pulls the other way because, precisely for the reasons which make a subsidy difficult to continue, a subsidy is difficult to choose in preference to a tariff.

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PART III

GROWTH AND LESS DEVELOPED COUNTRIES

CHAPTER VIII

IMMISERIZING GROWTH: A GEOMETRICAL NOTE

The effect of economic expansion on international trade has been receiving increasing attention from economic theorists since the publication of Professor Hicks' stimulating analysis of the "dollar problem."[1] It has, however, been insufficiently realised that under certain circumstances, economic expansion may harm the growing country itself.[2] Economic expansion increases output which, however, might lead to a sufficient deterioration in the terms of trade to offset the beneficial effect of expansion and reduce the real income of the growing country. It is the purpose of this note to formulate the conditions under which immiserizing growth will occur. Section I sets out the analysis geometrically and arrives at the criterion for immiserizing growth. Section II discusses some of the implications of this criterion.

I

In the ensuing analysis we assume the traditional two-country, two commodity "real" model where full-employment always obtains. We also assume, to simplify the analysis, that growth is confined to a single country so that the other country (i.e., the rest-of-the-world)

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[1] J. R. Hicks [3]. The following are of interest: H. G. Johnson [5]; E. J. Mishan [6]; and W. M. Corden [1].

[2] Exception must be made, however, in the case of Professor Johnson [4] [5].

is not experiencing any growth in output; this assumption enables us to assume the offer curve of the rest-of-the-world as "given" during the course of our analysis. Finally, we simplify the problem by beginning with an investigation of the conditions under which growth would leave the country just as well off as before, and then determining whether the equilibrium actually realised would involve still less favourable terms of trade; this approach has the convenience of avoiding the need for an explicit analysis of the income effect of growth.

Consider now Figure (1) which represents the growing economy. C_0 is the pre-expansion consumption, P_0 the pre-expansion production point, P_0C_0 the pre-expansion terms of trade or price-line, C_0R_0 the imports of Y into the country and R_0P_0 the exports of X from the country. The production possibility curve tangential to P_0C_0 has not been drawn in to avoid cluttering up the diagram; the indifference curve through C_0 is tangential to P_0C_0 at C_0 and has been drawn partially. Consider now growth which pushes the production possibility curve outwards and which, at constant terms of trade, would bring production from P_0 to P_1'. Now assume that the terms of trade are changed just enough to offset the gain from growth; the relevant price line being C_1F_1 which is tangential to the old indifference and the new production possibility curve. We later assume, legitimately for infinitesimal changes, that C_1P_1 coincides with C_0P_1'.

The combined effect of the expansion and the compensating adjustment of the terms of trade is to reduce the demand for imports from C_0R_0 to $C_1'R_1'$. This reduction can be analysed into the sum of three effects:

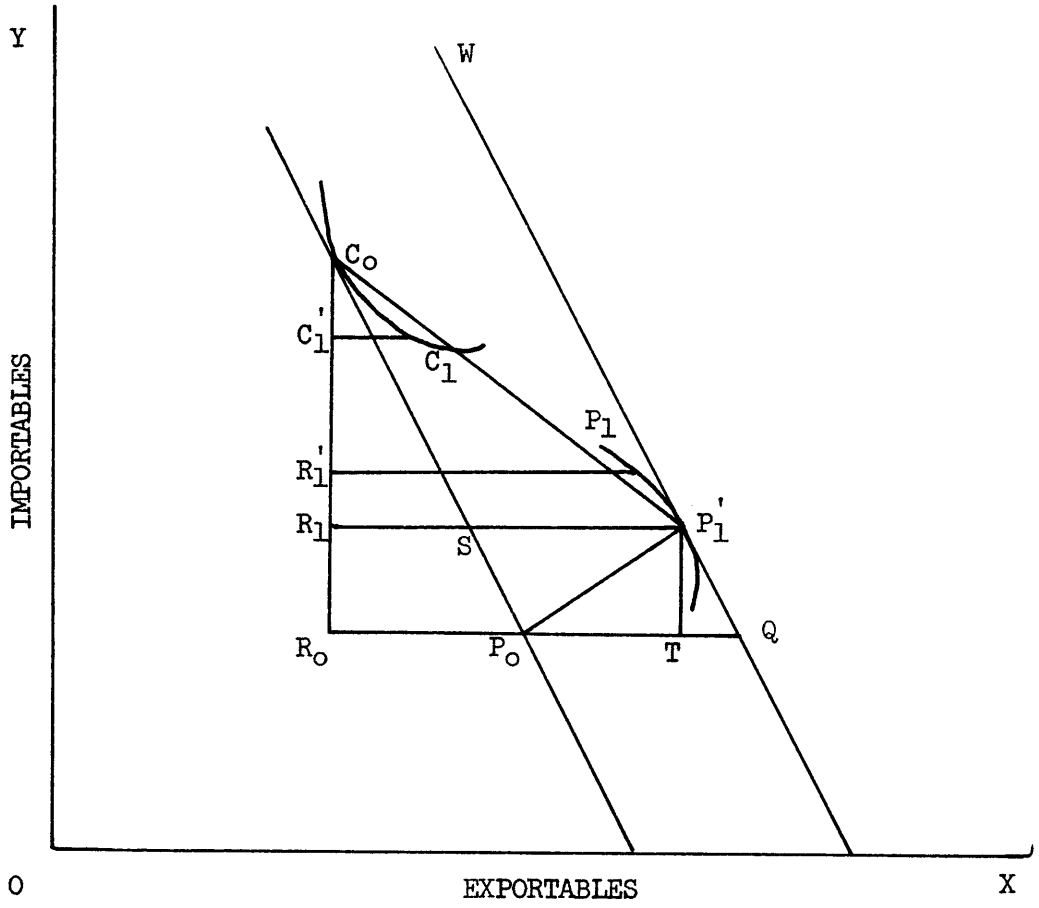

Figure (1)

(1) The increase in production of importables due to economic expansion:

This increase (R_0R_1 in the diagram) may be analysed as follows. Let p_0 and p_1 be the original and the zero-gain prices respectively, measured as the number of units of exportables required to buy a unit of importables. Then the change in total output, valued at initial prices, is:

$$P_0T + TQ = P_0Q = SP_1'$$

and

$$SP_1' = \frac{P_1'R_1 - R_1S}{C_0R_1} \cdot C_0R_1 = (p_1 - p_0) \cdot C_0R_1$$

The change in the production of importables is:

$$R_0R_1 = P_1'T = \frac{\partial Y}{\partial K} \cdot P_0Q = \frac{\partial Y}{\partial K} \cdot SP_1'$$

where K is defined to be the country's productive capacity which is assumed to be kept fully employed and is measured by the value in terms of exportables of the output the country would produce at the initial terms of trade and Y is the domestic output of importables. Then,

$$R_0R_1 = C_0R_1 \cdot \frac{\partial Y}{\partial K} \cdot (p_1 - p_0)$$

Since we have assumed the changes to be infinitesimal, it follows that we can assume $C_0R_1 = C_0R_0$, the initial volume of imports, so that

$$R_0R_1 = M \cdot \frac{\partial Y}{\partial K} \cdot dp \qquad (S_m \equiv M) \qquad (1)$$

where M is the quantity of imports.

This shows the change in the production of importables due to the economic expansion itself. The expression is normally positive, indicating that the output of importables increases, consequent on

economic expansion, at constant terms of trade. It should be noted here, however, that, as argued in Section II, the output of importables may actually contract due to the expansion.

(2) The decrease in consumption of importables due to the price-change:

The price-change (from p_0 to p_1) shifts consumption along the indifference curve to C_1. The consumption of importables is then reduced by:

$$C_0C_1' = - \frac{\partial C}{\partial p} \cdot dp \qquad (2)$$

where C is the total demand for importables.

(3) The increase in production of importables due to the price-change:

The price-change shifts production along the production possibility curve to P_1. The production of importables is then increased by:

$$R_1R_1' = \frac{\partial Y}{\partial p} \cdot dp \qquad (3)$$

The total decrease in the domestic demand for imports[3] is the sum of the three effects (1), (2) and (3):

$$\left(M. \frac{\partial Y}{\partial K} + \frac{\partial Y}{\partial p} - \frac{\partial C}{\partial p} \right) . dp \qquad (4)$$

This expression measures the decrease in demand for imports when the effect of growth on real income is exactly offset by an adverse movement of the terms of trade In the abnormal case where output of importables falls as a result of growth, the expression may be negative, indicating an increase in the demand for imports.

Whether the country will actually be made worse off or not

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[3]As distinguished from importables.

depends on what would happen to the quantity of imports supplied if the terms of trade were adjusted as assumed. The change in imports supplied as a result of such a price change is:

$$\frac{\partial S_m}{\partial p} \cdot dp \qquad (5)$$

The sum of (4) and (5) constitutes the excess supply of imports at the zero-gain terms of trade: if it is positive, the terms of trade will not move against the growing country enough to deprive it of all gain from growth; but if it is negative, the price of imports will have to rise still further to preserve equilibrium, and the growing country will actually be made worse off by growth.

The economic meaning of this criterion for immiserizing growth will be considered in the next section; for this purpose a neater formulation of the criterion is desirable, and this can be derived by subjecting it to some algebraic manipulation.

Multiplying (4) and (5) by $\frac{p}{M.dp}$, we get our criterion for immiserizing growth as:

$$\left(\frac{C}{M}.\varepsilon + \frac{Y}{M}.\sigma + y + r_m\right) < 0 \qquad (6)$$

which may be written as:

$$\left(\frac{C}{M}.\varepsilon + \frac{Y}{M}.\sigma + y\right) < - r_m \qquad (7)$$

where

$$\varepsilon = - \frac{p}{C} \cdot \frac{\partial C}{\partial p}, \qquad r_m = \frac{p}{M} \cdot \frac{\partial S_m}{\partial p} \qquad (S_m \equiv M)$$

$$\sigma = \frac{p}{Y} \cdot \frac{\partial Y}{\partial p} \text{ and } y = p. \frac{\partial Y}{\partial K}$$

This criterion is also expressible in the alternative equivalent form:

$$\left(\frac{C}{M} \cdot \varepsilon + \frac{Y}{M} \cdot \sigma + y\right) < 1 - n_x \qquad (8)$$

where $n_x = \frac{p}{X^o} \cdot \frac{\partial X^o}{\partial p}$ and X^o is the quantity of exports. This follows from the fact that n_x and r_m are the <u>total</u> elasticities of the rest-of-the-world's offer curve; n_x being the elasticity of the rest-of-the-world's demand for imports (into the rest-of-the-world) in response to an infinitesimal change in the terms of trade and r_m being the elasticity of the rest-of-the-world's supply of (its) exports (to the growing country) in response to an infinitesimal shift in the terms of trade. It is a well-known proposition in the theory of international trade that $n_x - r_m = 1$; hence, $1 - n_x = - r_m$.

II

What are the implications of the criterion that we have derived in Section I? It will be remembered that $\varepsilon = \frac{p}{Y} \cdot \frac{\partial Y}{\partial p}$ and is thus necessarily positive and $\sigma = - \frac{p}{C} \cdot \frac{\partial C}{\partial p}$ which again, being the constant-utility or expenditure-compensated demand-elasticity with respect to a change in the price of importables, is necessarily positive.[4] We can see from (6), (7) or (8) that the <u>possibility</u> of immiserizing growth is increased if:

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[4]This argument obviously rests on the assumption of "well-behaved" (convex) indifference curves and (concave) transformation curves, concavity being defined with reference to the origin and <u>not</u> in the strict mathematical sense.

(i) $\frac{Y}{M}$, the ratio of domestic production to import of importables is small. Since $\frac{C}{M} = 1 + \frac{Y}{M}$, it follows that $\frac{C}{M}$ will also be small when $\frac{Y}{M}$ is small;

(ii) ε, the constant-utility demand-elasticity for importables with respect to a change in the price of importables, is small; this would depend on the substitution effect against importables being negligible when the price of importables rises; and

(iii) σ, the elasticity in supply of importables when production shifts along the production possibility curve in response to a change in the price of importables, is small.

These are, neither singly nor in combination, sufficient conditions for immiserizing growth. In fact, the possibility of immiserizing growth arises only when, with these conditions favourably fulfilled, either or both of the following crucial conditions are fulfilled:

(a) the offer of the rest-of-the-world is inelastic, (i.e., r_m is negative, which may be for the extreme, and by no means necessary, reason that the growing country's exports are Giffen goods abroad); and

(b) growth actually reduces the domestic production of importables at constant relative commodity prices (i.e., y is negative).

Stringent as the latter condition may appear at first sight, recent analyses have shown that it is feasible under relatively simple

assumptions. Thus the Rybczynski proposition states that under a two-commodity, two-factor model where, say, labour and land being the factors, one good is labour-intensive and the other land-intensive, if labour (land) increases in supply, then the output of the land-intensive (labour-intensive) industry must actually contract if the relative commodity prices are maintained constant.[5] Professor Johnson has recently advanced the proposition that under neutral technical progress in one industry, the technology of the other and the total factor endowment remaining unchanged, the output of the other industry must actually fall under constant relative commodity prices.[6] It may be of interest to note that under biased progress as well it is possible to establish conditions under which the output of the non-innovating industry will contract.[7]

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[5] Rybczynski [7]. Linear homogeneity of the production functions and diminishing returns are sufficient conditions for the proposition to hold. The strong Samuelson notion of factor-intensity is not necessary.

[6] Johnson [5]. Diminishing returns are sufficient for this proposition to hold. The proposition can be readily extended to more than two goods and factors.

[7] The conditions under which this result will obtain have been investigated in a brilliant paper by Findlay and Grubert [2].

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CHAPTER IX

TRADE LIBERALIZATION AMONG LDC'S, TRADE THEORY AND GATT RULES[1]

Political attitudes change rapidly and astonishingly in the field of international, commercial policy. To those accustomed to the protectionist policies of the LDC's in the decade and a half since the War, it is remarkable that the LDC's today are actively discussing the issue of trade liberalization among themselves.

Not merely are they discussing it, but several of them have actively engaged in mutual negotiations to get action started. The most striking developments have undoubtedly been those in South America, where the Treaty of Montevideo represented the formal inauguration of LAFTA (The Latin American Free Trade Area),[2] of which Ecuador, Colombia,

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[1]This paper has grown out of my having been a member of two United Nations "Expert Groups," in November 1964 at ECAFE and in February 1966 at UNCTAD, on this general subject. It is really an academic economist's attempt at discovering the rationale, if any, behind the attempts of the developing countries to liberalize trade in certain specific ways which do not "square with" what economic analysis would predict as "rational." Throughout the paper, LDC's mean less developed countries, an identifiable bloc of countries at the UNCTAD now, and GATT stands for the General Agreement on Tariffs and Trade. I should like to record my general indebtedness, to the numerous colleagues on the two United Nations Groups as also to members of a Seminar at I.B.R.D. for their comments. My thanks are also due to Harry Johnson for incisive comments on the penultimate draft of this paper and for drawing my attention to his own work [6]. Recent work of Linder, Cooper and Massell also relates to some of the questions touched upon in this paper.

[2]As far as tariff reductions are concerned, Sidney Dell records in his A Latin American Common Market? [4] that "...the LAFTA countries achieved a certain initial measure of success following the entry of the Treaty of Montevideo into force. The first round of negotiations was

Peru, Chile, Argentina, Uruguay, Paraguay, Brazil and Mexico are already members, and the Treaty of Managua on Central American Economic Integration which has already accelerated significantly the integration process among the member countries Salvador, Guatemala, Costa Rica, Honduras, and Nicaragua.[3]

Elsewhere, the current picture is not as much in character, but the outlook points the same way. The East African Federation, comprising Tanganyika, Uganda and Kenya, and the UDEAC (Union Douaniere et Economique de l'Afrique Centrale), with Congo (Brazaville), Gabon, the Central African Republic, Chad and the Federal Republic of Cameroon in French Equatorial Africa as its members, are two of the conspicuous examples in the African continent. But they trace their ancestry to colonial periods and their "integrated markets" have recently been witness to disruption by measures such as inter-member QR's, tariffs and surcharges.[4] However, the measures taken by the members to review these developments and retain the framework of a generally reduced and low level of trade barriers between member countries, rather than

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held in Montevideo from 24. July to 12. August, 1961, the second in Mexico City from 27. August to 21. November, 1962, the third in Montevideo again from 5. October to 31. December, 1963, and the fourth in Bogota from 20. October to 11. December, 1964." [4, p. 70]. For details and evaluation, see Dell [4, Chapter V].

[3]Dell [4] has a most useful account in Chapter IV of the background to this Treaty and subsequent development.

[4]A useful account of the disruptionist trends, immediately after independence of the three East African Territories, is contained in a contribution of Arthur Hazlewood to a forthcoming publication, of the Royal Institute of International Affairs, on Integration in Africa, edited by Hazlewood himself.

follow post-independence policies of industrialization behind universal trade barriers, themselves signify an implicit decision to liberalize trade among themselves.

There has also recently been developments such as the Regional Cooperation for Development between Pakistan, Iran and Turkey, which aims explicitly to create "regional" division of labour with attendant liberalization of mutual trade barriers, and the still-undefined moves towards a Middle Eastern Common Market. Asia, however, has witnessed little concrete efforts or ideas in this direction, despite ECAFE's efforts to initiate regional liberalization of trade.[5]

Reasons for Trade Liberalization:

The reasons for these efforts at trade liberalization among LDC's are several.

(1) There is a growing appreciation of the simple fact of inefficiency of specialization which industrialization behind indiscriminate, high trade barriers involves. Many LDC's, especially in the ECAFE region, feel that starting from the present position of QR's, it is possible to relax restrictions on a mutual basis with other LDC's and reduce "overlapping" import substitution or industrialization,

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[5]The ASA (between Malaya, Thailand and Philippines) and the Maphilindo (between Malaya, Philippines and Indonesia) have remained politically utopian in their concept altogether. Several ECAFE conferences have also resulted in Ministerial resolutions on trade liberalization with practically no concrete results. On the other hand, the recent establishment of the Asian Development Bank, with the contribution mainly of Japan and the United States, may lead to the beginning of a more active interest in region-oriented tariff cuts or quota liberalization.

(provided that balance of payments difficulties resulting, if any, are not excessive and payments arrangements are forthcoming to assist in the short-run). The emphasis here is on economic inefficiency arising from producing things which could well be imported more cheaply from others who are better placed, by natural resources or otherwise, to produce them.

(2) This argument, however, is eclipsed by the more recent emphasis on the inefficiency which arises from the inability to exploit economies of scale in industrial activities if one has to industrialize within essentially national markets. This argument has come up in both African and Latin American contexts and there are three ways in which it can be encountered.

(i) It is often presented, in the African and Central American contexts, in the strongest conceivable terms as a sine qua non of industrialization. Individual countries are absolutely non-viable because it is impossible to conceive of any industrial activity which can be set up even remotely within sight of its optimum scale in view of the extremely small, effective demand. Thus, industrialization cannot be conceived of at all unless the markets are widened through trade. Hence the case for international trade liberalization.

(ii) The preceding argument overstates the case. The real point is that, if scale economies cannot be exploited, the real return to investment in industrial activity will fall, raising thereby the resources necessary to

achieve the same level of industrialization. The scale of the effective demand in many African countries, for example, is perhaps so small in relation to achievable economies that the increase in costs may be significant; but it is not meaningful to describe the resulting situation as one of "non-viability." In the reformulated version, therefore, the argument merely amounts to stating that industrialization, with access to extra-national markets, would be achievable by an LDC at lower cost via the resulting exploitation of economies fo scale.

(iii) Indeed, the "non-viability" argument comes up, in a different version, in Latin America, among the industrialized countries of Brazil, Argentina and Mexico. They discuss their problems of industrialization in a Fraserian, evolutionary framework and argue that they have "completed the first stage of industrialization, involving the production of consumer goods," reasonably adequately within national markets. But the "next stage," involving the establishment of heavy industry, is impossible to contemplate, in view of the scale economies involved, within national frontiers and is conditional upon access to international markets.[6]

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[6]This "two-stage"method of argument is absolutely "classical," based on historical observation of industrialization, and has frequently been used to "establish" the inadvisability of beginning first with

(3) Finally, there is the traditional argument that foreign trade can be an instrument for increasing competitiveness and hence the efficiency of industrial activity.[7] The experience of the LDC's has underlined the inefficiencies which arise from domestic monopolies sheltering behind trade barriers. This has been a powerful argument, in Latin America especially, for initiating reductions from very high tariff levels so as to reintroduce some "measured degree" of competition. Note, however, that this argument presupposes that investment is forthcoming; since in most LDC's, this itself is frequently a result of fenced-off, national markets, the concern with efficiency of investment is something which comes at a later stage in the process of industrialization; after all, the LDC's cannot be expected to worry about efficiency unless there is something to be efficient about!

These arguments for trade liberalization are quite sensible, of course, and familiar to economists. Not that they are always used to advantage or with a correct appreciation of their limitations. For example, the fact that economies of scale operate in industrial activities should not make the LDC's, operating a customs union and an industrial allocation policy in harness (as in East Africa, Equatorial Africa and Central America) forget that (i) the spatial distribution

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heavy industry a la the Soviet Union. It is now well recognized, of course, that no such "laws" can be derived and the "Soviet model," which reverses the stages, can make considerable sense. See, for example, Maurice Dobb [5].

[7]The inefficiency here relates to the lack of incentive, in a sheltered market, for reducing costs to the minimum at whatever level of output which is chosen by the entrepreneur.

of demand, (ii) transportation costs, (iii) the inter-temporal growth of demand at different points of consumption and (kv) the external economies obtaining via the geographical clustering of certain industries are also factors to be considered and that the optimal solutions, even when trade barriers are absent, may still demand that "uneconomic scale" plants be constructed in different member countries in the same activity.[8]

Distinguishing Features of LDC Trade Liberalization:

However, the most interesting aspect of the LDC efforts at trade liberalization is that they are characterized by certain patterns which are both readily discernible and difficult to reconcile with what traditional trade theory would predict as the behaviour of governments "rationally" pursuing economic welfare. The most notable of these features may be listed here at the outset.

(1) The trade expansion efforts are sought to be on a preferential basis, among a few or all LDC's but excluding the developed countries. Where the preferential groupings fall within the purview of GATT's Article XXIV (exempting 100 per cent preferential arrangements from the contractual commitment to extending MFN treatment to all other GATT members), there is no institutional change involved in this demand. But the LDC's clearly would like to extend the operation of such an exemption to less-than-100 per cent preferential arrangements

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[8]Not merely are these qualifications infrequently appreciated but also there is danger that the industrial allocations among members of a union may, in practice, be the product of "horse trading."

among LDC's. They are thus demanding really the suspension of automatic MFN rights by the developed GATT members with respect to the LDC members.

(2) Furthermore, the experience in Latin America in particular shows that the LDC efforts at tariff cuts and trade liberalization are oriented very clearly towards trade diversion. Looked at from the viewpoint of traditional trade theory, therefore, the LDC efforts seem to be directed at the wrong kind of tariff cuts altogether! The acceptance of the increment in intra-regional trade in LAFTA as an index of its success, without any attempt at separating out trade diversion from this figure, as also the impatience exhibited in Latin American circles with requirement of GATT's Article XXIV[9] that the average external tariff must not be greater after a customs union or free trade area (which would, among other things, make trade diversion via the raising of external tariffs impossible) are pointed reminders of this divergence between LDC demands and behaviour on the one hand and traditional predictions and prescriptions on the other.

(3) The LDC negotiations and literature are unanimous in insisting upon "reciprocity" of benefits. This is familiar from the history of tariff negotiations anywhere. The reciprocity takes the

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[9]"With respect to a free-trade area, or an interim agreement leading to the formation of a free-trade area, the duties and other regulations of commerce maintained in each of the constituent territories and applicable at the formation of such free-trade area or the adoption of such interim agreement to the trade of contracting parties not included in such area or not parties to such agreement shall not be higher or more restrictive than the corresponding duties and other regulations of commerce existing in the same constituent territories prior to the formation of the free-trade area, or interim agreement, as the case may be."

form, quite acutely in most LDC cases, of balancing of incremental trade flows rather than demands of identical tariffs cuts or any other method. Both the strict insistence on reciprocity and the specific form taken by it are not readily reconciled with what traditional trade theory, as analyzed below, would indicate as the likely pattern of LDC behaviour.

(4) As a corollary to this concern with this form of reciprocity, there is also discernible among many LDC's a preference for negotiations and action on trade liberalization among smaller rather than larger groups. As a consequence, there is already discernible a growing conflict of opinion on whether any sub-set of LDC's should be allowed to discriminate against the other LDC's when a less-than-100 per cent programme of tariff cuts, outside the purview of GATT's Article XXIV, is involved. The dominant trend, however, seems to be in favour of the more "liberal" version which would permit discriminatory tariff cuts applicable even within a sub-set of LDC's.

There are broadly two sets of issues that arise from these patterns of LDC behaviour and demands.

(1) Is it possible to "explain" them in terms of the traditional theory of preferential trade liberalization - associated mainly with Viner, Meade and Lipsey[10] - if one makes the additional assumption

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[10]The main literature is: J. Viner [12]; J. Meade [9]; and R. Lipsey [8]. There is also the "monetary" theory of trade discrimination, associated with the names of Frisch, Fleming and Meade, which is not touched upon in this paper, but which would be relevant in understanding payments problems and assessing current IMF rules.

that the LDC governments act "rationally" in pursuit of economic welfare? Or do we have to modify the theory itself so that it leads to predictions of behaviour which are consistent with those observed? It is argued, later in this paper, that we indeed require a modified, new theory which fits the observable facts very much better and that such a theory can be obtained by modifying the LDC governments' assumed "utility function."

(2) In light of such an "explanation" of LDC behaviour and demands, the question immediately arises as to what attitude economists ought to take concerning the amendments proposed by LDC's in the GATT rules. The following analysis formulates a conceptual framework which provides a possible case for accepting such amendments, while also examining its limiting assumptions.

Explanation of Distinguishing Features of LDC Trade Liberalization:

It is possible, of course, to say that the LDC's are "muddled" and "irrational"; such views are not as uncommon as one would imagine. They are in fact held especially by those who have not reconciled themselves to the exercise of governmental action and hence cannot admit of its possible rationality.

On the other hand, purely political explanations are both possible and undoubtedly relevant. Thus, for example, the desire to liberalize trade within the LDC group, to the exclusion of the developed countries, could be explained, partly at least, by reference to a desire to attain "solidarity" within the LDC group. There are most certainly overtones of such notions as "solidarity," "bargaining power,"

"political cohesion and strength" and the like in some of the regional LDC groups such as LAFTA and in Central America; they are to be traced to the political dominance of the United States in the area as also the example of the European Common Market which too was enveloped in a political cloak of similar cloth.

There also seems to have been considerable interest shown by some of the developed countries themselves in getting the LDC's to liberalize trade among themselves as an "act of self-help." This too is to be explained, at least partially, in political terms as an attempt to (i) divert LDC attention away from pressing on with their claims at UNCTAD for concessions from the developed countries, (ii) create predictable dissensions among the LDC's (on issues such as that of discrimination among themselves) and thus break the LDC-block (such as it is) at UNCTAD, and (iii) promote, in particular, regional groupings of LDC's which would then be easier to attract into preferential groupings with the developed countries in the region, thus reinforcing the traditional economic and political ties[11] (as with United States

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[11] That Raul Prebisch, Secretary General of UNCTAD, has been worried by this aspect of the problem is clear from his address to the United Nations Trade and Development Board, stating: "Unfortunately, there are some symptoms that the spirit of Geneva is not being applied, and that on the contrary there is an aggravation of the tendency towards a system of discriminatory preferences in certain parts of the world. I cannot hide from the Board my great concern at signs in certain Latin American circles, which are manifesting themselves with increasing force in requests to the United States for a preferential system to be exclusive to Latin American countries." [4, p. 34]. Indeed, the fact that LAFTA exists now is likely to make both the demand for, and grant of, such discriminatory preferences by the United States a significant possibility.

and Latin America or EEC and French Africa).[12]

Similarly, the interest in trade-diverting trade expansion may be explained in terms of a political inability to lower tariffs on protected, domestic industries. Since producers typically tend to turn into articulate and powerful pressure groups, it is plausible to argue that the politics of democratic systems will reflect producer interests more readily than any others, so that trade-diverting trade expansion is certainly likely to be preferred to trade-creating trade expansion.

While such explanations are certainly relevant, it is also of equal interest to note that practically the entire range of LDC behaviour can be "explained" by recasting traditional trade theory into a somewhat different mould. This is, in fact, readily done.

(A) Traditional Analysis:

The traditional analysis classifies preferential tariff reduction into two ideal categories: (i) trade diverting and (ii) trade creating. Each of these well-known types may be considered, in turn, from the viewpoint of predictions of behaviour that they would generate on the assumption of "rational" behaviour in the sense discussed earlier.

I. Trade diverting tariff reduction: Looked at from the viewpoint of a tariff-cutting country (M), and the partner-country (P) in whose favour the tariff is cut, a trade diverting tariff cut leads to

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[12]Economists are particularly prone to scoffing at such "fears." They would be well advised to read, in case they are sceptical, E. M. Carr's brilliant account of the inevitable interaction of economic philosophy and rational, political interest in his The 20 Year's Crisis: 1919-1939, [2].

the following situation according to the traditional theory;[13]

(a) country M will lose from the trade diversion shifting the source of imports to the higher cost supplier, country P;

(b) on the other hand, the cheapening of the commodity, on which the tariff is cut preferentially, may lead to a net consumption gain;[14]

(c) country M can therefore be left as before, or may gain or lose from a trade diverting tariff cut;

(d) as for country P, it will <u>either</u> gain from opening trade with country M or by improving its terms of trade with it <u>or</u> have its welfare position unchanged if it is a "large" country (in the Samuelson sense).

The matrix of welfare possibilities from a preferential tariff cut by country M in favour of country P, according to traditional theory, is thus the following.

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[13]Note that, in analysis that follows, only the <u>simpler</u> analytical models of Viner and Lipsey [8] are used. Complications can arise, however, if this is not done. For example, as Lipsey [8] has pointed out, even the consumption effect can be negative if one takes a <u>three-good</u> model. Also, as Mundell has shown recently, unless gross substitutability is assumed between the goods of each country in a <u>three-good</u>, three-country model, the terms of trade of the partner country (P) with the third country can worsen, thus presumably opening up the possibility of a loss to it.

[14]This was shown by Lipsey [7]. Note, however, the qualifications noted in footnote 13.

Matrix (1): Welfare Possibilities Under a Trade Diverting Tariff Cut by One Country (M) - on Traditional Theory

Possibility	Country	
	M	P
(1)	Gains	Gains
(2)	Gains	Unchanged
(3)	Loses	Gains
(4)	Loses	Unchanged
(5)	Unchanged	Gains
(6)	Unchanged	Unchanged

Note that, in two cases at least, (1 and 2), there seems to be a clear reason why reciprocity by country P does not represent a *sine qua non* for a tariff cut by countryM; whereas, only in three cases (3 - 5) would it seem that country M could not be induced to cut its tariff on country P without demanding some measure of reciprocity from it. Note also that whereas reciprocity would not be necessary in the cases where trade diversion leads to welfare gains, the insistance on reciprocity would arise most compellingly only in cases where the trade diversion leads to a loss (as will happen in cases 3 and 4) where again all that reciprocity may lead to is a loss to *both* countries instead of one. Thus we *either* fail to provide rationale for reciprocity at all or provide it in cases where the possibility of there being preferential tariff cuts at all is dismal.

So far, therefore, the theory fails to explain why the LDC's seem to prefer trade diverting tariff cuts and simultaneously to insist on reciprocity (of incremental trade flows). We can, however, go somewhat further than we have. Within the framework of this analysis itself, there are two ways in which the reciprocity demands may be justified even in cases where country M gains from a unilateral, preferential tariff cut causing trade diversion:

(a) On the one hand, we could introduce a game-theoretic formulation into the analysis. For example, in the two cases 1 and 2, where country M stands to benefit unambiguously from a preferential tariff cut, its insistance on a reciprocal tariff cut could lead perhaps to a mutual, simultaneous tariff cut which may make country M even better off than under a unilateral, discriminatory tariff cut.[15]

(b) At the same time, we could well argue that the alternative to a unilateral, preferential tariff cut by country M is not merely the status quo but could well be a unilateral non-discriminatory tariff cut.

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[15]This aspect of tariff bargaining, which may rationalize certain reciprocity demands even within the traditional theoretical framework, has always been ignored by those who voice puzzlement as to the insistance of many countries on reciprocity of one kind or another in tariff negotiations. See, for example, Harry Johnson [6] whose elegant analysis neglects altogether this line of argument. Failure to see this line of argument can be traced to many liberal writers, such as Lionel Robbins who in The Economist in the Twentieth Century [10, pp. 137-38] recognizes the problem explicitly and tries to account for reciprocity by arguing that the burden of adjustment with unilateral tariff cuts would be greater.

Thus it could be argued that the willingness to cut a tariff preferentially in favour of country P involves a potential loss (or reduction in gain) as compared with a situation where country M would have cut its tariff non-preferentially, and therefore the reciprocity demand follows from the consequential (implicit) loss to country M.[16]

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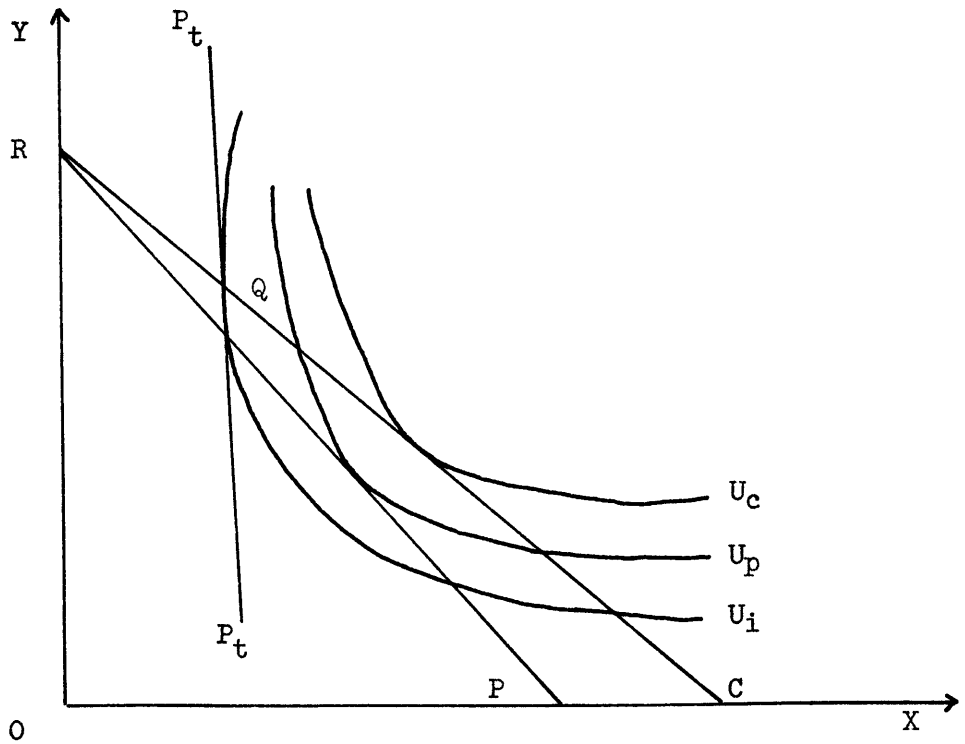
[16]This point can be readily seen from Lipsey's, op.cit., well-known diagram. Assume that country M, specialized on producing OR of Y, has an initial, non-discriminatory tariff which leads to trade with country C at price-ratio OC, and consumption at Q with domestic, tariff-inclusive price ratio being P_t and welfare at U_i. If the tariff is eliminated altogether, welfare will increase to U_c. If the tariff is cut only for country P, trade will accur along price-line RP and welfare will be at U_p. Note that $U_p > U_i$ but $U_p < U_c$.



Therefore, in terms of U_c, there is a loss from a preferential tariff removal, even though it is a case where trade diversion increases welfare ($U_p > U_i$).

We can somewhat strengthen therefore the case for expecting "rational" governments to press for reciprocity. Note, however, that while reciprocity may be explained along these lines, we cannot so explain the desire for balancing the incremental trade flows--i.e., the specific form that reciprocity demands take. Moreover, the analysis does not really explain why the sub-set of countries M and P are interested in negotiations for trade liberalization with each other and not with others. To make this implicit but important assumption plausible, we would have to bring in some extraneous, political argument; as argued earlier, a sub-set of countries may well decide to undertake liberalization among only themselves consequent upon a political decision to "integrate their political and economic systems." Indeed, some such political assumption would be necessary even to explain why it is that, since both countries M and P can lose from such trade diverting trade liberalization despite reciprocity, and such possibilities do not seem to be excluded by any m eans by recent LDC experience, the LDC's in fact seem to opt nonetheless for such trade liberalization. Unless, therefore, one relies on such political arguments at a crucial stage of the analysis, the traditional theory will not be able to come to grips with even the most obvious features of LDC attempts at trade liberalization.

II. Trade creating tariff reduction: When we analyse the case of trade creating tariff cuts, the inability of traditional theory to come to grips with LDC behaviour seems even more evident. Assuming that country M is preferentially cutting its tariff again, if it is a trade creating tariff cut it will lead to the following situation

according to traditional theory.

(a) country M will lose its inefficient industry, partially or wholly, to country P;

(b) country M will consider itself as having improved its allocation of resources and will also derive a consumption gain, leaving it a net gainer; and

(c) country P will not or will have gained depending on whether it is or is not "large."

The matrix of welfare possibilities under the traditional theory is then as follows.

Matrix (2): Welfare Possibilities Under a Trade Creating Tariff Cut by One Country (M) - on Traditional Theory

Possibility	Country	
	M	P
(1)	Gains	Unchanged
(2)	Gains	Gains

By contrast with the case of trade diverting tariff cuts, we now have one case of harmony of interests and another where the tariff-cutting country gains anyway. In neither case, therefore, would reciprocity appear to be a prime requisite before country M would cut its tariff.[17]

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[17]Again, as with the analysis of trade diversion, we could strengthen somewhat the case for reciprocity by using a game-theoretic

Traditional analysis would then also imply that trade creating tariff cuts will be profitable whereas trade diverting tariff cuts would not be so except where the consumption gain is decisive. Hence we would infer from traditional analysis that trade creating tariff cuts are more likely to occur in practice than trade diverting tariff cuts. This is yet another conclusion which seems to contradict LDC experience.

(B) Modified "Utility Function"

Consider, however, the following modification to each LDC's objective or utility function:

(i) let each LDC attach intrinsic significance to the level of import-competing industrial output that trade diversion attracts to each country and trade creation attracts to one country "at the expense of" the other; and

(ii) let each country ignore the significance of any possible consumption gain from the cheapening of products in domestic markets subsequent on tariff cuts.[18]

Note further that the addition of these new arguments in the LDC objective function seems quite plausible because, in particular:

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formulation or by pointing out the potential loss from discriminatory, as distinct from a possible non-discriminatory, tariff cut.

[18]For this reason, though more so by virtue of the difficulty of accepting the notion of "given preferences" on which the whole theory rests, I have found it useful to develop the welfare theory of trade in my lectures in Delhi in terms of technological efficiency rather than utility rankings. For details on this, see my forthcoming paper [2].

(i) the LDC's typically wish to industrialize and hence use tariffs (and/or quantitative restrictions) for this purpose, so that the attraction of import-competing industrial production would be considered a desirable result in itself; and

(ii) in most cases, the trade pattern of the LDC's involves imports of components, materials and machines, to which the notion of a consumption gain is only indirectly applicable.[19]

If these modifications are made, consider what happens in the case of trade diversion examined earlier on traditional lines. The matrix of welfare possibilities will change radically. Country M will now feel that it has "lost" through having to import the commodities from country P at a higher cost whereas, in its opinion, country P has registered a definite "gain" because it has now started or expanded production of these commodities. Given therefore this change in the objective function, the matrix reduces to a simple, conflict situation where the tariff cutting country M feels it has lost and the other country P has gained. Reciprocity thus becomes extremely important and no trade diverting tariff cuts or free trade areas/customs unions

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[19]There is also an associated "revenue" problem. Where LDC's have levied tariffs for earning revenue, their removal or reduction, on other LDC's, could well result in a loss of revenue in case of trade diversion, if the increment in imports from the resulting cheapening of the item in domestic consumption is not large enough to offset the reduction in the tariff rate. Experience in East Africa and French Equatorial Africa, in particular, suggests that this possible loss of revenue is considered an important "loss" factor by LDC's in continuing or entering upon integration schemes.

may therefore be expected to make progress unless reciprocity is built into the arrangements from the beginning.

At the same time, it becomes easy to see that reciprocity would ensure that, by satisfactory distribution of trade-diverted industrialization, both countries could emerge feeling that they have gained from the reciprocal, discriminatory tariff cuts.[20] Again, it is easy to see now that the LDC's would prefer to liberalize trade with one another rather than with the advanced countries. Since industrial production has value in itself, the LDC's would consider it disadvantageous to negotiate tariff cuts (on industrial products) with advanced countries (whose competitive strength in manufactures is assumed to be greater) unless they are one-way, in their favor, thus ruling out reciprocal tariff cuts (including customs unions and free trade areas) except among the LDC's (who are presumed to be at a more comparable or "similar" stages of development vis-a-vis one another) and also explaining their well-known insistence on "non-reciprocity" by LDC's for tariff cuts made by the advanced countries.[21]

For similar reasons, trade creating tariff cuts would, under the modified theory, equally exhibit demands for reciprocity and would appear less attractive than under traditional theory, thus corresponding

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[20]It is assumed, in the following analysis, that a decisive weight will usually be attached by LDC's to the question of whether industrial activity expands or contracts in the economy.

[21]This "principle" of non-reciprocity has been brought up even within preferential groupings, as in the special treatment meted out to the "less developed" members of both EEC and LAFTA, with respect to implementation of tariff cuts.

again more closely to observable facts about LDC's. Thus, for example, the matrix of welfare possibilities from such a unilateral tariff cut (Matrix 2) will now be changed. Country M will reduce its estimate of gain (by the amount of the consumption gain, if any) and, more significantly, has a new "loss" factor because the contraction or elimination of its import-competing manufactures will be considered undesirable per se. At the same time, country P will be thought to have definitely gained because it has attracted to itself or expanded the manufacturing activity which has declined in country M. The matrix of welfare possibilities thus reduces again to a simple conflict situation where country P is supposed to have gained and country M to have lost. A unilateral tariff cut by country M is thus ruled out and reciprocal tariff cuts by country P become a sine qua non of country M's tariff cuts even in trade creating situations. Moreover, since value is attached to industrial production per se, the LDC's fail to see any rationale in contracting the output of existing manufactures, so that trade creating tariff cuts seem to them to be "unnecessary" or "unfruitful" and hence inferior to trade diverting tariff cuts which bring more industrial activity to the member LDC's.

If therefore the new theory is accepted, it is possible to explain practically all the puzzling features of LDC negotiations, from reciprocity to preference for trade diverting tariff cuts. The most interesting of these implications may now be brought together and further spelled out:

(1) trade liberalization will inevitably be accompanied by considerable interest in "reciprocity" arrangements, even though

traditional theory does not so imply;

(2) trade diverting tariff cuts, provided reciprocity is worked out, are far more likely to be acceptable than traditional theory would imply (the creation or expansion of import-competing, industrial production being a desirable objective in itself);

(3) trade creating tariff cuts will be far less likely to be acceptable, even when reciprocity is worked out, than traditional theory would imply (the decline of import-competing, industrial production being an undesirable objective in itself);

(4) trade diverting tariff cuts, in consequence, are more likely to occur in practice than trade creating tariff cuts, again contrary to what traditional theory would imply;

(5) the "reciprocity" requirement is further likely to take the form of attention to whether the resulting, incremental trade flows between the participating countries are balanced: this, in turn, would be an indication of the degree of the production "advantage" which the new theory stresses as a significant source of gain;[22]

(6) the new theory would also reinforce political explanations in predicting that LDC's would turn to one another for tariff cutting exercises: trade diversion is more readily practiced against the developed countries which still continue overwhelmingly to be the major exporters of industrial manufactures to the LDC's;

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[22]Evidence of such behaviour by LDC members of common markets and free trade areas is to be found in the experience in LAFTA and in East Africa. The Kampala Agreement of 1964 explicitly argues along the lines of balanced trade flows within the East African Federation, for example.

(7) the new theory would simultaneously explain the demand to have GATT's article XXIV amended so as to allow the raising of the average, external tariff in a preferential tariff cut (in a 100 per cent programme); if tariffs were to be preferentially cut only from existing levels, and if these tariffs may be expected to be higher on items where trade creation rather than trade diversion is likely,[23] the effort at preferential tariff cuts could be jeopardised by having to concentrate on trade creating rather than trade diverting cuts;

(8) further, in view of the insistence on reciprocity, the preference is likely to be for tariff cuts among smaller groups of LDC's rather than larger groups; reciprocity is easier to work out within smaller groups, especially when it takes the specific forms outlined earlier and is so important to the participants, whereas smaller groups also make it easier to supplement an "unpredictable" trade mechanism by a "more direct" and simultaneous policy of "industrial allocations" among members;[24] and

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[23]This appears to have been the case in LAFTA countries; see Dell [4, Chapter V].

[24]Indeed, one of the important features of all LDC attempts at trade expansion, to date, has been the unwillingness to initiate tariff cuts and trust them to result in efficient, industrial division of labour in the classical, textbook manner. Even where the classical method was initially adopted, as in East Africa and with LAFTA, direct, industrial allocations of one kind or another among the member countries have now been envisaged and machinery actually set up to deal with the question. There are two major reasons for this: (i) the LDC's recognize, from experience, that wasteful duplication, or even multiplication, of industrial capacity, which the enlargement of markets via tariff cuts is intended to avoid, cannot frequently be eliminated in practice without governmental intervention, and (ii) the LDC's feel that market forces would tend to gravitate industrial activity towards the already industrialized areas within the group, so that interference with the market

(9) the preference for trade diversion is likely to accentuate still further the tendency to prefer smaller groups, for the simple reason that there are more outsiders to divert trade from when the group is smaller.

Indeed, these are all very distinctly the special features of LDC attempts at trade liberalization and of their consequential demands for GATT revision.

Should GATT rules be changed?

The logical question then is whether it makes economic sense to amend the GATT rules so as to accommodate the LDC patterns of behaviour and demands. There are three main types of position which can be taken on this general issue.

(1) Either one can be cynical and argue that, after all, countries act exactly as they want to despite GATT membership, so that there is little point in amending these rules. While there is force in the contention that actual practice manages frequently to bypass international obligations--as, for example, with the GATT rules on export subsidies which are widely flouted in devious ways--their nuisance value is very evident and they frequently involve resort to indirect and inefficient ways of achieving legal consistency between international obligations and national action. The very fact that LDC's want GATT rules changed implies that they must, at least sometimes,

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mechanism would be necessary to direct part of the industrialization towards the "weaker" members. On the other hand, the offsetting disadvantages of such industrial allocations by political agencies, unless managed with reference to economic criteria, could also be significant.

be constrictive. So this cynical dismissal of the question must be rejected.

(2) Alternatively, one may argue the opposite case: that, if a sufficient number of countries want a change in the GATT rules, it will go through and there is no point in arguing the matter any further. Such a cynic may well point to the insertion of Article XXIV, undoubtedly to accommodate an impending European Economic community which enjoyed equally the support of the United States while the LDC's were apathetic or reconciled to impotence in influencing events; after all, even traditional theory cannot show that a 100 per cent tariff cut, on a preferential basis, is invariably superior to a partial cut or no cut at all and yet that is exactly what Article XXIV implicitly asserts! If LDC's manage to muster enough bargaining strength, eventually they may well succeed in changing GATT rules around to suit their demands. But again, unless the developed countries can be persuaded to acquience in these amendments, the progress towards them would be inevitably slow and halting. So this form of cynical dismissal of the question must also be rejected.

(3) Indeed, even from an intellectual standpoint, it is necessary to argue through the question whether the LDC demands <u>ought</u> to be supported.

In answering this question, one has to be clear about what exactly is the <u>alternative</u> to <u>not</u> amending the GATT rules in accordance with LDC demands. This, in turn, amounts to asking what is really the alternative to LDC's not being allowed to liberalize trade <u>among</u> themselves and whether, from an economic point of view, that alternative

is superior.

Emphasis is being placed here quire deliberately on defining the most realistic alternative, in comparison with which the possibility of amending GATT rules in the LDC-suggested direction must be judged. Much too often economic issues are mis-judged because the alternatives considered are really irrelevant. Thus, for example, devaluation was widely considered to be inflationary in its impact because the alternative implicitly considered was that of utilization of reserves to ease the deficit. It was later realized that the correct comparison, from a policy viewpoint, was with alternative adjustment policies all being evaluated subject to non-availability of reserves, and that once this was done it was by no means obvious that devaluation would be inflationary by comparison with, for example, QR's.[25]

The starting point in finding the right alternative to answer our present question seems to be the fact that industrialization is among the primary, immediate objectives of the LDC's. One may debate whether this is a desirable, legitimate "economic" objective or whether it is to be classified as a "non-economic" objective. Regardless of the precise reasons for considering industrialization as an LDC objective, that the LDC's so consider it is the essential fact to be noted.

If then industrialization is to proceed in an LDC, the immediate consequence of such a decision for most LDC's would be for the imports,

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[25]Credit for this insight goes to Egon Sohmen [11] who, to my knowledge, was the first to reformulate the question of the impact of devaluation upon the price level in this manner.

of the items in which the import-substitution occurs, to shrink below their level otherwise.[26] Trade diversion, in this sense, is already implicit in the decision to industrialize. Nothing in current GATT rules can effectively block an LDC member from undertaking such trade diversion in pursuit of its policy of industrialization.

(A) Case for GATT Revisions:

From this way of looking at things, the most favorable case for accepting the LDC behaviour and demands emerges as follows.[27]

If the LDC's could be allowed to reduce tariff barriers among themselves, this could permit the given trade diversion (implicit in each LDC's decision to industrialize) to be carried out at lower cost because the trade diversion, while continuing against the non-members, would be eliminated or reduced as among the (member) LDC's. To put it yet differently, and more illuminatingly, the tariff cuts (among the LDC's) would in fact be permitting trade creation among the LDC's in relation to the situation where they would have industrialized behind national tariff walls. The contention then is that, regarded in this light, the apparently trade diverting attempts by LDC's at mutual tariff preferences turn out really to be effectively trade creating.

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[26] This argument presupposes, of course, that industrialization will lead to the imposition of tariff (or equivalent QR) protection and that the level of industrialization which free trade will permit falls short of the desired level. Both of these seem to be realistic assumptions, of course, about LDC's.

[27] At the I.B.R.D. seminar, where this paper was presented, Bela Balassa pointed out to me that my way of presenting the strongest case in favor of accepting LDC demands is implicit in the writings of Raul Prebisch, Cooper and Massell and Balassa, although the formulation of the argument is different.

On this line of argument, several arguments for modifying GATT rules seem to become persuasive. For example, the automatic extension of MFN treatment by LDC's to the developed members could be removed on the ground that the trade diversion away from the developed countries will take place anyway, thanks to individual LDC action, so why hold up the (implicit) trade creation among the LDC's that such an amendment would facilitate?

Similarly, why not modify Article XXIV of GATT so as to permit the raising of the external, average tariff when entering a 100 per cent, preferential agreement: if the alternative again is the raising of national, LDC tariff barriers which GATT cannot effectively prevent (except when the duties are "bound"), why not consider the suggested modification of Article XXIV as permitting a less undesirable, alternative procedure which would reduce the LDC-cost of industrialization?

Again, if LDC's will not as readily wish to dismantle existing lines of industrialization and would rather concentrate instead on ensuring that the future doses of industrialization are efficiently made by having wider markets among the LDC's--thus concentrating on the gains from implicit trade creation, as defined here--it would appear that the alternative to not letting them discriminate between tariffs on existing and on new industries (to come), as Article XXIV would require, is likely to make the LDC's continue the present policies of industrialization in small, domestic markets and thus forego even the advantages that could accrue from implicit or potential trade creation. By this argument, therefore, there would again be a good case for letting LDC's, even in Article XXIV situations where the LDC's would

commit themselves to eventual, full integration, discriminate in their progressive tariff cuts between existing and newer industries (much as there is now accepted an asymmetry between manufactures and agriculture).[28]

(B) Arguments against GATT Revisions:

The above case is, in fact, the most favorable one that can be built up for making some of the GATT revisions that the LDC's have been demanding. But it rests on two crucial assumptions which need to be spelled out very clearly, for it is around them that economists are likely to divide in their judgment of what changes in GATT are desirable.

(i) The first crucial assumption (already stated explicitly) is that the LDC's would, in fact, if GATT rules are not changed, raise their tariffs (QR barriers) in pursuit of industrialization. While this assumption is plausible, in the light of LDC experience, it could be challenged on the dubious argument that the increased cost of the resulting attempt at industrialization behind national tariff walls would itself reduce the degree of trade diversion (and hence economic inefficiency)

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[28]This could be done quite readily by permitting a different rate of progressive tariff cuts on these two classes of products and thus effectively lengthening considerably the time over which the existing industries would have to adjust. The fact of growing industrialization and incomes, as also the prospect of eventually integrated market, would then both induce and permit an orderly decline in the relative and/or absolute level of the industry in the LDC where it is inefficient.

which LDC's are willing to undertake in pursuit of industrialization.[29]

(ii) The second crucial assumption is more serious. The preceding case for GATT revisions really presupposes that the LDC's will undertake tariff negotiations in a way which, while discriminatory, does in fact reduce (if not minimize) the mutual cost of any given degree of industrialization among the member countries. There is an important difference between arguing that discriminatory arrangements among LDC's could reduce the mutual cost of member-LDC industrialization and asserting that it would necessarily do so.[30]

Indeed, from the analytical point of view, this way of posing the problem leads to at least three questions of importance and relevance to the present discussion.

(a) If an arbitrarily-defined sub-group of LDC's desires to achieve a given level of industrialization, within each

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[29]This is, in fact, the type of argument which has long been used by the opponents of foreign aid, such as Milton Friedman, who claim that foreign aid featherbeds many inefficiencies which would become insupportable if the countries receiving aid had to make do with their own resources. This argument, of course, presupposes that the recipient countries agree with these commentators in regarding certain policies as "inefficient," an assumption which is notoriously invalid--there is a well-known law of intransitivity which operates in these matters: X thinks his economics is better than Y's and Y thinks the other way around. The effect of withdrawal of aid is more likely to be the reinforcing of the very same policies that these opponents of foreign aid dislike.

[30]The experience in LAFTA, where the tariff cuts seem to have been indiscriminatingly trade diverting, can only make one skeptical with respect to the second assumption being discussed here.

country, what is the optimal level and structure of the external tariff which will permit this to be done at least cost within the framework of an integrated market? (No such solution need exist, of course, if the level of industrialization within any member cannot be sustained without protecting against the other members, thereby violating the presence of an integrated market within the sub-group.)

(b) Within the same, arbitrarily-defined sub-group of LDC's, what is the optimal set of policy instruments for achieving the required level of industrialization within each LDC? Here, the range of policy instruments being considered extends beyond tariff policy.[31]

(c) Given a set of LDC's, each with its own target of industrialization, what is the optimum sub-set of LDC's from any one LDC's point of view, which will permit it to achieve its objective at least cost, assuming for example that the sub-set will act so as to minimize cost for the group as in (i) or (ii) preceding?

It is not clear that LDC's would, in fact, examine their possibilities of preferential arrangements in the careful way that is necessary, so

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[31] Cooper and Massell [3] raise also the somewhat more limited question of whether the LDC's could reduce their mutual cost of industrialization through preferential arrangements. They use a constant-cost model, which is somewhat limited for dealing with the questions of importance to LDC's (such as economies of scale); but it is nonetheless a useful device, exploited with great skill by the authors.

that it is inevitable that economists would be divided on the set of rules that they would like to see at GATT on the question of preferential tariff arrangements.

The questions concerning GATT revisions are thus not easily answerable; they involve resort to judgments of a fairly crucial type about what is likely to happen in response to the changes. Even the framework devised in this paper, to strengthen the case for these revisions, cannot make the case for them definitive.

Ultimately, the issue is likely to be judged also in the light of the views which economists have concerning whether the possibility of preferentially reducing trade barriers among LDC's is likely to constitute the only feasible route by which the world will move closer towards freer trade or whether it will only lead to a sustained and strengthened fragmentation of the world economy.

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