MFR PAPER 987

During 1968-1971, retail prices of fish products rose faster than beef or poultry prices. Here an economist discusses where the money goes.

Price Spreads of Fish Products Among Producers and Distributors

ERWIN S. PENN

ABSTRACT

The rapid increase of fish prices has recently caused public concern. To find the cause of the difference between the price the fisherman receives for his product and the ultimate price paid by the consumer, this report provides an analysis of how the consumer's dollar is distributed to four marketing levels: fisherman, processor, wholesaler, and retailer.

The difference or margin between selling and purchasing prices of each level and the share of the consumer's dollar by each level and each cost component are calculated for 14 fish products. The report also analyzes the costs and profits incurred by each marketing function and describes the major influences on margin differences.

The purpose of the study is to provide a systematic guide that individual firms in the fishery can use to examine their margins, costs, and profits for each fish product, and compare them with the figures presented in this study as national averages for the same product.

INTRODUCTION

Although fish is not the dominant item in food budgeting for the average American, it is important to those who desire a balanced diet by virtue of its nutritive qualities. Consumers are as concerned about prices of fish as they are about other food items. Retail prices for edible seafood products increased 28 percent in the United States during 1968-71, while beef prices increased 20 percent and poultry prices, 6 percent, in the same period (Figure 1). Despite the price freeze in late 1971, both consumers and advocates of consumer protection remain concerned over the high prices already reached for fish products. A close examination of fish pricing by each marketing level seems necessary.

Selected for this study are four groundfish fillets (cod, haddock, flounder, and ocean perch), halibut and salmon in steak and dressed forms, canned salmon and tuna, and four shellfish products (blue crabs, American lobsters, sea scallops, and shrimp). Their production accounts for 36 percent of total fish harvested in the United States in 1971 on a round-weight basis.

Erwin S. Penn is an economist, Economic Research Division, NMFS, Washington, DC 20235.

AUTHOR'S NOTE

Price data of this study cover the period 1950-71 for finfish and 1959-71 for shellfish. The report does not include the prices later than 1971 because prices at the processor's level of different fish products have not been published since then. As a result of an unparalleled pattern of price variations that developed in 1972 and the early part of 1973, price relationships among various marketing levels (other than the processor's) tend to be different from those projected in the present study. The deviation is striking in the price relationships among different levels during Phase II of price controls when the prices at the ex-vessel level were not frozen but those at other levels were.

The trends established in this study are influenced by more recent developments. The relaxation of price control in early 1973, the price ceiling imposed on meat products shortly afterward, and other proposals in the wind would serve to create further disparities between the meat farmer's share of the consumer's dollar and the fisherman's share.

Also, fish products consumed in the United States have a higher percentage of imports than most other major food products. The devaluation of the U. S. dollar twice during the recent period not covered by this study has, therefore, a bullish effect on the prices of fish products, especially at the wholesale and retail levels.

Bearing the above qualifications in mind, readers will be able to reconcile the results of this study with the newly developed situation.

ERWIN S. PENN

Washington, D.C.
March 1973

Price Spread

The differences between the prices charged by the producer and those paid by the consumer can be explained by price spreads. For a fish product, the

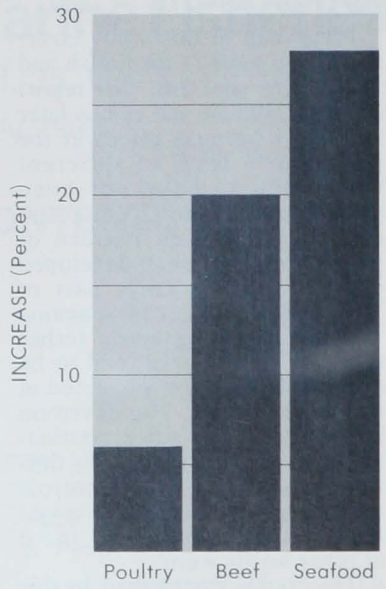

Figure 1.—From 1968 to 1971, retail prices for seafood products increased almost five times as much as those for poultry, and almost half as much more than those for beef.

price spread is the difference between the price paid for the final product by the consumer and the dock side value of an equivalent weight of the product. This difference includes the payments received by all agents performing services in moving fish products from fishermen to consumers. These services include handling (landing), processing, storage, transportation, wholesaling, and retailing.

From dockside to retail the spread is composed of margins at various levels. The difference between the retail price and the cost of the product to the retailer (or price paid to the wholesaler) is called the retail margin. The difference between the price charged by the wholesaler and the cost of purchase from the processor is called the wholesale margin. In the same manner the processor's margin can be estimated from what was paid at dockside and the price received from the wholesaler. Prices at the four levels were collected for most of the selected fish products over the period 1950-71.[1]

[1]Retail prices of some fish products are not available for the 1950's.

Purpose of the Study

Each marketing level contributes some value either by changing the form or place of the product. Each level gets its return for the value added to the final product. To study the contribution of value and to analyze the operating costs at each marketing level would be the first move to determine how effective every sector of the fishery is compared to other industries. To serve as an intermediate objective, this study is designed at this stage to:

1) present estimates of the costs and profits comprising the margins for a number of selected fishery products; and
2) encourage individual firms at each level to review their own operations by comparing their margins with the national averages.

THE FISHERMAN'S SHARE

The fisherman's share in the retail market for finfish varies considerably depending on the products. It averaged from 42.3 percent for halibut steaks to 25.7 percent for canned salmon. The weighted average share in the finfish group is estimated at about 36.6 percent in 1971. This means that, on the average, fishermen received about 37 cents and marketing firms 63 cents of each dollar spent for fresh and canned finfish products by consumers in retail food stores (Figure 2).

The fisherman's share in the shellfish retail market was higher in most cases than that in finfish in 1971. It ranged from 77.9 percent for sea scallop meats to 24.9 percent for blue crab meat. The weighted average share in the shellfish market was almost 47.4 percent. In other words, fishermen received about 47 cents and distribution channels 53 cents of each consumer dollar spent for shellfish products.

Variation Over Time

The fisherman's share in the finfish market varied considerably during the 22 years after 1950. When we examine the historical series of the fisherman's share in groundfish products, greater shares—around 40 percent—are found during the early 1950's (Table 1). This greater share could be attributed to lower marketing costs due to less services involved, cheaper materials used in packaging, and lower freight rates. At the harvesting level, on the other hand, less efficient methods in fishing were practiced in earlier years before the rapid transition to trawling and the extensive use of electronic equipment, such as fish finders, depth indicators, and automatic steering. The unit cost at the ex-vessel level was, therefore, raised while prices at the retail level stayed stable and competed with imports.

During the period 1954-65, the fisherman's share in groundfish products was depressed somewhat in certain years. The downturns during this period almost coincide with the recession years 1954-55, 1960-61, and 1964, when ex-vessel prices dropped more noticeably than retail prices.

The rise of the fisherman's share in groundfish products to above 39 percent after 1966 could be explained by the following: (1) the rapid growth in the size and sales of supermarkets since 1963 has lowered marketing costs; (2) centralization of purchases by chain stores has tended to reduce invoice costs; and (3) increasing imports of fish products have exerted more pressure on retail prices than on ex-vessel prices in the domestic market.

The fisherman's share in canned tuna retail prices was greater than in canned salmon in all the years since 1950. One reason for this was that the amount of canned tuna at the retail level was more than double that of canned salmon. Half of the tuna supply in the U.S. market was imported at a lower price. The average price spread of canned tuna was, therefore, reduced, which tends to increase the fisherman's share. Second, the production season for salmon historically has been shorter than for tuna, and the domestic market for salmon is not supplemented by imports as it is for canned tuna. Thus

Table 1.—Fisherman's share of consumer's dollar for finfish products compared with farmer's share of the same for beef, pork, and market basket foods, 1950-71.

Year	Fisherman's share: Fresh cod, flounder, haddock fillets	Fisherman's share: Frozen ocean perch fillets	Fisherman's share: Salmon steaks (fresh)	Fisherman's share: Halibut steaks (fresh & frozen)	Farmer's share[1]: Canned fish: Pink salmon	Farmer's share[1]: Canned fish: Tuna (chunk)	Farmer's share[1]: Beef (choice grade)	Farmer's share[1]: Pork	Farmer's share[1]: Market basket of foods[2]
	Percent								
1950	39.5	N.A.	N.A.	N.A.	27.7	N.A.	74	64	47
1951	40.7	N.A.	N.A.	N.A.	33.2	N.A.	77	63	49
1952	40.1	31.7	N.A.	N.A.	28.0	N.A.	74	60	47
1953	37.6	29.5	N.A.	N.A.	29.4	33.0	66	67	44
1954	35.1	30.9	N.A.	N.A.	28.1	34.0	68	65	43
1955	35.4	29.2	N.A.	N.A.	30.2	32.5	66	54	41
1956	35.5	30.1	N.A.	N.A.	25.7	33.0	65	52	40
1957	37.3	29.7	N.A.	N.A.	31.2	32.4	65	55	40
1958	39.8	30.9	N.A.	N.A.	24.4	33.5	67	58	40
1959	39.7	29.4	N.A.	N.A.	30.7	32.1	66	46	38
1960	34.2	29.7	N.A.	23.4	32.7	34.0	65	51	39
1961	32.4	27.7	N.A.	29.0	22.7	32.4	62	52	38
1962	33.2	28.6	N.A.	35.5	30.9	34.0	68	51	38
1963	33.5	30.3	N.A.	24.5	25.9	29.6	62	48	37
1964	31.2	27.4	N.A.	30.1	24.9	31.8	60	48	37
1965	32.2	26.7	N.A.	34.9	25.7	32.6	65	58	39
1966	35.3	30.7	N.A.	38.4	[3]	32.8	63	57	40
1967	35.3	24.1	39.8	31.8	[3]	30.0	64	52	38
1968	34.6	23.4	36.4	34.3	[3]	38.9	65	51	39
1969	39.5	25.9	34.5	52.9	[3]	39.8	65	55	41
1970	42.3	26.3	N.A.	47.5	[3]	39.3	63	50	39
1971	41.2	23.4	34.0	42.3	[3]	40.1	65	45	38

[1]Compiled by the U.S. Department of Agriculture.
[2]Include meat products, dairy products, poultry, eggs, bakery and cereal products, fresh fruits, fresh vegetables, processed fruits and vegetables, fats and oils, and miscellaneous products—farm-originated food products purchased annually per household by wage-earners and clerical worker families and single workers living alone. Meals in eating places, imported foods, seafoods, and foods not of farm origin are excluded.
[3]Series discontinued by the Bureau of Labor Statistics.

Table 2.—Fisherman's share of consumer's dollar for shellfish products, 1959-71[1].

Year	Fisherman's share: Sea scallop meat	Fisherman's share: Frozen raw peeled shrimp	Fisherman's share: Live American lobsters	Fisherman's share: Blue crab meats
	Percent			
1959	53.8	36.3	49.1	39.2
1960	44.8	40.8	46.2	26.7
1961	49.3	44.8	45.5	28.6
1962	52.2	47.0	44.9	27.9
1963	55.1	36.5	50.8	25.6
1964	56.3	44.4	54.7	28.3
1965	59.1	43.6	51.1	29.9
1966	50.8	48.5	51.6	27.0
1967	63.8	39.8	54.6	23.0
1968	64.0	45.2	[2]	29.3
1969	66.0	45.4	[2]	26.0
1970	72.3	43.2	[2]	21.5
1971	77.9	49.9	[2]	24.9

[1]Retail prices of most shellfish products are not available for the years before 1959.
[2]Series discontinued since 1968.

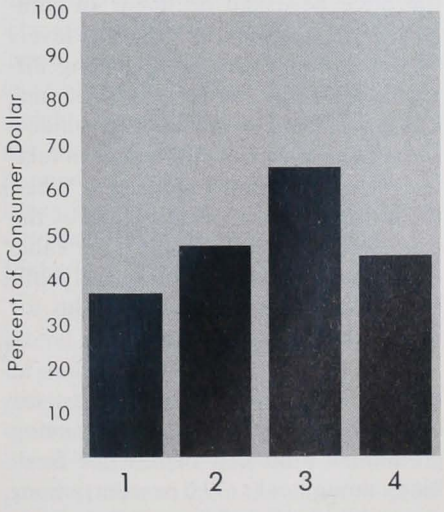

Figure 2.—In 1971, the fisherman's share of the consumer's dollar averaged 36.6 percent for finfish, 47.4 percent for shellfish. For comparison, the farmer's share for choice beef was 65 percent, for pork 45 percent (see Table 1). The scale of operations appears to account for some of these differences: about 10 times as much beef, about 6 times as much pork, are consumed as seafood products.

salmon have higher storage costs and a greater risk of price declines during the marketing period.

During the 13 years 1959-71, the fisherman's share for shellfish increased in three products—sea scallops (2.2 percent a year), live American lobsters (14 percent a year), and frozen raw peeled shrimp (0.5 percent a year)—and declined in blue crab meats (−0.7 percent a year).

The fisherman's share in the shrimp market showed a distinct upward trend following the pattern of consumption. Shrimp consumption increased at the rate of 5.6 percent a year during the 5 years 1967-71, whereas retail prices, after adjustment to constant value, stayed stable. As ex-evessel prices, after value adjustment, continued to increase during this period, the fisherman is bound to get a bigger share in the retail market.

Ex-vessel prices of sea scallops and live American lobsters increased faster than retail prices over the years since 1959. The increase has raised the fisherman's share in these two products in recent years.

The decline in the fisherman's share in blue crabs is attributed to a different reason. Blue crab meat processing is labor intensive, and its costs increase more rapidly than the expenses in harvesting.

Comparison With the Farmer's Share

The weighted average of the fisherman's share was 47.4 percent of shellfish retail prices in 1971 and compared favorably with 38 percent of the farmer's share in the market basket of 63 food items compiled by the U.S. Department of Agriculture in the same period (Tables 1 and 2).

But the fisherman's share of 36.6 percent in the finfish market was much lower than the farmer's share in the beef market (65 percent) and the pork market (45 percent). Beef and pork are sold in large quantities in the market. Compared with fish products, beef consumption averaged about 10 times greater and pork consumption 6 times

greater during 1969-71. To handle the big quantities of meat products, each meat packing plant is operated on a much bigger scale and with more automation than a fish processing plant. It is likely that meat packing has an edge over fish processing in being able to lower packing and marketing costs because of economies of scale (National Commission on Food Marketing, 1966). In the retail market fish are not sold in as large quantities as meat. Owing to bigger quantities in the sale of meat, meat prices, particularly beef prices, are more often offered by retail stores as the "price leaders" to attract customers. Beef and pork prices are, therefore, cut to the lowest possible levels (National Commission on Food Marketing, 1966b). This reduces the margins on beef and pork sales and raises the farmer's share accordingly.

TREND OF PRICE SPREADS OF FISH PRODUCTS

The price spread of a food product can be divided into as many margins as there are ownership transfers and available price information. In this study, the prices of each fish product are gathered at four levels—ex-vessel, processing, wholesale, and retail.

Ex-vessel Prices[2]

When prices at all levels are adjusted to constant dollar value[3], ex-vessel prices since 1950 trended upward for some species, particularly cod, haddock, sea scallops, and American lobsters, and downward for ocean perch and tuna. Because of changes in stocks or runs[4], ex-vessel prices of flounder, halibut, king salmon, blue crab, and shrimp fluctuated annually without a discernable trend. Better harvesting years command lower ex-vessel prices.

Price margins for most fish products were relatively large at the ex-vessel level because of high wage costs. Over two-fifths of gross earnings was spent on labor and about one-fifth on capital costs.

Processor's Margin and Markup

Price margins at the processor's level for most fish products were as large as those at the ex-vessel level because processing is rather labor intensive. Processor's prices, after adjustment to constant dollar value, increased slightly for most of finfish products during the last two decades and for shellfish during the last decade. Exceptions to this observation were canned tuna, fresh flounder fillets, and frozen ocean perch fillets.

The decline of processor's prices usually followed the drop of ex-vessel prices. If the ex-vessel price of one product dropped more than the processor's price, the processor's margin increased despite the fact that the price he asked declined. In comparing the margins at different levels of one product and those among different products over a period of time it is more convenient and better understood to express the differences in relative instead of absolute values. When the processor's margin is divided by the processor's price the result is the value of markup interpreted as the gross profit in percent of the processor's sales, or simply the gross profit rate.

During 1969-71 gross profit rates at the processor's level were highest for ocean perch fillets (52.3 percent) among groundfish products, highest for fresh king salmon steaks (39.5 percent) among dressed and steak forms of fish products, and higher for canned pink salmon (56.9 percent) than canned tuna.

Over the past 20 years, gross profit rates for fresh cod fillets, fresh flounder fillets, halibut steaks, and fresh blue crab meat increased slightly at the processor's level, while canned tuna and fresh haddock fillets declined and canned pink salmon, frozen ocean perch fillets, and raw peeled shrimp remained almost unchanged.

The processor's markup, as will be seen later, is in most instances higher than the wholesale level. About 55 to 60 percent of the processor's margin is labor and material costs which increased faster than the overhead costs. In addition, the amount spent for food product advertising increased even faster than wage costs. These expenses are incurred by the processor when the products bear the manufacturer's name.

Wholesale Margin and Markup

In most instances, retail prices are subject to lesser fluctuation than are ex-vessel prices. Since retail prices are relatively stable, it follows that somewhere in the channels of distribution, market margins must be reduced (raised) when ex-vessel prices rise (decline).

Prices at the wholesale level fluctuated more distinctly and moved upward for most fish products except that wholesale prices of canned tuna and ocean perch fillets declined slightly and those of canned pink salmon and fresh flounder fillets remained more or less constant.

An increase in wholesale price does not necessarily imply that the wholesale margin over the processor's price has increased. During 1969-71, wholesale markups (gross profit rates) for packaged and canned fish products are estimated around 15 to 16 percent, with the exception of American lobsters (36 percent) and fresh king salmon steaks (29.4 percent[5]).

Although wholesale prices increased, wholesale margins remained relatively stable. A similar increase in whole-

[2]Ex-vessel prices are the prices agreed upon between the seller, the fisherman, and the buyer, the wholesaler or processor, at the dockside for the exchange of certain amount of fresh fish landed by the fisherman on a per pound basis.

[3]The constant dollar value of a commodity at any market level is one when the current price of the commodity is adjusted to a value as if the price has not risen due to inflation compared with a certain period as the base year. The adjustment is made by dividing the actual prices of the commodity in a time series by the corresponding indexes from the implicit price deflator series for non-durable goods. In this study we use 1967 as the base year.

[4]Stock refers to the resource available for each species. Run refers to the act of a fish to migrate or ascend a river to spawn.

[5]Wholesale margin of American lobsters is larger than other fish products because they are sold live and heavy transportation costs are assumed by the wholesalers. Part of fresh salmon steaks is shipped by air freight, the costs of which are paid by the wholesalers.

saler's cost of sales, i.e., processor's prices, equalized the margins at the wholesale level over the period.

Retail Margin and Markup

Price margins at the retail level for some fish products are as large as at the ex-vessel level. For the last two decades retail prices of most fish products under our study, after adjustment to constant value, fluctuated slightly with a mild upward trend. Prices of canned tuna and halibut steaks, however, were declining. Those that showed an abrupt change in price movements, particularly during the years 1969-71, were fresh flounder fillets and fresh haddock fillets with a sudden retail price upturn and fresh sea scallops and blue crab meat with a sudden drop in retail prices. While most retail prices, after they are deflated, were moving upward, the gross profit rates of fish retailers increased slightly only in four products—canned pink salmon, fresh flounder fillets, frozen ocean perch fillets, and fresh blue crab meat, markups for halibut steaks and fresh sea scallops declined drastically while markups for the rest dropped slightly during the period covered in our study.

A retail food store is a multiproduct firm which handles thousands of food and nonfood items simultaneously. Costs are allocated not separately to each individual commodity but to a product-mix of a group of related commodities. Less emphasis is placed on profit margins of individual commodities, as the pricing strategy of a retail store is focused on the maximization of the overall profit of the entire store.

The rigidity of such a pricing practice of each retail store causes the retail price of each item to be less responsive to the cost of sales. As a result, the retail margin narrows in the short run as wholesale prices advance.

The average rate of markups at the retail level is somewhere between those at the processing and wholesale level. During 1969-71 retail markups were relatively high for most groundfish (34-37 percent) except fresh haddock fillets (17 percent). Markups for blue crab meat and canned fish products ranked next between 24 and 28 percent; while those for fish steaks, sea scallops, lobsters, and peeled shrimp were around 20 percent.

The overall average of retail markups of different fish products were about 63 percent higher than wholesale markups during 1969-71. In some instances, they rose to double the rate of the latter. The following reasons account for the higher markup rate at the retail level:

1. Most fish products are sold by retailers in quantities of less than 10 pounds in each transaction, whereas they are disposed of at tens of thousand pounds in each dealing at other levels.

2. Higher operating and overhead costs per unit sold are incurred at the retail level. About 67 percent of retail costs is operating expenses that include mostly salaries of salesmen attending the fish counter.

3. Spoilage and shrinkage increase progressively as fish products are distributed through marketing channels from the dockside to the consumer. The greatest loss is assumed by the retailer. Most of our retail prices are collected from New York City, where the weight loss due to spoilage and shrinkage was 5.3 percent in winter and 6.0 percent in summer—about 1.9 and 2.2 times higher respectively than at the wholesale level (Bureau of Commercial Fisheries, Marketing Division, 1966).

4. Retailers pay about 1.5 cents per pound in winter and 2.0 cents per pound in summer for quality control of fish products on items such as ice, refrigeration, chemical additives, glazing, brine, and other treatments—about 15 percent higher than the amount paid by producers and distributors for the same purpose (Bureau of Commercial Fisheries, Marketing Division, 1966).

Despite the high costs involved in retailing fish products, retail markups for most fish products trended downward during the last decade for shellfish (except blue crab meat), and during the last two decades for groundfish (except flounder and ocean perch fillets) and canned fish products (except salmon).

Fish products with a relatively high unit price usually have low retail markups. Overhead costs are often allocated to products not according to their value but to the volume of floor space occupied. High-priced peeled shrimp, live lobsters, sea scallops, and halibut and king salmon steaks illustrate this observation. Those products that have easily discernable quality and are purchased relatively frequently by consumers are also given low retail markups because of the large turnover of their sales. That is one of the reasons why canned tuna retail markups dropped rapidly for the last 4 years.

Comparison of Price Changes at Retail Level With Those at Other Levels

As was indicated in the discussion of retail food market behavior, retail prices moved upward without much fluctuation as did prices at other levels. The trend of retail price movements reacts with price trends at other marketing levels differently from one product to another. A comparison of the price movements of the four levels over the last two decades can be summarized as follows:

1. Products whose retail prices increased at a slower rate than prices at the other three marketing levels are:
   a. halibut steaks and fresh sea scallops (distinctively slower);
   b. fresh haddock fillets, raw peeled shrimp, and live American lobsters (moderately slower); and
   c. canned chunk tuna (slightly slower).

2. Products whose retail prices increased at a faster rate than at the other three marketing levels are:
   a. fresh flounder fillets (moderately faster), and

b. canned pink salmon, frozen ocean perch fillets, and fresh blue crab meat (slightly faster).

3. Only one product, fresh cod fillets, saw its retail prices increase at about the same rate as prices at other levels.

COSTS AND PROFITS—THE COMPONENTS OF PRICE SPREADS

To develop a better understanding of price spreads and their variation between products and between marketing levels of each product, it is necessary to examine the services performed in getting the fish products from dockside to the retail market and the costs and earnings involved in performing these services at each level. Each category of costs differ among different marketing levels, e.g., labor is less involved in the wholesale level than in processing and harvesting levels. The cost components and net profits (or losses) for different levels are compiled from summary tables and statements published by Business Income Tax Return Statistics (U.S. Internal Revenue Service, 1967), Supermarket Financial Statements (Supermarket Institute, Inc., 1965), Detailed Statistics on Canned Seafoods, Fresh and Frozen Packaged Fish (Census of Manufactures, 1967), and numerous individual cost studies for specific fish products. Costs and receipts of different fishing vessels are compiled by the NMFS Economic Research Division.

The information and data so collected for marketing levels are processed and then reduced to ratios expressed as percentages of the margin at each of the four levels—harvesting (fishing), processing, wholesaling, and retailing as shown in Tables 3 and 4. These ratios are used as bases to allocate the costs to each fish product according to the actual margin calculated from price studies at each level (Table 5 and Figure 3).

DIVISION OF CONSUMER'S DOLLAR SPENT ON FISH PRODUCTS

Prices of fish products are expressed in cents per pound. They can be converted to pounds per dollar at the retail level, i.e., the value of a consumer food dollar. A consumer's dollar spent for each fish product can be sliced many ways. It can be divided according to marketing functions to show how much the fisherman, processor, wholesaler, and retailer earn of each dollar spent by the consumer. The share of a consumer's dollar can also be distributed according to costs spent by the four functions to show how much goes to labor, materials, capital expenses, operating expenses, and net profit in the production and marketing of each fish product. A different comparison is offered here to evaluate the services rendered and profits earned by all the functions involved in bringing each fish product to the consumer market (Table 6 and Figure 4).

It is observed that, in general, market margins (except at the harvesting level) tend to be proportionally higher for lower priced fish products as labor and overhead expenses are fixed for all products regardless of their differences in value. Ocean perch fillet is an example among the groundfish. By the same token, margin ratios for halibut steaks (cheaper in price) are higher than those for fresh king salmon steaks (more expensive) at all levels except the wholesale level. The consumer pays more out of his food dollar at the wholesale level for fresh king salmon steaks, because a large part of their shipment was delivered by air-freight from Seattle by the wholesaler. This tends to inflate the wholesale margin of salmon steaks.

Prices of shellfish are generally higher than those of finfish products on a meat weight basis. Higher priced prod-

Table 3.—Cost rates, as percentage of price margin, at different market levels.

	Margin	Materials & fuels	Labor	Capital costs	Operating expenses	Net profit
	Percent					
I. Retail:						
a) Supermarket[1]	100.0	4.1	6.3	16.9	63.6	9.1
II. Wholesale:						
a) Food & kindred products[2]	100.0	14.8	6.1	9.2	45.4	24.5
b) American lobster (live)[3]	100.0	23.0	13.0	7.0	47.0	10.0
III. Processing:						
a) Fresh & frozen packaged fish[4]	100.0	36.5	22.2	7.8	25.3	8.2
b) Canned & cured seafoods[4]	100.0	34.3	19.9	9.7	29.6	6.5
c) Food & kindred products[1]	100.0	21.3	11.2	9.0	44.0	14.5
d) Peeled shrimp[5]	100.0	27.0	33.2	9.3	22.5	8.0
e) Blue crab meat[6]	100.0	25.3	44.2	2.2	21.3	7.0
IV. Wholesale and processing combined:						
a) Scallop & oyster[7]	100.0	20.2	13.2	9.6	45.0	12.0

[1] Published by Supermarket Institute, Inc., 1965.
[2] *Business Income Tax Return Statistics*, Internal Revenue Service, 1967.
[3] Derived from the *Joint Master Plan for the Northern Lobster Fishery*, BCF, Department of the Interior, April 1970.
[4] *Census of Manufactures*, U.S. Department of Commerce, 1967.
[5] Survey of the U.S. Shrimp Industry, Vol. 1, Fish and Wildlife Service, Special Scientific Report—Fisheries No. 277, U.S. Department of Commerce, 1954.
[6] Derived from discussions with the staff in the Market Research and Services Division, NMFS, Department of Commerce.
[7] Derived from figures and information given in *Culture, Handling and Processing of Pacific Coast Oysters*, Bureau of Commercial Fisheries, 1960.

ucts enjoy higher profit in monetary terms but lower profit rate against sales in relative terms. This applies to shellfish products. Conversely, profit rates for finfish products generally ranked higher than those for shellfish products.

CONCLUSIONS

Dividing each price spread into margins at different functional levels and breaking each margin down into component costs and profits to examine them in depth are the first steps toward evaluating the effectiveness of a marketing system.

Over half of the margin at the harvesting level is labor cost. Wage rates have been increasing faster than most costs, and this trend is likely to continue. The slow recruitment of resources of certain species and the lag in harvesting efficiency in some fisheries (Bell, 1971) will further accelerate the increase in ex-vessel prices or fishermen's margin compared to other levels.

Component costs at the wholesale level are mostly administrative. Margins at this level will increase much slower than at the ex-vessel level, although wholesale price will increase according to the price charged by the processor.

Processor's costs are comparatively less involved in labor than fishing vessels but more than at the wholesale and retail levels. Processor's margin tends to rise at a pace between the rates of increase in wholesale and ex-vessel prices.

At the retail level, observations made at the variation of margins for different products have born out the expectation that:

1) margins vary directly with the perishability of products and the distance of shipment;

2) margins vary inversely with the rate of turnover, the level of unit price, and the amount of imports of identical products; and

3) retail margins are higher on manufacturers' brands than on private brands.

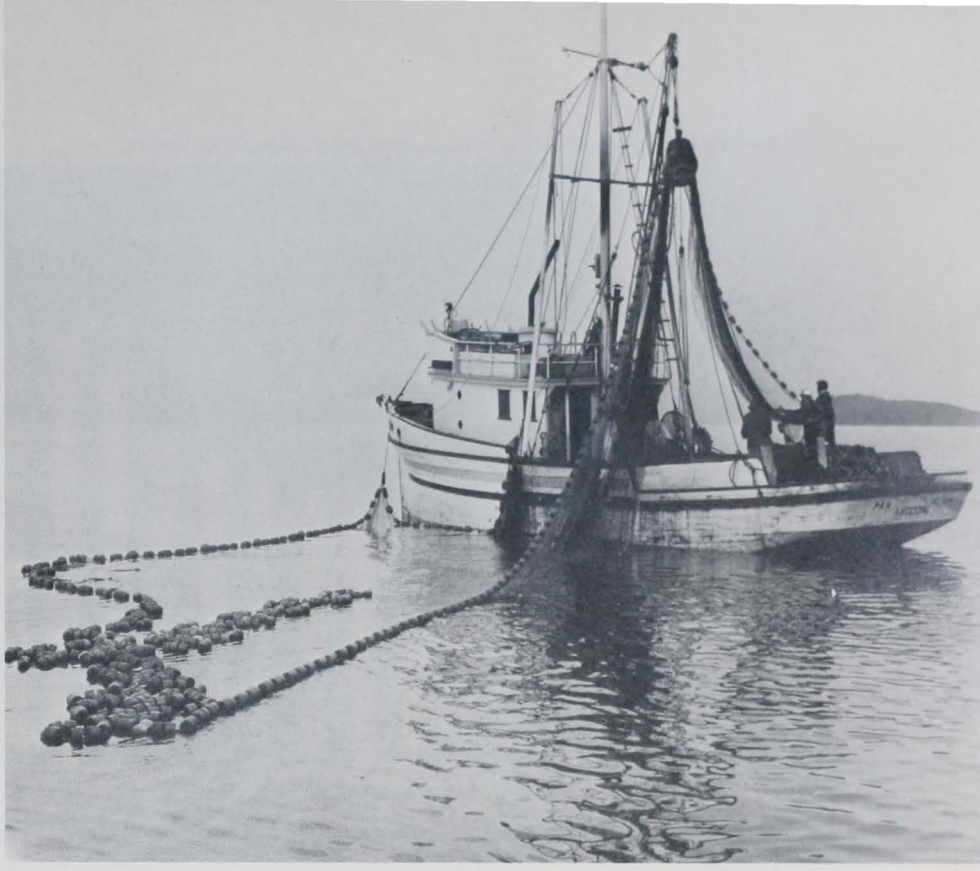

Figure 3.—In the late 1960's, salmon purse seiners earned the highest net profit (16.1 percent) of any of several common types of U.S. fishing vessels. At the bottom were Boston large trawlers (4.3 percent, 1964-66) and New Bedford sea scallop draggers (4.5 percent, 1967-68). (See Table 4.)

Table 4.—Cost rates, as percentage of gross receipts, for different fishing vessels at the harvesting level. (Average of 3 years—1966-68, unless otherwise marked.)

	Gross receipts	Materials fuels, etc.	Labor	Capital costs	Operating expenses	Net profit
1. Boston large trawler (1964-66)	100.0	19.6	47.2	16.6	12.3	4.3
2. New Bedford dragger (1967-68)	100.0	18.6	47.0	18.0	11.3	5.1
3. Rhode Island small trawler (1964)	100.0	16.1	47.1	21.1	7.1	8.6
4. Halibut vessel	100.0	18.5	36.6	21.4	12.0	11.5
5. Salmon troller	100.0	12.5	32.5	31.8	11.1	12.1
6. Salmon purse seiner	100.0	9.8	39.0	21.8	13.2	16.1
7. Tuna purse seiner	100.0	13.2	41.5	25.2	13.1	7.0
8. American lobster inshore boats with traps (1966)—same for blue crab traps[2]	100.0	16.3	43.1	9.8	28.4	6.0
9. Gulf shrimp otter trawler	100.0	13.9	37.6	16.6	25.5	6.4
10. New Bedford sea scallop dragger (1967-68)—same for oyster dragger	100.0	14.5	[3]48.0	15.8	17.2	4.5

[1] Salmon troller earnings and costs for 68 vessels surveyed by the Division in 1968.
[2] *Estimation of the Economic Benefits to Fishermen, Vessels, and Society from Limited Entry to the inshore U.S. Northern Lobster Fishery*, draft manuscript by Frederick Bell, March 1970.
[3] Shucking done on boat.

Source: *Basic Economic Indicators*, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 1970.

Table 5.—Average annual margins of fish products at four market levels, 1969-71.

Products	Harvesting	Processing	Wholesale	Retail
		-Cents per pound-		
Groundfish fillets:				
Fresh:				
Haddock	67.75	22.28	8.69	21.38
Flounder	43.79	26.07	14.80	44.73
Cod	36.93	26.69	9.95	31.60
Frozen:				
Ocean perch	15.87	14.37	9.89	23.64
Steaks:				
Halibut	49.92	25.53	9.35	20.50
King salmon	57.91	37.66	39.50	33.91
King salmon (dressed)	52.17	33.93	35.60	30.53
Canned products:				
Salmon (1963-65)[1]	18.17	21.47	8.58	23.41
Tuna, chunk (1963-65)[2]	24.77	23.85	9.58	15.77
Tuna, chunk (1969-71)	38.81	28.64	11.24	19.04
Fresh shellfish products:				
Live American lobster	77.52	[3]	43.52	26.63
Blue crab meat	56.88	88.34	23.36	65.75
Sea scallop meats	131.60	[4]	13.57	36.74
Frozen shellfish products:				
Peeled shrimp	110.62	49.90	32.87	46.07

[1] Figures not available in later years.
[2] Use the same period to compare with salmon.
[3] Sold live.
[4] Landed shucked.

When price spreads of different periods are compared, the year-to-year changes are ascribed to one or more of the following seven factors: (1) demand and supply, (2) cost of production factors, (3) different profits made by producers and dealers, (4) degree of processing and extent of services, (5) quantity of imports, (6) revaluation of currency, and (7) efficiency of the marketing system.

Precise measurement of the last factor is possible only for individual firms on a case by case basis. Detailed micro data are needed for such a purpose. They were not collected since they are not suitable for the macro analysis of an industry on an aggregate or national basis as the case is in this study.

Individual fish dealers at either the producing or distributing level, however, will have a chance to identify whether there is room for improvement in their performances by examining and comparing the magnitude of their margins, component costs, and profits with those of similar products presented in this report as national averages.

Table 6.—Distribution of consumer's dollar spent in various fish products in the United States according to the average prices of 1969-71, by marketing functions and cost items.

	Fresh haddock fillets	Fresh flounder fillets	Fresh cod fillets	Frozen ocean perch fillets	Halibut steaks (fresh & frozen)	Fresh king salmon steaks	Dressed fresh king salmon	Canned pink salmon[1]	Canned tuna chunk[1]	Canned tuna chunk	Live American lobster	Fresh blue crab meat	Frozen peeled shrimp	Fresh and frozen sea scallop meats
								Cents						
By marketing functions														
Retailing	17.80	34.57	30.04	37.07	19.46	13.70	9.09	32.68	21.31	19.48	18.03	28.05	19.23	20.19
Wholesaling	7.23	11.44	9.46	15.50	8.87	26.26	27.90	11.97	12.95	11.50	29.47	9.96	13.72	7.45
Processing	18.55	20.15	25.37	22.53	24.24	18.20	24.67	29.87	32.24	29.30	[2]	37.69	20.83	[3]
Harvesting	56.41	33.84	35.11	24.88	47.40	41.83	38.31	25.36	33.48	39.71	52.49	24.27	46.19	72.34
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
By cost items														
Profits at 4 levels: Total	5.99	9.61	9.58	13.32	11.38	11.09	11.23	14.64	9.55	9.06	7.73	8.23	10.78	6.91
Retailing	0.29	3.15	2.73	5.55	1.78	1.56	0.82	5.67	1.94	1.57	1.64	2.55	1.75	1.84
Wholesaling	1.76	3.09	2.31	3.79	2.17	3.52	3.75	2.93	3.17	2.81	2.94	2.44	3.15	1.83
Processing	1.51	1.65	2.08	1.85	1.98	1.72	2.02	1.95	2.09	1.90	[2]	1.78	2.92	[3]
Harvesting	2.42	1.72	2.46	2.13	5.45	4.28	4.64	4.09	2.33	2.78	3.15	1.46	2.96	3.25
Materials and fuels	19.75	16.32	18.63	14.48	19.73	19.73	17.96	15.64	18.27	17.78	16.07	16.12	14.44	12.42
Labor	32.28	22.77	24.32	21.24	24.50	24.50	20.20	18.26	22.44	24.24	27.59	29.50	26.00	36.45
Capital costs	14.82	13.29	12.77	14.62	16.13	16.13	17.12	14.36	16.35	17.20	10.25	9.29	14.24	15.52
Operating expenses	27.13	38.01	34.70	36.25	28.23	28.23	33.49	37.06	33.36	31.48	38.22	36.87	34.94	28.67
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[1] 1963-65 average prices are used here since the retail price series of canned pink salmon was discontinued by BLS in 1966. Prices of the same period are used for canned tuna for comparison.
[2] No processing.
[3] Shucked at sea.

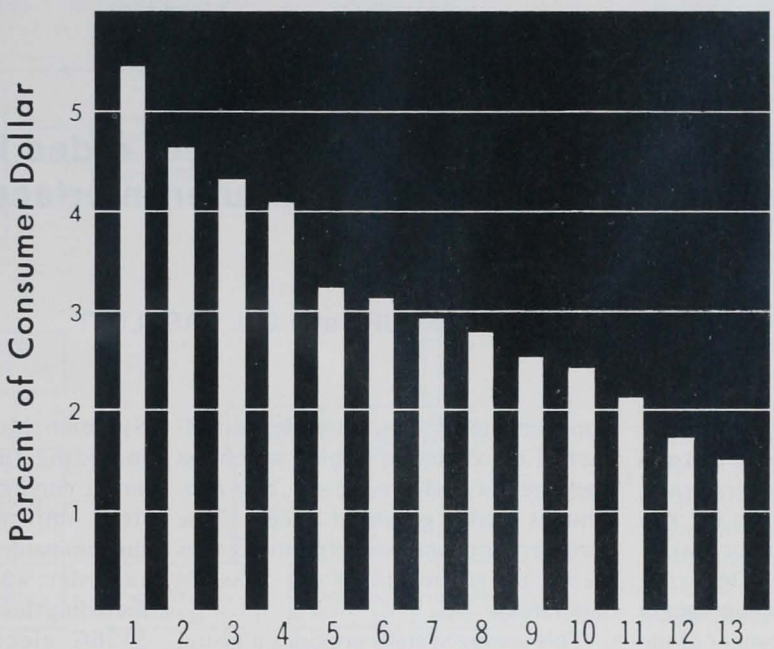

Figure 4.—The percent of the consumer's dollar that went for profits to the fisherman in 1969-1971 ranged from 5.45 for halibut steaks to 1.46 for fresh blue crab meat (see Table 6). 1, halibut steaks (fresh and frozen); 2, dressed fresh king salmon; 3, fresh king salmon steaks; 4, canned pink salmon; 5, fresh and frozen sea scallop meats; 6, live American lobster; 7, fresh peeled shrimp; 8, canned tuna chunk; 9, fresh cod fillets; 10, fresh haddock fillets; 11, frozen ocean perch fillets; 12, fresh flounder fillets; 13, fresh blue crab meat.

LITERATURE CITED

Bell, Frederick. 1971. The measurement and analysis of labor productivity changes in United States fisheries. National Marine Fisheries Service, Economic Research Division, file manuscript #106. p. 107-112, 121-219, 148-151, 152-160, 169-193.

Bureau of Commercial Fisheries, Marketing Division. 1966. Research study concerning potential effects of radiation processing on market supplies of the domestic fishing industry. p. 24-40.

National Commission on Food Marketing. 1966a. The structure of food manufacturing. p. 83.

1966b. Cost components of farm-retail price spreads for foods. p. 5.

U.S. Internal Revenue Service. 1968. Business income-tax returns. 391 p. 1968. Corporate tax returns. 33 p.

U.S. Bureau of the Census. 1967a. Census of business, 416 p. 1967b. Census of manufactures, p. 14-15.

MFR Paper 987. The paper above is from Marine Fisheries Review, *Vol. 35, No. 7. Reprints of this paper, in limited numbers, are available from D83, Technical Information Division, Environmental Science Information Center, NOAA, Washington, DC 20235.*