

SERIES: BACKGROUND NOTES

AN OUTLINE OF THE THEORY OF TRADE
AND TRADE POLICY

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Foreword

This short text is intended to accompany the course on the theory of trade and commercial policy that is a part of the introduction to the GATT's training programme in trade policy. It covers the chief aspects of the theory in its present form and it has two uses. It can serve either to review or prepare a subject before its discussion during a session or, in answer to the wish expressed by former trainees, provide a concise summary of a particular concept or analysis once the programme is over. To this end, reading references have been added at the end of each chapter which, together with the works cited in the footnotes, will enable trainees to explore each subject more fully.

Twelve figures and a few algebraic formulae have been added to the text. They form part of the oral presentation and have been retained in the written version at the express request of the majority of trainees who consider them to have two advantages. On the one hand, they enable those for whom English is a third or fourth language to grasp an analysis without the impediment of words which may seem obscure. For those for whom language is no obstacle, on the other hand, geometry and algebra allow the clarification of concepts and the swift, rigorous statement of a proposition.

The text is general. That is to say, it is not written in terms of a particular model of ownership of the means of production or of a given system of economic regulation. Thus, where the analysis relates to the private ownership of the means of production, the necessary modification for its application to a socialist economy is indicated. Similarly, although most of the text is written in terms of a market system regulated through price mechanism devices, direct controls and central planning are also discussed.

As to development, some of the examples, illustrations and implications of the propositions presented relate to developed economies. Most, however, concern the developing countries, and chapters VIII and IX are devoted to the measures recommended for infant industry promotion and for industrialization. For this text has a double objective. It is to present the general analysis of international trade and commercial policy as well as some of its applications to the developing countries. But it is also to provide the representatives of developing countries taking the GATT Course with a handy manual that will enable them to elucidate, and so perhaps to solve, the trade policy problems they may some day encounter.

Chapter I

THE GAINS FROM TRADE

International trade, which takes place because of different prices in different parts of the world, enables countries to obtain goods more cheaply abroad than they can produce them at home, and so to raise their real income. This truth, which seems obvious today, was only acknowledged relatively recently.

Historical background and proof

From the 16th to the 18th century, that is during the period which preceded modern economic analysis, the mercantilist school dominated economic thought and taught that international trade was a means of securing a balance of trade surplus. This was expected to stimulate domestic production on the one hand, and to serve to accumulate gold and other means of international settlement on the other. The "treasure" so amassed was, in turn, to enable the young nation-states to arm, to defend themselves and, if necessary, to attack their neighbours. In keeping with the objective they assigned to international trade, the mercantilists advocated a commercial policy which consisted in the promotion of exports and the prohibition of imports, or at least their reduction to a minimum. The idea that trade could serve any other purpose than to secure a trade surplus, and that imports in particular could increase the real income of the importing country was unknown to them.

The first to put it forward was Adam Smith (1723-1790), a Scottish economist who, in 1776, published a work which has since become a classic entitled "An Enquiry into the Nature and Causes of the Wealth of Nations". He maintained that if a country produced a good at a cost which was absolutely lower than that of the same good produced in a second country, and if it produced another good at a cost which was absolutely higher than that of the comparable good produced in the second country, the first country would find it profitable to export the good which it produced at a cost which was absolutely lower than the second country, and to import the other product. For, by doing so, it would

obtain the imported product at a lower cost than if it were to produce it itself. This demonstration of the gains from trade, which stressed absolute differences in costs of production, has since become known as the "theory of absolute advantage".

It was followed by the theory of another scholar, David Ricardo (1772-1823), an English economist who, in 1817, published "On the Principles of Political Economy and Taxation". He showed that it was not necessary for costs of production to be absolutely, but only relatively, different in two countries for them to be able to gain from trade, and he demonstrated this with the help of the example which is presented below in tabular form:¹

<u>Table 1</u>		
<u>Units of labour required to produce one unit of</u>		
	<u>Wine</u>	<u>Cloth</u>
Portugal	80	90
England	120	100

As the table shows, in Portugal one unit of wine costs 80 units of labour and one unit of cloth 90 units of labour. In England the cost of one unit of wine and of one unit of cloth are 120 and 100 units of labour, respectively. Portugal thus has an absolute advantage in the production of both products since it produces both at a lower cost than England, and England has an absolute disadvantage in the production of the two products since it produces both at a higher cost than Portugal. According to Adam Smith, therefore, trade between the two countries would be unprofitable.

Let us, however, look at the exchange ratios in the two countries. If we assume with Ricardo that the value of a good reflects its labour cost, in Portugal one unit of wine will exchange for 0.88 unit of cloth, while in England it will exchange for 1.2 units of cloth. In England, on the other hand, a unit of cloth will exchange for only 0.83 unit of wine, while in Portugal it will exchange for 1.12 units of wine. A Portuguese

¹It appears in the text of Chapter VII of the "Principles".

wine-dealer wishing to buy cloth will therefore find it in his interest to do so in England, and an English cloth-dealer wishing to buy wine will therefore do well to buy it in Portugal. These exchanges moreover, will benefit not only the dealers individually, but also their countries.

For, should Portugal wish to increase its production of cloth by one unit, it will have to give up 1.12 units of wine, whereas if it obtains the cloth through trade, it will give up only 0.83 unit of wine. Similarly, should England wish to increase its production of wine by one unit, it will have to give up 1.2 units of cloth, whereas through trade it will need to give up only 0.88 unit of cloth. It follows that Portugal and England will, respectively, obtain cloth and wine more cheaply through trade than if they produced them themselves. In other words, trade will enable them to extract a greater value of goods and services from given resources than if they were to be content with self-sufficiency.

The necessary condition for such a gain is, according to Ricardo, that Portugal should export the good it produces at a relatively low cost, that is wine, and that it should import the good it produces at a relatively high cost, that is cloth, as compared to England, and that England should export the good it produces at a relatively low cost, that is cloth, and should import that which it produces at a relatively high cost, that is wine, as compared to Portugal. Thus Ricardo's theory, which focuses on the difference in relative, or comparative costs, as the element justifying trade has come to be known as the "theory of comparative advantage".

Two observations follow. The first is that Ricardo's theory does not supersede Adam Smith's; it includes it. For absolute advantage is only an extreme case of comparative advantage. Thus, it may be said that the theory of comparative advantage is a general theory which embraces the theory of absolute advantage as a special case.

The second observation, which is essential, is that the gain from trade will depend on whether the prices which traders rely on reflect production costs. For if prices reflect such costs poorly, a country may

not reap all the possible gain from trade or, in the limit, may trade against its comparative advantage. The problem posed by prices which either do not, or which only imperfectly, reflect the costs and values of goods and services can be acute in developing countries in particular.

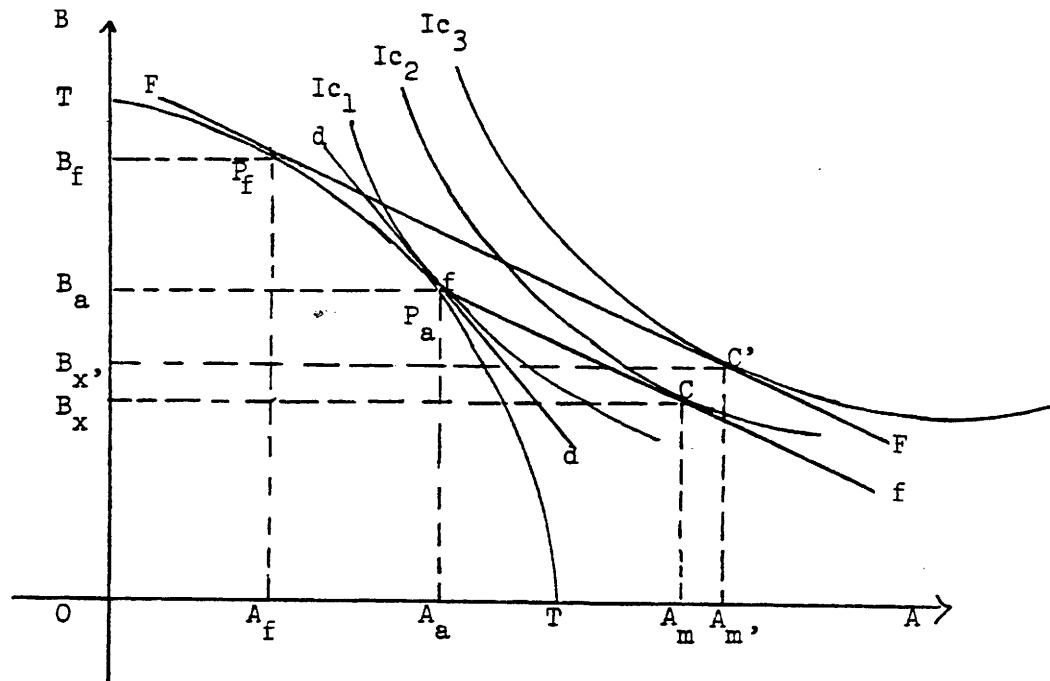
The gain from exchange and the gain from specialization

So far, we have been concerned with the gain accruing to a country that exchanges a product that it produces relatively cheaply as compared to another country, for a product which it produces relatively expensively as compared to that same country. But the gain from trade consists not only of this gain, which may be termed the "gain from exchange"; it also consists of the "gain from specialization".

Let us suppose in the above example that Portugal's entire resources consist of 160 units of labour employed in producing two units of wine, and of 90 units of labour employed in producing one unit of cloth. Let us assume that Portugal wishes to increase the quantity of cloth at its disposal and that, trade with England being possible, it chooses to do so by selling one unit of wine for cloth on the English market. The Portuguese will then have at their disposal one unit of wine and 2.20 units of cloth instead of the combination of one unit of wine and 1.88 units of cloth they would have had if they had chosen to transform one unit of wine into cloth in the absence of trade. But let us now suppose that in view of Portugal's comparative advantage, which is in the production of wine, it decides to devote all its resources to this. It will then produce 3.12 units of wine and, after keeping 1.12 units for its own consumption, will be in a position to trade two units of wine for 2.40 units of cloth on the English market. Thus, by specializing in the product in which it has a comparative advantage, a country will be able to reap a greater gain than in the absence of specialization, for the gain from specialization will be additional to the gain from exchange. Nevertheless, as the above example shows, Portugal will benefit from trade with England, even in the absence of specialization. In other words, the gain from trade does not depend upon a change in the structure of production.

This can also be shown with the help of the following diagram:

Fig. 1



Curve TT is the transformation curve of a given country, that is the curve showing the combinations of products A and B which it is possible for it to produce given its resources and technology. Ic_1 is an indifference curve representing the various combinations of products A and B which enable the country to attain a given level of real income. Curve Ic_2 is an indifference curve representing the various combinations of products A and B which enable it to achieve a level of real income higher than that of Ic_1 , and Ic_3 shows the combinations of products A and B which enable the country to reach a level of real income higher than that of Ic_2 .

Initially, the country is self-sufficient, that is autarkic at point P_a where the output B_a of B is equal to the consumption B_a of B, where the production A_a of A is equal to the consumption A_a of A and where the level of real income is represented by indifference curve Ic_1 .

The country then begins to trade, the relative prices of A and B on the world market being measured by the slope of line ff. When compared with line dd, the slope of which measures relative prices in the country in autarky, ff indicates that product B has greater value, that is can be exchanged for more A, on the foreign market than on the domestic market, whereas product A is more expensive, that is exchanges for more B, on the domestic than on the foreign market. The country will therefore find it profitable to export product B and to import product A at world prices. As the diagram shows, by exporting $B_a B_x$ of B and importing $A_a A_m$ of A, it will, without changing its production, reach consumption point C and the level of income represented by indifference curve Ic_2 , which is higher than Ic_1 .

The country's gain will be even greater, however, if it specializes according to its comparative advantage, which is in product B, and moves from production point P_a to production point P_f , where its output of B will have increased from quantity B_a to B_f , its output of A will have declined from A_a to A_f and where its domestic exchange ratio will have become equal to the foreign exchange ratio ff. For, by exporting $B_f B_x$, that is a greater quantity than $B_a B_x$ of product B and by importing $A_f A_m$, that is a greater quantity than $A_a A_m$ of product A, it will reach consumption point C' and the level of real income represented by indifference curve Ic_3 , which is higher than Ic_2 . It is clear, however, that even if the country does not change the composition of its output, that is does not move from production point P_a to production point P_f , it will nevertheless gain from trade since this will enable it to reach indifference curve Ic_2 , which is higher than Ic_1 .

The analysis of the components of the gains from trade thus shows that the international division of labour which specialization implies is not a condition for those gains, though this is often claimed. A gain will result from the mere exploitation of the differences between domestic and foreign price ratios without any change in the production structure. The international division of labour will, however, increase this gain, and may do so substantially.

Services

So far, it is only trade in goods that has been considered, and nothing has been said about trade in services, although this has developed very quickly in the second half of the twentieth century and has become the subject of multilateral negotiations. As might be expected, and as certain authors have already pointed out¹, the theory of comparative advantage applies to these flows as well as to trade in goods. So does the explanation of trade offered by the factor proportions theory² of trade, the summary presentation of which takes up most of the following section.

Explanations of the differences in exchange ratios in different countries

It is now time to examine what it is that determines differences in relative prices, that is in exchange ratios, in different countries or in one country as compared to the rest of the world. The most widely known theory on the subject was elaborated in the present century by two Swedish economists, Eli Heckscher³ and Bertil Ohlin⁴. Since it explains differences in relative prices by differences in factor endowments, it is also described as the "factor proportions account of trade". The theory asserts that a country which, for example, has proportionally more labour than another country which, in turn, has proportionally more capital than the first, will produce labour-intensive goods more cheaply than the

¹B. Hindley and A. Smith, "Comparative Advantage and Trade in Services", The World Economy, December 1984, pp. 369-389.

²R. Findlay and H. Kierzkowski, "International Trade and Human Capital: A Simple General Equilibrium Model", Journal of Political Economy, December 1983, pp. 957-978.

³"The Effect of Foreign Trade on the Distribution of Income", Ekonomisk Tidskrift, Vol. XXI, 1919, pp. 497-512.

⁴Interregional and International Trade (Cambridge, Mass.: Harvard University Press - Harvard Economic Studies, Vol. XXXIX, 1933).

second country, which will produce capital-intensive goods more cheaply than the first. If trade becomes possible, the first country will export labour-intensive goods and import capital-intensive ones, while the second will export capital-intensive goods and import labour-intensive ones. Thus, to take a hypothetical case, were Asia to have a proportionally larger labour force than Europe, and Europe, a proportionally larger amount of capital than Asia, then Asia would export labour-intensive goods, such as textiles, to Europe, while Europe would export capital-intensive goods, such as machinery, to Asia. Similarly, if Africa were relatively better endowed with land than Europe, and Europe were relatively better endowed with capital than Africa, Africa would produce and export agricultural and mining products to Europe, while Europe would produce and export machinery to Africa.

For this theory to be confirmed, however, requires the influence of factor endowments on relative costs and prices to dominate, that is to outweigh all other possible influences. These are numerous. To begin with, whereas the theory assumes technology to be the same in all countries, differences in technology exist between countries and can compensate for a relatively poor endowment of a given factor. Similarly, whereas the theory supposes constant returns to scale, increasing returns to scale, which imply that costs per unit of production fall as the scale of production increases, may obtain and offset the effect of relative factor proportions on the costs of production.

Factor-intensity reversals may, further, outweigh the influence of relative factor endowments, for the theory holds true provided factor intensities are different for different products, but remain the same whatever the level of production and whatever the country in which production takes place. Labour-intensive goods have thus to be labour-intensive for all levels of production and in all countries and the same has to be true of capital-intensive or of land-intensive products.

The quality of the factors has, moreover, to be the same in trading countries. For, if the land, for example, is richer in a country which is poorly endowed with it than in a country which is richly endowed with it, the quality of the land in the first country can compensate for the lack of it quantitatively speaking.

Fifthly, the tastes of consumers, whether these be State or private, must be the same in the countries concerned, and the level of income in one country as compared to another be such as not to alter their preferences. If not demand, which along with supply determines price, may more than compensate for the effect of relative factor endowments. Lastly, competition must be perfect and commercial policy pursued so as not to counteract the influence of differing factor proportions.

Once these assumptions are lifted, the Heckscher-Ohlin theorem no longer holds true. But, abandoning any one of them provides us with another explanation of the difference of relative prices in different countries. Thus, in addition to the Heckscher-Ohlin theorem, factor intensity reversals, differences in factor qualities, commercial policy, imperfect competition, increasing returns to scale and different tastes may explain trade.

The last three explanations figure prominently in an analysis which has developed since the middle of the seventies and which, in contrast to the Heckscher-Ohlin theory, focuses not on inter-industry but, instead, on intra-industry trade. The point of departure of this approach is the observation that most trade takes place between developed economies whose relative factor endowments are the same, thus making it necessary to examine explanatory variables which the factor proportions theory leaves aside.¹ Although the analysis of intra-industry trade has already given rise to an impressive literature, it does not so far amount to a complete and coherent theory.

¹H. Grubel and P. Lloyd, Intra-industry Trade: The Theory and Measurement of International Trade in Differentiated Products (London: MacMillan, 1975).

The analysis of intra-industry trade also includes differences in technology, that is in production functions, as well as innovation, as explanations of trade, and uses them to discuss North-South relations.¹ It is the technology gap, indeed, more than the Heckscher-Ohlin theory which, to-day, is engaging the attention of those who study trade between developed and developing countries, on the one hand, and between the developed and the socialist economies, on the other.

Reading References

- Jagdish N. Bhagwati, The Theory and Practice of Commercial Policy: Departures from Unified Exchange Rates (Princeton: Princeton University, 1968 - Special Papers in International Economics), pp. 1-8.
- P.T. Ellsworth, J. Clark Leith, The International Economy (New York: MacMillan, 1975), Chapters 1-3, 6, 7.
- Peter B. Kenen, International Economics (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), pp. 7-23.

¹P. Krugman, "A Model of Innovation, Technology Transfer and the World Distribution of Income", Journal of Political Economy, 1987, pp. 253-266.

Chapter II

THE DISTRIBUTION OF THE GAINS FROM TRADE

We have just shown that international trade enables the countries taking part in it to reap gains and thus to increase their real income. We must now ask how these gains are distributed among the countries engaging in trade. We shall see that this depends on the terms of trade, that is on the ratio between a country's imports and exports.

The terms of trade and the size of countries

If we go back to Table 1, we see that the terms of trade can either be the exchange ratio obtaining in Portugal, that is one unit of wine for 0.88 unit of cloth, the exchange ratio obtaining in England, that is one unit of wine for 1.20 units of cloth, or an exchange ratio lying between the two, for instance 1.00 unit of wine for 1.00 unit of cloth. These three cases enable us to define the "dominant", the "small" and the "large" country on international markets.

A country is said to be "dominant" when its own domestic price becomes the international price, as is true of Portugal and England respectively in the first two cases above. A country is said to be "small" when it accepts the domestic price of another country, or the price obtaining on the world market, as is true of England and Portugal respectively in the first two cases above. A country, finally, is said to be "large" when it influences international prices by varying the quantity that it buys or sells on the world market, as is true of both Portugal and England in the third case just mentioned.

Thus, a country is small, dominant or large in international trade not because of its physical size, its population, its national income or its income per head, but because of its influence, that is its bargaining power, in one or more of the international markets in which it operates. When that influence is of the same order in sufficient markets, it determines the country's bargaining power with respect to its terms of trade. A country which, for example, has no bargaining power on any of the international markets in which it buys or sells, will be small with respect to its terms of trade, which in so far as it is concerned will be a datum.

The economic size of countries will determine the distribution of the gains from trade. Although it may seem paradoxical at first sight, the dominant country will not benefit from trade, for it will buy its imports and sell its exports at the prices it would have paid or received under autarky. On the other hand, a small country dealing with a dominant one will reap all of the gains from trade. This is illustrated in Table 1 in the case of Portugal's trading wine for cloth at the rate of one unit of wine for 1.2 units of cloth, that is at England's domestic exchange ratio. Large countries, finally, will share the gains from trade and will thus benefit from trade to a lesser extent than the small country.

Although it is easy to imagine a dominant country, it is often difficult to identify one in practice. On the other hand, there are many cases where the world market is dominant with respect to a single country, that is where a country is small in relation to the world market. If England were the world in the case just cited, this would be true of Portugal. And leaving theory for reality, Switzerland is small, for example, with respect to the world market for petroleum.

Statistical measures of the terms of trade

Changes in the terms of trade can be measured in various ways. The chief indicators are four in number.¹

First, there are the net barter terms of trade, N, which are the ratio, expressed as an index, of export to import prices:

$$N = \frac{\text{Index of export prices} \times 100}{\text{Index of import prices}}$$

Second, there are the gross barter terms of trade, B, which are the ratio, expressed as an index, of the volume of imports to the volume of exports:

$$B = \frac{\text{Index of the volume of imports} \times 100}{\text{Index of the volume of exports}}$$

¹See Gerald M. Meier, The International Economics of Development, Theory and Policy (New York: Harper and Row, 1969), pp. 41-45.

Third, there are the single factorial terms of trade, S, which are the ratio, expressed as an index of export to import prices multiplied by an index of productivity in the export industries:

$$S = N \times \text{index of productivity in the export industries.}$$

To this can be added the double factorial terms of trade, which are measured by multiplying N by the ratio of the index of productivity in the country's export industries to the index of productivity in the industries producing the country's imports abroad, and which thus take account of the evolution of productivity in both sectors.

Lastly, there are the income terms of trade, I, which are the ratio, expressed as an index, of the value of exports divided by the price of imports:

$$I = N \times \text{index of the volume of exports.}$$

The measure of the terms of trade most widely employed is N, the net barter terms of trade, which is used by the United Nations, for example, to measure the changes in the terms of trade of developed and developing market economies shown in Table 2.

The base year of the indices being 1980, the indicator of the net terms of trade shows a slight improvement for the developed market economies from 1960 to 1970 and a substantial deterioration from 1970 to 1984. In the case of the developing market economies, the indicator shows relative stability from 1960 to 1970, followed by a rapid upswing, the indicator more than doubling between 1970 and 1983, and a market decline since then. The movements since 1970 are explained by the variations in the price of oil, which have had a direct effect on the unit value of the imports of the developed countries, and on the unit value of the exports of the developing countries including the oil producers.

Table 2
Terms of Trade¹ (1980 = 100)

	1960	1965	1970	1975	1976	1977	1978	1979	1981	1982	1983	1984
DEVELOPED MARKET ECONOMIES ²												
North America	117	120	122	109	109	106	108	107	99	100	101	100
Europe	128	132	136	117	117	113	110	107	102	104	108	106
EEC	108	112	111	103	102	102	103	103	97	99	99	99
EFTA	113	112	115	103	102	102	104	106	97	99	100	98
Other Europe ³	100	100	104	105	107	105	104	101	101	106	103	106
Africa ⁴	90	91	103	73	71	87	85	88	88	87	...	...
Asia ⁵	143	150	143	113	133	120	112	107	92	86	85	...
Oceania ⁶	175	160	176	127	127	131	143	126	101	104	105	109
	122	125	114	105	101	97	103	106	100	99	97	...
DEVELOPING MARKET ECONOMIES ²												
Africa	46	48	50	73	78	77	75	84	103	102	93	...
Asia	...	...	...	...	...	...	...	...	...	...	...	...
Asian Middle East (excl. petroleum)	...	...	...	...	...	...	...	...	...	...	...	...
Other Asia	...	...	...	...	...	...	...	...	...	...	...	...
America (excl. petroleum)	...	...	...	...	...	...	...	...	...	...	...	...

	1982				1983				1984				1985
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I
DEVELOPED MARKET ECONOMIES ²													
North America	100	101	99	99	102	101	100	101	101	101	100	100	102
Europe	104	104	104	106	108	109	109	108	108	107	106	106	109
EEC	97	100	98	98	99	100	99	98	99	99	99	98	97
EFTA	97	99	98	98	99	99	99	98	99	99	97	99	97
Other Europe ³	106	105	106	102	104	105	103	104	107	107	105	106	104
Africa ⁴	86	83	...	...	...	...	...	...	...	...	...	...	...
Asia ⁵	88	89	86	89	86	83	85	85	...	...	...	...	...
Oceania ⁶	105	107	104	101	103	107	105	109	109	109	107	108	107
	99	98	98	97	98	97	97	97	93	93	93	95	93
DEVELOPING MARKET ECONOMIES ²													
Africa	102	101	102	102	93	91	93	92	92	92	...	...	...
Asia	...	...	...	...	...	...	...	...	...	...	...	...	...
Asian Middle East (excl. petroleum)	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Asia	...	...	...	...	...	...	...	...	...	...	...	...	...
America (excl. petroleum)	...	...	...	...	...	...	...	...	...	...	...	...	...

Source: Monthly Bulletin of Statistics, October 1985, pp. xxiv and xxv.

Notes referring to Table 2

1. Unit value index of exports divided by unit value index of imports.
2. This classification is intended for statistical convenience and does not, necessarily, express a judgement about the stage reached by a particular country in the development process.
3. Indexes for "Other Europe" have been recalculated for the whole period covered by this table to exclude the data for Greece which joined EEC on 1 January 1981.
4. South Africa.
5. Israel and Japan.
6. Australia and New Zealand.

The terms of trade and the gains from trade

It is tempting to use measures of the evolution of the terms of trade to indicate variations in the gains from trade and their distribution. Thus, from the figures in the above table one might be led to believe that the gains, and consequently the real income, of the developed market economies declined from 1960 to 1980 and that those of the developing market economies increased. As we shall see, however, indicators of terms of trade give only part of the picture, that is take only one aspect or, at most, a few aspects of a country's trade into account, and thus can only be used with caution to draw such conclusions.

Imagine for example that, starting from balance of trade equilibrium, a country's export prices increase relatively to its import prices, so that the value of N rises. Apparently, the country can now buy more imports per unit of exports and thus derive a greater benefit from trade. Suppose, however, that at the same time the volume of goods exported drops as compared to the volume imported, so that the value of B rises, and that the country has a deficit in its trade balance. Such a situation could be caused by a faster rate of inflation in the country concerned than in the rest of the world. Is it then reasonable to speak of an increase in the gains from trade, and hence in the income, of the country concerned, and of a reduction in the gains of its trading partners?

Consider a second example. Suppose that the rise in N is accompanied by a rise in B and the continued balance of trade equilibrium of the country concerned. Such a situation may arise from a change in the tastes of the rest of the world in favour of the products the country exports, which makes it possible, on the one hand, to maintain or even increase the volume of exports in spite of the rise in prices and, on the other, to increase the volume of imports even more rapidly. In such a case, the country is in a better position since in equilibrium, it can now buy more imports for the same volume of exports than before. Its partners, other things equal, suffer a deterioration in their terms of trade and real income, however.

Lastly, let us take a third case. Suppose that there is a decline in the price of the country's exports as compared to the price of its imports, hence a decline in N . Does such a decline indicate reduced gains from trade for the country in question and increased gains for its trading partners? Consider B , first, and assume that its value declines owing to an increased volume of exports, the trade balance remaining in equilibrium. The answer is then in the affirmative, other things equal. Next consider I and suppose that the value of this indicator does not change because falling export prices are offset by an increase in the quantity of exports. The answer is the same as in the preceding case since the value of I has only been maintained because the country has contributed more exports to compensate for the fall in its export prices. Finally look at S and suppose that here too lower export prices, and therefore a lower N , are accompanied by a compensating productivity increase in the export sector. The value of S has thus remained unchanged, but what of the gains from trade? They too have remained the same, for, although the country's export prices have declined and it can therefore import less per unit of exports, each of these costs proportionally less in terms of economic resources. In other words, the cost of each imported unit in terms of the resources employed in the production of exports has remained constant. Thus, when considering N as compared to S , we find, in spite of the changes in B and I , that the country's gains from trade have remained unaltered. The gains of its trading partners, on the other hand, have increased, other things equal, since they obtain more imports per unit of exports.

Care is therefore required when attempting to draw conclusions concerning the evolution of the gains from variations in a measure of the terms of trade. This applies as much to the interpretation of the indices presented in Table 2 as to the discussion of the secular deterioration in the terms of trade of the developing countries which we examine below.

Secular deterioration of the terms of trade of the developing countries

The thesis according to which the terms of trade of the developing countries are undergoing secular deterioration was formulated by

Raoul Prebisch¹ and Hans Singer², and drew considerable attention during the first United Nations Conference on Trade and Development (UNCTAD). Its starting point is the evolution of England's terms of trade over the period extending from 1876/80 to 1936/38. During this time England imported essentially food and raw materials and benefited from an improvement in its net barter terms of trade. This led to the conclusion that over the same period the terms of trade of England's suppliers deteriorated and had a secular tendency to do so. England's suppliers, moreover, were taken to be developing countries.

The thesis has been subjected to a number of criticisms, some of which merely refer to questions of definition or statistics. Thus, it has been observed that the evolution of England's terms of trade cannot be considered as representative of the terms of trade of all developed countries and that among the countries which supplied its raw materials and food, there were the United States, which were certainly an agricultural exporter, but no longer a developing country at the end of the period in question. The point has also been made that England's net barter terms of trade were the ratio of c.i.f. import prices to f.o.b. export prices, and that they improved owing to the very rapid fall in freight costs at the turn of the twentieth century. The general question of the significance of price indices in the long run has also been raised, when both the quality and the assortment of the products included in the index vary. Above all, however, it has been stressed that even if the value of *N* did fall for the developing countries during the period considered, this in itself does not mean that they suffered a reduction in their real income. For productivity in many countries, for instance South America, greatly increased during the period. In other words, it is quite possible that a reduction in the export prices of the developing

¹Raoul Prebisch, The Economic Development of Latin America and Its Principal Problems (Lake Success, New York: United Nations, Department of Economic Affairs, 1950); "Commercial Policy in the Underdeveloped Countries", American Economic Review, May 1959, pp. 251-273.

Raoul Prebisch was Executive Secretary of the Economic Commission for Latin America (ECLA) and the first Secretary-General of UNCTAD.

²Hans W. Singer, "The Distribution of Gains between Investing and Borrowing Countries", American Economic Review, May 1950, pp. 473-485.

Hans W. Singer is Emeritus Professor, University of Sussex, and a Fellow of the Institute of Development Studies (IDS) at the University of Sussex.

countries relative to their import prices was compensated, or more than compensated, by increased productivity in the export sector.¹

The Singer-Prebisch thesis is, moreover, contradicted by another theory which goes back to Ricardo and Malthus², which was supported by Keynes³, is implicit in the first report of the Club of Rome⁴ and has now been taken up by the advocates of agricultural protectionism in the industrial countries. It predicts that as the world industrializes and its population increases, there will be a growing demand for raw materials and food and hence an increase in their prices relative to those of industrial products. As a result, the terms of trade of the countries supplying raw materials and food will have a secular tendency to improve.

It is true, as we have just mentioned, that a rising trend has recently been observed in the prices of a number of raw materials, especially oil. Nevertheless, the idea of any kind of secular trend in the net barter terms of trade is not very convincing. For they are a price ratio, and the prices of products traded in international markets are determined by supply and demand. These, in turn, change over time and cause variations in import and export prices and so in the terms of trade, which deteriorate or improve as circumstances dictate. Thus, although secular movements in the terms of trade may occur, there is no reason why they should necessarily do so, or why they should do so in one direction rather than another.

¹Most of these points are summarized in Gottfried Haberler, "Terms of Trade and Economic Development", Economic Development for Latin America, Howard S. Ellis (ed.) (London: MacMillan, 1961), pp. 275-297.

²Thomas Robert Malthus (1766-1834), English economist and author of the Essay on the Principle of Population.

³John Maynard Keynes (1883-1946), English economist and author of the General Theory of Employment, Interest and Money.

⁴Donella H. Meadows and Dennis L. Meadows, The Limits of Growth. A report for the Club of Rome's Project on the Predicament of Mankind (New York: Universe Books, 1972) 205 p.

Growth and the terms of trade

Let us conclude by taking a look at a closely related subject, namely the effects of growth on the terms of trade. This analysis was elaborated at the beginning of the fifties by John R. Hicks, an English economist who was professor at Oxford at the time, and who was later awarded the Nobel prize in economics.¹

The theory analyses the effects of an increase in economic resources and of technological progress on production, and of an increase in income resulting from growth and of the changes in tastes associated with it, on consumption. The combination of production and consumption effects determine variations in the level of trade which, with one exception, are expansionary. The exception is characterized, on the production side, by an absolute increase in the output of importables and by zero growth or an absolute decline in the output of exportables. This is associated, on the consumption side, with an increase in the demand for importables and exportables proportionate to the increase in income due to growth, or by a more than proportionate increase in the demand for exportables.² The effect of growth on production and consumption is then to reduce trade below its level prior to growth and hence to increase the economy's degree of self-sufficiency.

The consequences of development on the growing country's terms of trade depend on the overall effect of growth on production and consumption, and on the size of the economy. If the country is a large one and there is no development in the rest of the world, its growth will, unless it leads to greater self-sufficiency, cause a deterioration in its terms of trade. In the more normal case, where there is simultaneous growth in the country concerned and in the rest of the world, the answer will no longer depend only on the country's growth but also on the growth of the rest of the world, and it may be that the growing country's terms of trade will improve whatever the bias in the overall effect.

¹John R. Hicks, "An Inaugural Lecture", Oxford Economic Papers, June 1953, pp. 117-135.

²This presentation of the theory disregards inferior goods.

If the country is small and there is no growth in the rest of the world, its terms of trade will remain unchanged whatever the overall bias of its growth. If there is growth in the rest of the world and the small country simultaneously, its terms of trade may deteriorate or improve.

It will be apparent that the field of analysis covered by this theory embraces that of the Singer-Prebisch proposition, since the economies experiencing growth include those of the developing countries. But it provides no support for the thesis of the two authors. For, whether the growing country is large or small and whether it alone grows or does so in a world which is also developing, it is not condemned to a secular deterioration of its terms of trade. These will improve, deteriorate or remain unchanged as circumstances dictate. In other words, the conclusions of the theory coincide with the findings to which the empirical discussion had led us.

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Chapter III

TRADE POLICY AND ITS INSTRUMENTS

So far, we have dealt with the factors which determine trade, the gains it may bring and the distribution of those gains. But we have not allowed for any central authority that could influence imports and exports. We do so now, and begin by examining the instruments available to it in the conduct of its trade policy.

This is the policy whereby a central authority determines the level, direction and composition of trade, and the rates of divergence between the domestic and foreign prices of traded goods. Trade policy may be protectionist. If so, it will promote national production and raise the domestic price of the protected product above its price in the foreign market. Or, it may be anti-protectionist, in which case it will discourage national production and reduce the price of the negatively protected product below its price in the world market. Or, lastly, trade policy may equate domestic and foreign prices. In a market economy, this will be achieved by a policy of free trade¹.

Chief instruments

The instruments available to a central authority pursuing any type of economic policy can be divided into two categories, namely price mechanism devices and direct controls. This classification will be applied to the instruments of trade policy. These, however, may in addition have an immediate effect on trade and a secondary effect on the domestic production and consumption of exportable and importable goods or, on the contrary, have an immediate impact on domestic production or consumption, for example, and a secondary effect on trade. Only the trade policy instruments which have an immediate impact on trade will be dealt with in what follows. The chief of these are shown below in Table 3.

¹Provided that importers and exporters are perfectly competitive.

Table 3

The chief trade policy instruments

<u>Price mechanism devices</u>	<u>Direct controls</u>
Tariffs - <u>ad valorem</u> specific equalizing	Quotas or quantitative restrictions
Export subsidies	Directives
Multiple exchange rates	
Advance import deposits	

Consider the left-hand column first. An ad valorem duty is a tax, or charge, on imports per unit of value. A specific duty, on the other hand, is a tax, or charge, on imports per physical unit. An equalizing duty is a tax which collects the difference between the administratively fixed domestic price and the varying foreign price. Corresponding to these three types of tariff, there may be import subsidies, export taxes or, as indicated in the table, export subsidies.

But let us return to the three types of duty. The rate of ad valorem duty will remain the same regardless of the foreign price, and it will ensure that the domestic price is always higher than the foreign price by a given percentage. On the other hand, the ad valorem equivalent of a specific duty will vary, declining if the world price increases, and increasing if the world price declines. In a period of world-wide inflation, its impact will consequently diminish. The ad valorem equivalent of an equalizing duty will also vary, declining if the world price increases, and increasing if the world price declines. Unlike ad valorem and specific duties, however, the equalizing tariff will sever the link between the domestic and the world price, since the former will be fixed administratively irrespective of variations in the latter.

Multiple exchange rates, which introduce different rates for different directions of trade flows, or different groups of products, may be assimilated to ad valorem taxes and subsidies. The advance

import deposit, finally, also constitutes an import tax, which may be calculated by the formula¹

$$z \cdot q \cdot r.$$

where

z = the proportion of the c.i.f. import value to be deposited

q = the time-period, expressed as a proportion of a year, for which the deposit has to be made

r = the rate of interest

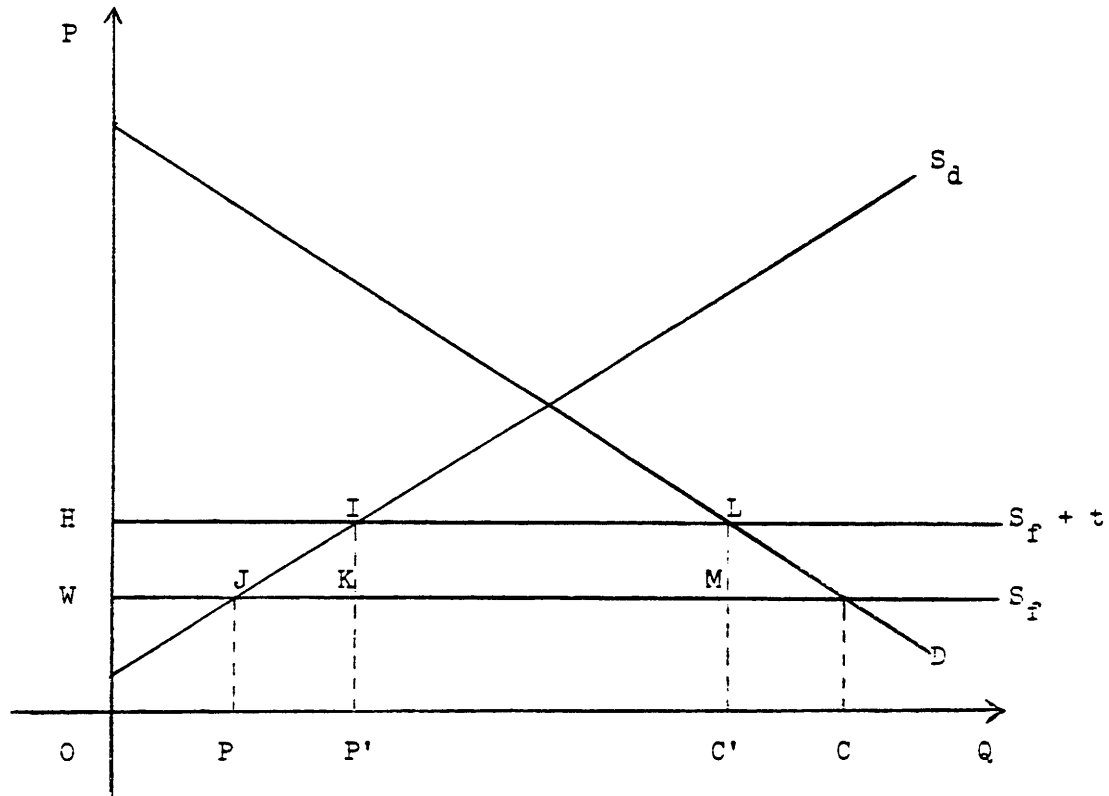
Next, examine the right-hand column of Table 3. The first instrument it lists is the quota or quantitative restriction, which constitutes an administrative limitation imposed on the quantity or value of imports or exports. The second is the directive, which may, but need not, be a plan directive and which is an instruction to import or export a certain quantity or value of a product or a group of products.

Effects of tariffs and quotas

Having identified the chief commercial policy instruments, we can define both the effects of the tariff, that is of the price mechanism device which serves to analyze the others employed in the foreign trade field², and those of the quantitative restriction, which is the most widespread form of direct control. These effects may be studied with the help of the following figure.

¹W.M. Corden, The Theory of Protection (Oxford: Clarendon Press, 1971), p. 10.

²Either because, like export taxes, they are duties applied to a trade flow, or because import or export subsidies constitute negative duties, or because, like multiple exchange rates or advance import deposits, they may be converted into duties or subsidies.

Fig. 2

The vertical axis measures price and the horizontal axis, quantity. Curve S_d represents the domestic supply of importable product Q, and curve S_f the foreign supply of product Q, which is assumed to be infinite at world price OW. Curve D is the demand for the importable. If the domestic price is equal to the world price OW, the domestic supply or production is OP, the demand or consumption is OC, and imports are the difference between domestic supply and demand, that is PC. But if the central authority intervenes by means of an import tariff, so that foreign supply including the tariff is represented by curve $S_f + t$, the domestic price rises from OW to OH and, as a result, production increases from OP to OP', consumption declines from OC to OC', and imports are reduced from PC to P'C'.

The increase in the quantity produced, PP', constitutes the production, or protection, effect of the tariff. The reduction in the quantity demanded, CC', constitutes the consumption effect of the tariff. The reduction of the quantity imported from PC to P'C' constitutes the import effect or since, other things equal, a reduction in the quantity imported improves the payments situation, the balance-of-payments effect. To these must be added two further effects. The first, measured by the area WHIJ, constitutes the increase in producers' surplus, or the redistribution effect. The second, measured by the area IKLM is the revenue effect, that is the receipts of the customs authorities. They are equal to the quantity imported under the tariff times the tariff, WH.

If the central authority resorts to a quantitative restriction equal to P'C', which reduces the total supply of importable product Q and thus determines the domestic price OH, the production, consumption, import and redistribution effects will be the same as in the case of a tariff at the rate of $\frac{WH}{OW}$. The revenue effect, on the other hand, will disappear as a rule, the difference between the foreign and the domestic price going to the importers, to middlemen, or to the foreign exporters. The difference between the two prices will only be collected by the customs authorities if they combine a tax at the rate of $\frac{WH}{OW}$ with import licences, or if they auction off the import licences.

The equivalence of tariffs and quotas

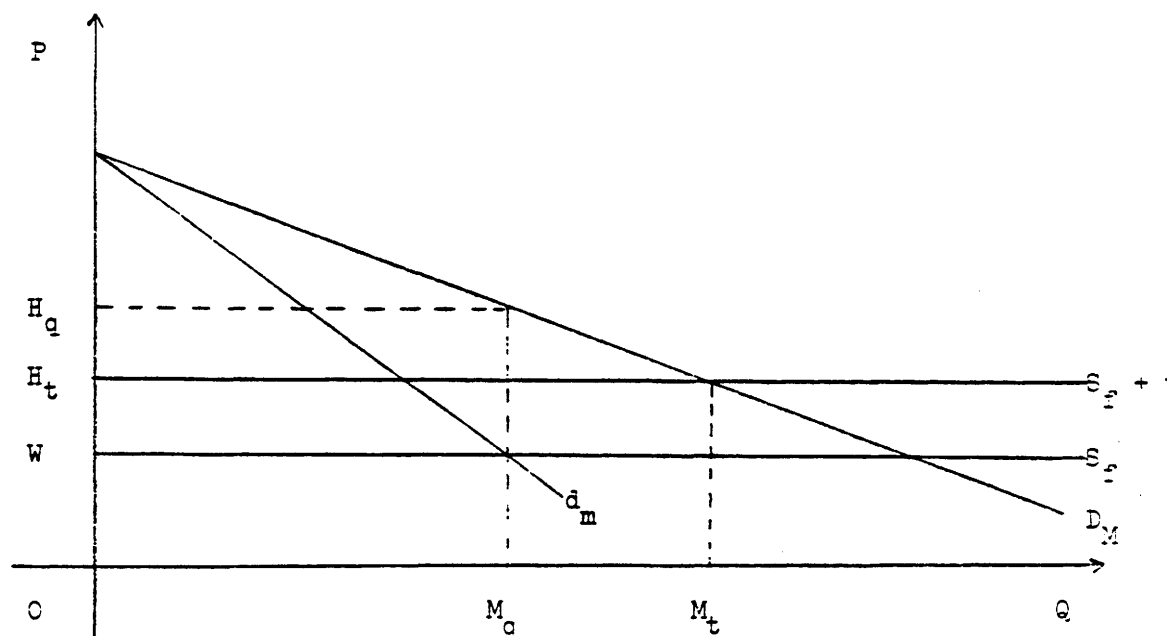
The foregoing serves to bring out what is known as the equivalence of tariffs and quotas. This means that a tariff normally results in a volume of imports which, if set alternatively as a quota, determines a rate of divergence between domestic and foreign prices equal to the tariff. This too can be demonstrated with the help of Figure 2.

A tariff at the rate of $\frac{WH}{OW}$ will have the production, consumption, redistribution and revenue effects already mentioned and will determine the quantity of imports P'C'. If the tariff is abolished and replaced by an import quota equal to P'C', supply and demand in the domestic market will be in equilibrium at price OH, and the rate of divergence between domestic and foreign prices will be $\frac{WH}{OW}$, that is equal to the rate of the initial tariff.

Jagdish Bhagwati, an Indian trade theorist and professor at Columbia University has shown, however, that this result rests on the assumption that the producers, foreign suppliers and importers of importable product Q are perfectly competitive.¹ If competition is not perfect in one or other sector, the equivalence of tariffs and quotas breaks down.

Where there is a monopoly of production, for instance, the replacement of a tariff by a quantitative restriction which permits the entry of the same volume of imports as the tariff will result in a rate of divergence between domestic and foreign prices which is higher than the tariff. Similarly, the replacement of a tariff by a quota which allows the entry of the same volume of imports as the tariff but which is allocated to a monopoly importer may reduce the volume of imports and result in a rate of divergence between domestic and foreign prices which is higher than that of the tariff, as may be seen from the following figure:

Fig. 3



¹Jagdish Bhagwati, "On the Equivalence of Tariffs and Quotas", Robert E. Baldwin et al., Trade, Growth and the Balance of Payments. Essays in Honor of Gottfried Haberler (Amsterdam: North-Holland, 1965), pp. 53-67.

As in the case of Figure 2, curve S_f represents foreign supply, and $S_f + t$ foreign supply plus the tariff. Curve D_M represents the demand for imports, that is the difference between D and S_d for all prices at which there is an excess of the quantity demanded over the quantity supplied domestically in Figure 2. Curve d_m is the monopoly importer's marginal revenue curve corresponding to D_M . Given the tariff, the volume imported is OM_t and the domestic price is OH_t . If a quota for quantity OM_t then replaces the tariff and is allocated to a single importer, the quantity of imports will be reduced to the level at which the importer's marginal revenue is equal to his marginal cost, that is to OM_q , and the rate of divergence between the domestic and foreign price will rise to exceed the tariff, that is to $\frac{H_q W}{OW}$. Similarly, an import or export monopoly would exclude equivalence between the two trade policy instruments.

The implications of this analysis for commercial policy are of particular importance for the developing countries and are the following:

- (i) Contrary to general belief, quantitative restrictions are not certain, that is do not ensure the import or export of the quantity or value authorized by the quota; this is demonstrated in the case we have just considered of a quota allocated to a monopoly importer.¹
- (ii) The combination of a quota, which results in a certain rate of divergence between domestic and foreign prices, and a tariff at a lower rate does not make the tariff redundant, contrary to what has long been taught; this too may be understood by referring to Figure 3.
- (iii) The auctioning of import licences enables the central authority to collect the quota-holder's profit only if importers are perfectly competitive.
- (iv) The combination of competitive quotas and monopolistic producers, which reduces both the quantity and the efficiency of domestic production, must be accompanied by a clause ensuring the liberalization of imports whenever there are signs of deteriorating quality, inefficiency or restrictive production policies.²

¹On the other hand, it is clear from the analysis of the various types of trade policy instruments that the directive is certain.

²Bhagwati, p. 67.

Bhagwati's study has been followed by a voluminous literature on the equivalence of trade policy instruments. This has distinguished between global and partial equivalence and suggested partial equivalences different from those of Bhagwati. Other instruments, such as voluntary export restrictions, directives and state-trading have been compared to the tariff. Moreover, equivalence has been examined on the assumption that trading partners practice retaliation, and given uncertainty.¹

The debate has demonstrated the different ways in which trade policy instruments operate under different market structures. But the value of the analysis lies, on the one hand, in the use that can be made of it in the negotiation of agreements on the reduction of trade barriers between countries using different trade policy instruments. It lies, on the other, in the contribution which it can make to the transition to trade regulation by means of price mechanism devices in economies which previously relied essentially on the direct control of their imports and exports.

¹See on these various points: W.M. Corden, The Theory of Protection (Oxford: Clarendon Press, 1971), pp. 212-215; Hirofumi Shibata, "A note on the Equivalence of Tariffs and Quotas", American Economic Review, March 1968, pp. 137-142; Harriet Matejka, Trade Control in East Europe (Geneva: Médecine et Hygiène, 1978), pp. 218-248; C.A. Rodriguez, "The Non-Equivalence of Tariffs and Quotas under Retaliation", Journal of International Economics, August 1974, pp. 295-316; G. Fishelson and F. Flatters, "The (Non) Equivalence of Optimal Tariffs and Quotas under Uncertainty", Journal of International Economics, November 1975, pp. 385-394.

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Chapter IVTARIFFS AND EXCHANGE RATES

Tariffs, and trade taxes in general whether they affect imports or exports, may be compared not only to quantitative restrictions, which are other trade policy instruments, but also to domestic taxes and subsidies. The comparison, it goes without saying, may also be made in the case of negative trade taxes, that is of import and export subsidies.

The equivalence of trade and domestic taxes and subsidies

A tariff at a given rate may thus be considered as a combination of a production subsidy and a consumption tax, both at the same rate. This may be shown with the help of Figure 2.

Assume that a production subsidy is introduced at the rate of $\frac{WH}{OW}$. This will increase the price paid to producers from OW to OH, will bring about an increase in production equal to PP', a reduction in imports of the same amount, a rise in producers' surplus equal to WHIJ, and will require a government disbursement equal to WHIK. Assume further that a consumption tax is then introduced at the same rate of $\frac{WH}{CW}$. This will increase the price paid by consumers from OW to OH, will result in a reduction in consumption and imports amounting to CC', and in tax revenue for the central government equal to WHLM. If the consumption tax at the rate of $\frac{WH}{OW}$ is then combined with a production subsidy at the same rate, the revenue from the consumption tax will be partly absorbed by the production subsidy to an amount represented by the area WHIK. This will leave a receipt for the central authority equal to IKLM, and the production, consumption, import and redistribution effects will be + PP', - CC', - (PP' + CC'), and + WHIJ, respectively. In other words, the effects of combining a production subsidy and a consumption tax at the rate of $\frac{WH}{OW}$ will be equivalent to those of a tariff at the same rate. The same may be demonstrated in the case of an export subsidy, and it can be shown symmetrically that an import subsidy or an export levy is equivalent to a combination of a production tax and a consumption subsidy at the same rate as the import subsidy or export tax.

The analysis of these equivalences has given rise to the terms "subsidy-equivalent" of the tariff to designate the area WHIK in Figure 2, and "consumer tax equivalent" of a tariff to designate the area WHLM¹, and these same expressions can also be used in the case of an export subsidy. Symmetrically, one can speak of the "tax-equivalent" of an import subsidy or an export levy, and of the "consumer subsidy equivalent" of either of these measures².

The discussion of the equivalence of trade taxes or subsidies and domestic taxes or subsidies is of interest for three reasons. First, it draws attention to the production-subsidy and consumption-tax effects of a tariff or export subsidy as well as to the production-tax and consumption-subsidy effects of an export tax or import subsidy. We will have occasion to return repeatedly to these properties of trade taxes and subsidies. Second, it reminds us that instruments of economic policy designed to affect domestic variables such as production and consumption have effects on trade when the activities involved relate to importable or exportable products. Third, the discussion suggests that when a government cannot make use of a trade policy instrument owing, for example, to international obligations, it can still, in principle, employ domestic economic policy instruments to achieve the same objectives. In practice, however, its ability to do so will depend on the freedom with which it can decide on the use of such instruments without having to obtain the approval of parliament or the people.

Trade taxes and subsidies and exchange rates

Having considered trade taxes and subsidies and domestic taxes and subsidies, it is time to turn to the equivalence between trade taxes and subsidies and changes in the exchange rate.

A uniform tariff on all imports combined with a uniform subsidy on all exports has the same effect on the trade balance as a devaluation at

¹W.M. Corden, The Theory of Protection (Oxford, Clarendon Press, 1971), pp. 7 and 11.

²These equivalences, incidentally, help one to grasp the way in which an "excise duty" operates. The term is generally used to designate the combination of a tariff and a production tax at the same rate, which means that the excise duty will operate like a consumer tax. But note that it may be used to designate only the production tax with which the tariff is combined, in which case the latter will be referred to as the "border tax", or "border tax adjustment". W.M. Corden, The Theory of Protection (Oxford, Clarendon Press, 1971), p.12.

the same rate. Thus, a devaluation of 20 per cent will increase the price of imports in terms of local currency by 20 per cent, as if they were taxed at the same rate, and will increase the price of exports in local currency by 20 per cent, as if they were subsidized at the same rate. Conversely, a uniform subsidy on imports combined with a uniform tax on exports will have an effect on the trade balance equivalent to a revaluation at the same rate. A 50 per cent revaluation, for example, will reduce the price of imports in local currency by 50 per cent as if they were subsidized at the same rate, and will also reduce the price of exports in local currency by 50 per cent as if they were taxed at the same rate.

If we refer to the analysis in the preceding section, moreover, it is obvious that a devaluation of a certain rate is equivalent not only to a combination of a uniform tariff and a uniform export subsidy at the same rate but also to a combination of production subsidies and consumption taxes on importable and exportable products at the same rate. Conversely, a revaluation of a certain rate is equivalent not only to a combination of a uniform import subsidy and a uniform export tax at the same rate, but also to a combination of consumption subsidies and production taxes on importable and exportable products at the same rate.

Many countries have, at one time or another, made use of the equivalence of exchange-rate changes and trade taxes and subsidies in order to substitute a combination of such taxes and subsidies for a devaluation or revaluation of their currency. This has been true in particular of the developing countries, which have sometimes chosen to replace a devaluation by a combination of explicit or implicit¹ import taxes and export subsidies for long periods at a time. It has also been true of the socialist countries, where the resort to trade policy instruments for purposes of external equilibrium has often completely eliminated the use of the exchange rate.

¹Implicit trade taxes are the rates of divergence between domestic and foreign prices resulting from direct controls.

Tariffs under flexible exchange rates

If trade taxes and subsidies can replace a devaluation or a revaluation, is the converse true? Can a devaluation or revaluation replace trade taxes and subsidies? Clearly, a devaluation or, under a system of flexible exchange rates, a depreciation of 10 per cent can replace a uniform import levy of 10 per cent, and a revaluation or appreciation of 10 per cent can cancel the protective effect of a uniform import tax of 10 per cent. Similarly, a devaluation or depreciation of 20 per cent can replace a uniform export subsidy of 20 per cent, and a revaluation or appreciation of 20 per cent can cancel the protective effect of a uniform export subsidy of 20 per cent. But is this to say that tariffs are useless under a system of flexible exchange rates? The question arises because it has been claimed that under the present system of flexible exchange rates, tariffs and hence tariff negotiations, are redundant.¹

A change in the exchange rate, or in an equivalent combination of uniform taxes and subsidies, will affect the prices of both imports and exports and hence the level of domestic as compared to foreign prices. It will consequently modify the country's macroeconomic equilibrium. The chief effect of the tariff, on the other hand, will be on the prices of imports as compared to those of other goods on the domestic market, that is on relative prices. It will consequently influence the allocation of the country's economic resources given its macroeconomic equilibrium. This will be true whether the tariff is uniform, providing it is not accompanied by a uniform export subsidy, or whether its structure is differential, that is composed of taxes which give different activities different rates of protection. For, in the first case, the tariff will raise the prices of importables relatively to those of exportables and of non-traded goods, and so influence resource allocation. In the second, it will not only raise the prices of importables relatively to those of other goods on the domestic market, but will also influence relative prices within the importables sector.² It follows that a variation in

¹Richard Blackhurst, Jan Tumlin, Trade Relations under Flexible Exchange Rates (Geneva: GATT - Studies in International Trade, No. 8, 1980), Section I.

²It may be noted that one of the difficulties encountered by countries which have chosen to maintain external balance by using trade policy instruments instead of variations in the exchange rate has been that the trade taxes and subsidies used have rarely been uniform and of the same rate. Differential rates have then caused important distortions in resource allocation and have often imposed a heavy economic cost on the countries concerned.

the exchange rate cannot eliminate the effect of a tariff, which by acting on relative prices will continue to influence resource allocation whatever the exchange rate.

It remains true, however, that an appreciation of the exchange rate of 10 per cent under a system of flexible exchange rates will offset, or more than offset the effect of a uniform duty of 10 per cent or of differential duties of 0 to 10 per cent. It will thus give the impression that exchange-rate flexibility renders tariffs redundant and that a return to another exchange-rate system will be necessary if tariffs are to recover their function. But, what must then be asked, is how the macroeconomic disequilibrium which, under the flexible exchange-rate system, will have been corrected by an appreciation of the exchange rate, will be adjusted under another exchange-rate system.

Under a system of fixed exchange rates, the correction will be brought about either by inflation in the first country or by deflation in that country's trading partners, or by a combination of the two adjustment mechanisms. In both cases, the changes in price levels will offset, or more than offset, certain tariffs. Under a system of fixed exchange rates which provides for devaluation or revaluation under certain conditions, the macroeconomic imbalance will be corrected by revaluation in the first country, devaluation in partner countries, or a combination of revaluation in the first country and devaluation in the partner countries. Here again, exchange-rate changes will offset, or more than offset, tariffs of 0 to 10 per cent. In other words, it will not be possible to avoid macroeconomic adjustment with its consequences on the price level. Under a system of fixed exchange rates, it will at best be possible to postpone it.

We may therefore conclude that whatever the form taken by the correction of the macroeconomic imbalance, its influence on the exchange rate or on the level of domestic prices relative to that of foreign prices will affect certain producers of importable goods. A return to a system of fixed exchange rates will not avoid this necessary adjustment and will not be able to prevent the protective effects of certain tariffs being more than compensated for by movements in other variables at the time of the correction. The effect of the tariff on relative prices and hence on resource allocation will nevertheless persist whenever such changes take place, whether the exchange rate is fixed or flexible. And the same will therefore be true of tariff negotiations which modify the rates of duty.

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W.M. Corden, The Theory of Protection (Oxford: Clarendon Press, 1971), Chapter 2.

Chapter V

NOMINAL AND EFFECTIVE PROTECTION

Having defined the various trade policy instruments and identified, analysed and compared their effects, we shall deal, in this chapter, with the measurement of protection. We distinguish two measurements of protection and thus of negative protection. They are the rate of nominal, and the rate of effective, protection.

Nominal protection

The rate of nominal protection measures the protection given to the product. It may be defined with the help of Figure 4., which is like Figure 2, but for a few differences. Symbol j signifies the importable product. Symbol p_j , instead of distance OW , stands for the world price of j and its domestic price prior to protection. Symbol p'_j , instead of distance OH , stands for its domestic price after protection. The rate of nominal protection may then be calculated by the following formula:

$$t_j = \frac{p'_j - p_j}{p_j} \quad (1)$$

where

t_j = rate of nominal protection of product j

p'_j = price of product j after protection

p_j = price of product j in the absence of protection.

When the instrument of protection is the tariff, as in the case of Figure 4, the rate of nominal protection and of the nominal tariff coincide.

Effective protection

The rate of effective protection measures the protection given to production activity, that is to the value-added by the manufacturing process. It may be determined with the help of Figure 5.

Fig. 4

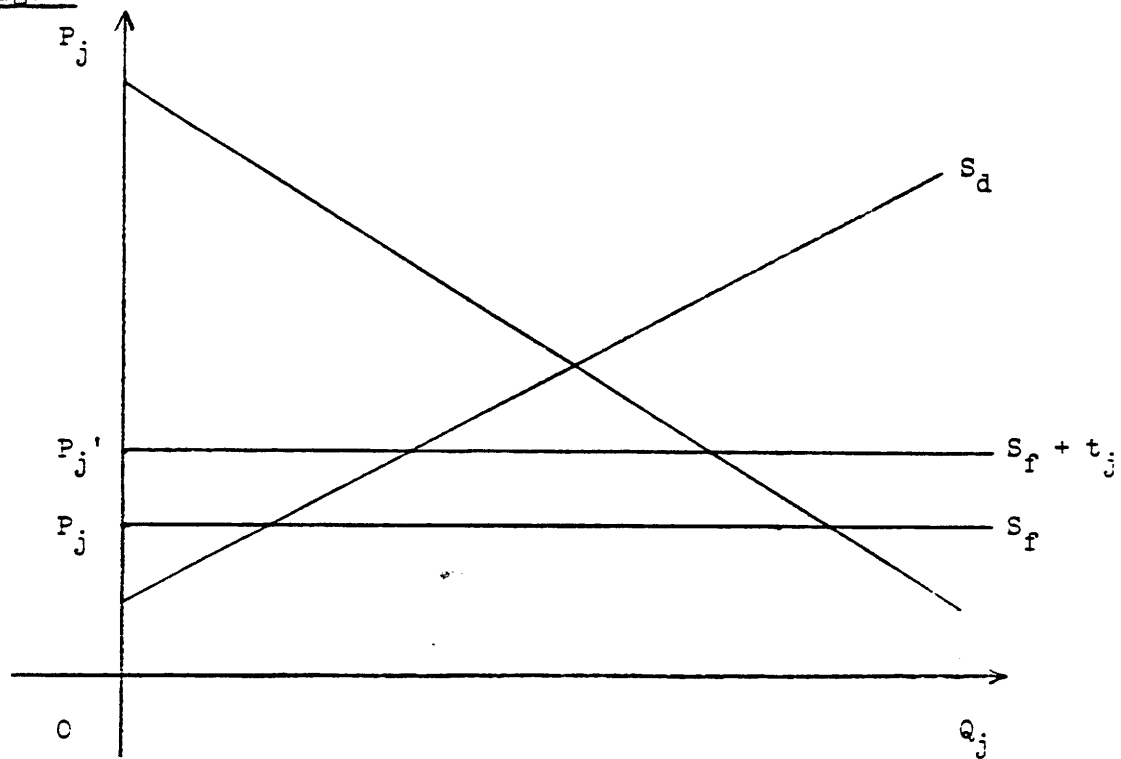
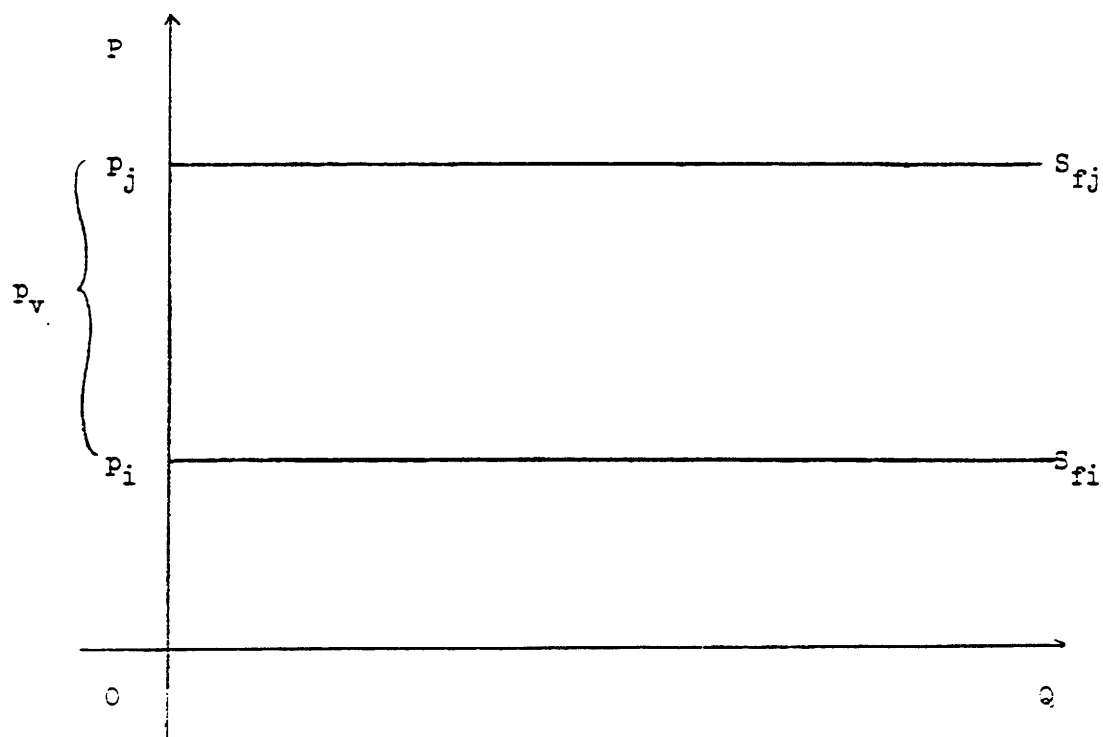


Fig. 5



The vertical axis measures prices, and the horizontal axis quantities, of final product j and intermediate product i ¹. It is assumed that the output of one unit of the final product requires one unit of intermediate product, both being importables. Curve S_{fi} represents the foreign supply of the intermediate product while curve S_{fj} represents the foreign supply of the final product. The world price of the intermediate product, and its domestic price in the absence of protection, is p_i . The world price of the final product, and its domestic price in the absence of protection, is p_j . The price of one unit of value-added in the industry producing j is p_v , which is equal to $p_j - p_i$. We shall call p_j and p_i the nominal prices of j and i and p_v the effective price of j .²

The rate of effective protection may then be calculated as follows, using a formula analogous to that used in the case of nominal protection:

$$g_j = \frac{p_v' - p_v}{p_v} \quad (2)$$

where

g_j = rate of effective protection of economic activity j , that is the proportional increase in the effective price of j resulting from protection

p_v' = effective price after protection

p_v = effective price in the absence of protection.

But, whereas t_j depends only on the price of the final product and hence on the protection given that product, g_j depends on the prices of both the final and the intermediate good and, therefore, on the protection given both these products. This can be illustrated by an arithmetic example.

¹The intermediate product may be either a raw material or a manufactured product.

²W.M. Corden, The Theory of Protection (Oxford: Clarendon Press, 1971), p. 31.

Arithmetic example

Suppose that the final product j is steel with a value of F. 1'000.- per ton, and that the intermediate product i consists of the inputs, such as pig-iron and coal, which go into the production of a ton of steel and the price of which is F. 600.-. The value added by the steel industry is thus F. 400.-. Starting from a situation in which there is no protection, then suppose that, first, protection of 20 per cent is given to the final product, namely steel. The rate of nominal protection on steel will then be

$$t_j = \frac{1'200 - 1'000}{1'000} = 20\%$$

but its rate of effective protection will be

$$g_j = \frac{600 - 400}{400} = 50\%$$

Suppose, second that, without any protection being granted the final product, protection of 33.3 per cent is given to the intermediate product, that is to the inputs from which the steel is made. In this case

$$t_j = 0\%$$

but

$$g_j = \frac{200 - 400}{400} = -50\%$$

Suppose, last, that protection of 20 per cent is given to the final product, steel, and of 33.3 per cent to the intermediate product, namely the inputs from which the steel is made. We will then have

$$t_j = 20\%$$

as in the first case and

$$g_j = \frac{400 - 400}{400} = 0\%$$

Basic formula

The above example is based on the following three assumptions. The foreign price of the importable is given and does not vary with protection and the changes in the quantity imported which it brings about. The country concerned is thus small. The share of the intermediate product in the final product remains constant and does not vary following the increase in the price of the intermediate product which protection prompts. Lastly, imports continue after protection. Given these assumptions, the rate of effective protection may be expressed in terms of three elements which are the rate of nominal protection on j , the rate of nominal protection on i , and the share of the intermediate product in the final product. The formula presented relates to tariffs but, as will be seen, effective protection may be measured for other instruments of commercial policy.

In addition to the symbols t_j , p_j , g_j , p_v , p_v' already defined, let
 a_{ij} = the share of the intermediate product in the cost of the final product in the absence of protection, and
 t_i = the rate of the nominal tariff on intermediate product i .

Then,

$$p_v = p_j (1 - a_{ij}) \quad (3)$$

and

$$p_v' = p_j [(1 + t_j) - a_{ij} (1 + t_i)] \quad (4)$$

which, in view of (2), gives us

$$g_j = \frac{t_j - a_{ij} t_i}{1 - a_{ij}} \quad (5)^1$$

which is the basic formula for calculating effective protection. It can be modified to take account of the protection of exportables, of more than one intermediate product, and of domestic taxes and subsidies equivalent to tariffs on the final and intermediate products.

¹See W.M. Corden, The Theory of Protection (Oxford, Clarendon Press, 1972), pp. 35-36.