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VARIOUS METHODS FOR MEASURING AND ANALYSING ECONOMIC ASSISTANCE

(Note by the Secretariat)

1. At the 63rd Session of the Committee for Fisheries Member countries having already carried out quantitative and/or qualitative analyses on relevant issues regarding the study on economic assistance were invited to present their work and their conclusions at the Committee's 64th Session. The attached paper, "United States Government Support of the Fishing Industry" has been submitted by the U.S. authorities.
2. This document is circulated to the Committee for Fisheries for INFORMATION AND DISCUSSION at its 64th Session, scheduled for 27-29 September, 1989.
3. In submitting this paper the U.S. authorities note that although the United States supports the calculation of PSE or other measure of government support, it has not chosen a specific methodology. The purpose of this paper is to serve as an example of one way the calculations could be done.

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UNITED STATES GOVERNMENT SUPPORT OF THE FISHING INDUSTRY

I. INTRODUCTION

1. One of the objectives of the United States government in the international trade arena is the reduction of trade barriers. The U.S. government believes that U.S. industry is capable of competing successfully in the international market place provided that the competition is fair. That is, foreign industries do not have an unfair advantage which results from one or more forms of governmental support. Such support is common, and it comes in a variety of forms some of which are not immediately apparent. Although support is common, there appears to be a growing awareness that benefits can be achieved by reducing support and thereby increasing competition.

2. Recognition of the benefits that can be realised from free trade go beyond the confines of the United States. The recently begun multilateral trade negotiations under the auspices of the General Agreement of Tariffs and Trade (GATT) are an example of an international effort to reduce trade barriers.

3. In its initial efforts to study the issue, the GATT has focused attention on support provided to agricultural producers. Its efforts are still in their infancy as the member countries grapple with their own points of view. The following statement typifies these beginning efforts. "The complexity and diversity of the measures employed to protect the operation of domestic price and income support arrangements have been a major impediment in previous negotiations to the development of a comprehensive and balanced approach to liberalising trade in agriculture". ["Quantitative Measurement of Support: The PSE (Producer Subsidy Equivalent)". Note by the Secretariat, GATT, Spec. (87) 37, 8 September, 1987, p. 1].

4. The Organisation for Economic Co-Operation and Development has also addressed the issue of governmental support to agriculture. Their work is somewhat further along than is that of the GATT, and they are quantifying support by means of estimating a producer subsidy equivalent (PSE). At the present time, the GATT is considering use of the PSE.

5. An attractive characteristic of the PSE is that it is broad in scope and it reduces a variety of kinds of support to a uniform measure. Another GATT statement captures this concept very well.

As a measure of the overall level of support or assistance to producers of a given product, the PSE concept requires in principle that all transfers from whatever source be included. Whether the explicit or implicit transfer/subsidy accrues from a deficiency payment programme, from border measures, from tax concessions or from government services provided at less than cost is a matter of indifference, in the economic sense, in calculating PSEs. Thus, an income transfer of one dollar in export subsidies stands on the same footing as a one-dollar income transfer from a government-financed research programme. ("Quantitative Measurement of Support: The PSE", Note by the Secretariat, GATT, Spec. (87), 8 September 1987, p. 3).

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6. The U.S. Department of Agriculture is also utilising the PSE as a means of estimating support to both U.S. agriculture and various other countries' agricultural sectors. Their analysis is contained in "Government Intervention in Agriculture: Measurement, Evaluation, and Implications for Trade Negotiations", International Economics Division and National Economics Division, Economic Research Service, United States Department of Agriculture (USDA), Foreign Agricultural Economic Report n° 229, April 1987. The paper does a good job of explaining what the PSE is and how it can be used.

A PSE... is an estimate of the revenue required to compensate producers if existing government programmes were eliminated. The measures take account of the usual budget outlays that finance such intervention, but also include policies that do not result in specific budget outlays such as tariffs, import quotas and permits, and variable levies. The results constitute an index of government intervention and provide a common basis for cross-country and cross-commodity comparisons. In effect, these measures allow one, theoretically, to appraise and compare proposed concessions in a multilateral forum like the GATT. This potential for comparability is a significant step toward finding a common ground for negotiations. ("Gov't Intervention...", USDA, p. v).

Use of the PSE in Fisheries

7. The U.S. fishing industry is interested in the concept of the PSE and wants to see it used to study the support received by the various fishing industries around the world. As a result, the National Marine Fisheries Service has begun to study the support provided to the U.S. fishing industry. The methodology used is conceptually the same as that used by USDA in their study of agriculture.

8. While the methodology is the same, there is not a direct duplication of the procedure. One reason is that the data availability is sometimes limited for some of the seafood products. In some cases, data is available for output of processed seafood products, while in other cases it is available for landings only.

9. In addition to variability in the data, there are a variety of fish products. For example, fish fillets can be cut from 15-20 different fish, and each species of fish has its own conversion factor from landed weight to processed weight. This product variation makes for a computational procedure which can be frustrating and tedious because of the numerous species-product combinations which exists.

10. The quantification of fisheries support can be done in either of two ways. The choice is determined by the nature of the programme and sometimes by the availability of data. One approach is to use the budgeted funds for such programmes as funded research projects, marketing programmes, and certain transfer payments. A second approach is to estimate the market price support which results from a programme. This approach is used in the case of tariffs and the effect that their protection has on prices. In other cases, the nature of a given programme is such that neither approach is suitable; in these cases an analytical approach is adopted which seems appropriate. Estimating the support due to the Capital Construction Fund is an example of an ad hoc analysis, and it is explained in detail later.

II. QUANTIFICATION OF SUPPORT IN FISHERIES

11. The estimates of government support for U.S. fisheries can be disaggregated by type of support. The first group is composed of the programmes that can be analysed by estimating the market price support. The second is that for which the use of budgeted funds is appropriate. In fisheries, U.S. tariff protection is in the market price support category and most other support programmes can be evaluated by means of the budget approach. In the sections that follow, each section explains the estimation procedure used to quantify that programme. We should note that the PSE for several U.S. support programmes has not yet been calculated. Nevertheless, this report quantifies the major programmes and provides a sample of methods applicable.

Tariffs

12. Tariffs are a form of support for a domestic industry. They enable the domestic product to be sold at a price above what would otherwise be charged. That is, relative to a world price, or an external reference price, the domestic product receives a higher price. The amount of the price premium is determined by the tariff itself. In fact, the premium (in dollars per unit, e.g., pounds) is probably the tariff expressed in the same terms, i.e., dollars per pound.

13. The Model. The theoretical model (explained in detail on pages 23-26 of the USDA publication, "Government Intervention in Agriculture, Measurement, Evaluation, and Implications for Trade Negotiations", April 1987) requires the estimation of a value that is defined by the external reference price, or world price, the size of the tariff, and the domestic industry supply curve. To apply such a model for fisheries products is particularly difficult because of the absence of international prices that could be used as an external reference price. In addition to that limitation, there are severe data limitations, and as a result, it would be difficult, if not impossible, to estimate an industry supply curve.

14. In view of the difficulty involved in rigidly applying the theoretical construct, a pragmatic modification was made in order to estimate the support derived from tariff protection. It is for this reason that the term "market price support" is used rather than "price wedge" which refers to a different methodology. Basically, the modification is the same as that used by USDA in their quantification work. The first modification is required by the fact that there is no external reference price which can be compared with a representative domestic price to determine the price difference caused by the tariff. To get around this obstacle, we assume that the duty collected represents support provided. From the total value of duty collected, the per pound support can be calculated by dividing the duty collected by the quantity (pounds) imported.

15. This approach works well for tariffs which are not prohibitively high. The prohibitively high tariff results in both zero imports and zero duty collected. Under these conditions, the estimation procedure fails to work. This does not mean that there is no support; in fact, the level of support could be quite high. Theoretically, it could be as high as the tariff, that is, it could raise the domestic price by the same percentage as the ad valorem tariff rate.

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16. For the sake of this support-estimating exercise, the maximum theoretical support is computed. To do this, tariffs in excess of 10 per cent were arbitrarily chosen for consideration. Tariff rates less than or equal to 10 per cent were assumed to be low enough that they would not be prohibitive. Twelve fishery products have tariffs that exceed 10 per cent. Of those twelve, only two -- both sardines -- had no imports; both of them have a 20 per cent tariff. In order to estimate the support these two tariffs provide, we made the following assumption and computations:

Assumption: The maximum possible support is realised from the tariff, i.e., support equals the tariff rate.

(Data for these and other calculations were obtained from National Marine Fisheries Service, U.S. Dept. of Commerce, NOAA sources. Some of these sources are published, e.g. Fisheries of the U.S., and some are not. The unpublished ones are available to the public by request. Although the National Marine Fisheries Service maintains some proprietary data, no classified, confidential, or proprietary sources were used for any of these calculations).

Calculations:

1. Determine domestic production volume of the same product as that with the prohibitive tariff. For example, in 1986 two sardine product categories with 20 per cent tariffs were not imported. The comparable domestic product had a wholesale volume of 510 734 standard cases (11 951 176 lbs) valued at \$21 256 000.
2. Estimate the unsupported value of the domestic product (assuming that the value of domestic production includes support equal to the tariff). Using the 1986 sardine example:

$$\begin{aligned} \text{Unsupported value} &= \frac{\$21\,256\,000}{1.2} \\ &= \$17\,713\,000 \end{aligned}$$

3. Convert product value to round weight equivalent value by using the appropriate conversion factor:

$$\$17\,713\,000 / 1.69 = \$10\,481\,065$$

4. Compute support at the tariff rate:

$$\$10\,481\,000 \times 20\% = \$2\,096\,200$$

Note: Another computational procedure could have been used instead of the one described. The other one requires using value and quantity to compute a price which in turn is used for subsequent calculations. The two procedures are theoretically the same, but the method used is preferred because of the reduced need for calculations and for rounding.

17. The second modification must be made because of the absence of an industry supply curve. Knowledge of the estimated curve would permit inclusion of the industry's supply response to the higher, tariff-supported domestic price. To avoid the estimation problems associated with the industry supply curve, we assume a constant level of output by the domestic industry. This assumption is reasonable because of the regulated nature of the fishing industry. Regulations start with biological considerations and include social and/or economic analysis as appropriate.

18. Fishery Tariffs. In the fishery products tariff schedule, most of the U.S. tariffs are imposed on processed products rather than on unprocessed fish which in many cases are used as a raw material for processing in a U.S. plant. Naturally the different processed products on which tariffs are collected have undergone different types of processing. To make a direct comparison of the industry support derived from these tariffs could be misleading. In order to facilitate both inter-product and inter-country comparisons, conversion calculations were made to express the tariffs as if they were imposed at the time of landing, i.e., in live weight equivalent. To effect these conversions requires using product to live-weight factors in order to convert weight of processed product to a live weight equivalent.

19. The exact procedures used for the conversions depend upon the data availability. Are data available for processed product or for landings, which are naturally recorded in live weight? If the data are available for processed product, the conversion to live weight equivalent is done with the appropriate factor. The appropriate duty collected must similarly be expressed in dollars per pound of live weight equivalent. This calculation requires multiplying volume of imported processed product in pounds by the product-to-live weight factor to get live weight equivalent in pounds. The total value of duty collected is then divided by the live weight equivalent of imports. The result is a duty rate expressed in dollars per pound of live weight equivalent of imported processed product. It can be thought of as a proxy for a tariff, or duty rate at the ex-vessel point. If we refer back to the theoretical model at this point, the duty rate proxy, calculated above is the same as the estimated price differential between the "world" market price and the domestic price. It represents to the per pound support that the domestic industry enjoys. To expand to the total domestic industry support requires multiplying the calculated rate by the live weight equivalent of the domestic industry's output of processed product.

20. These calculations can be expressed symbolically with the following equations:

$$(1) \quad Q_P^D \times F_{(P/LW)} = Q_{LWE}^D$$

$$(2) \quad Q_P^I \times F_{(P/LW)} = Q_{LWE}^I$$

where Q_P^D = quantity of domestic processed product (lbs)

$F_{(P/LW)}$ = factor for product to live weight conversion

Q_{LWE}^D = computed live weight equivalent of domestic processed product (lbs)

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Q_P^I = quantity of imported processed product (lbs)

Q_{LWE}^I = computed live weight equivalent of imported processed product (lbs)

$$(3) \quad D_C / Q_{LWE}^I = D_R^I$$

$$(4) \quad D_R^I \times Q_{LWE}^D = S^D$$

where D_C = total duty collected on imported processed product (\$)

D_R^I = duty rate (\$/lb of live weight equivalent of imported processed product)

S^D = support provided to domestic industry

If, on the other hand, the data for domestic production are available only for landings instead of for processed product, the above procedures for estimating support must be modified. Naturally no adjustment is necessary to express landings data in live weight equivalent terms. The landings must be reduced, however to reflect any diversion of fish into a product form other than the one receiving the tariff protection. For example, in the case of a tariff on a canned product, suppose that 25 per cent of the landings are sold in fresh and the balance are canned. The total landings figure would be reduced by 25 per cent in order to reflect the fact that the benefit of the tariff protection accrues only to the 75 per cent of landings that are eventually canned.

21. After making this single change, the calculations are made as described above. The equation (1) becomes (1a):

$$(1a) \quad Q_{LT}^D \times P_P = Q_{LP}^D$$

where Q_{LT}^D = total domestic landings

P_P = percentage of total domestic landings that go into tariff-protected product

Q_{LP}^D = quantity of domestic landings that go into the tariff-protected product

Equation (4a) is used in place of (4):

$$(4a) \quad D_R^I \times Q_{LP}^D = S^D$$

22. In actually making the computations, there was an incentive to work with aggregated data. The incentive came in the form of reducing the magnitude of the number of products and the computations that had to go with them. The potential for increased efficiency seemed real enough, but in fact proved to be unworkable because of the diversity of the conversion factors for different species in the same product. Of the fifteen different species of fish that were imported as fillets there were eight different product to live weight conversion factors. No factors were known to be sufficiently representative that they could be used to make the conversion from fillets to live weight equivalent for all fillets. As a result of the difficulty, say impossibility, of working with aggregate data, virtually all calculations were, by necessity, made with disaggregated data.

Sardines

23. If the computational procedures described above remain unclear, an example may serve to illustrate and hopefully clarify the steps. Canned sardines are suitable for illustrative purposes; they require all of the calculations associated with going from product weight data to live weight equivalent, but because of there being only a single species, aggregation is possible thereby avoiding lengthy, tedious calculations.

24. Beginning with the import and duty calculations, the U.S. imported fifteen tariff classifications of canned sardines which amounted to 59 143 433 pounds of product. The duty collected amounted to \$3 506 196. (In the U.S. the amount of duty collected is a statistic maintained by the U.S. Census Bureau. Having such a figure available is convenient, but if it is not available, the number can be calculated. If the tariff is an ad valorem rate, it is multiplied by the value of imports; if it is a per unit rate, it is multiplied by the quantity imported). The first step is to convert the pounds of imported canned product to live weight equivalent. The appropriate conversion factor is 1.69.

Imported Canned Product	Factor	Live Weight Equivalent
59 143 433 lbs	x 1.69	= 99 952 402 lbs

The duty collected on the canned products is then modified to express it in terms of dollars per pound of live weight equivalent.

Duty Collected	Live Weight Equivalent of Pounds Imported	Duty Rate
\$3 506 196	/ 99 952 402 lbs	= \$0.035079/lb

25. Once the duty rate per pound (live weight equivalent of pounds imported) has been calculated, the volume of domestic product (expressed in live weight equivalent of processed product) which benefits from tariff protection must be estimated. One approach to doing this is to assume that the tariff protection is broad and that all product forms benefits from the tariff. In the case of sardines, it would mean that the tariff protection for canned product would apply to non-canned products, e.g., bait and animal food, as well as the canned product. The other approach assumes that the canned and

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non-canned markets are separate. Because of the separation, the protection afforded by the tariff on canned imports does not affect the price for non-canned (non-protected) products. It is the latter approach that is used in this analysis.

26. The reason for this approach is that in most cases, the alternative to processed use is fresh fish. The best quality fish go to market fresh and command a premium price. Although the geographic markets for fresh fish are growing, it is usually the case that the fish is sold in a limited area. The market structure, therefore, is similar to the theoretical price discrimination model. There are two different and distinguishable market high quality fish sold fresh and the lower quality, higher volume fish destined for processing, i.e. canning, freezing, or some other prepared form. Second, because of the quality differences and the limits on the quantity of fish that can be sold fresh, there is virtually no opportunity for arbitrage.

27. The direct beneficiary of tariff protection on processed products is the processor. While the processor's benefits, in the form of higher product price, may be partially passed on to the price of fish, the issue involved is the extent to which this higher processed product market price might have the effect of raising the fresh fish market price. Such an effect seems unlikely because of the higher quality and price of fresh fish.

28. According to Fisheries of the U.S., 1986, the U.S. sardine industry canned 15.6 million pounds of canned product. The product to live weight conversion is effected with a 1.69 conversion factor.

$$\begin{aligned} 15.6 \text{ million pounds of product} \times 1.69 &= \\ 26.4 \text{ million pounds (live weight equivalent)} \end{aligned}$$

The 26.4 million pounds represent the live weight equivalent of U.S. packed sardines. This quantity must be further adjusted, however, because only approximately half of the canned sardines were landed in the United States. It is only that volume that will be considered receiving the benefit of tariff protection.

$$50\% \text{ of } 26.4 = 13.2 \text{ million pounds (live weight equivalent)}$$

29. Duty rate (per pound of live weight equivalent) multiplied by the live weight equivalent of U.S. caught and canned sardines yields the support enjoyed by the U.S. sardine industry.

$$13.2 \text{ million pounds} \times \$0.035079 = \$0.5 \text{ million}$$

30. This approach results in an estimated of support to the U.S. sardine industry of \$0.5 million when expressed in terms of live weight equivalent.

31. Tariff Support of Other Fisheries Products. The same basic approach was used to estimate the magnitude of support afforded by tariff protection of other products, and the calculations were similar to those described above. In particular:

- a) All support was expressed in terms of the live weight equivalent;
- b) Imported raw material was excluded;

- c) Non-protected U.S.-caught product was excluded; and
- d) Processed product/live weight equivalent relation- ships were applied to specific products and species rather than to aggregated data.

32. In spite of the similarities, each set of calculations was different. The difference was due to the variability in the way data were available and the different characters of the product grouping. Canned sardines can easily be treated as one homogeneous product, but there are more than sixteen species of fish that are used to make fillets. These sixteen species have seven different rates of conversion to fillets, and those conversion factors range from 2.78 to 5.00.

33. Calculations depended on the form in which data were expressed. If the data were in live weight terms rather than finished product terms it was obviously not necessary to compute live weight equivalents. Adjustments had to be made, however, to account for any diversion of raw material to product forms which were not protected by tariffs.

34. For the purpose of this paper, it does not seem to be useful to describe all of the procedural variations in detail. Suffice it to say that fishery products were disaggregated into the following categories and sub-categories:

- a) Fresh or frozen:
 - Finfish
 - Shellfish
- b) Canned:
 - Finfish
 - Shellfish
- c) Processed but not canned:
 - Fillets
 - Blocks
 - Cured
 - Roe
 - Other edible
 - Other shellfish.

III. CAPITAL CONSTRUCTION FUND

35. The Capital Construction Fund as it applies to fishing vessels enables fishermen to construct or reconstruct (and sometimes to acquire) fishing vessels with funds that have received preferential tax treatment. The preferential treatment of these funds comes in the form of Federal income tax deferral on fishing vessel income that is deposited in the Fund and that will be used for fishing vessel construction.

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36. Tax Deferral. Federal income taxes are deferred until the funds are withdrawn and used for vessel construction. The funds withdrawn are not taxed directly (as was the case with the popular IRA prior to 1987). Instead, the withdrawn amount is subtracted from the value of the vessel that is used for depreciation purposes. Thus, as the depreciable value is decreased, the tax shield provided by the annual depreciation is decreased. This means that taxable income is increased by the amount of the tax deferral granted at the time of the deposit.

37. The quantification procedure for estimating the annual benefits that accrue to fishermen involves a number of steps, but basically the present value of the tax deferral resulting from deposits is calculated. The taxes due as a result of the reduced depreciation are subtracted from the deferred taxes to yield a net tax saving. For the purpose of estimation, a constant tax rate was assumed. In view of the fact that this assumption means that tax liability is not avoided -- it is merely delayed -- one might reasonably ask, "How is any saving realised for the fisherman participating in the CCF"? The answer is that the value of the saving is due to the delay in paying the tax; the longer the delay, the greater the saving.

38. This intertemporal transfer can be an elusive concept to grasp, but it can be handled by reducing all transactions to a common point in time by means of discounting. Once converted to that common point, they can be compared directly.

39. To illustrate the CCF quantification methodology, an example is presented below. Table 1 shows a hypothetical schedule of deposits and withdrawals made for the purpose of constructing a new fishing vessel at a cost of \$100 000.

Table 1

HYPOTHETICAL SCHEDULE OF DEPOSITS AND WITHDRAWALS
BOAT CONSTRUCTION COST: \$100 000

<u>Year</u>	<u>Deposits</u>	<u>Withdrawals</u>
Present	\$20 000	0
1	5 000	\$20 000
2	20 000	5 000
3	3 000	4 000
4	1 000	4 000
5	1 000	5 000
6	0	5 000
7	0	7 000
TOTAL	\$50 000	\$50 000

40. The benefits that accrue to the vessel owner come in the form of tax relief. The first step is to estimate the present value of the tax deferred. This is done by estimating the tax and discounting the stream of taxes deferred to the present. A tax rate of 40 per cent is assumed for making this estimate. These calculations are shown in Table 2.

Table 2

CALCULATING THE PRESENT VALUE OF TAXES DEFERRED

Year	Deposit	Tax rate	Tax deferred	Discount factor ^{a)}	Present value of tax deferred
Present	\$20 000	40%	\$8 000	1.000	\$8 000
1	5 000	40%	2 000	0.917	1 834
2	20 000	40%	8 000	0.842	6 736
3	3 000	40%	1 200	0.772	926
4	1 000	40%	400	0.708	283
5	1 000	40%	400	0.650	260
TOTAL					\$18 039

- a) 9 per cent was chosen because it is the approximate long run average mortgage rate. The discount factor formula is:

$$\frac{1}{(1+i)^n}$$

where i is the interest rate and n is the period (year).

Tax Liability

41. The inevitability of paying taxes is not violated even in the CCF programme, and the present value of the estimated tax liability must be computed. This estimation of tax liability is not so straightforward as is estimating the deferred taxes. The reason for the difficulty is that the funds withdrawn from the fund are not immediately subject to taxation. Instead, when a withdrawal is made for the purpose of paying for the vessel, the amount of the withdrawal is deducted from the depreciable value of the vessel. By reducing the amount that can be depreciated (and similarly deducted from taxable income), the income subject to taxation is effectively increased. The amount of this increase can be estimated by comparing the two depreciation schedules -- one without adjustment due to CCF withdrawal and one with the adjustment. For the purpose of the analysis, a straight line depreciation over ten years was used. The normal, straight line schedule is adjusted to reflect the deductions from depreciable value that are the result of fund withdrawals. The two schedules are shown in Table 3 along with the additions to income each year.

42. The present value of the income taxes due on the additional income [Col. (3)] must be subtracted from the present value of the taxes deferred in order to reach a net benefit for the fishing vessel owner. Calculation of the additional tax due and discounting to the present are shown in Table 4.

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Table 3

COMPARISON OF DEPRECIATION SCHEDULES WITH AND WITHOUT
PARTICIPATION IN CAPITAL CONSTRUCTION FUND

Year	Normal depreciation schedule (1)	CCF depreciation schedule (2)	Additional taxable income due to decrease in depreciation (1)-(2) (3)
1	\$10 000	\$8 000	\$2 000
2	10 000	7 500	2 500
3	10 000	7 100	2 900
4	10 000	6 700	3 300
5	10 000	6 200	3 800
6	10 000	5 700	4 300
7	10 000	5 000	5 000
8	10 000	3 800	6 200
9	10 000	0	10 000
10	10 000	0	10 000

Table 4

CALCULATING THE PRESENT VALUE OF TAXES DUE

Year	Additional taxable income	Tax due 40%	Discount factor	Present value of tax due
Present	\$0	\$0	1.000	\$0
1	2 000	800	0.917	734
2	2 500	1 000	0.842	842
3	2 900	1 160	0.772	896
4	3 300	1 320	0.708	935
5	3 800	1 520	0.650	988
6	4 300	1 720	0.596	1 025
7	5 000	2 000	0.547	1 094
8	6 200	2 480	0.502	1 245
9	10 000	4 000	0.460	1 840
10	10 000	4 000	0.422	1 688
TOTAL				11 287

43. Once the present values of taxes deferred and taxes due have been calculated, the savings for the vessel owner can be estimated. This example results in a present value of taxes saved amounting to \$6 752.

Present value of taxes deferred	\$18 039
Present value of taxes due	11 287
Present value of taxes saved	6 752

44. The last step in the process of estimating the support (which is the same as "taxes saved") is to express the savings as a per cent of deposits. In the example, deposits must be expressed in present value terms in order to avoid the problems of intertemporal comparisons.

45. The present value of deposits is \$45 099.

$$\frac{\text{PV savings}}{\text{PV deposits}} = \frac{\$ 6 752}{\$45 099} = 15\%$$

The support provided the industry amounted to approximately 15 per cent of the amount deposited. (The sample of CCF accounts for which this same analysis was done showed that support was 14.74 per cent). If the figure of 14.74 per cent is used to estimate total support based on annual contributions of approximately \$55 million, the total estimated support is \$8.107 million.

46. Sensitivity to changes in assumption. Two important assumptions made for this analysis deserve further attention. First is the tax rate selected. The 40 per cent rate was selected because it is representative of the marginal rates that were paid by the sample accounts. Some of the vessel owners made deposits in their CCF accounts under the old tax law (pre-1987) and are making (or will make) withdrawals under the new tax law. To incorporate the tax law change into the analysis would distort the result because the estimate of support would be exaggerated. For this reason, a constant tax rate was used for both deposits and withdrawals.

47. An argument could be made for using the lower rates in the new tax law. To determine the effect of a lower marginal tax rate, the calculation were made using a 30 per cent rate. Not surprisingly, it resulted in a smaller estimated support. The support expressed as a percent of annual contributions (deposits) was 11 per cent rather than 15 per cent with the assumption of 40 per cent tax rate.

48. Another assumption that has an impact on the level of support is the selection of a discount rate. In general, a higher discount rate will reduce future values relative to present values. This particular analysis however involves the comparison of two discounted payment streams thus making it more difficult to predict the effect of a change in the discount rate. The calculations were made using a 6 per cent rate, and the effect was to reduce the estimated support to 11 per cent of deposits. A 12 per cent rate raises support to 18 per cent.

49. The support provided the fishing industry by the Federal government's programme of deferring taxes by means of participation in the Capital Construction Fund amounts to approximately \$8.1 million annually. The analytical technique used was to discount the stream of benefits realised through the tax deferral and compare that with the stream of payments when the taxes come due.

50. Sensitivity of the estimated support to changes in assumptions is not great.

51. The analytical technique is workable in practice as well as in theory. The major estimation problem is assembling the detailed data from records that were never designed to support this type of analysis.

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IV. OTHER SUPPORT PROGRAMMES

52. Saltonstall-Kennedy Grants. The Saltonstall-Kennedy Act of 1954 as amended by the American Fisheries Promotion Act of 1980 has the objective funding research and development projects directed to solving problems associated with harvesting, processing, marketing, recreational and related infrastructures. Project funding is effected by means of grants to universities, state and local governments, Regional Fishery Development Foundations, and industry associations. The Saltonstall-Kennedy Grant Programme is a cooperative government-industry cost sharing programme in which the government must provide at least 50 per cent, but no more than 80 per cent of the cost share. Based on a review of funded projects, in 1986, \$6.5 million were approved for projects which show the potential for benefiting commercial fisheries.

53. The National Seafood Promotional Council. This council conducts generic promotion of U.S. seafood products. The Fish and Seafood Promotion Act of 1986 created the Council and directed that the Council develop annual plans and a budget to pay for executing these plans. Among the specific activities to be covered by the plans are generic marketing and promotion including consumer education and research.

54. Funding for the Council will primarily be from Saltonstall-Kennedy Funds. In 1988, the Council has a budget of \$2.6 million, 60 per cent of which is Saltonstall-Kennedy projects already taken into account. Thus, 40 per cent of \$2.6 represents to non-S-K funding.

40 per cent of \$2.625 million	=	\$1.050 million
Less: Administration costs		<u>0.350 million</u>
Net amount of support for promotional activities	=	\$0.700 million

55. National Sea Grant Programme. These grants provide technical support and educational services which link universities with Sea Grant Programmes and marine resource user groups. The National Sea Grant College and Programme Act authorises support programmes at Sea Grant Colleges and other institutions. The programmes are supported by means of grants and contracts; their purpose is to support research, education, and advisory services in fields related to the development of marine resources.

56. Because the programmes support such a broad range of research projects, it is inappropriate to consider that all of the funds support commercial fisheries. The approved projects for 1986 were reviewed individually and only those projects which appeared to have direct application to commercial fisheries were included. Some of the criteria used were:

- a) Projects with a management orientation were excluded;
- b) Projects involved in basic, scientific research were excluded;
- c) Projects with direct benefit for commercial fisheries were included.

Applying these criteria to the 1986 funded projects resulted in including projects with a Federally funded value of \$8.8 million. The funding of these projects amounts to approximately 25 per cent of the value of all Federally funded Sea Grant projects.

57. Sea Grant Matching Funds from States. The various states with Sea Grant universities support Sea Grant research in addition to Federal Government support. The same projects that were included for purposes of estimating Federal support were included for estimating state support. In 1986, the state funding for Sea Grant research supporting commercial fisheries amounted to \$6.3 million.

58. Development and Utilisation Laboratories. The National Marine Fisheries Service operates laboratories whose mandate is to do research directed at development and utilisation problems. All of the research is related to commercial fisheries. In 1986, funding to these laboratories amounted to \$5.6 million.

59. Fisheries Vessel and Gear Damage Compensation Fund. Under this programme, owners of U.S. fishing vessels receive compensation for damage for gear or to the vessel. The damage must have been incurred by another vessel or gear and must have occurred in U.S. waters. In 1986, U.S. vessel owners received \$1.2 million from this programme.

60. Fishermen's Contingency Fund. This fund compensates domestic fishermen for gear losses due to underwater obstructions. The type obstructions which qualify are those related to oil or gas exploration, development, or production on the outer continental shelf. It is a direct grant programme and in 1986 made compensatory payments amounting to \$750 000.

61. Fishermen's Obligation Guarantee Programme. NOAA's loan guarantee programme enables fishermen to buy vessels with funds borrowed at better than market rates. These preferential rates can come in one or more of several forms, e.g., low interest rate, longer time to repay the loan, or even loans that might not be made by commercial lenders. As is the case with U.S. Department of Agriculture loans, estimating the values of the fishermen's benefits is complex. The estimates have not been completed but work is continuing to complete them.

62. Fuel Tax Exemption. Gasoline and kerosene are taxed for the purpose of building and maintaining roads. It is a form of user fee; those using the roads help pay for their construction and maintenance. Fuel purchased for some off-road uses, e.g. boats and farm vehicles, are exempt from paying the tax and in that way receive a form of government support equal to the taxes that are exempt from collection. Estimating the exempt tax is difficult and has not yet been completed. It will be included at a later date.

63. USDA Loan Programmes. The U.S. Department of Agriculture administers several loan programmes under which some fisheries interests, or activities, qualify for benefits. The benefits accrue to the loan recipients in the form of reduced interest payments. Estimating the value of these benefits is difficult for several reasons. First, preferential loan rates are difficult to quantify because of the long periods of time over which repayment schedules take place. To attempt to make an estimate of this kind requires that so many assumptions be made about these schedules that the exercise tends to become an

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academic one. Second, the fisheries loans are not handled in a way that facilitates making estimates of their magnitude. As a result, only very rough estimates can be made. At the present time, these estimates have not been made, but work is continuing to complete them.

64. The three Department of Agriculture programmes which are administered by the Farmer's Home Administration are:

- Disaster Emergency Loan Programme;
- Real Estate Loan Programme;
- Production Operating Loan Programme.

Table 5

U.S. FISHERIES SUPPORT PROGRAMMES
PRODUCER SUBSIDY EQUIVALENTS (PSE)
1985-1987 AVERAGE

Programme	Annual Support (\$ million)
Direct payments	0
Market price supports	
Tariffs	70.4
Fresh/frozen	
Processed, not canned	
Canned	
Input support	
Farmers home administration	
Production operating loans	n.a.
Real estate loans	n.a.
Fishermen's obligation guarantee programme	n.a.
Capital construction fund	7.4
Other programmes	
Research	
Saltonstall-Kennedy grants ^{a)}	6.5
NMFS development and utilisation laboratories	5.6
National sea grant	8.8
Marketing	
National seafood promotional councils	2.3
Transfer payments for vessel/gear loss	
Vessel and gear damage	1.2
Fishermen's contingency fund	0.8

a) S-K includes the Regional Fisheries Development Foundations.

V. SUMMARY

65. The United States government has a number of programmes which support the fishing industry. This paper describes the techniques used to estimate the level of government support to these programmes. Only the loan and loan guarantee programmes have not been estimated.

66. In the partial analysis prepared for this paper, tariffs constitute the major share of U.S. support. Support in the form of research related to production or to fish harvesting is the next largest single category.

67. No specific comparisons can be made with other countries support of their fishing industries because this analysis is not complete and because no other studies have been made public. The United States Department of Agriculture has made some estimates of agricultural support in the U.S. and in other countries. Depending upon the commodity and the country, some of their estimates exceed 50 per cent.

68. In the analysis made to date, U.S. government support to the fishing industry appears to be small. It will be very interesting to learn more about the level of support that other countries are providing.

69. The estimates of support in this paper are the results of initial analysis. They can and no doubt will be improved with review and revision of procedures and with the availability of better data.