Toward a Rational Seafood Trade Policy

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Introduction

With a record trade deficit of almost $146 billion in 1986, and continued high deficits in 1987, there is growing concern about how continued deficits will affect the U.S. economy. Because fishery products had a record $6.3 billion deficit in 1986, the U.S. National Marine Fisheries Service (NMFS) has made the reduction of the fisheries trade deficit one of its top priorities. A recent NMFS trade objective was to "increase exports and domestic consumption of U.S. fishery products" which would lead to a reduction in the trade deficit. In this paper we explore this policy in terms of practicality and desirability.

Composition of Fishery Trade Deficit

In 1986, over $2.8 billion or 37 percent of U.S. fishery imports were of nonedible products, principally jewelry containing some fish components such as shell. If we examine only edible fishery imports and exports, then the trade deficit is only $3.5 billion. In Figure 1 we see that seafood imports are concentrated in a relatively few products. Shrimp, by far the leading item, makes up 29 percent of edible imports. Groundfish, spiny lobster, tunas, and scallops along with shrimp make up 66 percent of our edible imports.

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Figure 2 demonstrates that edible U.S. seafood exports are even more concentrated than imports. Salmon products, at $726 million, account for 56 percent of edible exports. The next highest products are shrimp ($69 million) and herring ($66 million). The remaining 33 percent of exports are scattered among a variety of products.

When compared with what is occurring in the overall U.S. trade picture, fishery products have actually fared very well. In Figure 3, U.S. exports and imports of fishery products are compared with total merchandise imports and exports. Fishery exports form an increasing percentage of total merchandise exports, and imports a decreasing total.

U.S. Outlook for Seafood Demand

Current data suggest that seafood demand in the U.S. has been rising steadily over the past few years. Figure 4 shows U.S. per capita consumption of seafood and the consumer price index for fish and shellfish. Per capita consumption has gone up steadily since 1982 while real seafood prices have also risen. Rising consumption in the face of higher prices indicates that seafood demand has increased. The most recent increase in demand is partly attributed to an increasing awareness of the healthfulness of seafood, particularly as it relates to heart disease.

A recent study by the Department of Agriculture (Blaylock and Smallwood, 1986) makes projections about the U.S. demand for food to the year 2020, based on the Bureau of Labor Statistics' Continuing Consumer Expenditure Survey. The projections are based on U.S. Census Bureau projections of such factors as the age, racial, and regional distributions of the population, in addition to their own projec-

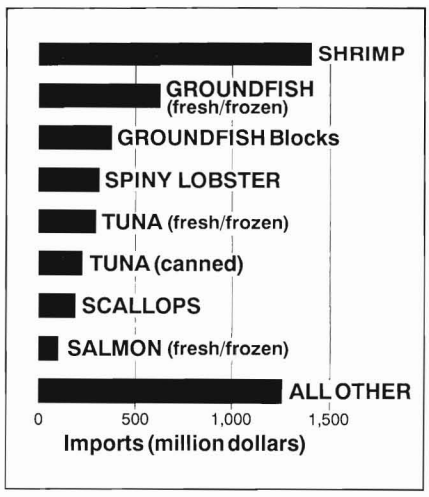

Figure 1.—Edible U.S. seafood imports, 1986.

Figure 2.—U.S. edible seafood exports (major products), 1986. Data is in millions of dollars.

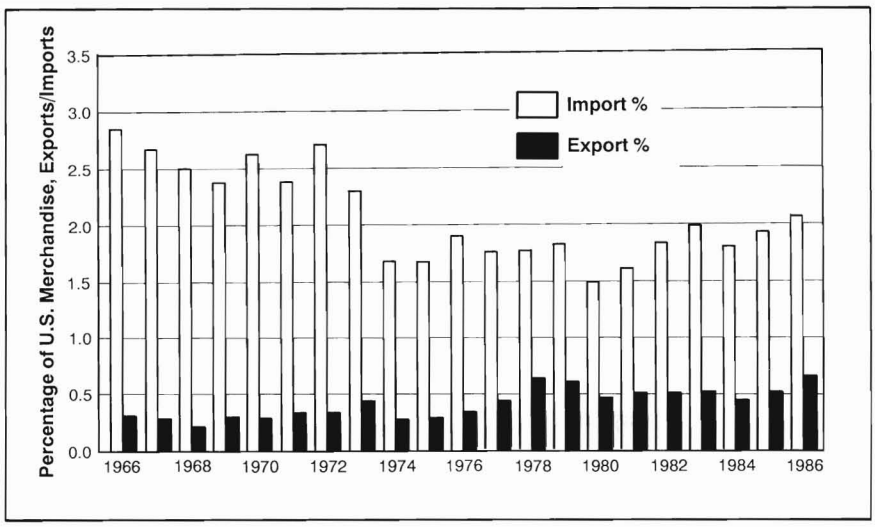

Figure 3.—Fishery exports/imports as a percentage of total U.S. trade.

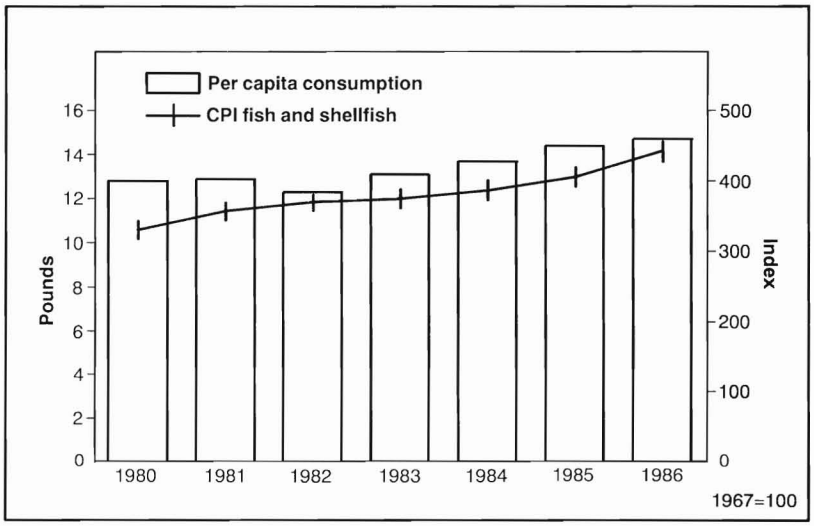

Figure 4.—Per capita seafood consumption and prices (CPI), 1980-86.

tions about consumer income. These projections depend on two key assumptions: 1) Preferences of the demographic groups do not change over time (e.g., as an individual moves into a higher age group he or she adopts the tastes and preferences of that group), and 2) the relative prices of the food groups remain the same. With these caveats in mind, they find that by the year 2000 consumer expenditures on seafood consumed at home will increase by 11.7 percent over 1980 expenditures if consumer incomes increase 1 percent annually; those expenditures will increase by 21.1 percent if incomes increase 2 percent annually. (Census provides a low, middle and high series of projections. All results discussed here are based on the middle series.)

The USDA study estimates what would happen in the seafood market if no other changes occur. In reality, there has been a significant increase in consumer demand for seafood since the expenditure survey was conducted. As a result, we estimate that 1986 at-home seafood expenditures increased by 54 percent over the 1980-81 USDA study. This was due to a 34 percent increase in seafood price and a 15 percent increase in per capita consumption. These estimates far exceed the USDA projections. However, we assume that the demographic changes leading to changes in seafood demand occur on top of the recent increase in demand, and that percentage increases in expenditures predicted by the USDA model are still valid. Projections, however, will be more meaningful if they are made from the higher base of 1986 consumption and expenditures.

According to the BLS 1980-81 consumer expenditure survey, weekly per capita food expenditures were $19.49, with $13.18 at home and $6.31 away from home. Expenditures on seafood during this period were 3.1 percent of the at-home food expenditures or $0.41 per person per week. This was equivalent to total annual expenditures for seafood at home of $4.82 billion. NMFS estimates of total seafood expenditure during this period was $12.84 billion. Thus, it was estimated that $8.02 billion was spent on seafood away from home. This is approximately 11 percent of the total away-from-home food expenditures estimated in the BLS survey. Since seafood consumed during the 1980-81 period averaged 2.92 billion pounds edible weight, the average retail price for seafood was calculated as $4.40 per pound.

Updating the above calculations to 1986, we find that at-home seafood expenditures were $7.67 billion, or $0.62 per person per week. Away-from-home expenditures were $12.56 billion, or $1.01 per person per week. The total of $20.2 billion represents a nominal increase in seafood expenditures of 58 percent over 1980 expenditures.

Using the USDA projections, in the year 2000, at-home seafood per capita expenditures will increase from 9.3

percent to 17.1 percent over 1985 expenditures. Using 1986 expenditures data as a base, this translates to an at-home per capita seafood expenditure of $0.67-$0.73 per week. Away-from-home seafood expenditures will increase to $1.09-$1.22 per week. Total annual seafood expenditures in the year 2000 are thus estimated to be $24.52-$27.17 billion. Using the assumption that real seafood prices do not increase after 1986, the quantity of seafood consumed will increase to 4.16-4.61 billion pounds edible weight. This means that per capita consumption will increase another 5-17 percent (15.5-17.2 pounds per person). Thus, for there to be no real increase in seafood prices, supplies of edible seafood will have to rise 18-31 percent over 1986 levels. These projections are summarized in Table 1.

Table 1.—Seafood expenditure and consumption.

Item	Expenditures (× 1,000) and consumption		
	1980-1981[1]	1986[2]	2000[3,4]
At-home	$4,820	$ 7,670	$ 9,34-$10,170
Away-from-home	$8,020	$12,560	$15,190-$17,000
Per-capita consumption	12.9 lb.	14.7 lb.	15.5-17.2 lb.

[1]Sources: Blaylock and Smallwood, 1986; Fisheries of the United States, various years.
[2]Estimate.
[3]Projection, low figure based on 1 percent annual rise in consumer income, high figure on 2% rise.
[4]Assumes no real price change for seafood.

Table 2.—Alternative seafood supply scenarios in the year 2000.

Scenario	Domestic landings (million lb.)	Imports (million lb.)	Price change (%)	Per capita consumption lb.)
Base	3,393	7,360-8,157	0	15.5-17.2
1986 Supplies	3,393	6,227	14-21	13.1
U.S. landings grow	4,526-5,323	6,227	0	15.5-17.2

Outlook for U.S. Seafood Supply

The real price of seafood has risen considerably since the time that the BLS survey was conducted. Yet, the projections from the USDA study relied strongly on the assumption that seafood prices would remain steady. This assumption would be valid if supply were able to expand at the same rate as demand. However, with fishery resouces this is not likely to be the case. Domestic commercial landings have actually declined from 1980 to 1986 by 7 percent. To keep up with increasing demand, imports increased by 20 percent over the same period. The increase in imports was partially fueled by a strong U.S. dollar making imports relatively cheap, but this was still not enough to offset the increase in demand, and prices rose 34 percent.

To account for different supply conditions and the result it will have on seafood prices, expenditures and quantity consumed, we took an ad hoc approach by incorporating a price elasticity from another study in the USDA model. Price elasticity measures the percentage change in quantity consumed of a commodity due to a 1 percent change in its price. A recent study by Cheng and Capps (1986) calculated an elasticity of -0.89 for shellfish and -0.67 for finfish. These values are considered inelastic in that the percentage change in quantity is smaller than the percentage change in price. For total seafood elasticity, we used the midpoint of the elasticity estimates, -0.78.

Although it is not a statistically valid procedure to append the elasticities to the USDA model, doing so provides a rough idea of seafood consumption under various scenarios, without having to incur the costs of estimating a new model. The scenarios are based on different assumptions about price changes, U.S. landings, and import levels. The results of the scenarios are summarized in Table 2. The first scenario or base case is the one discussed above where it is assumed there are no price changes and U.S. landings are at their 1986 levels. In scenario two, U.S. landings and imports are set at their 1986 levels, resulting in a 14-21 percent rise in real price and a decline in per capita consumption to 13.1 pounds per person. The third scenario keeps imports at their 1986 levels and shows the increase in U.S. supplies necessary to keep prices at their 1986 levels. These scenarios represent extremes. It can be expected that some supplies will be due to increased U.S. landings, some from imports, and that some demand will not be met by increased supplies leading to a real price rise.

Potential Supply

The techniques employed here are not suited to breaking out how the increase in demand will affect individual seafood products. In fact, by aggregating all edible seafood into a single category, the approach assumes that the relative quantities consumed of each product do not change. Thus, an increase in seafood consumed of 18-31 percent, as predicted in the base scenario, translates into an increase of 18-31 percent for shrimp, salmon, groundfish, etc., over the 1986 levels.

We realize that the supply situation in fisheries can vary greatly from year to year for individual products. It is unlikely that the supply will expand such that all species are produced in the same proportions. It is more likely that supplies of some species will be higher and some lower. Consumers will substitute accordingly, and prices will adjust. For example, increases in domestic processing of Alaskan pollock are likely to exceed the 31 percent limit in the base scenario. This, however, may make up for shortages in other groundfish species. The lowering in price due to large pollock supplies will depend on how closely consumers' perceive pollock as a substitute for groundfish and other products. The closer the substitute, the less the price decrease. Much of the pollock will be transformed into surimi and eventually analog seafood products. It is unknown where these analog products fit in seafood consumption patterns. Are they substitutes for other seafood, or expanding seafoods substitutability for other protein such as chicken or soy?

The potential for the expansion in supplies of major seafood products varies by product. The most important product, shrimp, has the greatest potential for expansion of supply. This is

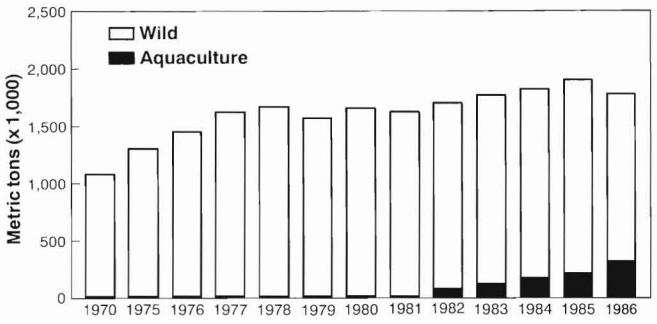

Figure 5.—World shrimp catch.

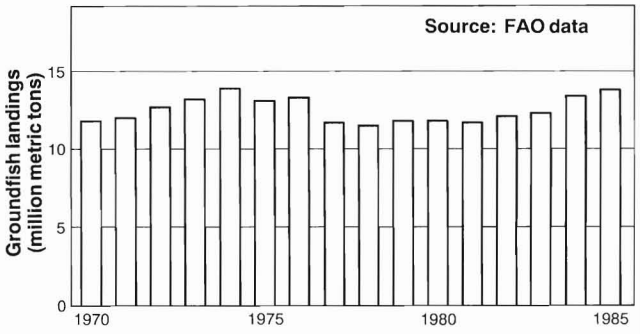

Figure 6.—World groundfish landings, 1970-85.

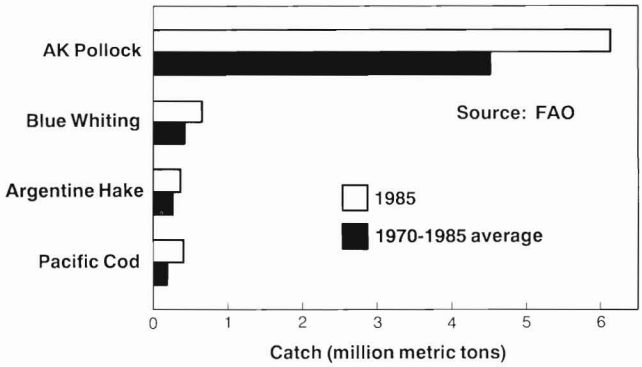

Figure 7.—Major groundfish species with increasing catches.

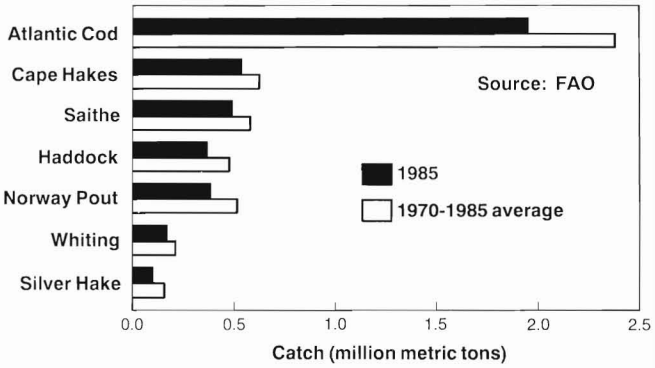

Figure 8.—Major groundfish species with decreasing catches.

due to the rapidly increasing production of farmed shrimp. Although world production of wild shrimp has been fairly constant, aquaculture production has begun to rise tremendously (Fig. 5). In contrast, the potential for increases in world groundfish supplies is limited. Without aquaculture, production of these products has not increased over time (Fig. 6). Although certain products such as Alaska pollock and blue whiting have increased, these have replaced major species that have decreased such as Atlantic cod and haddock (Fig. 7, 8). This shift in species distribution of the groundfish catch has been favorable to the United States because of the large Alaska pollock resource in the U.S. exclusive economic zone.

Summary and Conclusions

The record seafood trade deficit is not a problem, but a sign of growing demand for seafood products. The United States cannot supply this growing market with domestic resources; it must continue to import more seafood products. Any policies that promote domestic consumption and exports lead to upward pressure on seafood prices and greater demand for imports. There are ways, however, that the growth in imports can be tempered. Some U.S. fish stocks (e.g., Atlantic groundfish) are depleted to a level where the sustainable yield is well below the stocks' potential if allowed to rebuild. Reducing fishing pressure on these stocks can result in higher landings in the long run, reducing the dependence on imports.

Another area where the U.S. can displace imports with domestic landings is through developing substitutes for traditional fishery products. The best example of this approach is the use of surimi-based products to simulate items such as crab legs or shrimp. Still another approach is to get consumers to accept species available in the U.S. exclusive economic zone as substitutes for products that are imported.

Last, we propose that demand for imports can be tempered by removing the natural obstacle presented by the environment to increased U.S. production. In other words, the development of an aquaculture industry would allow seafood producers to expand production in response to real price increases for their product. The major aquaculture successes in the United States are currently catfish, trout, and crayfish. There is tremendous potential for salmon aquaculture and perhaps many other species demanded by U.S. consumers.

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