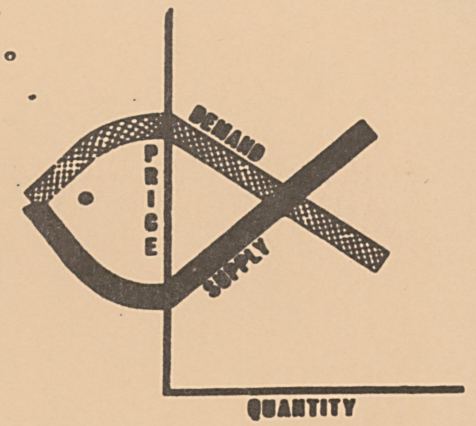

NOT FOR QUOTATION

Tariffs and Fishery Products

An Evaluation

by

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TARIFFS AND FISHERY PRODUCTS: AN EVALUATION *

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Perspective

Protection of American industry, in the manufacturing, agricultural, and extractive sectors, is generally conceded to have reached its highest level with the adoption of the Smoot-Hawley tariffs in 1930. With this tariff act the number of items upon which duties were levied exceeded 3,000, giving the United States one of the most complicated tariffs in the world. Under the Smoot-Hawley Act, moreover, the average nominal ad valorem equivalent of the import duties was approximately fifty-three percent.[1] Prior to this, as an element of the Fordney-McCumber tariffs of 1922, the U.S. had accepted a tariff valuation procedure called the American selling price system. The impact of this method of product valuation for tariff purposes was to increase the assessed valuation of imported products relative to their U.S. "landed value," i.e., value including cost, insurance, and freight (c.i.f.). Thus, the American selling price valuation procedure, while applied predominantly to chemical products, served to raise even higher than the Smoot-Hawley average the real tariff barriers faced by foreign competitors of U.S. producers and was especially onerous to foreign commodities subject to ad valorem, rather than specific, rates.

* This is the theoretical section of a contract No. 2-35268 let by the Economic Research Division (ERD) in 1971. As yet, the ERD has not received the empirical section which is expected shortly.

The potential windfall gain afforded to American import-competing industries was, however, hardly noticeable. No sooner had protective levels been increased than the bottom dropped from under the world economy. In the present context this had two important consequences. In that foreign prices were more flexible downward than U.S. prices, imports became increasingly competitive with goods produced in the U.S. so that an increasing number of foreign commodities found it possible to slip through even the heightened U.S. tariff wall. Or rather would have found it possible had it not been for the second important consequence -- a catastrophic drop in U.S. aggregate demand which fell upon foreign as well as domestically produced goods and services. So the enhanced profits that American import-competing industries could have expected from the Smoot-Hawley tariffs were substantially diluted by the world-wide depression of the 1930's. Indeed, the evidence suggests that the "income-effects" induced by the depression and the consequences of relative price-level flexibility were more adverse to U.S. industry than to producers in competing nations. In 1932, for example, the volume of U.S. exports (i.e., others' imports) was only fifty-three percent of the level in 1929, while the comparable figures for France, England, Italy, and Japan were fifty-nine percent, sixty-three percent, seventy-seven percent, and ninety-four percent respectively.[2] Since even in the 1930's the U.S. was the dominant importer in the world economy we can reasonably infer that the better performance of foreign exporters was due in some measure to their superior ability to penetrate U.S. as well as third-country markets. Thus,

events of the depression conspired to lower relatively the degree of protection afforded American import-competing industries despite congressional efforts, via the Smoot-Hawley tariffs, to the contrary.

The trend in the U.S. toward greater protection was halted in 1934 with the passage of the Reciprocal Trade Agreements Act. Since then the U.S., along with other economically advanced countries, has by and large, and with some short-term lapses, followed a strategy of tariff reduction and elimination of non-tariff barriers to international trade. On the surface, at least, there was no concerted effort in U.S. governmental circles to justify trade liberalization in terms of the widely-accepted argument that, at least for advanced countries, economic welfare is maximized by a regime of universal free trade. Presumably, the proponents of the various reciprocal trade agreements act renewals judged that this justification would fall on deaf congressional ears. Rather the ostensible rationale was that negotiations under the reciprocal trade agreements would be designed to improve the export position of U.S. producers, while minimizing concessions that would disadvantage import-competing industries. To this end, a number of key bargaining techniques were adopted, including most-favored-nation treatment, principal-supplier bargaining formulae, and judicious selection of commodities upon which tariff concessions might be offered.[3]

Pursuit of the objective of trade liberalization has, of course, not been single-minded. The free-trade argument for welfare maximization entails the shifting of resources out of

industries for which tariff concessions have removed the basis of putative comparative advantage. Yet, with each renewal of tariff negotiation authority for the administrative branch, Congress has seen fit to expand upon, and make more readily available, escape clause provisions, whereby adversely affected industries can gain redress from the government. On the whole, however, the executive branch has not been overwhelmingly receptive to petitions for redress under reciprocal trade agreements legislation, nor have other bases for exceptions to tariff concessions been effectively pursued by import-competing industries.[4] With exceptions, then -- and certainly fishery products have not been among these exceptions -- administrative branch bargaining sessions undertaken under the Reciprocal Trade Agreements Act and its several extensions have resulted in a lowering of U.S. tariff barriers, from which U.S. consumers (and some producers too, for that matter) have been substantial beneficiaries.

This process of liberalization found its apotheosis in the so-called "Kennedy round" of tariff negotiations which, for all intents and purposes, began in 1963 and were concluded in mid-1967, although the entire set of concessions negotiated during these bargaining sessions was not to be completely implemented until the present year, 1972. Concession authority, under the Kennedy round, permitted across-the-board reductions in tariffs of fifty percent except for a small list of commodities which were previously subject to escape clause actions or where tariff reductions would threaten to impair national security. Moreover, for commodities with existing tariff levels of five percent or

less, the negotiators were empowered to eliminate the duty completely.

An appreciation of the relative tariff levels in the U.S., before and after the Kennedy round negotiations, can be gained from a perusal of Table 1, although the data are limited to non-agricultural products. Clearly, U.S. tariff cuts prior to the Kennedy round had made tremendous in-roads on the levels legislated in the Smoot-Hawley tariff schedule. It will be recalled that the average, nominal ad valorem rate of those tariffs was fifty-three percent on dutiable imports (which was derived from the rates for all commodities) whereas for non-agricultural products, excluding mineral fuels, the average, nominal ad valorem rate had dropped to 13.5 percent on the eve of the Kennedy round. Further as a result of the Kennedy round negotiation, U.S. tariffs were to be compressed a further thirty-six percent. This left in the U.S., as of January 1, 1972, an average, nominal ad valorem equivalent on dutiable non-agricultural imports of 9.6 percent.

This estimate of the present average tariff level in the U.S. only roughly is confirmed in an official study undertaken by the U.S. Tariff Commission. Taking dutiable imports as a whole -- and not just non-agricultural imports -- as a base, the Tariff Commission found that in the early 1950's the tariff duties collected, expressed as a percentage of dutiable imports, varied between twelve and thirteen percent, whereas in the last few years the range has been eleven to twelve percent.[5] Thus, the drop in ad valorem equivalent rates registered by the Tariff Commission

Table 1

U.S. Tariff Levels for Nonagricultural Products (Other than Mineral Fuels), before and after Kennedy Round Cuts[a]

Category	Average Tariff on Dutiable Imports, as Percentage of c.i.f. value		Percent Cut in Kennedy Round
	Before Cuts	After Cuts	
Mineral products	9.9	7.5	24
Chemical products	17.8	9.3	48[b]
Rubber products	11.3	6.0	47
Hides, furs, leather products	16.2	10.4	36
Raw hides, skins, fur	4.1	3.6	54
Articles of leather, fur	17.5	11.2	36
Wood and cork products	6.8	7.1	49
Wood, natural cork	0.9	0.3	89
Articles of wood, cork	7.4	7.9	49
Pulp and Paper	10.9	5.5	50
Pulp	free	free	--
Paper	10.9	5.5	50
Textiles	21.4	20.1	20
Natural fiber and waste	18.3	15.9	16
Yarn and basic fabrics	19.1	21.8	24
Special fabrics, apparel, other	25.0	20.6	18
Footwear and headwear	16.1	12.1	25
Stone, ceramic, and glass products	21.0	15.0	29
Base metals and metal products	8.5	6.3	34
Unwrought, pig iron, scrap	5.2	5.0	35
Basic shapes and forms	8.5	6.4	25
Steel	6.5	5.7	12
Other	19.6	10.4	47
Articles of base metal, misc.	14.7	7.7	48
Nonelectric machinery	11.9	6.0	50
Electrical machinery	13.6	7.1	48
Transportation equipment	7.1	3.5	51
Precision instruments	21.1	13.1	38
Miscellaneous	19.5	11.5	41
Total	13.5	9.6	36
Manufactures[c]	14.3	9.9	36

Source: E. H. Preeg, Traders and Diplomats (1970), p. 208.

a. Based on c.i.f. value (converted from f.o.b. or American selling price value), 1964 imports.
b. Includes cuts conditional on acceptance of the separate agreement on American selling price; the reduction would otherwise be about 45 percent.
c. Includes all categories except mineral products; raw hides, skins, fur; wood, natural cork; pulp; natural fiber and waste; unwrought, pig iron, scrap.

does not approach that in the previously cited estimate. But it should be noted that the bases of the computations are different and that the Tariff Commission study did not include the final stages of the implementation of Kennedy round concessions.

Though there have undoubtedly been reductions in U.S. protection in the last few years, their significance should not be over-estimated. An assessment by Kravis is worth quoting in extenso, since it stresses that seemingly substantial tariff concessions may not yield equally substantial reductions in prices to U.S. buyers:

> The notion that tariff concessions played a major role in the increase in U.S. imports is not strongly supported by the timing of the import changes. If tariff concessions were an important influence, each round of tariff reductions should have been followed by a surge of imports. In fact, neither the reductions made in the 1956 round nor those made in the Dillon Round of 1961-62 appear to have a large gross impact on U.S. imports. The great increase in imports between 1967 and 1968 did come at a time when the first Kennedy Round reductions went into effect, but the 23 percent increase in imports could not have been attributable to any major degree to a cut in tariffs that can hardly have amounted to an average reduction in price to U.S. buyers of as much as 1 percent.[6]

These generalizations -- that prices dropped little in response to the U.S. tariff concessions and that the recent large expansion of imports must be attributed to factors other than tariff adjustments -- are difficult to fault. But we should not necessarily be lulled by them, since they are based on aggregative data. On a commodity-by-commodity basis tariff concessions may have led to appreciable price reductions causing appreciable stress on some domestic industries. Whether this is the case

for fishery products will be examined shortly.

As Tables 2-4 show, when compared with Table 1, the average tariff level presently prevailing in the U.S. is not out-of-line with those obtaining in other industrialized countries.[7] For total non-agricultural products the average, nominal ad valorem rate on United Kingdom dutiable imports (10.6 percent) is higher than that of the U.S. (9.6 percent), while the comparable tariff levels in Japan (9.5 percent) and the European Economic Community (8.1 percent), especially the latter, are below that of the U.S. A slightly different pattern exists in the degree of protection of manufactured goods, with both the U.K. and Japan granting higher levels of protection than the U.S., whereas the E.E.C. countries are less protective of manufacturing industries.

In all countries encompassed by these tables, however, non-agricultural products' protection is lower than that of manufactured goods taken alone. This reflects the fact that on the average countries place lower rates of nominal duties on raw materials than on intermediate or finished goods, a phenomenon called tariff escalation. For later analysis, the existence and degree of escalation in the U.S. tariff structure becomes crucial since it is the pattern of escalation which determines, in large part, the difference between nominal protection granted a commodity and its effective rate of protection -- as explained below, a much more meaningful concept for purposes of ascertaining misallocation of productive resources as a consequence of typical tariff walls. For a very rough index of the degree of escalation built into the tariff structures of the countries encompassed in

Table 2

United Kingdom Tariff Levels for Nonagricultural Products (Other than Mineral Fuels), before and after Kennedy Round Cuts[a]

Category	Average Tariff on Dutiable Imports, as Percentage of c.i.f. Value		Percent Cut in Kennedy Round
	Before Cuts	After Cuts	
Mineral products	9.3	4.8	48
Chemical products	18.8	9.4	50[b]
Rubber products	13.6	7.8	43
Hides, furs, leather products	17.7	13.1	30
Raw hides, skins, fur	9.4	free	100
Articles of leather, fur	18.2	13.1	28
Wood and cork products	5.2	7.3	50
Wood, natural cork	1.5	4.8	60
Articles of wood, cork	13.6	8.0	46
Pulp and paper	16.6	13.2	21
Pulp	10.0	5.3	47
Paper	16.6	13.2	21
Textiles	20.6	16.9	18
Natural fiber and waste	8.4	6.2	60
Yarn and basic fabrics	19.1	15.0	22
Special fabrics, apparel, other	22.9	19.6	14
Footwear and headwear	22.8	14.7	36
Stone, ceramic and glass products	16.4	10.3	37
Base Metals and metal products	12.8	9.0	30
Unwrought, pig iron, scrap	6.9	6.1	30
Basic shapes and forms	11.8	9.2	22
Steel	11.3	9.2	19
Other	14.6	9.1	38
Articles of base metal, misc.	17.9	10.9	39
Nonelectrical machinery	14.2	8.6	39
Electrical machinery	20.1	12.4	38
Transportation equipment	20.0	11.0	45
Precision instruments	26.4	13.5	49
Miscellaneous	20.1	10.5	48
Total	16.6	10.6	39
Manufactures[c]	17.8	10.8	39

Source: E. H. Preeg, Traders and Diplomats (1970), p. 210.

a. Based on c.i.f. value, 1964 imports; excludes imports from the EFTA and the Commonwealth.
b. Includes cuts conditional on acceptance of the separate agreement on American selling price; the reduction would otherwise be about 20 percent.
c. Includes all categories except mineral products; raw hides, skins, fur; wood, natural cork; pulp; natural fiber and waste; unwrought, pig iron, scrap.

Table 3

European Economic Community Tariff Levels for Nonagricultural Products (Other than Mineral Fuels), before and after Kennedy Round Cuts[a]

Category	Average Tariff on Dutiable Imports, as Percentage of c.i.f. Value		Percent Cut in Kennedy Round
	Before Cuts	After Cuts	
Mineral products	9.4	5.5	42[b]
Chemical products	14.3	7.6	47
Rubber products	15.0	7.8	48
Hides, furs, leather products	9.2	5.7	38
Raw hides, skins, fur	free	free	--
Articles of leather, fur	9.2	5.7	38
Wood and cork products	10.9	8.8	41
Wood, natural cork	6.5	4.0	75
Articles of wood, cork	13.8	9.5	31
Pulp and paper	10.7	7.5	30
Pulp	6.0	3.0	50
Paper	14.4	11.1	23
Textiles	16.0	12.6	21
Natural fiber and waste	3.0	3.0	0
Yarn and basic fabrics	13.0	11.4	12
Special fabrics, apparel, other	20.7	14.9	28
Footwear and headwear	17.8	12.4	30
Stone, ceramic and glass products	14.1	8.0	43
Base metals and metal products	9.9	7.0	29
Unwrought, pig iron, scrap	7.4	6.8	8
Basic shapes and forms	9.7	7.0	28
Steel	9.4	6.7	29
Other	11.4	8.8	23
Articles of base metal, misc.	12.8	7.2	44
Nonelectrical machinery	11.1	6.4	42
Electrical machinery	14.2	9.1	36
Transportation equipment	15.4	9.9	36
Precision instruments	13.3	8.4	37
Miscellaneous	16.5	9.8	41
Total Manufactures[c]	12.8	8.1	37
	13.5	8.6	36

Source: E. H. Preeg, Traders and Diplomats (1970), p. 209.

a. Based on c.i.f. value, 1964 imports; excludes trade within EEC and imports from associated countries.

b. Includes cuts conditional on acceptance of the separate agreement on American selling price; the reduction would otherwise be about 20 percent.

c. Includes all categories except mineral products; raw hides, skins, fur; wood, natural cork; pulp; natural fiber and waste; unwrought, pig iron, scrap.

Table 4

Japanese Tariff Levels for Nonagricultural Products (Other than Mineral Fuels), before and after Kennedy Round Cuts[a]

Category	Average Tariff on Dutiable Imports, as Percentage of c.i.f. Value		Percent Cut in Kennedy Round
	Before Cuts	After Cuts	
Mineral products	12.0	6.2	48
Chemical products	19.7	10.7	46
Rubber products	15.1	7.5	50
Hides, furs, leather products	19.9	12.7	36
Raw hides, skins, fur	16.0	15.0	6
Articles of leather, fur	20.6	12.3	40
Wood and cork products	15.6	10.1	35
Wood, natural cork	10.9	6.7	39
Articles of wood, cork	20.4	13.6	33
Pulp and paper	6.7	6.4	5
Pulp	5.0	5.0	0
Paper	13.2	11.4	14
Textiles	23.5	13.6	42
Natural fiber and waste	15.1	7.7	49
Yarn and basic fabrics	23.2	12.8	45
Special fabrics, apparel, other	24.8	15.5	38
Footwear and headwear	26.3	22.7	14
Stone, ceramic and glass products	16.9	9.5	44
Base metals and metal products	11.0	7.1	36
Unwrought, pig iron, scrap	10.2	6.6	35
Basic shapes and forms	19.2	13.1	32
Steel	15.6	10.3	34
Other	23.4	16.3	30
Articles of base metal, misc.	15.5	9.3	40
Nonelectrical machinery	15.6	10.0	36
Electrical machinery	17.8	10.8	39
Transportation equipment	18.4	13.9	25
Precision instruments	19.1	10.0	48
Miscellaneous	14.7	8.5	42
Total	15.5	9.5	39
Manufactures[b]	17.6	10.7	39

Source: E. H. Preeg, Traders and Diplomats (1970), p. 211.

a. Based on c.i.f. value, 1964 imports.
b. Includes all categories except mineral products; raw hides, skins, fur; wood, natural cork; pulp; natural fiber and waste; unwrought, pig iron, scrap.

Tables 1-4, we can compare, for each table, the gap between manufacturing protection levels and those for the more inclusive commodity groups, non-agricultural products, since the latter embraces raw materials which are excluded from the former commodity category. The larger the gap in favor of manufactures, the greater the degree of tariff escalation. By this very approximate indicator, after the Kennedy round concessions were embedded in the tariff structure, the degree of escalation in the U.S. is slightly greater than that of the U.K., but appreciably lower than the escalation found in the E.E.C. and Japanese tariff schedules. As we shall see, escalation in the structure of nominal tariff rates is one way of securing effective protection for commodities at higher stages of fabrication while still sheltering domestic producers of raw materials. In instances, however, where raw materials are subject to higher tariff rates than those imposed on the finished products that embody the material inputs a nominal protective tariff on finished goods may, in point of fact, yield a negative level of effective protection to finished goods producers.

This issue -- the disparity between nominal protection and effective protection granted to a particular type of producer -- potentially is of signal importance in the U.S. In the tariff negotiations during the Kennedy round it readily became apparent that the U.S. tariff structure was subject to a much greater degree of dispersion than were the schedules of other industrial countries. Table 5, which in effect ranks unspecified commodity categories by level of the applicable nominal ad valorem tariff,

demonstrates this conclusively. Without exception, both before and after the Kennedy round concessions, the U.S. imported a larger percentage of commodity-types to which a five percent or lower tariff rate applied than did either the U.K., the E.E.C., or Japan. And, just as importantly, this was juxtaposed to a larger percentage of commodity categories with nominal ad valorem tariffs in excess of twenty percent than was the case, with the exception of the E.E.C. rates on the eve of the Kennedy round, in the other economically advanced countries. Naturally, the resultant impact on effective rates of protection of this relatively extreme degree of dispersion in the U.S. tariff structure depends upon whether, in fact, in any particular vertical production structure[8] the tariff rates are escalated, or the reverse -- de-escalated. But one generalization would seem to be germane irrespective of the "direction" of the tariff escalation: Compared to the other industrial countries with which we are here comparing the U.S. its effective rates of protection would show, on the whole, greater divergence from the listed nominal rates than would be true of the U.K., the E.E.C., or Japan. This is a consequence of differing degrees of tariff rate dispersion.

Evidence on the existing level of protection for natural resource-based products is much more difficult to come by. One reason for this is that non-tariff restrictions on trade -- especially the use of quotas -- are, for these goods, such an important component of the overall protective level. The import quotas on oil are mentioned in the newspapers almost daily, for example. But non-tariff restrictions on imports are also salient for

Table 5

Distribution by Category of Dutiable Nonagricultural Products (Other than Mineral Fuels) by Tariff Level, before and after Kennedy Round Cuts[a]

Tariff Level[b] (in percent)	Percentage of Product Categories: Before Cuts				After Cuts			
	U.S.	U.K.	EEC	Japan	U.S.	U.K.	EEC	Japan
0.1- 2.5	1.3	0.1	0.5	0.1	3.7	1.6	3.0	1.6
2.6- 5.0	3.2	0.2	2.9	1.7	21.3	13.1	18.3	7.5
5.1- 7.5	6.8	1.2	6.7	0.8	25.3	14.1	35.2	29.2
7.6-10.0	14.7	16.2	18.2	7.7	17.7	34.3	26.8	27.8
10.1-12.5	15.8	4.4	17.4	3.7	9.5	14.2	8.3	12.7
12.6-15.0	11.8	15.6	25.8	32.4	7.7	7.4	5.0	10.1
15.1-17.5	11.8	13.7	13.6	10.7	5.5	7.1	2.4	4.0
17.6-20.0	7.3	19.7	10.6	21.0	2.8	6.1	0.8	4.3
20.1-25.0	11.0	15.2	4.0	12.3	4.2	2.1	0.1	2.4
25.1-30.0	8.8	6.7	0.1	5.9	1.5	---	---	0.4
30.1-40.0	4.7	6.7	0.1	3.3	0.5	---	---	---
Over 40.0	2.8	0.3	0.1	0.4	0.3	---	0.1	---
Cumulative								
0.1- 5.0	4.5	0.3	3.4	1.8	25.0	14.7	21.3	9.1
0.1-10.0	26.0	17.7	28.3	10.3	68.0	63.1	83.3	66.1
0.1-15.0	53.6	37.7	71.5	46.4	85.2	84.7	96.6	88.9
0.1-20.0	72.7	71.1	95.7	78.1	93.5	97.9	99.8	97.2
0.1-30.0	92.5	93.0	99.8	96.3	99.2	100.0	99.9	100.0

Source: E. H. Preeg, Traders and Diplomats (1970), p. 214.

a. Based on four-digit Brussels Tariff Nomenclature categories.
b. Percentage rate based on c.i.f. value, 1964 imports; U.S. rates are converted from f.o.b. or American selling price.

strictly agricultural commodities, and this renders the calculation of ad valorem protective equivalents a very difficult and imprecise task.

Nevertheless, one such computation has recently been undertaken for the major staples in a Western diet. For the E.E.C., for example, in the mid-1960's wheat, sugar, milk, eggs, beef, and pork, taken together, were favored by a level of protection equivalent to 52 percent ad valorem, reflecting the favorable treatment the farm sector has persistently been able to obtain within the Common Market. In the U.S. the same set of agricultural commodities received protection equivalent to an eighteen percent ad valorem tariff rate,[9] giving farmers here, too, an appreciable advantage over other types of producers on the average. Because so much of the protection accorded to the farm sector is attributable to non-tariff devices, the Kennedy round, which brought forth a drop in U.S. tariffs on non-agricultural goods of 36 percent, made little inroads on farmers' relative position vis-a-vis their foreign counterparts.

Fishery products fared less well than agricultural goods in the U.S. tariff schedules and under the Kennedy round concessions. Before these negotiations began, as Micuta has pointed out,[10] something more than fifty percent, by value, of edible fishery products entered the U.S. duty free. Of the non-edible fishery items, fishmeal -- by far the most important fishery import -- was also free of tariff levies. Moreover, the Kennedy round added a significant amount of fishery product imports to this duty free status. Micuta notes: "Of the 1964 dutiable

fishery imports of $197 million, over half . . ." would become duty free as a consequence of the Kennedy round concessions. Further, it is estimated that "over four-fifths of U.S. imports of fish and fish products [will be] entering duty free by January, 1972. About $89 million in 1964 imports will remain dutiable," and, of this total, "$50.7 million underwent a linear cut in duty of 50 percent."[11] Thus, of total edible fishery products imported into the U.S., after the Kennedy round adjustments are implemented, roughly 75 percent by value will enter duty free. On approximately another 12.5 percent the tariff rates will have been cut by half. Micuta, however, adds a cautionary note to this last statement: "The fact that the average pre-Kennedy Round tariff rate on fishery products was already quite low . . . makes the total magnitude of these reductions not as large when measured by percentage points as could be expected otherwise."[12]

An examination of the set of tariff reductions on fishery products under the Kennedy round negotiations reveals a fairly definite pattern. Items which entered either fresh or in a frozen state typically entered free before the Kennedy round or were placed on the duty free list as a consequence of these bargaining sessions. In contrast, fishery products which entered the U.S. in canned form were usually subjected to a linear tariff cut of fifty percent, but retained a tariff as of January, 1972. In the case of shellfish, for example, scallops entered duty free and continue to do so, whereas clams (and juice) in cans are now protected by ad valorem tariff duties and oysters (and juice) in airtight containers are guarded by specific duties; however,

clams and oysters not canned enter duty free. Lobsters and shrimp enter duty free regardless of the form in which they are imported. Crabs, unless they are imported whole, are subject to an ad valorem duty which was reduced by fifty percent in the Kennedy round.

Of the true fish, halibut now enters the U.S. duty free, irrespective of the imported form, but had previously been protected by a modest specific tariff. Salmon and tuna, if fresh, chilled, or frozen, are now permitted free access to U.S. markets; otherwise, importers of canned salmon and tuna must pay a rather steep (for fishery products) ad valorem rate. Indeed, tuna canned in oil was one of the few commodities that managed to be exempted from the widespread Kennedy round tariff cuts; it remains subject to a 35 percent ad valorem tariff rate. For the numerous species of groundfish, too, a tariff typically remains if the fish is not brought into the U.S. fresh, chilled, or frozen.[13] Thus, it is seen that the generalization given at the outset of this paragraph -- that canned fishery products imported into this country are subjected to a tariff while fresh, chilled, or frozen fishery products imports are not -- is substantially supported although there are minor exceptions which are not reproduced in the above listing.

To some extent though, this information is misleading as applied to fresh fish. For 180 years -- since 1792 to be precise -- it has been illegal for foreign vessels to bring fresh fish directly to U.S. shores. Fishery products must first be landed at a foreign port before being shipped to the U.S. This long-standing

prohibition on direct importation may well explain the fact that very little fresh fish is found among U.S. imports. To land and then transship these fish adds as directly to their cost-of-delivery to the U.S. market as would an equivalent tariff on their direct importation into the U.S. Thus, the seeming fact that fresh fish may enter duty free should not be construed as signifying the absence of any importation cost-increasing devices.

Obviously, compared to processed -- frozen or canned -- fishery products, fresh fish is a relatively low-valued commodity. In addition, because of its perishability, its sale at relatively attractive prices is restricted to a market of limited geographic scope. In this context, the cost add-on due to the import proscription, in conjunction with the duty free status of chilled or frozen fish, leads to a rational decision on the part of foreign fishery interests to process raw fish abroad before transshipment to the U.S. A higher valued, more widely marketable commodity can better bear the fixed or sunk costs that face a potential fishery product exported to the U.S. market. Waugh and Norton observe that " . . . little fresh (not frozen or canned) fish is imported [into the U.S.] and, except for limited shipments of non-frozen fish from Canada, imported fish are fully processed abroad (for example, canned sardines or packaged frozen lobster) or shipped to the U.S. in an intermediate processed form such as frozen blocks, and are further processed by domestic producers."[14] In a sense, the upshot of the 1792 law protecting fish harvesters has been the encouragement of a viable export industry abroad; the profitability of a foreign fishery products processing

industry has been enhanced relative to direct exportation to the U.S. of fresh fish, even though these fish are harvested in waters adjacent to the most attractive market in the world.

When these types of protection -- fresh fish importation prohibitions, duty free status of frozen fish, and tariff coverage of canned fishery products imports -- are considered in light of the vertical structure of the fishery products industry -- fish harvesters, processors of various kinds, wholesalers, retailers, and consumers -- a relatively complex pattern of effective protection might emerge. One should not lose sight of the fact that fish harvesters are protected by the 1792 law, even though ostensibly fresh fish enter duty free. The impact of this is to raise the cost of fresh fish, insofar as U.S. fish harvesters would not have been the low cost providers of any given fish species, to U.S. fish processers. That frozen fish products, by and large, enter the U.S. duty free is a boon to all segments of the fishery products industry that build upon frozen fish as a materials import, but it reduces the attractiveness of the market as faced by U.S. fish harvesters. The tariff on canned fishery products protects canners, of course, and hence is relatively injurious to all purchasers of canned fish, but it also increases relatively the attractiveness of providing materials inputs (including fish) to the fish cannery tier of the industry by giving this cannery tier a larger profit margin with which to absorb the presumably higher costs of domestically harvested fresh fish inputs. And so it goes.

Before we attempt to access the significance to the fishery products industry of this complicated protective structure, however, it will serve us well to examine the merits and demerits of the main protective device for fishery products -- the tariff. The operational lever through which a tariff exerts its effects is by creating a difference between the domestic price of the protected commodity and its price in the world market, i.e., the price at which the commodity would be available, in a regime of free trade, to its domestic purchasers. This is only one kind of distortion that can be intentionally imbedded in the price structure. For example, taxes and subsidies, while they do not distort the world vs. domestic price relationship, drive a wedge, in effect, between prices received by producers and prices paid by purchasers -- a different type of distortion in the price structure. These different distortions, of course, yield different impacts on consumer welfare, producer "welfare," and the allocation of productive resources. It will be important to spell these out in a context that ignores the vertical structure of the fishery products industry. (We shall bring this in explicitly in our analysis of Part III.) Nevertheless, it should be reminded that the analysis of Part II is somewhat more general than we have just indicated. The 1792 prohibition of direct fresh fish imports, too, drives a wedge between domestic and world prices of fresh fish. In this respect, at least, the proscription is identical to a tariff. Thus, the discussion of Part II is applicable not only to tariffs, but to the import cost-increasing effects of the prohibition of direct fresh fish imports.

II -- Analysis of a Tariff's Effects

The simplest format within which to analyze the impact of a tariff is to make the so-called "small country" assumption. That is, demand in the country imposing the tariff, in this study assumed to be the U.S., is too small relative to the total market for the commodity protected to have an appreciable impact on the world price of the product. Whether this is valid in the case of U.S. fishery product imports, especially on a product by product basis, is no doubt debatable. Not only is the U.S. market a substantial component of the entire world market for many fishery products; in the case of some commodities elasticities of supply are very low, possibly inelastic. In either instance the small country assumption would be highly questionable. But as a pedagogical device, its ability to facilitate a simplified exposition is perhaps sufficient warrant for its application.

A second simplification needs notice as well. We have seen, in some instances, that remaining tariffs on fishery products are specific, the duty being, say, so many cents per quantum unit of imports. It may be, too, depending on transportation rate structures, that the transshipment minimum requirement for the importation of fresh fish is in the nature of a fixed cost per unit of import rather than expressed as a percentage of the value of imports. Nevertheless, it makes our task easier, especially when relying upon a diagrammatic exposition, to assume that all tariffs are ad valorem, or that specific tariffs and transportation cost differentials have been converted into appropriate ad valorem

equivalents. This simplification will not be critical at the beginning of this exposition of the effects of a tariff, but subsequently and in Part III, where we set forth a discussion of the implications of the theory of effective tariffs, it will be a crucial facet of our analysis.

It will also simplify the discussion if we assume that at each tier in the fishery products industry there are both many buyers in each of the relevant markets and also many sellers. That is, our analysis will be conducted within a purely competitive framework. The consequence of this condition, for our purposes, is two-fold: First, it assures that no price distortions between consumers and producers stem from non-tariff or non-tax or -subsidy imposed conditions in the market. Second, all economic units on each side of any given market can be treated as though they were homogeneous. All producers receive the same price for their identical outputs and pay the same price for identical inputs, and all consumers pay the same price per unit for their purchases.

Since, at the outset, no attention will be given to the vertical structure of the fishery products industry, this particular articulation of the "pure competition" assumption may appear overly elaborate. At this point it is. We need only assume two market levels for present purposes: a level for factors and a market for output -- and that these are purely competitive on each side. But again, in our discussion and application of the theory of effective tariff protection the more elaborate formulation will be most beneficial.

It has been stressed that a tariff opens up a gap between the world price and the domestic price of the commodity in question. Say the U.S. imposes a tariff on fishery products. Under the small country assumption the home (U.S.) price of fishery product imports is increased, relative to the world price, by the full amount of the tariff. The consequence of responses to this price wedge, as we shall call the difference between the world and domestic prices, is (1) to cause U.S. consumers to reapportion their expenditures away from fishery products and (2) to cause U.S. producers to shift productive resources toward these products. For both reasons the volume of fishery products imports will have been reduced.

A straightforward demonstration of this can be presented with the help of Figure 1, which utilizes the so-called transformation schedule. That schedule depicts schematically the amounts of fishery products and of other goods that can be produced in combination by fully employing all of the productive factors available in the U.S. It is, in short, a "trade-off" or opportunity cost function showing how much of one commodity's production must be foregone in order to produce slightly more of the other. As drawn in Figure 1, the transformation schedule, QQ, implicitly assumes a degree of substitutability, although not completely perfect, between the factors of production, say labor and capital, in the production of fishery products and other goods in general. It also reflects increasing opportunity costs of transforming one commodity into the other by shifting factors of production from one industry to the other. Neither of these assumptions, which

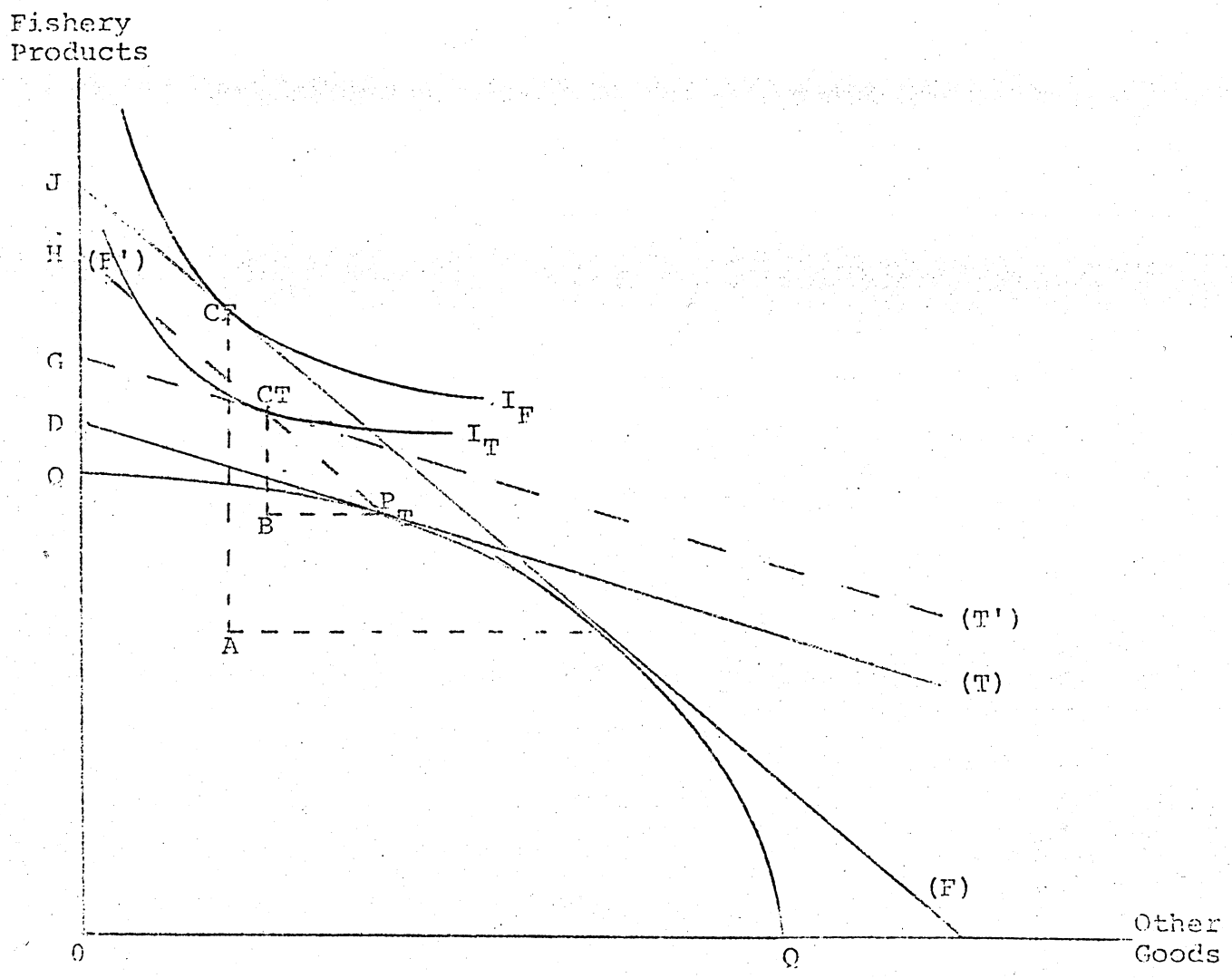


Figure 1

dictate the smooth, bowed out shape of the transformation schedule, is exceptional.

In this diagram, the slope of line (F) indicates the free trade or world price of fishery products relative to other goods. If this price reigned in the U.S., rational domestic producers would produce a combination of fishery products and other goods given by the coordinates of P_F (free trade production). Rational consumers would absorb fishery products and other goods indicated by the coordinates of C_F (free trade consumption). The difference in commodity combinations associated with these two points is accommodated by U.S. exports of AP_F of other goods in order to import AC_F of fishery products. The level of satisfaction or welfare that is attained in this free trade situation is given by indifference curve I_F, the highest possible level attainable given the conditions underlying Figure 1.

Now suppose that a tariff is imposed on fishery products, which raises the price of fishery products relative to other goods as is indicated by the flatter slope of line (T). Thus, the slope of line (T) indicates the post-tariff domestic price ratio, whereas the slope of line (F) indicates the pre-tariff or world price ratio. As is shown, the protective tariff causes production of fishery products to be increased and output of other goods to be decreased as resources are reallocated. The new post-tariff production combination is given by point P_T. It can be seen, also, that the aggregate value of production has dropped as a consequence of production adjustments to the tariff, as well as a change in the optimal product mix. If the total value of

production is measured in terms of the world (free trade) price ratio, with fishery products as the numeraire, the value of output will have fallen from OJ to OH. This is one indication of the cost to the U.S. associated with the imposition of a tariff -- a cost that arises because resources are shifted out of the commodity (other goods) in which, according to Figure 1, U.S. producers are assumed to have a comparative advantage and into the commodity (fishery products) in which the U.S. industry is at a comparative disadvantage. Clearly a gain accrues to factors involved in the fishery products industry. Indeed, it can be proved that the real income of the factor used more intensively in producing fishery products is increased as a result of the tariff.[15] But at the same time -- and this frequently escapes attention -- a relatively larger loss is suffered by the other goods industry and the real income of the factor used intensively by this industry deteriorates. Thus, looking solely at the production side of economic activity, a tariff, as it were, imposes a sacrifice on all in order to benefit a few; there is an income redistribution at the same time that overall output is diminished.

The consumption effect of the imposed tariff on fishery products is of equal interest. As already mentioned, the original equilibrium consumption pattern under free trade is given by point C_F. The tariff, by increasing the relative price of fishery products to U.S. consumers, induces them to alter this pattern. The post-tariff consumption of fishery products is decreased while, as drawn in Figure 1, the consumption of other goods is increased, as shown by the coordinates of point C_T compared to those of C_F.

In making this adjustment to the tariff, consumers in general are left worse off, since the "welfare" level consistent with indifference curve I_T is less than that associated with I_F; but there is no other possible consumption pattern by which U.S. consumers can improve on the welfare position attained at C_T.

One of the subtleties of this line of argument is the nature of the "equilibrium solution" in the post-tariff situation. There are two conditions to be fulfilled. Consumers must adjust so that the relative marginal satisfaction yielded by the two commodities is equal to the post-tariff, domestic price ratio and international trade must be balanced at world prices. The latter condition is satisfied by any point lying on line (F'), such as C_T.

The effect of the tariff on fishery products on the "economic position" of U.S. citizens -- for it is assumed that the U.S. has implemented the tariff -- can now be readily summarized. The pre-tariff production and consumption combinations are represented respectively by P_F and C_F. The tariff increases the relative domestic price of fishery products and draws forth greater domestic output of fish. This is illustrated by the movement along the transformation schedule, QQ, from P_F to P_T, at which the slope of line (T) indicates the post-tariff relative domestic price. Line (F'), which is drawn parallel to line (F) and through P_T, gives the combination of fishery products and other goods that has a value identical to that at P_T, in terms of world prices. The domestic consumers' consumption choice must be somewhere along this line (F'), specifically at C_T where indifference curve I_T has the same slope as line (T'), the domestic price ratio, which is drawn

parallel to line (T). In consequence of the production and consumption adjustments, import demand for fishery products is reduced from AC_F to BC_T; the value of output declines from OJ to OH; and aggregate real income deteriorates from the level indexed by I_F to that of I_T. Moreover, C_T is less than an optimal consumption combination, since the domestic price ratio [slope of line (T)] has been distorted, by the tariff, away from the world price ratio [slope of line (F)]. Finally, as discussed above, there is an income redistribution in favor of the factor utilized relatively intensively by the protected industry at the expense of the factor utilized relatively extensively by this industry.

We should not forget, however, that the tariff on fishery products will yield some revenue and recognition of this "revenue effect" may force us to alter some of our generalizations about the negative impact of a tariff. Let us assume that the entire amount of the tariff revenue is returned to consumers as a lump-sum payment to be used at their sole discretion.[16] If we value factor earnings (equal to output) at domestic prices, the post-tariff income level is given by OD. The revenue from the tariff is equal to DG and since this is returned to consumers, its spending permits them to attain the consumption pattern indicated by C_T.[17] Nevertheless, this contribution, while the best that is attainable in the face of a tariff, is inferior to the combination given by the free trade equilibrium position, C_F, in which no tariff revenue was available to pass back to consumers. There is, then, no need to qualify our conclusions when we acknowledge the availability of tariff revenues.

So far, because of our use of the small country assumption, we have excluded the possibility that the fishery products tariff may induce adjustments in the world price ratio. This is probably an unrealistic exclusion. In Figure 1, the reduction of U.S. demand for fishery products and the cut in imports would probably bring about some decrease in the relative world price of fishery products, thus serving to improve the tariff-implementing country's barter terms of trade. This is further reinforced by the fact that after the tariff the U.S., as the diagram indicates, is also willing to offer less exports of other products at the given world price ratio. If the likely reduction in the relative world price of fishery products occurs, then the price behind the tariff barrier -- the domestic relative price of fishery products -- will not increase by the full extent of the tariff. If the reason for levying the tariff is to protect the domestic fishery products industry,[18] this reaction in world markets is a matter of interest, since it reduces the size of the wedge that the tariff drives between the world price and the domestic price of the protected commodity. The world price adjustment, therefore, reduces the impact of the tariff and to the degree that it does so the negative consequences of the imposition of a tariff are diminished, as is the degree of protection any given tariff rate extends to the protected industry. The income redistribution is smaller; the welfare loss is smaller; the output loss is smaller.

Indeed, under some conditions, the price wedge imposed by the tariff is reversed, as it were: the post-tariff domestic price of the imported, dutiable commodity falls compared to its

world price. This would happen if the foreign demand for the home country's export commodity (other goods, in our example) had a very low price elasticity. The tariff on fishery products would then fail to protect the industry, as intended, and would, rather, cause resources to be reallocated toward the other goods industry, i.e., the export industry.[19] The ill effects of the tariff would then, of course, be reversed. In Figure 1, lines (T) and (T') would be steeper than line (F); P_T would lie to the right and below P_F; and C_T would lie above and, presumably, to the left of C_F, yielding a higher level of overall consumer satisfaction. This set of "perverse effects" of a tariff is, however, not likely to be applicable to the U.S. experience with protection of fishery products.

The foregoing discussion reminds us not only of the detrimental effects of a tariff, but also, through the Stolper-Samuelson theorem, of its beneficial impact on a particular segment of the economy. Especially for the fish harvesting component of the fishery products industry, because the productive factors -- both labor and capital -- are relatively specifically tied to their present employment, we would expect trade policies to be vitally important. Special interests are always to be found supporting trade restrictions. But beyond that, specific factors[20] in industries in direct competition with imports can usually be relied upon to favor tariffs or other protective measures.

The model implicit in the argument employing Figure 1 does not admit the possibility of specific factors of production. Labor receives the same return regardless of whether it is found in the fishery products industry or in the other goods industry.

And so does capital. This follows from our explicit assumption of purely competitive markets and our implicit assumption of perfect domestic factor mobility. If one factor stands to gain from protection, the other must lose. It might be assumed, however, that swift factor movements between industries insure that each factor would be advantaged if the imposition of a tariff benefits the community in general. It is the search for just such a justification for a tariff that has led to the so-called "pauper labor" defense of trade restrictions. Reduction of tariffs, i.e., a movement toward a free trade regime, has typically caused labor, usually the more specific of our two factors, to claim impoverishment as a result of the prospective importation of the products of cheap foreign labor. This argument against relaxation of protection has, as often as not, been given an appreciative ear by those members of congress who find the "impoverished labor" among their important constituents. It behooves us, then, to give it more than a cursory glance, especially since both labor and capital in the harvesting segment of the fishery products industry are considered to be relatively immobile.

One element of the "pauper labor" defense of tariffs is that some protection is necessary in order to keep the outputs of foreign low-wage labor from undercutting American goods in U.S. markets. This has nothing to do with anti-dumping arguments, since dumping signifies that, say, commodities are being sold in the U.S. at prices which fail to cover costs of production. Rather, the "pauper labor" justification of tariffs contends that it costs so much less to produce goods abroad than at home. What is

ignored here, of course, is that capital, as well as labor, is used to produce output. And where labor is cheap, capital is dear. Unit costs of goods are therefore not necessarily low where labor is poorly paid. Nevertheless, the importation of labor-intensive commodities does serve to relieve a relative shortage of labor in home markets; and would, therefore, reduce the real return to labor below what it would be if protected by a tariff.

Still, a tariff, even to prevent the incursion of goods from "pauper labor" countries, does bring in governmental revenue. Why cannot this additional revenue be used to recompense that portion of the economy which suffers a loss of real income as a result of the tariff? The feasibility of internal redistribution as a remedy to the adverse effects of protection depends upon whether protection can, in fact, engender an improvement in the country's terms of trade. We know that, in the absence of retaliation, a large country can use tariffs as leverage on its terms of trade. Indeed, although we will not recapitulate the argument here, an economically large country such as the U.S., by raising its tariff walls, can improve its economic welfare. This is the so-called optimal tariff argument, and its validity depends not only on the absence of retaliation by countries against which the tariff is raised (for their welfare is lessened in the face of a tariff increase), but also that the terms of trade <u>are</u> subject to the influence of tariff adjustments. <u>If</u> a country can manage to achieve an optimal tariff, which maximizes the community's real income, it can use other devices -- taxes and subsidies, for

example -- to offset the attendant adverse redistributive effects.

Moreover, the wherewithal to achieve income redistribution need not be supported only by tariff revenues. Suppose, to revert to an assumption used earlier in this section, a country is so small in the relevant markets that it exercises no leverage at all on its terms of trade. For this country, a free trade regime is optimal and there would, therefore, be no tariff revenues available to distribute. Still in moving from a no-trade to a free trade position, this country's scarce factor would incur a loss of real income and the abundant factor would gain. There are, however, measures at hand by which the abundant factor can be taxed in order to compensate the scarce factor for its losses and, importantly, still leave the abundant factor better off than it would have been in the no-trade situation. Thus, if the scarce factor were to be persuaded to support a movement toward free trade, it would have to receive firm guarantees that compensating income redistributions would be implemented.

We have indicated that the validity of the optimal tariff argument is contingent upon non-retaliation. If one expects retaliation, as has already been shown, the home country may no longer gain by imposing a tariff. Nevertheless, the possible consequence of retaliation -- a progressive deterioration of all countries' welfare -- does not prevent the scarce factor from pushing for protective legislation. Regardless of the effect of retaliation by foreign countries, its consequence is probably to further raise the price of import-competing products and, hence,

to increase the return to the scarce factor. Thus, in the absence of iron-clad assurances about compensatory variations in income it is entirely to be expected that a scarce factor will actively seek protective measures, and among these, of course, are tariff duties. The fishery products industry is apparently no exception to this.

Success will, as we have seen, drive a wedge between domestic and world prices that will favor the industry producing the dutiable commodity. This wedge affects not only relative prices but, via the market mechanism, it also induces changes in resource allocation and consumption patterns. But a tariff may not be the optimal way to do this. There are other mechanisms that drive price wedges. A comparison of these instruments with the effects of a tariff will demonstrate that the latter is a suboptimal way of altering a country's production structure and, thus, the composition of imports.[21]

Driving a wedge between the domestic price and the world price of a commodity is a tariff's modus operandi. In contrast, distortions between consumer prices and producer prices can be caused by consumption and production taxes and subsidies. A production subsidy lowers the price consumers pay relative to the return producers receive; a consumption tax raises the price consumers pay relative to per unit receipts of producers (whether domestic or foreign). These tax-subsidy devices accomplish some of the impacts of a tariff without the deleterious side-effects we have already outlined.

Let us see why this is the case by first assuming that the government wishes to increase the domestic output of imported goods above its free trade level. A tariff would do this, but would also change the consumption pattern and reduce the community's real welfare. (See Figure 1.) A production subsidy will increase output, and its influence on the consumption pattern will result in a higher real welfare than would eventuate from a tariff, but not so high as would be yielded by a free trade regime.

Consider Figure 2.[22] Again, the world price ratio between fishery products and other goods is indicated by the slope of line (F). The free trade production combination and consumption pattern are shown by the coordinates of P_F and C_F respectively. It will also be convenient to retain the small country assumption so that the international terms of trade are unaffected by the nation's policy decisions.

As before, a tariff on fishery products would shift productive factors so that output of fishery products is increased to the ordinate of P_T while the output of other goods falls to the abscissa of P_T. The relative domestic price of fishery products rises as shown by the flatter slope of line (T). The new consumption combination is given by C_T, with tariff proceeds equal to DG (in terms of domestic prices with fishery products as the numeraire), and the marginal rate of substitution along indifference curve I_T being equal to the domestic price ratio. Trade has been limited, from imports of fishery products of AC_F under free trade to BC_T under the tariff. In other words, so far we have duplicated Figure 1.

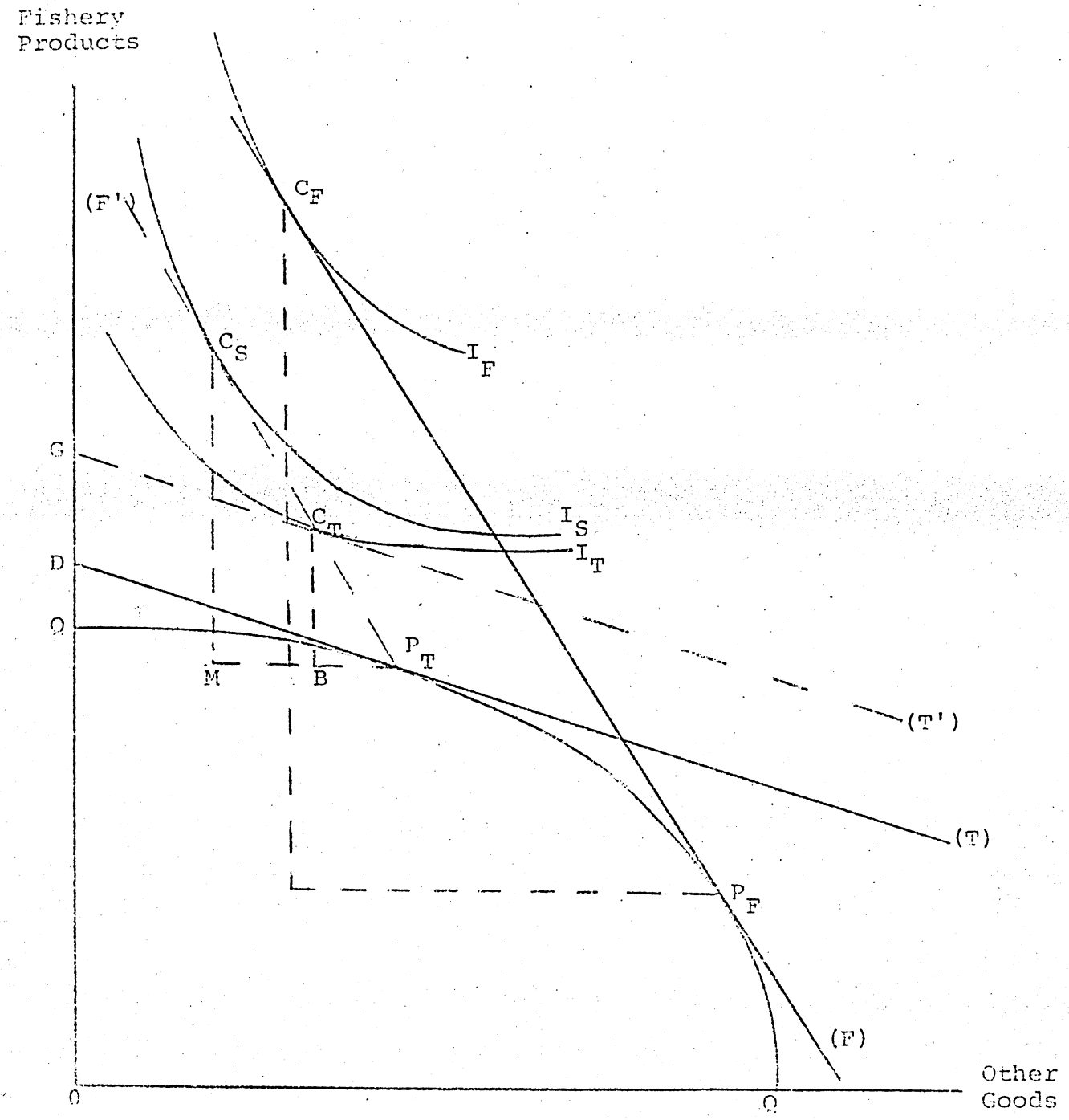

Fishery
Products
(F')
C_F
C_S
I_F
G
C_T
I_S
I_T
D
Q
P_T
M
B
(T')
(T)
P_F
(F)
0
Q
Other
Goods

Figure 2

But output of fishery products equal to the ordinate of P_T can be obtained by an appropriate production subsidy to this industry. Suppose that a subsidy is granted domestic fishery products firms at a level which is just sufficient to offset the relatively higher costs of producing fishery products at P_T (given by the slope of the transformation schedule, QQ, compared to world prices). However, consumers may continue to purchase goods at world prices. Since line (F'), indicating world prices, intersects indifference curve I_T at C_T, consumers are able to achieve a higher level of satisfaction, I_S, by choosing the consumption pattern given by the coordinates of C_S. Thus, the same level of production of fishery products, P_T, can be achieved either through a tariff or an output subsidy; but the latter scheme entails a smaller sacrifice in real welfare, since I_S is higher than I_T. Of course, the new, post-subsidy level of fishery products imports, MC_S, is greater than BC_T, imports under the tariff regime, but still fishery products firms receive, in effect, the same degree of protection. The subsidy is a more efficient device because it permits the same level of output of fishery products without distorting consumers' choices. Still, under free trade the community could have enjoyed satisfaction of the level indicated by I_F. That I_S is a lower level of welfare is the sacrifice made in order to support the production of fishery products at P_T.

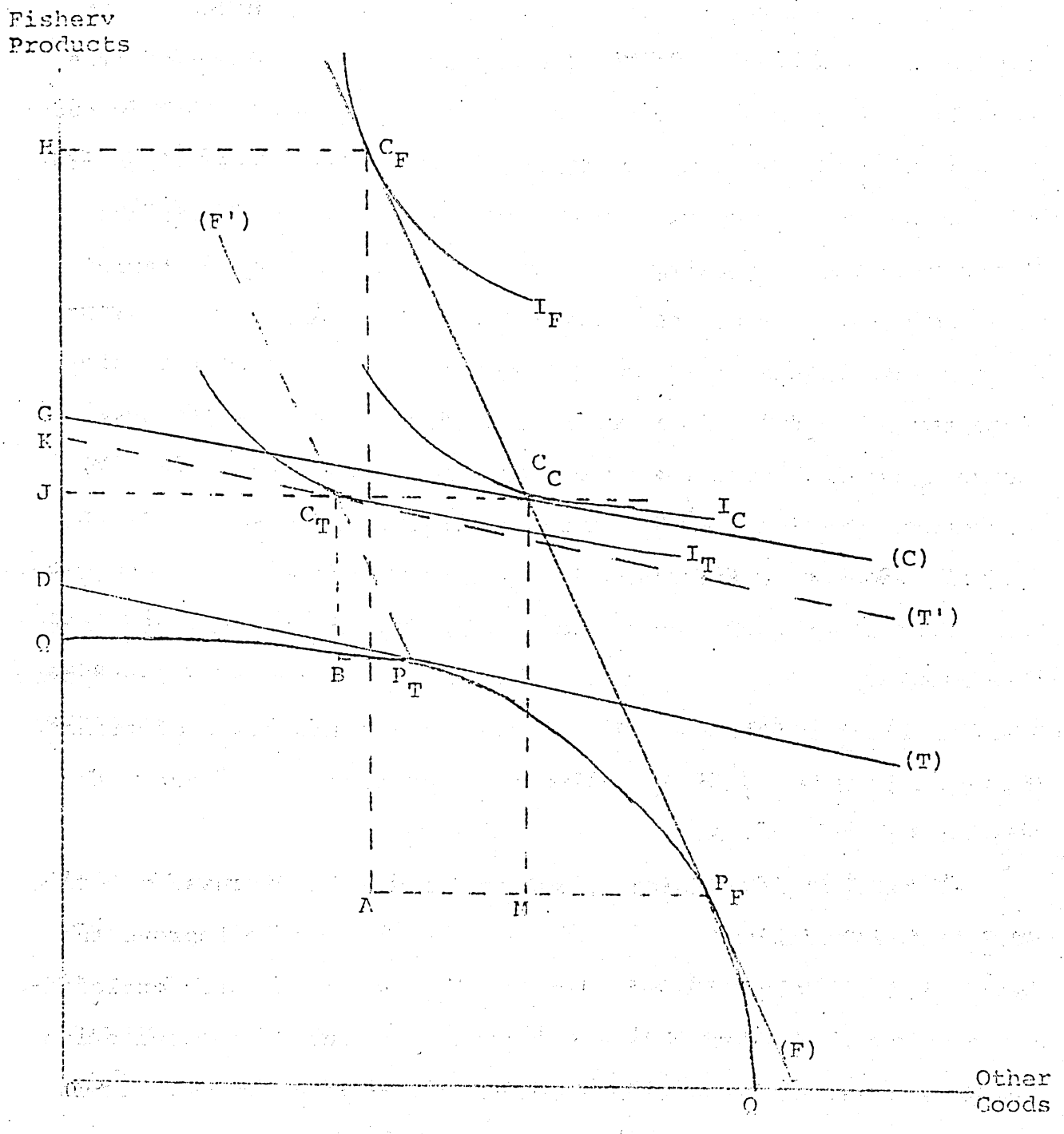
A second device for reducing imports, say of fishery products, is to impose a tax on the consumption of these goods. A tariff (i.e., a tax on imported goods only rather than on consumption) would have the same primary consequence, of course, but

would also result in an increase in the output of a relatively costly industry and a greater loss of economic welfare than would attend the implementation of a consumption tax. Figure 3 demonstrates these conclusions.

Again, in Figure 3, the free trade equilibrium position is given by P_F and C_F at the world terms of trade between fishery products and other goods given by the slope of line (F). With taste patterns indicated by the indifference map of Figure 3, OH worth of fishery products would be consumed, of which AC_F would be imported, in a free trade situation. Suppose, however, that it is decided that consumption of OH worth of fishery products is leading to serious resource exhaustion and that, given the amounts of fishery products consumed by other countries (again at world prices), a maximum sustainable yield of the fishery could be achieved by cutting consumption, say, to OJ.[23]

One way to achieve consumption of OJ of fishery products is to impose a tariff on their importation. The consequence, as we have already seen, is to shift domestic production to P_T and local consumption to C_T, and imports would drop radically. The tariff raises the relative price of fishery products, which is indicated by the slope of line (T) or line (T'). The tariff yield is given by DK and a loss of welfare, as consumers adjust to the new price ratio, is shown by the fact that indifference curve I_T, and its related satisfaction level, is appreciably lower than that indicated by indifference curve I_F.

But consumption of fishery products can also be reduced from OH to OJ by the imposition of a consumption tax. The side-effects


Fishery
Products
H
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B
P_T
(T)
P_F
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M
(F)
O
Other
Goods

Figure 3

of this policy will differ from those of a protective tariff. By instituting a consumption tax of the appropriate amount and, hence, raising the price of fishery products to consumers so that relative prices are indicated by the slope of line (C),[24] consumers will shift their expenditure pattern toward more of other products and less of fishery products. Still, since fishery products firms must continue to compete at the ruling world price ratio, there is no incentive to reallocate resources toward the fishery products industry, as would have happened had a tariff been imposed. Hence, the production pattern after the consumption tax continues at P_F and, by setting a tax rate so that the post-tax price ratio is equal to the slope of the indifference curve I_C at C_C [where the international terms of trade line (F) intersects the line showing the governmental-imposed ceiling on fishery products consumption JC_C], the consumption pattern becomes C_C. Imports are, of course, less, MC_C, than in the free trade situation, AC_F. But, even more important, the reduction of economic welfare which accompanies the given cut in consumption of fishery products is less (I_F to I_C) with the consumption tax than with the tariff (I_F to I_T).

These last two diagrams, and the pertinent discussion, drive home an essential point. If a government wishes to improve the lot of the fishery products industry or to cut resource exploitation down to a maximum sustainable yield by changing consumption patterns, a tariff is not the best device available to it. It is not optimum because, as we have shown, it affects <u>both</u> production and consumption. If the government wishes to impose changes in

the production of fishery products, a production subsidy (or tax if it wishes to cut output) is a more economically defensible instrument; if it wishes to alter the level of consumption of fishery products, a consumption tax (or subsidy) is more appropriate. In addition, these instruments have the virtue of making obvious an important facet of economic life that a tariff usually conceals: a particular industry is being favored (or harmed) or a particular commodity is being subjected to consumption controls.

Moreover, there is another point to be made as a consequence of the foregoing demonstrations. We have assumed that markets are purely competitive. Where this is not the case, market distortions arise that may result in lower levels of production, of efficiency, and of consumer satisfaction than can be achieved under purely competitive conditions. Of course, a reversion to purely competitive markets would presumably provide a satisfactory remedy to these market distortions. But where this is impossible, or even undesirable, counter-distortions can be created which will yield approximations to the purely competitive results. A tariff is one device that can provide appropriate counter-distortions. Nevertheless, with adaptation, the preceding arguments can be used to show that taxes and subsidies are more efficient instruments for purposes of generating counter-distortions. Even here, then, where a tariff can be defended as a socially desirable device, it turns out to be a "second-best" policy instrument.

So far, our discussion has shown that under reasonably realistic conditions the implementation of a tariff leads to advantages for the industry to which protection is extended, to changes in

the distribution of income among the productive factors, and to a reduction in the overall economic welfare of the members of the community that imposes the tariff. These effects of a tariff are general but their relative importance depends upon the market conditions which exist for the imported product whose domestic price is raised in response to the tariff. Only by specifying demand and supply conditions in the particular market with which we are concerned can we hope to approximate a quantitative assessment of the various consequences of instituting a tariff. Contrary to the general equilibrium analysis so far presented, this task gets us into the area of so-called partial equilibrium conditions. We are assuming, in effect, that the particular market we are analyzing is sufficiently small that changes in the market price for the product do not ramify into other markets in the economy in any noticeable way. Figure 4, utilizing conventional market supply and demand relationships, provides a demonstration of the effects of a tariff upon an individual product -- on the economic welfare of producers and consumers of that product -- and upon the government's tariff revenues. It should be cautioned, however, that this tool of analysis still fails to recognize the vertical structure of the industry producing the product; there is assumed to be merely a single commodity requiring no other commodity inputs, as distinct from factor inputs, in its productive process. This assumption, which is far from realistic in the case of fishery products, will be relaxed in the next section of this evaluation.

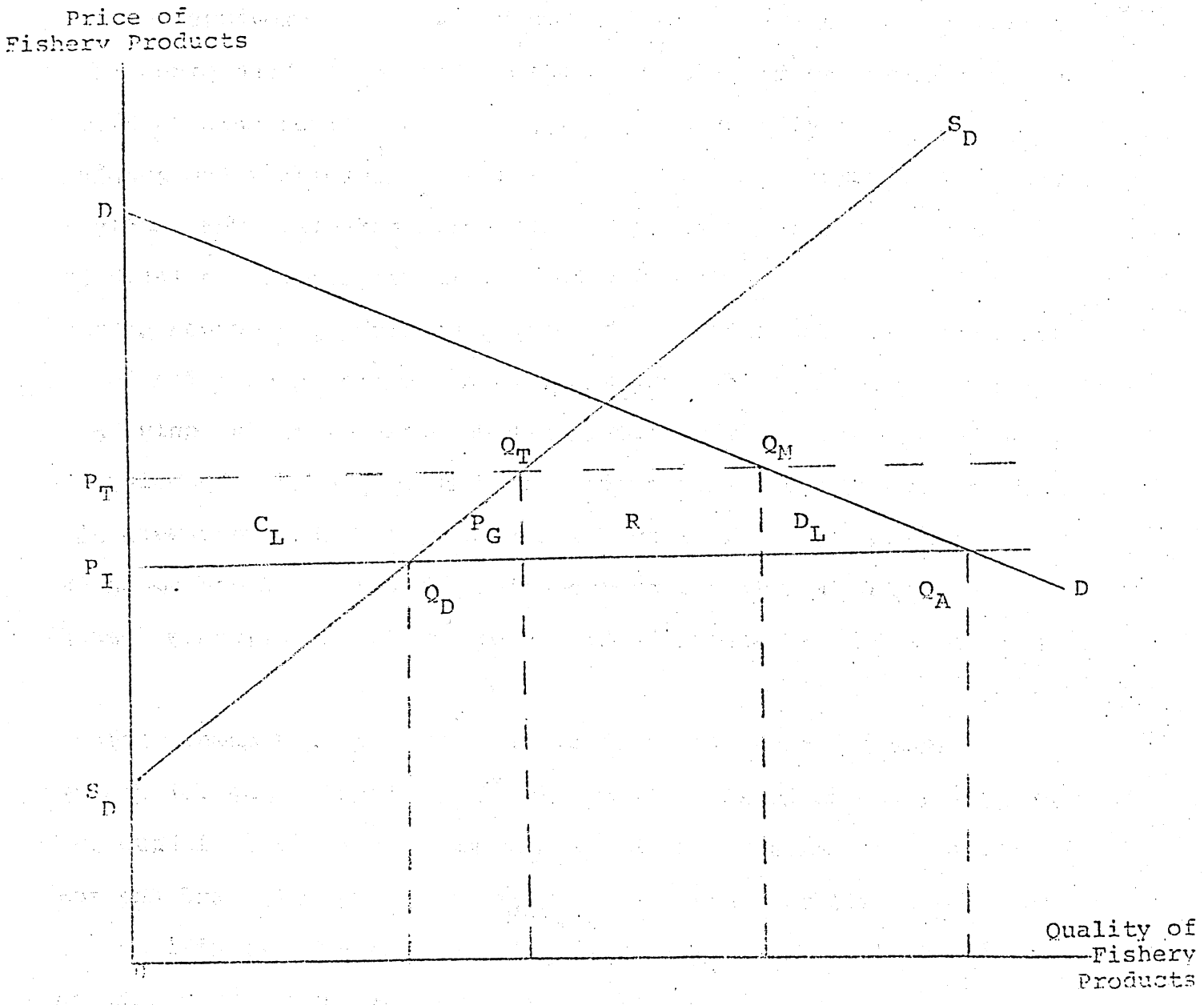
Price of
Fishery Products
S_D
D
Q_T
Q_M
P_T
C_L
P_G
R
D_L
P_I
Q_D
Q_A
D
S_D
Quality of
Fishery
Products

Figure 4

In Figure 4, let us assume that the U.S. produces some fishery products but that on balance it is a net importer of these goods. Assume also, as already noted above, that the U.S. is a purchaser of relatively small amounts of fishery products in world markets so that the international price of these products is unaffected by the size of U.S. purchases. Given this "small country" assumption the horizontal line P_I represents the supply of fishery products to the U.S. from world markets. The supply curve is therefore perfectly elastic with respect to the international price. In contrast, the supply of fishery products provided by domestic producers, S_DS_D, is assumed to have a finite, positive elasticity, indicating that domestic firms can only be induced to provide larger amounts of fishery products by being offered higher prices. Finally, it is assumed that consumers of fishery products will respond to price changes for these goods in accordance with the relationship shown by DD, the domestic demand curve.

In the absence of a tariff, given the depicted demand relationship, the price P_I will prevail in the home market for fishery products. At this price, of course, domestic firms will have supplied P_IQ_D of fishery products, imports will be Q_DQ_A, and the total amount of fishery products purchased by consumers will be P_IQ_A. Imports are therefore playing a "gap-filling" role between domestic demand and domestic supply.

But suppose, as a consequence of pressures from the domestic fishery products industry for protection, that an <u>ad valorem</u> duty, at a rate equal to P_IP_T/OP_I is imposed on fishery products. Since

U.S. purchases are of negligible size the price of fishery products on the international market will not be affected and so the domestic price of the commodities, P_T, must exceed the world price, P_I, by the full extent of the new tariff, so long as demand and supply conditions are such that the tariff rate is not so large that imports are entirely prohibited. Figure 4 shows that post-tariff imports will have fallen to Q_TQ_M, the amount of fishery products supplied by domestic firms will have expanded to P_TQ_T, while total consumer intake of fishery products will have dropped to P_TQ_M, all because of the price wedge between the domestic and international price that is brought on by the tariff.

With these "developments" specified we can now trace the tariff effects among the fisheries industry, consumers of fishery products and the government and show that, regardless of redistributive impacts, the overall welfare is lessened due to the tariff imposed. Traditionally, it is thought that the total satisfaction or welfare derived from a commodity by its consumers is measured by the amount they could be made to pay rather than make do without the commodity. This amount is indicated by the area between the demand curve and the horizontal line given by the going market price -- in our example P_I in the no-tariff situation and P_T after the tariff wall is erected. This is the notion usually referred to as the consumers' surplus, a measure of the net gain consumption of fishery products confers upon consumers. Before the tariff the fishery products consumers' surplus is given by the triangular area, in Figure 4, P_IQ_AD; after the tariff it shrinks to the area P_TQ_MD. Thus, the amount of welfare that the tariff

"costs" the consumer is equal to the trapezoidal area, $P_I O_A O_M P_T$.

However, the tariff conveys some benefit to the domestic producers of fishery products. The area under the supply curve (up to any given quantum of output measured along the horizontal axis) is the conventional measure of the opportunity cost of the productive factors employed to generate this output quantum of fishery products. Where it is possible to expand output only at increasing costs per unit the factors employed will, at any given commodity price, receive rewards in excess of those that are barely necessary to meet the opportunity cost of their employment. Thus, a producers' surplus occurs, the magnitude of which is indicated by the area lying between the prevailing price line and the supply curve. In our example, the free trade producers' surplus is given by the triangular surface $S_D O_D P_I$, which is increased to $S_D O_T P_T$ by the tariff on fishery products. Clearly, fishery products producers gain an amount equal to the area $P_I O_D O_T P_T$ from the tariff, and this is smaller than the welfare loss, $P_I O_A O_M P_T$, borne by consumers.

Nevertheless, there is yet another element to assaying the impact of the tariff, stemming from the fact that if the tariff rate is non-prohibitive it will generate some government revenue. Since with our assumptions the government collects duties equal to $P_I P_T$ on each unit of fishery products imported, the total tariff revenue accruing to the government is equal to $P_I P_T$ times $O_T O_M$, the area labeled R in Figure 4. This area, representing government tariff collections has welfare implications, of course; but what this is turns on the assumption regarding the government's disposition of this revenue. Two typical assumptions are either, as before, the government returns the funds directly

to the consumers who are free to spend as they wish or that the revenues are used to provide governmental services that, at the margin, are of equal value to consumers as would be an equal outlay on private consumption. Both of these assumptions mean that the revenue collections are just as beneficial to consumers, dollar for dollar, as is the consumers' surplus.

When the adjustments to the tariff are placed in their welfare terms a comparison of tariff effects on the several domestic interests is relatively straightforward. The fishery products consumers' loss from the tariff is the value of the total area given by the sum of areas $C_L + P_C + R + D_L$. This is offset for the entire community by a tariff-induced expansion of producers' surplus equal to area C_L and by an increment to government revenues of area R in value. Clearly, the net loss to the community from the ad valorem tariff on fishery products is given by the sum of triangular areas $P_G + D_L$. The latter area is conventionally called the dead-weight loss to the consumers of fishery products. The former area, P_G, is extra real cost entailed in securing the quantum $P_T Q_T - P_I Q_D$ of fishery products from the domestic industry rather than from foreign sources through imports.

A visual inspection of Figure 4 indicates the role of supply and demand conditions[25] in assigning different approximate magnitudes to the values of loss of fishery products consumers' welfare, improvement in the fisheries industry's welfare, and the net reduction in community satisfaction. For any given ad valorem tariff, the producers' gain varies inversely with the slope of the domestic supply function, $S_D S_D$; the gain would be minimized, although still positive, in markets where the domestic supply is

invariant to changes in price. Ignoring the government revenue effect, reduction in consumers' surplus, for any given tariff change, varies directly with the slope of the demand curve for fishery products. But in part this may be compensated for by virtue of the government's tariff collections also varying directly with the slope of DD. Government revenues also increase, given the ad valorem duty as the slope of the domestic supply curve is greater. Finally the dead-weight loss (D_L) and the community's extra costs from shifting to domestic suppliers (P_G) are both maximized by low slopes for the two functional relationships. These generalizations apply, it should be noted, only when the tariff is not prohibitive.

One could, in view of these conclusions from the partial equilibrium analysis of Figure 4, speculate on the distribution of welfare effects from protecting the "producers" of various types of fishery products. Where estimates of the slopes or elasticities of the product demand and supply curves are available the task would not be difficult. However, when we recognize that the fishery products industry consists of a vertical structure of factor inputs, fishery products outputs, and fishery products inputs, the exercise is meaningless as concerns the appraisal of the producers' surplus change that is generated by a tariff. So let us turn now to an examination of the effects of a vertical industrial structure for purposes of analysis of a tariff's potential effects. That is, let us examine the so-called theory of effective tariffs.

Nevertheless, before going on it should be made perfectly clear that permitting articulation of the vertical structure of an industry does not negate our conclusions regarding the tariff-induced loss in consumer welfare. This loss is contingent only on the existence of a tariff on the final product which is purchased by the consumer. Recognition of separate production strata within an industry has implications for the allocation among these strata of the so-called production effect, and hence for the distribution of the producers' surplus. The revenue effects of a tariff and the aggregate size of the extra costs incurred by shifting purchases from foreign low-cost suppliers to higher-cost domestic suppliers (P_G in Figure 4) are, of course, partly determined by the vertical structure of the industry. But the change in consumers' surplus and the magnitude of the dead-weight loss (D_L in Figure 4) are unaffected by the realities of the vertical structure of the industry; for these effects of import duties, only the nominal tariff rate on the final product is relevant.

III -- Analysis of Effective Tariff Protection

Our concern heretofore has been a demonstration of the consequences of imposing an ad valorem tariff on a single, final good that is produced by a completely homogeneous industry. But an industry typically consists of many firms. While every firm presumably must exercise some interest in its contribution to the market for final goods it is by no means the case that every firm in an industry chooses to produce a good whose immediate destination

is the "market baskets" of final consumers. In any given industry, we typically find firms producing raw materials to serve as inputs for other firms; and we find these latter firms being processors or fabricators for still other firms. And so on, up through wholesaling and retailing. In other words, almost every industry consists of a vertical layering of productive processes and the demand for the output of these processes is, like the demand for the productive factors per se, ultimately derived from demand in the final goods market. The theory of effective protection takes as given this vertical stratification of all productive activity, and hence is appreciably more realistic, and complicated, than the analyses of the preceding pages.

It should be pointed out that it is of little moment whether the firms in the industry are completely vertically integrated or whether, as implied above, each stratum of the productive activity is occupied by firms that are entirely independent of those in every other stratum. For purposes of effective tariff analysis, as for other areas of microeconomic reasoning, it is the process -- or stratum -- that is the important unit of organization. The penchant of economists to organize their thoughts around a somewhat fictionalized "firm" may be adequate if one is concerned about certain facets and results of profit maximizing behavior; but it is not the best organizational concept for purposes of discussion of resource allocation or, alternatively, relative costs of inputs and the consequences of changes in these. In this instance, the productive process or industry stratum is the most analytically powerful "unit of account." The theory of effective protection

has this as its basis, attempting to assess the effective ad valorem rate of protection that is conferred upon any given productive process by the vertical "structure" of nominal protective measures and by the vertical structure of the particular industry.

Clearly, the fishery products industry is characterized by a vertical structure more or less like that outlined above. There is the harvesting segment of the industry which, perhaps because of its unique features or its appreciable political influence, many people are apt to equate with the entire industry. This, for the most part, since dockside retail sales are minuscule, is a gross distortion of reality. Layered on top of the harvesting process are other strata of fish processing activities: (1) preparation of the raw fish for, say, freezing, salting, canning, or otherwise curing; (2) the freezing or canning process, although often preparation and freezing or canning are wedded in a single firm; (3) not infrequently, the freezing and canning stages are separate-firm processes with canners using fish in a variety of forms in a frozen state as raw materials inputs; and finally (4) the marketing or distribution (wholesaling and retailing) process. In evaluating the impact of tariffs on the fishery products industry this vertical structure becomes an integral part of the analysis.

We should also briefly recall the vertical structure of nominal protection -- not effective protection -- as sketched in Part I. First, we have noted that fish harvesters were the beneficiaries of some protection by virtue of the 1792 Federal legislation

which precluded direct U.S. entry from foreign vessels of fresh fish. By, in effect, forcing fresh fish caught by foreigners to be first landed on foreign soil before exportation to the U.S., foreign fish harvesters have been put at a cost disadvantage vis-a-vis U.S. fish harvesters, just as though their fresh fish products had been subject to an import duty. The "input costs" of fishery products processors relying upon fresh fish are, therefore, higher than they would be in the absence of the 1792 proscription on direct fresh fish imports. At the processing strata of the industry, however, we must distinguish between imports of canned fishery products, upon which a nominal tariff is typically levied, and fishery products in frozen form, which usually enter duty free. The consequence of this is that U.S. canners receive tariff protection of course, but those relying upon frozen fishery products inputs also gain from equivalent positive effective protection while those using fresh fish inputs will have a lower rate of effective protection, for any given level of the nominal tariff on canned fishery products imports, or possibly even a negative effective protection rate, depending upon the magnitude of the transshipment costs[26] and upon the fresh fish input coefficients.[27] Finally, marketers or distributors of canned fishery products are adversely affected by the nominal tariff on canned fishery product imports, but those who are fortunate enough to specialize in purveying fishery products in frozen form are not compelled to endure this adverse impact. Also, distributors who concentrate in selling fresh fish, if not the dockside sales of fish harvesters, are subjected to the cost disadvantage imposed by the 1792 direct import proscription. These are conclusions about the ultimate

protective consequences for the fishery products industry that, as we shall soon see, stem from the vertical structure of nominal protection extended to different strata or processes in the overall industry.

In order to demonstrate these conclusions in a somewhat general format, let us assume that a commodity for a final goods market is produced at home as well as being imported. This so-called importable (we may think of it as canned fish) we will designate by the letter, Q, which stands for final output. The importable commodity Q, moreover, requires two types of inputs when produced domestically: (1) another importable product, which we will designate as a commodity I for input commodity (we may think of it as raw fish), which of course is both imported and produced at home, but is not directly consumed at home; rather it is consumed only as embodied in commodity Q; and (2) a batch of the original factors of production, which we will call the value-added product of the canning segment of the fishery products industry. That is, it is the "product" of the canning activity. If the total value of commodity I used in the production of commodity Q is added to the value-added product of the canning activity we end up with the value of the final product of the canning stratum of the fishery products industry, i.e., the total revenues received by canners from the market in which canned fish are sold. The final consequences of nominal tariffs on commodity Q and commodity I are what we propose to examine under our analysis of effective protection.

Let us assume, to simplify the argument, that, as stated in footnote 27, there is, as concerns that element of commodity Q's production function involving commodity I, a fixed input coefficient. It will be convenient to define units of the value-added product of the canning process so that the physical input coefficient of commodity I into commodity Q is also fixed. One advantage of this assumption is that in the next diagram we can measure quanta of commodity Q and commodity I on the same axis. Further, let us assume that the price elasticity of supply of imports of each of these commodities is infinite. In other words, we wish to retain the so-called "small country" assumption of the preceding section. Finally, we find it useful, so as to rule out the possibility of alterations in the barter terms of trade, to assume that irrespective of the levels of import tariffs or of demand relative to supply there remain imports of both commodity Q and commodity I.

Figure 5 provides a diagrammatic basis for our analysis of the effective protection granted to commodity Q, given its own nominal tariff and the nominal tariff on imports of commodity I. On the horizontal axis are found quantities of Q and I, with the axis' units for Q and I chosen so that one unit of I is required in order to produce one unit of Q.[28] Prices of these commodities, on a per unit basis, are shown on the ordinate. The demand curve for commodity Q, DD, shows at a series of prices the amount of Q that will be purchased, whether produced by domestic or foreign suppliers. The domestic supply curve of I we designate by

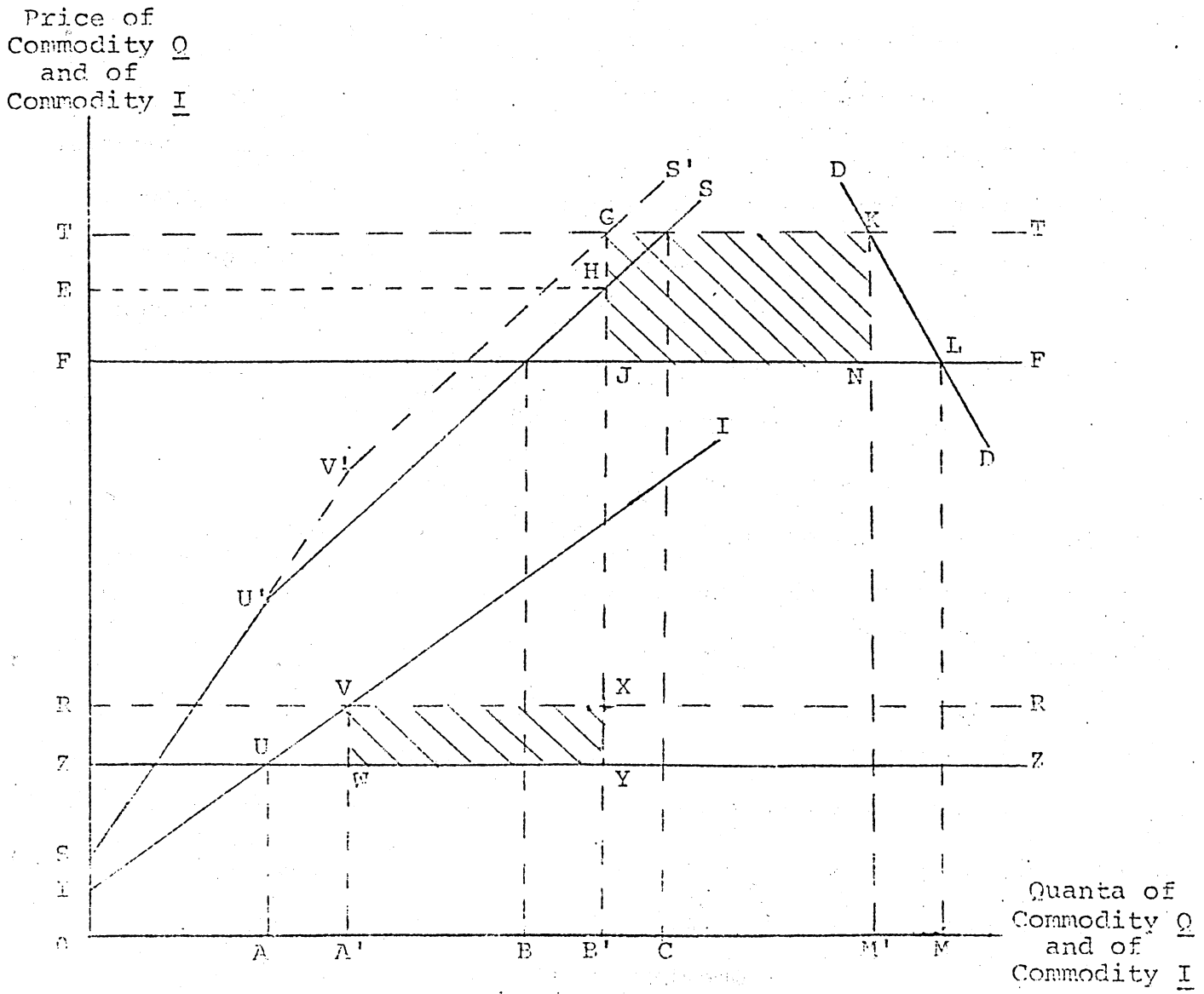
Price of Commodity Q and of Commodity I
S'
S
D
G
K
T
T
H
E
F
L
F
J
N
I
V'
D
U'
V
X
R
R
U
Z
Z
W
Y
S
I
O
A
A'
B
B'
C
M'
M
Quanta of Commodity Q and of Commodity I

Figure 5

II. Alternatively, the supply curve of imports of I is given by ZZ, its horizontality reflecting our assumption of perfectly elastic supply conditions abroad. Next, let FF indicate the perfectly elastic supply of imports of commodity Q.

Finally, let us derive the domestic supply relationship for commodity Q, which is by no means the simple supply curve we are accustomed to in partial equilibrium analyses. This relationship is given by the kinked curve SU'S, which is formed as follows: it is the vertical addition of the supply curve of I which domestic producers of Q face and of the supply curve of the value-added product contained in commodity Q. The first of these supply curves -- that for I facing domestic producers -- is the conventional IUZ, i.e., at U further amounts of I demanded are met by imports, whereas for quantities of I demanded that are less than OA domestic producers supply the market. The second supply curve -- for Q's value-added product -- is novel. It is novel because the value-added product of Q supplied depends not on the price of Q, per se, but rather upon the price of the value-added product of Q, or what we shall call the effective price of Q.[29] (Effective price will be discussed more fully momentarily.) The supply of the value-added product depends upon the price of the activity, not upon the nominal price of commodity Q. Given that the value-added product of Q is positively related to the effective price of Q, we find that the domestic supply curve of commodity Q, SU'S, is always rising relative to the supply curve for commodity I that domestic producers of Q face, provided, of course, that the effective price and the nominal price of Q are positively correlated.

Under free trade circumstances, i.e., in the absence of tariffs, Figure 5 indicates the following pattern of consumption and production of commodities Q and I. OM of Q will be consumed, of which OB is produced domestically and BM is imported at the nominal price of OF. However, as we shall note, Q's effective free-trade price is ZF. The fact that OB of Q is produced domestically determines the total domestic demand for commodity I, OB^{30}, of which AB is imported and OA is produced by domestic firms.

To illustrate what is meant by the effective price of commodity Q, let us suppose that a nominal tariff, equal to FT/OF, is imposed on the importation of Q. It is immediately clear that this tariff will cause an increase in Q's nominal price of OF before the tariff to one of OT after the tariff. But what has happened to the effective price of Q? In the pre-tariff or free trade situation the domestic price and the world market price of each commodity must be the same. That is the nominal prices of I and Q, respectively, are OZ and OF. Thus, since the per unit value-added product of Q is the difference between the commodity input price of I and the price of the final good, Q, it is clear that the effective price of Q -- the price of the activity -- is ZF. That the tariff on Q has increased its nominal price to OT, while the nominal price of I is untouched, means that Q's effective price too has risen to ZT. This, in turn, means that the effective protective rate for Q is FT/ZF, i.e., the proportional increase in the effective price resulting from the nominal tariff. A glance at the diagram shows that this effective rate

of protection, FT/ZF, is greater, on an ad valorem basis, than the nominal rate of protection of Q, FT/OF.

In contrast, had the tariff been placed on commodity I rather than commodity Q a different effective price for Q would have obtained. Suppose a nominal ad valorem tariff of ZR/OZ had been levied on imports of I, raising its nominal price to OR; imports of commodity Q continue, we assume, to enter duty-free. In this event, the effective price of Q, rather than being either ZF or ZT, as in the previous two examples, would have been at the lower level of RF. Since the tariff on the input commodity, I, reduces the effective price of the output commodity, Q, the effective rate of protection offered the latter by the levy on I is negative. Specifically it is -ZR/ZF.

Assume, however, that a nominal tariff of the percent given by ZR/OZ and FT/OF is levied respectively on commodity I and commodity Q. Since we are implicitly assuming that there are, in effect, no commodity inputs going into the production of I its nominal and effective rates of protection are identical. However, what has been the consequence of this combined tariff levy on the effective protective rate for commodity Q? Clearly, its post-tariff nominal price is OT and, as indicated, the nominal rate of protection is given by FT/OF. But the effective price of Q would have changed from ZF, the free-trade effective price, to RT, Q's effective price after both tariffs have been imposed. This would yield an effective rate of protection for Q equal to (FT-ZR)/ZF. In the case illustrated in Figure 5, since the tariff on Q causes an increase in its nominal price, FT, which exceeds

the increase in I's nominal price, ZR, induced by its tariff duty, the effective protective rate on Q is positive. However, had the relative magnitude of the changes in the nominal price been reversed -- with I's price increase exceeding that of Q -- the effective rate of protection on commodity Q would have been negative.

Having become familiar with the notion of effective protection, and with its diagrammatic treatment, let us now trace out the welfare and distributional consequences of tariffs which cut across the vertical structure of an industry. Again refer to Figure 5. The tariff on Q of FT/OF causes consumers to reduce their purchases of Q from OM to OM', and hence to lose consumers' surplus of FTKL. These "consumption effects" depend only on the nominal tariff on Q; they are not contingent on the effective rate of protection. Moreover, what we termed the "dead-weight loss" of Figure 4 is affected also only by the nominal tariff on commodity Q. But since we have assumed that tariffs are imposed on both Q and I, the changes in producers' surplus and in the extra costs of securing Q and I from domestic producers rather than from lower-cost foreign sources are not unrelated to the effective protective rate. Because a tariff has been imposed on I, domestic output of that commodity is raised from OA to OA'. But as well, this duty shifts upward to IVR, from IUZ, the I commodity supply curve that confronts home producers of Q. The tariff, in effect, is a tax on the inputs to the production of Q and, consequently, raises its costs of production. Because of this shifting of the I supply curve, the new supply curve of Q is SV'S', the segment V'S' being

vertically above the old Q supply curve by the amount of the tariff duty on I, i.e., by ZR. The new domestic production of Q is, therefore, at a rate of OB', which is less than would have taken place if I had not been subjected to the import tax. (Had there been no duty on I imports, home production of Q would have been OC.) Note, however, that compared to the situation in which there were no tariffs, the domestic output of Q has expanded. Specifically, from OB to OB', which would only happen if the effective price of Q has risen in consequence of the application of the two tariff duties. Thus, the tariff on a unit of Q imports, FT, must be greater than the tariff on a unit of I imports, ZR. It is also clear that imports of Q have fallen, both because the quantity of Q demanded is reduced and domestic output is increased.

Imports of I, too, have decreased from AB to A'B', as Figure 5 is drawn. But this is not inevitable. Both the domestic output of I and the quantity of it demanded have increased. Had I's domestic supply been somewhat less elastic and the elasticity of supply of Q's value-added product greater the quantum of I imports could have increased. However, even with the elasticities depicted in Figure 5, imports of I would definitely have dropped if the per unit tariff on Q had been less than the per unit duty on I. Had this been so, the effective rate of protection of Q would have been negative and domestic production of Q would have decreased. Imports of Q might have decreased or increased. But the quantity of I demanded would have fallen and, with greater output of I induced by its protective tariff, imports of I could only have been reduced.

Of course, the tariffs raise revenues for the government, and the consequence of these, under the revenue "disposal" assumptions enunciated in Part II, is to reduce the drain that the tariff levies impose upon consumers. From Figure 5 it is clear that the government receives WVXY in tariff duties on I imports and JGKN on Q imports. Thus, government tariff revenues are equal in value to the two cross-hatched areas. In a sense, consumers are "taxed" by the tariff on I by an amount equal to ZRXY, but since they receive back from the government, by our previous assumptions, WVXY, the consumers are subsidizing I firms to a value indicated by ZRVW. Thus, ZRXY is the tax equivalent of the tariff on I, and ZRVW is its subsidy equivalent. If we take as given this consumer tax, as it were, on commodity I and, hence, accept that SV'S' is commodity Q's supply curve, the subsidy equivalent of the nominal tariff on Q is given by the area FTGJ. It should be observed, however, that this degree of subsidization would not have been required to raise the output of Q to OB' had it not been for the tariff on I. Without the I tariff, a subsidy of FEHJ to activity Q would have been sufficient to increase its output by BB'. Thus, the subsidy equivalent for the tariff on Q in part pays for the tax equivalent for the duty on I. Specifically, I's tax equivalent amounts to ETGH of Q's subsidy equivalent, with the remainder, FEHJ, as noted just above, being the net subsidy equivalent for Q. FE, of course, is the excess of the duty on Q over the tariff duty on I of ZR.

From these results we can observe several consequences of an effective protective rate. Given the assumptions we have been

employing, the effective rate affects only the domestic production of Q. It neither influences the quantity of Q demanded nor the amount of I produced at home. The consumption of Q is dependent, rather, on the nominal tariff on Q and domestic output of I is contingent on I's nominal duty. Since we are assuming that some I will always be imported, a tariff on Q, while increasing the quantity of I demanded, has no impact on the home production of I. The tariff on Q, therefore, provides protection only to value-added in the Q stratum of the industry. Additionally, we observe that the expansion of Q production is a function of both the effective protective rate and the supply elasticity of Q value-added product. The effective protective rate, as developed here, differs from the nominal rate in that (1) it comprehends the effects of the tariff on I and (2) it expresses the change in the domestic price of Q relative to its effective, rather than nominal, price. In allowing for the tariff on input commodities, the notion of an effective rate encompasses the possibility that despite positive nominal protection of Q, a tariff structure can be such that the production of Q will drop.

One assumption of this model, so far merely implicit, may seem crucial. The I producing firms have been assumed to be completely vertically integrated. That is, I does not build upon commodity inputs, but only on factor inputs. This assumption, it turns out, does not appreciably delimit the theoretical model of effective tariffs. If we wished to consider that commodity I contains another commodity input, we could then, as in the preceding paragraphs, compute an effective rate of protection for I which

conceivably would differ from its nominal rate of protection. This effective rate for I would depend on its nominal rate, on the nominal protection granted to its input commodity, and on the amount of the input commodity utilized by a unit of I's output. Nevertheless, as long as we retain the assumptions that foreign supplies of imported commodities are infinitely elastic and that imports of all relevant commodities continue (that no tariffs are prohibitive), the effective rate of protection on a given commodity is not affected by duties on commodity inputs that go into making the commodity input of the given commodity. Only nominal tariffs on adjacent productive strata have a bearing on the effective protective rate of the process of the higher stratum in the industry.

Moreover, the assumption that Q has only a single commodity input, I, is not critical. It is merely conveniently simplifying. As long as each commodity input is combined in fixed proportion to the commodity output we can use this proportion to weight the several tariff rates on input commodities like I. The weighted average of the several input tariffs thus is substituted for the single input tariff rate, ZR/OZ in Figure 5, in the above analysis, and the weights are the pre-tariff input coefficients of the several input commodities. Indeed, it is by resorting to this weighting technique that empirical estimates of effective tariff rates can be undertaken on a commodity by commodity basis. Clearly, what is needed for these calculations are not only nominal tariff rates -- and the tariff rate equivalents of other trade impediments, taxes, and distortions internal to the industry's structure -- but the shares of the several commodity inputs in the production

costs of the commodity output in a situation where free-trade prices would reign. To state this, of course, is to indicate the hazards inhering in such empirical estimates. To believe that the input coefficients are, to all intents and purposes, fixed may not be stretching the credible too far; but to assume that the measured input coefficients are exact reflections of the "free-trade" coefficients, given the level and structure of tariffs that were tabulated in Part I, would be quite implausible.

Footnotes

[1] I. Wexler, Fundamentals of International Economics, 2nd ed. (1972), pp. 282-83.

[2] League of Nations, World Economic Survey, 1933-34 (1934) is the source of these comparative export statistics.

[3] See J. M. Letiche, Reciprocal Trade Agreements in the World Economy (1948), for an authoritative discussion of this range of issues during the early stages of reciprocal trade agreements negotiations.

[4] The applicability of these generalizations to fishery products is confirmed by J. E. Micuta, "Pertinent U.S. Trade Barrier Information By 'Master Plan' Fisheries," Division of Economic Research, National Marine Fisheries Service (n.d., mimeographed).

[5] The figures are taken from U.S. Tariff Commission, "Value of U.S. Imports for Consumption, Duties Collected and Ratios of Duties to Values, under the Tariff Act of 1930, 1930-69," (February, 1970, processed).

[6] I. B. Kravis, "The Current Case for Import Limitations" in Commission on International Trade and Investment Policy, United States International Economic Policy in an Interdependent World: Papers, Vol. I (July, 1971), p. 149.

[7] See also ibid., pp. 147-48, for a like conclusion.

[8] The notion of a vertical production structure simply recognizes that most final goods -- or even most goods upon which tariffs are imposed -- are built up from raw materials and

intermediate goods. This recognition of the distinction between "inputted" goods and final goods is crucial to our subsequent discussion of the difference between nominal protection and effective protection. It is because of the essential nature of this distinction in formulating a theory of effective protection that we talk of effective protection of value-added or of a productive process, rather than of a commodity.

[9] O. Gulbrandsen and A. Linbeck, "Swedish Agricultural Policy in an International Perspective," Skandinaviska Banken Quarterly Review (No. 4, 1966). Comparable rates for the E.F.T.A. countries and for Canada were 36 percent and 12 percent respectively.

[10] Micuta, op. cit. The following information on nominal tariffs on fishery products relies heavily upon this document.

[11] Ibid., p. 3.

[12] Ibid., p. 4.

[13] The "tariff status" of groundfish is a very complex issue. In the first place, groundfish is a catch-all category, and different species are treated differently for tariff purposes. Secondly, for one category of import, a specific tariff is combined with a quantitative amount, to which it is applicable. Thirdly, although Micuta's evidence suggests that groundfish protection was reduced by the Kennedy round negotiations, a report to the President and Congress asserts that the duty on fresh and frozen groundfish fillets was not negotiable during the Kennedy round since the Tariff Commission found evidence of "serious economic injury" in its 1956 investigation of the groundfish industry.

See Report of the Secretary of the Interior to the President and the Congress on The Effects of Imports on the United States Groundfish Industry (May, 1969), p. 5. This points out, too, that groundfish are imported in many forms.

[14] F. V. Waugh and V. J. Norton, Some Analyses of Fish Prices: Bulletin 401 of the University of Rhode Island Agricultural Experiment Station (1969), p. 7.

[15] This follows from the Stolper-Samuelson theorem. It should be emphasized that real income, and not just money income, increases. If the price of fishery products rises, and say capital is used intensively in this industry, not only will the return to capital rise, but also this return will increase in greater proportion than the increase in fishery products prices. Conversely, in the theoretical model being used here, the real return to labor -- the productive factor which is relatively non-intensively used by the fishery products industry -- will fall. W. F. Stolper and P. A. Samuelson, "Protection and Real Wages," Review of Economic Studies (November, 1941). By the above, we do not presume to suggest that the fishery products industry utilizes capital more intensively than labor compared to the other goods industry. The relative factor intensity of the fishery products industry, so far as we can ascertain, has not been determined empirically.

[16] Any other assumption, such as that the government spends the tariff revenue as it sees fit, would take us into a discussion of the nature of the social welfare function and its comparison with the private welfare function. This would lead us far

afield, especially since in the U.S. tariff revenues are such a minute component of the total revenues available to the government.

[17] In technical jargon, the budget line appropriate to consumers after the tariff refund is line (T'), which lies beyond the transformation schedule by the amount of revenue yielded by the tariff.

[18] Other possible motives for tariffs are, of course, revenue raising, to subsidize industries vital to national defense, balance of payments considerations, and temporary succor for an "infant industry." But irrespective of motive, the consequences of a tariff are those adumbrated above.

[19] This argument was first raised by L. Metzler, "Tariffs, the Terms of Trade, and the Distribution of National Incomes," Journal of Political Economy (February, 1949). See, also, R. W. Jones, "Tariffs and Trade in General Equilibrium: Comment," American Economic Review (June, 1969). Specifically, if the foreign import demand elasticity is smaller than the marginal propensity of the home country to consume the commodity which it is exporting, a tariff on the imported good will in effect protect the export industry.

[20] Specific in the sense that they are highly immobile between industries and occupations. Consequently, the price mechanism fails to operate effectively as a reallocative device.

[21] Export taxes and quantitative restrictions (QRs) will not be considered here. Within the model we are using, export taxes are identical to import taxes (tariffs) in their microeconomic effects. Quantitative restrictions, on the other hand, require a

different type of diagrammatic apparatus for effective analysis.

[22] This figure is derived from W. M. Corden, "Tariffs, Subsidies, and the Terms of Trade," Economica (August, 1957).

[23] Whether this is a desirable, or even feasible, target for one nation to pursue unilaterally is, of course, dubious. But the example serves to illustrate what might happen if such a goal was pursued effectively.

[24] Line (C) will typically have a flatter slope than lines (T) and (T'), which is to say, if we think in terms of ad valorem rates, that the consumption tax will be at a greater percentage rate than would be the comparable tariff rate. This is a reflection of the fact that the consumption tax leaves consumers with higher real income than does the commensurate tariff. So, unless more of this real income is taxed away (than under the tariff), some of it will spill over into the consumption of fishery products so that consumption would not turn out to equal the government-imposed ceiling of OJ. (An implicit assumption of this reasoning is that fishery products are not inferior goods. Rather, as consumer incomes increase, more fishery products will be demanded.)

25. Economists usually signify by demand and supply conditions the factors that determine elasticity, or that concept itself. Elasticity, here with respect to price, is defined as the percentage response in the quantity of the product either demanded or supplied that is induced by a one percent change in the price of the product, all other determining conditions remaining unchanged. Traditionally, economists have ignored the algebraic sign of the number that depicts this response, and this tradition is followed in the discussion just below. Moreover, since elasticities are difficult to visualize with the eye alone, as is required when using diagrammatic explanations, the discussion is couched in terms of slopes. So in the following, demand and supply conditions are characterized by the absolute value of the slope of the relevant functional relationships. Also, in order to simplify, in this and subsequent partial equilibrium analysis, it is assumed that all supply and demand relationships can be accurately depicted by linear functions.

26. The magnitude of transshipment costs determining the minimum cost differential that foreign fish harvesters must overcome in order to land fresh fish in the U.S. As mentioned above, the U.S. purchasers of fresh fish -- whether final consumers or processors -- must presumably pay for these transshipment costs whether utilizing imported or domestically harvested fresh fish.

27. By input coefficient is meant the physical amount of the commodity input, in this case fresh fish, required to produce one unit of output, in this instance of canned fishery products. For

purposes of subsequent analysis we must assume that the input coefficient of commodities is fixed for all domestic firms irrespective of the scale of production or the relative prices of the several inputs and the output. It is not necessary, however, to assume that productive activity is restricted to "fixed coefficient" techniques in the utilization of the original factors of production. See, for example, the discussion in H. G. Grubel and H. G. Johnson (eds.), Effective Tariff Protection: Proceedings of a Conference Sponsored by the General Agreement on Tariffs and Trade and the Graduate Institute of International Studies, Geneva, Switzerland, 17 to 20 December 1970 (1971), passim; and W. M. Corden, The Theory of Protection (1971), especially Chaps. 3 and 6. Subsequent analysis relies upon the two works.

28. The respective unit-sizes thus reflect the fixed input coefficient given by Q's production function.

29. The market price of Q in the free trade situation could be termed the nominal price of Q. It will determine the quantum of Q demanded in the absence of a tariff on imports of Q, but it has no bearing on the size of the batch of original productive factors utilized in activity which uses I to produce Q.

30. Recall that because of the units in which quanta of Q and I are designated, equal distances along the abscissa, such as OB, do not represent an equal amount of each of the commodities.