ECONOMIC ASSISTANCE MEASURES

Introduction

There has been an increasing interest in quantifying economic assistance and a number of methods have been developed for quantification. Given the experience and knowledge acquired in the field of agriculture in the Directorate for Food, Agriculture and Fisheries[1], as well as the comprehensiveness of the method, it was considered natural to use PSEs as one possible starting point for a quantification exercise in fisheries. The following breakdown of the measures to be quantified are thus directly taken from the PSE analysis.

Document [FI/305] "Various Methods for Measuring and Analysing Economic Assistance", listed four groups of measures, i.e.: i) Market price support; V"Y ii) Direct income support; iii) Indirect income support; and iv) Other support. Market Price Support covers those measures that raise the market price received by producers for their output; this support is implemented through the market and thus at the same time raises prices paid by consumers. Direct Income Support covers those measures that raise the effective return received by producers; this support is implemented through the budget and does not raise the price paid by consumers. Indirect Income Support covers those measures that reduce the costs paid by producers, mainly for their inputs used in current production; this support is implemented directly or implicitly through the budget and has no direct effect on market prices. Other Support covers the measures that generally have an impact in the longer-term by reducing costs to the sector as a whole. This support is implemented directly or indirectly through the budget, is of general benefit to the sector as a whole and has no direct effect on producer or consumer prices. In those instances in which any of the above groups of policies involve producer levies or taxes', this is included as a negative subsidy. It will be noted that the direct and indirect income support and also most measures under other support will have a budget-line in the State or local budget. However, this will not necessarily be the case for market price support where all sorts of regulations of the market will influence the market prices.

The purpose of the present note is twofold; to address quantification possibility of the two main areas of economic assistance, i.e. those coming from market price support and those which are direct budget payments, and for the former evaluate the use of the price wedge (as used in the Agriculture PSE work) and the duty collected technique, as submitted by the United States and Canadian authorities.

The document will first address the use of the price wedge and the duty collected in quantifying the market price support. The key problem associated with the price wedge is the choice of an appropriate domestic producer price and an appropriate reference price, and the interpretation of the size of the price wedge, i.e. which policies are captured and their contribution to the price wedge. As for the duty collected, the main weakness is that only one measure is quantified -- only tariffs -- and especially so in an environment such as fisheries where tariffs have shown to be low and limited to a few countries.

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[1] "Agricultural Policies, Markets and Trade, Monitoring and Outlook 1989", OECD, Paris, in particular Part IV and Annex II.

Secondly, the document will address the measurement of budget payments, i.e. those payments which are being directly paid to the sector and which do not directly influence the market price. While there are problems associated with the measurement, the important challenge lies in understanding the effect on the industry of the different kinds of budget payments.

Market price support

Price wedge

The basic idea behind the price wedge is to establish a domestic producer price and compare this with a reference price where the latter, as far as possible, should not be distorted by the policies being considered. The price wedge will then show the amount by which the domestic producer price is higher due to policies which are in place. These policies could include various types of border measures (such as tariffs and quotas), price setting mechanisms, marketing structures and arrangements and management.

Annex IV makes a first attempt to identify domestic producer prices for the main producers of cod and attempts to identify a reference price which can be used to establish the price wedge. This preliminary work has shown that there are some practical problems associated with the establishment of a reference price as well as a domestic price. In the meantime, an explanation of the price differences between the cod landed in' the countries shown would be interesting. For example, why does cod, landed in the United States, command a price three times higher than cod landed in Canada?

In this regard, the following list of issues relates to the interpretation of the price wedge and needs subsequently to be discussed:

Do the price differences between the landing prices (and hence price wedge) contain elements of:

- tariffs;
- quantitative restrictions; price regulation;
- price regulation;
- management;
- organisation of markets;
- market structure;
- landing restriction on domestic or foreign fleet;
- different products (quality differences, consumer

Previous work by the Committee for Fisheries, in particular "Trade and Access to Resources" (OECD, 1989), has addressed some of the above areas. A summary of these areas can be found in Annex II.

From this list, which does not pretend to be all-inclusive, two areas need to be explained, i.e. the management and the organisation and structure of markets.

Basically. the effect of management is to limit the take off of the resource with a view to obtaining a long-term sustainable yield; by doing this, the quantities being-landed are limited and less than, at least in the short-term, what would be- the case in a free-for-all situation. This is explained in the paper presented by the Australian authorities.

On the curve above, a fishing effort of D represents the open access situation; at this point, fishermen will receive normal profits. While restricting effort to point K, we reach a point where there is a maximum between total costs and total revenue; at this point (MEY) the society or fishermen maximise the profit, called "rent" in fisheries terminology. As to who will actually benefit from the "rent" depends on how the management works as well as the Organisation of the market.

The introduction of or changes in management measures will alter the supply and hence the price. The price facing domestic producers is a function of demand and the supply which is determined by the restrictions which the management authority has imposed. Thus the producer price observed on the domestic market "contains" elements of management. The price which does not have management in it, is the price which reigns under a free-for-all situation but as mentioned in another document [See paper submitted by the United States] such a free-for-all situation will lead to "open-access market failure" and an overexploited resource.

The Committee's discussion on quantification should address the question of measurement of the "rent" and its distribution as influenced by the management regime and market structure. A priori, it is difficult to see how these rents can be isolated from the price gaps (cf. Annex III to this document).

It is important recognise that the market structure (monopoly, monopsony, oligopoly) and institutional Organisation (auction, contract sale, forward integration) have an impact on who benefits from the policy measures. The distribution of the rent or who benefits from the regulation of the fishery is also, to a large extent, determined by market structure and Organisation. Price setting mechanisms vary considerably among Member countries and even from species to species within the same country. It is important to analyse these various mechanisms since the assistance afforded by a given measure -- be it market price support or direct budget payment -- will be pushed up or down in the distribution chain and may be captured at a level different from the level which was originally targeted to receive assistance.

The above illustrates that the price wedge would not only capture the difference between an assisted domestic price and a reference price but that each set of prices contains elements generated by the fishery management system. The situation with regard to the system of selling, the distribution chain and the different management regimes have an effect and would have to be taken into account in the interpretation of the price wedge, in particular as regards the allocation of benefits. Also, the interaction between management, trade flows and border measures such as tariffs and import quotas is not fully understood.

As such, the Committee for Fisheries would, if it decided to quantify economic assistance with the price wedge, be confronted with two main issues. First, to find an appropriate reference price, an absolute necessity for -calculating a price wedge. In the ensuing stage of the analysis, i.e. for the interpretation of the price wedge, the main issue will be the disaggregation of the price wedge with a view to identifying and interpreting the different policies which work simultaneously in the fishing sector.

Duty collected

At its 64th Session in September 1989, the Committee for Fisheries was presented with a method called the duty collected method. While the method has the advantage of being easily understood and practicable, the main disadvantage is that the method only considers tariff barriers, the importance of which is diminishing. A GATT study, "Problems of Trade in Fishery Products" ' indicates that on a weighted average basis, those countries have reduced the rate of tariff applied to MFNs since the conclusion of the Tokyo Round from 6.5 per cent to 4.1 per cent, i.e. by 37 per cent. The rate of reduction was only slightly greater for unprocessed products than for processed products as is indicated below.

Table 1. Pre- and post-Tokyo round MFN tariff averages[1] of developed countries[2]

Products	Pre-Tokyo Round	Post-Tokyo Round	% Reduction
Fishery products	6.3	4.1	37
Unprocessed	6.3	4.0	37
Processed	9.2	6.3	31

1. Average of all tariff items (i.e. duty-free as well as dutiable items) weighted by total 1977 imports.
2. Austria, Canada, EEC, Japan, Finland, Norway, Sweden, Switzerland and the United States.

The duty collected method assumes that the tariff (the value of it to the public boxes) on the processed product or unprocessed raw material provides protection to the amount of the domestically-caught fish which undergoes similar processing to that of the imported product. It does not take into account that qualities of domestically-caught fish do not correspond to what is needed to process the imported product; this will, for example, be the case for fat content in herring products. In other words, imported products are treated in the model on the same footing as domestically-produced products, and, furthermore, as if they can be produced domestically.

The above remarks pose a particular problem when the tariff protected product is not produced domestically while the tariff is in position for protecting substitute products which are produced domestically. Canned products of certain types of fish and preparations (e.g. tuna, mackerel, salmon) are consumed in the same way (sandwiches, salads) and, as such, will be considered as substitutes by the consumer.

Other issues to be analysed further by the Committee before the method is operational is the definition of "domestic production", i.e. what should be included (foreign landings, domestic landings abroad) as both these factors will change the level of protection. As an example, one could consider the Danish herring market; in 1987 Danish domestic landings of 66 000 tons were complemented by direct foreign landings of 44 000 tons and imports overland of around 22 000 tons, thus the total supply to the processing industry of fresh, chilled, whole herring totalled 132 000 tons. Most of these quantities would subsequently have been exported to other EEC markets, mainly in the form of processed products. The following tariff rates apply to fresh herring intended for further processing:

Fresh, chilled or frozen whole:

25/2 to 15/6	free
rest of year	15

Sweden has a preferential agreement for 20 000 tons at zero per cent and for the latter part of the year there is an EEC tariff quota of 34 000 tons bound in GATT at zero per cent.

What is important is that more than 50 per cent of Danish supplies to the processing industry is of foreign origin, most of which enters duty free but which is processed into-product forms which carry duties. The highest of these duties is for prepared and preserved herring products with a maximum of 20 per cent; these products are imported to a limited extent.

Yet another issue which has not received attention is, from whom the market protects itself by the use of tariffs. This is similar to the question of the existence of the international traded price to be used in the price wedge calculation. The herring products mentioned above can only be produced in limited quantities outside Denmark/EEC and even then only in a few countries. This is partly because fish distribution throughout the world is far from equal (in the case of herring, only Canada, Iceland, Norway and Sweden outside the EEC enjoy herring catch possibilities), partly due to taste/tradition differences and partly technological (economies of scale as 0 well as innovation). Another product and species which will give rise to similar interpretative problems is Alaska pollack and surimi, now almost exclusively caught and processed by the United States and Japan.

Finally, with the aim of obtaining an overview of the practical problems involved in the calculation of the duty collected, Annex IV presents a table on the existence of required data for quantification using duty collected. This table indicates that only a few OECD Member countries have the data required for a duty collected calculation readily available.

Budget payments

The following will briefly consider direct and indirect income support as well as other support; these forms of economic assistance measures could be considered as budget payments from the public. In previous surveys made by the Committee for Fisheries on subsidies, the scope of the analysis was confined to the area of budget payments so that information is readily available. It should, however, be recalled that the Committee for Fisheries at its 64th Session did not arrive at a common understanding of the definition of economic assistance.

The paper “Inventory of Assistance Instruments in the Fishing Industry and Managemnet Measures" contains a catalogue of programmes or measures which are currently in place in Member countries. It lists the budget payments mainly from State budgets which are involved in running the programmes.

Table 2 gives accounts for direct support or budget payments for each Member country, as far as it has been possible to do so based on data submitted. Annex I to this document provides a listing for each country of the different measures which have been taken into account.

Table 2. Budget payments in OECD Member countries, 1987, unless otherwise stated in Annex I

Val. : US$ million, 1987 exchange rates, 1 ECU = 1 US$

	EEC	Belgium	Denmark	France	Germany	Greece	Ireland	Italy	N'lands	Portugal	Spain	U.K.
Landings												
'000 tons	5537	36	1637	770	162	139	225	405		385	1043	736
million $	6964	94	497	1298	128	480	104	1487		355	1813	707
Vessels												
Number	81107	201	3219	9427	919	20375	1596	19735			17464	8171
GRT	1685528	23385	132000	194065	51705	na		273977		208488	649457	152451
Fishermen	296110	1263	9000	29875	3091	39000		55090		43111	94246	21434
Exports million $	4728	168	848	608	412	78	186	165	952	156	477	680
Imports million $	9418	526	395	1711	1249	119	62	1723	509	432	1306	1387
National aid million $	147.20	2.79	2.72	30.50	18.20	8.05		3.29		16.15	33.30	32.20
Harvesting	96.57	1.38	2.41	29.90	15.50	8.05		3.29		13.84	22.20	
Processing	17.46	1.41	0.44	0.60	2.70	0.00		0.00		2.31	10.00	
EEC aid ECU	119.39	0.94	2.15	14.76	6.23	7.92	4.60	20.13	1.07	15.99	36.02	9.58
Harvesting	94.09	0.41	1.21	12.42	4.41	6.37	1.84	16.12	0.66	11.22	32.20	7.23
Processing	25.30	0.53	0.94	2.34	1.82	1.55	2.76	4.01	0.41	4.77	3.82	2.35
Total aid million $	266.59	3.73	4.87	45.26	24.43	15.97	4.60	23.42	1.07	32.14	69.32	41.78
Harvesting	190.66	1.79	3.62	42.32	19.91	14.42	1.84	19.41	0.66	25.06	54.40	7.23
Processing	42.76	1.94	1.38	2.94	4.52	1.55	2.76	4.01	0.41	7.08	13.82	2.35
Direct aid relative to landings	3.83	2.97	0.55	2.35	14.20	1.68	0.00	0.22		4.55	1.84	4.55
Same with EEC aid	3.83	3.98	0.98	3.49	19.06	3.33	4.41	1.57		9.05	3.82	5.91

Table 2. Budget payments in OECD Member countries, 1987, unless otherwise stated in Annex I (cont'd)

Val. : US$ million, 1987 exchange rates, 1 ECU = 1 US$

	Australia	Canada	Finland	Iceland	Japan	N'lands	Norway	Sweden	Turkey	USA
Landings										
'000 tons	198	1563	89	1632	12739	152	1868	182	384	4983
Million $	475	1239	33	644	18793		831	112	470	3600
Vessels										
Number	9090	36267	559	902	434509	2600	22671	532	8404	93400
GRT			na	116637	1829755	na	343979	32226	98095	
Fishermen	21000	85049	2100	5917	422550	na	29913	4478	46300	256000
Exports million $	433	2091	8	1070	1276	399	1485	122	37	1660
Imports million $	303	526	161	0	8566	29	112	408	8	8820
Total aid million $	0.56	68.50	7.30	0.00	2043.00	5.30	92.50	14.32		7.40
Harvesting			5.47				81.00	14.32		7.40
Processing	0.56		1.83				18.00	0.00		
Price support			4.04				5.22	13.09		
Total aid net of price support	0.56	68.50	3.26	0.00	2043.00	5.30	87.28	1.23	0.00	7.40
Direct payments relative to landings	0.12	5.53	9.91	0.00	10.87		10.50	1.10	0.00	0.21

Source: Review of Fisheries and published matem several journals, etc.

It will be noted that the figures for support do not include value of tax provisions nor value of low interest loans, etc. It is recalled that local and regional subsidies in almost all cases have not been taken into account (with the exception of Germany and Canada). National support in EEC Member States excludes the part coming from EAGGF. The Community finance is given in its own entry (see note on the EEC in Annex I.

The difference in coverage from country to country stems from different reporting in response to the questionnaire. The following examples illustrate this problem. Canada and Germany have included local and regional subsidies in their answers to the questionnaire; other countries appear not to have included such payments. If support paid by regional authorities is excluded, the figure for Canada would be 3.6 per cent (and not 5.5 per cent) and that of national aid for Germany 12.7 per cent (and not 14.2 per cent). An essential part of the Japanese support is provided for certain infrastructure purposes (fishing ports and fishing grounds). Other Member countries have excluded this kind of support in their submissions. If this part of the support is excluded, the figure for Japan would decrease to 3.9 per cent of the value of landings instead of 10.9 per cent when included.

These examples point to the importance of the Committee coming to an agreement on a coverage of economic assistance measures.

With due respect to the remarks made above, a number of interesting observations could be made in analysing the data available. One is that the budget outlays associated with market price support (which has been deducted to be consistent with the PSE model) in 1987, in-the EEC, amounted to ECU 17.4 million corresponding to 0.25 per cent of the landed value, while the same figure for Norway yields 0.6 per cent, for Finland 12.2 per cent and for Sweden 11.7 per cent.

With regard to the effect of the measures on the industry itself -- on trade, etc. -- this will depend on a number of factors, including:

- The industry structure: if there is vertical integration between processing and harvesting, economic assistance to the harvesting sector may be spilled over to the processing company, while this may not be the case for individual owner operated vessels.

- The management regime: the different ways of managing resources (e.g., either by effort or catch limits) may give rise to different responses to economic assistance by the fleet.

- The programme coverage: some types of programmes that have not been sufficiently covered by the questionnaire, including, inter alia, social welfare measures to the processing sector of the industry.

Also it should be underlined that the figure for the direct budget payment in relation to landings needs to be interpreted carefully. The figure expresses the financial assistance given to a particular fishery, the structure of which is quite different from country to country. For example, while the value of the Australian fishery ($475 million) is around the same as the Danish fishery ($497 million), the tonnage caught (and the effort employed to catch this tonnage) is more than eight times greater in Denmark (1 637 000 tons) than in Australia (198 000 tons). Reasons behind the different structure are that the same fish do not inhabit all the oceans of the world, that consumers have different preferences for different fish species and that the relative scarcity of fish species is different. In Australia the very high unit-value of landings is caused by one predominant species in this fishery, i.-.e. rock lobster, while the low unit value of Danish landings follows from the very large fishery of species destined for fish meal and oil. Different

possibilities for expressing the measure are possible, e.g. in relation to value of landings, per fisherman, per GRT employed as effort, etc. and underlines that one should be cautious in interpreting the results.

The above preliminary work shows that there exists a possibility for quantifying assistance arising from budget payments. However, there is further work to be undertaken in a number of areas, with a view to attaining a higher level of transparency.

Preliminary and tentative conclusions

This paper has dealt with the quantification of budget payments and market price support, these two areas of assistance differing considerably in the way they can be addressed. The paper has emphasised issues which are to be further discussed by the Committee with a view;, to approaching a valid and consistent economic model for the quantification of economic assistance in fisheries. The following presents some preliminary and tentative conclusions.

Market price support

Two main issues have been identified with the use of the price wedge, one relates to data availability (see Annex IV) and the proper definition of a reference price, and the second the decomposition and interpretation of the price wedge into the effects of the various measures applied in the fisheries sector.

The duty collected method only captures the value of tariffs and as such is of limited use insofar as tariffs are mostly of minor importance in the fisheries environment. Furthermore, the data required for such a calculation is available in only a few countries.

The Secretariat therefore proposes that the Committee further develops the commodity case study presented in Annex IV with the use--of the price wedge. Besides the inclusion and analysis of more refined data, the study could be enlarged to include countries which are main producers or consumers of cod. On the basis of such a study of the market price support element for cod, to be presented at the 66th Session of the Committee for Fisheries (September 1990), further transparency would be attained on the various policies which are applied on this market.

Budget payments

While acknowledging that far more work needs to be undertaken on budget payments with a view to making them more internationally comparable, the note has presented a preliminary effort of standardisation. The work of the Committee on these economic assistance measures could concentrate on two main avenues, i.e.:

i) To identify which measures should be included, in particular:

- payments for infrastructure;
- payments related to disasters;
- payments from local authorities;

- payments for social purposes (e.g. unemployment relief);

- payments for access to resources.

It should be reiterated that this, also in the context of budget payments and their effects on the industry, and between industries from country to country, is dependent on the specific industry structure.

ii) To improve the comparability of these budget payments:

The document has proposed setting budget payments in relation to landed value. However, as shown, the landed value may cover very different industry structures. Other ways of presenting these figures could be explored.

NOTES AND REFERENCES

"Agricultural Policies, Markets and Trade, Monitoring and Outlook 1989, OECD, Paris, in particular Part IV and Annex II.

ANNEX I: SUMMARY OF DIRECT ASSISTANCE IN OECD MEMBER COUNTRIES

Australia

Financial assistance is available through taxation concessions, the Export Market Development Grants Scheme (1986/87: A$627 000) and via government funding of the Fishing Industry Research and Development Trust Fund (FIRDTF) on a matching dollar for dollar basis, and the Fisheries Development Trust Account (FDTA) (1988/89: A$300 000). Research is primarily undertaken by the Commonwealth Scientific and Industrial Research Organisation and the Australian Bureau of Agricultural and Resource Economics.

The fishing industry is exempt from the full Federal excise duty on distillate used for the purpose of primary production. In January 1989, the excise was 21.5 cents per litre.

Assistance is also available to those involved in establishing or extending export markets for fish products. The Innovative Agricultural Marketing Programme provides funds to stimulate innovation in the marketing of agricultural products with emphasis on export marketing and associated production, processing and development activities for agricultural products. To date (1988), twelve fisheries-related projects have received support under this programme since its inception in 1986, involving a total of A$ l 083 561 (1986/87: A$ 128 000 and 1987/88: A$ 656 660).

On top of this, but co-financed by the fishing industry itself is the Natural Fisheries Adjustment Programme, with a A$6 million Commonwealth funded purse from which particular parts of the fishing industry, i.e. those with excess capacity, can receive loans.

Finally, the industry receives indirect aid in the form of management of the industry, collection, analysis, research and dissemination of i information on.

The available information, and excluding the value of loans, tax concessions and exemption from full excise duty, suggests a total direct aid in the order of $560 000 in 1986/87, mainly granted to export marketing activities.

Basic statistics, 1987

Landings in-national ports	197 500 tons
Value	A$678.9 million ($475.4 million)
Number of vessels	9 090 with licence
Number of vessels	na
Number of fishermen	21 000
Exports	A$617.9 million ($432.6 million)
Imports	A$433.3 million ($303.4 million)

For both domestic landings and exports, prawns, rock lobster and abalone provide the lion's share; of landings these three species account for two-thirds of the value; for exports the three species account for 84 per cent of the value.

Belgium

As a member of the EEC, financial assistance has to comply with Community rules. Total financial aid amounted to BF 104.6 million[2] ($2.8 million) in 1987, of which BF 52.0 million, or 50 per cent went to the harvesting sector and the remaining BF 52.5 million went for processing, marketing and distribution. A large part of the assistance to the harvesting sector has been used for decommissioning and restructuring the fleet, the aim being to maintain the fleet at the 1982 level (about 200), i.e. small-owner-operated units, to develop a coastal fishery fleet of multi-purpose vessels.

Basic statistics, 1987

Landings	35 900 tons
Value	BF 3 503 million ($93.8 million)
Number of vessels	201 with 23 385 GRT
Number of fishermen	1 263
Exports	BF 6 300 million ($168.7 million)
Imports	BF 19 660 million ($526.6 million)

Belgian landings mainly take place at auction in Zeebrugge and Ostend and are concentrated on a few species of high value (sole, plaice and cod) accounting for two-thirds of the landed value.

The BF 52.5 million assistance to the secondary sector went primarily for modernisation purposes and investments in distribution, while around BF 4.5 million was for marketing support.

There has been a reorientation of aid o over the last few years with increasing emphasis on modernisation of the secondary sectors.

In addition to national aid, the Community granted ECU 940 000 in 1987, of which ECU 410 000 for the harvesting sector and ECU 530 000 for the processing sector.

Canada

Total direct financial assistance to the fishing industry amounted to C$ 90.8 million ($68.5 million) in 1987.

The principal instrument in assisting the fishing industry is the federal-provincial Economic Regional Development Agreements (ERDA). In 1987 the total amount of money involved in the three subsidiary agreements (with Nova Scotia, New Brunswick and Prince Edward Islands) amounted to C$ 83.5 million of which C$ 52.5 million is financed from federal sources. As from 1989, the ERDAs have been extended to cover Quebec with an initial total financial package of C$ 35 million, half to be

[2] This amount does not include the EEC share of assistance nor amounts paid by the EEC for withdrawals, etc. in application of the marketing regime.

covered by the federal budget. Although the specific programme varies with each of the subsidiary agreements it covers areas such as market development, infrastructures, harvesting And quality enhancement for the harvesting and processing sectors. The main objective of the programme is the limitation of excess processing capacity.

Basic statistics, 1987

Landings	1 563 100 tons
Value	C$ 1 643 million ($1 239 million)
Number of vessels	36 267 (1986)
Number of fishermen	85 049 (1986)
Exports	C$ 2 773 million ($2 091 million)
Imports	C$ 697 million ($525.6 million)

From the available information it is not known how much each sector receives.

The Fishing Vessels Insurance Plan (FVIP) provides insurance to the fleet on a cost recovery basis. However, the DFO incurred administrative expenses of C$ 2.4 million. Furthermore, commercial fishermen obtain gasoline excise tax refund. A specific programme to Newfoundland is the Newfoundland Bait Service run by the federal government. Net expenses of this scheme were C$ 1.4 million in 1987/88.

In addition C$ 3.5 million was provided through the Atlantic Fisheries Technology Programme via initiatives aimed at upgrading handling, storage, off-loading, improving productivity and efficiency, etc.

Both the harvesting sector (for vessels) and the processing sector may apply special depreciation provisions of their investments against income. In the case of fishermen, they may depreciate their vessels/conversion costs in a straight line with a maximum of 33 1/3 per cent a year. In the processing sector, the depreciation rate differs in accordance with the regime, the maximum being 45 per cent (1989) in Cape Breton.

There is no price support, however the Fisheries' Prices Support Board bought C$ 2.1 million worth of canned mackerel for the Canadian International Development Agency.

Denmark

As a Member of the EEC, financial assistance has to comply with Community rules. In 1987, a total of DKr 18.6 million ($2.72 million) was allocated as national aid, of which DKr 15.6 million to the harvesting sector and DKr 3 million to the processing sector In addition, the Royal Danish Fisheries

Bank provided loans for the construction and purchase of vessels, for processing plants and machinery; however, these loans are given on a commercial basis.

EEC grants to the Danish fishing industry in 1987 amounted to ECU 2.15 million, of which ECU 1.21 million went to the harvesting sector and ECU 0.94 million went to the processing sector.

Basic statistics, 1987

Landings	1 636 700 tons
Value	DKr 3.4 billion ($497.1 million)
Number of vessels	3 219 with 132 000 GRT
Number of fishermen	9 000 (estimate)
Exports	DKr 5.8 billion ($847.9 million)
Imports	DKr 2.7 billion ($394.7 million)

It is not known from the information available whether the fishing industry benefits from any special tax regime with regard to income or depreciation.

Around 50 per cent of all domestic landings for human consumption (total of around 400 000 tons) are landed for auction, the remainder is sold on contract to processing companies.

For the EEC's multiannual guidance programme covering the years 1987-1991 the maximum Danish net aid (exclusive of FEOGA financing) has been set at DKr 275 million, of which more than half will be used for deactivating fishing vessels.

Finland

In 1987, Government appropriations for the different subsidy measures amounted to Mk 32 100 000 ($7.3 million), of which Mk 24 050 000 was destined for the harvesting sector, Mk 3 550 000 for processing and marketing and Mk 4 500 000 for the Government's share of insurance indemnifications. The largest share of the support to the harvesting sector is directed towards price support and production support for herring, which received an appropriation of Mk 17 760 000 in 1987 while the value of herring landings amounted to Mk 70.6 million. The 1987 breakdown was as follows:

- Price support (Mk 10.76 million)
- Production support (Mk 7 million)
- Transport subsidy (Mk 3.3 million)
- Support for inland fishery (Mk 800 000)
- Loans for fishermen (interest rebates) (Mk 2 190 000)
- Loans for processing industry (interest rebates) (Mk 1 950 000)
- Sales promotion (approximately Mk 1 600 000)
- Fishing insurance (Mk 4 500 000)
- Total (Mk 32 100 000)

Basic statistics, 1987

Landings	88 900 tons
Value	Mk 144.7 million ($32.9 million) (plus Mk 305 million for aquaculture)
Number of vessels	559
Number of fishermen	*2* 100 full-time, 4 800 part-time
Exports	Mk 36.9 million ($8.4 million)
Imports	Mk 707.0 million ($160.8 million)

A condition for the fishermen receiving price support is that the buyer pays a minimum price for the raw material. This minimum price varies according to end use. In addition, transporters of herring may obtain subsidies from landing site to processing plant.

With a view to modernising the fleet and harvesting techniques, fishermen may obtain loans from commercial banks with interest rebates paid by the Government (1987: Mk 2 190 000).

For the processing and marketing sectors, loans with interest rebates are available (1987: Mk 1 950 000) in addition to an allocation of Mk 1 600 000 for the promotion of fish sales through advertising activities.

On the basis of available information, it is not known whether the fishing industry is subject to any special tax regimes. Fishermen paid a total of Mk 19.5 million for fishing licences, Mk 13.3 million for ordinary licences and Mk 6.2 million for special licences. The former amount is used to finance management, scientific work, etc.

France

In 1987, the Government and local authorities allocated a total of FF 183.2 million ($30.5 million) in financial aid of which some FF 3.6 million went to the processing/distribution sector. HOM used FF 34.8 million (1986) for the promotion of fish and fish products; FF 5 million of which was used for promotion on export markets. In addition to direct aid some FF 120 million was available as loans with interest rebate (rate not known). By far the largest part of the direct aid was used for construction of new vessels and the modernisation of existing ones while some FF 20 million was used for aquaculture.

From Community sources, the French fishing sector collected ECU 14.76 million in 1987; ECU 12.42 million to the harvesting sector and ECU 2.34 million to the processing sector.

Basic statistics, 1987

Landings	770 000 tons
Value	FF 8.7 billion ($1 447.7 million)
Number of vessels	9 427 with 194 068 GRT
Number of fishermen	29 875
Exports	FF 3 653 million ($607.7 million)
Imports	FF 10 287 million ($1 711.4 million)

Germany

As a Member of the EEC, financial assistance has to comply with Community rules. Federal government support in 1987 amounted to DM 29.2 million ($16.2 million), while support provided by Lander amounted to an additional DM 3.6 million ($2 million). Of this amount, some DM 27.9 million was used in the harvesting sector and DM 4.9 million was for the processing sector.

Within the harvesting sector, the largest programmes were:

i) Adapting harvesting capacities	DM 9.8 million
ii) Structural measures	DM 5.9 million
iii) Transitional allowances -- deep-sea fisheries	DM 9.5 million

In the processing sector much of the DM 4.9 million was used for sales promotion.

In addition to the above, from EEC resources the German sector received ECU 6.23 million in grants in 1987; ECU 4.41 million for harvesting and ECU 1.82 for processing.

Basic statistics, 1987

Landings	161 900 tons
Value	DM 230.4 million ($128.2 million)
Number of vessels	919 with 51 705 GRT
Number of fishermen	3 091
Exports	DM 740.4 million ($411.9 million)
Imports	DM 2 243.8 million ($1 248.5 million)

Greece

As a Member of the EEC, fi financial assistance has to comply with Community rules. In 1987, Greek national aid to the fishing sector totalled Dr 1 090.1 million ($8.05 million). None of this support was directed to the processing sector. Around half of this aid (Dr 531.5 million) was used to finance the replacement and modernisation of fishing vessels. Dr 225.9 million was used for the construction of new fishing ports and other infrastructure projects.

Basic statistics, 1987

Landings	139 100 tons
Value	Dr 65 025 million ($480 million)
Number of vessels	20 375
Number of fishermen	39 000
Exports	Dr 10 553 million ($77.9 million)
Imports	Dr 16 090 million ($1 118.8 million)

In addition to the national aid above, the Greek fishing industry received ECU 7.92 million from Community sources.

Iceland

There are no direct subsidy schemes applicable to the fishing sector. On an economy wide basis the National Catastrophe Fund, the Institute for Regional Development and the Unemployment Insurance Fund cover fishing. Certain incentives of accumulated depreciation are available. The Icelandic Export Board with a total budget of around IKr 80 million received one-eighth of its budget from the State, the remainder being financed by levies on exports of fish products. However, there is a Price Board which decides on minimum prices for fish landed (more information needed).

Basic statistics, 1987

Landings	1 632 500 tons
Value	IKr 24.9 billion ($643.8 million)
Number of vessels	902 with 116 637 GRT
Number of fishermen	5 917
Exports	IKr 41 435 billion ($1.07 billion)
Imports	nil

Ireland

As a Member of the EEC, financial assistance has to comply with Community rules. National grants are available to develop the catch sector with a view to increasing landings. In addition, grants are given towards development projects in aquaculture. A total of Ir£ 6.6 million (US$ 24.7 million) is budgeted for the 1988-91 period.

Grants from several agencies are available to the processing sector. The projects should aim at optimum utilisation of new materials, create maximum value added and employment. In addition, in 1987 the Irish fishing industry received a total of ECU 4.6 million from Community sources: ECU 1.84 million to the harvesting sector and ECU 2.76 million to the processing sector.

Basic statistics, 1987

Landings	224 500 tons
Value	Ir£ 70.2 million ($104.3 million)
Number of vessels	1 596 (1985)
Number of fishermen	12 050 (1986)
Exports	Ir£ 125.2 million ($186 million)
Imports	Ir£ 41.4 million ($61.5 million)

Italy

As a Member of the EEC, financial assistance has to comply with Community rules.

National direct financial assistance to the Italian industry in 1987 amounted to L 4 268 million ($3.29 million) all of which was destined for the harvesting sector.

Most of the support is directed towards the modernisation of the fleet, including scrapping of old vessels, conversions, etc.

In addition to national aid, the Italian sector received Community grants of ECU 20.13 million in 1987. ECU 16.12 million was to finance projects in the harvesting sector and ECU 4.01 million to the processing sector.

Basic statistics, 1987

Landings	342 143 tons
Value	L 1 778 238 million ($1 372 million)
Number of vessels	19 735 with 273 977 GRT
Number of fishermen	55 090
Exports	L 213 436 million ($164 million)
Imports	L 2 293 002 million ($1 769 million)

Japan

For the financial year 1987, the budget for the Fisheries Agency had an appropriation of ¥ 295 532 million ($9 043 million) with the following main headings:

Table 3. Budget for the Fisheries Agency in 1987

	1987	1988
Public expenditures -- infrastructure (fishing ports, fishing grounds, maintenance)	190 351	225 989
Non-public expenditures (improvements, development programmes)	19 237	19 874
Fisheries management (restructuring, emergency, small-scale fisheries)	21 112	18 474
Consumption, marketing processing	3 884	4 070
Resource development and access fees and surveys	22 231	22 563
Other (compensation, research, enforcement)	38 717	38 374
TOTAL	295 532	329 344

However, excluding expenditures for infrastructure purposes, i.e. port maintenance,-etc. direct aid to the fishing sector in 1987 amounted to ¥ 105.2 billion or $725 million (source: Marine Fisheries Review, NMFS).

Basic statistics, 1987

Landings	12 465 000 tons
Value	¥ 2 588 billion ($17 972 million)
Number of vessels	434 509 with 1 829 755 GRT (1986)
Number of fishermen	422 550 (1986)
Exports	¥ 183.7 billion ($1 275.6 million)
Imports	¥ 1 233.5 billion ($8 565.9 million)

There are no particular measures for the taxing of fishery income.

Netherlands

The sector received ECU 1.07 million in 1987 from EEC sources.

New Zealand

Direct measures are only applicable to the harvesting sector, i.e. the Regional Development Investigation Grant Scheme with a total budget of NZ$ 9 million ($5.3 million) for the fiscal year 1987/88, a significant portion of which has been used in fisheries and aquaculture projects. Indirect measures are available: i) tax incentives (the most important being the Income Equalisation Scheme), ii) buy-back of fish stocks following the introduction of the New Zealand ITQ system, iii) public service and iv) management of resources.

Basic statistics, 1987

Landings	152 000 tons
Value	?
Number of vessels	2 600
Number of fishermen	9 deep-sea enterprises and 2 000 inshore fishermen are quota holders
Exports	NZ$ 676.3 million ($399 million)
Imports	NZ$ 49.9 million ($29.4 million)

With regard to the buy-back of fish stocks, NZ$ 55 million was used in 1986 in the inshore fishery, and NZ$ 1.4 million in 1987 for paua. It should, however, be recalled that the buy-back of quotas can be inversed, i.e. the fishermen pay for quotas held by the government. For example, TACs have been revised upwards for hoki and orange roughy which ultimately were sold to industry for a total of NZ$ 71 million.

For the processing sector the introduction of the ITQ schemes and hence the buy-back scheme led to compensation to small fish packing houses dependent on inshore fisheries; they were subsequently eligible for a preferential tender of orange roughy and hoki. Finally, and until 1990 when the scheme is to be phased out, the Export Market Development Taxation Incentive assists exporters to recover some of their costs involved in promoting their goods on export markets through tax refunds.

Norway

All economic assistance to the Norwegian fishing industry is negotiated on an annual basis between the Government and the Norwegian Fishermen's Organisation. In 1987 the financial support package amounted to NKr 623.4 million ($92.5 million) well below the amounts disbursed in the previous five year period when amounts of NKr 1.1 billion to NKr 1.37 billion had been used. -Meanwhile, the NKr 623.4 million does not include investment aid channelled to the processing sector through the

Regional Development Fund and the State Fishery Bank. The considerable decrease in support has been due to reductions in the allocation from the price support scheme which, in 1981, amounted to NKr 35.2 million compared with NKr 636.7 million a year earlier. In addition to the direct payments, fisheries receives tax incentives, the value of which is estimated by the Norwegian authorities to be around NKr 100 million.

For the harvesting sector, in 1987, some NKr 546.1 million was used (not including the tax incentive) while the processing sector received NKr 121.5 million (not including the investment incentive) of which NKr 29.5 million was used for export and marketing assistance.

Basic statistics, 1987

Landings	1 867 700 tons
Value	NKr 5 601.4 million ($831 million)
Number of vessels	22 671 with 343 979 GRT
Number of fishermen	29 913
Exports	NKr 10 009 million ($1 485 million)
Imports	NKr 752.6 million ($111.7 million)

Portugal

Total national financial aid in 1987 amounted to Esc 2 275.4 million ($16.15 million) of which Esc 1 950.2 million was used in the harvesting sector.

By far the largest amounts are used for construction and modernisation in the fleet as well as support for aquaculture.

Basic statistics, 1987

Landings	385 200 tons
Value	Esc 50 030 million ($355 million)
Number of vessels	
Number of fishermen	43 111
Exports	Esc 21 915 million ($155.6 million)
Imports	Esc 60 831 million ($431.8 million)

On top of the national aid, the Portuguese fishing industry received ECU 15.99 million in Community finance, ECU 11.22 million for the harvesting sector and ECU 4.77 million for processing.

Spain

Excluding assistance from Community sources, direct financial aid amounted, in 1986, to Ptas 4 108.9 million ($33.27 million), loans to Ptas 19 197 million in addition to a transfer of Ptas 310.5 million to the autonomous communities. Of this amount Ptas 1 237.1 was destined for the processing sector. Community aid in the first year (1987) of the multi-annual programme (1987-1991) amounted to ECU 36.02 million corresponding to around Ptas 4 700 million. Of the Community finances, ECU 3.82 million was for the processing/marketing sector.

Basic statistics, 1987

Landings	1 043 200 tons
Value	Ptas 223 891 million ($1 813 million)
Number of vessels	17 441 with 692 221 GRT
Number of fishermen	94 246 (1986)
Exports	Ptas 58 888 million ($476.9 million)
Imports	Ptas 161 200 million ($1 305 million)

The lion's share of financial aid goes for the restructuring of the fleet and the building of new vessels.

Sweden

In the 1987/88 financial year, total economic assistance to the harvesting sector amounted to SKr 90.8 million ($14.32 million), of which SKr 83 million ($13.09 million) was disbursed through the price regulation system. While direct aid is only available to the harvesting sector, the processing sector may benefit from low interest loans of 5 per cent when this concerns investments in machinery and for structural adjustment purposes. In addition to this direct aid, fishermen and fishing enterprises benefit from tax incentives which levels out fluctuations in taxable income and hence the tax burden. The financial support of SKr 90.8 million excludes social support schemes, the most important of which is unemployment relief with an amount of SKr 21.6 million in 1988.

Next to the price system, most financial assistance to the harvesting sector is geared towards **low** interest loans and loans with government warrantee for financing investment in vessels and technical equipment for vessels.

As regards the financing of the price regulation system, it should be noted that the system is not directly financed by the State budget. Funds come from a levy imposed on all imported fish and certain fish products and on all fish landed by Swedish vessels.

Basic statistics, 1987

Landings	181 600 tons
Value	SKr 709.8 million ($112 million)
Number of vessels	532 with 32 228 GRT
Number of fishermen	4 678 (1985)
Exports	SKr 772.2 million ($121.8 million)
Imports	SKr 2 584.3 million ($407.5 million)

Turkey

In Turkey, investment incentives have been given to the industry in the form of duty exemption on domestic goods/raw materials, interest rate rebates, tax concessions and the payment of a premium.

Basic statistics, 1987

Landings	384 395 tons
Value	TL 403 448 million ($470 million)
Number of vessels	8 404 with 98 095 GRT
Number of fishermen	46 300
Exports	$36.9 million
Imports	$7.9 million

United Kingdom

Being a Member of the EEC, financial assistance has to comply with Community rules. In 1987, total direct financial aid to the harvesting sector amounted to £19.68 million ($32.3 million) in grants, the majority of which was used for construction and modernisation of fishing vessels.

Basic statistics, 1987

Landings	735 740 tons
Value	£432.7 million ($707 million)
Number of vessels	8 171 with 152 451 GRT
Number of fishermen	21 434 of which 15 706 full-time
Exports	£416 million ($679.7 million)
Imports	£849 million ($1 387 million)

These schemes are administered through the Sea Fish Industry Authority (SFIA) and the Highlands and Islands Development Board. In addition, the SFIA carries out promotions for marketing fish and fish products which for 1984-1989 will receive Government funding of £11.9 million (i.e. £2.38 million per year). For the construction of vessels, tax incentives providing for free depreciation of fishing vessels are available. In addition the harvesting sector benefits from a restrictive licensing system (no finance) with a view to rationalising the fleet.

For the processing, marketing and distribution sectors, and besides what is available from FEOGA, regional development grants directed towards small enterprises are available. In addition the SFIA activities also include financing projects to help processing, marketing, etc. The Government co-finances the SFIA activities, however to be discontinued from 1989 after which the only source of financing is a levy on first-hand sales of all fish, domestic as well as imported.

From EEC sources, the U.K, harvesting sector received a total of ECU 7.23 million and the processing sector ECU 2.35 million, i.e. a total of ECU 9.58 million.

United States

Very few direct programmes with Federal State finance are available to support the commercial harvesting sector. In fact, only the Santonstall-Kennedy Act disburses public funds and this only for research and development projects related to fisheries. In 1987, this programme received $7.4 million in Government funding. Other programmes applicable to the harvesting sector (i.e. the Fishermen's

Obligation Guarantee Programme, the Fishermen's Guarantee Fund and the Fishing Vessel Aid Gear Damage Compensation Fund) are either self-supporting or financed by other sources than Government.

One programme, the Capital Construction Fund allows for tax deferral for future vessel constructions while the Fishermen's Contingency Programme which compensates fishermen for gear losses due to oil or gas exploration provided $750 000 in 1987 financed via an assessment of the oil/gas exploitation companies.

Basic statistics, 1987

Landings	4 983 200 tons
Value	$3.6 billion
Number of vessels	93 400 (including motor boats) (1987)
Number of fishermen	256 000 (1987)
Exports	$1.66 billion
Imports	$8.82 billion

EEC

Total EEC commitments for fisheries (Chapter 4 of the Community budget) in the 1987 fiscal year amounted to ECU 232.6 million. Table I only mentions those aid programmes which follow under i) the Community programme to improve and adapt structures in the fisheries and aquaculture sectors; and ii) the Community programme for the improvement of conditions for processing and marketing aquaculture and fisheries products.

Meanwhile, Chapter 4 of the budget contains the following main headings and commitments for 1987:

40 Guarantee fund (interventions) (market price support)	ECU 17.79 million
41 Inspection/surveillance	ECU 0.304 million
42 International fishery agreements	ECU 81.880 million
47 Structural measures:	
reorientation of fishery activity	ECU 38.364 million
adaptation and modernisation.	ECU 94.120 million
Producer organisations	ECU 0.068 million
Biological studies	ECU 0.492 million
TOTAL	ECU 232.607 million

ANNEX II

On tariffs

Weighted MFN tariff-averages for the developed economies are, following the last round of MTN, reduced to 4.1 per cent. The bulk of trade takes place under MFN arrangements. Tariff escalation is a main problem. The proportion of bound tariffs is high.

On quantitative import restrictions

In most reports the use of quantitative import restrictions is considered to be the most serious measure. Two types of restrictions exist -- global quotas and tariff quotas. While the former is applied in Finland and Japan, the latter is confined to the Community. In addition, France, Norway, Sweden, Spain and Portugal (until end 1992) will apply quantitative import restrictions on a number of products.

However, while the above type of restrictions have been well covered, other restrictions which work in the same way have not been addressed to a desirable extent. Here, inter alia, product standards such as the (minimum) size P fish and shellfish and quality standards, have been singled out as being of special concern.

On quantitative export restrictions

Export restrictions are applied by Canada, Australia and New Zealand for a limited number of products and product forms.

On landing prohibitions

Landing prohibitions will have the same effect as export restrictions or import restrictions, depending on whether they are applied to the domestic fleets' landings abroad or foreign fleets' landings on the domestic market.

Landing prohibitions on foreign fleets are applied, at least, by the United States, Norway, Sweden, Iceland, Canada and Australia either under certain conditions or as a general rule.

Landing prohibitions on domestic fleets abroad are applied by Canada on herring and salmon. Iceland has introduced the possibility of fining vessels which land too much fresh fish abroad by reducing their quota allocations.

On measures which might affect exports

Export refunds are not used to promote the trade in fish and fish products. Exports can, however, be financed using generic export financing schemes; there already exists an OECD code on such measures. More common is the involvement by governments in services rendered by embassies at trade fairs, etc. Based on FI/304, there do not seem to be large amounts of money involved. A few countries use export restrictions or have legislation or rules which, under certain circumstances, can be applied to this effect (the EEC, Sweden and Iceland).

On price regulation systems

The Community's price regulation systems have provisions regarding reference prices.

Swedish price regulation systems have provisions for export fees.

On sanitary regulations and standards

The Committee for Fisheries was presented with a document entitled "The impact on trade in fish and fish products by sanitary and hygienic regulations" and, at its 64th Session, had a preliminary discussion on this work. It has, in general, been recognised that these regulations have an impact on trade -- in some cases they have serious consequences on trade -and they need special treatment. Quantifying their impact is, however, an impossible task.

ANNEX III: THEORETICAL ASPECTS OF NATURAL RENEWABLE RESOURCES AS A COMMON PROPERTY

The curve presented in the main text is reproduced from the Australian delegation's paper presented to the Committee's 64th Session (cf. document FI/305(Addendum 3)]. The following will briefly explain the biological and economic background to this curve and touch on some management aspects.

Biological considerations

In addition to being a natural resource fish is also renewable; as such it is somewhat different from other natural resources e.g. coal and minerals that are exhaustible. That fish is a renewable resource means that man can take from it without endangering its future, however, over and above a certain point, the more that is taken the less will be left for later use. In addition above a certain size of a fish stock, growth will be inhibited b lack of food which conversely means that if some fish are being taken out of the stock (by e.g. fishing) the overall weight of the stock will increase as more food will be left to the remaining fish. The following graph explains this paradox.

If the stock is left at its own the stock will find a natural growth equilibrium at k where the number of fish leaving the stock (death) equals the number of fish coming into the stock. The point k is often referred to as the natural environments carrying capacity and represents the "trade off" point between over crowding of the sea, the amount of food and the survival rate for newcomers[3]

It can also be seen from the curve that at half the population size the maximum growth rate of the stock will be realised. This point will be where the fish stock can be on a sustainable long term level without changes to the stock size. This point is referred to as the maximum sustainable yield MY); biologists like to see fishing regulated in such a way that this point i achieved.

Assuming that the price the fisherman gets for his landings is constant, the biological curve above giving the yield is the same as the total revenue curve in the fishing. That the price is a constant is a reasonable assumption as we are talking about individual small well defined "sub sectors" of the total fishery (with regard to species, to stocks and to geographical areas) where local changes lb supply do not affect the prices; excess demand can be satisfied from out side areas. The following graph then depicts the introduction of revenue into the biological curve from above; the curve TR gives the total revenue of the fishery as a function of effort.

The total cost curve TC on the above graphs has been drawn under the assumption that fishing costs are increasing as effort is-increasing. As the number of vessels is getting larger the costs associated to finding fish etc., are also getting higher (i.e. external diseconomies).

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[3] This brief on biologics and economics is simplistic. It excludes for example that natural fluctuations in the fish stocks are caused by other factors like hydrographics. Also the assumption here is a single stock with no interaction with other stocks (i.e. multi-species models).

From the graphs giving the cost and revenue (total, average and marginal) in the fishery it becomes apparent that-three points are of particular interest. The first is the open access equilibrium point (OAD) defined as the intersection between the total costs and total revenue curve. Here there will be no more than normal profits earned in the fishery; however, for reasons of common property nature this point could very well in the short run be passed and have devastating consequences for the stocks.

The second point of particular interest is where the vertical difference between total costs and total revenue is biggest. At this point (corresponding to point k on the graph in the main text) the society will benefit the most and the factor allocation between the different sectors of the economy is optimal; when marginal revenue equals marginal costs in the fishery. However, at this point the fishery and, this is where resource economics differ from other economic theories, will produce the maximum economic rent possible.

It is important to note from the above that contrary to other sectors of the economy a limitation of the fishing effort (to point k where the maximum rent is created) will create the optimal resource allocation and the highest welfare to producers and consumers. As such fishing is different from other economies where only free competition will lead to optimal resource allocations; in fishery free competition will lead to a collapse of the fish stocks.

Management considerations

There exists a range of management systems each based on different management objectives i.e. efficiency (optimal allocation in the economy), income distribution in the fishery (whatever regulation is introduced in the fishery the income of fishermen will change) and effectivity (securing that the fishery continuously is modernised and new investments are taking place).

One of the most important differences between natural resources economics and other economics (e.g. agriculture) relates to the common property nature of the resource i.e. that no one owns the resources and that hence the fishermen will race to exploiting the resource with the resulting no rent situation as an outcome. As shown above this not only leads to a collapse of the fish stocks (e.g. whales) but also gives rise to misallocation of resources in the economy as a whole.

Should the fishery be limited by an overall catch limitation only and thus have free entry (no limit on the effort to be deployed) over capitalisation and misuse of effort will be the result; consequently the "rent" will be dissipated. This is an often cited reason why fishermen in general are not rich people. Wealthy fishermen exist but are confined to the ones who have had a lucky catch or those who are working in a management system so that the rent is taken by the fishermen and shared by the few.

Three other points should be recalled in the discussion on management. The first relates to the nature of investments that fishing vessels represent. Their longevity of say 30 years is very long compared to other investments in working capital. The second relates to the fisherman himself. Often he is living in regions with few alternative occupations, he is a fisherman because his family has been in the industry for generations and is general poorly educated. The third point is that he still has the chance for the great catch which will make him wealthy for the rest of his days. These three points explain a lot on the fishing business; among others that it is difficult to regulate the effort and that it is difficult to move fishermen into other occupations.

ANNEX IV: PRACTICAL ASPECTS OF QUANTIFYING MARKET PRICE SUPPORT

The Committee has been presented with two possible methods of quantifying the market price support, i.e. the price wedge as used in agriculture and the duty collected as presented by the United States Delegation in document EFI/305(Addendum M. The calculation of the price wedge captures all policies that influence the domestic producer price, while the duty collected only calculates the value of the tariff. As such, the duty collected does not have the global character that the price wedge has and the degree of transparency offered will then be quite different.

This note has been developed with a view to undertaking a calculation of market price support in the fisheries sector. For the purpose of this note, a single species, i.e. Atlantic cod, was taken as the product, the ultimate aim being to identify the technical problems associated with a "price wedge" and the "duty collected" when applied to the fishing sector.

The note has been divided into two main chapters; the first addresses the possibility, from a practical point of view, of calculating a price wedge, i.e. the difference between the world price and the domestic producer price as used in the agricultural PSE calculations; the second addresses the possibility of calculating duty collected. The practical aspects which will be considered include data availability and quality.

Price wedge calculation

Part of the consideration of the PSE calls for a price comparison between the price practised in the domestic market, i.e. the domestic producer price and a reference price, often referred to as the world market price. Such calculations should be undertaken when policies in place tend to suggest that a price gap could exist. This difference (P-Pw) is referred to as the price wedge; if it is positive, the domestic producers receive a price higher than the price reigning at the international level, the reasons for which could be tariffs or NTBs such as quotas, minimum prices, etc. or other market price support policies.

The level at which to calculate the price difference is as close to the producer price as possible, which in fisheries means at the landing stage. As will be seen later, this does not pose problems for the domestic price but as whole and unprocessed fresh fish is traded only in rare or particular cases (distance to the consumers) the only available choice for the world reference price will inevitably be a processed product.

The domestic producer price

Landings, quantities and values, are the source of data for the domestic producer price. Data were taken for the United States and Canada (these are reported in live weight) and for Denmark, Norway and Sweden (data are reported in landed weight and were convert Table 1 depicts the landings and values for 1986 and 1987 in live weight, in national currencies and in US dollars (exchange rates are published in the OECD's "Foreign Trade Bulletin").

Table 4. Landing statistics for cod
Quant. : tons
Val. : national currency

	1986			1987		
	Quantity	Value	Av.P. US$	Quantity	Value	Av.P. US$
United States	27 737	36 142	1.30	26 814	44 179	1.65
Canada	479 000	216 870	0.326	467 360	329 173	0.530
Denmark	128 910	1 195 738	0.924	127 391	1 179 172	1.09
Norway	262 900	1 609 000	0.667	301 000	2 238 000	0.888
Sweden	43 500	278 100	0.723	44 300	301 300	0.864

Source: Review of Fisheries

It should be noted that the value of landings is expressed in national currency while average price is in US dollars per kilo.

It will be seen from the above table that average landing prices differ considerably from country to country. It is important that the domestic producer prices are comparable across countries, i.e. that the product cod is the same in all the countries and that the producer price is calculated on the same basis. There are some technical reasons why cod prices could differ from country to country; at the level of landings the question which should be addressed is whether the products are homogeneous i.e. is a cod landed in Denmark the same as a cod landed in Canada?

The harvesting method and on-board fish handling are important factors in the determination of the producer price. Trawl caught fish receives lower prices than gill netted fish which again receives prices lower than long lined fish. Other factors such as icing, on-board gutting, time at sea are also important.

Finally, because of the different price systems in use, there is a problem with the data sets. Landings data in Denmark for cod are based on auctions, in Norway and Sweden on the fishermen's sales Organisation, in the US and Canada on direct sales between harvester and processor. In addition, in the case of vertical integrated companies (situation especially prevalent in Canada and the United States) the value of the landings does not represent the market value of the fish at the landing stage but rather the target income of the employed. Thus, quite a difference in price series could perhaps be explained by the different sales mechanisms between primary producer and processor. More transparency on this issue is desirable.

The reference price

For the present exercise, frozen fillets of cod were used as the point of departure. In fact, among the cod products which exist, frozen cod fillets are probably the most traded. There are several producers, the most important being Denmark, Canada, Norway and Iceland and the most representative consumer is the United States, having the largest market. Other products of cod were not found to have the same characteristics; for example, while trade in fresh cod by value is large, the markets are delineated by the

freshness itself and high transport costs and is in the hands of a few exporting countries. For salted cod products, the production is in the hands of few and the consumers are concentrated in three major countries.

For the reference price, several possibilities are given and are based on average import or export values of frozen cod fillets. Prices are expressed in US dollars per kilo and converted to live weight. For example, Denmark exported 55 421 tons worth DKr 1 408 071 in 1986, which gives an average value of DKr 25.41 per kilo frozen fillet. The conversion to live weight equivalents using factor 2.95 gives an average value of DKr 8.61 per kilo live weight and with DKr 8.091 to the US dollar, the price expressed in US dollars of the frozen fillet of cod gives $1.064 per kilo live weight.

Table 5. Examples of live weight equivalent values for reference price
$/kg

	1986	1987
FROZEN COD FILLETS		
United States imports	1.11	1.49
Canadian exports	1.09	1.49
Danish exports	1.064	1.352
Norwegian exports	0.954	1.251
Swedish exports	0.917	1.382
Swedish imports	1.064	1.446
FRESH WHOLE COD		
Swedish exports	0.936	1.098
Danish exports	1.72	1.96

Source: In most cases the data are taken from the "Review of Fisheries".

It will be noted-that the figures in Table 5 are raw data an have only undergone conversion to live weight equivalents and into US dollars. However, it is apparent that there is a range within which a reference price can exist. The price range in 1987 is from $1.49 per kilo to $1.251 per kilo, a range of 20 per cent which could be explained by the Danish and Norwegian distance from the United States market, i.e. transport costs. Yet another explanation of the difference can be the different product mix in "frozen cod fillets" which covers blocks as well as IQF fillets, shatterpacks, etc.

In Table 2, two price sets on average export values for fresh cod have been given to show the following problem with these price series. The Danish average export value of fresh, whole cod is not only above the Swedish; it is also above the average value of the frozen cod fillet which has undergone substantial processing. It is the opposite for Sweden when in 1987 the average value of fresh, whole cod exports were lower than frozen fillets. From this it would seem that the fresh, whole cod exported from Sweden is a different product from the Danish. Such differences need to be addressed before the data can be used for comparisons.

The conversion factor from processed frozen cod fillets to live weight used is 2.95 and reflects an average yield from whole live cod to frozen fillet weight. As such it does not reflect other costs

associated with processing such as labour, water and other variable costs. Hence, the average export price which the processor receives needs adjustment for the processing cost before a comparison with the landing prices can take place. While making this adjustment, account has to be taken of the value of "waste", some of which is subsequently processed (e.g. cod liver and roe and mince estimated to be around 8 per cent of the weight of the final product) and sold for consumption.

The conversion factors could vary from country to country and they will depend on the quality of landings used as input (harvesting method, etc.) and the final product. For example, the Danish Ministry of Fisheries reports that yield in filleting in Danish processing plants varies from 40 per cent to 55 per cent which includes mince of 8 per cent, but this is based on landed weight, and not live weight.

This being said, probably the most interesting observation is that in all but one case the average export price or average import price using this price as a reference price is above the average price paid to the fisherman. The only exception to this is the United States where fishermen, in 1987, received $1.65 per kilo compared with an import price of frozen cod fillets of $1.49 per kilo on live weight basis.

To summarise the adjustment needed to arrive at a comparable price series for landings and processed product (or vice-versa) is:

- conversion of weights to a common standard (e.g. live weight equivalent);
- currency conversions;
- adjustment for transport costs;
- adjustment for quality (common standard), which includes:
  - for the harvesting sector -- that there is a difference as to where the cod is caught, how it is caught, on board handling, etc.;
  - for the processing sector -- that there is a difference as to quality of output as well as input;
- adjustment for handling and processing costs, i.e.:
  - labour costs, water, electricity, waste water purification, etc.;
  - adjustment for waste and its eventual subsequent sale;
  - adjustment for profit in the processing.

The availability of data sufficiently detailed to cope with these calculations and, of course, their reliability should be addressed.

One aspect in the fishing industry and differing from one Member country to another, but which needs to be addressed, is the linkage in the distribution channels. In at least two cases (the Canadian and United States Alaskan ground fish industries) there is a high degree of vertical integration between harvesting and processing. Hence, the landing prices or values recorded do not necessarily reflect the market price for the catch.

Finally, it has been shown that the same product description can cover quite different products/market situations and hence create large price differences.

Duty collected calculation

This approach was presented by the United States authorities at the 64th Session of the Committee for Fisheries. For further details see document [FI/305 Addendum 1]. This method is appropriate to use when no other measures or policies than tariffs are in place.

The basic idea for the calculation of the duty collected can be described by using the following formulae:

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

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

where

${}^{D}_{P}Q$ = quantity of domestic processed product (lbs)

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

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

${}^{I}_{P}Q$ = quantity of imported processed product (lbs)

${}^{I}_{LWE}Q$ = 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

The landing figure must be reduced 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 as 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.

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

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

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):

$$(4a)\qquad \frac{I_D}{D_R} \times Q_{LP} = S_D$$

The calculation of the duty collected in practise is somewhat more cumbersome than the above formulae suggest, due in particular to the different situations which exist in Member countries with regard especially to utilisation of raw material. The following presents an example for Denmark and the product chosen was cod. As far as possible the availability in other Member countries of the different types of statistics required for the calculation is addressed in this example. (At the end of the exercise is a list of the required statistics and a checklist for existence in Member countries).

Table 6. Danish imports of cod products, 1987

Quant. : tons
Val. DKr '000

		Total		Extra EEC[1]	
	Tariff (%)	Quant.	Val.	Quant.	Val.
Whole					
Fresh, chilled	12	58 773	501 465		386 369
Frozen	12	17 968	202 429		202 429
Salted	13[2]	10 330	241 250		238 899
Fillets					
Fresh, chilled	18	310	6 610		6 341
Frozen	15[3]	6 518	144 903		142 312
Salted	20	40	794		794

1. Approximate figure and includes imports from all sources other than EEC.
2. 0 per cent within 25 000 tons suspended indefinitely for EEC total.
3. 8 per cent within 10 000 tons for EEC total.

However, even within these tariff rates the following have not been taken into account:

- Imports from Greenland and the Faeroe Islands enter Danish territory duty free;
- Imports of frozen fillets from Iceland enter at 0 per cent, those from Norway at 3 per cent and those from the Faeroe Islands (to the rest of the Community) at 3 per cent;
- The Community rules on inward processing have not been taken into account. These rules foresee that duty paid on imports are refunded after processing and export outside the EEC;

- The preferential agreements which, for example, foresee that Sweden may enter duty free for limited amounts, i.e.:

  - 3 500 tons of whole fish, including cod;

  - 1 500 tons of cod fillets.

(However, Sweden applied an export tax of SKr 0.5 per kg until March 1987 on fresh cod.]

In addition, during 1987, the Community opened the following autonomous tariff quotas applicable also to the Danish industry:

- 57 000 tons at 3.7 per cent fresh or frozen whole cod;

- 10 000 tons at 0 per cent of frozen fillets;

- 40 000 tons at 5 per cent of salted, undried cod;

- 1 000 tons at 10 per cent of dried, unsalted cod;

- 250 tons at 10 per cent of dried and/or salted fillets.

The breakdown of Danish imports in 1987 for the above products coming from Sweden, Norway, Iceland and others was as follows:

Table 7. Breakdown of Danish imports
DKr '000

	Sweden	Norway	Iceland	Other
Whole				
Fresh, chilled	131 993	31 084	10 304	158 870
Frozen	1 675	49 333	12 280	132 942
Salted	-	98 085	30	1 622
Fillets				
Fresh, chilled	1 830	158	1 594	1 059
Frozen	171	20 563	19 229	3 265
Salted	-	459	44	-

At this stage, because of the lack of more detailed in-house information, it was decided to explore the existence of data required for calculating a duty collected in OECD Member countries. A circular letter was issued asking for:

- Utilisation, i.e. for each species landed, do you have statistics on their subsequent processing into different product forms i.e. headed and gutted fresh and frozen whole fish, fresh, frozen and salted fillets, ready-to-cook products, etc. and the quantities which are produced?

- Statistics on the output from your domestic processing industry, are they by different product forms (as detailed as possible), by quantity and value or sales by the processor/wholesaler?

- Do you have special product to live weight conversion factors and imports to live weight conversions factors, insofar as these differ, or do you use the internationally set standards such as those used by FAO?

- Duty collected, for each tariff line do you keep a record of the collected duties (total for the year)?

- If not, can you split your imports (by quantity and value) into the different categories corresponding to the different tariff treatments applied?

It will be seen from Table 8 that only in a few cases is it possible to calculate a duty collected. It will also be noted from Table 8 that, in particular, statistics on Utilisation of landings and processing industry output are available in only a few countries.

Table 8

Country	Utilisation of landings	Processing industry output	Conversion factors country specific or FAO	Duty collected	Split imports into different tariff treatment
Australia	Only landings subsequently exported	For a limited range of products of export value	"Fisheries of the US" and country specific	+	+
Belgium	n.a.	n.a.	Country specific	+	-
Canada	Until 1985, estimates for 1986-88	+	Country specific	Internal use	By category of imports
Denmark	n.a.	+	Country specific	-	?
Finland	n.a.	n.a.	n.a.		
France	n.a.	For frozen and canned products only, by species only	Country specific	-	+
Germany	n.a. expect for the high-sea fleet	Exists without differentiating between fish species	Country specific	n.a.	n.a.
Greece	n.a.	n..	International set standards	Not readily available	-
Iceland	+	+	Country specific	No imports	No imports
Ireland					
Italy					
Japan	n.a.	For three broad categories of output and only by quantity	Country specific but live weight not used	Not public	+
Netherlands					

Table 2 (cont'd)

Country	Utilisation of landings	Processing industry output	Conversion factors country specific or FAO	Duty collected	Split imports into different tariff treatment
New Zealand	n.a. but can eventually be derived through export statistics	n.a.	Country specific	+	
Norway					
Portugal					
Spain					
Sweden	n.a.	For broad categories and by limited number of species	Country specific	+	+
Turkey					
United Kingdom	n.a.	n.a.	Country specific	n.a.	n.a.
United States					
EEC (statistics for the Community as a whole)	n.a.	n.a.	n.a.	n.a.	n.a.