Alaska Salmon Markets
and Prices

by

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May 1992

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Preface

This report is part of a series of papers and workshops intended to provide information and encourage fishermen and others to work together to improve the salmon market, sponsored by the Alaska Commercial Fishing and Agriculture Bank (CFAB) and the Alaska Department of Commerce and Economic Development, Division of Economic Development. Additional support was provided by the University of Alaska Natural Resources Fund.

My goal in the report is to provide a straightforward description of Alaska’s salmon markets and factors influencing salmon prices, as well as a compilation of basic data about salmon harvests, production, exports, and prices. I hope that the report will provide a useful reference source for those involved in discussions of policy issues facing the Alaska salmon industry.

The report is organized as a series of short chapters illustrated by graphs. A set of data tables on salmon markets and prices are provided at the end of the report, as well as notes on the data sources.

I hope to update and expand this report in the future. I welcome any comments, suggestions or questions which readers may have.

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# Table of Contents

I. Introduction ................................................................. 1

II. Alaska Salmon Harvests .................................................. 3
    Harvest Values ......................................................... 4
    Harvest Prices ......................................................... 6

III. Alaska Salmon Processing .............................................. 7
    Production Volume and Value ......................................... 7
    Production Yields ..................................................... 10
    Production Prices ..................................................... 10
    Average Processing Margins .......................................... 11
    Salmon Roe Production and Prices .................................. 13

IV. Alaska Salmon Markets ................................................ 15
    Alaska and U.S. Salmon Harvests .................................... 15
    U.S. Salmon Products and Markets .................................. 15
    Salmon Exports ....................................................... 16

V. World Salmon Supply ................................................... 19
    World Salmon Markets ................................................. 21

VI. Factors Affecting Salmon Prices ..................................... 25
    Adjusting Prices for Inflation ....................................... 25
    Supply and Demand .................................................... 26
    Harvest Price Volatility .............................................. 26

Factors Affecting Salmon Demand ....................................... 27
    Exchange Rates ....................................................... 27
    Prices of Competing Products ....................................... 28
    Consumer Incomes ..................................................... 29
    Population ............................................................. 29
    Consumer Tastes ....................................................... 29
    Quality ................................................................. 31
    Marketing .............................................................. 31

Factors Affecting Salmon Supply ........................................ 31
    Increasing Price-Responsiveness of Salmon Supply .............. 32
    Harvest Expectations ................................................ 33
    Inventories ............................................................ 34

Markups from Harvest to Retail Prices ................................ 35
    Factors Affecting Costs .............................................. 37
    Regional Price Differences .......................................... 38
    Organized Bargaining ................................................ 38
VII. The Boom and Bust in Sockeye Salmon Prices ......................... 39

VIII. Future Alaska Salmon Markets and Prices ............................. 45
   Farmed Salmon Costs ............................................. 46
   Strategies for the Alaska Salmon Industry .......................... 47

References .............................................................. 49

Appendix ................................................................. A-1
   Data Notes .......................................................... A-4
   Data Tables ......................................................... A-13
List of Figures

Figure 1  Average Harvest Prices, Alaska Sockeye and Pink Salmon, 1980-1991 . . . 1
Figure 2  Alaska Salmon Harvest Volumes, 1980-1991 ................................. 3
Figure 3  Percent of Alaska Salmon Harvest Volume and Value, by Species, 1980-1991 ................................. 4
Figure 4  Alaska Salmon Harvest Value, 1980-1991 ................................. 5
Figure 5  Volume and Value of Alaska Salmon Harvests, 1980-1991 ........... 5
Figure 6  Alaska Salmon Average Harvest Prices, 1980-1991 ....................... 6
Figure 7  Total Salmon Harvest and Production Volume, 1984-1990 ........... 7
Figure 8  Share of Frozen Salmon in Total Salmon Production, 1984-1990 ....... 8
Figure 9  Alaska Frozen Salmon Production, 1984-1990 ............................ 8
Figure 10 Value of Alaska Frozen Salmon Production, 1984-1990 ................... 9
Figure 11 Alaska Canned Salmon Production, 1984-1990 ............................ 9
Figure 12 Average Production Prices for Alaska Salmon, 1984-1990 ............ 10
Figure 13 Average Sockeye Salmon Harvest and Production Prices, 1984-1990 .... 12
Figure 14 Average Pink Salmon Harvest and Production Prices, 1984-1990 ...... 12
Figure 15 Average Processing Margins for Sockeye and Pink Salmon, 1984-1990 . 12
Figure 16 Alaska Salmon Roe Production, 1984-1990 ............................... 14
Figure 17 Average Production Prices for Alaska Salmon Roe, 1984-1990 .... 14
Figure 18 Alaska Salmon Harvests as Percent of Total U.S. Harvests, 1986-1990 ............ 15
Figure 19 Share of U.S. Salmon Production by Species, Product, and Market .... 16
Figure 20 Share of U.S. Salmon Production by Product, Market, and Species .. 16
Figure 21 Average U.S. Salmon Production by Product, Market, and Species . 16
Figure 39  Japanese Salmon Supply and Consumption, 1975-1990 ............... 38
Figure 40  Japanese Salmon Imports, by Country, 1981, 1986 & 1991 ........... 39
Figure 41  Salmon Wholesale Prices at Tokyo Central Wholesale Markets, in Yen/Kilogram .................................. 40
Figure 42  Prices for Alaska Sockeye Salmon, 1980-1991, in Dollars per Round Pound .......................................................... 41
Figure 43  Estimated Japanese Salmon Inventory, 1988-1991 .................... 41
Figure 44  Retail Price of Frozen Sockeye in Fifteen Japanese Cities, July 1991 ... 42
Figure 45  Average Seattle Wholesale Prices for Selected Fresh Salmon Products, July-September, 1991 .................................. 44
List of Appendix Data Tables

Table 1  Alaska salmon harvest volume, value and prices, 1980-1991 ........... A-13
Table 2  Estimated Alaska harvests of enhanced salmon .................... A-14
Table 3  Alaska salmon production volume, by species, 1984-1990 .......... A-15
Table 4  Alaska salmon production value, by species, 1984-1990 .......... A-16
Table 5  Share of Alaska salmon production volume, by product, 1984-1990 ...... A-17
Table 6  Alaska salmon average production prices, by species, 1984-1990 ...... A-18
Table 7  Average processing margins for Alaska salmon, 1984-1990 ........ A-19
Table 8  Estimated salmon processing yields, by species and product .......... A-20
Table 9  Alaska salmon roe production volume and value, 1984-1990 .......... A-21
Table 10  Comparison of Alaska and U.S. salmon harvest volumes, 1986-1990 .. A-22
Table 11  Estimated average U.S. salmon production by product, market and species, 1986-1990 . A-23
Table 12  Distribution of U.S. salmon production by product, market and species, 1986-1990 .................. A-24
Table 13  Volume, value and average price of salmon exported from the United States, 1986-1990 ................ A-25
Table 14  Volume and value of salmon exported directly from Alaska, 1986-1990 .................. A-26
Table 15  U.S. exports of fresh and frozen salmon by country and destination, 1986-1990 .................. A-27
Table 16  U.S. salmon exports to Japan, 1986-1990 .......................... A-28
Table 17  U.S. exports of domestic canned salmon, by country of destination, 1986-1990 .................. A-29
Table 18  World harvests of wild salmon, by country and species, 1986-1990 (thousand mt) .......... A-30
Table 19  World harvests of wild salmon, by species and country, 1986-1987 (thousand mt) .......... A-31
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 20</td>
<td>World production of farmed salmon, by country, 1986-1990 (thousand mt)</td>
<td>A-32</td>
</tr>
<tr>
<td>Table 21</td>
<td>World salmon supply, 1986-1990 (thousand mt)</td>
<td>A-33</td>
</tr>
<tr>
<td>Table 22</td>
<td>Estimated 1989 salmon harvests, production, exports, imports and consumption, by country (thousand metric tons)</td>
<td>A-34</td>
</tr>
<tr>
<td>Table 23</td>
<td>Nominal and real harvest prices for Alaska salmon, 1980-1991</td>
<td>A-36</td>
</tr>
<tr>
<td>Table 24</td>
<td>Dollar exchange rates for selected salmon producing and consuming countries</td>
<td>A-37</td>
</tr>
<tr>
<td>Table 25</td>
<td>Per capita income and population in selected Alaska salmon markets, 1980-1988</td>
<td>A-38</td>
</tr>
<tr>
<td>Table 26</td>
<td>Annual per capita consumption of fish and other products, selected countries (pounds per capita)</td>
<td>A-39</td>
</tr>
<tr>
<td>Table 27</td>
<td>U.S. annual per capita consumption of selected fish products (pounds)</td>
<td>A-40</td>
</tr>
<tr>
<td>Table 28</td>
<td>Estimated annual per capita consumption of salmon in the United States and Japan (pounds)</td>
<td>A-41</td>
</tr>
<tr>
<td>Table 29</td>
<td>Alaska statewide historic catch and projected catch, by species, 1970-1992 (thousands of fish)</td>
<td>A-42</td>
</tr>
<tr>
<td>Table 30</td>
<td>U.S. carryover inventory, new supply, and shipments of canned salmon, 1985-86 through 1990-91 (cases)</td>
<td>A-43</td>
</tr>
<tr>
<td>Table 31</td>
<td>Approximate costs and prices in the production and distribution of canned pink salmon, 1991</td>
<td>A-44</td>
</tr>
<tr>
<td>Table 32</td>
<td>Estimated harvest prices for sockeye salmon harvested in gill nets at selected Alaska ports, week ending July 28, 1990</td>
<td>A-45</td>
</tr>
<tr>
<td>Table 33</td>
<td>Japanese salmon supply and consumption, 1975-1990 (metric tons)</td>
<td>A-46</td>
</tr>
<tr>
<td>Table 34</td>
<td>Japanese salmon supply and consumption, May-April, 1986-87 through 1991-92 (metric tons)</td>
<td>A-47</td>
</tr>
<tr>
<td>Table 35</td>
<td>Japanese domestic salmon harvests and salmon imports, May-April, 1986-87 through 1991-92 (metric tons)</td>
<td>A-48</td>
</tr>
</tbody>
</table>
Table 36  Japanese salmon imports, by product and country, January through November, 1990 and 1991 .......................... A-49


Table 38  Volume of salmon sold at Tokyo central wholesale markets, by species and product, 1981-1991 (metric tons) ............................... A-51

Table 39  Price of salmon sold at Tokyo central wholesale markets, by species and product (yen/kilogram) ............................... A-52

Table 40  Price of salmon sold at Tokyo central wholesale markets, by species and product, 1981-1991 ............................... A-53

Table 41  Estimated Japanese salmon inventory, by month, 1988-1991 (metric tons) ............................... A-54

Table 42  Retail price of frozen sockeye salmon in fifteen Japanese cities (frozen sliced salmon, yen per hundred kilograms) ............................... A-56

Table 43  Average Seattle wholesale prices for selected fresh salmon products, weeks 29 through 38 (July-September), 1986 - 1991 ............................... A-57
I. INTRODUCTION

Since 1988, Alaska salmon fishermen have watched the bottom drop out of salmon prices. Between 1988 and 1991, the average price Alaska fishermen received for sockeye salmon fell from $2.35 per pound to $.77 per pound, and the average price of pink salmon fell from 79 cents per pound to 13 cents per pound. The bust in salmon prices followed an equally dramatic boom in prices between 1985 and 1988.

Figure 1: Average Harvest Prices, Alaska Sockeye and Pink Salmon, 1980-1991

What caused the boom and bust in salmon prices, and what lies ahead for the Alaska salmon industry? This report addresses these questions, and provides basic data needed for informed discussion of policy issues related to salmon prices and markets.

The report is organized in short chapters illustrated by graphs. Data tables on salmon markets and prices are provided at the end of the report, as well as notes on the data sources. All of the graphs used in the report are based on data provided in the tables.


This report is only an introduction to the complicated subject of salmon markets and prices. The salmon industry is diverse and is changing rapidly. There are substantial differences in salmon harvesting, processing, and marketing between species and regions. The farther along the distribution chain from harvest to retail sale, the greater the variety of product forms, distribution channels, market outlets, and prices. This report presents...
average data for salmon prices and other factors. Readers should keep in mind that the report provides an overview picture of salmon markets and prices, but does not necessarily describe the situation faced by specific individuals or companies.

In many cases, fisheries data from different sources are inconsistent. Data for recent years are usually preliminary and are sometimes "best guess" estimates. The data presented in the report are the best available at this time; however readers should be aware that data from other sources may differ (usually only slightly) and that better data are likely to become available over time. Finally, even the best data may not always be completely accurate. The data notes includes a discussion of data sources used for the report.
II. ALASKA SALMON HARVESTS

The major species of salmon harvested in Alaska are chinook (king), sockeye (red), coho (silver), pink (humpback or humpy), and chum (dog). From 1980 through 1991, annual Alaska salmon harvests averaged about 615 million pounds.

Pink and sockeye salmon accounted for the largest shares of salmon harvests by weight. Pink salmon made up 41 percent of harvests, sockeye 38 percent, chum 14 percent, coho 6 percent, and chinook 2 percent.

There are significant year-to-year fluctuations in salmon harvests. Harvests were only 509 million pounds in 1987, compared with more than 700 million pounds in 1991. Fluctuations in total harvests reflect fluctuations in harvests of individual species. For example, pink salmon harvests were only 165 million pounds in 1987, compared with 349 million pounds in 1991. However, harvests of chinook and chum salmon were lower in 1991 than in 1987.

Bristol Bay and southeast Alaska each account for about one-quarter of Alaska salmon harvests. Other regions include Prince William Sound (16 percent), Alaska Peninsula/Aleutians (13 percent), Kodiak (9 percent), Cook Inlet (7 percent), and Northwest/Interior (4 percent).

The regional distribution of harvests varies greatly between years. For example, in 1989, southeast Alaska accounted for 37 percent of the total salmon harvest, compared with only 17 percent in 1988.
The regional distribution of harvests varies by species. Usually, Bristol Bay accounts for more than half of sockeye salmon harvests, while fisheries in southeast account for the largest share of harvests of the other four species. However, regional harvests very substantially from year to year. For example, the 1988 southeast pink salmon harvest was only 36 million pounds, compared with 208 million pounds in 1989.

Hatcheries account for an increasing share of total Alaska salmon harvests. Hatchery salmon grew from 8 percent of the total fish harvested in 1986 to 29 percent in 1990, or 23 percent of harvest volume measured in pounds. Hatcheries accounted for an estimated 45 percent of the 1990 harvest of pink salmon.

Harvest Values

From 1980 through 1991, the annual ex-vessel value of total Alaska salmon harvests averaged $434 million. Harvest values rose sharply in the second half of the decade, from $387 million in 1985 to $781 million in 1988, and then declined to $312 million in 1991. The crash in salmon prices between 1988 and 1991 resulted in a 1991 harvest value only two-fifths that of 1988, even though the harvest volume was a third higher.

Sockeye accounted for almost three-fifths (59 percent) of the total value of salmon harvested between 1980 and 1991. Pink salmon accounted for 19 percent of the total harvest value during this period. Even though the average pink salmon harvest volume was greater than that of sockeye salmon, the average price per pound for sockeyes was more than three times as high as the average price per pound for pinks.
Figure 4: Alaska Salmon Harvest Value, 1980-1991

Figure 5: Volume and Value of Alaska Salmon Harvests, 1980-1991

(millions of lbs, $)

Volume

Value

Peak
$781
535

$312
Harvest Prices

During the period 1980-91, chinook salmon commanded the highest average price per pound ($1.70), followed by sockeye ($1.11), coho ($.94), chum ($.45) and pink ($.32).

The crash in salmon prices has been most severe for Alaska’s two most important salmon species: sockeyes and pinks. Prices for all salmon species rose dramatically between 1986 and 1988, and then fell to about 1986 levels in 1989. For the two most important species, sockeye and pink salmon, prices fell slightly in 1990 and then sharply in 1991. Trends were different for chinook, coho, and chum salmon: for these species, prices rose in 1990, and in 1991 fell sharply for coho and chum but remained about the same for chinook.
III. ALASKA SALMON PROCESSING

Production Volume and Value

Most salmon harvested in Alaska, after sale by fishermen to processors, is either frozen or canned. In 1990, frozen salmon accounted for 59 percent of production volume and canned salmon accounted for 37 percent. Fresh salmon and other products (such as smoked salmon) accounted for only a small share of production volume.

Figure 7: Total Salmon Harvest and Production Volume, 1984-1990

The allocation of production between frozen, canned and other forms of production varies widely between species. Almost all chinook, chum, and coho salmon production is frozen or fresh. Only pink and sockeye salmon are canned in significant volumes. In 1990, about 77 percent of pink salmon production and 18 percent of sockeye salmon production was canned.

The share of frozen salmon in production increased between 1984 and 1988, but fell in 1989. This trend is correlated with the trend in average production prices of frozen salmon. However other factors, including run size, canned salmon prices, and relative costs in canning and processing probably also affect processors' allocation of salmon between frozen and canned production.

The volume of Alaska frozen salmon production remained fairly steady during the late 1980s. Sockeye accounted for more than half of frozen production volume in most years. Sockeye made up more than 62 percent of frozen salmon production in 1990.
Figure 8: Share of Frozen Salmon in Total Salmon Production, 1984-1990

Figure 9: Alaska Frozen Salmon Production, 1984-1990
Because of rising prices, the value of frozen salmon production rose dramatically between 1984 and 1988. Then, with falling prices, the value fell sharply in 1989 and 1990. Sockeye accounted for an even larger share of frozen salmon production value than of volume; this share was 74 percent in 1990.

Figure 10: Value of Alaska Frozen Salmon Production, 1984-1990

The trend toward canning a smaller share combined with declining total harvests to produce a dramatic drop in Alaska canned salmon production between 1984 and 1988. However, canned production was sharply higher in 1989. Pink salmon accounted for 75 percent of canned production volume and 62 percent of canned production value in 1990.

Figure 11: Alaska Canned Salmon Production, 1984-1990
Production Yields

*Total processed weight is only about two-thirds of harvest weight.* Parts of the fish, such as the heads and entrails, are usually discarded in production. There is water loss after harvest. Some fish spoil or for other reasons are never processed.

The percentage of original weight remaining after processing is known as the *yield*. Yields in processing vary significantly depending upon product, fish size, species, fish condition, handling, and other factors. Average yields for headed and gutted salmon (the form in which most salmon are frozen) are usually in the range of 70-80 percent. Average yields for canned salmon are usually in the range of 55-70 percent. The analysis in the rest of this chapter assumes average yields of 74 percent for frozen salmon and 65 percent for canned salmon.

Production Prices

"Production price" refers to the average value per pound of production, calculated as total value divided by total volume. An alternative term is "primary wholesale price."

*Trends in production prices were similar to trends in harvest prices, peaking in 1988 and falling sharply in 1989.* For frozen salmon, production prices tended to be highest for chinook salmon ($3.24/lb in 1990), followed by sockeye ($2.45), coho ($2.26), chum ($1.23), and pink ($0.79). Average 1990 prices for canned sockeye salmon ($3.38 per pound) were much higher than for pink salmon ($1.73 per pound).

Figure 12: Average Production Prices for Alaska Salmon, 1984-1990

![Graph showing average production prices for Alaska Salmon from 1984 to 1990.](Image)
Average Processing Margins

Many people are interested in the markup in salmon prices between the harvest level and the processor, wholesale and retail levels in the salmon distribution chain. Making meaningful comparisons between prices at these different levels is complicated by several factors.

First, harvest prices are usually expressed in dollars per harvested (round) pound, while production prices are usually expressed in dollars per processed pound. In order to compare trends in harvest and production prices, both prices should be expressed in the same units. Prices may be converted using these formulas:

\[
\text{(price/round pound)} = \text{(price/processed pound) x (yield)}
\]

\[
\text{(price/processed pound)} = \frac{\text{(price/round pound)}}{(yield)}
\]

For example, suppose that the price of frozen salmon is $2.00 per processed pound, and the yield in freezing is 74 percent. The price per round pound is $2.00 x .74 = $1.48. For every pound of processed fish sold, the processor receives $2.00, but for every pound of fish purchased in the round, processed with a yield of 74 percent, and then sold, the processor receives only $1.48.

Second, salmon sold by a fisherman to a processor may be processed into several different products, including frozen salmon, canned salmon, and roe. There are different markups, reflecting different processing costs, for each product.

I use the term "average processing margin" to refer to the difference between average production price and average harvest price, both expressed in dollars per round pound. (Margin is not the same as profit. To calculate profit, we would have to subtract other production costs besides raw fish from production margins—such as labor, packaging, energy, water and overhead.)

As shown in Figures 13 and 14, trends in production prices for sockeye and pink salmon were similar to trends in harvest prices. As shown in Figure 15, average processing margins were highest in 1988—when harvest and production prices were highest—and declined in 1989 and 1990. The crash in salmon prices after 1988 did not result from higher processing margins. Instead, both harvest prices and processing margins have declined since 1988.
Figure 13: Average Sockeye Salmon Harvest and Production Prices, 1984-1990 ($/round pound)

![Graph showing average Sockeye Salmon harvest and production prices, 1984-1990.](image)

Note: Production prices are converted to $/round pound assuming yields of 74% for frozen and 65% for canned.

Figure 14: Alaska Pink Salmon Harvest and Production Prices, 1984-1990 ($/round pound)

![Graph showing Alaska Pink Salmon harvest and production prices, 1984-1990.](image)

Note: Production prices are converted to $/round pound assuming yields of 74% for frozen and 65% for canned.
Salmon Roe Production and Prices

Total Alaska salmon roe production was almost constant between 1986 and 1990, at about 14 million pounds, despite fluctuations in total salmon harvests and production. Salmon roe production was usually between 2 percent and 3 percent of total harvest volume, and between 3 percent and 4 percent of total production volume. Salmon roe accounted for between 5 percent and 7 percent of total production value.

Salmon roe did not experience the boom and bust in production prices experienced by other salmon products between 1984 and 1990. Salmon roe production prices rose steadily over this period from about $3.00 per pound to about $4.50 per pound.

Accounting for the value of salmon roe production increases the average processing margin per round pound. Put differently, if a processor extracts roe from a fish and then freezes the fish, the processor receives income both from selling the frozen fish and from selling the roe.

The increase in processing margin depends upon the average roe yield, which may vary widely. Although salmon roe processing yields range between 3 percent and 10 percent of harvest weight, the average yield for all Alaska salmon production in 1990 was about 2 percent—which suggests that not all salmon roe are processed.

Data are not available by species on roe production and yields. Applying the average 1990 roe yield of 2 percent of harvest volume to a roe production price of $4.50 per pound results in average roe production value per round pound of $4.50 x 2 percent = $.09, which would be about 15 percent of the 1990 average processing margin for sockeye salmon. For regions or species with higher roe yields, the contribution of roe to the processing margin would be higher. For example, a roe yield of 5 percent would result in average roe production value per round pound of $4.50 x 5 percent = $.22.
Figure 16: Alaska Salmon Roe Production, 1984-1990 (million lbs)

Figure 17: Average Production Prices for Alaska Salmon Roe, 1984-1990 ($/lb)
IV. ALASKA SALMON MARKETS

Alaska and U.S. Salmon Harvests

Relatively few data are collected on markets for Alaska salmon. However, since Alaska salmon constitute a very large percentage of U.S. harvests, data on U.S. salmon markets provide a good indication of Alaska’s markets.

*Alaska accounted for 91 percent of total U.S. salmon harvests between 1986 and 1990.* Alaska accounted for 96 percent of pink harvests, 96 percent of sockeye harvests, and 92 percent of chum harvests. For these species, Alaska’s markets were essentially identical to U.S. markets.

![Figure 18: Alaska Salmon Harvests as % of Total U.S. Harvests, 1986-1990](image)

U.S. Salmon Products and Markets

*Fresh/frozen exports account for more than 80 percent of sockeye production.* Fresh/frozen exports account for progressively smaller shares of production of coho (73 percent), chum (61 percent), chinook (32 percent), and pink (25 percent). For these species, smaller shares of fresh/frozen exports are offset by larger shares for fresh/frozen domestic consumption, with the exception of pink salmon. *Nearly half of pink salmon production is canned salmon for domestic consumption.*

*Sockeye salmon account for more than half of U.S. fresh/frozen exports. However, sockeye salmon accounts for the smallest share of fresh/frozen production consumed domestically.*
Salmon Exports

Because Alaska accounts for an overwhelming share of U.S. salmon harvests, U.S. salmon exports are largely exports of Alaska salmon. *About four-fifths of U.S. exports of fresh/frozen salmon go to Japan.* Much smaller volumes go to Canada, France, and the United Kingdom.
In most years, sockeye account for more than two-thirds of U.S. fresh/frozen exports to Japan. Almost all sockeye fresh/frozen exports go to Japan. Only about three-quarters of chinook exports and about half of chum, coho and pink exports go to Japan.

The United Kingdom accounts for about half of U.S. canned salmon exports, followed by Canada, Australia, and the Netherlands.
Figure 23: Share of Exports to Japan in U.S. Fresh/Frozen Salmon Exports, 1986-1990

- Sockeye: 96%
- Chinook: 79%
- Coho: 60%
- Pink: 56%
- Chum: 55%

Figure 24: Share of U.S. Exports of Canned Salmon, by Country, 1986-1990

- United Kingdom: 54%
- Australia: 16%
- Canada: 15%
- Netherlands: 9%
- All other: 6%
V. WORLD SALMON SUPPLY

World salmon supply consists of both wild salmon (including natural and ocean-ranched) and farmed salmon, which are raised entirely in pens. Alaska salmon are all wild, and make up about 90 percent of the U.S. harvest of wild salmon.

*The world supply of salmon almost doubled between 1980 and 1990.* In one decade, total supply grew from 574 thousand metric tons to 1035 thousand metric tons (one metric ton equals 2,204.6 pounds).

![Figure 25: World Salmon Supply, 1980-1990](image)

World harvests of wild salmon increased by 35 percent between 1980 and 1990. Increasing harvests of hatchery or ranched salmon in Alaska and in Japan played a major role in the growth of wild (non-farmed) harvests.

*The major suppliers of wild salmon are the United States, Canada, the Soviet Union, and Japan.* Most Alaska harvests are sockeye and pink salmon. In contrast, more than four-fifths of Japanese harvests are chum salmon. By far the largest share of Russian harvests are pink salmon.

Farmed salmon production increased from 6 thousand metric tons in 1980 to 258 thousand metric tons in 1990--a volume close to the total Alaska harvest and one-quarter of world supply. The rapid growth in farmed salmon production caused Alaska’s share in world salmon supply to fall from 40 percent to 31 percent.
Figure 26: Wild Salmon Harvests by Country and Species, 1987

Figure 27: Farmed Salmon Production, 1986-1990
Norway produces about half of the world's farmed salmon. Production is expanding rapidly in other countries, including Scotland, Japan, Canada and Chile. Most farmed salmon are Atlantic salmon, although farming of Pacific salmon, in particular coho and chinook, is gaining ground in British Columbia and Chile.

Europe is the largest market for farmed salmon, but exports to the United States are growing steadily. Chile and Norway are also exporting more and more farmed fish to Japan.

The crash in salmon prices has taken its toll on salmon farming, and many salmon farms are in financial difficulty. Until salmon prices rise, the rate of growth in farmed production is likely to slow significantly in higher-cost areas such as Norway and Canada. But farmed production is continuing to grow rapidly in lower-cost areas such as Chile.

World Salmon Markets

Figures 28-31 illustrate approximate 1989 world production and consumption of fresh/frozen and canned salmon by major salmon producing regions (precise data are not available).

In 1989, the United States and Japan both produced about one-third of the world supply of fresh and frozen salmon, and salmon farming countries produced about one-fourth. Although total U.S. harvests are significantly higher than Japan's, a significant part of the U.S. harvest is canned, while very little of the Japanese harvest is canned.

Japan is by far the world's largest market for fresh/frozen salmon. Japan consumes not only all of its own fresh and frozen production, but also a large share of United States and Canadian production. In 1989, Japan consumed about three-fifths of world production of fresh and frozen salmon. Europe consumed about one-fifth of world fresh and frozen salmon, while the United States consumed only about one-eighth.

Russia and the United States are the world's major producers of canned salmon, followed by Canada. Most Russian salmon is consumed domestically. The United States and Canada both export part of their canned salmon production. In 1989, other countries (primarily in Europe) consumed about one-tenth of world canned salmon production.
Figure 28: Approximate World Production of Fresh/Frozen Salmon
in 1989, by Producing Region

(thousand metric tons)

- Consumed elsewhere (mostly Europe)
- Consumed in USSR
- Consumed in Japan
- Consumed in Canada
- Consumed in USA

Canadian consumption of Canadian salmon is underestimated (see Table 22).

Figure 29: Approximate World Production of Fresh/Frozen Salmon
in 1989, by Consuming Region

(thousand metric tons)

- Produced in salmon farming countries
- Produced in USSR
- Produced in Japan
- Consumed in Canada
- Consumed in USA

Canadian consumption of Canadian salmon is underestimated (see Table 22).
Figure 30: Approximate World Production of Canned Salmon in 1989, by Producing Region

Note: USSR figure is based on assumption that most salmon are canned for domestic consumption; figure may be significant overestimate.

- Consumed elsewhere (mostly Europe)
- Consumed in USSR
- Consumed in Japan
- Consumed in Canada
- Consumed in USA

Produced in USA: 89
Produced in Canada: 30
Produced in Japan: 7
Produced in USSR: 117
Produced in salmon farming countries: 0

Figure 31: Approximate World Production of Canned Salmon in 1989, by Consuming Region

Note: USSR figure is based on assumption that most salmon are canned for domestic consumption; figure may be a significant overestimate.

- Consumed elsewhere (mostly Europe)
- Consumed in USSR
- Consumed in Japan
- Consumed in Canada
- Consumed in USA

Consumed in USA: 72
Consumed in Canada: 25
Consumed in Japan: 7
Consumed in USSR: 112
Consumed elsewhere (mostly Europe): 27
VI. FACTORS AFFECTING SALMON PRICES

Many different factors affect salmon prices. This chapter provides a general introduction to what determines salmon prices, and why they change over time.

Adjusting Prices for Inflation

*Harvest prices have declined faster—or not risen as rapidly—if we take into account the effects of inflation.* Even if harvest prices don’t change, the purchasing power of what fishermen are paid for fish is reduced by inflation. Economists distinguish between the *nominal* price which fishermen are paid and the *real* price, which takes into account the effects of inflation. Real prices are expressed in dollars of a particular year.

Expressed in nominal dollars, sockeye salmon harvest prices rose between 1980 and 1991 from $.59 per pound to $.77 per pound. But because U.S. consumer prices rose by 67 percent over this period, the real price of sockeye salmon (expressed in 1980 U.S. dollars) fell to $.46 per pound.

![Figure 32: Nominal and Real Harvest Prices for Sockeye and Pink Salmon, 1980-1991 (real prices in 1980 dollars)](image)

Adjusting for inflation can be confusing because inflation rates differ between regions and for different parts of the economy. For example, Alaska consumer prices only rose by about 47 percent between 1980 and 1991, compared with 67 percent for the United States as a whole. Different adjustments for inflation are appropriate for different purposes. For this reason, the prices given in this report are nominal prices. Adjusting for inflation is less important for describing or explaining price changes over short periods of time.
Supply and Demand

Salmon prices are determined largely by supply and demand. Demand is the amount of a salmon product buyers want to buy. Demand is affected partly by the price of the product, but also by other factors such as consumers' incomes and tastes, and the prices of competing products such as tuna, chicken, or other salmon products. Supply is the amount of a salmon product sellers want to sell. Supply is determined partly by the price of the product, but also by other factors such as natural salmon runs, hatchery returns, and the relative costs of producing different products and delivering them to different locations.

Prices adjust to the levels needed to balance supply and demand. Prices balance the supply of each salmon product in each location with the demand for that product in that location, at each level of the distribution chain from harvest to retail sale.

If buyers want more of a salmon product than is being offered for sale, they usually bid up the price. This helps to balance supply with demand, because at a higher price buyers usually demand less and sellers are usually willing to supply more. If sellers are offering more of a salmon product than buyers want, they usually lower the price. This helps to balance supply with demand, because at a lower price buyers usually demand more and sellers are usually willing to supply less.

As other factors besides price which affect supply or demand change, prices keep changing in order to keep supply balanced with demand. Later sections of this chapter discuss how a number of different factors affect supply or demand and in turn price. These sections discuss how each factor alone would affect fisheries prices, assuming all other factors stayed the same. Actual prices depend on the combined effects of many different factors, some of which may tend to raise prices at the same time that others tend to depress prices.

Harvest Price Volatility

Salmon harvest prices are determined from the top down. The retail price can't be above a level at which consumers will buy. At each stage of the purchasing chain from retailers to processors, buyers must offer a lower price to cover costs and profits. Subtracting the mark-ups or margins at each stage determines how much money is left over to pay fishermen. Salmon harvest prices are also determined from the bottom up, in the sense that the harvest price can't be lower than fishermen are willing to fish for. But as long as prices don't significantly affect the harvest--as long as fishermen are willing to keep fishing--prices are mainly determined from the top down.

Fishermen are affected most by price booms and busts, because they are at the bottom of the price chain. If prices all change by the same dollar amount at the retail, wholesale, processor and harvest levels, the percentage change in prices will be highest at the harvest level, because harvest prices are smaller. For example, suppose that the retail price is $3 per pound, the wholesale price is $2 per pound, and the harvest price is $1 per pound. If prices at each level increase by $1 (so that mark-ups remain constant), the $1 increase represents a 33 percent increase at the retail level, but it represents a 100 percent increase
at the harvest level. If prices at each level decrease by 60 cents, this would represent only a 20 percent decline in the retail price, but a 60 percent decline in the harvest price.

**Even if markups do not change, fishermen's share of the retail price changes as prices go up and down.** In the example above, if prices at each level rise by $1 per pound, the harvest price will increase from 33 percent of the retail price to 50 percent of the retail price. If prices at each level fall by 60 cents, the harvest price will fall from 33 percent of the retail price to 17 percent of the retail price.

**In sensivity of supply to price tends to increase the volatility of salmon prices.** In any given year, the amount of wild salmon which fishermen catch and sell to processors is not greatly affected by price. Although fishermen may love high prices and hate low prices, but what they supply depends mainly on the size of the run, rather than harvest prices. If the supply of salmon by fishermen were more sensitive to harvest prices--if fishermen harvested less when prices were low--this would keep prices from falling as much in high harvest years, and from rising as much in low harvest years.

**Factors Affecting Salmon Demand**

Many different factors affect the demand for salmon. These include--to name a few--exchange rates, prices of competing products, consumer incomes, population, and consumer tastes. Factors which increase demand tend to cause prices to rise; factors which decrease demand tend to cause prices to fall.

**Exchange rates**

Changes in the value of foreign countries' currencies relative to the U.S. dollar, or exchange rates, can sharply affect demand for salmon. Many factors having little to do with the seafood industry, such as international trade balances and monetary policies, cause exchange rates to fluctuate. Changing exchange rates change the relative purchasing power of each country's currency in the other country (although these effects may be partly offset by different rates of inflation).

Changes in the exchange rate between the dollar and currencies of countries which import Alaska salmon, such as Japan, affect the demand for salmon. Between 1985 and 1988 the value of the Japanese yen relative to the U.S. dollar increased by 86 percent. In 1984, 2374 yen were worth $10, but in 1988 2374 yen were worth $18.60. For the same number of yen, a Japanese buyer who paid $10 for a salmon in 1984 could pay $18.60 in 1988. This was one of the factors which helped to drive up prices of Alaska salmon exported to Japan during this period.

Changes in exchange rates also affect the ability of other countries to compete with Alaska in supplying fish to world markets. For example, exchange rates between the dollar and the Norwegian krone affect the relative competitiveness of Norwegian and Alaska salmon in international salmon markets. Between 1980 and 1985, the value of the krone was falling relative to the dollar, making Norwegian salmon more competitive in European markets. Since 1985, the value of the krone relative to the dollar has risen gradually.
Prices of Competing Products

Prices of competing products can have an important effect on demand for salmon products. If prices of competing products rise, demand for salmon may rise, as people switch from buying those products to buying salmon. If prices of competing products fall, demand for salmon may fall.

Many products compete with salmon. These include other protein sources such as poultry, other fish, and other species of salmon. The higher the substitutability between salmon and other products—the more willing consumers are to shift between salmon and other products in response to relative price changes—the more their prices tend to move together. For example, fresh coho salmon and fresh sockeye salmon are considered fairly close substitutes; while fresh coho salmon and canned pink salmon are not close substitutes. As a result, prices for fresh sockeye salmon track more closely with prices for fresh coho salmon than with prices for canned pink salmon.

Long-term substitutability between products is greater than short term substitutability, because it takes time for consumers to become aware of substitute products and for suppliers of substitutes to penetrate new markets. This is important in understanding the impacts of increasing world production of farmed salmon on Alaska salmon harvest prices. Over time, farmed salmon has begun to compete with Alaska salmon in more markets and has had greater effects on Alaska salmon prices.
Consumer Incomes

As consumer incomes rise, people can afford to purchase more fish as well as more of other products. Higher incomes may cause demand for some salmon products to rise and demand for other salmon products to fall. For example, higher incomes tend to increase the demand for fresh salmon but lower the demand for canned salmon (because higher incomes allow consumers to buy other, more expensive protein products).

Increasing consumer incomes also affect the salmon product forms which consumers demand. As their incomes increase, consumers tend to demand higher quality products, and products with less preparation time, such as steaks and fillets rather than whole fish. They also tend to eat more in restaurants.

In most years, consumer incomes grow worldwide. But income growth varies widely from year to year, and incomes may fall during recessions. In the 1980s, growth rates in real (inflation-adjusted) per capita income varied from -3.5 percent to 5.6 percent in the United States and from 0.6 percent to 6.0 percent in Japan. So even though over time rising incomes raise the demand for salmon, in some years falling incomes may lower the demand for salmon.

Income growth varies between countries. The United States may be pulling out of a recession, which could raise demand for some Alaska salmon products. Japan may be heading into a recession, which could lower demand for other Alaska salmon products.

Population

As population increases, the demand for fish increases. During the 1980s, annual population growth rates were about 1.0 percent in the United States and about 0.6 percent in Japan. If nothing else changed, population growth would result in a small but steady increase in salmon demand and prices over time.

Consumer Tastes

Consumer tastes for salmon and competing products change over time, affecting demand patterns and prices. Different consumer tastes contribute to wide variations in fish consumption patterns between different countries.

*Japan consumes more than three times as much fish per person as the United States, and more than ten times as much fresh/frozen salmon per person.* Estimated per capita consumption of fish is about 40 percent higher in France than in the United States and 30 percent higher in Canada than in the United States.

*In the United States, fish consumption is low compared with other protein sources such as beef, poultry and pork.* In 1990, the average American consumed more than five times as much meat as fish.