Mackerel: Competitiveness of the U.S. Industry in Domestic and Foreign Markets

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PREFACE

On September 4, 1992, following receipt of a request from the Senate Committee on Finance (appendix A), the U.S. International Trade Commission instituted investigation No. 332-333, Mackerel: Competitiveness of the U.S. Industry in Domestic and Foreign Markets, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)). The committee requested that in its investigation the Commission develop, to the extent possible, information on the following subjects:

(1) U.S. and foreign industry profiles.--Profile the U.S. and foreign mackerel harvesting and processing sectors, addressing the extent of direct government involvement in the industry.

(2) U.S. and foreign markets.--Describe the U.S. market and important foreign markets for mackerel products, particularly markets in the Middle East, Europe, West Africa, and the Caribbean. In addition, describe tariff and nontariff barriers encountered in these markets.

(3) Competitiveness assessment.--Analyze the principal factors bearing on the competitiveness of U.S. mackerel products in both U.S. and foreign markets, including trade barriers, government policies, and other economic factors.

The committee requested the Commission to report the results of its investigation by June 8, 1993.

Copies of the notice of the investigation and of the public hearing were posted at the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and the notice was published in the Federal Register of September 16, 1992 (57 F.R. 42761, reproduced in appendix B). A public hearing in connection with this investigation was held in the Commission Hearing Room, 500 E Street SW., Washington, DC, 20436, beginning at 9:30 a.m. on January 26, 1993. (A list of witnesses appearing at the hearing is presented as appendix C.)

Information for this study was obtained from the following sources: the Commission's files; staff interviews with representatives of harvesters, processors, traders, and industry associations in the United States, Europe, the Caribbean, Japan, and elsewhere; the Departments of State and Commerce; the United Nations Food and Agriculture Organization; the Commission of the European Communities; U.S. embassies; foreign governments; trade publications; and testimony submitted at the public hearing on this investigation. The time period for the study is 1987-91. Data for 1992 are included when available.

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EXECUTIVE SUMMARY

This investigation was conducted at the request of the Senate Committee on Finance. In a letter of August 4, 1992, the Committee stated that the development of the U.S. Atlantic mackerel resource, one of the few remaining underutilized species on the Atlantic coast, was of concern and interest to the U.S. Congress. More specifically, because the U.S. demand for Atlantic mackerel as human food is relatively low, due to consumer tastes and preferences, the Committee requested that the Commission provide an analysis of the foreign markets for Atlantic mackerel and the conditions of competition between U.S. and foreign suppliers of mackerel in these markets. These foreign competitors include the European Community and Norway. Accordingly, the Committee requested the Commission to conduct an investigation under section 332(g) of the Tariff Act of 1930 (19 U.S.C., 1332(g)) covering the period 1987 to 1991, with data for 1992 as available. The following paragraphs summarize the findings of the investigation.

Profile of the U.S. Industry and Market

- U.S. commercial fisherman caught almost 37,000 metric tons of all species of mackerel in 1992, a decline of 29 percent from the 1991 harvest of 52,000 metric tons. The 1992 harvest generated $15.0 million in gross revenues. Most was processed into fresh or frozen mackerel products (fish for human consumption and bait).

- The U.S. harvest of Atlantic mackerel reached 16,600 metric tons in 1991, up 33 percent from the 1987 harvest of 12,500 metric tons. The U.S. harvest fell by 24 percent to an estimated 12,629 metric tons in 1992. The total ex-vessel value of the harvest rose to $5.5 million in 1991, up from the 1987 level by $2.1 million, but fell to $3.8 million in 1992. Average prices received by Atlantic mackerel harvesters reached $329 per metric ton in 1991, nearly twice the 1987 level of $170, but fell to $304 per metric ton in 1992.

- The U.S. harvest of other mackerel species (Spanish, king, Pacific and jack) declined from 59,803 metric tons, valued at $15.5 million, in 1987 to 23,902 metric tons, valued at $11.2 million, in 1992. Average unit values for most of these species rose during 1987-92, from $259 per metric ton in 1987 to $469 per metric ton in 1992, or by 81 percent.

- U.S. imports of fresh or frozen mackerel remained relatively steady at an annual average of 2,922 metric tons ($4.5 million) during 1987-92. The two largest suppliers of U.S. imports are Japan and Canada.

- U.S. exports of fresh or frozen mackerel (all species) rose from 658 metric tons, valued at $681,000, in 1987 to 15,631 metric tons, valued at $14.9 million, in 1992. As a share of production volume, exports grew from 1 percent in 1987 to 43 percent in 1992. The largest export markets in recent years have been the Republic of Korea (South Korea), Japan, Jamaica, and the former Soviet Union. Although U.S. exports of frozen Atlantic mackerel to Japan where higher in 1990 and 1991 than in earlier years, both Japan and South Korea primarily import Pacific and jack mackerels from the United States. Jamaica is the largest export market for Atlantic mackerel.

- Apparent U.S. consumption of fresh or frozen mackerel declined from 74,600 metric tons, valued at $21.3 million, in 1987 to 23,750 metric tons, valued at $4.3 million, in 1992. This decline is mainly the result of export opportunities that have diverted production from domestic markets where prices are low to markets such as Japan where prices are high. Additionally, the seasonal nature of the mackerel harvest tends to limit the availability of frozen mackerel in the short run to supply various markets.

- The U.S. mackerel industry consists of three vertically related sectors: harvesting, processing, and distribution. Each sector consists of various types of firms that deal in a wide variety of fish products in addition to mackerel and that differ in the type of technology they use and the type of mackerel produced.

- To reduce costs and improve product quality, the U.S. mackerel industry has been actively investing in new technology for onboard and shoreside processing. However, costs remain high largely because of the small scale of U.S. enterprises, and high fuel and labor costs. Additionally, to increase capital in the industry, mackerel prices must be sufficiently high to attract harvesters from alternative fisheries to the mackerel fishery.

- The Federal Government (Commerce Department) oversees the management of the U.S. mackerel fisheries through the implementation of fishery management plans (FMPs). The Atlantic mackerel was designated as an underutilized species in its most recent FMP. The Commerce Department also controls foreign fleet participation in the Atlantic mackerel fishery through its allocation of the U.S. Atlantic mackerel resource to foreign interests. In 1992, the U.S. Secretary of Commerce reduced to zero the foreign-directed fishing allocation for Atlantic mackerel. This action was not viewed favorably by U.S.-fishery participants such as the Netherlands, which claimed that it violates U.S. obligations with respect to the General Agreement on Tariffs and Trade (GATT).

- Mackerel is listed as an eligible commodity for export as food aid under Public Law 480 and is eligible for export credit under the

U.S. Department of Agriculture's Export Credit Guarantee Program (GSM 102). However, no food aid program that includes mackerel has been concluded nor have any mackerel sales been made under GSM 102. U.S. mackerel's cost in relation to other eligible commodities, such as grain, and the availability of mackerel from other lower-cost sources are the primary reasons cited for this situation.

Profile of Foreign Industries and Markets

- The world harvest of Atlantic mackerel in 1991 reached 693,300 metric tons, according to the United Nations Food and Agricultural Organization (FAO), slightly below the recent record of 708,700 metric tons set in 1988. The United Kingdom and Norway together accounted for nearly half of the world harvest. The United States ranked eighth, with 4 percent of the world harvest.

- The principal foreign competitors of the U.S. Atlantic mackerel industry are Norway, the United Kingdom, Ireland, the Netherlands, and Germany. In addition, Russia, the Baltic nations, and Poland are or in the recent past have been important producers, as well as significant markets. World exports of fresh or frozen mackerel (all species) jumped to a record 704,900 metric tons in 1991, up from 588,400 metric tons in 1990. The principal contributor to this increase was Norway, which has been actively targeting the Japanese market. In 1991 the United States accounted for 2 percent of world exports of fresh or frozen mackerel. The former Soviet Union has declined in importance as economic difficulties have forced reductions in the distant-water and coastal fleets.

- By far the largest import market for fresh or frozen mackerel is Japan, with 15 percent of world imports in 1990. Overall mackerel imports by Japan rose from slightly more than 1,000 metric tons in 1985 to 195,000 metric tons in 1991. This increase was prompted mainly by a decline in domestic mackerel landings. Norway is the principal supplier of Japanese mackerel imports, due to its advantage in harvesting relatively fat-rich mackerel. In 1991, Japan's reported imports of U.S. mackerel rose to 7,300 metric tons, or about 4 percent of total Japanese imports.

- Other relatively large import markets include Nigeria and Côte d'Ivoire, which together accounted for 13 percent of world imports in 1990. There is an established demand for mackerel in these and other African markets, mainly because of the relatively low price and high oil content of mackerel. However, although they present possible export opportunities, West African mackerel markets are volatile and have been characterized in recent years by significant fluctuations in import levels and prices. This market instability has been caused by a number of factors mainly related

to unfavorable macroeconomic conditions, such as stagnant income levels, volatile global commodity prices, foreign exchange shortages, and current account deficits. Competition from third-country exporters has also contributed to uncertainty for U.S. exporters in these markets. Moreover, current estimated production costs for U.S. processed mackerel appear to be higher than the prices quoted for sales to these markets by foreign suppliers.

- Egypt is among the most promising Middle East markets for U.S. mackerel exports because of its large and growing population and a ready demand for relatively low-cost protein sources such as mackerel. In the past most mackerel imports (mainly from Europe) were channeled through the state sector and were often subsidized. Similar to the West African markets, U.S. exports to Egypt are constrained by unfavorable macroeconomic conditions, and third-country competition, as well as government procurement policies and procedures in Egypt.

- Jamaica currently is the largest market for U.S. exports of Atlantic mackerel and offers potential for future import growth. It has longstanding ties with U.S. exporters of a wide variety of products and, although it has been experiencing macroeconomic constraints similar to those in West Africa, Jamaica continues to be a relatively large consumer of mackerel, mainly because of the low price of mackerel as a protein source. In addition, the Jamaican market prefers lower fat Atlantic mackerel offered primarily by the East Coast U.S. mackerel fishery.

- Mackerel is a widely consumed protein source in Eastern Europe, owing mainly to its low price and ease of preservation, and the countries of this area have traditionally been large importers of mackerel products from the West. However, as a result of the recent restructuring of these economies this trade pattern has been upset as many importers face difficulties obtaining sufficient hard currency to pay for their mackerel.

Conditions of Competition

- U.S. mackerel exporters face a two-tiered world import market typified at the high-price end by Japan and at the low-price end by Nigeria, Egypt, and other developing countries. Differences in these types of markets require the U.S. industry to adopt different marketing strategies and products to ensure the competitiveness of their products in these respective markets. In high-price markets, the quality of the U.S. product is a critical factor determining U.S. competitiveness. In low-price markets, the success of U.S. exporters depends on the price of the U.S. product relative to the price from competing suppliers and to the price of alternative protein sources in these markets.

- The most important factors identified in this investigation as influencing the competitive position of the U.S. Atlantic mackerel industry relative to its European competitors include production and transportation costs, product quality, and marketing practices. U.S. production costs are high relative to other competing countries partly because the small size of U.S. fishing vessels does not allow the industry to take advantage of economies of scale that can reduce unit production costs. Transportation cost differentials arise because of the U.S. location relative to major markets in West Africa and the Middle East, and the inability of the U.S. industry to benefit from large volume discounts. These high costs tend to limit the ability of the U.S. industry to compete in a number of developing country markets where price is the most important demand factor.

- The gap between U.S. and European product quality, while narrowing, tends to put the U.S. product at a competitive disadvantage in high value mackerel markets, such as Japan. The range of products offered and the marketing experience of European competitors also tend to place U.S. exporters at a competitive disadvantage in many mackerel markets, particularly those in developing countries, where European competitors have already established market contacts and stable trade relationships.

- Trade barriers in importing countries for mackerel products include both tariff and nontariff trade barriers. With the exception of Ghana, tariffs in major markets for fresh or frozen mackerel tend to be at relative low or moderate levels. Nontariff barriers include primarily the import quota in Japan. Although a number of these barriers have been reduced or eliminated in recent years, they contribute to higher prices of fish products in the importing countries and they reduce both the price and volume of shipments from exporters, including the U.S. industry.

- Exchange rate depreciation relative to the U.S. dollar in a number of developing-country importers has made the price of all imported mackerel more expensive as mackerel trade is largely negotiated in dollars. These exchange rate changes have also been symptomatic of financial difficulties that have resulted in shortages of foreign exchange. These shortages, combined with higher local currency prices, tend to favor exports from lower-cost, non-U.S. sources because they reinforce the importance of price as determinant of export supply to such markets.

- Fishery management programs in foreign exporting countries such as the EC member states and Norway include harvest quotas and price support policies. On balance, these programs tend to restrict mackerel harvests, thus placing upward pressure on both world prices and price levels in these countries. The higher world prices benefit the U.S. industry, as well as other exporters who sell mackerel in international markets. Norwegian bait assistance

also provides indirect benefits to U.S. mackerel exporters who receive higher prices for mackerel consumed as food.

- In Western and Eastern Europe, as well as in the United States, government assistance has been provided in a variety of forms for the construction or acquisition of vessels and shoreside facilities. In most countries (except for some privatization efforts in Eastern Europe) these assistance programs appear to have been eliminated because of budgetary constraints or overcapitalization in fisheries. However, even in countries where the programs no longer exist their benefits remain; past grants for construction, for example, continue to reduce current mortgage payments below what they would be had the owner paid for the entire facility. These benefits in turn serve to reduce the output prices required for the facility to break even or make a profit.

- In the United States, the U.S. Government policy of open access by U.S. vessels to the Northeast Atlantic groundfish stocks, which make up an alternative fishery for many would-be Atlantic mackerel fishermen, has served to raise the price necessary to attract fishermen to mackerel, thereby raising processing and export costs. More recently, the reduction to zero in the foreign-directed allocation for Atlantic mackerel could result in lower ex-vessel prices for U.S.-harvested mackerel in the short run, but it could also lead to higher prices in the long run should the U.S. industry expand its exports as a result of reduced foreign supply.

CHAPTER 1. INTRODUCTION

Atlantic mackerel is one of the few remaining underutilized U.S. fishery resources and one of the largest.[1] The resource has grown substantially in the past decade, to a stock size believed capable of sustaining a long-term annual harvest of at least 200,000 metric tons. However, the annual U.S. commercial harvest averaged only 13,053 metric tons during 1987-92. Aside from the bait market, there is little domestic or foreign demand for U.S. Atlantic mackerel. As a result, its price, relative to that for groundfish and other alternative fish species, has remained too low to attract much interest among U.S. fishermen, and the resource has traditionally been allocated (by the U.S. Government) to foreign fishing industries that supply various European and developing-country markets, such as those in Western Africa.

In recent years there has been considerable interest among industry members and Government fishery managers alike in "Americanizing" U.S. fisheries that are fished by foreign fleets, including mackerel. In the past this Americanization effort has consisted of U.S. Government assistance for construction of vessels and shoreside processing facilities, as well as other incentives to build up capital in the fishing industry. This assistance, however, has also resulted in overcapitalization in traditional fisheries, such as cod and flounder, with the result that such efforts have been reduced in an attempt to protect these more valuable fisheries. More recently, the effort to Americanize the Atlantic mackerel fishery has consisted of reducing or eliminating fishing quota allocations to foreign harvesting and processing fleets. The intent of this policy is to raise foreign demand for U.S. mackerel by reducing foreign mackerel production in U.S. waters. This, in turn, would put upward pressure on prices so as to attract U.S. harvesters to mackerel.

Americanization of Atlantic mackerel has been slow, however, and some U.S. industry officials claim that foreign trade barriers are important impediments to development of the U.S. industry. Such barriers, it is asserted, consist of artificially low costs of capital and other inputs among foreign producers. Import barriers in foreign markets are also cited by some industry members.[2] According to the U.S. industry, these trade barriers contribute to foreign price quotations that are typically well below U.S. costs of production, even before transportation is taken into account.

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[1] Although there are three major U.S. commercial fisheries for mackerel (Atlantic, Spanish/king, and Pacific/jack), this investigation primarily concentrates on the fishery for Atlantic mackerel (Scomber scombrus). When other mackerel species and products are relevant to specific issues, such as U.S. export, they are included in the discussion.

[2] Transcript of hearing, pp. 20 and 27.

Within the context of these issues, the Senate Committee on Finance, in a letter of August 4, 1992, requested that the Commission assemble and present information on the U.S. mackerel industry, its principal foreign competitors, and important foreign markets for mackerel products and that it analyze the principal factors having a significant bearing on the competitiveness of U.S. mackerel products in both U.S. and foreign markets, including trade barriers, government policies, and other economic factors. A discussion of these issues is the primary concern of this report.

Scope of the Report

The Product

This investigation covers fresh, frozen, cured, or canned mackerel. U.S. mackerel resources are harvested by U.S. and foreign wetfish and freezer vessels,[3] and then processed into the various products covered by this study.[4]

U.S. commercial fishermen caught almost 37,000 metric tons of mackerel in 1992, generating $15.0 million in gross revenues at the ex-vessel or dockside level. Most was processed into fresh or frozen mackerel products. U.S. canned-mackerel production totaled $2.0 million in 1992. U.S. exports of mackerel (all forms) in 1992 totaled $15.3 million, of which 98 percent was mackerel in fresh or frozen form. The Republic of Korea (South Korea), Japan, and Jamaica were the largest markets for U.S. fresh and frozen mackerel exports in 1992. U.S. imports of fresh or frozen mackerel, which enter mostly during the U.S. mackerel "off season," (summer and fall), totaled $4.2 million in 1992. Canada was the largest U.S. supplier of fresh mackerel, and Japan was the largest supplier of frozen mackerel.

Mackerel harvested and processed from all species by the U.S. industry is marketed primarily as seafood for human consumption. Significant amounts of U.S.-harvested mackerel are also destined for the bait, pet food, and fishmeal markets. As bait, mackerel is used in lobster and crab traps, and on the lines of hooks used by longliners fishing for tuna, halibut, and other fishes. It is also a common ingredient in seafood-based pet foods, particularly canned cat food. The fishmeal market is a last resort for mackerel because of its low unit value; fishmeal is a common ingredient in animal feeds, such as those used to feed salmon and trout in aquaculture facilities. Figure 1-1 depicts the relationships among the various harvesting, processing, and distribution subsectors and international trade for mackerel.

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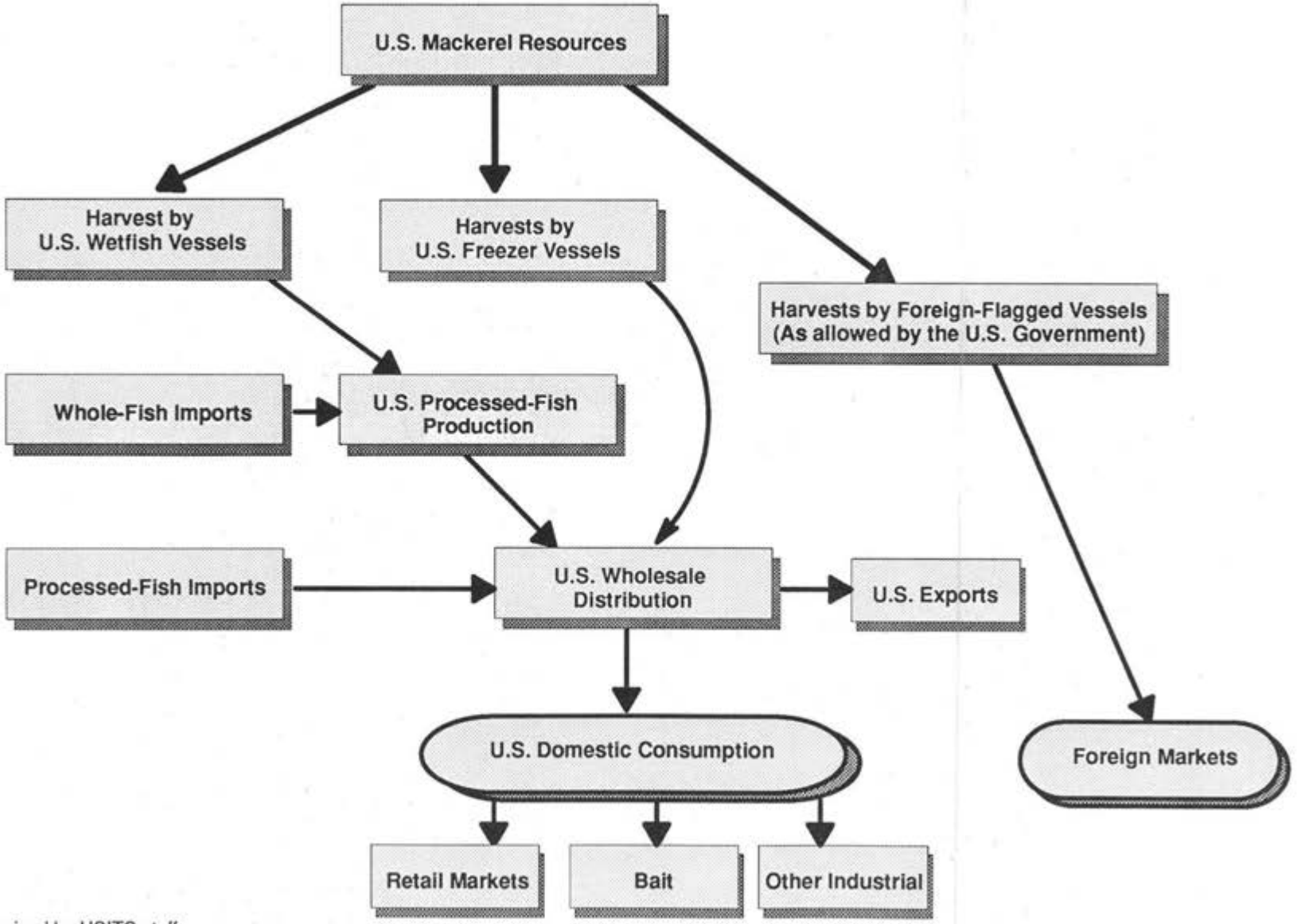
[3] Freezer vessels have the capability of freezing fish at sea, whereas wet fish vessels do not have this capability.

[4] Foreign participation is subject to foreign agreement with the U.S. Government and U.S. allocation of the allowable mackerel harvest for foreign directed fishery. In 1992, the allocation for foreign direct fishing for Atlantic mackerel was reduced to zero.

Figure 1-1
U.S. mackerel resources: Harvesting relationships and international trade



Source: Derived by USITC staff.

Biological Characteristics

Mackerel are pelagic (surface-feeding) fish, which are found in salt water bodies around the world. Most species typically are found in temperate waters, and not in the very warm equatorial and very cold polar waters; however, some species (e.g., the sierras) are common in equatorial waters. Mackerel are migratory fish and appear near coastal waters in large concentrations only during a few months of the year. Mackerels include several species of finfish belonging to the Scombridae family of fishes. The following tabulation lists the commercially significant Scombridae species of mackerel, with their scientific (Latin) names.[5]

Common name	Scientific name
Atlantic mackerel	Scomber scombrus
Pacific mackerel	Scomber japonicus
Spanish mackerel	Scomberomorus maculatus
King mackerel	Scomberomorus cavalla
Painted mackerel	Scomberomorus regalis
Gulf sierra	Scomberomorus concolor
Pacific sierra	Scomberomorus sierra
Bullet mackerel	Auxis rochei
Frigate mackerel	Auxis thazard

Among the commercially most important mackerel species in North America are the Atlantic, Pacific (also called chub), king, and Spanish mackerels. Of much less commercial importance in North America are the painted (or cero), bullet, and frigate mackerels and the gulf and Pacific sierras.

Another important fish species examined in this investigation is called the jack (or horse) mackerel (Trachurus symmetricus). This species is not a true mackerel; it is a member of the jack, or Carangidae family.[6] However, it typically is marketed alongside true mackerels because in the fish industry it is considered commercially equivalent to Pacific mackerel and part of the mackerel industry and market. The Scombridae family also includes certain commercially important related species, the most common being certain tunas (e.g., yellowfin, albacore, and skipjack) and bonito; however, these species are outside the scope of this investigation.

Somewhat different species of mackerel occur in the eastern Atlantic, but because they are difficult to distinguish in the marketplace they

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[5] C. Richard Robins, et al., A list of Common and Scientific Names of Fishes From the United States and Canada (Bethesda, MD: American Fisheries Society, 1980), pp. 56-57.

[6] Ibid., p. 43. Another Pacific fish species, known as Atka mackerel (Pleurogrammus monopterygius), likewise is not a true mackerel but is a member of the greenling or Hexagrammidae family. Atka mackerel are not examined further in this investigation.

sometimes share similar names with the western Atlantic species, particularly in the European market (chapter 3). A commercially important example is Scomber colias, which in the United Kingdom goes under the common names Spanish mackerel or chub mackerel. Although rare in North American waters, this species is common in the Mediterranean and off the French and Iberian Atlantic coasts. However, throughout the North Atlantic the dominant species is Scomber scombrus, known on both sides of the Atlantic simply as mackerel.

The Atlantic mackerel appears in greatest numbers off the Mid-Atlantic States during the fall and early winter, migrating along the New England and Canadian Maritime Provinces' coasts in late winter and early spring; the largest quantities are harvested in the waters off the Mid-Atlantic and southern New England States. The king mackerel ranges from the Mid-Atlantic States to the Gulf of Mexico and the Caribbean, and some stocks occur as far south as the waters off Brazil. Spanish mackerel typically ranges from the upper Mid-Atlantic States to the Gulf of Mexico. Both king and Spanish mackerels appear in their greatest numbers off the Mid-Atlantic States in summer and off South Florida in the winter, a pattern suspected to be related to water temperature.[7] Pacific and jack mackerels occur in the Pacific Ocean, along the coasts of Central and North America as far north as Puget Sound.

Mackerel congregate in large schools (with a school holding as much as several dozen tons) for purposes of feeding and for defense against predators. Among their food sources are herrings and other small finfish, squid, crustaceans and plankton, although when a school is on a "feeding frenzy" they are known to eat almost anything resembling food. Their predators include tunas, sharks, and humans.

At maturity, mackerel are much smaller than their cousins, the tunas. As its name implies, the king mackerel is the largest of the commercially important mackerels, typically weighing in at up to 10 pounds and reaching 3 feet in length. Most of the other mackerel species grow to 1 to 2 feet in length and 2 to 5 pounds in weight. They typically have a blue or blue-green back, with silver sides and belly, and their scales are so small as to be almost unnoticeable. All mackerels are streamlined in shape and therefore are fast swimmers. Some mackerels (especially the king mackerel) are popular game fish and support a significant U.S. recreational fishery.

U.S. Industry Segments

The U.S. mackerel industry consists of three vertically related sectors: harvesting, processing, and distribution. The harvesting sector consists of firms and individuals that fish for mackerel using a variety of fishing techniques that are described in detail in chapter 2 of this report. Processors consist of firms that can, cure, or otherwise handle and process

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[7] Gulf of Mexico and South Atlantic Fishery Management Councils, "Amendment 1 to the Fishery Management Plan for the Coastal Migratory Pelagic Resources (Mackerels)" Apr. 1985, sec. 5.

fresh or frozen fish for the wholesale market. Some harvesting vessels, particularly freezer trawlers, can also be considered part of the processing sector. Distributors consist of firms that sell processed fish for domestic consumption or for export.

There are also three major geographic segments of the U.S. mackerel industry:

1. **The Atlantic mackerel fishery**, which extends from the waters off New England to the Mid-Atlantic States. In 1992 the U.S. harvest of Atlantic mackerel totaled 12,629 metric tons, valued at $3.8 million. This industry consists of hundreds of commercial fishing vessels (which harvest other species in addition to mackerel), and dozens of onshore processing plants, although most production is concentrated in about one hundred freezer and wetfish trawlers and fewer than a dozen processing plants that are based in New Jersey and New England. In U.S. waters there is a large surplus of Atlantic mackerel, which has traditionally been allocated to foreign fleets, often in joint ventures with U.S. harvesters. The main products are mackerel for bait and whole frozen mackerel for human consumption. This segment of the industry is heavily export-oriented and competes most strongly with Atlantic mackerel producers in Western Europe.

2. **The fisheries for king and Spanish mackerel**, ranging from the Mid- and South Atlantic States to the Gulf of Mexico. In 1992 the U.S. commercial harvest of these species totaled 3,716 metric tons, valued at $6.8 million. Recreational fishermen account for a much greater portion of the U.S. harvest of these species than that of Atlantic mackerel. The commercial fishery is concentrated in the waters off South Florida and is almost exclusively oriented to the domestic market for fresh or frozen whole fish.

3. **The fisheries for jack and Pacific mackerels** are found along the Pacific Coast States. In 1992 the U.S. commercial harvest of these species totaled 20,186 metric tons, valued at $4.4 million. This segment consists of numerous small vessels and processors scattered along the coast. Much of the catch is destined for canneries; in addition, a significant portion of the harvest is exported to Pacific rim markets, including Japan and South Korea. At their southern end, these mackerel fisheries are shared with harvesters from Mexico, whose rising harvest rates reportedly are interfering with U.S. fishery management efforts.[8]

Although this report generally discusses the entire U.S. mackerel industry, it focuses on the east coast segment of the industry that produces frozen Atlantic mackerel (Scomber scombrus). This is the industry segment most concerned with the development of export markets and--because there is a large surplus of unharvested Atlantic mackerel--it is the primary industry segment for which there is a significant chance of future growth in production and exports.

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[8] NMFS, Our Living Oceans: Report on the Status of U.S. Living Marine Resources, 1992 (U.S. Dept. of Commerce, Dec. 1992).

Foreign Producers and Markets

The principal foreign rivals to U.S. mackerel exporters that are analyzed in this study include the United Kingdom, Norway, the Netherlands, and other European coastal nations. These countries are all competitors of the U.S. Atlantic mackerel industry. In addition to the mackerel resources in European waters, the fishing fleets of a number of these countries traditionally have depended on surplus mackerel resources in U.S. waters for a significant part of their supply.

The foreign markets examined in this investigation are limited to a select group of developing nations in West Africa, the Middle East, Eastern Europe and the Caribbean, as well as Japan. These regions are considered of particular interest because they represent potential growth markets for Atlantic mackerel. Most are developing economies with limited potential for domestic protein production and therefore with a potentially large demand for fish imports. Additionally, many are in temperate or tropical regions, where food is commonly preserved by smoking or other curing methods, which is typically how mackerel is preserved. Equally important, most of these economies currently are significant markets for important foreign rivals of the U.S. mackerel industry, and such rivals' presence in these markets has made it more difficult for U.S. exporters to establish footholds.

Study Time Period and Data Sources

The data sources for this report include the Commission files; staff interviews with representatives of harvesters, processors, traders, and industry associations; U.S. embassies; foreign governments; and trade publications. In addition Commission staff traveled to the United Nations Food and Agriculture Organization in Rome, Italy; the Commission of the European Communities in Brussels; Jamaica; and the United Kingdom to interview government and industry officials. Information was also obtained from the Commission's hearing, held on January 26, 1993, in Washington, D.C.

The time period for the study is 1987-91. Data for 1992 are included when available. All of the statistical tables are included in Appendix D of this report.

Organization

Chapter 2 describes the U.S. mackerel industry, including its structure, recent trends in production and other measures of economic performance and the important role that the Federal Government plays in managing fisheries. The primary foreign competitors of the U.S. Atlantic mackerel industry are discussed in chapter 3. This discussion includes the general economic structure of the major foreign industries, their principal markets, and for some foreign fleets their interaction with the U.S. industry in U.S. waters off the Atlantic coast. Chapter 4 describes the major foreign markets, both

current and potential, that are of interest to U.S. exporters of Atlantic mackerel.

Finally, chapter 5 examines the effects of the factors affecting the competitiveness of U.S. mackerel products in both U.S. and foreign markets. In foreign exporting countries, the major factors affecting competitiveness include economies of scale and scope, which concern the size of operation and the variety of products produced or marketed, as well as transportation costs and marketing experience. The extent to which tariffs and nontariff barriers in importing countries affect U.S. exports and the export prices received by exporters is also discussed in this chapter. Also important are government policies toward fishery management, which are seen to directly affect the price and quantity of mackerel harvested, processed, and exported by foreign competitors thus influencing the prices received by third-country exporters such as the United States.

CHAPTER 2. THE U.S. INDUSTRY AND MARKET

Trends in U.S. Production, Trade, Consumption and Prices

Production

The U.S. harvest (production) of all mackerel species totaled 36,531 metric tons in 1992, 50 percent below the peak harvest of 72,526 metric tons in 1989 (table D-1). An increase in prices of 9 percent sustained the total value at about $19.5 million annually through 1991, but in 1992 the value declined by 23 percent to $15 million. With the exception of 1989, mackerel production, especially for species other than Atlantic mackerel (Spanish, king, Pacific, and jack), generally declined during 1987 to 1992 from 59,803 metric tons, valued at $15.5 million, in 1987 to 23,902 metric tons, valued at $11.2 million in 1992.

The quantity of U.S. production of fresh or frozen Atlantic mackerel approximates (at least by quantity) the data on the domestic catch of Atlantic mackerel, for virtually all such mackerel is marketed in whole, frozen form. The following tabulation summarizes the recent trend in the domestic catch of Atlantic mackerel (data from the Commerce Department; includes fish delivered to foreign processing vessels):

Year	Quantity of catch (*metric tons*)	Value of catch (*$1,000*)
1987	12,517	2,123
1988	12,377	2,722
1989	14,638	4,261
1990	10,415	3,794
1991	16,647	5,476
1992	12,629	3,836

Although variable, the domestic catch of Atlantic mackerel generally rose during 1987 to 1991, but fell by 30 percent in 1992.

Canned mackerel is the only other mackerel product for which production data are available. Mackerel canners use jack and Pacific mackerels as raw material. Generally, production of canned mackerel is variable, and the mackerel processed by canners accounts for less than 10 percent of the total mackerel harvest. The following tabulation summarizes recent trends in canned-mackerel production (data from the Commerce Department):

Year	Quantity (*1,000 metric tons*)	Value (*$1,000*)
1987	6,630	5,777
1988	8,201	8,777
1989	7,993	6,983
1990	10,626	10,500
1991	3,988	3,421
1992	2,223	1,981

Trade

Fresh and frozen mackerel are both imported and exported by U.S. firms. Imports of fresh and frozen mackerel remained fairly steady during 1987 to 1992 at about 2,600 to 3,500 metric tons annually (table D-1). Such imports enter mainly from Canada and Japan and are used by U.S. processors largely to supplement domestic landings in both the bait market and the consumer food market. In 1992, imports were equivalent to about 12 percent (by quantity) of U.S. consumption. Canadian mackerel enters mainly through New England; Japanese mackerel enters mainly through Los Angeles.

Exports of fresh and frozen mackerel have risen significantly in recent years, mainly in response to market opportunities in Japan, the former Soviet Union, and the Republic of Korea (South Korea) (table D-2). In 1992, exports were equivalent to about 43 percent of U.S. production. In some instances increased export opportunities have reflected special situations--for example, Japan reportedly turned to U.S. exporters when Japanese domestic landings dropped temporarily (primarily a result of poor harvests) in 1990 and 1991--and do not necessarily represent sustainable export market growth. Growth in overall mackerel exports is remarkable, nevertheless, as the following tabulation of Commerce Department data suggests:

Year	Quantity (*metric tons*)	Value (*$1,000*)
1987	658	681
1988	1,624	1,328
1989	4,217	3,795
1990	16,340	18,023
1991	15,941	13,696
1992	15,631	14,950

In the Atlantic mackerel industry, exports accounted for an estimated 30 percent of production in 1992, a sharp decline from the record 1991 level

of 50 percent. Such estimated exports are shown in the following tabulation of official Commerce Department data:[1]

Year	Quantity (*metric tons*)	Value (*$1,000*)
1988	683	453
1989	987	1,057
1990	3,776	3,433
1991	8,301	6,604
1992	3,492	3,441

Between 1988 and 1991, estimated U.S. Atlantic mackerel exports increased in quantity by 12 times and in value by 15 times, to a record 8,301 metric tons valued at $6.6 million. However, exports (chiefly those to the former Soviet Union and Japan) fell in 1992, to 3,492 metric tons valued at $3.4 million, declines of 58 percent and 48 percent by quantity and value, respectively. Jamaica, Japan, Canada, and the former Soviet Union were the top four markets for U.S. Atlantic mackerel exports in 1991 and 1992 as shown in the following tabulation of U.S. Department of Commerce data (metric tons):

	1991	1992
Jamaica	1,738	1,823
Japan	2,933	62
Canada	743	893
Former Soviet Union	1,855	422
Spain	816	22
Other	216	270

Consumption

In the United States fresh and frozen mackerel are consumed mainly by certain ethnic groups for human food, and in the bait, pet food, and other industrial-use (e.g., fish meal and oil) market channels. In the case of U.S.-harvested Atlantic mackerel, an estimated 76 percent of domestic apparent consumption was sold to the bait market in 1992-93 with the remainder sold for human food in fresh or frozen form.[2] King and Spanish mackerels are primarily

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[1] U.S. exports of Atlantic mackerel, which are not distinguished in U.S. export data from other mackerel species, are estimated by Commission staff using the assumption that all mackerel exports from U.S. customs districts along the Atlantic, Caribbean, and Gulf of Mexico coasts consist only of Atlantic mackerel. They exclude Atlantic mackerel delivered by U.S. harvesters "over the side" to foreign vessels outside the 12-mile U.S. territorial sea.

[2] Mid-Atlantic Fishery Management Council, "1993-1994 Allowable Biological Catch, Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing,

(continued...)

destined for human consumption in fresh or frozen form, although some Spanish mackerel is also sold as marine mammal food to commercial aquariums and as bait elsewhere in the fishing industry.[3] Both Pacific and jack mackerels are harvested commercially for the markets for petfood and canned seafood for human consumption, and recreationally for bait and for human consumption.[4]

Apparent consumption of fresh or frozen mackerel (all species) has generally declined in recent years, as the following tabulation of Commerce Department data indicates:

Year	Quantity (*metric tons*)	Value (*$1,000*)
1987	74,563	21,263
1988	73,907	23,207
1989	71,148	19,829
1990[5]	43,270	2,626
1991	39,206	10,155
1992	23,756	9,267

The decline in apparent consumption largely reflects the growth in exports through 1992, which drew frozen mackerel from relatively low-valued domestic uses, such as bait, to higher value human-food markets in Japan and other countries.

Prices

Prices received by mackerel fishermen are determined in a variety of ways. Some fishermen receive what might be considered a "market" price in arms-length transactions with mackerel processors or bait dealers. Others are employed by or under contract to processors, thus their revenues are more or less equivalent to a salary from the processor. Still others belong to cooperatives, which process and sell the fish on behalf of the fishermen, giving fishermen the selling price of the processed product after deductions for the cooperatives' expenses.

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[2] (...continued)
Joint Venture Processing, and Total Allowable Level of Foreign Fishing Recommendations for Atlantic Mackerel, Loligo, Illex, and Butterfish," Aug. 1992.

[3] Gulf of Mexico and South Atlantic Fishery Management Councils, "Final Amendment 1, Fishery Management Plan and Environmental Impact Statement for Coastal Migratory Pelagic Resources (Mackerels)," Apr. 1985.

[4] Pacific Fishery Management Council, "Draft Fishery Management Plan for the West Coast Pelagic Fishery," Apr. 6, 1992.

[5] The sharp decline in the value of U.S. apparent consumption particularly in 1990 primarily reflects the rise in value of U.S exports to Japan in that year.

A general approximation of the annual trend in prices received by mackerel harvesters is obtained by simple division of the total value of the catch by the quantity of the annual catch. Although this process masks weekly or monthly variations in prices, as well as differences between ports and the above-noted differences in the types of fishing enterprises, it roughly approximates the long-run direction in prices received by mackerel fishermen.

Table D-3 shows data on average annual unit values for the U.S. catch of Atlantic mackerel (including foreign joint ventures), other mackerel, and all mackerel species combined. The average annual unit value o^O Atlantic mackerel more than doubled during 1987-90, to $364 per metric ton, then declined to about $304 in 1992, representing a net increase over the period of 79 percent. The decline in the U.S. price for Atlantic mackerel in 1991 most likely reflects the lower valued sales made to the former U.S.S.R. in that year. A lower average unit value for 1992 likely reflects lower valued sales to Russia and South Korea. Average annual unit values for all other species have risen in recent years, from $259 per metric ton in 1987 to $469 in 1992, or by 81 percent.

Industry Structure

Industry Sectors

The U.S. mackerel industry consists of three vertically related sectors: harvesting, processing, and distribution. Each sector consists of various types of firms that deal in a wide variety of fish products in addition to mackerel and that differ mainly in the type of technology used and the mackerel product produced.

The harvesting and processing sectors of the U.S. mackerel industry have become less distinct in recent years. In the past harvesters only caught and transported fish and did not physically transform or prepare the fish for commercial use or consumption. Rather, all of the filleting, boxing, and other marketing preparations were undertaken by onshore processors. In recent years, many of the freezer-trawlers used by harvesters (discussed below) also carry out onboard filleting and boxing for shipment to wholesale markets.[6] This practice is generally the case whether or not the mackerel is destined for human consumption.

Geographic distribution, as well as economic factors, has contributed to the industry structure associated with the different mackerel species. For example, the Atlantic mackerel resource is abundant enough to support both a

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[6] Such filleting in some cases is done with automatic filleting machines. There are also automatic machines for cutting mackerel into pieces for bait, but it is unclear to what extent such machines are used on U.S. harvesting vessels.

domestic harvesting and onshore processing industry and a significant foreign fleet of fishing and processing vessels; therefore, foreign joint ventures and other foreign-domestic interaction have traditionally played an important role in the structure and international competitiveness of the mackerel industry in New England and the mid-Atlantic States. In contrast, the Spanish and king mackerel resources off the South Atlantic and Gulf States are heavily fished, particularly by a large recreational sector, so there is little room for commercial industry growth and no room for direct foreign industry participation. On the Pacific coast the jack and Pacific mackerel resources are highly abundant, but competition in the frozen-mackerel export market and low prices for canned mackerel limit the attractiveness of these fisheries for West Coast fishermen and processors.

Harvesting

Harvesting techniques

In the commercial fishery for Atlantic mackerel, the vast majority of the harvest is taken by trawlers.[7] Some of the larger trawlers have a hold capacity of as much as 300 metric tons (660,000 pounds), although actual capacity utilization is usually less than 100 percent. Several of the larger trawlers are equipped with onboard freezers; these vessels, which are few in number but account for much of the total commercial harvest, freeze their catch onboard. Most smaller trawlers do not have onboard freezing capability and chill the catch on ice in the hold.

Prior to the early 1980s, the only freezer-trawlers in the Atlantic mackerel fishery were foreign-owned vessels. However, in recent years, Federal fishery management policies to "Americanize" the Atlantic mackerel fishery have shifted annual harvest allocations from the foreign to the domestic fleets. The U.S. industry also increased its investment in U.S.-owned freezer trawlers at the same time.

A less commonly used mackerel harvesting technique is purse seining.[8] Using this technique, a vessel (purse seiner) releases a smaller vessel from its stern, which holds one end of the seine fixed as the purse seiner takes off, releasing the seine as it encircles the school of fish. When the two vessels meet up again, the bottom of the seine is pulled together with a drawcord, trapping the school inside. The seine is then drawn to the side of the seiner with pulleys and blocks, and the fish are unloaded onto the deck.

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[7] A trawl is a large, bag-shaped net that is towed behind the vessel, called a trawler. When full, the trawl is drawn up to the stern of the trawler and the catch is unloaded onto the deck. A single tow of a trawl can capture several tons of fish. Several tows are made each day, and a single fishing trip lasts several days, until the hold is filled.

[8] A purse seine is a very long net (several hundred meters long) that is rectangular in shape. As described in chapter 3, this technique is much more common in the Western European mackerel industry.

As with trawling, a catch of several tons is possible. Once in the hold, the catch may be kept chilled with ice or frozen in brine.

Gillnets have traditionally been the primary commercial harvesting technique for Spanish mackerel. Gillnets may be suspended from poles or other fixtures or left to float freely, hung with weights from buoys. They are made of translucent material, with a mesh just large enough for the fish to put its head through up to the gills, which are then caught in the net when the fish tries to back out.

Smaller scale fishing for all species of mackerels, both commercial and recreational, is usually undertaken with poles and lines, usually from private boats and charterboats but sometimes from onshore sites such as bridges. Very small-scale (or artisanal) fishing techniques do not account for much of the mainland U.S. mackerel catch but are employed in some U.S. insular possessions, where the mackerel fishery is of minor importance.

Number and location of producers

There are hundreds of commercial mackerel harvesters scattered all along the Atlantic, Caribbean, Gulf, and Pacific coasts.[9] However, virtually all such harvesters fish for mackerel as a part-time or seasonal business, both because of the relatively low value of the fish and because mackerel appear in the waters of a particular State for only a few weeks or months each year.

Concentration in mackerel harvesting is much higher than the large number of harvesters might suggest. Much of the Atlantic mackerel harvest is undertaken by about a dozen freezer-trawlers, most of which are owned by or contracted out to a few onshore mackerel freezers and distributors, based in New Jersey and New England. These vessels concentrate more heavily on mackerel than other vessels do; thus, their share of the overall mackerel catch is greater than their numbers indicate. In past years a greater number of independent trawlers harvested mackerel, mainly for foreign joint-venture buyers; however, since 1992, U.S. Government policy changes have discouraged such joint ventures.

Processing

Processing techniques

The onshore processing sector consists of three main types of firms: fresh- or frozen-fish processors, canners, and cured-fish processors. As noted earlier, some freezer trawlers also process and box mackerel for shipment to wholesale markets.

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[9] In addition to the commercial fishery, there is a large sports fishery for mackerel, which contributes to the overall U.S. mackerel supply.

Processed fresh or frozen mackerel is the most important product in terms of volume and value of output. This processing is the simplest in terms of technology. Fresh mackerel requires little or no processing, because it is usually marketed in whole form. However, fresh mackerel is sometimes cut into fillets or (especially for king mackerel) steaks, in which case the fish must be gutted first. Such processing is also used for frozen mackerel, which is sometimes marketed as fillets (although most is marketed whole). Gutting and cutting are very labor-intensive. Some firms use automatic filleting machines, which are useful because mackerel is of relatively uniform size compared with many other fish species. However, these machines require a steady input of product to be efficient, and mackerel harvests are too unpredictable in many locations to make them economical.

The second type of processing--canning--entails cooking whole mackerel in large batches, after which the meat is separated from the body in large chunks and the bodies are discarded or reduced to fishmeal or other byproducts. The meat is put into cans, which are filled with brine or other medium and sealed. The cans are then cooked again, mainly to eliminate bacteria.

The third type of mackerel processing is curing. A common form of curing is smoking, in which the fish is filleted and hung in smoke-filled sheds or soaked in a smoke-flavored liquid. Another form of curing is salting, in which the fillets are stored in salt or a salty liquid. Smoking or salting is more effective than drying as a means of preserving oily fish such as mackerel, because the oils would prevent the fish from drying out before the meat spoils. Nonoily fish, such as cod, on the other hand, are more often cured by drying. Pickling mackerel is also a popular form of curing, but pickling is usually done abroad, after the frozen whole product is exported to the consuming market.

Number and location of producers

About a dozen mackerel-processing firms make up the bulk of the U.S. industry; most are located in the larger fishing ports along the mid-Atlantic and New England States. Mackerel canners are only on the west coast. Most canners produce mackerel only as a side line, with tuna production as their main line of business. However, all mackerel processors process other fishes, particularly during the warmer months, when mackerel is less abundant and other species are available.

Distribution

As noted in chapter 1, there are three main markets for U.S.-produced mackerel: (1) the domestic seafood market, and (2) the domestic bait and pet food market, and (3) the export market. Each market has a distinct distribution channel; however, the export market is of primary concern in this study. Some U.S. producers of export-destined mackerel products, particularly the larger firms, ship their product directly to buyers in foreign markets.

Such buyers in many cases can be located through published trade leads.[10] Other producers, especially the smaller firms, ship their products through export brokers or other indirect means, such as through a larger mackerel processor who, in turn, handles the export activities.

Costs of Production

The determination of production costs in the U.S. mackerel industry is complicated because both harvesters and processors (whether or not land based) handle a variety of fish species besides mackerel. Therefore, there may be economies of scope, whereby some costs are shared by different products and so the cost of producing any one product is lower than if the products were each produced in separate establishments. To some extent the multiple-product nature of mackerel harvesting and processing is due to the seasonal character of the fishery, although even during the mackerel season multiple products (e.g., mackerel and squid) are handled, the choice largely depending on relative selling prices for the species.

A number of studies, however, discuss production costs in the U.S. mackerel fishery, and one industry member supplied the Commission with public data on its freezer-trawler costs.[11] The different cost estimates are discussed below.

Harvesting

The fishing vessel (F/V) Relentless, owned by Seafreeze, Ltd., is a representative freezer-trawler built in 1988 at a cost of $3.5 million (entirely from private investment and commercial bank loans). With a crew of 10, the F/V Relentless has a daily freezing capacity of about 80,000 pounds of fish (36 metric tons) and a hold capacity of 350,000 pounds (159 metric tons).[12] The following tabulation details the operational expenses of the F/V Relentless for the years 1991 and 1992:[13]

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[10] Such market leads are frequently published in the Commerce Department's NMFS Fisheries Market News Report (three times weekly), the American Seafood Institute Report (monthly), and other trade publications.

[11] Seafreeze, Ltd., of Rhode Island, prehearing brief, and Brian Sweeney, general manager of Seafreeze, Ltd., transcript of the hearing.

[12] Given the role of F/V Relentless as a freezer-trawler, its maximum physical freezing capacity is its practical production constraint, although its maximum physical harvesting capacity--60,000 pounds in a 25-minute tow under ideal fishing conditions--is well in excess of its freezing capacity. Seafreeze prehearing brief, p. 2.

[13] These data cover the vessel's entire yearly operation and therefore include expenses for harvesting other species in addition to mackerel.

Item	1991	1992
Nets, supplies, and misc. equipment	$215,713	$244,557
Repair and maintenance	41,369	57,886
Fuel	202,236	248,762
Packaging	248,002	191,594
Offloading	96,118	70,422
Insurance	120,000	120,000
Food	41,479	55,887
Gross payroll	771,527	1,000,645
FICA	55,053	68,648
Unemployment	6,061	9,233
Loan payment	329,268	278,847
Other	1,145	1,698
Total	$2,127,971	$2,348,179

The average annual total cost of operating the F/V Relentless during 1991-92 was $2,238,075, or $7,993 per day, for an annual average of 280 days at sea. On a per-unit-of-output basis, the cost can be determined as follows. It takes about 5 days of fishing to fill the vessel's hold, not including 1 day steaming to the fishing grounds and 1 day returning to port, a total trip length of 7 days, or $55,951.[14] Assuming the hold is filled to capacity, the cost per unit of output is $0.16 per pound ($352 per metric ton). Thus, to break even at full capacity, the vessel would need to receive about $0.16 per pound for its catch.[15]

How typical these results are for the U.S. industry depends on a number of factors. For example, labor costs in fishing typically are determined on a "lay" basis, in which the crew receives a predetermined share of the revenue from the catch, less certain expenses such as the crew's food. The crew share and the expenses to be deducted differ from one vessel to the next, because they are determined by contract between the crew and the owner. The type of equipment used also affects costs: plate freezers, such as those used on the F/V Relentless, are less costly than blast freezers, such as those used on some European mackerel vessels, but they can result in a lower quality product.[16] Yet another factor is geographic location, which determines not only what time of year the mackerel resource is harvested but also what alternative species are available should relative prices make mackerel less economical. Unfortunately, the small number of vessels on which the Commission obtained cost data precludes further analysis of these factors.

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[14] Sweeney testimony, transcript, pp. 26-27.

[15] The average ex-vessel price as reported by the National Marine Fisheries Service for Atlantic mackerel in 1991 was 15 cents per pound.

[16] The relative cost of different freezer systems largely depends on the unit cost of electricity. In countries such as Norway, where fuel is cheaper than in the United States, blast freezers can be more economical than plate freezers. This issue is discussed in more detail in chapter 5.

Another way of analyzing the costs of U.S. mackerel harvesting is by examining the costs of operating otter trawlers in the northeast U.S. fishery for groundfish (cod, flounder, etc.). Although mackerel is not a groundfish, the otter trawler is the same vessel type as that most commonly used to harvest and deliver fresh or chilled (not frozen) mackerel to onshore processors. Estimated cost data for otter trawlers that operated in the mackerel fishery are summarized in table D-4 (annual costs averaged over the 1989-91 period in constant 1987 dollars).[17]

The data in table D-4 indicate that the cost of operating otter trawlers varies by the size of the vessel, with the estimated costs ranging from $39,695 for vessel with a hull capacity between 5 and 50 gross register tons (GRT) and $93,233 for a vessel with a hull capacity of between 51 and 150 GRT to $171,692 for a vessel with a hull capacity of over 150 GRT. Assuming actual vessel hull capacities of 25, 100, and 200 GRT, the average annual operating costs for otter trawlers would be $1,588 per GRT, $932 per GRT, and $850 per GRT, respectively. These data thus suggest that there are certain economies of scale to be gained by harvesting with a larger vessel.

Processing

The cost of offshore processing is significantly higher than that of onshore processing, although the former is generally believed to produce a fresher (and therefore more valuable) product.[18] Table D-5 details the various cost items for the two types of processing for hypothetical facilities, assuming that each operates at 85 percent of physical capacity. As shown in this table, the NMFS's estimated cost of processed mackerel ranges from $489 per metric ton for an onshore processor to $641 per metric ton for a freezer trawler.

These results also depend on various factors. For example, whether the onshore processor obtains fresh mackerel for an assumed 8 cents per pound depends on market conditions; an increase in price to 15 cents per pound (the average 1991 ex-vessel price) would raise costs by $154.28 (32 percent of the total), to a total of $643.57, about the same as the freezer-trawler. Reducing the time the finished product spends in cold storage would not only reduce costs, but would also raise product value, because product quality would be higher. As discussed in more detail in chapter 4, in either case the total cost (which does not include transportation to overseas export markets) is well above the prices for frozen mackerel quoted for other suppliers to certain foreign markets, such as West Africa.

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[17] U.S. Department of Commerce, National Marine Fisheries Service (NMFS), Northeast Fisheries Science Center, "A Brief Description of the Harvest Sector for Atlantic Mackerel in the United States," by John B. Walden, unpublished manuscript, 1993, tables 8-10.

[18] U.S. Department of Commerce, National Marine Fisheries Service, Northeast Region, "Cost Analysis of Harvesting and Processing Atlantic Mackerel," unpublished manuscript, 1991.

Trends in Costs

Harvesting

One of the most significant variable cost items in mackerel harvesting is fuel. A significant fixed cost is the capital invested in the vessel, the cost of which can be represented by interest rates. Figure 2-1 shows the trends in the cost of fuel and in interest rates in recent years, as represented by the consumer price index for fuel, and indexed changes in the prime and mortgage yield rates.[19] As these cost indicators suggest, the major variable and fixed costs associated with mackerel harvesting generally rose during the latter 1980s, after declining significantly during the early part of the decade.[20] The price of fuel in 1991, indexed at 94.6, was 22 percent above the low point of 77.6 in 1986 but nearly 10 percent below the peak price index of 104.6 exactly 10 years earlier. The prime rate and mortgage yield indexes followed similar trends, generally declining between 1981 and 1987, then rising again during the latter part of the 1980s. However, in 1990 the trends in fuel prices and interest rates reversed themselves and began to decline, reflecting general economic conditions more than conditions in the fishing industry.

Processing

Aside from the cost of the unprocessed mackerel input, the principal costs of mackerel processing are capital, labor, and energy. The cost of capital, the interest rate, was discussed above. The cost of labor for processing depends on two factors: wages and productivity. Wages in mackerel processing are closely tied to the minimum wage, which has remained stable in recent years. Labor productivity has increased in recent years with the addition of improved machinery and equipment. This new equipment, however, raises the cost of capital in a mackerel-processing plant.

Energy is an important cost component because of the vast energy requirements of freezers, which constitute much of the fixed capital of a mackerel-processing facility. Except for a dip during 1986-88, the cost of energy (electricity and piped gas) has been generally rising, as illustrated

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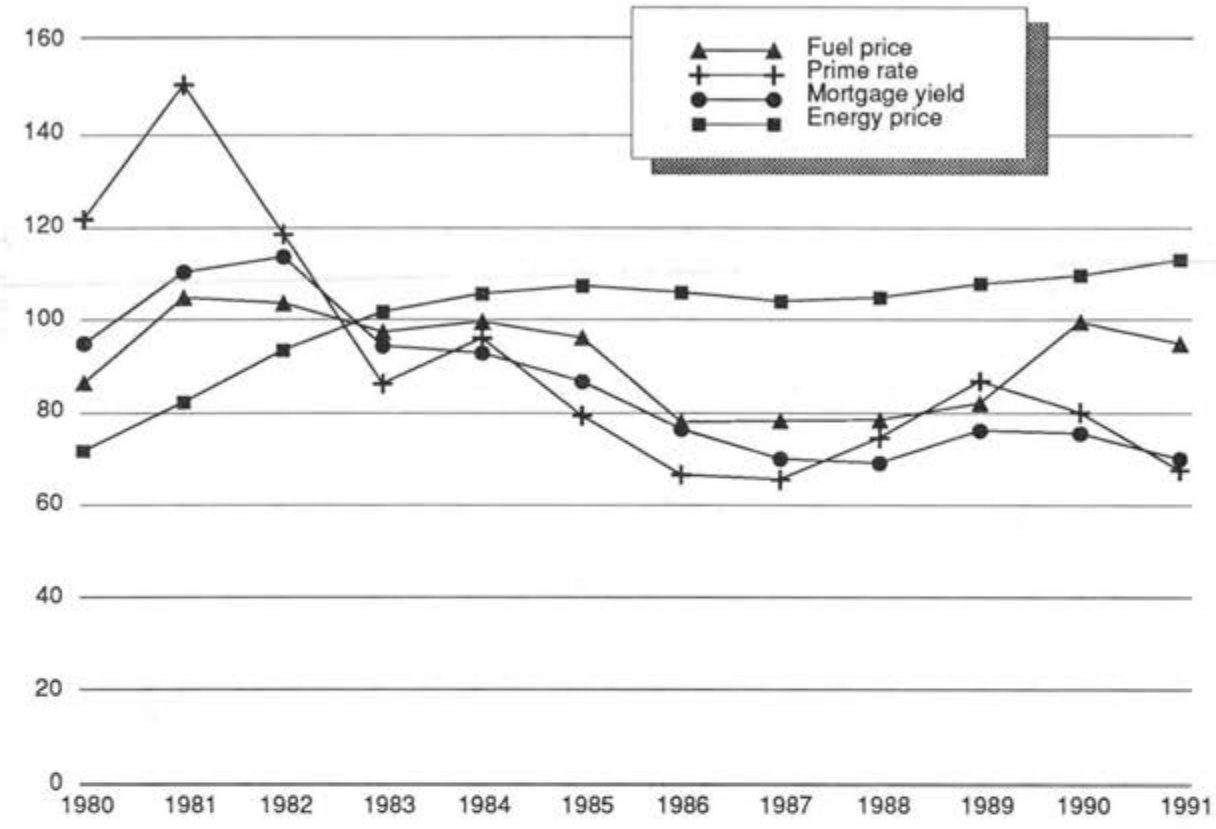
[19] Fishing vessels are durable goods, with a physical life of 30 years or more, and thus mortgage rates are probably a good guide for the cost of the fixed capital invested in the vessel. The prime rate, which is a short-term interest rate, can be used as a guide for trends in variable costs such as vessel repair and maintenance.

[20] Labor might normally be thought of as a harvesting cost, but as noted earlier, labor in mackerel harvesting is compensated on the basis of a share or "lay" system. That is, the crew of a vessel receives a share of the vessel's gross revenues from a trip, i.e., the value of the vessel's catch; as such, labor "cost" depends not on the actual amount of labor employed, but on the revenues received by the vessel.

Figure 2-1
Trend in cost indicators for U.S. mackerel harvests (Index is average for 1982-84)



Source: Economic Report of the President, Feb. 1992.

by the trend in the energy price index shown in figure 2-1. Between 1980 and 1991, the cost of energy rose by 58 percent, or at an average annual rate of about 4 percent during the 11-year period.

Foreign Fishing in U.S. Waters

A traditionally important part of the U.S. mackerel industry and market has consisted of foreign fishing and processing vessels operating in the U.S. exclusive economic zone (EEZ), commonly known as the 200-mile limit. The nations with the greatest mackerel-fishing activity in U.S. waters in the past have included the German Democratic Republic, the Netherlands, Poland, and the U.S.S.R. This aspect of the U.S. industry and market also is significantly affected by Federal and State fishery management policies, which are discussed in detail in the next section of this chapter.

Under procedures described in more detail below, a foreign government whose nationals wish to participate in the U.S. mackerel fishery must apply for access to the fishery. Typically, past practice has authorized a three-part participation, consisting of "directed" fishing by foreign vessels,[21] purchases of fish "over the side" from U.S. fishing vessels, and purchases of U.S.-harvested fish from shoreside processors. In a typical arrangement, for every 9 metric tons of directed foreign harvest by a foreign nation's fleet, the fleet must also purchase 3 metric tons "over the side" and 1 metric ton from U.S. shoreside processors. This is designed to ensure that the harvesting and processing segments of the U.S. industry also benefit from foreign participation in the U.S. fishery.

In a highly controversial reversal of policy, the Commerce Department in 1992 eliminated the directed fishing part of the foreign allocations due to a recommendation by the Mid-Atlantic Regional Fishery Management Council. The Federal Register notice is reproduced herein as appendix E. This action significantly reduced the attractiveness of foreign participation in the fishery because, according to European industry sources, directed fishing is usually more profitable for foreign fleets than purchases from U.S. harvesters or processors.[22] The Council, whose responsibility it is to develop the Atlantic mackerel management plan, recommended that in order to make more mackerel resources available for the U.S. industry, no total allowable level of foreign fishing be authorized.[23]

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[21] Directed fishing regulations allow the foreign vessel to harvest the fish itself. U.S. Department of Commerce, NMFS, Fisheries of the United States, 1991, May 1992, pp. 81-82.

[22] U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), "Final Initial Specifications for the 1992 Atlantic Mackerel Fishery," 57 F.R. 54189-54190 (Nov. 17, 1992). See especially the "Comments and Responses" section.

[23] Ibid.

U.S. Government Involvement in the Mackerel Industry

Fishery Management Plans

The principal types of Government involvement in the U.S. mackerel industry relate to fisheries management and foreign-fishery access. Both stem from provisions of the Magnuson Fisheries Conservation and Management Act of 1976 (MFCMA) (Public Law 94-265, as amended),[24] which provides for the conservation and management of all fishery resources within the U.S. EEZ. The U.S. EEZ extends from the States' coastal boundaries (in most cases 3 nautical miles from shore)[25] to 200 nautical miles from shore.

The MFCMA established eight regional fishery management councils, consisting of representatives of the fishing industry and of Federal and State Government agencies. Each council is charged with developing fishery management plans (FMPs) for the fisheries needing management within its jurisdiction. The FMPs are intended to protect the fisheries from excessive depletion. They are submitted to the Secretary of Commerce for approval and implementation and are enforced jointly by the Department of Commerce and the U.S. Coast Guard. Table D-6 summarizes the status of the utilization of the principal mackerel resources of the Atlantic, Gulf, and Pacific coasts as reported by the National Marine Fisheries Service. As shown in this table, two mackerel species--the Atlantic and jack mackerels--are designated as underutilized. The Spanish mackerel and king mackerel (Gulf of Mexico) are designated as overutilized, the Pacific mackerel, as fully utilized.

In the case of fisheries that are heavily fished, an FMP restricts or, if necessary, reduces fishing effort, to enable the fishery resource to recover. For fisheries that are lightly fished, such as the Atlantic mackerel, an FMP typically allows for an allocation of the surplus resource (i.e., over and above the domestic industry's needs) to foreign industry interests. This foreign allocation is known as the total allowable level of foreign fishing, or TALFF.

Domestic fishery management

Atlantic mackerel

Since 1977, Atlantic mackerel has been managed under the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan, administered chiefly by the Mid-Atlantic Fishery Management Council (MAFMC) in cooperation with its

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[24] 16 U.S.C. 1801.

[25] Exceptions include Texas, Puerto Rico, and the Gulf coast of Florida, whose seaward boundaries are 3 marine leagues (9 nautical miles). U.S. Department of Commerce, NMFS, Fisheries of the United States, 1991 (Washington, DC: NMFS, May 1992), p. 81.

New England counterpart, because of the vast range of the Atlantic mackerel resource. Like most FMPs, the FMP for Atlantic mackerel provides annual specifications relating to the allowable biological catch (ABC), which is that quantity of mackerel that could be caught in U.S. and Canadian waters minus the estimated catch in Canadian waters and still maintain an adequate spawning stock size. For mackerel, that spawning stock size is 600,000 metric tons.[26] In addition, the FMP provides an annual specification relating to the initial optimum yield (IOY), which is a modification of the ABC taking into account economic factors (e.g., world export potential, world import demand, U.S. export potential, etc.).[27] The IOY is divided into the domestic annual harvest (DAH), domestic annual processing (DAP), joint venture processing (JVP), and total allowable level of foreign fishing (TALFF). The DAH, DAP, a^Od JVP all relate to domestic industry activities. (The JVP also involves foreign factory ships that take U.S.-harvested fish.) The TALFF exclusively concerns foreign fishing activity within the U.S. EEZ, and is essentially, the difference between the IOY and the expected domestic and joint venture catches.

In November 1992 the Commerce Department published the following specifications for the 1992 ABC, DAH, and other aspects of the management of the Atlantic mackerel fishery (in metric tons):[28]

Allowable biological catch . . .	850,000
Initial optimum yield	95,000
Domestic annual harvest[1]	95,000
Domestic annual processing . . .	55,000
Joint venture processing	26,000
Total allowable level of foreign fishing	0

[1] Includes 14,000 metric tons as projected recreational catch.

In addition, the Mid-Atlantic Council has recommended to the Secretary of Commerce the following specifications for calendar years 1993 and 1994 (in metric tons):[29]

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[26] Mid-Atlantic Fishery Management Council, Amendment 4 to the Fishery Management Plan for the Atlantic Mackerel, Squid, and Butterfish Fisheries (approved Nov. 1991).

[27] Mid-Atlantic Fishery Management Council, Amendment 2 to the Fishery Management Plan for the Atlantic Mackerel, Squid, and Butterfish Fisheries (approved Mar. 1986), p. 4.

[28] U.S. Department of Commerce, NOAA, "Final Initial Specifications for the 1992 Atlantic Mackerel Fishery," (reproduced here as app. E).

[29] Mid-Atlantic Fishery Management Council, 1993-1994 Allowable Biological Catch, Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, Joint Venture Processing, and Total Allowable Level of Foreign Fishing

(continued...)

Allowable biological catch . . .	850,000
Initial optimum yield	100,000
Domestic annual harvest	100,000
Projected recreational catch . .	15,000
Domestic annual processing . . .	50,000
Joint venture processing	35,000
Total allowable level of foreign fishing	0

Other Atlantic, Gulf, and Pacific mackerels

Spanish and king mackerels since 1983 have been managed under the FMP for Coastal Migratory Pelagics, administered by the Gulf of Mexico Regional Fishery Management Council. On the Pacific coast, the management of jack mackerel is being transferred from the FMP for Groundfish (where it had been placed because it was harvested by foreign groundfish trawlers in the 1970s) to a new Coastal Pelagics FMP. The new FMP would also cover Pacific mackerel, which currently is not managed by a Federal FMP.[30]

Both Spanish and king mackerel stocks in the Gulf of Mexico are judged to be overfished;[31] that is, their stock sizes have been reduced below those levels that would maximize their sustainable yield. The stocks of these species in the South Atlantic, however, are judged to be not overfished but instead at or near their respective maximum sustainable yield (MSY) levels.[32] In all of these cases, the implications of these judgments include (1) that there can be no significant increase in sustained production from these fisheries and (2) that commercial and recreational fishing effort is to be closely monitored and, where necessary, restricted to avoid further reduction of the stock sizes and sustainable yields.

Among the restrictions on Spanish and king mackerels are a ban on the use of purse seines on overfished stocks and a ban on driftnets on all stocks; a specification that Gulf king mackerel may be taken only by hook-and-line or runaround gillnets; and a minimum size of 14 inches total length (12 inches fork length) for king mackerel.

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[29] (...continued)
Recommendations for Atlantic Mackerel, Loligo [squid], Illex [squid], and Butterfish, Aug. 1992, pp. 24-25.

[30] Currently Pacific mackerel is managed by the State of California. Under the State FMP, if the fish biomass exceeds 135,000 metric tons, the harvest is unregulated. If the biomass is between 18,000 and 135,000 metric tons, a quota of 30 percent of the biomass in excess of 18,000 metric tons is imposed. If the biomass falls below 18,000 metric tons, then commercial fishing is stopped. NMFS, Our Living Oceans (1992), p. 83.

[31] Gulf of Mexico Fishery Management Council, Amendment 6 to the Fishery Management Plan for Coastal Migratory Pelagics in the Gulf of Mexico and South Atlantic, June 1992, app. IV.

[32] NMFS, Our Living Oceans (1992).

Foreign fishery management

Foreign fleet participation in the U.S. fishery for Atlantic mackerel traditionally has been important in terms of both the foreign directed harvest and the foreign purchase of U.S.-harvested mackerel delivered "over the side" to foreign processing ships. A foreign nation that seeks an allocation of surplus U.S. mackerel resources must obtain a Governing International Fishery Agreement (GIFA) from the U.S. State Department.[33] An example of a GIFA (for the EC) is reproduced herein as appendix F. GIFAs are negotiated between the foreign nation and the State Department and are transmitted by the President to Congress for review. Once a GIFA is obtained, vessels of that foreign nation must apply to the State Department for an allocation of the desired species and a valid foreign fishing permit. The application and the recommendations of the State Department are reviewed by Congress, the Coast Guard, the appropriate Regional Fishery Management Council, and at the Commerce Department by the Assistant Administrator of the National Marine Fisheries Service (NMFS). NMFS may approve the application in whole or in part, with or without special conditions and restrictions. The approved application is forwarded to the applying nation by the State Department, and the applying nation must accept the conditions and restrictions on the application before a permit is issued.

For mackerel, the most common conditions and restrictions on foreign fishing permits concern fees paid to the U.S. Government and requirements concerning the purchase of mackerel from U.S. fishing vessels or shoreside processing plants. The fees include a poundage fee, an observer fee (to finance a U.S. Government observer stationed on the vessel while it is in U.S. waters), and a permit fee. As noted earlier concerning purchases of U.S. fish, foreign fishing companies in recent years have been subject to a "9:3:1" requirement; that is, for every 9 tons of mackerel directly harvested by the foreign fishing company, 3 additional tons must be purchased over the side from U.S. harvesters and 1 ton must be purchased from shoreside processors. This 9:3:1 ratio applies to every foreign nation whose vessels are authorized to fish for mackerel in U.S. waters, although the exact ratio may change slightly from year to year.

Prior to 1990, surplus U.S. fishery resources were required to be made available to foreign fleets.[34] A 1990 amendment to the MFCMA weakens this provision; such surplus now "may" be made available to foreign fleets.[35] Since 1992, however, this amendment has had the effect, intended or not, of completely eliminating the presence of foreign mackerel fleets in U.S. waters. Despite repeated requests from the Netherlands and other nations for foreign fishery allocations, the Department of Commerce authorized a zero Atlantic mackerel TALFF for the 1992 calendar year. As of May 1993, Commerce had not

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[33] The following discussion is drawn from NMFS, Fisheries of the United States, 1991, pp. 81-82.

[34] 16 U.S.C. 1801.

[35] See app. E.

announced its policy for the 1993 mackerel season, the bulk of which runs from January through spring.

Other Government Programs

Inspection standards and procedures

Like all seafoods, mackerel is subject to voluntary Federal inspection rather than the mandatory Federal inspection to which meats are subject. The U.S. Department of Commerce (Commerce) conducts the voluntary inspection program for fishing vessels, seafood processors, and marketers on a fee-for-service basis. Services include vessel and plant sanitation inspection and product inspection and grading, among others. Products that pass Commerce safety and wholesomeness tests are qualified to bear Commerce inspection marks, ranging from "U.S. Grade A" (the highest standard), to "Packed Under Federal Inspection," to "Officially Sampled," the lowest acceptable Commerce grade.

Financial assistance

The NMFS operates two types of programs of financial assistance to the U.S. fishing industry. The Fishing Vessel Obligation Guarantee Program guarantees loans for the construction, reconstruction, or reconditioning of fishing vessels and, as of 1982, shoreside processing plants. Typically, 20 percent of the construction cost is provided by the borrower and the rest is borrowed from a private lender, usually at 1 to 2 percentage points below the prime rate, for maturities of 15 to 25 years.

The Fishing Vessel Capital Construction Fund provides assistance for vessel acquisition only. Fishermen may defer payment of Federal income tax on the portion of their income that is set aside in the Fund. The funds must be used for payment toward the cost of vessel construction or reconstruction. Thus the program effectively creates an interest-free loan from the U.S. Treasury equal to the taxes that would otherwise have to be paid on current income. The depreciable value of the vessel is reduced by the amount of the investment from the fund; thus depreciation charges are reduced and taxable net income from the vessel's operation is higher.

Under the Fishermen's Protective Act of 1967,[36] the Fishing Vessel and Gear Damage Compensation Fund provides for the compensation to fishermen for gear damage resulting from manmade acts, such as damage from other vessels. Prior to 1980, damages from so-called "acts of God" were also covered. The financing of this program is provided by revenues received from fees assessed to owners of seized foreign fishing vessels, such as those caught operating illegally in U.S. waters.

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[36] 22 U.S.C. 1971 and following, Pub. L. 90-482.

Other Federal agencies that financially assist the fishing industry as well as other industries, include the Small Business Administration, the Farmers' Home Administration, and the U.S. Department of Housing and Urban Development.

The Jones Act (46 U.S.C. 883) requires that any U.S.-flag vessel engaged in commercial fishing in the United States must have a U.S.-built hull and, therefore, forbids U.S. fishermen from acquiring foreign-built vessels for use in U.S. fisheries. The Nicholson Act (46 U.S.C. 251) forbids foreign harvesting vessels from landing fish directly in U.S. ports, thereby protecting U.S. fishermen from direct competition from foreign harvesters but restricting the supply of fish to U.S. processors.

Food aid

Mackerel has been listed as an eligible commodity for export as food aid under Public Law 480 (P.L. 480) since fiscal year 1992.[37] To be eligible for export under P.L. 480, the Secretary of Commerce must determine that an "exportable surplus" of a seafood item exists, thereby allowing the commodity to be included on the list of eligible commodities. Title I of P.L. 480 provides for U.S. Government support to designated recipient countries through long-term (30-year), low-interest credit for purchases of eligible U.S. food commodities. Title II provides for U.S. Government purchases by tender of U.S. food commodities for donation to eligible countries through private voluntary agencies, international organizations, and in the case of emergencies, recipient governments. Under Title III of P.L. 480, the U.S. Government can forgive a Title I commodity loan provided that the local currency generated by the commodity sales is used for specific development purposes.[38]

However, as noted elsewhere in this report, no food aid program that includes mackerel has yet been concluded. The reasons include, among others, that U.S. mackerel costs more than grains and other eligible commodities and more than mackerel from other sources.[39] Analysts also cite as disincentives

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[37] The Agricultural Trade Development and Assistance Act of 1954 (Food for Peace) (Pub. L. 83-480) (7 U.S.C. 1701 and following, 68 Stat. 455).

[38] Title III of P.L. 480 is known as the Food for Development Program. Mark E. Smith, "United States Plays a Major Role in Food Aid Abroad," U.S. Department of Agriculture, Food Review, July-Sept. 1992, pp. 25-27.

[39] In 1992, continuing a long-standing program, the Canadian International Development Agency purchased $3.5 million worth of Canadian-produced canned mackerel for export under its food aid program. The intent of the purchase, according to the Ministries of Fisheries and of External Affairs, was to promote development and self-reliance in countries experiencing food shortages, to continue to supply traditional mackerel markets, and to provide significant employment to the Canadian industry.

(continued...)

for P.L. 480 mackerel sales the need for Title I sales to be repaid in dollars and the relatively high cargo rates between the U.S. east coast and West Africa.[40]

Commercial credit programs

U.S. mackerel exports have been eligible for export credit under the U.S. Department of Agriculture's (USDA's) Export Credit Guarantee Program, GSM-102, since 1984.[41] The purpose of this program, administered by USDA's Foreign Agriculture Service, is to facilitate U.S. agricultural commodity exports (including seafood) by guaranteeing exporters or their assignees that they will be repaid for export credit sales made to eligible countries.[42] USDA officials report that no U.S. mackerel sales have been made under this program and cite the same sales disincentives that affect mackerel food aid.

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[39] (...continued)

The former Soviet Union established joint ventures and/or provided significant food aid (including fish) and other economic assistance to a variety of developing countries, including Jamaica and numerous coastal nations of West Africa and the Middle East.

[40] NMFS official, conversation with USITC staff, Apr. 23, 1993.

[41] [Pub. L. 98-623, 98 Stat. 3409, amending 15 U.S.C. 714c (f). Another commercial credit program, the Intermediate Export Credit Guarantee Program, GSM-103, provides credit guarantees for up to 10 years but largely applies to commodities with a capital value, such as livestock and genetic material.

[42] General Accounting Office, Status Report on GAO's Reviews of the Targeted Export Assistance Program, the Export Enhancement Program, and the GSM-102/103 Export Credit Guarantee Programs, Feb. 21, 1990, app. III.

CHAPTER 3. FOREIGN INDUSTRIES

The principal foreign competitors of the U.S. Atlantic mackerel industry are found among the northern European nations, particularly those adjacent to the North Sea, such as Norway, the United Kingdom, Ireland, the Netherlands, and Germany (figure 3-1).[1] In addition, Russia, the Baltic nations, and Poland are or in the recent past have been important producers as well as significant markets. The North Sea, and the northeast Atlantic generally, contain rich mackerel resources whose abundance, with proper management, tends to keep harvesting costs down. Much of those resources are concentrated inside the exclusive economic zones (EEZs) of the European Community (EC) and nearby countries and so are available only to those nations' fleets. Major mackerel (all species) exporters include Norway, the United Kingdom, the Netherlands and Ireland (figure 3-2). Figure 3-3 and table D-7 shows the global mackerel catch by major harvesters for all mackerel species.

European Community

Industry and Market Structure

Mackerel resources

The two largest mackerel resources harvested by EC fishermen are in the North Sea and in a stretch of the North Atlantic extending from the waters off France, around the Atlantic coast of Ireland, to the waters off Norway. These mackerel resources constitute two distinct stocks, usually referred to as the North Sea and western mackerel stocks, respectively.

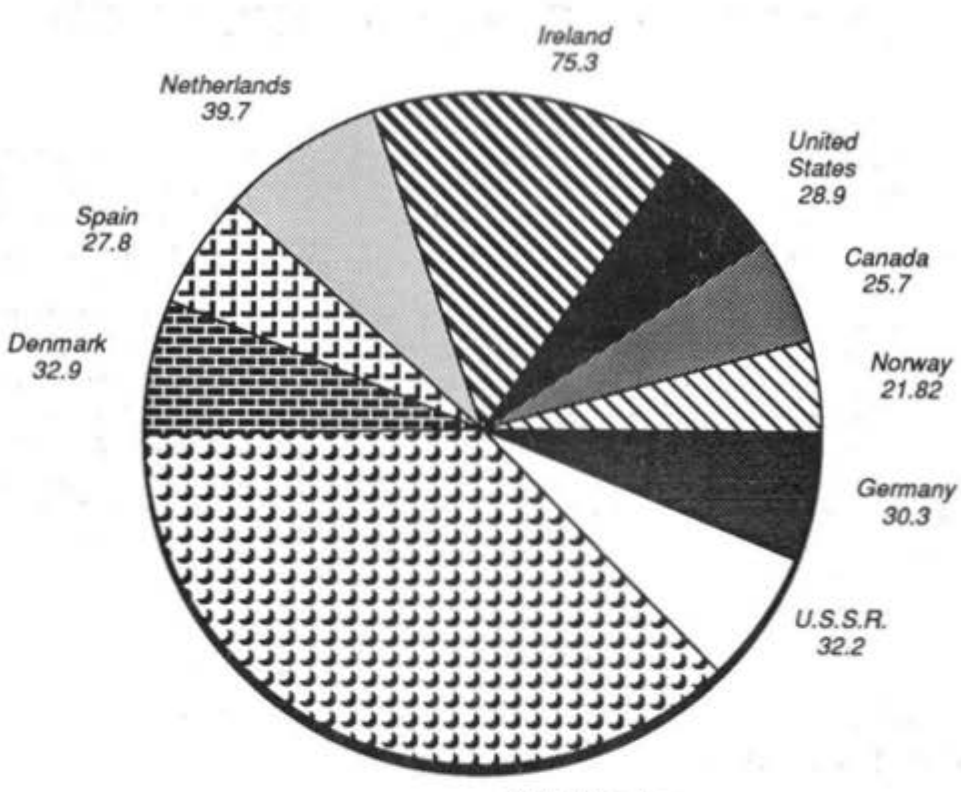
Both mackerel stocks are among the potentially most productive in the world, but they are also heavily fished, to the extent that biologists believe their current productive capability falls short of their long-term potential.

Principal fishing nations

The EC's principal mackerel-harvesting nations are the United Kingdom, Ireland, and the Netherlands, which together account for about 80 percent of the EC's total allowable catch. An indication of the relative importance of the fishing sectors of these and other EC nations is given by their proportion

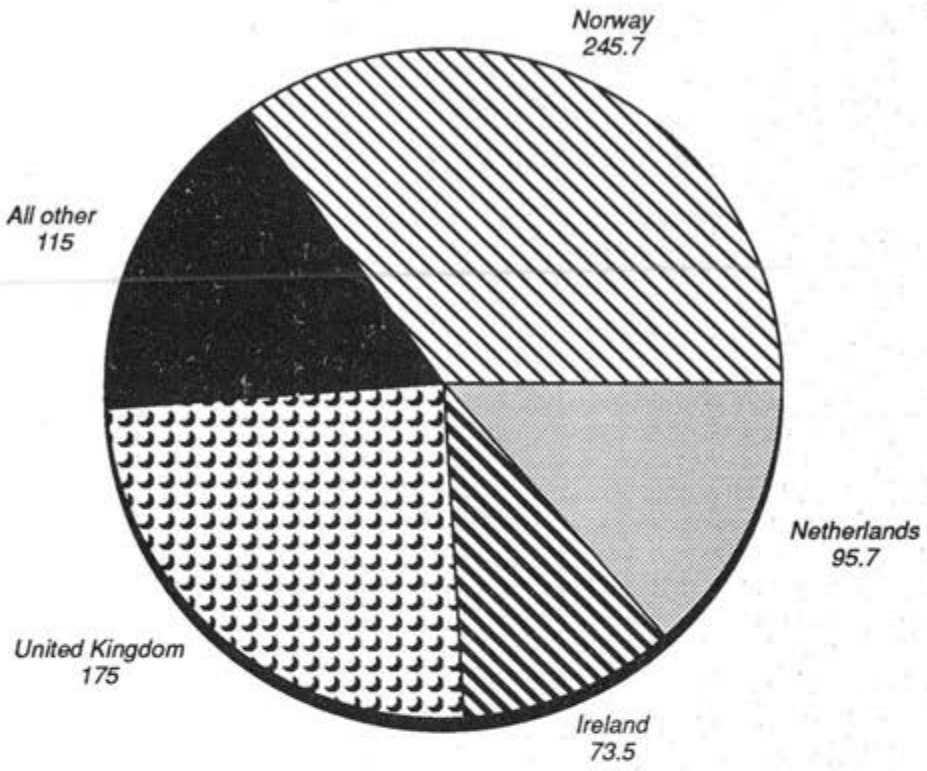
[1] On the west coast, U.S. exporters of jack and Pacific mackerels face competition in Japanese and other Asian markets from the mackerel industries of Japan, Thailand, Chile, and other Pacific rim nations, as well as Norway. However, this chapter focuses on the foreign competitors of the Atlantic mackerel industry.

Figure 3-1
Atlantic mackerel: Landings, by country, 1991 (1,000 metric tons)



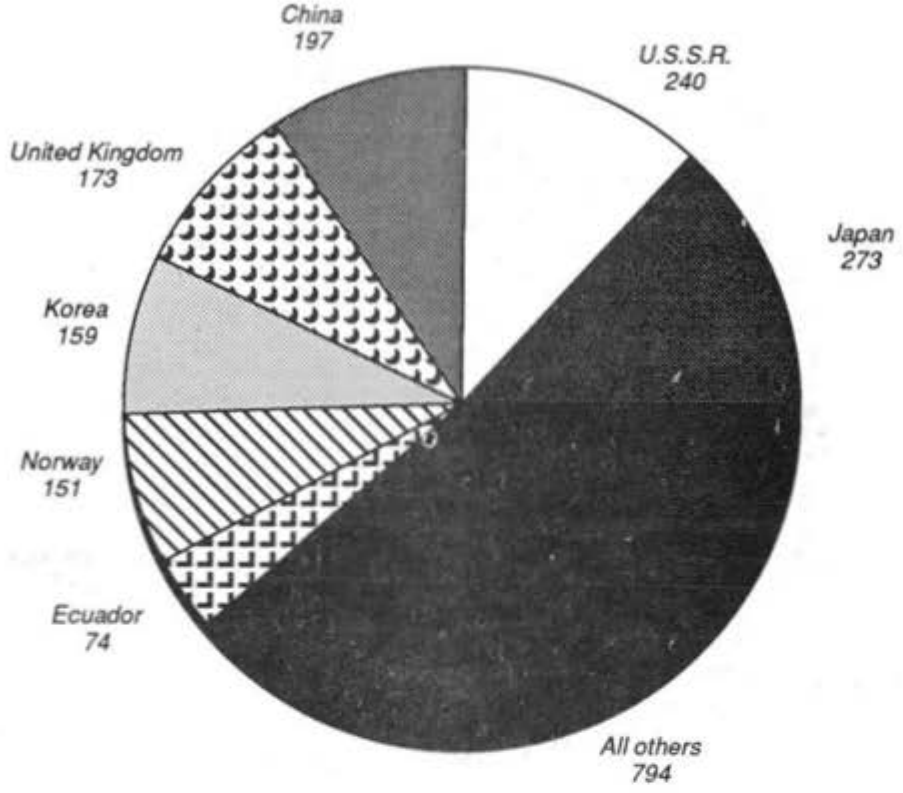
Source: Food and Agriculture Organization of the United Nations.

Figure 3-2
Mackerel: Exports (all species), by country, 1991 (1,000 metric tons)



Source: Food and Agriculture Organization of the United Nations.

Figure 3-3
Mackerel: Global catch, by major countries, 1990 (1,000 metric tons)



Source: Food and Agriculture Organization of the United Nations.

of the 1992 allowable mackerel harvest, as shown in the following tabulation (data supplied by the Commission of the European Communities) (in percent):

Nation	Proportion of the 1992 EC total allowable catch
United Kingdom	52
Ireland	19
Netherlands	9
Spain	6
Germany	4
France	4
Other EC	6
Total	100

Industry structure

The EC mackerel industry includes both harvesters and processors, who also distribute mackerel to the export market. However, unlike U.S. harvesting vessels, EC harvesting vessels also do much of the processing, particularly among the Dutch fleet of large freezer-trawlers. The small size of the EC market for mackerel has tended to restrict the growth of the onshore processing sector.

There are significant differences in the techniques used by EC harvesters. In the United Kingdom, for example, most mackerel is harvested by purse seiners. In the Netherlands most mackerel is harvested by freezer-trawlers that are much larger than either the British purse seiners or the freezer-trawlers used in the U.S. industry.

In the United Kingdom, mackerel harvesters typically deliver their catch directly to Eastern European processing vessels in a process known as "klondyking."[2] Most such fish is then delivered to the home markets of the processing vessels. In recent years, British harvesters have experienced difficulties in obtaining payment from Eastern European klondyke partners who are short of hard currencies. As a result, EC prices for mackerel have fallen. Barter arrangements have also become increasingly common as a means to maintain klondyking. Some barter arrangements are quite complex. For example, Scottish harvesters have recently been participating in a three-way arrangement in which Scottish-harvested mackerel is delivered to Russian klondykers, other Russian harvesters catch and deliver cod to a Danish trading

[2] Klondyking is an industry term that refers to the practice of a harvesting vessel from a particular country delivering its catch to a vessel from another country.

concern, and the Scottish harvesters obtain payment for the mackerel from the Dutch firm (which has sold the cod).[3]

The Dutch mackerel industry and trade is controlled by an industry association called the Dutch Seafrozen Fish Foundation, known in the world fish trade as "The Group." Formed in 1976, this IJmuiden-based organization consists of five firms engaged in harvesting, processing, and exporting mackerel and other small pelagics.[4] The Group operates 12 to 15 stern trawlers, each with a storage capacity of 2,000 to 4,000 metric tons and a daily freezing capacity of 250 metric tons.[5] The onshore facilities of the Group have a combined cold-storage capacity in excess of 300,000 metric tons. The Group's mackerel harvest comes from EC waters and from distant-water fisheries, including the U.S. Atlantic mackerel fishery until 1992. The Group's exports are destined primarily to Africa, the Middle East, other EC markets, and Japan, as indicated by the Netherlands export data in table D-8.

There are a number of factors explaining the Group's success in mackerel exporting, according to European industry officials interviewed by Commission staff. These factors include--

- The ability to offer importers a range of fish products in addition to mackerel;
- Extensive market contacts and trading skills developed by the Dutch business sector generally over many years as one of the world's preeminent commodity-trading nations;
- Apparent economies of scale in mackerel harvesting; and
- Careful coordination in marketing among its members.

The effects of these factors on the competitiveness of the Dutch mackerel industry in relation to its U.S. rivals are discussed further in chapter 5.

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[3] Other low-valued fish, such as capelin, are also bartered for by Russian harvesters and traders. Recent reported barter arrangements have put the barter price of a ton of cod at 20 tons of capelin (Eurofish, Mar. 26, 1992), which is probably not much different than the "cod value" of a ton of mackerel.

[4] The five vessel owners involved are Jaczon Rederij en Haringhandel (based in Scheveningen); N.V. Visserij Maatschappij Kennemerland (IJmuiden); W. Kwakkelstein (Vlaardingen); Cornelius Vrolijk (IJmuiden); and Van der Zwan (Scheveningen).

[5] Fishing News International, Mar. 1991.

Trade

The United Kingdom, the Netherlands, and Ireland account for the bulk of both intra-EC trade and EC exports of mackerel. Recent export trends for these three countries are presented in table D-8.

During 1987-91, exports of mackerel from these three EC exporters ranged from 440,900 metric tons in 1987 to 357,700 metric tons in 1990. Of total 1991 mackerel exports of 401,500 metric tons, roughly 345,000 (86 percent) were shipped outside the EC. The remaining exports were shipped to other EC member states, although these shipments may have subsequently been exported out of the EC by the EC importer.

The United Kingdom's largest EC market during 1990-92 was the Netherlands, which reexports most of its imports from the United Kingdom. The largest non-EC market for the United Kingdom was the former Soviet Union in 1990-91 and Russia in 1992, which imports through klondyke arrangements. As is evident from the January-September 1992 data in table D-8 (which cover the British mackerel-fishing season), British exports to Russia appear to have declined dramatically from 1991, reflecting the volatile market situation in Russia and much of Eastern Europe.[6] Despite the diversion of exports to the Netherlands shown by the threefold increase in the United Kingdom's January-September 1992 exports to the Netherlands, industry sources report that reduced demand in the Eastern European market was not fully compensated by increased exports elsewhere.

For the Netherlands, African, and Middle Eastern markets have accounted for the majority (63 percent during 1987-91) of exports in recent years. Except for small amounts exported to Japan, these developing economies account for most Dutch exports outside of the EC market.

For Ireland, much like the Netherlands, the largest non-EC markets for mackerel are the developing economies of Western and Northern Africa. The Egyptian market has been of importance in recent years, reportedly as a result of Government-to-Government contracts negotiated between the Irish Ministry of Fisheries and the Egyptian General Authority for Supply Commodities (known generally as ESTRAM) and supervised by the Irish Sea Fisheries Board (known by its Gaelic acronym BIM).[7] During 1988-91 Irish exports to non-EC markets dropped by 26,000 metric tons. Thirty-seven percent of this drop can be attributed to declining exports to the former Soviet Union. However, during this time period many Irish vessels are reported to have landed their catch at Norwegian ports, which require shorter steaming times (and lower fuel costs) than Irish ports. The landings were reportedly then shipped to markets in the former Soviet Union.[8] The German market has reportedly attracted Irish seafood exporters, who with the help of a promotional campaign by BIM, sought

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[6] Fishing News, Jan. 16, 1992.
[7] Abidjan 91, June 1991.
[8] The Irish Skipper, Dec. 1990.

out German retail chains in anticipation of a growing market following German reunification.[9]

Market characteristics

Most of the mackerel harvested by EC fishermen is exported to non-EC markets, because of limited demand within the EC. However, EC domestic consumption of mackerel, particularly in canned and fresh whole form,[10] appears to be greater than U.S. consumption. It is likely that the wider variety of canned mackerel products available in some European markets explains part of this EC demand. Mackerel at the retail level is often canned in sauces and other media, including curry, gravad, white wine marinade, horseradish, green peppercorn, and pizza sauces.[11] Mackerel canned in sauces reportedly accounts for 12.8 percent of the total British mackerel fillets market.[12] In Italy, in contrast, Commission staff located only oil-packed mackerel fillets among canned products, the same product form as that typically found in U.S. supermarkets.

The structural changes in European economies, according to industry sources, have altered the structure of demand for fish products, including mackerel. With rising incomes in Eastern European regions, such as the former German Democratic Republic, demand for whole smoked mackerel is said to be declining, whereas that for mackerel fillets and fish in sauces is on the rise.[13]

The available evidence suggests that price, rather than income changes, is the most important economic factor affecting EC mackerel demand, although few, if any, studies have specifically analyzed mackerel. One study examined the nature of consumer demand for "wet fish" (fresh, chilled, or smoked fish) in the United Kingdom, including the effects of changes in prices and income

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[9] The Irish Skipper, Oct. 1991.

[10] In the United Kingdom, for example, mackerel and other "oily" fish (including kippers and herring) accounted for an estimated 24 percent of overall British consumption of fresh fish in 1991. Super Marketing, Sept. 20, 1991.

[11] "John West Foods Offers Fish Recipe Dishes," Gorman's New Product News, Aug. 12, 1991.

[12] The Grocer, May 11, 1991.

[13] Infofish International, May 1991. This source also reported the adverse effects on whole-fish consumption caused by a 1987 nematode "crisis" in West Germany. Demand for whole or semiprocessed fish declined, and industry marketing campaigns have since succeeded mainly in restoring demand for fish products that are fully processed (and therefore perceived as safer). The associated effects on the mackerel industry probably included a shift in consumer demand from whole fish to fillets canned in sauces and other processed products.

on fish demand.[14] This study estimated own- and cross-price and income elasticities of demand[15] for four groups of seafoods[16] using various statistical estimation techniques, only one of which is summarized here.[17] The following tabulation presents the estimated elasticities for the "fat" group, which includes fresh and smoked mackerel:

Elasticity with respect to--	Additive direct translog	
	Total	Compensated
Income	0.06	([1])
Price of:		
White fish	1.19	1.23
Smoked white fish	0.05	0.06
Fat (including mackerel)	-2.47	-2.47
Other fish	1.16	1.18

[1] Not applicable.

The own-price elasticities of demand for the "fat" group are, as expected, negative; that is, the quantity demanded declines as the price rises and vice versa. The price elasticity of demand of -2.47 indicates that the demand for mackerel and other "fat" fish is quite elastic; that is, a 1-percent increase (decrease) in price will cause the quantity demanded to decline (rise) by 2.47 percent. The cross-price elasticities indicate that the quantity demanded of mackerel would be expected to decline in response to a decline in the price of cod or other white fish substitute because consumers shift to the relatively less expensive product. For example, in response to a

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[14] M.P. Burton, "The Demand for Wet Fish in Great Britain," Marine Resource Economics, vol. 7 (1992), pp. 57-66.

[15] The own-price elasticity of demand for a product is a measure of the percentage change in the quantity demanded of the product that results from a 1-percent change in its price; the cross-price elasticity of demand is a measure of the percentage change in the quantity demanded of the product that results from a 1-percent change in the price of a substitute product; the income elasticity of demand for a product is a measure of the percentage change in the quantity demanded of the product that results from a 1-percent change in consumer income.

[16] The categories were "white" (cod, pollock, haddock, and hake), "smoked white" (smoked cod and haddock), "fat" (herrings, kippers, mackerel, and smoked mackerel), and "other" (flounder, skate, sole, whiting, and rock salmon).

[17] The methods employed three different functional forms for the equations: direct translog, indirect translog, and additive direct translog. The last yielded the most statistically and theoretically defensible results, which are summarized in the tabulation. General information on translog (transcendental logarithmic) models is contained in most econometrics texts. See, for example, J. Johnston, Econometric Methods, 3d ed. (New York: McGraw-Hill, 1984), pp. 335-337.

1-percent drop in the price of fresh white fish, the estimated decline in quantity demanded is 1.19 to 1.23 percent. The cross-price elasticity is much smaller for smoked white fish, perhaps reflecting the greater differences in the product characteristics. The income elasticity of 0.06 is low, suggesting that income growth does not encourage increased consumption of mackerel and other "fat" fish; in response to an increase in income of 1 percent, the quantity demanded of "fat" fish rises by only 0.06 percent.

Government Involvement in the Industry

As in the U.S. mackerel industry, government plays important supportive and regulatory roles in the mackerel industries of EC member states. With the growing economic and legal integration of the member states, most of the responsibility for the support and management of the fishing industries in those countries has shifted to the EC Commission in Brussels, which administers the Common Fisheries Policy (CFP). The CFP provides for fishery management, price support, third-country agreements, and other policies and programs for fishing industry support and management.

Fishery management

Adopted in 1983, the CFP established the EC's EEZ (commonly known as the 200-mile limit), within which fishing vessels flying the flags of the EC member states can travel and fish freely. Fishing vessels from non-EC nations are excluded from most EC fisheries, with the exception of underutilized fisheries that can be made available to other nations by agreement with the EC Council. In this regard, EC law is consistent with both U.S. law and EC obligations under the United Nations Conference on the Law of the Sea (UNCLOS).[18]

Mackerel is considered a fully utilized resource in the EC, thus there is no surplus to allocate to non-EC fleets. However, both the western and North Sea mackerel stocks extend beyond the EC EEZ, where non-EC harvesters are active. Therefore, to ensure the long-term viability of these mackerel resources, the EC and non-EC nations, particularly the Faroe Islands[19], Norway, and Sweden, jointly manage these resources. Such joint management chiefly takes the form of an annual division of the total allowable catch (TAC) of the entire mackerel resource between the EC and non-EC nations.

The annual allocation to the EC of the mackerel TAC is in turn further subdivided by both geographic region and member state. The member-state allocations for 1993 are presented in table D-9.

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[18] UNCLOS provides a guide for the national fisheries policies of its signatory nations in much the same way the General Agreement on Tariffs and Trade (GATT) guides national policy on trade law.

[19] Although under the jurisdiction of Denmark, an EC member state, the Faroe Islands are not part of the EC.

As with any heavily utilized fishery, the determination of the annual TACs in the EC mackerel fishery involves conflicting interests. On one side are the biologists and others involved in fishery management, who seek to conserve the present resource to enable it to grow and yield greater future harvests. On the other side is the fishing and fish-processing industry, whose members would suffer from a significant cutback in current harvests even though future harvests would improve. In fact, one study has concluded that current harvest rates are two to three times the "optimal" level (i.e., the level that would maximize the long-term yield from the fishery).[20] According to this source, past EC policy emphasized protection of "short-term employment in the industry"; however, the study speculates that future EC policy will aim at increasing the fishery's long-term productive potential, thus enabling the EC industry to boost annual production and exports.

Price Support

The price support regime of the CFP contains three key elements: the guide price, the withdrawal price, and the reference price.[21] All are species-specific and are set by the EC Council or EC Commission. The guide price is set on the basis of a 3-year moving average of market prices (adjusted for expected market conditions) and is intended to provide an equitable return to the fishermen. The withdrawal price, which is usually 70 to 90 percent of the guide price, is the price the EC pays to remove fish from the market. Withdrawn fish may not be resold for human consumption; they typically are channeled to fishmeal, oil, and other industrial uses. The reference price is applied to EC imports of fish that compete with domestic landings. The reference price supports domestic prices with a levy that is applied to imported fish after market prices fall below the reference price level for three consecutive days.

The price-support payments are administered through private Producer's Organizations (POs) that operate on a regional or national level and are organized according to inshore, offshore, high-seas and deep-sea fishing operations. The EC Council sets the guide and withdrawal prices at the start of each fishing season. If the price received by a PO on the open market falls below the withdrawal price, the PO may remove a certain proportion of the supply from the market and channel it to industrial uses. However, the price-support payment to the PO declines as the proportion of total supply withdrawn increases.

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[20] John O.S. Kennedy, "Optimal Annual Changes in Harvests From Multicohort Fish Stocks: The Case of Western Mackerel," Marine Resource Economics, vol. 7 (1992), pp. 95-114.

[21] This description draws from U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), The Producer Subsidy Equivalent for Fisheries: The Cases of Canada, the European Community, and Japan, by Bogle and Gates Inc., Saltonstall-Kennedy Grant NA-88-ABH-00013, Sept. 1990.

As discussed in more detail in chapter 5, the impact of the EC's price-support program for mackerel on EC mackerel prices is uncertain because market conditions outside the EC (chiefly in Eastern Europe) have depressed export prices. EC harvesters and exporters often prefer to sell at prices below the reference price rather than have fish withdrawn for the much less valuable industrial-use markets.

Other EC fishery support provisions

There are Community wide ad valorem tariffs on imports of mackerel products. For fresh or frozen whole mackerel, the tariff depends on the time of year: between February 15 and June 15 (when EC harvests are generally at a peak) the tariff rate is 20 percent; at other times the tariff rate is zero. For mackerel fillets the tariff rate is 15 percent. For most species of mackerel in airtight containers the tariff rate is 25 percent (20 percent for Scomber australasicus).

The EC also negotiates international fishing agreements on behalf of the vessels of its member states. These agreements include reciprocal agreements (such as with Norway over the North Sea mackerel fishery), preferential trade agreements (such as with various African nations that receive preferential tariff treatment in the EC market in exchange for EC access to their fisheries), and financial agreements in which the EC pays compensation for EC vessel access to third-country waters. Most such agreements involve fisheries other than mackerel, but some do include mackerel; their economic effects are discussed further in chapter 5.

Norway

Industry and Market Structure

Mackerel resources

Norwegian mackerel harvesters rely on all of the main mackerel fisheries of the Northeast Atlantic: the North Sea-Skagerrak waters; the Norwegian Sea-Faroe Islands region; and the waters west of the British Isles. In figure 3-4 these three regions correspond to zones IV-IIIa, IIa-Vb, and VI-VII-VIIIabde, respectively. Of these regions, the first two dominate. The third region has declined in importance in recent years; in fact in 1990 (the latest available year) no Norwegian harvest was recorded in that region.[22]

The location of the Norwegian mackerel fishery is important in evaluating industry competitiveness. In particular, industry and trade

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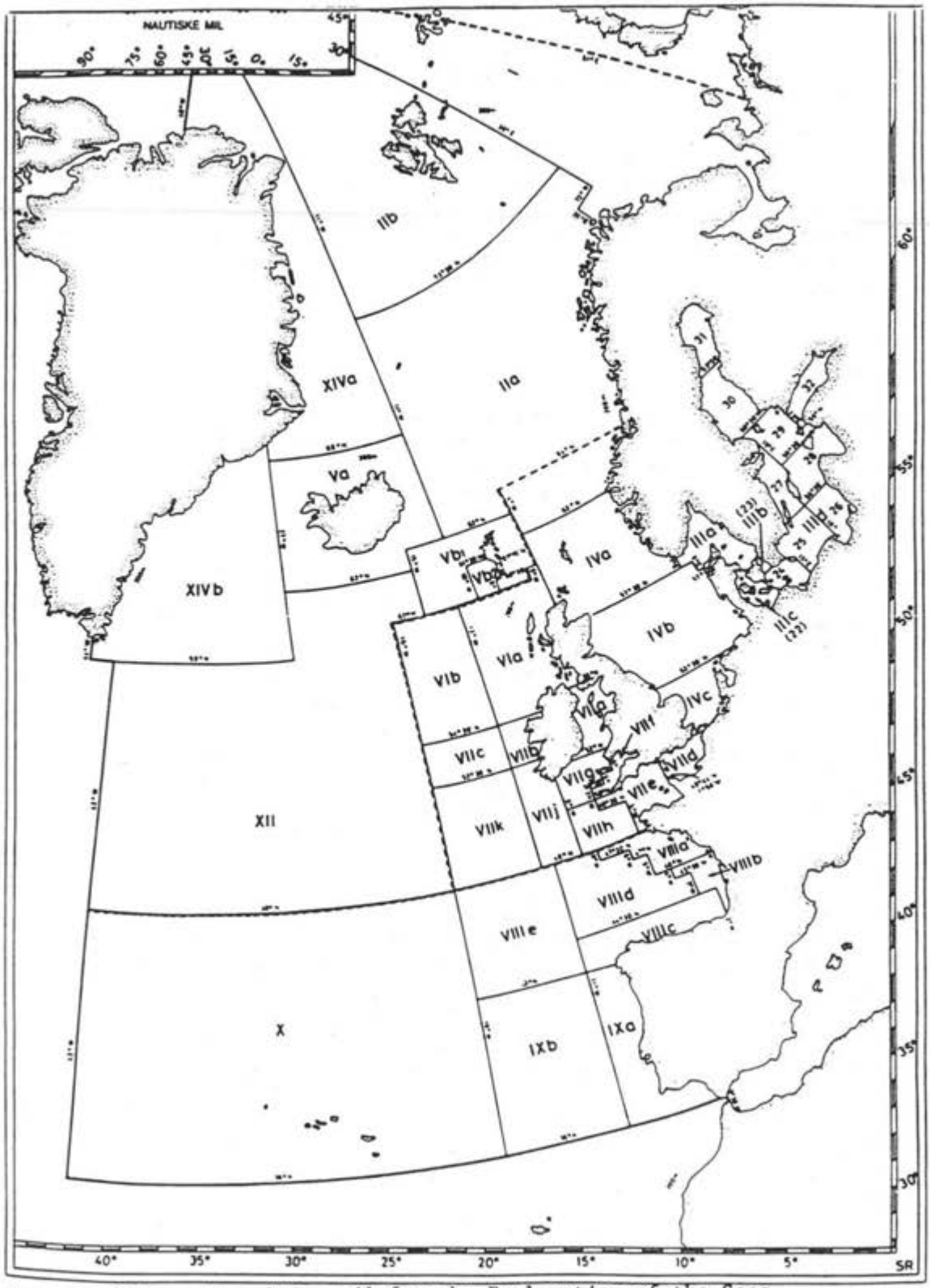
[22] Data from International Council for the Exploration of the Seas (ICES) Working Group; supplied to USITC staff at an interview with the Fisheries Counselor, Royal Norwegian Embassy, Washington, DC, Oct. 13, 1992.

Figure 3-4
International Council for the Exploration of the Seas zones in the Northeast Atlantic Ocean



Source: International Council for the Exploration of the Seas.

sources report that Norwegian mackerel has a reputation for high quality incertain markets because of the naturally high fat content of the fish.[23] This fat content is due to the coldness of the waters in which the fish are found, a competitive advantage that nature, rather than technology or economics, has provided to the Norwegian industry.

A high fat content, however, reportedly is preferred only in some markets, such as Japan (where European mackerel often is consumed in raw form) and actually is a disadvantage in other markets, such as the Caribbean and other markets with warmer climates.[24] However, the much higher unit value prevailing for mackerel in the Japanese versus developing-country markets makes fat content a potentially important factor in international competitiveness.

Industry structure

Three types of harvesting vessels are used in the Norwegian mackerel industry: purse-seine trawlers, and a "coastal" fleet consisting of small vessel that use drifnets, trolling lines and small scale seines. The 110-vessel purse-seine fleet is the most important, accounting for 88 percent of the total Norwegian mackerel catch of 180,000 metric tons in 1991. The trawler fleet, numbering 25 vessels, accounted for 2 percent of the total harvest. The coastal fleet (estimated to be in the hundreds by Norwegian industry sources), harvested 17,700 metric tons, or 10 percent of the total mackerel harvest.[25]

The heavy reliance on the purse-seine fleet to supply raw mackerel is an important reason why Norwegian mackerel has a worldwide reputation for high quality. Unlike trawlers, which crush the fish while they are towing the trawls for upwards of an hour, purse seiners keep the fish alive and swimming right up to the point when the net is hauled to the ship's side. The fish are bruised less and do not die before transfer from the net; thus, product deterioration is minimized. This aspect of Norway's competitive advantage is discussed in more detail in chapter 5.

A sales union, Norges Sildesalgslag, organizes the sales of the mackerel harvests. In 1991 Norges Sildesalgslag sold mackerel to 91 buyers, most of whom were processors.[26] These firms typically process many species of fish in addition to mackerel, and this diversification probably enables firms to operate plants of larger sizes than if they depended on the seasonal mackerel fishery. In attempting to investigate this issue, however, Commission staff were unable to locate information on the financial aspects of either the

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[23] William C. Quinby, Mayflower International, transcript of the hearing, p. 14, Jan. 26, 1993.

[24] Ibid., pp. 50-51.

[25] USITC staff interview with Fisheries Counselor, Royal Norwegian Embassy, Washington, DC, Oct. 13, 1992.

[26] Ibid.

harvesting fleets or the processing sector. Table D-10 presents data on the quantity and value of the annual Norwegian mackerel harvest, its disposition by product form, and the level of exports during 1987-91.

Trade

The most important markets for Norwegian exports of frozen mackerel during 1991-92 are indicated in table D-11. Of more than 260,000 metric tons exported in 1992, nearly 138,000 tons, or 53 percent (61 percent by value) were shipped to Japan, at an average unit value of $622 per metric ton. The Japanese mackerel market has been Norway's most important for several years, and exports to Japan have grown rapidly. The 1991 export level of 140,000 metric tons was 130 percent higher than the previous year's level of 60,800 metric tons, and more than four times the 1988 level of 32,700 metric tons. In 1992 the Japanese mackerel market was the target of a $2.3 million marketing campaign by the Norwegian Trade Council, a Government-sponsored export promotion board. The campaign was intended to counter the lingering adverse effects of some 1991 shipments of inferior-quality mackerel. Also noted in chapter 4, Norwegian exports in 1991-92 benefited from the late-1991 relaxation of Japan's import quota for frozen mackerel.

The developing countries of Africa and the Middle East also are important markets for Norwegian mackerel. In 1992 African and Middle Eastern markets (including countries aggregated in the "Other" category of table D-11) accounted for 77,500 metric tons of Norwegian exports, or 30 percent of the total quantity (22 percent of total value). Of the total quantity exported to Africa and the Middle East, Nigeria and Turkey were the main markets in their respective regions.

Eastern Europe is likely to be of growing importance as a market for Norwegian mackerel, particularly in view of recent declines in the Polish mackerel harvest. Eastern Europe and the countries of the former Soviet Union together accounted for 13,500 tons of 1992 Norwegian exports, or 5 percent of the total quantity (4 percent of total value), with Poland accounting for most of the shipments.

Market characteristics

Norwegian per capita consumption of seafood, at 44 kilograms per year, is the second-highest in Europe (behind Iceland) and more than twice the U.S. level of 21 kilograms.[27] The popularity of seafood for human consumption in

[27] U.S. Department of Commerce, NOAA, NMFS, Fisheries of the United States, 1991, May 1992, p. 72. Data are the average for 1987-89.

Norway extends to mackerel, for which, according to European market sources, there is a higher per capita demand than in most other Western nations.[28]

The fresh- or frozen-fish market is the destination for most of Norway's mackerel production (table D-10), accounting for 96 percent of the total volume of mackerel harvested in 1991 and an average of 73 percent during the period 1987-91. Most of it ultimately is exported in frozen form, mainly to Japan, where the high fat content and other quality attributes of the fish command a premium price in the sushi trade.

Mackerel that does not meet acceptable quality standards for human consumption is channeled into industrial uses, such as animal feed and fishmeal and oil. Norway's large aquaculture sector is a major user of such products; salmon and trout farms, for example, are important consumers of meal for fish food. During 1987-91 the markets for animal food and fish meal and oil accounted for approximately 23 percent of the total quantity of mackerel landed in Norway.

Prices

Table D-12 presents data on average unit values of various mackerel products in Norway, including fresh or frozen fish, during the years 1987-91. Prices generally increased during the 1987-88 period, declined in 1989, peaked in 1990, and declined again in 1991.

Government Involvement in the Industry

Fishery management

Norway coordinates its mackerel fishery management with the other countries that share its most important mackerel stocks. At the national level, Norwegian fishery management consists mainly of catch limits, in the forms of annual quotas to individual vessels and fishing organizations, allocated with annual licenses. Such licenses are required of a vessel before it can fish; the refusal to renew licenses (such as when a vessel needs replacement) is one way the Norwegian Government has sought to reduce overcapacity in some fisheries. Quotas are allocated on a per-vessel basis (and in some cases a per-trip basis) for the large-boat fleets and on a fleetwide basis for the coastal fleet of small craft.

The overall quotas are based on annual estimates of the maximum total allowable catch from each stock; such estimates are developed from

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[28] Unfortunately, calculation of apparent consumption of mackerel in Norway is hampered by unreliable import statistics regarding mackerel imported in recent years from Denmark for export to Japan. Some Norwegian industry officials believe that some of these reexports were accurately recorded and others were not.

recommendations from the International Council for the Exploration of the Seas (ICES), an international scientific organization with expertise in fisheries research and management. The Norwegian Government considers these TAC recommendations in developing its national fishery management policy, which underlies its strategy in negotiating multilateral fishery access agreements, which are described below.

Since 1966 Norway has had on its books a law forbidding the landing of foreign-harvested fish directly from the foreign harvesting vessel; the fish must be landed in a foreign port first.[29] However, according to the Organization for Economic Cooperation and Development (OECD), exceptions to this law are granted "liberally," especially when domestic supplies are short and Norwegian fish-processing capacity is underutilized. Exceptions are also granted regarding a quantitative restriction imposed on Norwegian imports of fresh or chilled mackerel. Although Norway is a large net exporter of mackerel, occasional shortages do develop in some years (such as in 1991), and import licenses are granted to provide raw material to help keep processing plants operating efficiently.[30]

Marine mammal and fishery issues

Norway faces a number of complex issues in effectively managing its mackerel and other fish resources. One is the interaction between marine mammal and fish (including mackerel) populations. Recently renewed interest in the hunting of whales and seals affects Norwegian mackerel management, because these marine mammals consume large quantities of mackerel and other fish, and they destroy nets and other fishing gear. Norway has announced its plans to resume whaling in 1993, and recently industry pressure has increased to broaden the scope of the legal harvest of seals from adults (currently legal) to babies (currently illegal).[31] As in Iceland and Atlantic Canada, at least some of the pressure from the Norwegian fishing industry to remove the bans on hunting whales and baby seals arises because increased marine mammal populations depleted important fishery stocks following the moratoria on the harvest of these mammals in the 1980s. Thus, Norwegian management of mackerel and other fisheries must deal with the economic problems in Norway's rural communities caused by reduced income from whaling and baby seal hunting, as

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[29] As noted in chapter 2, the United States has a similar restriction in the Nicholson Act.

[30] In 1991 the mackerel fishery suffered a significant decline in resource availability, and to maintain its market share in the important Japanese market Norway imported large quantities of mackerel from the EC (mainly Denmark) for reexport to Japan. However, according to industry and trade sources, these fish were of inferior quality. The Norwegian attempt to supplement its supply from the EC was considered a marketing blunder, for which Japanese importers reportedly penalized Norwegian exporters in 1992.

[31] U.S. Department of State, message reference No. 00930, prepared by U.S. Embassy, Oslo, Feb. 19, 1993.

well as the income lost from reduced harvests from depleted mackerel and other fish stocks.

Harvesting agreement issues

Another complexity is the transboundary nature of mackerel stocks. None of the mackerel stocks on which the Norwegian fishing industry is dependent lie entirely within the Norwegian EEZ; most are shared with the EC and other countries, and the so-called western mackerel stock (west of the British Isles) is completely outside Norwegian waters. Therefore, annual bilateral and multilateral agreements, most importantly with the EC, are necessary to allocate shares of the TAC.[32] The negotiations leading to these agreements involve annual consultations among all of the Scandinavian countries, the EC, the Baltic nations, Poland, and Russia. Trade and government sources report that for mackerel, the result of these negotiations is usually an arrangement by which non-Norwegian vessels can take a certain share of the TAC in Norwegian waters and vice versa.

In recent years Norway has negotiated arrangements with the EC, the Faroe Islands, and Sweden that allocate to Norway fishing quotas in various geographic regions, which are then suballocated to vessels. In the Norwegian Sea, for example, Norway is allocated most of the mackerel TAC above 62°N, except for an allocation for the Faroe Islands, which the 62nd parallel intersects. Between 62°N and 59°N (just above the northern tip of Scotland), the North Sea mackerel TAC is shared between Norway and the EC. Below 59°N the North Sea mackerel TAC is divided between Norway, the EC, and Sweden (which has an allocation in the Skagerrat among Norway, Sweden, and Denmark). Norway is also allocated a share of the western mackerel TAC in the area west of 4°W within the EC EEZ.

Financial support

Norwegian mackerel harvesters and processors benefit from the same Government programs that are available to other elements of the Norwegian fish industry. These programs have a number of objectives, including income support, industrial restructuring, and rural development in the northern regions.

Each year the Norwegian Fishermen's Association and the Norwegian Government negotiate a financial support package consisting of four main elements: price support for first-level sales of fish; financial support to

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[32] Joint management with Russia of the Barents Sea cod stock is another problematic necessity, particularly in light of recent Norwegian industry charges of Russian overfishing. Ibid. As discussed elsewhere in this report, this fishery concerns the mackerel industries of Norway, the EC, and the United States because of the impacts on mackerel prices allegedly caused by Russian "dumping" of cod on European markets.

reduce or offset operational costs; social schemes; and structural programs. The annual budget for the financial package (for all fisheries) for recent years, as reported in OECD, Review of Fisheries in OECD Member Countries (annual), is shown below (in millions of dollars):

Item	1986	1987	1988
Price support	86	12	19
Operational cost support	31	13	18
Social schemes	29	18	29
Structural programs	29	28	16
Other	5	6	2
Total	180	77	84

As seen in the tabulation, in 1987 policy emphasis shifted from reliance on simple price and cost intervention to a more important role for structural programs. According to the OECD, the increased reliance on structural programs and social schemes (primarily unemployment benefits) has been necessary to improve the industry's efficiency and thereby reduce the need for continued financial assistance in future years. Structural programs have included efforts to reduce fish-harvesting capacity in the large-boat and coastal fleets by offering financial incentives (grants) to scrap old vessels. Similar financial incentives have been offered to onshore processors to close underutilized plants (except in isolated areas that depend on those plants). Additional financial assistance is provided to harvesters, processors, and sales and marketing associations to improve production and marketing efficiency. Although price support is provided for other fisheries, this assistance is reportedly ineffective for mackerel because market forces, which include the influence of the Japanese market, maintain market prices at relatively high levels.

In addition to the above, the State Fishery Bank, which assists with vessel construction in the less heavily capitalized fisheries, provides loans at or below market rates to eligible fisheries. In the mackerel fishery, according to industry sources, only the coastal fleet is considered eligible for such loans. In the large-boat fleets, in fact, the emphasis has been placed on reducing capacity, for example, by not renewing licenses when boats need replacing.

Eastern Europe[33]

Industry structure

The mackerel industry in Eastern Europe, like most of the region's industries, has undergone dramatic structural changes in recent years because of the transformation of the region's economies and the dissolution of the Soviet Union. These changes, primarily manifested in the privatization of previously state-owned fishing and processing enterprises, not only have caused turmoil within the Eastern European industry, but have also contributed to economic disruption in industries and markets in Western Europe, the United States, and elsewhere.

Similar to their Western European counterparts, the harvesting fleets of Eastern Europe depend on the mackerel and other small pelagic resources of the Northeast Atlantic, including limited resources in the Baltic and Barents seas. In past years, significant supplies also were taken by Soviet and Polish vessels from U.S. waters (in both the Atlantic and Pacific); however, as discussed earlier, such foreign participation in the U.S. mackerel fishery has recently been halted. Russian and Polish harvesting effort in other distant-water fisheries has declined as well, mainly because of hard-currency shortages, which hinder these countries' ability to pay for fuel, supplies, and other expenses.[34]

The Barents Sea is becoming increasingly important to the Russian harvesting fleet for cod, which is then used to barter for mackerel, capelin, and other lower value species. The reported barter value for 1 ton of Russian-harvested cod is 20 tons of capelin,[35] which probably is not far from the barter price of mackerel. In the Barents seaport of Murmansk, mackerel and other small pelagics accounted for over 50 percent of fish landings in 1990 (before the distant-water fleet cutback). Most of this fish (a reported 2,000 to 3,000 tons a day) was distributed for domestic consumption within Russia.

The mackerel industry in Eastern Europe consists of harvesting vessels (chiefly freezer-trawlers), factoryships, and onshore processors. These vessels and plants formerly were under state ownership and control, but with the above-noted market and political transformations, most of those enterprises that have not closed down altogether have been privatized. Most vessels reportedly are now individually owned.

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[33] Except where noted otherwise, in this section "Eastern Europe" generally includes only Russia, Poland, Bulgaria, and the Baltic nations. However, the former East Germany, prior to Germany's reunification, held one of the largest mackerel fleets in Eastern Europe. No other Eastern European nation has a significant mackerel industry.

[34] World Fishing, Dec. 1992.

[35] Eurofish, Mar. 26, 1992.

An accurate accounting of the fleet size and tonnage capacity in the Eastern European mackerel industry is not available, because the data collected from the individual nations have not kept up with the recent rapid changes in the industry and market, particularly the emergence of small, private firms. Many harvesting vessels have been scrapped or otherwise taken out of service in the mackerel fishery because, according to European industry sources, they are too old and inefficient to be economically operated by profit-seeking firms. Another factor for the fleet reduction is poor resource availability; in Poland, for example, the annual harvest fell by over 90 percent between 1989 and 1990, reportedly because of "low productivity of accessible fishing grounds."[36]

Eastern European factory-processing vessels, particularly those of Russia, continue to participate in foreign joint ventures, most importantly the "klondyking" arrangements with British and Irish harvesters. However, these arrangements have become increasingly unattractive to British harvesters for two related reasons: (1) the economic turmoil in Eastern Europe, particularly the low supplies of hard currency, have made many of the region's enterprises uncreditworthy, although barter arrangements have helped alleviate this problem and (2) in 1991 the United Kingdom privatized its export guarantee program, thus raising the cost to British exporters of obtaining insurance against the risk of nonpayment by Eastern European buyers.[37]

Trends in mackerel production by certain Eastern European nations, as reported by the United Nations Food and Agriculture Organization (FAO), are shown in table D-13. Most of the chub mackerel harvested by the former Soviet Union since 1986 (and, after 1991, presumably also by Russia, the Baltic nations, or both) was taken in the South Atlantic waters off western Africa. Additional supplies have been harvested by Soviet (now Russian) trawlers in the North Pacific off the eastern coast of Siberia. Virtually all of the former Soviet Union's Atlantic mackerel was taken in the northeast Atlantic off the coast of Western Europe, and the Indian mackerels were taken in the western Indian Ocean. Polish fishermen harvested virtually all of their Atlantic mackerel in the western North Atlantic off the U.S. coast.

U.S. Department of Commerce data indicate that until 1991 the U.S. mackerel resource supplied considerable quantities of fish to the fleets from the former German Democratic Republic (GDR), Poland, and the former U.S.S.R. The largest recipient of these U.S. quantities was the GDR, as shown in table D-14.

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[36] U.S. Department of State, message reference No. 02790, prepared by U.S. Embassy, Warsaw, Feb. 23, 1993.

[37] According to industry sources, this program is now run by a Dutch concern.

Government Involvement in the Industry

Fishery management

Since most mackerel harvested by Eastern European harvesters is taken from foreign waters or on the high seas, there is no need for fishery management by the Eastern European nations themselves. To the extent that such nations participate in foreign nations' fisheries (such as the U.S. mackerel fishery before 1991), the responsibility for management of these fisheries belongs to such foreign nations.

Financial support

Prior to the transformation of the economies of Eastern Europe and the Soviet Union, the mackerel industries of these nations operated under the ownership and control of the respective governments. Vessel and plant construction and repair, crewmembers' and plant workers' wages, energy costs, fees for vessel access to foreign nations' waters, and other expenses of mackerel harvesting all were the responsibility of those governments. To the extent that the processed product was destined for home consumption (or for export to other Eastern bloc markets), even "prices" for the products did not exist, at least in the free market sense of the term. Rather, prices frequently were set to subsidize consumers, to provide a working wage for workers, to balance trade accounts of the Council for Mutual Economic Assistance (CMEA), or for other purposes.

The transformation of these markets towards free market economies has generally removed financial support to both consumers and producers. Mackerel prices in the home markets are being freed, and such prices reportedly are rising along with those for most consumer goods. On the industry side, vessel construction support, crewmember wages, and other costs are no longer the responsibility of the state but of the private enterprises that own and operate the vessels and processing plants.

However, the assistance once provided to the industry continues to show significant effects. For example, the fixed cost of a vessel with a 30-year economic life, built 10 years ago with construction assistance, will continue to fall below the cost of an unsupported vessel for the remaining 20 years, even if no monies currently are being paid. The privatization of Russian enterprises, for example, typically involves Government vouchers (denominated in rubles) that serve as shares in the newly privatized enterprise. At least two factors may distort the capitalized value of such enterprises: first, the fixed capital (the vessel or the processing plant) may be overvalued or undervalued, depending on the accounting system used to depreciate the capital equipment; second, the rapid depreciation of the Russian ruble may distort the current value of the shareholders' assets. In general, these factors will serve to undervalue the fixed capital in a privatized enterprise, to reduce its fixed costs, and to enable the enterprise to sell its output at a lower price than otherwise.

The effects on the harvesting sector are greater still if, as has been alleged by U.S. and European industry members, some Eastern European harvesting vessels are "missing" from the records. These vessels apparently are being operated by "cowboys"[38] (in the words of a Western European rival), whose only costs are fuel and crew compensation and who therefore seek to cover only those expenses when selling their catches. All information made available to the Commission[39] indicates that these vessels are dealing in "whitefish" (cod and other groundfish), rather than mackerel, but there are direct effects on the mackerel trade as well. These effects enter through barter arrangements, such as the British-Russian-Danish deals described earlier.

In Poland, as in Russia, privatization of the fishing industry is not yet complete. Currently in Poland there are an estimated 180 small, private fish-processing enterprises and an undetermined number of private importers of fish and fishery products.[40] The private processors are characterized by the Ministry of Transport and Maritime Economy as "basement operations," employing one to three persons each, but data on their output are unavailable.[41] In addition, there are three state-owned fish-processing and fish-trading companies, in Gdansk, Gizycko, and Chojnice, employing a total of 1,194 workers.[42] As in the Western European and U.S. industries, these firms process and trade a variety of fish products in addition to mackerel. The slow progress being made in privatizing the fish industry and the general economic difficulties in the industry are cited as reasons for the recent lobbying effort by the industry to reintroduce Government financial assistance programs that were "all but eliminated" in 1990.[43]

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[38] Western European industry term for captain and crew of certain Eastern European fishing vessels. Reportedly the operators of these vessels sell their catch to only cover short term expenses (fuel, wages, etc.). Consequently, they are usually willing to accept lower prices than other harvesters for their catch.

[39] See, for example, Seafreeze, posthearing brief, with attachments.

[40] U.S. Department of State, message reference No. 02790, prepared by U.S. Embassy, Warsaw, Feb. 26, 1993. Estimate by the Sea Fisheries Institute, Gdynia.

[41] Ibid.

[42] Ibid.

[43] Ibid.

CHAPTER 4. FOREIGN MARKETS

This chapter focuses on the prospects for expansion of U.S. mackerel sales to Jamaica and to countries in West Africa, the Middle East (Egypt), and Eastern Europe[1], markets which are largely supplied by other exporters. According to industry sources, these markets are considered to have the most potential for U.S. export growth.

Jamaica has been the largest market for U.S. exports of Atlantic mackerel since 1990, whereas exports to West Africa and Egypt are negligible. Although the former Soviet Union also imported U.S. Atlantic mackerel in both 1991 and 1992 (see chapter 2), U.S. exports to this market have been variable, due to its economic restructuring. As noted in chapter 3, however, this market is also a major supplier of mackerel products. The Japanese market presented limited opportunities to U.S. mackerel exports in the past, but domestic supply difficulties in 1990 and 1991 boosted Japan's mackerel imports from the United States as well as from other suppliers in these years. U.S. mackerel exports to Japan fell in 1992, however, the market is still considered to have potential for U.S. exports due to its size and the variety of mackerel products consumed.

This chapter discusses market conditions, channels of distribution, supply and demand, trade, prices, tariffs and other trade barriers, and other governmental practices and programs that affect U.S. and other countries' exports of mackerel to Japan, West Africa, Egypt, Jamaica, and Eastern Europe. Global imports of all mackerel species by major markets for 1990 are shown in figure 4-1.

Japan

The Japanese market holds the greatest potential for U.S. exports of mackerel. The most salient indicators of this potential include a large and affluent population, and the traditional prominence of fish in the Japanese diet. Japan has long been known as one of the world's leading markets for fish and fish products, and it is also the world's premier market for mackerel. Japan leads in global mackerel production, imports, and consumption (tables D-7 and D-15 and figures 3-3 and 4-1), but a steady, long-term decline in domestic mackerel catches has led to a concomitant rise in imports in recent years. U.S. mackerel exporters, aided by a sharp fall in Japanese landings in 1990 and 1991, as well as a favorable exchange rate, substantially increased their shipments of frozen mackerel to Japan in 1991.[2] The United States became the fifth leading foreign supplier, in terms of quantity, to the

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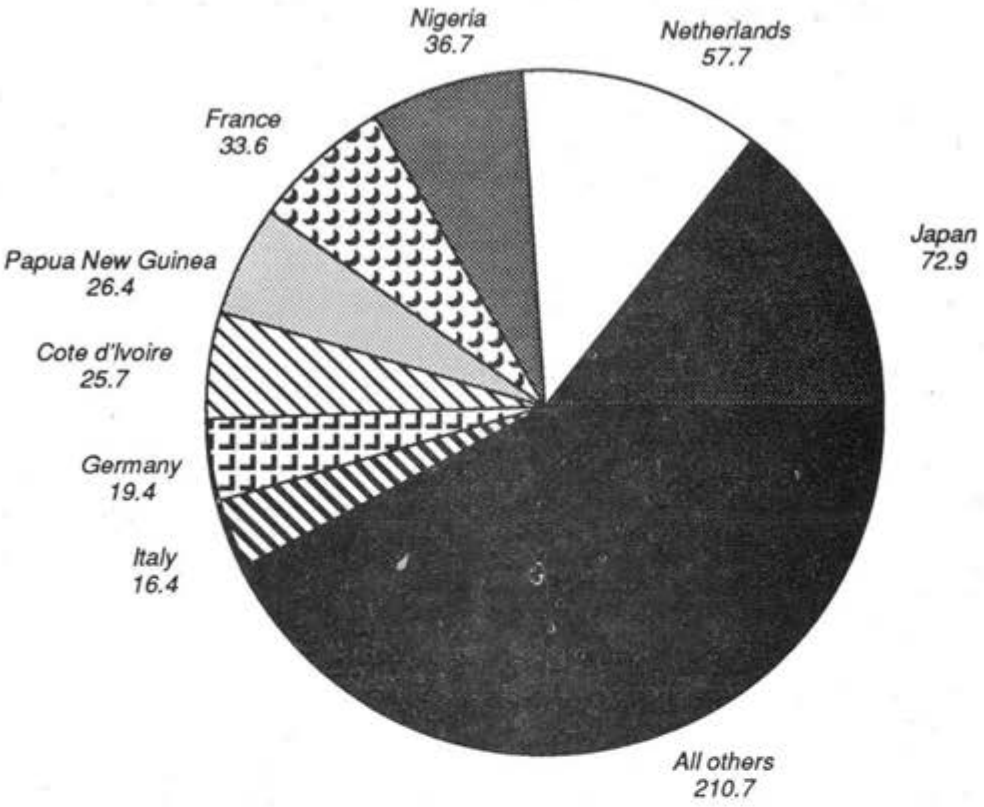
[1] Includes the former Soviet Union and other Eastern European countries.

[2] Sunee C. Sonu, Japan's Mackerel Market, NOAA Technical Memorandum, National Marine Fisheries Service (NMFS), Southwest Region, Sept. 1992, p. iv.

Figure 4-1
Mackerel: Global Imports, by major markets, 1990 (1,000 metric tons)



Source: Food and Agriculture Organization of the United Nations, 1990.

Japanese market in that year after having supplied virtually none in prior years.[3]

Supply and Demand

The supply[4] of mackerel in the Japanese market, while largely determined by domestic production, is increasingly provided by imports. The Japanese mackerel catch declined by nearly three-fourths during 1986-91,[5] during which period imports showed a nearly seventeenfold increase (tables D-16 and D-17). While the overall supply of mackerel in the Japanese market declined by slightly more than one half during 1986-91, the share accounted for by imports rose from 1 percent in 1986 to 39 percent in 1991 (table D-18).

With a population of nearly 125 million[6] and one of the world's highest income levels,[7] Japan is one of the most attractive consumer markets in the world. Mackerel is relatively inexpensive compared with competing protein sources in Japan. However, the Japanese market demands high quality mackerel products, and generally is willing to reward such quality with premium prices. The Japanese consume mackerel in a variety of forms, including fresh, frozen, smoked, dried, pickled, and canned. Japanese consumers generally prepare mackerel by broiling and, as such, prefer a relatively large sized fish with a high fat content.[8] This demand characteristic is a constraint on U.S. mackerel exports, which are of a lower fat content than that normally preferred. However, the large size of the Japanese market and the large variety of mackerel products in demand tend to mitigate this constraint.[9]

Japanese annual household consumption of mackerel has experienced a long-term decline, falling 56 percent, from 1.8 kilograms in 1986 to 0.8 kilograms in 1991 (table D-19). This decline mirrored the trend in domestic catches, as imports have not increased enough to fill the gap in production, and prices have risen since 1986. Mackerel is reportedly the ninth most popular seafood item consumed in Japan.[10] On a per capita basis,

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[3] Based on Japanese import data. These data appear to conflict with U.S. export data, which show U.S. exports of all mackerel products higher in both 1990 and 1991 relative to 1989 levels.

[4] Supply is defined as inventories plus the domestic catch and imports of mackerel.

[5] Because of an apparent decline in Northeast Pacific mackerel stocks. Ibid, p. iv.

[6] Central Intelligence Agency, The World Factbook 1992, p. 173.

[7] Japan's per capita GNP was an estimated $25,890 in 1990. World Bank, World Tables 1992, Baltimore, 1992.

[8] Sonu, Japan's Mackerel Market, p. 11.

[9] For instance, Lund's Fisheries, Inc. stated it has been successful in penetrating the Japanese frozen mackerel market. Jonathan D. Rubins, Lund's Fisheries, Inc., testimony before the U.S. International Trade Commission, Jan. 26, 1993.

[10] Ibid.

Japan trails only Iceland as a seafood consumer. Japanese consumption of fishery products totaled about 8.8 million metric tons in 1990 and averaged 72 kilograms per capita annually during 1987-89.[11]

Imports

In 1990, Japan imported 10.7 million metric tons of fish products, representing 27 percent of the world total.[12] Japanese mackerel imports totaled almost 73,000 metric tons in 1990, and were equivalent to approximately 15 percent of the world total (table D-15, figure 4-1). This amount rose to 195,000 metric tons in 1991 (table D-20). Frozen mackerel is, by far, the primary Japanese mackerel import (table D-20). The major sources of Japanese imports of frozen mackerel include Norway (nearly three-quarters of the total in 1991), Ireland (5 percent), Denmark (5 percent), the United Kingdom (4 percent), and the United States (4 percent) (table D-21).

Japanese imports of frozen mackerel dropped in 1992 to about 137,000 metric tons, mainly the result of a market adjustment to excessive inventory levels that developed during the previous year.[13] Japanese imports from most major suppliers, including the United States, fell.

Japanese imports from Norway and the EC countries are mainly from the Northeast Atlantic and are preferred for their relatively high fat content. Imports from the United States consist of Atlantic and Pacific mackerel of generally lower fat content.[14]

Prices

Japanese ex-vessel mackerel prices are relatively high owing to the domestic market demand for quality and the relatively large share of mackerel marketed in fresh form. These ex-vessel prices[15] rose sharply from $356 per metric ton in 1986 to $1,188 per metric ton in 1991 (table D-22, figure 4-2). A substantial decline in domestic landings was the primary factor in the price increase during the period.

Wholesale prices of mackerel in Japan vary by product form. Fresh mackerel currently commands a premium compared with frozen mackerel, and this premium has increased substantially in recent years (table D-23, figure 4-2).

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[11] United Nations Food and Agriculture Organization (FAO), Yearbook, Fishery Statistics, Commodities, 1990.

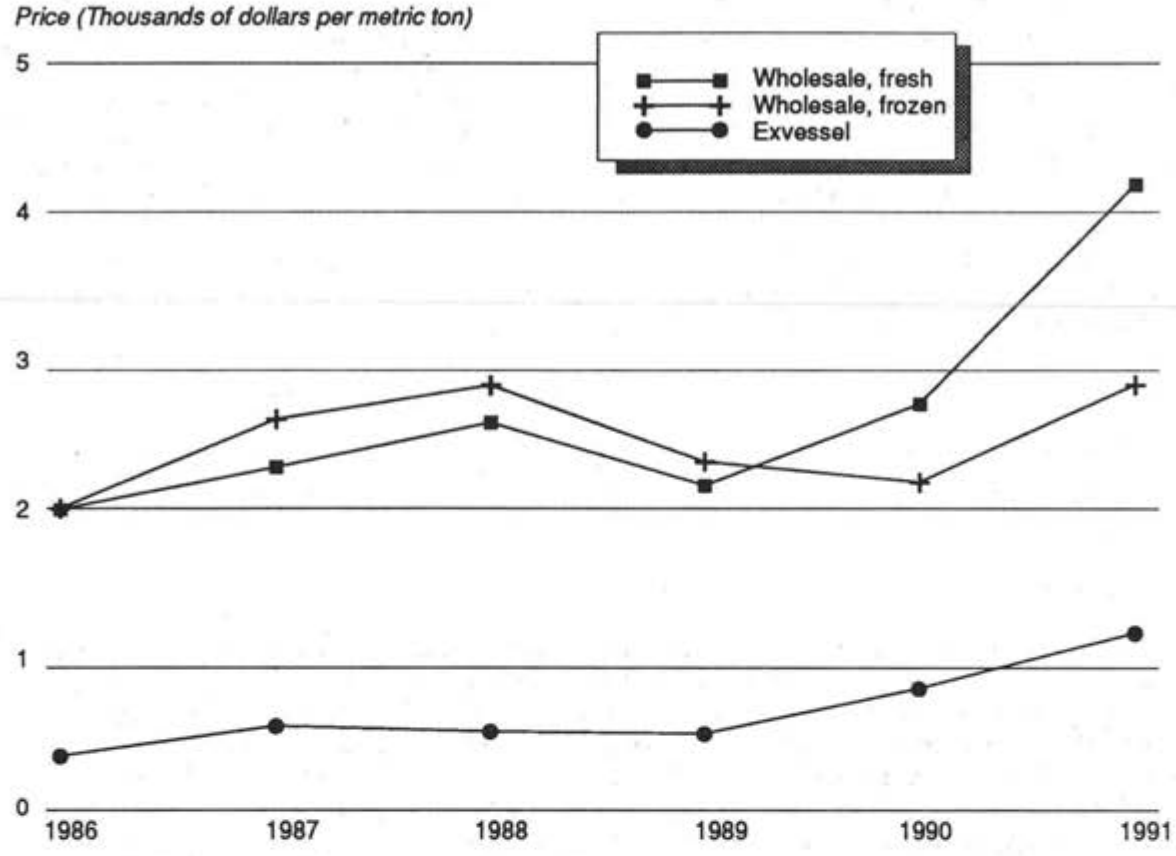
[12] Ibid.

[13] Sunee C. Sonu, NMFS, telephone conversation with USITC staff, Apr. 6, 1993.

[14] According to U.S. export data, an estimated 45 percent of total U.S. mackerel exports to Japan in 1991 consisted of Atlantic mackerel.

[15] Received by fishermen.

Figure 4-2
Mackerel: Japanese prices, by market level, 1986-91



Source: U.S. Department of Commerce and Japan Ministry of Agriculture, Forestry, and Fisheries.

Following the rise in ex-vessel prices, the wholesale price for fresh, domestically produced mackerel increased from $2,012 per metric ton in 1986 to $4,194 per metric ton in 1991, or by 108 percent (table D-23). The price for domestically produced, frozen mackerel rose by a smaller amount during this period, increasing from $2,018 per metric ton in 1986 to $2,851 per metric ton in 1991, or by 41 percent. Imported mackerel generally trades at lower prices and is directed to lower-valued processed products.[16]

Recent retail prices in the Tokyo region for fresh mackerel products are shown in the following tabulation according to the U.S. Department of State (in dollars per kilogram, 111.5 yen per dollar):[17]

Mackerel	Price
Fresh, headed and gutted	17.04
Fresh, fillets	26.91

Market Barriers

Japanese imports of mackerel are included under an import quota system that applies to 98 countries and 12 fishery commodity groups. The quota is administered by the Ministry of International Trade and Industry, which allocates the quota among individual importers, trading companies, and processors. The quota is set annually in terms of U.S. dollars and has increased in recent years, as shown in the following tabulation of data from Sonu, Japan's Mackerel Market, (1,000 U.S. dollars):[18]

Year	Quota
1987	85,000
1988	203,000
1989	243,900
1990	255,400
1991	344,560

Mackerel import categories covered under the quota include fresh or chilled, frozen, and prepared or preserved. Mackerel quota allocations are subject to a fee, which varies according to prevailing market prices for mackerel products. Recent fee levels have ranged between approximately 8 and 12 cents per kilogram.[19]

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[16] Sonu conversation.

[17] U.S. Department of State facsimile transmission to USITC staff, May 13, 1993.

[18] The data in the cited report are adjusted in this tabulation. Sonu conversation, Apr. 6, 1993.

[19] Sonu, Japan's Mackerel Market, p. 9.

Japanese tariff rates applicable to imports of mackerel products allowed by the quota are given in the following tabulation of data from the International Customs Tariffs Bureau, Bulletin International des Douanes, Japan:

Product form	Tariff rate		
	General	Preferential	Temporary
	(Percent ad valorem)		
Whole:			
Fresh or chilled	10	([1])	5
Frozen	10	([1])	5
Smoked	([1])	10[2]	([1])
Prepared or preserved	20	7.2[2]	9.6[3]

[1] No separate rate.
[2] Free to least developed developing countries.
[3] Rate may be multiplied by 5/4 under certain conditions.

The rate applicable to Japanese mackerel imports from the United States varies by product form. Whole mackerel is dutiable at 5 percent ad valorem, smoked mackerel at 10 percent, and prepared or preserved mackerel at 7.2 percent.[20]

Exchange Rates

Exchange rates have affected Japanese mackerel trade in recent years. A persistently strong yen, particularly measured against the dollar, has been cited as a key factor affecting the potential of U.S. exports of mackerel to Japan.[21] The yen has experienced a substantial appreciation against the dollar since 1985, as shown in figure 4-3 and the following tabulation of data from the International Monetary Fund's International Financial Statistics (in yen per U.S. dollar):

Year	Exchange rate
1987	144.64
1988	128.15
1989	137.96
1990	144.79
1991	134.71
1992	126.65

Between 1990 and 1992, the yen/dollar exchange rate declined by 14 percent, from about 145 yen to 127 yen per U.S. dollar. More recently, the yen reached

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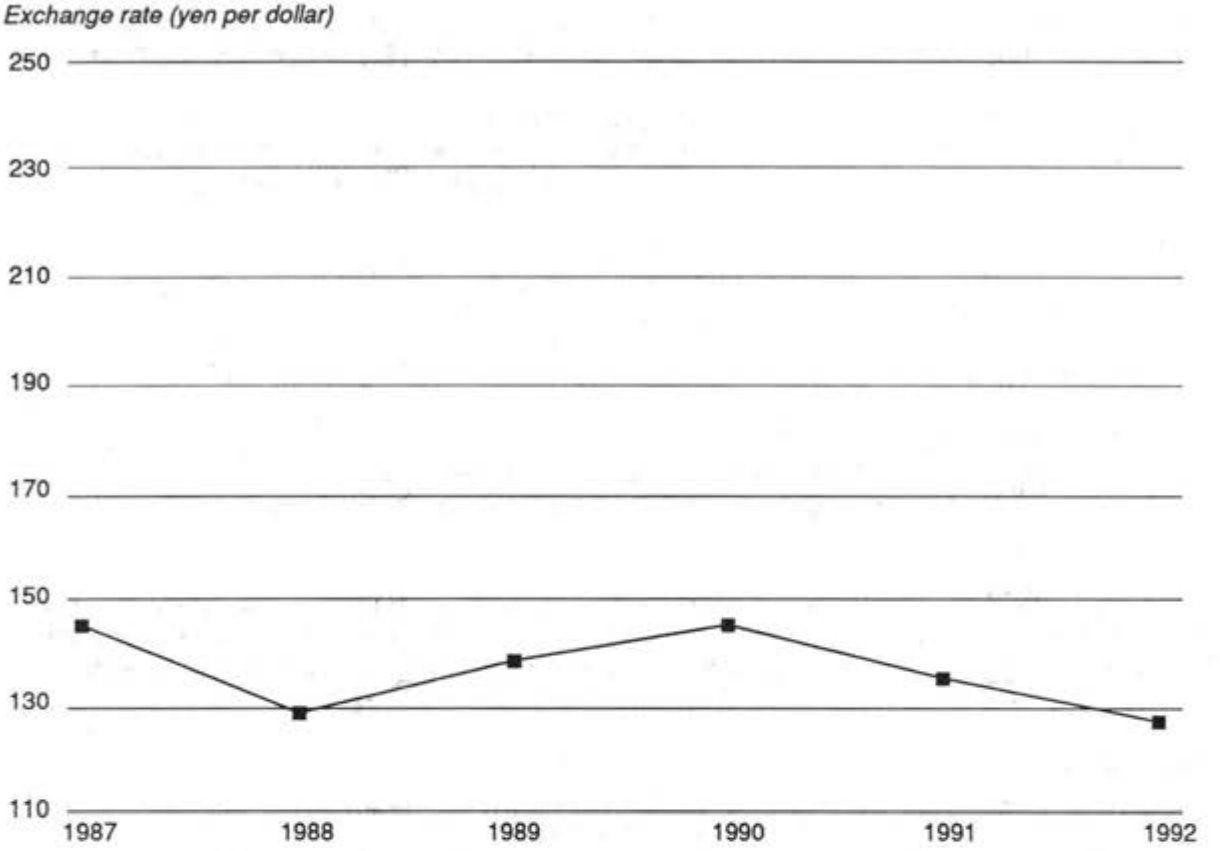
[20] The Temporary rate is applied before the General rate (under conditions set forth in article 8-2 of the Temporary Tariff Measures Law). For other products, a GATT rate may apply, but no such rate is specified for mackerel.
[21] Sonu, Japan's Mackerel Market, p. iv.

Figure 4-3
Exchange rate between the Japanese yen and U.S. dollar, 1985-92



Source: International Monetary Fund, *International Financial Statistics*, various issues.

record highs between 112 and 114 yen per dollar during late March-early April 1993.[22] Since mackerel contracts are largely negotiated in dollars, the appreciation of the yen in terms of the dollar reduces the yen price of imported mackerel in the Japanese market. The yen appreciation also improves the competitiveness of U.S. and other mackerel exporters vis-a-vis Japanese suppliers.

West Africa

West Africa comprises a diverse mix of countries running roughly parallel to and slightly north of the equator along the Gulf of Guinea from Nigeria to Senegal (figure 4-4).[23] The region includes many of Africa's major oil-producing countries and all countries in the Communauté Financiére Africaine (CFA) franc zone.[24] The countries share a common colonial past with ties primarily to countries of the European Community, from which they gained their independence in the late 1950s and early 1960s. Through vestiges of historic colonial ties, trading patterns, shared language, and adopted legal systems, the countries of West Africa retain these ties to Europe.

Market Situation[25]

Fish is a traditional and important element of the West African diet. Per capita consumption of fishery products varies greatly among West African markets. During 1987-89, such consumption averaged 10.0 kilograms throughout the West African region, ranging from 7.6 kilograms in Nigeria to 26.4 kilograms in Ghana (table D-24).[26] Moreover, the region's 3-percent average annual population growth has also contributed to the region's growing importance as a market for fishery products. Fish as a percent of total animal intake in various West African markets has been estimated to range between 22 and almost 70 percent in 1986.[27]

Imports of fishery products into the entire African continent totaled $886 million in 1990, up by about 24 percent since 1986 (table D-25). Of this

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[22] See, for example, Financial Times, Apr. 1, 1993, p. 30.

[23] The West Africa region is defined in various ways. The countries that constitute this region are identified in this report when appropriate.

[24] The CFA franc zone includes 13 French-speaking African countries. These countries are distinguished from other African countries in that they share same currency, the CFA Franc (CFAF), which, is pegged to the French franc at a rate of 50 CFAF to 1 French franc.

[25] The markets examined in this report include Nigeria, Côte d'Ivoire, and Ghana.

[26] For comparison, per capita fish consumption in the United States averaged 21.3 kilograms during the same period.

[27] Infopeche, West African Markets for Small Pelagics, Globefish Research Programme, vol. 7, (Rome: FAO, Sept. 1991), p. 4.

Figure 4-4
Major West African mackerel markets

Source: Dervied by USITC staff.

amount, $323 million, or more than one-third, was accounted for by the three West African markets included in this report, Nigeria, Côte d'Ivoire, and Ghana. Imports of fishery products by these markets rose by more than 70 percent during 1986-90.

The supply side of the major West African mackerel markets generally is dominated by imports. Domestic fisheries are artisanal to a large degree and provide a small share of supply.[28] For example, imports are estimated to provide 100 percent of mackerel supplies in Nigeria, 95 percent in Côte d'Ivoire, and 55 percent in Ghana. Imports into the region are largely in frozen, whole form. The general lack of refrigeration and of distribution infrastructure in the region has resulted in the customary practice of local smoking of imported, frozen mackerel as a method of preservation.[29] The relatively low price of mackerel and its oily consistency (preferred for smoking) have contributed to the substitution of frozen fish for more costly protein sources, such as beef, in the region.[30]

Comprehensive data on mackerel imports in West African markets are not available. However, the FAO reports that imports of frozen mackerel by Côte d'Ivoire and Nigeria generally declined from 108,336 metric tons, valued at $40 million, in 1986, to 62,409 metric tons, valued at $28 million, in 1990 (table D-26).[31] Additionally, data for EC exports, the major export source, indicate that EC exports of all mackerel products to the three West African markets under review also declined during 1987-91, falling from 80,616 metric tons, valued at $35 million in 1987, to 67,920 metric tons, valued at $29 million in 1991, (table D-27). Most of this trade is in frozen mackerel, which accounted for 97 percent of total EC exports during the period (table D-28). The fluctuations and declines in mackerel imports reflects the uncertain nature of these West African markets.

An important regional concern is food security, as Governments strive to provide for the nutritional needs of the population. The U.S. Department of Agriculture, which periodically provides an assessment of global food needs, estimates that Nigeria, Côte d'Ivoire, and Ghana each require food assistance.[32] This is because per capita food production in the region has fallen in recent years and incomes have not risen enough to afford commercial purchases of food imports. Although U.S. food assistance has not involved

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[28] Artisanal fishing is characterized by small-scale, labor-intensive operations that mainly fish close to shore.

[29] Frozen mackerel generally is thawed and immediately smoked.

[30] Christopher Delgado and Rebecca Lent, "Coastal Demand Constraints for Sahelian Livestock Products: Cote d'Ivoire," paper presented at the IFPRI/ISRA seminar on Regional Integration of Agricultural Markets in West Africa, Saly Portudal, Senegal, Dec. 2-4, 1992.

[31] No imports were reported for Ghana during the period.

[32] Economic Research Service (ERS), USDA, African Needs Assessment Situation and Outlook Report, Nov. 1991. Although this assessment is in terms of cereal import requirements, it provides an estimate of the general food security situation.

mackerel in the past, food aid and export assistance programs of the U.S. Government are possible avenues for the development of U.S. mackerel exports to West Africa.

Trading Patterns

General trade patterns in West African markets for mackerel have been determined by a combination of such factors as regional geographic differences in fish producing and consuming areas, barter and countertrade arrangements with the former Soviet Union and Eastern European countries, and former colonial ties with Western Europe. In general, the primary regional fishing grounds for small pelagics, including mackerel, are located along the extreme northern coast of Western Africa, between Morocco and Senegal, and along the extreme southern coast, between Angola and Namibia; the major import markets are generally located between these areas, mainly from Liberia to Zaire, where the bulk of the regional population is located.[33] This geography has shaped the regional flow of trade from the geographic periphery to the populated center.

Until recently, the fleets involved in selling small pelagics to African countries were mostly from Eastern Europe and the former Soviet Union, which sold fish at low prices to obtain much needed foreign exchange, or which exchanged fish for commodities through barter and countertrade arrangements. These trading arrangement made the entrance into the market by other competitors difficult, if not impossible. Following the break-up of the Soviet Union, the former Soviet and Eastern European fleets no longer control the African market. Consequently, the United Kingdom, Ireland, and the Netherlands have taken a larger market share.

Macroeconomic Situation

The potential of West African markets for U.S. mackerel exports is significantly tied to general macroeconomic conditions in this region. Import demand in these markets is influenced by such factors as income levels and trends, the availability of foreign exchange, inflation, and foreign debt, as well as population growth and consumer preferences for fishery products. In addition, recent government-mandated structural reforms and conditionality imposed by international lending institutions, such as the International Monetary Fund and the World Bank, have affected the macroeconomic situation in these markets. These reform strategies often include exchange rate stabilization, privatization of state-run or state-controlled enterprises, reductions in or elimination of tariff and non-tariff barriers, restrictions on international borrowing, and tight control over domestic credit expansion. Much of the schedule and structure for addressing the implementation of these reforms were imposed by international multilateral lending institutions in return for credit extension.

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[33] West African Markets for Small Pelagics, p. 1.

Macroeconomic indicators for selected African countries indicate that income levels for a number of countries have declined or stagnated in recent years. For instance, income (as defined by gross national product (GNP)) in Nigeria, the largest regional market, fell from $38.1 billion in 1987 to $33.4 billion in 1990, or by about 12 percent (table D-29 and figure 4-5). GNP in Ghana was stagnant during 1987-90, while that in Côte d'Ivoire rose by 13 percent between 1987 and 1988, but fell by 5 percent during 1988 to 1990. Per capita GNP in Côte d'Ivoire, the most affluent regional market, eroded during 1987-90 from $780 to $750, during which period levels in Ghana ranged between $380 and $400 while in Nigeria per capita GNP fell to $270 in 1989 (figure 4-6). Most of the region is dependent on commodity exports, and a general global decline in commodity prices, particularly for crude petroleum, cocoa, and coffee, has adversely affected export revenues in recent years.[34] As a result, many countries in the region ran negative current account balances during 1987-90, with Côte d'Ivoire's deficit at about 13 percent of GNP in 1990 and Ghana's at about 7 percent. Nigeria, however, experienced a surplus in 1989 and 1990, largely the result of a reduction in government budget deficits and of windfall oil profits occasioned by the Gulf War.[35]

Market Outlook

The outlook for the West African small pelagic market remains uncertain because of the region's volatile macroeconomic situation and uncertainty over the future of the former Soviet and East European fishing fleets, which were the major suppliers to the region in the past. One industry member recently stated that these fleets have been shifting their exports to Western European markets to obtain hard currency.[36] This withdrawal from the West African market may present opportunities for U.S. exporters, although there also is competition from Western European suppliers. Moreover, U.S. suppliers may have difficulty competing with these Western European suppliers because prices quoted for frozen mackerel in the region generally have been below U.S. production costs in recent years.[37] The relatively high cost of U.S. mackerel appears to be a constraint for U.S. exports to the region, as price rather than quality, is one of the most important factors influencing the demand for mackerel in the region.[38]

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[34] See, for example, USDA, ERS, Global Food Assessment Situation and Outlook Report, Nov. 1992, pp. 42, 44, 47.

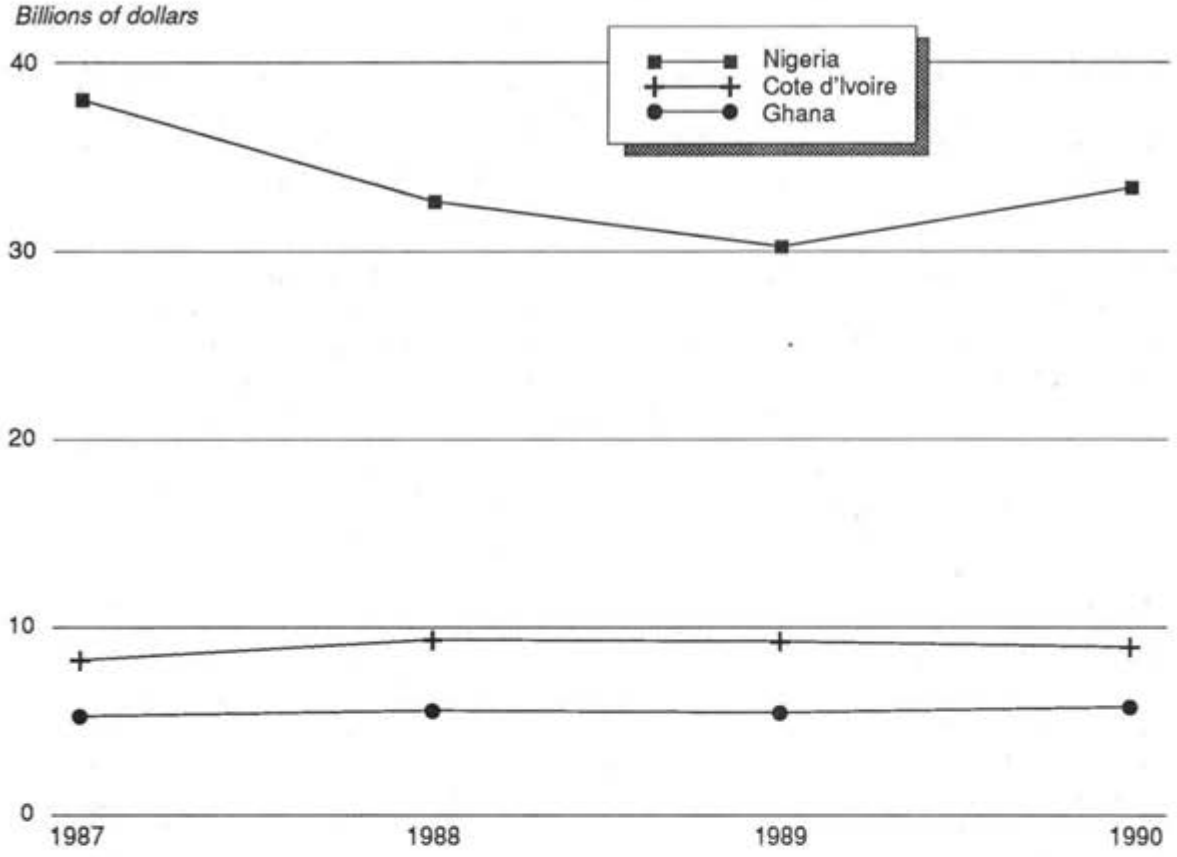
[35] World Bank, Trends in Developing Economies: 1991, p. 403.

[36] Finn Bergesen, Jr., Managing Director, Norwegian Fishermens Sales Organisation for Pelagic Fish, "World Pelagic Overview," paper presented at the 15th International Seafood Conference, Lisbon, Nov. 1-4, 1992, p. 8.

[37] For example, import and export unit values for frozen mackerel trade between West African markets ranged between $372 and $613 per metric ton during 1988 to 1992, while U.S. production costs currently are estimated to range between $489-$641 per metric ton before adding the cost of transportation (see chapter 2).

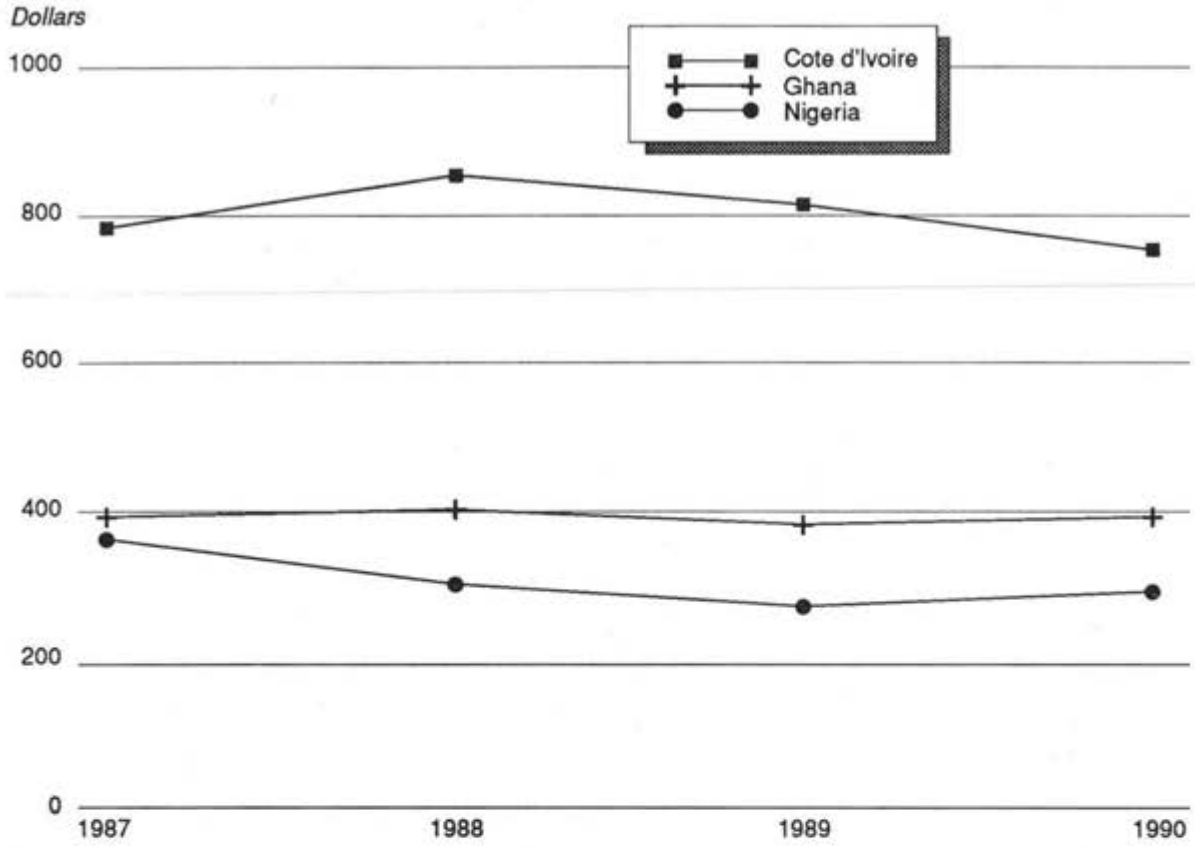
[38] NMFS, memorandum, p. 10.

Figure 4-5
GNP in selected West African markets, 1987-90



Source: The World Bank, *World Trade Tables 1992*, Baltimore, 1992.

Figure 4-6
Per capita GNP in selected West African markets, 1987-90



Source: The World Bank, *World Trade Tables 1992*, Baltimore, 1992.

Diverse and frequently-changing tariff and other trade regulations, as well as limited foreign exchange resources also hamper the region's potential as a market for U.S. mackerel exporters. A general lack of adequate handling, storage, and distribution infrastructure is another major problem facing most mackerel exporters to markets in the West Africa region.

The next three sections present a more detailed profile of mackerel markets in the West African countries of Nigeria, Côte d'Ivoire, and Ghana. These countries are among the most prominent regional markets for mackerel, both in terms of traditional trade patterns and potential for U.S. exporters.

Nigeria

Home to one in every four Sub-Saharan Africans, Nigeria's population of 126 million people in 1992 is Africa's largest.[39] Nigeria is a member of the Organization of Petroleum Exporting Countries (OPEC) and is Africa's leading oil-producing country, relying heavily on the petroleum sector for export earnings.[40] Despite substantial petroleum deposits and vast, largely untapped natural gas reserves, Nigeria remains one of the world's poorest countries, with a 1990 per capita GNP of $290 (table D-29).

Nigeria is one of the leading world importers of mackerel. In 1990, Nigeria trailed only Japan and the Netherlands as a global mackerel importer and accounted for 7 percent of the world total imports (table D-15).

Supply and Demand

Fish is a preferred source of animal protein in Nigeria and accounts for about 60 percent of total animal protein consumption.[41] Consumption of fish products in Nigeria was at levels in excess of 1 million metric tons in the early 1980s. However, Nigerian consumption fell due to the decline in the world price of oil, which affected the amount of foreign exchange available for fish and other imports.[42] Consumption of fish products in Nigeria is estimated to have totaled about 500,000 metric tons in 1990.[43] Nigeria's domestic fish production accounts for about 35 to 40 percent of total fish consumption, with imports accounting for the remainder.[44] Per capita fish consumption in Nigeria has also shown a long-term decline from an average of

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[39] Central Intelligence Agency, The World Factbook 1992, p. 253.

[40] World Bank, "Trends in Developing Economies: 1991," p. 402.

[41] NMFS, Northeast Region, memorandum for the record on the Small Pelagics Conference (held in Abidjan during June 10-12, 1991), June 25, 1991 (NMFS memorandum), p. 4.

[42] Infopeche, West African Markets for Small Pelagics, p. 42.

[43] U.S. Department of State, report from the U.S. Embassy, Lagos, May 6, 1992 p. 2.

[44] Ibid.

16.1 kilograms per year during 1979-81 to 11.5 kilograms per year during 1982-84[45] and further to 7.6 kilograms per year during 1987-89 (table D-24).

Nigeria is currently the largest market for frozen mackerel in West Africa. However, the size of the Nigerian market is constrained by relatively low, and generally declining, real income levels. Imports supply the entire Nigerian mackerel market as there is virtually no domestic mackerel catch (table D-30). Thus, the factors that affect the supply of mackerel in the Nigerian market are exogenous, and include world catch patterns and competition among competing suppliers.[46]

The relatively low price of mackerel however, is one of its most appealing attributes in the Nigerian market. Nigerian consumers prefer mackerel for its oily consistency, which aids in the smoking process. Due to its higher oil content, Nigeria's fish consumption patterns shifted to Atlantic mackerel from horse mackerel in the mid-1980's. However, horse mackerel remains the preferred species in Eastern Nigeria.

Channels of Distribution

Nigeria possesses the most developed and extensive infrastructure in the West African region.[47] Unlike neighboring countries, Nigeria has an extensive system of roads and cold storage facilities, which along with relatively low fuel costs, facilitates the distribution of frozen mackerel. Frozen mackerel enters the market through the port of Lagos,[48] from which it is distributed to the western part of the country through such major cities such as Ibadan, Benin City, and Kano and to the eastern part of the country through Port Harcourt and Calabar. Fish importers and agents generally employ fish distributors, the most important of which are the IBRU organization, the INLAKS Group, and the PRIMLAKS Group. These major distributors then market frozen mackerel to numerous smaller distributors through a network of cold storage facilities, mainly by refrigerated vans. The imported frozen fish trade in Nigeria is concentrated, with 10 distributors accounting for 85 percent of the total.[49]

Although Nigeria's infrastructure for the distribution of frozen fish is the most elaborate of any other West African country, it is still relatively limited, and the majority of fresh fish is sold within a 10-mile radius. Cold storage capacity is substantially underutilized, with only 30 percent of the installed capacity of 100,000 metric tons reportedly in use.[50] Retail

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[45] Data from Infopeche and FAO.

[46] Finn Bergesen Jr., "World Pelagic Overview," p. 5.

[47] Ibid., p. 44.

[48] Customs regulations require that frozen fish imports enter through this port. Ibid.

[49] U.S. Department of State, report from the U.S. Embassy, Lagos, May 6, 1992, p. 12.

[50] Infopeche, West African Markets for Small Pelagics, p. 44.

distribution is provided by agents of the distributors, usually small-scale independent retailers, or by the distributors themselves.

Imports

Nigeria's imports of all frozen fish have declined substantially from a peak of over 600,000 metric tons annually during the oil boom of the late 1970s and early 1980s to about 185,000 metric tons in 1990.[51] Such imports began to decline in 1982, when the Central Bank of Nigeria, prompted largely by falling oil revenues, imposed a price ceiling of $582 per metric ton on fish imports in an attempt to preserve scarce foreign exchange and bolster the domestic industry. Currency devaluations and changes in trade policy also contributed to significant variations in fish import levels during this period. For instance, in 1987, when Nigeria introduced an auction market for foreign exchange and liberalized imports of a number of products, fish imports increased by 58 percent.[52] In 1989, Nigeria's imports of fresh and frozen fish declined significantly (26.1 percent from 1988) because of a 39-percent devaluation of Nigeria's currency, the naira, which made imported goods, including fish, more expensive for most Nigerian consumers.

Nigeria's imports of fresh or frozen fish largely consist of frozen pelagics, of which the Netherlands, Norway, and the United Kingdom are the primary suppliers (table D-31). Specific data on Nigerian imports of mackerel by source countries are not available. However, such data can be partially estimated using EC and Norwegian export data, which are shown in table D-32. EC and Norwegian exports of mackerel[53] to Nigeria declined from 74,000 metric tons, valued at $28 million in 1988, to about 37,000 metric tons, valued at $16 million, in 1990. Such imports recovered to 66,000 metric tons, valued at $41 million, in 1991, and preliminary data indicate that levels will increase even further in 1992.[54] Fluctuations in import levels are an indication of the volatile nature of the Nigerian mackerel market.

Prices

Wholesale prices for mackerel in the Nigerian market can be approximated by export unit values.[55] Table D-32 and figure 4-7 provide these export unit values by major suppliers. The average annual unit export value for frozen mackerel exported to Nigeria from the EC generally rose from $435 per metric ton in 1987 to $490 per metric ton in 1991; the unit value of Norwegian product also rose from $372 per metric ton in 1988 to $419 per metric ton in

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[51] Ibid.

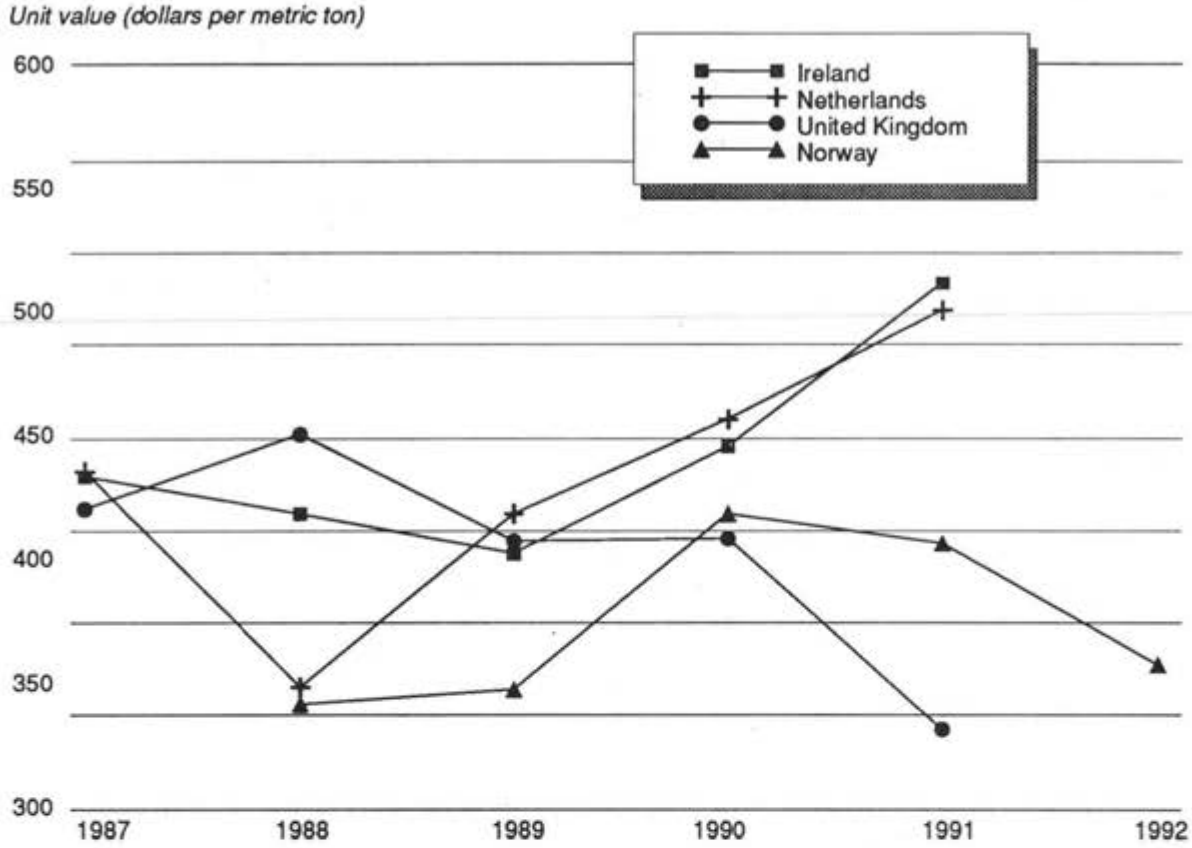
[52] Ibid. This increase occurred despite a 130-percent depreciation in the value of the naira in relation to the dollar in 1987.

[53] Includes fresh, chilled, frozen, and canned.

[54] During January-June, 1992, EC exports of mackerel to Nigeria totaled about 45,000 metric tons, according to EC export data.

[55] As approximated by export data from major sources.

Figure 4-7
Frozen mackerel: Unit values of exports to Nigeria, by major sources, 1987-92



Source: NIMEX and U.S. Embassy, Oslo, facsimile message, Mar. 10, 1993.

1990 before falling to $407 per metric ton in 1991 and to $358 per metric ton in 1992. EC prices are generally higher relative to those of the Norwegian product, perhaps reflecting quality as well as other factors.

Recent wholesale and retail prices for frozen and canned mackerel in Nigeria are given in the following tabulation according to the U.S. Department of State (in dollars per kilogram, 25 naira per dollar):[56]

Product form	Wholesale price	Retail price
Frozen	0.48-0.52	0.60-1.00
Canned	1.22-1.41	1.60-1.88

Market barriers[57]

In January 1989, the Nigerian Government reduced the scope of import prohibitions, and eliminated import licensing and a number of the commodity boards.[58] Nigerian mackerel imports are currently subject to a duty rate of 5 percent ad valorem.[59] Such duties were lowered on January 1, 1991, from 50 percent to 30 percent ad valorem, then lowered further on March 31, 1992, to 5 percent ad valorem in connection with foreign exchange reforms.[60] Mackerel imports, like all other fish imports, are required to have certification by the country of origin that the fish is radiation and toxin free as well as certification by a preshipment inspection agency verifying product quality, quantity, and length of time in storage.[61]

Exchange Rates

Nigeria has a comprehensive system of foreign exchange controls that require governmental approval of all foreign exchange payments made through the banking system.[62] Nigeria's currency, the naira, declined sharply in relation to the U.S. dollar during 1986-92 as shown in the following tabulation of data from the International Monetary Fund (in naira per U.S. dollar):

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[56] These data represent spot prices for relatively small transactions.

[57] Tariff information compiled by U.S. Department of Commerce, unless otherwise footnoted.

[58] World Bank, "Trends in Developing Country Economies: 1991," p. 403.

[59] U.S. Department of State, report from the U.S. Embassy, Lagos, Mar. 1, 1993.

[60] U.S. Department of State, report from the U.S. Embassy, Lagos, May 6, 1992, p. 12.

[61] U.S. Department of State, message reference No. 03038, prepared by U.S. Embassy, Lagos, Mar. 1, 1993.

[62] U.S. Department of Commerce, International Trade Administration, Nigeria: Foreign Economic Trends and Their Implications for the United States, FED 92-29, July 1992.

Year	Exchange rate
1986	1.75
1987	4.02
1988	4.50
1989	7.36
1990	8.04
1991	9.91
1992	17.30

Exchange rate changes in Nigeria have reflected the country's financial difficulties experienced in recent years. For instance, the sharp decline in the price of oil, Nigeria's major export, combined with governmental controls on the foreign exchange system and administered exchange rates, led to an overvalued exchange rate during the early to mid-1980s. In 1986 and 1989 the Nigerian Government introduced exchange rate reforms that resulted in substantial depreciations of the naira in relation to the U.S. dollar.[63] Despite these reforms, however, the demand for foreign exchange was generally greater than the supply, and a flourishing parallel foreign exchange market existed where the naira was exchanged for foreign currency at a discount to the official market rate.[64]

In 1992, further exchange rate reforms resulted in a depreciation of the official naira by 75 percent. The depreciation also reduced the differential in the value of the naira between the parallel and official markets. Under the new system, the value of the naira is determined in an "interbank market" where banks and licensed dealers introduce bids for the foreign exchange. Yet, the Government still controls the value of the naira in that the amount of foreign exchange allocated to this market by Nigeria's Central Bank has a major impact on the interbank rate.[65]

The depreciation of the naira during 1986-1992 most likely raised the local cost of mackerel and other imported goods in Nigeria. However, because currency depreciation in Nigeria was accompanied by reductions in import tariffs and other restrictions on trade, the effect on trade in certain years is not clear. Because the Government of Nigeria must still intervene to

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[63] See International Monetary Fund, Nigeria: Recent Economic Developments, SM/89/175, Aug. 18, 1989.

[64] Much of this trade is conducted with traders from neighboring Niger. Through this trade, Nigerian traders can exchange naira, which are nonconvertible outside Nigeria's banking system, for CFA francs, which can be converted to French francs at a rate of 50 CFAF to 1 French franc. For a description of this market, see Cathy L. Jabara, Structural Adjustment and Stabilization in Niger: Macroeconomic Consequences and Social Adjustment, monograph 11, Cornell University Food and Nutrition Policy Program, Washington, DC, June 1991.

[65] U.S. Department of State, message reference No. 03692, prepared by U.S. Embassy, Lagos, Mar. 1992.

support movements in its currency, the availability of foreign exchange, in addition to currency movements, is also an important factor affecting import demand for mackerel.

Côte d'Ivoire

With a GNP per capita of $750 in 1990, the Republic of Côte d'Ivoire is a middle income country and among the most developed in West Africa.[66] Despite its past economic success, however, Côte d'Ivoire has not been able to diversify its exports from reliance on cocoa and coffee, and its economy remains extremely vulnerable to changes in the world prices of these products. The Ivoirian economy has recently been beset by financial difficulties that have resulted in large fiscal and current account deficits which have increasingly been financed by foreign creditors, including the IMF. Ivorian GNP fell steadily during 1988-1990.

Côte d'Ivoire is a major global importer of mackerel. In 1990, Côte d'Ivoire ranked seventh among mackerel importers and accounted for 5 percent of the world total (table D-15).

Supply and demand

With a population of 13.5 million people in 1992, Côte d'Ivoire is a relatively small market compared with Nigeria.[67] The population has grown by about 4 percent annually since 1987. The smaller absolute market size is augmented by its relatively high per capita consumption of fish.

Total fish consumption in Côte d'Ivoire, mostly smoked fish, is estimated at about 300,000 metric tons annually.[68] Although Côte d'Ivoire has one of the highest levels of per capita fish consumption in West Africa, there are indications that such consumption is declining. Per capita consumption of fish in Côte d'Ivoire averaged 16.0 kilograms annually during 1987-89, down from an estimated 18.6 kilograms in 1985 (table D-24).[69] Because domestic fish production is not expected to increase substantially in the future, the country will need to rely increasingly on imports to satisfy any growth in overall demand.

As noted earlier, mackerel is also a preferred species in Côte d'Ivoire, largely because of its relatively low price and high fat content for smoking purposes. The market for mackerel is dominated by imports as the domestic catch of mackerel is relatively small (table D-33).

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[66] World Bank, "Trends in Developing Economies: 1991," p. 142.
[67] Central Intelligence Agency, The World Factbook 1992, p. 169.
[68] Ibid., p. 5.
[69] Infopeche, West African Markets for Small Pelagics, p. 21.

Channels of Distribution

Côte d'Ivoire reportedly has one of the most well organized distribution systems for handling fish of all the African countries.[70] The Ivorian market for fishery products is supplied by a few large companies that are well capitalized and able to import large quantities of fish. These companies control both the supply of fishery products and the prices at which the products are sold. A recent study found that 7 firms controlled 93 percent of total fish imports in 1988.[71]

The distribution of frozen fish, including mackerel, proceeds from importers through agents who sell on a commission basis. Most frozen fish is sold to processors and is smoked before being marketed to the final consumer. Frozen fish is distributed through an organized network of cold storage facilities throughout the interior of the country. A recent study identified 41 cold storage facilities in Côte d'Ivoire with a total capacity of about 23,000 metric tons.[72] Most of these facilities are leased by importers to local distributors.

Imports

In recent years, Côte d'Ivoire's annual frozen fish imports, excluding tuna,[73] have exceeded 100,000 metric tons and came mostly from Mauritania, the former Soviet Union, the Netherlands, and other countries in West Africa (table D-34). Horse mackerel accounted for 43 percent of the 114,613 metric tons of frozen fish imported in 1991, and mackerel for 20 percent (see table D-35).

Imports of all mackerel products by Côte d'Ivoire declined irregularly from 27,669 metric tons, valued at $15 million, in 1988, to 18,089 metric tons, valued at $11 million, in 1992 (table D-36). The Netherlands and the United Kingdom are the principal suppliers of mackerel to Côte d'Ivoire.

Côte d'Ivoire is eligible for food assistance under U.S. Public Law 480 (P.L. 480); however, no U.S. mackerel has been sold to Côte d'Ivoire under this program. This is because the funds allocated for P.L. 480 sales are fungible, and the Government of Côte d'Ivoire, to date, has preferred to import other commodities with such funds. Moreover, the Côte d'Ivorian companies that currently import fish have expressed concern that P.L. 480 sales, which are made on a government-to-government basis, would involve the Ivorian Government in importing fish, thereby distorting trade flows.[74]

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[70] Ibid.

[71] Ibid., p. 23.

[72] Ibid.

[73] Côte d'Ivoire is a major producer and exporter of canned tuna, for which it imports a substantial quantity of frozen tuna as raw material.

[74] Paul M. Earl, Fisheries Analysis Division, Northeast Region, NMFS, trip report on Abidjan, Côte d'Ivoire, May 1992, p. 10.

Prices

Wholesale prices for mackerel in Côte d'Ivoire can be approximated by the average annual import unit values. Using these values, the price of fresh or frozen mackerel[75] rose irregularly from $553 per metric ton in 1988 to $613 per metric ton in 1992 (table D-36, figure 4-8). EC and Eastern European sources had generally the highest prices, and the former Soviet Union and Africa the lowest (about $475 per metric ton in 1992).

Recent wholesale and retail prices for frozen, smoked, and canned mackerel in Côte d'Ivoire are given in the following tabulation of data from the U.S. Department of State (in dollars per kilogram, 277.5 francs per dollar):

Product form	Wholesale price	Retail price
Frozen	0.86-0.88	1.26-1.37
Smoked	(1)	3.14
Canned	(1)	11.40-12.11

[1] Not available.

Market Barriers[76]

Côte d'Ivoire depends to a large extent on import taxes for revenue generation; however, food items that do not directly compete with domestic production usually enter free of duty. Côte d'Ivoire has announced that the remaining taxes and tariffs will be reduced or eliminated by the end of 1993.

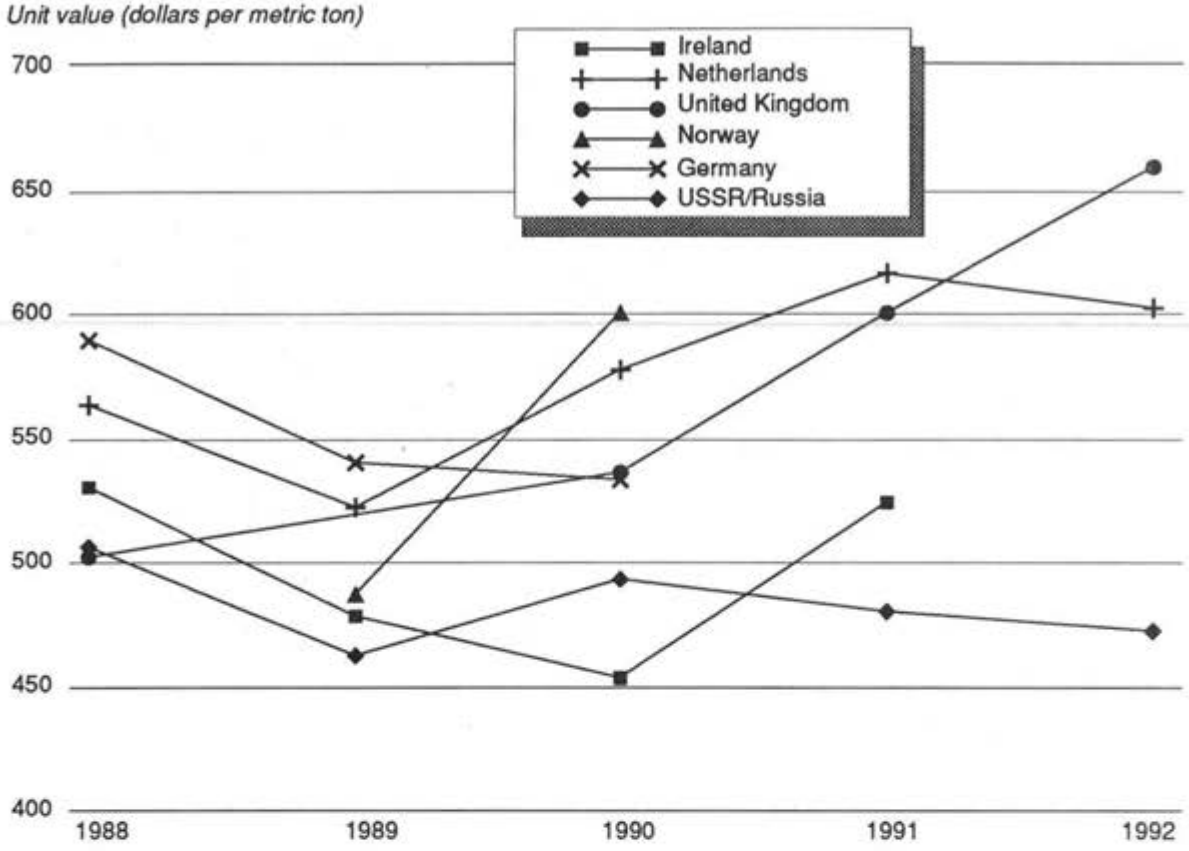
The following tabulation of data from the U.S. Department of Commerce shows current Côte d'Ivorian rates of duty for mackerel:

Heading No.	Description of goods	Revenue tax	Customs duty	Value added tax
16.04.15	Canned mackerel	17%	5%	25%
03.01.40	Mackerel, fresh (live or dead), chilled or frozen:	0%	0%	0%
03.02.39	Saltwater fish, dried, salted or in brine	32%	5%	25%
03.02.42	Mackerel, smoked	32%	5%	25%

[75] Virtually all frozen.

[76] Tariff information compiled by U.S. Department of Commerce, unless otherwise footnoted.

Figure 4-8
Fresh or frozen mackerel: Unit value of Côte d'Ivoire imports, by major sources, 1988-92



Source: U.S. Department of State, report from the U.S. Embassy, Abidijan, Feb. 26, 1993.

In addition, fresh, chilled or frozen mackerel is subject to a special tax on imported seafish of 20 CFA francs per kilogram. All mackerel products (fresh, frozen, or canned) are subject to a statistical tax of 2.5 percent ad valorem.[77]

Exchange Rates

Côte d'Ivoire is one of the seven members of the West African Monetary Union (WAMU).[78] As a WAMU member, Côte d'Ivoire shares the same Central Bank[79] and the same currency, the CFA franc (CFAF), with the other members.[80] According to International Monetary Fund, the CFA franc rose in relation to the U.S. dollar during 1986-1992 as shown in the following tabulation (in CFAF per U.S. dollar):

Year	Exchange rate
1986	346
1987	301
1988	298
1989	319
1990	272
1991	281
1992	265

Exchange rate changes in Côte d'Ivoire have generally been less erratic than those in other African countries, such as in Nigeria and Ghana, because these countries have responsibility for maintaining the value of their own currencies. With the CFA franc being pegged to the French franc, the movements in the CFA franc reflect the decline in the value of the U.S. dollar relative to the French franc since Côte d'Ivoire is unable to change the value of its currency.

Maintenance of a fixed parity with the French franc tends to facilitate trade in Côte d'Ivoire and other CFA franc zone countries because of the convertibility and the relative stability in the value of the CFA franc. However, the value of the CFA franc is maintained through Central Bank

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[77] U.S. Department of State, report from the U.S. Embassy, Abidjan, Feb. 26, 1993.

[78] The other members are Niger, Senegal, Togo, Benin, Mali, and Burkina Faso.

[79] This central bank is the Banque Centrale des Etats de l'Afrique de l'Ouest, or BCEAO, located in Paris, France.

[80] For a description of the UMOA monetary system see Cathy L. Jabara, Structural Adjustment and Stabilization in Niger: Macroeconomic Consequences and Social Adjustment, monograph 11, Cornell University Food and Nutrition Policy Program, Washington, DC, June 1991.

controls on credit expansion in each member state.[81] Thus, only a limited amount of CFA francs are available in any particular year to finance imports. Importers must compete for the limited supply of currency, which thus encourages them to import products at the lowest available price. Because mackerel contracts generally are established in U.S. dollars,[82] the decline in the value of the dollar relative to the CFA franc would have made imports cheaper, all other things held constant, but it most likely affected imports from different exporting countries equally.

Ghana

Ghanaian national income grew slowly and per capita income was stagnant during 1987 to 1990 (table D-29).[83] The country is heavily dependent on two export commodities, cocoa and gold, the prices of which tend to be volatile. Ghana's per capita consumption of fish, which averaged 26.4 kilograms annually during 1987-89, however, is among the highest in the region.

Supply and Demand

The absolute size of the Ghanaian market, as measured by population, was slightly more than 16 million in 1992[84]. Population growth has averaged slightly higher than 3 percent in recent years (table D-24). Ghana's per capita fish consumption has risen since the early 1980s, when it was about 20 kilograms.[85] The combination of a rising population and a rising per capita consumption of fish indicates a positive potential for mackerel exports to Ghana, although this potential is constrained by stagnant income levels. Fish provides a large share of total animal protein nutrition in Ghana (50 percent in 1986[86]). Seventy to eighty percent of the fish consumed in Ghana is smoked, dried, salted, fermented, or fried.[87] Total Ghanaian fish consumption is estimated to be about 373,000 metric tons annually (table D-24). Domestic supply holds a more prominent position in the Ghanaian mackerel market compared with other West African countries (table D-37). The domestic mackerel catch is supplied mainly by artisanal fishermen. This supply, however, is subject to substantial fluctuations caused by oceanographic and meteorologic conditions as well as by economic conditions that determine the size of the fleet.

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[81] Economists have estimated that the CFA franc is overvalued by 20 to 60 percent depending on the country of interest. See The Economist, May 8, 1993, p. 49.

[82] The main exception is contracts involving Eastern European and former Soviet suppliers, usually based on barter arrangements.

[83] World Bank, "Trends in Developing Economies: 1991," p. 223.

[84] Central Intelligence Agency, The World Factbook 1992, p. 128.

[85] Infopeche, West African Markets for Small Pelagics, p. 32.

[86] Ibid., p. 35.

[87] Ibid.

Mackerel is a preferred species in Ghana as it is throughout West Africa, largely because of the price and fat content attributes previously discussed. Ghanaian consumption of mackerel[88] fluctuated during 1988-90 between 13,691 and 21,010 metric tons annually (table D-37).[89]

Channels of Distribution

A monopoly for the distribution of frozen fish in Ghana was held by the parastatal State Fishing Corporation (SFC) throughout the 1980s. The SFC operated 41 cold storage facilities spread throughout Ghana with a combined capacity of about 17,000 metric tons.[90] This monopoly, however, has recently been relaxed. Another monopoly, on fish imports, was held by the Ghana Procurement Agency, mainly to control foreign exchange flows. The establishment of a currency auction system led to the dismantling of this monopoly.[91] Ghana's sizeable fish harvest is generally distributed by small-scale retailers.

Imports

Over 70 percent of Ghana's total fishery product imports are frozen. Ghanaian frozen fish imports increased by 88 percent during 1988-91 (table D-38). Such imports in recent years have been dominated by relatively inexpensive small pelagic species, such as horse mackerel, mackerel, and herring. These species accounted for almost 99 percent of Ghana's frozen fish imports during 1988-90. The Netherlands, Ireland, and Bulgaria are the largest frozen fish exporters to Ghana (table D-39).

Ghana's frozen fish imports grew steadily until the mid-1980s, when the West African coastal countries extended their EEZs to 200 nautical miles from shore. This extended EEZ zone reduced the fishing activity of Ghanaian fishermen in neighboring nations' waters, as well as the production generated from this activity. The Government restricted fish imports after 1986 to conserve foreign exchange, and such imports declined to a record low of 500 metric tons that year. With the economy showing signs of recovery after 1987, however, restrictions were eased, and imports began to rise.[92] As discussed above, the Ghana Procurement Agency had the sole charter for importing fish in the mid-1980s.

Imports of frozen mackerel by Ghana rose steadily from 6,087 metric tons in 1988 to 9,466 metric tons in 1990, or by 56 percent (table D-38).

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[88] Virtually all of which is frozen.

[89] Includes imports and landings; export data are not available. As such, this figure may be overstated.

[90] Infopeche, West African Markets for Small Pelagics, pp. 34-35.

[91] Ibid., p. 34.

[92] Ibid., p. 32.

Principal suppliers include the EC and Norway (table D-40). Exports of mackerel to Ghana tend to fluctuate by source and by year (table D-40).

Prices

Wholesale prices in Ghana for mackerel are approximated by average annual unit values of imports. Prices of imports of frozen mackerel from EC members, the primary form and source, fluctuated annually and averaged $435 per metric ton in 1991 (table D-40, figure 4-9).

Market Barriers[93]

Although trade continues to be protected by a system of import taxes and duties, the government abolished its import licensing system in January 1989, and importers are now required to present only an import declaration form.[94] In 1992, Ghana began enforcement of a stricter product labeling law for all categories of imports, including food. Imports must show the point of origin, date of manufacture, ingredients, and expiration date, if product is perishable.[95]

The following tabulation of data from the U.S. Department of Commerce shows Ghanaian tariff rates relating to mackerel products:

H.S. code	Tariff Description	Rates of taxes	
		Duty	Sales tax
03.02.64	Mackerel or chilled, excluding fish fillets and other fish meat of heading 03.04 . . .	20%	10%
03.03.74	Mackerel frozen, excluding fish fillets and other fish meat of heading 03.04 . . .	20%	10%
03.04	Mackerel fillets and other fish meat (whether or not minced), fresh, chilled or frozen	20%	10%
03.05	Mackerel, smoked whether or not cooked before or during the smoking process . . .	10%	10%
16.04.15	Prepared or preserved mackerel	20%	22.5%

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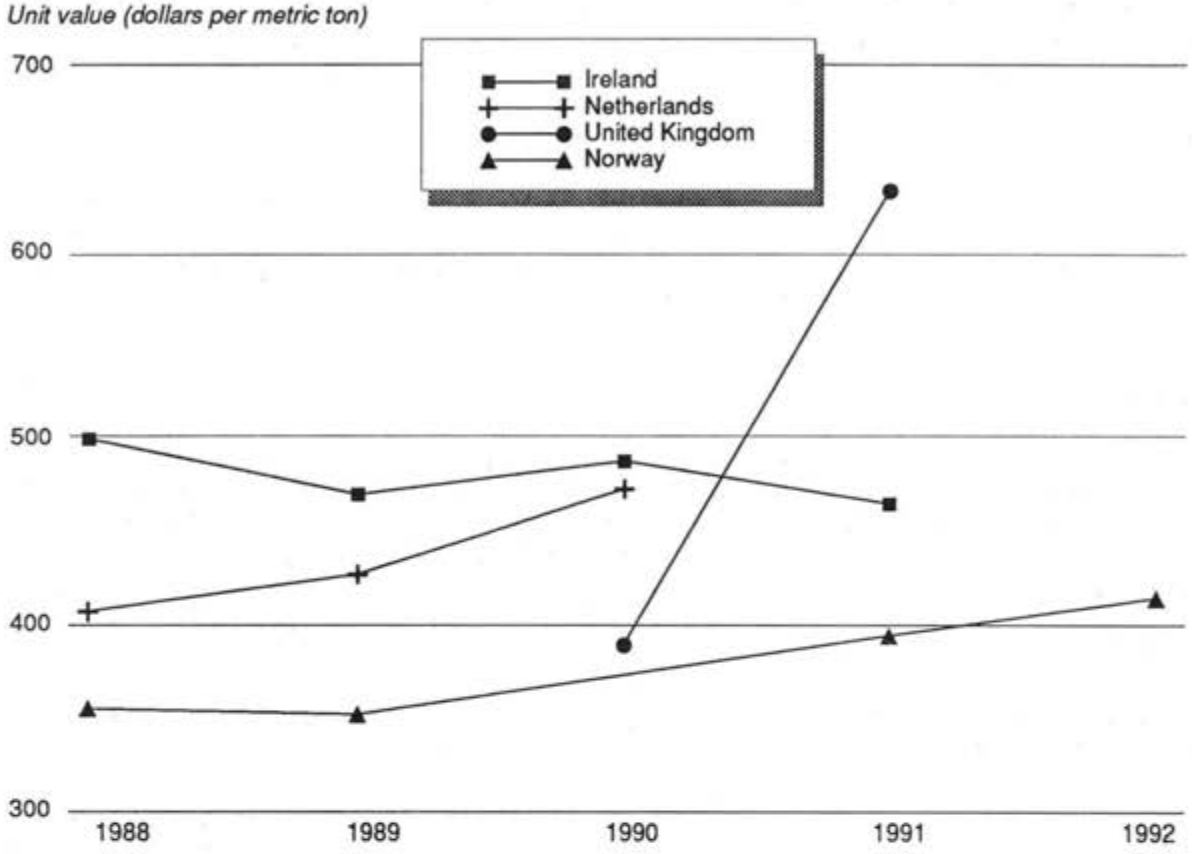
[93] Tariff information compiled by U.S. Department of Commerce, unless otherwise footnoted.

[94] World Bank, "Trends in Developing Economies, 1991: p. 224.

[95] U.S. Department of Commerce, FET 93-01, Jan. 1993, p. 7.

Figure 4-9
Frozen mackerel: Unit value of Ghanaian imports, by major sources, 1988-92



Source: NIMEX and U.S. Department of State, report from the U.S. Embassy, Abidijan, Feb. 26, 1993.

Exchange Rates

According to the International Monetary Fund, the Ghanaian currency depreciated in value against the U.S. dollar during 1986-91 as shown in the following tabulation (in cedis per U.S. dollar):

Year	Exchange rate
1986[1]	89.2
1987	153.7
1988	202.4
1989	270.0
1990	326.3
1991	387.8
1992[2]	520.0

[1] Official rate.
[2] Estimate.

Similar to Nigeria, exchange rate movements in the Ghanaian cedi have reflected the financial difficulties experienced by Ghana in recent years. Exchange rate reforms introduced in 1986, 1987, 1988, and 1990 resulted in substantial depreciations in the value of the cedi relative to the U.S. dollar. In April 1990, Ghana introduced an "interbank" market for foreign exchange, which was supported by weekly wholesale auctions conducted by the Bank of Ghana.

To reduce the role of Ghana's Central Bank in foreign exchange trading, the Government of Ghana discontinued the Central Bank's weekly foreign exchange auction in March 1992.[96] However, commercial banks in Ghana still suffer from a shortage of foreign exchange, which must be purchased from the Central Bank to supplement the available funds.[97] Thus, as in Nigeria and Côte d'Ivoire, foreign exchange availability, in addition to exchange rate changes, is an important factor affecting import demand for mackerel.

The Middle East and Egypt

The Middle East spans an area from Iran in the east to Egypt in the west. Although the region is homogeneous in some respects, such as its general embrace of Islam, it is also heterogeneous in dimensions, such as income levels (with income per capita ranging from a high of about $20,000 for the United Arab Emirates to a low of $600 in Egypt), the availability of natural resources, and economic systems and policies. The Gulf War seriously

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[96] U.S. Department of State, message reference No. 01945, prepared by U.S. Embassy, Accra, Mar. 1992.
[97] Ibid.

affected regional economic developments in 1991: trade flows were interrupted, tourism receipts fell, and migrant workers returned from the Gulf region following the war. Since 1992, however, activity has slowly returned to a more normal level.

Of all the Middle East markets, Egypt holds the most likely potential as a U.S. market for mackerel. This potential is indicated by Egypt's relatively large and growing population, which totalled about 56 million in 1992, and its continuing need for relatively low-cost protein sources, such as mackerel. The Egyptian economy, however, has been in decline during the past several years as GNP dropped almost 12 percent during 1987-90 (table D-41). Government-directed market reforms and structural adjustment measures taken under the advice of the World Bank and International Monetary Fund have also imposed economic constraints on the Egyptian market in recent years.

Supply and Demand

Virtually all of the supply of mackerel in the Egyptian market is accounted for by imports. As such, the primary supply factors affecting this market include world catch patterns and competition for supplies from other markets. A consumer preference for mackerel has developed in recent years, largely based on mackerel's relatively low price compared with other animal protein sources in Egypt.[98] This price differential is supported by government subsidies for most seafood items.[99]

The total consumption of fisheries products in Egypt averaged about 370,000 metric tons during 1987-89; per capita consumption averaged a relatively low 7.4 kilograms annually during the period (table D-24). Egyptian mackerel consumption is approximated by the import levels discussed below. It is believed that the great bulk of mackerel consumption is in frozen form. Canned mackerel consumption is believed to be minor and fresh smoked mackerel reportedly are not available in the marketplace.[100]

Channels of Distribution

Although the Government has been improving Egypt's infrastructure during the past decade, a significant part of the market continues to lack basic infrastructure, such as paved roads and reliable electricity.[101] The lack of infrastructure limits the availability of cold storage facilities and restricts the area of distribution of frozen mackerel supplies.

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[98] NMFS, The Egyptian Fisheries Market, IFR-90/55, July 31, 1990, p. 1.

[99] NMFS memorandum, p. 6.

[100] U.S. Department of State, Report from the U.S. Embassy, Cairo, Mar. 2, 1993, p. 1.

[101] Library of Congress, Federal Research Division, Egypt: A Country Study, ed. by Helen Chapin Metz, 1991, pp. 160-163.

In the past, the bulk of Egyptian imports of fish products were channelled through the government-controlled Egyptian Fisheries Company. However, an increasing share of such imports is expected to be handled by the private sector in the future.[102] Most Egyptian imports of frozen fish by the state sector are procured by a supply tender, and prospective foreign suppliers are required to bid through an Egyptian agent.[103] In addition, a significant share of Egyptian frozen fish imports in the past were under barter arrangements with the former Soviet Union, a situation that ended with the breakup of the Soviet Union. The foreign supply of frozen fish to Egypt, including mackerel, reportedly is increasingly dominated by J. Marr Seafood, Ltd., based in the United Kingdom.[104]

Imports

Egypt imports approximately 90,000 metric tons of frozen fish products annually, estimated to be valued at well over $40 million.[105] Under a trade agreement, the former Soviet Union was to supply Egypt with 40,000 metric tons of frozen fish annually, mainly horse mackerel, sardines, and hake. This commitment was not totally fulfilled and lapsed after the breakup of the Soviet Union.[106] J. Marr Seafood Ltd. supplies the bulk of Egypt's remaining frozen fish imports, reportedly because it is willing to accept a rejection clause[107] that requires payment to be withheld until a consignment's release by the appropriate Egyptian Health Authorities at the port of entry. This clause has probably discouraged other exporters from entering this market.

Precise data on Egyptian imports of mackerel are not available. The chairman of the Egyptian Fisheries Company has estimated annual mackerel imports between 200,000 and 250,000 metric tons.[108] The former Soviet Union was the predominant supplier until its dissolution in 1991, and the current main sources include the Netherlands, Ireland, the United Kingdom, and Norway.[109] Recent exports of frozen mackerel from these sources to Egypt ranged between 11,038 metric tons, valued at $4.5 million, in 1988 to 24,724 metric tons, valued at $11.4 million, in 1990 (table D-42).[110]

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[102] NMFS, The Egyptian Fisheries Market, p. 1.
[103] NMFS memorandum, p. 6.
[104] NMFS, The Egyptian Fisheries Market, p. 1.
[105] Ibid.
[106] Ibid. The Soviet Union supplied only 27,000 metric tons in 1989.
[107] Included in letters of credit.
[108] This estimate appears high compared with other data.
[109] U.S. Department of State, report from the U.S. Embassy, Cairo, Mar. 2, 1993, p. 1.
[110] These data suggest that the bulk of Egyptian mackerel imports are not captured by foreign supplier's export statistics.

Prices

As in West Africa, price, rather than quality, is the most important factor affecting the demand for mackerel in Egypt.[111] Wholesale prices for mackerel in the Egyptian market can be approximated by annual average export unit values of major suppliers. During 1988-91, prices of frozen mackerel exported from major European sources to Egypt were irregular but exhibited a general upward trend (table D-42, figure 4-10). Such prices in 1991 ranged between $419 per metric ton for Norwegian product to $505 per metric ton for mackerel from the Netherlands. As noted about West Africa, these prices are also below current estimated U.S. production costs.

Current retail prices for various mackerel products in the Egyptian market are presented in the following tabulation of data from the U.S. Department of State (in dollars per kilogram):

Product form	Retail price
Frozen	0.55
Canned	1.76

The price for canned mackerel represents product that was produced domestically from imported mackerel.

Market Barriers[112]

Egypt has relied in the past on the extensive use of nontariff barriers, including an import ban list, to protect local industry and to limit imports of luxury items. This list was reduced to 105 items in the summer of 1991 and further reduced to 78 items in August 1992. Under agreements with the IMF and World Bank, the list eventually is to be eliminated altogether.[113] Still listed, however, is "Prepared or preserved fish, including caviar and caviar substitutes except tunny [tuna]." However, there are various exemptions to the list, including the tourist trade.[114]

The following tabulation of data from the U.S. Department of Commerce shows Egyptian tariffs for imports of mackerel:

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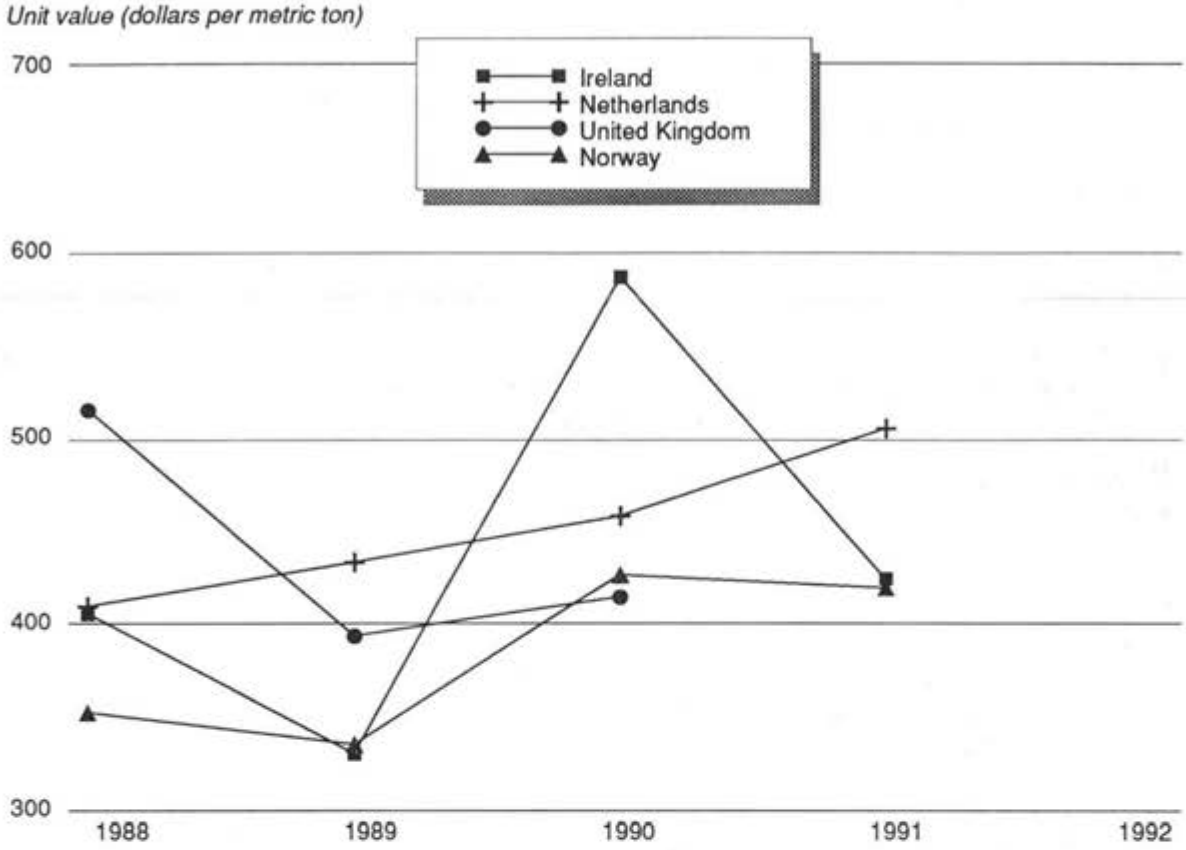
[111] NMFS memorandum, p. 10.

[112] Tariff information compiled by U.S. Department of Commerce, unless otherwise footnoted.

[113] U.S. Department of Commerce, desk officer, communication with USITC staff, Feb. 10, 1993.

[114] U.S. Department of State, report from the U.S. Embassy, Cairo, Mar. 2, 1993.

Figure 4-10
Frozen mackerel: Unit value of Egyptian imports, by major sources, 1988-92



Source: NIMEX and U.S. Department of State report from the U.S. Embassy, Oslo, Mar. 10, 1993.

H.S. code	Description	Duty rate
03.01	Mackerel, fresh, chilled, or frozen	0.7%
03.02	Mackerel, dried, salted, in brine, or smoked . .	3.5%
16.04	Mackerel, prepared or preserved	3.5%

Exchange Rates

According to the International Monetary Fund, the Egyptian currency depreciated against the U.S. dollar during the 1986-1992 period as shown in the tabulation below (in Egyptian pounds [LE] per U.S. dollar):

1986[1]	.70
1987	.70
1988	.70
1989	1.10
1990	2.00
1991	3.30
1992	3.30

[1] Official rate.

Movements in the Egyptian exchange rate reflect the structural changes in the exchange-rate policy introduced during this period.

Prior to 1991, the Egyptian Government operated a multiple-rate exchange system which included: (1) a Central Bank rate, (2) a "free" interbank rate, and (3) a free market rate.[115] The Central Bank rate was fixed at LE 1= US$ 1.43, and was used for transactions involving oil and cotton exports, Suez Canal fees, imports of essential foodstuffs and agrochemical inputs, and public sector transactions. A second "interbank" rate, which was partly free and partly fixed, was institutionalized in 1987 and covered transactions outside the Central Bank rate. The third rate, the free market rate, covered tourist and some export receipts, as well as certain worker remittances.

This exchange rate system was abolished in February, 1991, and replaced by a dual exchange rate regime, consisting of a primary (official) market and secondary (free) market.[116] Under this system, the government maintained the official rate in the LE 3.29 to LE 3.32 per U.S. dollar range. The multiple currency practice was abolished in November 1991. The Government has since

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[115] Library of Congress, Federal Research Division, Egypt: A Country Study.

[116] U.S. Department of Commerce, Foreign Economic Trends Report: Arab Republic of Egypt, June 1992.

stabilized the value of the Egyptian currency through high interest rates and credit controls that are negotiated with the IMF.[117]

The Caribbean Basin and Jamaica

The Caribbean Basin region comprises a diverse mix of independent island nations and territories that still maintain legal affiliation with other countries, mostly through historic colonial ties with the United Kingdom, France, the Netherlands, and the United States. The region's only operating trade arrangement is the Caribbean Common Market (CARICOM), established in 1973 as a mechanism to establish a common market among the English speaking countries. During 1991, the CARICOM countries reached an agreement on a new common external tariff (CET), which has generally been accepted by most members. However, the tariff range of 0 to 45 percent is very broad, and the upper-end rate, which is applied to goods that compete with domestic production, has created a costly form of a regional import substitution regime.[118] The addition in some countries of temporary surcharges and stamp duties to the basic CET has further raised the protection level for certain industries.

Jamaica is the largest Caribbean market for U.S. mackerel exports. It has a population of approximately 2.5 million with close economic ties to the United States based on proximity, trade, and investment (table D-43). The United States is Jamaica's principal trading partner, accounting for US$ 911 million, or 51 percent of Jamaica's imports, and US$ 345 million, or 30 percent of Jamaica's exports.[119]

Economic activity in Jamaica has slowed in recent years because of declining earnings in the country's two leading sectors, tourism and the bauxite/alumina industry, which together account for approximately three-quarters of Jamaica's foreign exchange earnings. Their decline caused austerity measures to be implemented under a 1990 IMF loan agreement.[120] The reduced rate of economic growth is also attributable to the effects of a 65-percent devaluation of the Jamaican currency, an 80 percent rate of annual inflation, and high interest rates charged for local currency loans.[121]

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[117] Ibid., p. 4.

[118] World Bank, Annual Report 1992 (Washington DC).

[119] U.S. Department of Commerce, message reference No. 026675, prepared by U.S. Embassy, Kingston, Dec. 10, 1992.

[120] Inter-American Development Bank (IDB), Economic and Social Progress in Latin America: 1992 Report, pp. 124-129.

[121] U.S. Department of Commerce, message reference No. 026675, prepared by U.S. Embassy, Kingston Dec. 10, 1992.

Supply and Demand

Mackerel is an important source of inexpensive protein for most Jamaicans. While Jamaica does not have a significant domestic catch of mackerel, it does export minimal amounts of smoked and salted mackerel to the Cayman Islands and Trinidad and Tobago. Jamaicans prefer Atlantic mackerel since its lower fat content makes it suitable for pickling. U.S. Atlantic mackerel, which is caught in the winter, is preferred by Jamaican consumers to Canadian mackerel which is caught in the summer and has a higher fat content. Also, according to Jamaican processors, the Canadian mackerel is not frozen until it is brought ashore; thus the Canada fish can deteriorate somewhat and be reduced to a lower quality product.

Imports

Precise data on Jamaican mackerel imports prior to 1991 are not available. As a proxy, the following tabulation of U.S. Department of Commerce data shows U.S. exports of fresh, chilled or frozen (mostly frozen) mackerel to Jamaica during 1988-92:

Year	Quantity (Metric tons)	Value (Thousand dollars)	Price (per metric ton)
1988	585	354	605
1989	316	83	263
1990	1,354	1,259	930
1991	1,758	1,483	844
1992	1,910	1,769	926

Jamaican figures for imports of fresh, chilled or frozen mackerel for 1991 (the first year for which mackerel is broken out into these categories in Jamaica's import schedule) show imports from the United States of 3,050 metric tons out of total imports of 3,308 metric tons. Other suppliers, according to Jamaican records, were Canada and the Netherlands, with a very small amount coming from Belize. The current import price, as stated by U.S. industry representatives and Jamaican importers, is approximately $780 to $840 per metric ton.[122] Russian mackerel reportedly is available at approximately $600 per metric ton.[123]

Jamaica also imported 3,100 metric tons of canned mackerel in 1991, 2,700 of which came from Thailand. Other suppliers were Ireland, Chile, and China, with smaller amounts coming from Argentina, Poland, and Canada. Canned mackerel is very popular, with as many as 10 different brands available in

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[122] USITC staff interview with a member of the U.S. mackerel industry, Kingston, Jamaica, Feb. 10, 1993.

[123] Ibid.

supermarkets. Small amounts of salted, pickled, and smoked mackerel are also imported from Canada, the United States, and Norway. According to a representative of one of Jamaica's major distributors, if imported pickled mackerel prices become much lower, importing pickled fish rather than pickling it in Jamaica may become attractive.[124]

Channels of Distribution

Most mackerel imported into Jamaica is processed by two firms near Kingston. It is pickled in brine, sometimes with spices added, and sold in buckets to supermarkets, where it is packed in smaller packages and sold to the public. In some cases the processors import the mackerel, pickle it, and sell it to distributors, who sell it to supermarkets and smaller food stores. In other cases, the distributors, especially the larger ones, import the mackerel themselves and then contract with a processor to pickle it for them, after which they sell it to food stores.

A factory for canning sardines and mackerel was opened in the mid-1980s but closed after 4 years. Jamaican Government sources attribute its failure to two factors: (1) a decline in import duties and the stabilization of the Jamaican dollar made it cheaper to import; and (2) the canned fish was not sold in Jamaica but reexported to the rest of the Caribbean.[125] During its operation, the factory tended to obtain its supplies from Norway because of the fact that it was partly owned by Norwegians.[126]

Prices

Price is the chief factor influencing the demand for mackerel in Jamaica. Pickled mackerel sells in supermarkets for approximately US$3.31 per kilogram. Canned mackerel is available at approximately US$2.56 per kilogram.

Tariffs

Fresh or frozen fish for processing (mostly mackerel) enters Jamaica free of duty. Since it is a basic foodstuff, the Government encourages its availability at low prices and supports the fish processing industry in Jamaica. Canned fish enters Jamaica at a tariff rate of 5 percent. Fresh or frozen fish not for processing (for sale as fresh) is assessed a duty rate of

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[124] Commission staff interview with a representative of the Jamaican mackerel industry, Kingston, Jamaica, Feb. 10, 1993.

[125] USITC staff interview with Jamaican Government officials, Kingston, Jamaica, Feb. 11, 1993.

[126] Jamaican Government sources also reported to Commission staff that if canned fish were sold in Jamaica as well as exported to other Caribbean countries, a fish canning factory could be a successful venture in Jamaica. Ibid.

45 percent because it is deemed to compete with local catches of fresh fish and with Jamaican efforts to promote fish farming.

Exchange Rates

According to the International Monetary Fund, the Jamaican dollar fell in value relative to the U.S. dollar during 1986-92 as shown in the following tabulation (in JDOL per U.S. dollar):

Year	Exchange rate
1986	5.5
1987	5.5
1988	5.5
1989	5.7
1990	7.2
1991	12.1
1992	23.0

Prior to 1989, the Jamaican dollar was pegged to the U.S. dollar. The Government, in the past, maintained the value of the Jamaican dollar through foreign exchange controls. During 1988-90, the JDOL was devalued by 31 percent to reduce its overvaluation relative to the U.S. dollar.

Through agreements negotiated with the IMF, foreign exchange controls were lifted in September 1991. The exchange rate is currently maintained through restrictive monetary policy and high interest rates.[127] Following the decontrol of foreign currency trading, however, the value of the JDOL fell from JDOL 16 to an April 1992 rate of JDOL 29 per U.S. dollar.[128] The decline in the value of the Jamaican dollar has tended to reduce import demand. However, shortages of foreign exchange reportedly have resulted in parallel market activity and in queueing for foreign exchange purchases.[129]

In June 1992, Jamaica's central bank, the Bank of Jamaica, established a foreign exchange stabilization fund to help stabilize the value of the Jamaican currency.[130] Commercial banks and licensed foreign exchange dealers voluntarily sell 5 percent of their daily foreign exchange intake to this fund, and contributors can withdraw up to 50 percent of their total

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[127] U.S. Department of State, message reference 11481, prepared by U.S. Embassy, Kingston Dec. 1992.

[128] Ibid.

[129] Ibid.

[130] U.S. Department of State, message reference No. 10642, prepared by U.S. Embassy, Kingston, Nov. 1992.

contribution to the fund in the event of a foreign exchange shortfall. During July-December 1992, the value of the JDOL stabilized at JDOL 22.2 = US$1.[131]

Eastern Europe[132]

Macroeconomic Situation

The countries of the former Soviet Union and the rest of Eastern Europe have undergone dramatic political and economic changes in recent years. In a macroeconomic context, these changes have included the partial transformation of the economy from a command or socialist system to a market system. As a result, internal prices (and, between the former COMECON members, external prices) are being "freed"--that is, they are increasingly reflecting supply and demand conditions in the marketplace. Some, but not all, Eastern European currencies have become convertible into other currencies through official exchange rates, replacing the black-market rates upon which East-West trade and barter arrangements often were based in past years. Furthermore, firms are being privatized, which forces their newly capitalistic owners to buy from and sell to the West at prices and volumes that must, at least in the long run, earn them a profit.

For U.S. and other western mackerel exporters and importers, the economic changes in Eastern Europe have been nothing short of chaotic. Eastern Europe has traditionally been a large importer of mackerel products from the West, a trade position solidified by Eastern European harvesters' loss of traditional distant-water fishing grounds when Western European and North American coastal nations extended their fishery jurisdictions to 200 miles in the 1970s (see chapter 3). As described below, mackerel is a widely consumed protein source in Eastern Europe, owing mainly to its low price and ease of preservation. For the Western European industry, Eastern Europe has traditionally been a "safety valve," in the words of a UK harvester, that could be counted on to siphon off excess supplies when fishing was good and/or other markets softened.

These trade patterns have been upset in recent years, because Eastern European importers now often have difficulty obtaining sufficient hard currency to pay for their mackerel imports from the West, which has closed the "safety valve" and depressed prices received from Eastern European importers. This in turn has forced Western European exporters to turn elsewhere, such as to West Africa and the Middle East. As a result, prices in those markets have fallen also. As noted in the previous chapter, additional downward pressure on world mackerel prices is coming from Eastern European harvesting vessels

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[131] U.S. Department of State, message reference No. 11481, prepared by U.S Embassy, Kingston, Dec. 1992.

[132] This discussion covers the following countries: the former Soviet Union, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and the former Yugoslavia.

being operated by "cowboys," whose main costs are fuel and labor and who therefore are more willing to accept low prices for their harvest. The economic effects on U.S. and European exporters caused by these events in Eastern Europe are discussed in more detail in chapter 5.

Supply and Demand

Supply

Both domestic production and imports have traditionally been important sources of mackerel supply in Eastern Europe. "Domestic" producers are considered here to include harvesting vessels sailing under the flags of Eastern European nations but operating in nonEastern European waters. Indeed, much of the mackerel harvest by Eastern European-flag vessels has historically taken place in foreign waters, including the U.S. Atlantic mackerel fishery. Consequently, one of the main determinants of domestic supply has been the ability to gain access to such distant waters. The wave of extended maritime jurisdictions (200-mile limits) that took place in the 1970s severely restricted Eastern European access to traditional fishing grounds. Especially since the elimination of foreign access to the U.S. Atlantic mackerel fishery, the loss of productive foreign fishing grounds has created a significant demand for mackerel imports in Eastern Europe.

The reduction in domestic supply has been exacerbated by the recent transformations of Eastern European economies. In particular, the need to earn profits has forced the scrapping of numerous large factoryships that were either to old or inefficient to operate profitably in world mackerel markets. The need for Eastern European producers to earn hard currency (and profits) has led to a number of changes: a smaller proportion of the fish is brought back to the home market (Russian joint venture fish in U.S. waters, for example, occasionally is delivered to African markets, according to U.S. industry sources); frozen mackerel is increasingly preferred over cured mackerel; and, as a consequence, much of the old harvesting/ processing capacity is being eliminated, with consequent constraints in supply availability in Eastern European markets.

Despite these supply-side pressures on the industry, the demand for mackerel remains high, thus suppliers have found ways to overcome currency shortages and other problems. An example is the three-way barter arrangement between the United Kingdom, Russia, and Denmark, described in chapter 3.

Demand

To a greater extent than in Western economies, mackerel has traditionally found a large market in Eastern Europe. This is due primarily to its low cost and ease of preservation (mainly by pickling or other curing). Indeed, until recently, according to European industry sources, many of the "processing" vessels that carried mackerel back from foreign (whether U.S. or

European) joint ventures merely cured the fish in barrels onboard, for distribution in Eastern European markets as cured fish.

Data on per capita consumption of fisheries products in Eastern Europe do not distinguish between mackerel and other species, but comparisons between Eastern European fish consumption and that elsewhere perhaps reflect differences in mackerel consumption as well. The following tabulation presents U.N. Food and Agriculture Organization data on per capita fish consumption for Eastern Europe during 1987-89 (the latest available period):

Country	Kilograms
Albania	3.2
Bulgaria	6.4
Czechoslovakia	6.8
German Democratic Republic	13.4
Hungary	5.0
Poland	13.8
Romania	8.8
Yugoslavia	3.8
Soviet Union	28.9
World average	13.3

On a per capita basis, consumers in the former Soviet Union are the region's largest fish eaters, consuming more than twice the world average of 13 kilograms. At the low end of the scale are the Balkan nations; e.g., Albania and Bulgaria. These differences probably reflect geographic considerations as much as anything else; compare the consumption rates between the coastal nations of Germany and Poland, for example, with those of the landlocked nations of Czechoslovakia and Hungary. With cured mackerel--a low-valued product whose transport costs would add considerably to the final delivered cost--the differences in consumption patterns are likely to be even greater.

A wide variety of other economic and demographic factors influence mackerel consumption patterns. As noted, markets have been weakened by the economic disruptions caused by the macroeconomic transformations. This is felt most keenly by importers, who must pay hard currency for those imports they cannot barter. Inflation during the 1980s was rapid in some Eastern European countries, according to the World Bank, ranging from 2 percent in Bulgaria to 54 percent in Poland, to 123 percent in Yugoslavia. Continuation or worsening of such inflation rates, if not matched by increases in income, will serve to reduce consumer demand for foodstuffs. On a per capita basis, gross national product in Eastern Europe is low by Western standards, ranging (in 1990) from $1,620 in Romania to $3,140 in Czechoslovakia; moreover, it is generally declining in the near term as economies strive toward market systems. Low incomes tend to cause consumers to prefer inexpensive proteins such as mackerel; however, to the extent that mackerel is considered an "inferior" good in these countries, future improvements in incomes may not be reflected in increased mackerel consumption.

Imports

The primary source of mackerel imports into Eastern Europe is the EC, particularly the United Kingdom and Ireland, whose "klondykers" (see chapter 3) deliver harvested mackerel to Eastern European factory vessels for delivery back to domestic markets. Trends in the quantity and value of EC-Eastern Europe trade are shown in table D-44. Between 1988 and 1991 (the latest available year), shipments of fresh or frozen mackerel remained fairly steady in value, at about $25.5 million. However, the total quantity fell from 92,749 to 82,650 metric tons, a decline of just over 10,000 tons, or 11 percent. Closer inspection of table D-44 indicates that most of this decline occurred in the trade in fresh whole fish (i.e., klondyke sales), especially in Poland and Bulgaria, whose factory ships have declined significantly in number (see chapter 3). Offsetting the decline in shipments of fresh whole fish were increased shipments of frozen whole fish, including a large increase (nearly 20,000 tons) in shipments to Poland.

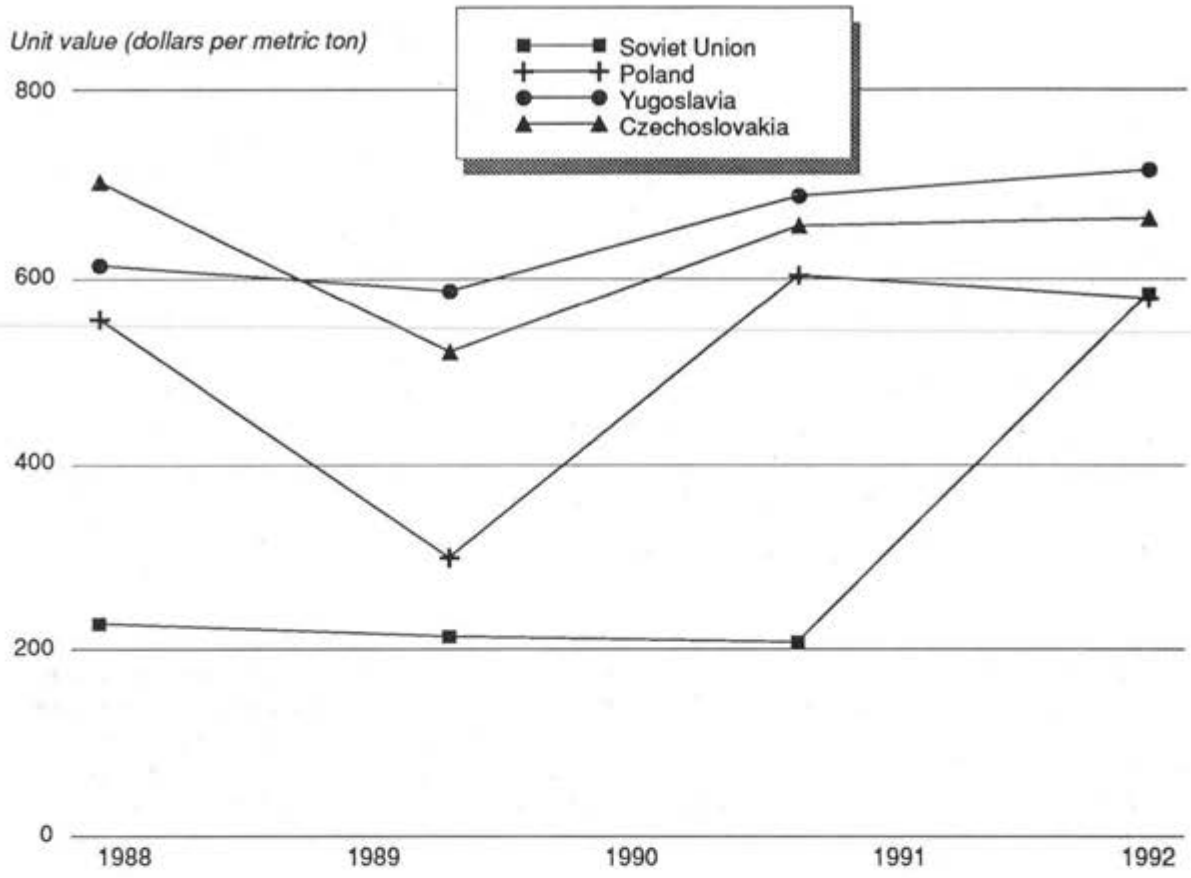
Prices

Table D-44 also presents data on average unit values of EC shipments of fresh or frozen mackerel to Eastern Europe. Figure 4-11 shows trends in the average unit values of EC exports of frozen mackerel to Eastern Europe. Immediately apparent in table D-44 is the large difference between the relatively low-valued fresh whole fish and the higher-valued frozen whole and filleted fish. In the former Soviet Union, for example, the average unit value of fresh whole fish in 1991 was $230 per metric ton, less than half the unit value for frozen whole fish of $582 per metric ton. This difference reflects not only the higher cost of processing frozen fish (including electricity and packaging that is not used in processing fresh fish) and the different types of marketing arrangements between the two product types. Fresh fish marketed in klondyking arrangements is transferred in bulk at sea, with little handling and no extra travelling to port to unload from the harvesting vessel. Mackerel for the frozen-fish market, on the other hand, is brought to port, unloaded, frozen, boxed, and generally costs much more to prepare for shipment to export markets.

Market Barriers

The only known market barriers to U.S. exports of mackerel products into Eastern Europe (other than sanitary inspections and other policies, which virtually all nations apply to all food imports) are tariffs. The following tabulation of data from the U.S. Commerce Department summarizes current (1993) tariffs in selected Eastern European markets.

Figure 4-11
Frozen mackerel: Unit value of EC exports to Eastern Europe, 1988-92



Source: Data from table D-44.

Country	Fresh whole	Frozen whole
	(percent)	
Bulgaria	10	10
Hungary	7.8	7.8
Czech Republic	0.5	0.5
Slovak Republic	0.5	0.5
Poland:		
Scomber scombrus and Scomber japonicus:		
Feb. 15-June 15	5	5
June 16-Feb. 14	20	20
Scomber australicus	15	15
Romania	20	20
Russia	10	10
Yugoslavia[1]	Free	Free

[1] Prior to 1992. Current tariff rates are not available.

Eastern European tariff rates on whole mackerel--except for the currently invalid Yugoslavian rates--range from a low of 0.5 percent (Czech and Slovak Republics) to a high of 20 percent in Romania and Poland (between June 16 and the following February 14). Poland follows the EC system of seasonally differentiating the tariff rate to provide a higher tariff (and protection to the domestic industry) during the heavy fishing/processing months of June-February.

Exchange Rates

Included in the recent transformations of several Eastern European economies are efforts to make their currencies convertible to foreign currencies. In the past, some such currencies, such as the Soviet ruble, were not readily convertible to western currencies, which served as an impediment to East-West trade. Some currencies were significantly overvalued when market transformations occurred, as evidenced by the decline in the Russian ruble to near-worthlessness in recent months. Associated with the rapid devaluation of some currencies have been high rates of inflation. The following tabulation of data from the International Monetary Fund summarizes the trends in exchange rates and inflation in recent years for selected Eastern European currencies:

Country	Change in currency value (1988-1991)	Rate of inflation (1988-1992)
	(percent)	
Czechoslovakia	-51.3	95[1]
Poland	-96.0	6,027[1]
Romania	-81.3	645[2]
Yugoslavia	-98.7	68,645[3]

[1] Through Sept. 1992.
[2] Through June 1992.
[3] Through Mar. 1992.

These high rates of currency devaluation and inflation highlight the difficulties associated with exporting to these economies, particularly if such business is of a long-term contractual nature. Generally, however, according to EC industry sources, EC mackerel exports to Eastern Europe have been either on a sale-by-sale basis or through barter arrangements, both of which help insulate the parties involved from losses arising from trends in currency or price changes.

CHAPTER 5. U.S. INDUSTRY COMPETITIVENESS ASSESSMENT

Introduction

The events and trends in production, consumption, and trade in mackerel products outlined in previous chapters have taken place against the background of a highly competitive international market for mackerel and for fishery products in general. From the perspective of U.S. Atlantic mackerel exporters--most of whom are relative newcomers in international markets--this competition is intensified by the small size of the U.S. industry relative to its major rivals in the European Community (EC) and Norway. Additionally, the international market for mackerel has become increasingly volatile in recent years as the dissolution of the former Soviet Union and the financial difficulties of a number of developing countries have led to fluctuations in both foreign supplies and import demand.

In their efforts to expand exports, U.S. mackerel exporters face a two-tiered world import market typified at the high-price end by Japan and at the low-price end by countries such as Nigeria, Egypt, and other developing countries, as well as countries in Eastern Europe. Differences in these types of markets require the U.S. industry to adopt different marketing strategies and products to ensure the competitiveness of their product in these markets. For instance, in Japan, product quality is an important factor in mackerel demand; therefore, in this market the quality of the product and the ability of the U.S. industry to expand into niche markets for its product may be a more important competitive factor than the price of the product. In contrast, consumers in developing economies and in Eastern Europe prefer mackerel for its relatively low-cost protein content; therefore, price is the predominant factor. The success of U.S. exporters in expanding in these markets hinges on the price of the U.S. product relative to the price of the product from competing suppliers and to the price of alternative protein sources available in the importing countries.

As discussed in chapter 2, the United States has an abundance of Atlantic mackerel. In theory, this large supply of U.S. Atlantic mackerel should provide U.S. suppliers an advantage in foreign markets by lowering U.S. harvesting costs relative to the costs of foreign suppliers. However, the results of this chapter indicate that a number of factors have tended to offset this advantage, with the result that the U.S. industry currently operates at a competitive disadvantage in a number of large foreign markets. As shown in chapter 4, the primary market to which the U.S. industry has been successful in exporting Atlantic mackerel is Jamaica, where a zero import tariff, relatively low transportation costs from the United States, and consumer demand for lower-fat Atlantic mackerel provide a competitive advantage to the U.S. industry.

Factors influencing the competitiveness of the U.S. Atlantic mackerel industry relative to foreign exporters in other markets identified in this

investigation include production and transportation costs, product quality, and marketing practices. Depreciating foreign currencies, and tariff and nontariff barriers in selected foreign markets have also contributed to higher prices for mackerel imported from U.S. and other suppliers. These exchange rate changes have placed imported mackerel at a competitive disadvantage relative to domestic suppliers of mackerel and other competing products. Tariff and nontariff barriers place imported mackerel at a competitive disadvantage relative to suppliers of all other competing products in importing country markets.[1]

Despite the abundance of U.S. Atlantic mackerel, both U.S. production and transportation costs are high relative to the costs incurred by the European industries. High U.S. production costs are partly explained by the small size of U.S. fishing vessels relative to the vessels of European competitors, who are able to reduce their harvesting costs through economies of scale. Relatively high transportation costs arise because the U.S. industry is located further from a number of major foreign markets, and it is not able to take advantage of volume transportation discounts. These high production and transportation costs tend to limit the ability of the U.S. industry to compete against European competitors, particularly in markets such as West Africa, the Middle East, and in Eastern Europe where price is the most important demand factor.

At the same time, however, the gap between U.S. and European product quality, while narrowing, tends to put the U.S. product at a competitive disadvantage in high price mackerel markets, such as Japan. The range of products offered and the marketing experience of European competitors also tends to place U.S. exporters at a competitive disadvantage in many mackerel markets, particularly those in developing countries, where European competitors have already established market contacts and stable trade relationships.

Tariff and nontariff barriers among mackerel importers, such as Eastern Europe, Japan, Ghana, and elsewhere, affect the competitiveness of U.S. (and other foreign exporters') mackerel exports relative to competing domestic industries. These barriers raise the price of imported mackerel relative to the prices of competing products in these markets, all other things held constant. This tends to reduce the quantity and price of U.S. mackerel exports. Elimination of tariff barriers in foreign markets would have a range of likely effects, depending upon the price responsiveness of both demand in the importing country and U.S. export supply. Likely effects of tariff elimination on U.S. mackerel prices and U.S. exports for selected markets are summarized later in this chapter and further analyzed in appendix G.

Exchange rate depreciation relative to the U.S. dollar in a number of developing countries has made the price of all imported mackerel more expensive in these countries relative to competing domestic products, all

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[1] As noted in chapter 4, mackerel is not produced in a number of developing country markets. However, imported mackerel competes with other domestic fishery products as well as beef as a protein source for human consumption.

other things held constant, as mackerel trade is largely negotiated in dollars. In a number of cases, exchange rate depreciation has been accompanied by reductions in tariffs and liberalized import procedures, which has tended to offset somewhat the adverse effects of such depreciation on import demand. Exchange rate changes have also been symptomatic of financial difficulties, however, that have resulted in shortages of foreign exchange in a number of markets. These shortages, combined with higher local currency prices, tend to favor exports from lower-cost, non-U.S. sources.

Certain government assistance and fishery management programs, both in the United States and abroad, also influence the ability of the U.S. mackerel industry to compete in foreign markets, although to a lesser extent than the factors mentioned above. On balance, government policies in the major mackerel exporting nations of Western Europe (the EC and Norway) restrict mackerel harvests and raise prices, thereby weakening European industry competitiveness compared with the U.S. industry, at least in the short run. U.S. Government policies and programs, in the past, have also tended to boost U.S. competitiveness through financial support for vessel construction, but such support has diminished in recent years.

Two of the more influential policies currently affecting the U.S. mackerel fishery are the U.S. management of Atlantic groundfish stocks and Federal regulation of foreign fleet participation in the U.S. Atlantic mackerel fishery. The traditional U.S. Government policy of open access by U.S. vessels to the Northeast Atlantic groundfish stocks, which make up an alternative fishery for many would-be Atlantic mackerel fishermen, has served to raise the price necessary to attract fishermen to mackerel, thereby raising processing and export costs. More recently, the elimination of directed fishing in U.S. waters could put downward pressure on the ex-vessel price of U.S.-harvested mackerel in the short run by forcing harvesters to depend solely on U.S. buyers (processors and exporters) for U.S.-harvested mackerel. However, this policy also reduces the foreign supply of mackerel which, in the long run, could lead to higher prices for U.S. mackerel should the U.S. industry expand its exports as a result of reduced foreign supply.

Production and Transportation Costs

The relatively high costs incurred by the U.S. mackerel industry in production (including procurement of harvested fish) and transportation place the U.S. mackerel industry at a competitive disadvantage compared with its European competitors. Such costs are a central element in the industry's ability to compete, particularly in markets such as West Africa where price is the main bargaining factor. Allowing for differences in marketing arrangements, product quality, and other determinants of competitiveness, production costs determine the extent to which mackerel producers can price competitively in export markets while at the same time earning a return over cost that provides a sufficient incentive to remain in the fishery.

Production Costs

A number of factors potentially affect harvesting and processing costs in the mackerel industry. As noted in chapter 2, harvesting costs are largely determined by the applicable costs of labor, energy, and capital, the size of the fishing vessel, the harvesting technique used, and whether other fish besides mackerel are harvested. For processors, determinants of cost include the ex-vessel price of harvested fish, the size of the processing plant, as well as the costs of labor, energy, and capital used in processing. Government policies can affect these costs, as can environmental fluctuations and other natural events that impact mackerel abundance. This section discusses some of the factors affecting U.S. harvesting and processing costs, and it compares U.S. harvesting costs to the costs incurred in foreign industries.

Harvesting Costs

The wide range of scale among European mackerel-harvesting enterprises makes it difficult to examine a "typical" enterprise for comparison with U.S. operations. Vessel sizes range from the small (often under 35 feet) vessels in the Norwegian coastal fleet to the mid-size trawlers in the United Kingdom fleet, to the large factoryships, trawlers and purse seiners in the Dutch and East European fleets. In addition to this wide range in scale, the analysis is complicated by the economies of scope described in chapter 2. That is, because harvesters and processors handle a variety of species, it is difficult to determine costs, especially fixed costs, for any one species.

Researchers in the National Marine Fisheries Service (NMFS) of the U.S. Department of Commerce, through their continuing examination of foreign participation in the U.S. mackerel fishery, however, have collected some limited information on foreign costs of mackerel harvesting in U.S. waters. The NMFS researchers were able to overcome the multispecies problem because such foreign vessels fishing in U.S. waters typically target the one species (mackerel, in this case) for which they have received a permit from the U.S. Government.

The foreign vessel in the NMFS research was the fishing vessel (F/V) Novator, built in Norway in 1987 at a cost of $21 million. Its original owners, a group of Irish industry interests, intended the vessel for use in EC waters. However, it was sold to Soviet interests for operation in the U.S. Atlantic mackerel fishery during the winter-spring 1990 season. During that time, according to NMFS, the total daily cost of operating the F/V Novator (exclusive of steaming time) was $21,600. Reportedly similar in design to Dutch mackerel harvesting vessels of similar size, it has a daily capacity of 200 metric tons, indicating an average harvesting cost of $108 per metric ton.[2] During its operation in the U.S. fishery, however, the NMFS researchers

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[2] According to the Scottish Fishermen's Organization, the Soviets carried a crew of 40 on this vessel, while the Dutch would have carried a crew of only

(continued...)

assumed for their analysis that the actual daily output was 126 metric tons, for an average cost of $171 per metric ton.

Although detailed economic data for the F/V Novator beyond those noted above are not available, it is potentially useful to compare the available data with corresponding data for U.S. harvesters. Recall the description of the Rhode Island-based F/V Relentless, a U.S. freezer trawler which is typical of the larger, U.S. fishing vessels, in chapter 2. Of particular interest is the difference in vessel scale: the daily capacity of the F/V Novator is 200 metric tons, more than 5 times the capacity of the F/V Relentless at 36 tons/day. At one point in its 1990 joint venture (whether at the venture's completion is not known), the F/V Novator held in excess of 8,400 metric tons of product in its hold; the hold capacity of the F/V Relentless is 159 metric tons. The unit cost for the F/V Novator is $171 per metric ton, or less than half of the unit cost for the F/V Relentless of $352 per metric ton.

These vessel characteristics suggest several implications for the respective operation of the vessel. One relates to economies of scale: the sheer size of the foreign vessel explains part of the vast difference in their average unit costs. Another concerns product quality: the F/V Relentless returns to port to empty its hold every 2 weeks or so, and therefore presumably delivers a fresher (i.e., more valuable) product than that delivered by the F/V Novator after its several-month tour of duty in U.S. waters. From an export-competitiveness perspective, the importance of these implications depends on the type of market targeted; freshly frozen, top-quality product (albeit at a higher price) could be considered competitive in a quality-conscious market such as Japan, while a moderate-quality, lower-cost product, produced in bulk quantities, could be more competitive in markets such as those in West Africa.

Processing costs

The ex-vessel or dockside price paid by processors to fishermen for harvested mackerel is the most important cost component for processors and exporters of frozen mackerel. For the U.S. industry, probably the most important influences on these ex-vessel mackerel prices are average variable costs of harvesting and, especially for the "wetfish" (nonfreezer) trawler fleet, the prices for alternative species.

If the prices of alternative species are high relative to mackerel, operators of wetfish trawlers will tend to seek out those other species instead of mackerel; therefore, mackerel processors will have to offer a higher price to wetfish trawlers. In the U.S. Atlantic mackerel fishery, alternative species include groundfish (e.g., flounder) and squid; these

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[2] (...continued)
25. While this differential could be due to lower Soviet labor productivity, NMFS personnel suggest that it also may be attributable to lower Soviet costs of labor, capital, or other inputs, which would help them carry a larger crew at the same total operating cost.

species often command ex-vessel prices several times that of mackerel.[3] The competition from these valuable alternative species requires that mackerel prices be raised in order to attract fishermen from alternative species. This in turn raises processors' costs and imposes a competitive disadvantage on processors and exporters who rely on wet fish trawlers for mackerel supplies.[4]

Mackerel abundance

The abundance of mackerel in the U.S. fishery also affects ex-vessel prices and therefore holds important implications for U.S. industry competitiveness. The concentration of the mackerel resources influences harvesting efficiency (and costs) insofar as the catch per unit of harvesting effort (measured in total days fished, for example, or in number of boats) is higher the greater the stock size on a given fishing ground.

The U.S. mackerel industry enjoys a clear international advantage in its abundant supplies of raw material, particularly Atlantic mackerel. The vast size of this resource, with a spawning stock numbering in the millions of fish and a long-term potential yield estimated at 200,000 metric tons, is the envy of many northern European competitors interviewed by Commission staff. Such foreign competitors have not only been closed out of this resource by U.S. fishery policy since 1992, but must cope with significantly diminished resources in their own waters, such as the North Sea mackerel stock and the so-called western mackerel stock to the west and north of the British Isles.[5]

As discussed above, the primary reason the U.S. Atlantic mackerel stock is so large is the attractiveness of the higher valued alternative species

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[3] An indication of the price gap between mackerel and alternative species is shown in a comparison of prices in Rhode Island and New Jersey, which account for nearly 90 percent of the U.S. Atlantic mackerel harvest. In 1992, according to official (preliminary) statistics of the U.S. Department of Commerce, the ex-vessel prices of flounders (all species), long-finned squid, and Atlantic mackerel in Rhode Island averaged $1.12, $0.44, and $0.18 per pound, respectively; in New Jersey, such prices averaged $1.20, $0.57, and $0.07.

[4] Freezer trawlers, in contrast, are more commonly under the control of processors and exporters (through contracts or direct ownership), and therefore can be directed to search for mackerel without the incentive of a higher price. Such trawlers are becoming increasingly important in the U.S. Atlantic mackerel industry, and this trend should alleviate the competitive disadvantage imposed by higher prices for alternative species.

[5] According to one researcher, the North Sea mackerel stock is economically overfished (sustainable harvests are less than their maximum potential). The western fishery, although not currently overfished, will be if recent harvest rates are allowed to continue at 2 to 3 times the "optimal" level for the fishery (the level at which sustainable harvests are maximized). See John O. S. Kennedy, "Optimal Annual Changes in Harvests from Multicohort Fish Stocks: The Case of Western Mackerel," Marine Resource Economics, Vol. 7 (1992), pp. 95-114.

whose high prices (in many cases because of declining abundance) draw U.S. harvesters away from the relatively low-priced mackerel resource. The apparent lack of interest in the mackerel resource among most U.S. fishermen can be seen by comparing actual harvests with potential yields. Of the current potential yield of Atlantic mackerel of 400,000 metric tons, the 1991 commercial harvest totaled only 16,600 tons, or 4 percent of the current potential yield. In addition, the estimated current potential yield is twice the long-term (sustainable) potential yield of 200,000 metric tons because the mackerel population has grown as a result of its underutilization.[6]

In sharp contrast, the Northeast groundfish stocks are so overutilized that the current potential yield of 408,000 metric tons (for all of the 35 species of groundfish species combined) is almost the same as that for Atlantic mackerel alone, and is nearly 25 percent below the long-term potential yield of 534,000 metric tons.[7] The recent actual groundfish yield (about 225,000 metric tons) is, like mackerel, below the long-term potential, for groundfish. Unlike mackerel, the shortfall in the harvest of groundfish results not from too few harvesters, but from too few fish.[8] [9]

The abundance of U.S. mackerel should provide the U.S. industry with a competitive advantage relative to these foreign competitors. In contrast to the U.S. situation, access to the mackerel resource in Western and Eastern Europe is constrained by a variety of government measures designed to conserve this resource. For example, within EC waters, the EC Common Fisheries Policy (discussed below) limits the quantities of mackerel allowed to be harvested by each member state. A similar system is used in Norway. For the fleets of the former Soviet Union and Eastern Europe, which traditionally relied on distant-water fisheries, the 200-mile limits of the United States and other coastal nations have restricted or even eliminated access by those fleets to their traditional resources. However, high harvesting and processing costs, aside from the availability of the mackerel resource, as well as other factors noted below, appear to be constraining the development of this industry.

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[6] "Long-term potential yield" is defined as the maximum long-term average yield (harvest) that can be achieved through conscientious stewardship of the resource. "Current potential yield" is the yield or harvest that can be taken at present, depending on current abundance and the current production rate. U.S. Department of Commerce, National Marine Fisheries Service, Our Living Oceans: Report on the Status of U.S. Living Marine Resources, 1992, Dec. 1992, pp. 6-7.

[7] For estimated long-term and current yields of mackerel and groundfish, see ibid., pp. 35-42.

[9] Ibid., p. 35.

[9] The diversion of harvesting effort discussed earlier is not the only connection between the mackerel and groundfish fisheries. The large and growing population of mackerel, according to NMFS scientists, is likely to be interfering with the recovery of the groundfish stocks for biological reasons, such as competition for the same plankton and other food supplies, and consumption of groundfish larvae by adult mackerel. However, these biological relationships are beyond the scope of this study.

Transportation Costs

In all major foreign markets for mackerel, except for the Caribbean, the U.S. Atlantic mackerel industry is at a transportation-cost disadvantage compared with its European rivals. For example, in early 1993, according to shipping-company officials interviewed by Commission staff, transport rates for frozen mackerel between New York and West Africa/Middle East ports ranged between $7,000 and $8,000 per 40-foot container (a container holds 48,000 pounds), depending on the foreign port (small ports being more expensive). These rates, which are inclusive of unloading and other charges, are equivalent to between $370 and $420 per metric ton. In sharp contrast, Western European mackerel industry officials reported to Commission staff that, depending on the export market (ports in North and West Africa), their transport costs amounted to $100 to $200 per metric ton.

There are two main reasons for such cost differentials. One is the U.S. industry's relatively long distance from most markets. For example, the Japanese market is closer to Norway than to the East Coast of the United States. The markets in West Africa, the Middle East, and, especially, Eastern Europe all are closer to the Western European suppliers than to U.S. suppliers.

The second reason is the small quantity of shipments that the U.S. industry currently seems able to assemble for transport to most foreign markets. Brokers and shipping industry officials interviewed by Commission staff reported that the per-unit rates for shipping mackerel to West Africa and other nontraditional U.S. export markets would decline only when regular, large shipments can be arranged. Until that time, mackerel exporters will not obtain the preferential rates offered to large-volume shippers (such as poultry exporters).

In addition, many European suppliers, especially Dutch exporters, offer a range of fish products to potential buyers. This marketing technique promotes greater overall shipment volume and enables buyers to obtain several different types of fish products in one shipment. As a result, marketing costs for both exporters and importers are generally reduced.

The U.S. industry has the capability, at least in theory because of its potential harvest size, to ship large volumes to individual markets. However, a number of factors affect the ability to ship in bulk, including sufficient import demand and dependable supplies of harvested mackerel.[10] Consequently, the U.S. industry cannot gain a transportation-cost advantage until it gains a significant share of foreign markets, which in turn requires some means of offsetting its disadvantage of greater distance from markets.

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[10] Despite an abundance of mackerel in U.S. waters, the availability of mackerel for onshore processing at any one time can vary because of water temperature (which can force mackerel into deeper waters), seasonal migration patterns along the coastline, and competition from higher-priced alternative species that can divert fishermen from mackerel fishing.

Product Quality

The importance of product quality in mackerel industry competitiveness varies from one market to another. As noted earlier, the Japanese market is a highly discriminating one and, as the experience of Norwegian exporters suggests, the cost of supplying less-than-top-quality product can be high. In West African markets, in contrast, the demand is more price-sensitive, and as long as the product is of acceptable quality the supplier with the lowest price or other attractive bargaining terms will get the sale. Even in the markets for industrial products, product quality can be important. The demand in the bait market is for high-quality mackerel, while that for animal feed or meal and oil is for mackerel of virtually any quality provided an acceptable price can be negotiated.

The U.S. industry suffers a competitive disadvantage in terms of product quality compared with certain foreign rivals; however, the gap is narrowing with improved U.S. industry technology. A large part of the advantage of the Dutch and Norwegian industries comes from their use of purse seiners in mackerel harvesting. The advantage of purse seiners is two-fold: first, the fact that the fish is alive virtually until it reaches the vessel's hold gives the purse seine method an advantage over trawling (in which the fish are dead and crushed for several minutes before hauling aboard the vessel); second, virtually all large purse seiners are originally equipped with on-board freezers, whereas a number of the freezer trawlers in the U.S. mackerel fleet were converted from wet-fish boats. At the hearing held at the Commission in January, it was suggested that the U.S. industry perhaps could counter this foreign advantage by acquiring and retooling some idle purse seiners from the U.S. tropical-tuna industry; however, this option apparently is not currently considered a viable one.[11]

Recent U.S. industry investment in modern freezing technology on vessels and in onshore processing facilities is likely to help bridge the U.S.-European gap in product quality. For example, Seafreeze, a Rhode Island-based operator of freezer trawlers, was among the first to deploy freezer trawlers (some converted from other types of vessels) in the Eastern U.S. fisheries for mackerel and other species. By freezing on board, these vessels deliver product that is of significantly higher quality than what a wet-fish trawler would deliver after the same time at sea. Lund's Fisheries, a mackerel processor in New Jersey, has recently equipped its onshore processing plant with eight computer-controlled blast cells, which, according to the

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[11] In response to a query from Commissioner Rohr as to the option of converting U.S. purse seiners to mackerel fishing, a representative of Seafreeze stated that "that thought has not even occurred to us." A representative of Mayflower International stated that a tuna purse seiner "doesn't have the horsepower to tow a mid-water net, and it takes some sophistication, really, to purse seine these mackerel." Transcript of the hearing, pp. 64-65.

firm, reduces freezing time, enabling the plant to freeze more than 300,000 pounds of product per day.[12]

Freezing technology is an important factor in product quality. Of the two basic types of freezers, blast and plate, the former yields higher quality product but requires more energy, according to industry sources, and so is more costly in the U.S. industry. In Norway, in contrast, electricity is relatively inexpensive, owing to the prevalence of hydroelectric power, and this advantage in inexpensive energy enables Norwegian mackerel processors to economically employ blast freezers.

Another source of European competitive advantage comes from nature rather than technology. The cold waters and rich feeding grounds in which the Norwegian industry harvests its mackerel yield mackerel with relatively high fat content, a product characteristic that is prized in high-value markets such as Japan. In contrast, the relatively low fat content of the mackerel in U.S. waters makes that product best suited for cured fish, a product in greatest demand in developing economies.

Marketing

Effective marketing is an important determinant of overall competitive advantage in mackerel exporting. The success of some U.S. mackerel exporters in Jamaica, the painful lessons learned by Norway in the Japanese mackerel market, and the difficulties in maintaining marketing ties with firms in the evolving Eastern European economies all point to the role played by marketing skills in successful mackerel exporting. As discussed below, the U.S. industry generally suffers a competitive disadvantage in mackerel marketing, especially compared with its Dutch rivals.

In addition to product quality and transportation, elements of marketing that potentially influence competitiveness in mackerel exporting include experience in selling to a particular market, an ability to supply a range of products in addition to mackerel, and coordination among the various suppliers within a nation's industry. In all these elements, the European mackerel industry, particularly in the Netherlands, appears to have the clear competitive advantage. The Dutch fish-marketing organization known as the Group was discussed in chapter 3. The importance of the type of marketing skills mastered by the Group cannot be overemphasized in explaining the competitive advantage enjoyed by the Netherlands in mackerel exporting.

The Dutch have experience and skill in commodity trading, developed over hundreds of years in the business, which have a number of spill-over effects in mackerel exporting. For example, long-standing contacts are made with buyers in foreign markets (a fact that relates to the range of commodities offered. Loyalty of such contacts is important for a commodity often in

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[12] Jonathan Rubins, Lunds' Fisheries, transcript of the hearing, pp. 18-19.

uncertain supply, such as mackerel. In Nigeria and other mackerel markets with only a handful of large distributors, developing stable trade relationships with buyers clearly can be an important competitive asset. In addition, developing skill in commodity marketing and exporting is made easier when the home country has many such firms from which to lure skilled managers.

The range of products offered is also an important competitive factor. The Group offers a range of fish products, mostly of pelagic species, which is a significant bargaining advantage when dealing with large buyers or state agencies in importing countries. Such buyers can therefore obtain a range of products with a minimum of effort, which, by reducing buying costs, is an important consideration in developing countries with scarce financial resources.

Related to the range of products is careful coordination among the members of the Group. In a manner similar to a cartel, the Group operates so as to provide only one member the first opportunity at supplying a particular country or region. This practice reduces competition among the Group members. Not only does this raise the financial returns to the successful Group member (and, applied worldwide, to the Group as a whole), it further cements the buyer-seller relations that are important in establishing a solid foothold in a foreign market.

Tariff and Nontariff Import Barriers

Tariff rates for fresh or frozen mackerel in some of the more important foreign markets were described in chapter 4. Outside of Eastern Europe, with the exception of Ghana, these tariffs currently are relatively low. The Ghanaian tariff rate of 32 percent (including an import duty of 20 percent and a 10-percent sales tax) is the highest among the markets analyzed, followed by Japanese and Nigerian import duties of 5 percent. Import duties on fresh or frozen mackerel in the other importing countries outside of Eastern Europe range from 0 (Jamaica) to 0.7 percent (Egypt). As noted in chapter 4, Nigeria's import duty had been as high as 50 percent before January 1, 1991. In Eastern Europe import duties for fresh or frozen mackerel range from 0.5 percent in the Czech and Slovak Republics to a high of 20 percent in Poland (during June-February only and 5 percent during other months).

As with tariffs, some important official NTBs that U.S. mackerel exporters face have been declining in recent years. Two of the largest African markets, Nigeria and Ghana, eliminated import licensing and other NTBs in 1989. Japan has significantly relaxed its import quotas for fish, including mackerel, although this has been less of a benefit to U.S. exporters than to higher value producers such as Norway.

Tariffs and nontariff import barriers (e.g., quotas) create a wedge between the prices paid by consumers in the importing country and the prices received by all foreign exporters. The higher price paid by consumers causes a decline in consumption in the importing country, and also an increase in domestic production if there is a domestic industry. The lower price received

by foreign exporters causes a decline in the quantity exported. Thus, U.S. exporters suffer from the combined effects of lower volume and lower price. Appendix G further discusses measurement of these effects, and it illustrates the types of trade and price changes that could occur if mackerel tariffs were to be eliminated in selected import markets.[13]

Exchange Rates

As described in chapter 4, a number of potential markets for mackerel have experienced severe volatility in the rate of exchange between their currency and the U.S. dollar. Among the developing country markets, this volatility is attributable to an array of causes, including changes in general economic conditions and government policy adjustments in response to international aid agreements, among other factors. In most cases, the importing country's currency has depreciated relative to the dollar (often because of the freeing up of formerly controlled exchange rates), which has served to raise prices and to weaken the price competitiveness of all exporters in relation to domestic suppliers of competing products. The following tabulation summarizes recent trends in exchanges rates for mackerel-importing countries discussed in chapter 4 (all exchange rates in foreign currency per U.S. dollar):

Country	1986	1988	1990	1992[1]
Japan	168.5	128.2	144.8	126.7
Nigeria	1.8	4.5	8.0	17.3
Côte d'Ivoire	346.0	298.0	272.0	265.0
Ghana	89.2	202.4	326.3	520.0
Egypt	0.7	0.7	2.0	3.3
Jamaica	5.5	5.5	7.2	23.0
Czechoslovakia	15.0	14.4	18.0	29.5
Poland	175.0	431.0	9500.0	10576.0
Romania	16.2	14.3	22.4	76.4

[1] Exchange rates for Czechoslovakia, Poland, and Romania are only available up to 1991.

With the exception of Japan and the Côte d'Ivoire, most currencies have lost value in relation to the dollar. The naira of Nigeria, for example, rose from 1.8 naira to the dollar in 1986 to 17.3 naira to the dollar in 1992, a depreciation of nearly 900 percent in 6 years. From the point of view of Nigerian importers, therefore, in 1992 it took nearly 10 times as many naira to buy a given quantity of U.S.-exported mackerel (assuming it was priced at a constant dollar price) as it did in 1986. Relatively large declines in the

[13] The examples in appendix G show the effect on U.S. exports and export price. However, similar effects would occur for other foreign exporters to these markets.

value of importers' purchasing power also occurred in Ghana, Egypt, and Jamaica, and several countries in Eastern Europe. Since mackerel trade is largely contracted in dollars, foreign currency depreciation relative to the dollar, at the margin, has contributed to higher local prices for mackerel in these countries.

Despite such exchange rate changes, chapter 4 shows that in a number of these countries mackerel imports actually rose during periods when countries experienced a loss of value in their currencies. This can be attributed to declines in tariffs (in Nigeria, for example, from 50 to 5 percent during the period), other macroeconomic factors, and more aggressive marketing by third-country exporters. From the viewpoint of U.S. exporters, however, such currency depreciations have added further burdens on their attempts to successfully break into these markets. Moreover, higher local currency prices in importing country markets tend to benefit lower-cost, non-U.S. suppliers.

The exchange rates of major mackerel-supplying regions rose against the U.S. dollar during 1986-1992 as shown in the following tabulation (in foreign currency per U.S. dollar):

Region	1986	1988	1990	1992	Percentage change 1986-92
Norway . . .	7.3947	6.5170	6.2597	6.2145	16.0
EC (ECU) . .	1.0192	.8447	.7855	.7711	32.2

The appreciation of the foreign suppliers' currencies against the U.S. dollar suggests that exchange rate changes contributed to a decline in the local prices received for mackerel by competing foreign exporters, all other things held constant. The magnitude of the effect of these currency changes is uncertain, however, because foreign fishermen may have had incentives to raise their dollar-denominated prices in markets where demand is not highly responsive to price changes.

Government Assistance to Producers

The EC Common Fisheries Policy

As shown below, the Common Fisheries Policy (CFP) of the European Community (EC) has both short- and long-run effects on EC mackerel production and ex-vessel prices. The effects of the CFP restrictions on the EC harvesting effort are shown geometrically in appendix H. In the short term, it serves as a hindrance to EC mackerel exports (within 1 to 5 years),[14] and,

[14] Here and later in this chapter the "short term" will be taken to mean that period of time too short to allow fish population adjustments in response (continued...)

therefore, tends to put upward pressure on mackerel prices in both EC and non-EC markets. In the long term, however, EC exports could be greater than in recent years assuming that the CFP harvest restrictions achieve their intended effect of restoring depleted fisheries. These increased exports could likely place downward pressure on mackerel prices in world markets, including those served by U.S. exporters.

The effects on the U.S. industry from these changes center on the likely price changes. Aside from certain possible side effects on inefficiency,[15] the effects on the selling price of the harvested mackerel depend on the effectiveness of the CFP price regime in supporting mackerel prices. In the short term, the reduced harvest rate will tend to put upward pressure on prices, reducing or eliminating the need for support.[16] However, higher prices tend to worsen problems with EC enforcement of its harvest restrictions, because higher prices attract additional harvesters who have incentive to circumvent the member-state regulations to successfully land and market the catch.[17]

In the long term, the increased harvests attributable to resource recovery will put downward pressure on prices, and here the CFP price-support regime may have more of an impact. When the regime is enforced (and, as noted below, this is not always the case), it serves to support the prices paid to harvesters, which in turn raises the cost of raw material to processors and exporters, thus making them less competitive in world mackerel markets.

Therefore, in either the short or the long term, the combined effects of the CFP are to maintain EC internal and export prices above what they would otherwise be, which in turn puts upward pressure on the prices received by non-EC exporters (including the U.S. industry) and paid by foreign importers.[18]

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[14] (...continued)
to changes in fishing effort. The long term is a period long enough to accommodate any such adjustments.

[15] See Lee G. Anderson, The Economics of Fisheries Management, 2d ed. (Baltimore: Johns Hopkins, 1986), ch. 6. Such effects include overcapacity as harvesters race to get as much of the annual quota as possible. These problems can be alleviated by per vessel allocation of the quotas, as occurs in a number of EC member states.

[16] In reality, significant price declines have occurred in EC mackerel fisheries in recent years. However, this is due to weak markets (such as in Eastern Europe) and has nothing to do with the supply constraints of the CFP.

[17] Member states that have encountered past problems with underreporting of mackerel harvests include the Netherlands and Ireland. Eurofish, Mar. 26, 1992.

[18] It should be reemphasized, however, that these conclusions depend on the supposition that the mackerel resources in question are (or in the absence of effective regulation would be) fished beyond their maximum physical productive potential.

It should also be noted that the effects on mackerel prices from the CFP minimum price system are actually uncertain in that the minimum price for mackerel has often not been enforced in recent years, according to representatives of European producer organizations contacted by Commission staff. This is largely due to the conditions in the major export markets for EC mackerel, such as Eastern Europe. Since the beginning of the transformations of the command economies in Eastern Europe, Eastern European buyers in the klondyking (joint venture) arrangements with United Kingdom and Irish harvesters reportedly have often not been able to afford to pay the EC minimum price for mackerel. Rather than lose sales,[19] EC harvesters have been willing to forego the support provided by the minimum price and accept a lower price from the klondyke buyers. In West Africa, as well, the markets usually cannot support a price equal to the EC minimum price, and so the EC exporters (usually Dutch) are often willing to take less than the minimum price to make the sale.

The CFP also contains provisions for the removal of harvesting capacity from many fisheries, including mackerel. In general, financial assistance is provided by the EC Commission, through the regional producers' organizations, for the removal of fishing vessels, whether by scrapping old vessels, diverting them from over- to under-utilized fisheries (including reflagging vessels so that they may participate in other nations' fisheries), and retooling for nonfisheries use.

The likely effects of this intended capacity reduction on the mackerel harvest differ depending on whether one considers the short or long term. In the short term, the total volume of the EC mackerel harvest should decline as harvesting capacity is reduced. However, the intent of the capacity reduction program is to alleviate the overfishing problem in the mackerel fisheries. Therefore, in the long term, the fish stocks are expected to recover from their depressed states and, as a result, the overall harvest from these stocks should increase, even with the smaller amount of harvesting capacity. Therefore, the expected effects of the reduction in EC harvesting capacity are a decline in the volume of the mackerel harvest in the short term and an increase in the long term. It should be emphasized that the effect on mackerel prices will depend on mackerel stock reproduction rates, environmental conditions, and other exogenous factors.

Norwegian Fishery Management

Norway's system of quota regulation and price support is similar to that of the EC CFP. Thus, the licensing program for the large-boat fleet (purse seiners and trawlers) has the same types of probable effects on the Norwegian mackerel-harvesting and processing sector as the above-described CFP has on

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[19] For many United Kingdom and Irish harvesters, the main alternative to sales through klondyking is to give up their unsold catch to the EC for withdrawal (reduction or other industrial uses). In that case, the harvester only receives a fraction of the minimum price anyway, so often the klondyke sale is an attractive option despite the low price.

the EC industry. In contrast to the EC program, however, the Norwegian support price for mackerel largely serves as a price floor. This is because the high-valued Japanese market for Norwegian exports tends to maintain actual Norwegian prices at levels above the support level. Therefore, there does not appear to be any significant direct price-support effects on world markets for Norwegian mackerel for human consumption.

Other programs, however, do have likely practical effects. An example is the bait support program for bait buyers, which has the likely effect of raising the prices received by producers of mackerel for bait and for other uses. This policy provides indirect benefits to U.S. mackerel exporters who compete with Norwegian exporters and also receive higher prices.

According to the Organization for Economic Cooperation and Development (OECD) Annual Review of Fisheries, the Norwegian Government provides financial assistance to bait buyers to lower their cost of bait while maintaining an acceptable return to bait producers. As in the U.S. industry, a significant quantity of Norway's mackerel output is channeled to the bait market, where it is used by the coastal fleet in traps, hook-and-line gear, etc. Therefore, the bait subsidy also benefits mackerel suppliers.[20] In effect, the bait subsidy reduces the price to buyers and raises the price received by bait suppliers in Norway and the quantity produced. At least some of this increased quantity of mackerel must come from the markets for other mackerel products, such as fresh or frozen mackerel for human consumption.[21] Therefore, the diminished supply of those alternative products tends to put upward pressure on their prices as well.

Financial Assistance For Fixed Costs

In past years, harvesting vessels and processing plants often were constructed with government assistance, typically in the forms of grants or low-interest loans in the EC, Norway, Eastern Europe, and the United States. More recently, fiscal pressures on governments and problems with excess harvesting capacity have led to elimination of most of those sources of fixed-cost assistance to the industry. In fact, government policies in recent years have tended to discourage rather than encourage investments in harvesting and processing capacity.

However, the past assistance received by vessel and plant owners, even if no longer available to new applicants, in many cases continues to benefit the owners and operators of such vessels and plants. Current mortgage payments are lower because grants covered part of the original cost of

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[20] The bait subsidy increases bait supply, which in turn lowers the price that bait consumers must pay. However, the price received by bait suppliers is higher than the consumer price by the amount of the subsidy. Therefore, for bait suppliers, both the price and quantity sold are higher because of the subsidy.

[21] Recall from chapters 2 and 3 that the quality of mackerel for bait often is at least as high as that for human consumption.

construction or acquisition. Current loan payments are lower because of past loan assistance; vessels are larger or more efficient than they would otherwise have been without the assistance that enabled the owners to acquire bigger or better vessels. The lack of detailed financial data precluded the quantification of the cost reductions created by such assistance on particular vessels or plants. However, appendix I provides a discussion of how such assistance could potentially affect harvesting and processing costs in the mackerel industry.

Other Government Practices

Foreign Market Development and Food Aid Programs

A number of exporting countries implement export promotion and food assistance programs that include mackerel. Examples include the promotional activities of the International Trade Administration of the U.S. Commerce Department; the Japan External Trade Organization (JETRO), operated by the Ministry of International Trade and Industry; the Programme for Export Market Development, administered by the Department of External Affairs in Canada; and, in the EC, the Irish Export Board (known by its Gaelic acronym CTT) and the British Overseas Trade Board.

Certain countries, through general economic development programs, provide some assistance in establishing export markets for mackerel, but more commonly it is through food aid programs that exports are supported. Such government assistance not only helps the recipients of the economic assistance but it often is explicitly used to promote the donor nation's food industries. In mackerel, such activities by the governments of some producing countries have been essential elements in developing successful export market penetration, and therefore have affected the relative competitiveness of the U.S. industry. Three countries or regions that have actively promoted mackerel and other pelagic species in market development or food aid include[22] the former Soviet Union, the member states of the EC, as well as Canada.[23]

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[22] Norway does not include mackerel in its food aid assistance because the high Japanese demand for Norwegian mackerel has made it too valuable to be donated as food aid.

[23] In a variety of pelagic fisheries, the EC has negotiated access agreements for the fishing fleets of its member states with a variety of coastal nations in West Africa and elsewhere. Although these arrangements do not significantly increase the supply of EC-harvested Atlantic mackerel (tuna and other pelagic species are more commonly the subject species), they do alter the structure of developing-country demand for mackerel products by providing alternative fish products to the developing-country markets and, as with the Soviet aid, creating the conditions for development of local fishing and processing industries. A general discussion of these EC access agreements, with specific application to tuna, is found in USITC, Tuna: Current Issues Affecting the U.S. Industry (investigation No. 332-313), USITC

(continued...)

The principal effect of these programs is on the foreign demand for mackerel exports, including those from the U.S. industry. Commodities, including pelagic fish, delivered to a developing country under food assistance programs tend to depress the recipient nation's demand for unsubsidized fish from third-country exporters.[24] Likewise, the development of the local fishing industry that arises from technological advice and other economic-development incentives boosts domestic fish supplies and, therefore, reduces import demand. The effects on U.S. exports in particular cannot be accurately quantified. In many cases the gap between the U.S. export price and the local market price suggests that the U.S. exporter probably would not have been able to make the sale anyway. The reduced foreign demand for imports puts downward pressure on the prices received by all exporters, including the U.S. industry.

U.S. Fishery Management Policies

Certain U.S. fishery management policies potentially affect U.S. and foreign mackerel production, trade, and prices. One such U.S. policy is the Federal regulation of foreign participation in the U.S. mackerel fishery. Another is the Federal management of the groundfish fisheries.

As noted in chapter 2, the U.S. Government has restricted foreign direct fishing in U.S. waters for Atlantic mackerel since 1992. This policy is too recent for the Commission to assess its effects on U.S. and foreign mackerel industries. As noted earlier, in the short run this policy should primarily benefit U.S. processors and exporters of Atlantic mackerel. This is because the policy will likely discourage joint ventures with foreign vessels,[25] thereby forcing U.S. harvesters to largely depend on U.S. buyers. At the same time, the policy could result in expanded export sales of U.S. mackerel by reducing foreign supplies. In this event, mackerel prices, including ex-vessel prices, could rise with the increased demand for U.S. mackerel.

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[23] (...continued)
publication 2547, Aug. 1992.

A precedent for this type of arrangement in the U.S. fishing industry exists in the Pacific tropical-tuna fishery, from which insights might be gleaned as to a potential application in mackerel. For a discussion of how economic development assistance from the U.S. Government has contributed to the growth in harvests and processed-tuna production in the central and western Pacific, see USITC, Tuna: Current Issues Affecting the U.S. Industry, USITC publication 2547.

[24] The actual trade-off between food-aid fish and freely traded fish is likely to be less than 1-for-1 because the price-depressing effects of the increased supply of food-aid fish will tend to spur consumption of additional supplies of fish products, including freely traded imports.

[25] As noted in chapter 3, interested foreign parties have stated that the restrictions on foreign directed fishing make it less profitable for them to enter into joint ventures in the U.S. market.

When foreign-directed fishing is allowed[26], certain other restrictions apply to foreign participation in the U.S. mackerel fishery, such as poundage and other fees and minimum quantities of U.S.-processed fish that must be purchased if fish is also to be harvested directly. Some restrictions may affect foreign participation--specifically, such fees may affect the prices foreign fleets are willing to pay for U.S.-harvested and -processed mackerel and the quantities they are willing to harvest directly and to purchase from U.S. harvesters and processors.

The effect of the various fees on foreign fishing depends on whether the fees are lump-sum amounts or per-unit-of-harvested-fish amounts and on whether they exceed the value of the return received from the fishery. In the past, the three main fees in the mackerel fishery were the permit fee, the poundage fee, and the observer fee. Except for the poundage fee, these are lump-sum fees--that is, they do not depend on the amount of fish actually taken by the foreign fleet.

Imposition of the permit and observer fees reduces the returns from directed fishing, but as long as their sum does not completely eliminate the return net of cost, the fees have no effect on the quantity of fish harvested by the foreign fleet since they do not affect the marginal cost of harvesting fish.

However, the poundage fee directly affects the marginal cost of harvesting fish, and so influences the amount of fish harvested by the foreign fleet. Such a fee results in a reduction in the quantity of harvested fish, which, in turn, raises the price of the foreign-harvested mackerel. The higher price for the foreign mackerel also puts upward pressure on the price for U.S.-harvested mackerel. In sum, the indirect effects of the poundage fee on the U.S. industry include a greater amount of mackerel available for harvest by U.S. fishermen; a reduction in the foreign harvest and, in turn, the supply of mackerel in foreign markets; and a higher price for U.S.-produced mackerel.

Conclusion

The U.S. mackerel industry is a relative newcomer in international markets and, like other fledgling industries, its firms have found an array of competitive factors positively and negatively influencing their success in penetrating world mackerel markets. On the one hand, the U.S. industry benefits from an abundant mackerel resource. On the other hand, relatively high costs of production and transportation; low product quality relative to the quality demanded in high value markets, such as Japan; and lack of marketing experience adversely affect the U.S. industry's competitiveness relative to its Western European competitors. Additionally, tariff and nontariff barriers, as well as depreciating foreign currencies have tended to

[26] U.S. regulations regarding directed fishing could be changed in the future to allow this activity in U.S. waters.

place mackerel imports from the United States (and other exporters) at a competitive disadvantage relative to competing domestic products. These factors largely affect the competitiveness of the U.S. industry in markets other than Jamaica, where the zero import tariff, preference for low-fat Atlantic mackerel, and relatively low transportation costs enhance the competitive position of the U.S. industry.

On balance, government policies in the major mackerel exporting nations of Western Europe (the EC and Norway) tend to restrict mackerel harvests and raise prices, thereby weakening European industry competitiveness compared with the U.S. industry, at least in the short run. In contrast, U.S. mackerel policies, aside from the indirect effects of the groundfish industry, have tended to boost U.S. competitiveness through financial support for vessel construction, although such support has diminished in recent years. More recently, the U.S. Government has restricted foreign-directed fishing in U.S. waters, which could result in a possible expansion of U.S. exports as a result of reduced foreign supply.

Competitive disadvantages in costs, product quality, and marketing can be overcome, as the success of the industry's competitors in Western Europe suggests. For example, the use of larger harvesting vessels would reduce unit costs because of economies of scale, such as those enjoyed by the large vessels of the Dutch and Norwegian fleets. However, for the industry to take advantage of the economies of scale offered by increased investment in larger fishing vessels, the demand for the product must grow such that it becomes economically worthwhile for them to invest in such large vessels, which can cost upwards of $15 million each.[27]

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[27] The same types of constraints on industry growth apply to the problems with obtaining advantageous transportation rates from international shippers, and with offering a range of fishery products to potential foreign buyers.

APPENDIX A

Letter of request from the Senate Finance Committee

cc: The Commission
TO: Dockets

United States Senate

COMMITTEE ON FINANCE
WASHINGTON, DC 20510-6200

August 4, 1992

'92 AUG -6 P4:24

The Honorable
Don E. Newquist
Chairman
U.S. International Trade Commission
Washington, D.C. 20436

Dear Mr. Chairman:

The development of the U.S. Atlantic mackerel resource, one of the few remaining underutilized species on the Atlantic coast, is of concern and interest to the U.S. Congress. Therefore, the Senate Committee on Finance requests that the U.S. International Trade Commission conduct an investigation under section 332(g) of the Tariff Act of 1930, as amended (19 U.S.C. 1332(g)), for the purposes of assessing the competitiveness of U.S. mackerel products in foreign markets.

In its investigation, the Commission should, to the extent possible, develop information on the following subjects:

(1) U.S. and foreign industry profiles.--Provide economic profiles of the U.S. and foreign mackerel harvesting and processing sectors, including the extent of direct government involvement in the industry.

(2) U.S. and foreign markets.--Describe the U.S. market and important foreign markets for mackerel products, particularly markets in the Middle East, Europe, West Africa, and the Caribbean. In addition, descriptions should be provided of tariff and non-tariff barriers encountered in these markets.

(3) Competitiveness assessment.--An analysis should be provided of the principal factors having a significant bearing on the competitiveness of U.S. mackerel products in both U.S. and foreign markets, including trade barriers, government policies, and other economic factors.

The Commission should report the results of the investigation no later than 10 months following receipt of this letter.

Thank you for your cooperation in and attention to this important matter.

Sincerely,

Lloyd Bentsen
Chairman

APPENDIX B

Commission's notice of the investigation

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

(Investigation No. 332-333)

MACKEREL: COMPETITIVENESS OF THE U.S. INDUSTRY IN DOMESTIC AND FOREIGN MARKETS

AGENCY: United States International Trade Commission.

ACTION: Notice of investigation and request for comments.

EFFECTIVE DATE: September 4, 1992

SUMMARY: Following the receipt on August 6, 1992, of a request from the Committee on Finance, U.S. Senate, the Commission instituted investigation No. 332-333 under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) for the purpose of assessing the competitiveness of U.S. mackerel products in foreign markets. The Committee requested that in its investigation, the Commission should, to the extent possible, develop information on the following subjects:

(1) U.S. and foreign industry profiles.--Provide economic profiles of the U.S. and foreign mackerel harvesting and processing sectors, including the extent of direct government involvement in the industry.

(2) U.S. and foreign markets.--Describe the U.S. market and important foreign markets for mackerel products, particularly markets in the Middle East, Europe, West Africa, and the Caribbean. In addition, descriptions should be provided of tariff and non-tariff barriers encountered in these markets.

(3) Competitiveness assessment.--An analysis should be provided of the principal factors having a significant bearing on the competitiveness of U.S. mackerel products in both U.S. and foreign markets, including trade barriers, government policies, and other economic factors.

As requested by the Finance Committee, the Commission will seek to report the results of its investigation by June 8, 1993.

FOR FURTHER INFORMATION CONTACT: Roger Corey ((202) 205-3327), Agriculture Division, Office of Industries, U.S. International Trade Commission. For information on the legal aspects of this investigation, contact William Gearhart ((202) 205-3091) of the Office of the General Counsel. Hearing-impaired persons can obtain information on this investigation by contacting the Commission's TDD terminal on (202) 205-1810.

PUBLIC HEARING: A public hearing in connection with this investigation will be held in the Commission Hearing Room, 500 E Street S.W., Washington, DC, 20436, beginning at 9:30 a.m. on January 26, 1993. All persons have the right to appear by counsel or in person, to present information, and to be heard. Persons wishing to appear at the public hearing should file a letter asking to

testify (state the names and titles of witnesses) with the Secretary, United States International Trade Commission, 500 E Street S.W., Washington, DC, 20436, no later than the close of business (5:15 p.m.) on January 12, 1993. In addition, persons testifying must file prehearing briefs (original and 14 copies) with the Secretary by the close of business on January 19, 1993. Any posthearing briefs should be filed not later than the close of business on February 12, 1993.

WRITTEN SUBMISSIONS: Interested persons may submit written statements concerning the investigation. To be assured of consideration, written statements must be received by the close of business on February 12, 1993. Commercial or financial information that a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform to the requirements of section 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). All written submissions, except for confidential business information, will be made available for inspection by interested persons. All submissions should be addressed to the Secretary, U.S. International Trade Commission, 500 E St. SW, Washington, D.C. 20436.

By order of the Commission.

Paul R. Bardos
Acting Secretary

Issued: September 9, 1992

APPENDIX C

Witnesses at the public hearing

CALENDAR OF PUBLIC HEARING

Those listed below appeared as witnesses at the United States International Trade Commission's hearing:

Subject	:	MACKEREL: COMPETITIVENESS OF THE U.S. INDUSTRY IN DOMESTIC AND FOREIGN MARKETS
Inv. No.	:	332-333
Date and Time	:	January 26, 1993 - 9:30 a.m.

Sessions were held in connection with the investigation in the Main Hearing Room 101 of the United States International Trade Commission, 500 E Street, S.W., Washington, D.C.

ORGANIZATION AND WITNESS:

National Fisheries Institute, Inc.
Arlington, VA

Panel

Rick E. Marks, East Coast Representative,
Washington, D. C.

William C. Quinby, Managing Director,
Mayflower International LTD.,
Gloucester, MA

Jonathan D. Rubins, Lund's Fisheries, Inc.
Cape May, NJ

Brian A. Sweeney, General Manager, Seafreeze LTD.,
North Kingstown, RI

- End -

APPENDIX D

Statistical tables

Table D-1
Fresh or frozen mackerel: U.S. production, imports, exports, and apparent consumption, 1987-92

Year	Production[1]	Imports	Exports	Apparent consumption	Exports as a share of production	Imports as a share of consumption
	Value (1,000 dollars)					
1987.....	17,617	4,327	681	21,263	4	20
1988.....	18,427	6,108	1,328	23,207	7	26
1989.....	19,535	4,089	3,795	19,829	19	21
1990.....	16,766	3,883	18,023	2,626	107	148
1991.....	19,408	4,443	13,696	10,155	71	44
1992.....	15,042	4,175	14,950	4,267	99	98
	Quantity (metric tons)					
1987.....	72,320	2,901	658	74,563	1	4
1988.....	71,994	3,537	1,624	73,907	2	5
1989.....	72,526	2,839	4,217	71,148	6	4
1990.....	57,005	2,605	16,340	43,270	29	6
1991.....	52,350	2,797	15,941	39,206	30	7
1992.....	36,531	2,850	15,631	23,750	43	12

[1] "Production" is the U.S. domestic catch of Atlantic, Spanish, king, Pacific, and jack mackerels.
[2] Not available.

Note.--Apparent consumption = Production + Imports - Exports.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table D-2
Fresh or frozen whole mackerel: United States exports by principal markets, 1989-92

Market	1989	1990	1991	1992
	Quantity (kilograms)			
South Korea	55,336	1,287,512	1,152,022	7,309,856
Japan	1,500,435	8,638,629	6,381,338	3,003,288
Jamaica	309,589	1,332,784	1,739,967	1,823,420
Fiji	872,180	2,402,626	1,381,689	1,144,278
Canada	623,159	654,934	796,158	967,304
Commonwealth of Independent States[1]	0	0	1,855,117	421,800
Australia	732,364	163,363	172,770	278,011
Venezuela	0	0	18,661	206,059
Malaysia	0	113,872	289,690	176,047
Costa Rica	0	0	12,797	86,396
Mexico	0	0	31,987	72,134
Singapore	0	0	40,367	55,620
Spain	0	20,860	816,200	22,008
Iceland	0	0	0	21,023
Indonesia	0	0	38,100	0
Philippines	0	0	1,146,859	0
Portugal	0	0	19,050	0
All others	124,292	1,710,817	1,252,526	0
World total	4,217,355	16,340,094	15,941,289	15,631,001
	Value (dollars)			
South Korea	89,340	1,645,222	981,409	4,921,042
Japan	1,594,266	11,828,190	7,059,968	5,391,161
Jamaica	75,500	1,239,610	1,459,853	1,708,463
Fiji	418,462	997,988	750,716	579,001
Canada	888,104	1,080,959	1,270,025	1,549,814
Commonwealth of Independent States	0	0	253,125	56,943
Australia	568,659	135,182	97,776	266,979
Venezuela	0	0	32,089	119,430
Malaysia	0	72,339	225,684	88,179
Costa Rica	0	0	7,274	60,222
Mexico	0	0	17,257	60,893
Singapore	0	0	43,979	60,462
Spain	0	41,337	826,837	32,351
Iceland	0	0	0	11,562
Indonesia	0	0	16,002	0
Philippines	0	0	575,793	0
Portugal	0	0	11,715	0
Total others	161,212	972,659	670,451	0
World total	3,795,543	18,023,086	13,696,443	14,949,677

[1] Formerly the Soviet Union.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table D-3
U.S. mackerel catch: Average annual unit values, 1987-92

(Per metric ton)

Year	Atlantic	Other	All species
1987	$169.61	$259.08	$243.60
1988	219.92	263.43	255.95
1989	291.09	263.85	269.35
1990	364.28	278.43	294.11
1991	328.95	390.22	370.74
1992	306.09	(1)	(1)

[1] Not available.

Source: U.S. Department of Commerce.

Table D-4
Estimated cost data for otter trawlers that operated in the U.S. mackerel fishery, during 1989-91

	Vessel size range--		
Item[1]	5-50 GRT[2]	51-150 GRT[2]	>150 GRT[2]
Fixed costs:			
Gear	$8,902	$14,095	$33,407
Electronics	3,509	3,385	8,352
Engine	3,123	9,216	26,961
Other hull costs	4,038	5,090	6,170
Insurance	7,800	21,095	34,256
Variable costs:			
Fuel	6,371	26,624	42,656
Ice	3,534	7,584	11,160
Food	2,418	6,144	8,730
Total	$39,695	$93,233	$171,692

[1] Annual costs averaged over the 1989-91 period in constant 1987 dollars.
[2] GRT = gross register ton, a volume measure of the vessel's hull capacity.

Source: John B. Walden, "A Brief Description of the Harvest Sector for Atlantic Mackerel in the United States." Unpublished manuscript, U.S. Department of Commerce, National Marine Fisheries Service, Northeast Fisheries Science Center, 1993, tables 8-10.

Table D-5
Freezer trawler and onshore processor: Processing cost data, 1991

(dollars per metric ton)

Freezer trawler	Cost	Onshore processor	Cost
Labor	153.93	Raw material[2]	176.32
Fuel and oil	127.61	Labor	77.14
Food	33.06	Packaging	33.06
Supplies	15.20	Freezing	88.16
Packaging	35.48	Overhead[3]	66.12
Payroll taxes	15.92	Cold storage[1]	26.45
Repairs and maintenance	45.40	Freight	22.04
Nets and twine	40.70	Total	489.29
Unloading charges	10.80		
Cold storage[1]	26.45		
Freight	22.04		
Insurance	65.24		
Debt service	24.77		
Depreciation	24.58		
Total	641.18		

[1] Storage for 30 days; includes handling.
[2] Purchase of fresh or chilled fish from wetfish trawlers at $0.08 per pound.
[3] Includes energy (other than freezing), insurance, depreciation, equipment maintenance, interest, management expenses, and normal profit.

Source: National Marine Fisheries Service, U.S. Department of Commerce, Gloucester, MA.

Table D-6
Mackerel resources: Yield and status of utilization, by species and areas, 1991

Species and area	RAY[1]	CPY[2]	LTPY[3]	Status of utilization
		(*Metric tons*)		
Atlantic mackerel[4]	62,700	400,000	200,000	Under
Spanish mackerel:				
Atlantic	2,576	2,946	3,702	Over
Gulf of Mexico	1,979	3,626	5,535	Over
King mackerel:				
Atlantic	2,969	4,533	3,632	Under
Gulf of Mexico	2,622	2,040	9,750	Over
Jack mackerel	8,766	52,600	100,000	Under
Pacific mackerel	32,907	28,000	28,000	Full

[1] Recent average yield.
[2] Current potential yield.
[3] Long-term potential yield.
[4] Includes foreign landings and more recreational landings.

Source: NMFS, Our Living Oceans, 1992.

Table D-7
Mackerel (Scomber spp.): World catch by major countries, 1986-90

(1,000 metric tons)

Country	1986	1987	1988	1989	1990
Japan	945	701	649	527	273
U.S.S.R	377	245	356	334	240
China	132	166	241	232	197
South Korea	104	102	163	169	159
United Kingdom (Scotland)	145	195	189	155	173
Ecuador	108	117	147	146	74
Norway	157	157	162	143	151
All others	659	596	609	602	794
Total	2,627	2,278	2,516	2,308	2,061

Source: Food and Agriculture Organization of the United Nations, 1989, 1990.

Table D-8
Fresh or frozen mackerel: Exports from selected EC nations, by destinations, 1987-91 and Jan.-Sept. 1992

(1,000 metric tons)

Country	1987	1988	1989	1990	1991	1992[1]
United Kingdom:						
To EC markets:						
Netherlands	23.0	10.3	14.1	16.6	8.7	22.5
Ireland	0.0	6.8	3.8	0.0	0.6	10.2
France	19.1	15.3	14.0	15.8	17.5	8.7
Spain	0.6	0.0	1.9	2.7	3.2	1.4
Germany	26.3	14.9	25.1	3.5	0.8	0.4
Subtotal	69.0	47.3	58.9	38.6	30.8	43.2
Other:						
Russia	38.4	48.2	62.4	43.2	47.2	7.8
Bulgaria	13.5	10.9	14.3	6.7	10.4	0.0
Poland	3.1	0.0	3.5	0.0	0.3	0.7
Nigeria	6.2	1.8	3.8	1.1	6.1	2.0
Japan	0.3	0.2	0.5	1.3	5.7	0.8
Subtotal	61.2	61.1	84.5	52.3	69.7	11.3
Total United Kingdom	268.2	231.4	276.9	212.9	242.3	92.5
Netherlands:						
To EC markets:						
Italy	2.5	3.8	5.1	4.7	4.6	(2)
Germany	7.0	5.3	8.2	6.0	3.7	(2)
France	2.1	1.6	3.6	1.5	0.7	(2)
Subtotal	11.6	10.7	16.9	12.2	9.0	(2)
Other:						
Nigeria	36.0	29.4	21.5	10.0	27.0	(2)
Cote d'Ivoire	12.9	15.9	15.9	7.3	9.3	(2)
Japan	6.4	1.4	3.9	2.8	7.4	(2)
Egypt	0.0	3.3	9.9	15.0	7.1	(2)
Ghana	0.0	1.7	5.3	5.6	4.1	(2)
Togo	2.5	7.5	9.9	10.4	3.2	(2)
Iran	9.9	10.7	14.4	10.6	0.0	(2)
Subtotal	67.7	69.9	80.8	61.7	58.1	(2)
Total Netherlands	89.2	102.3	112.9	88.3	95.7	(2)
Ireland:						
To EC markets:						
France	4.1	6.8	5.9	5.7	7.3	(2)
Netherlands	11.8	7.6	1.3	1.4	5.1	(2)
Germany	7.5	2.2	1.4	3.0	4.2	(2)
Subtotal	23.4	16.6	8.6	10.1	16.6	(2)
Other:						
Nigeria	19.8	22.5	9.6	10.2	12.8	(2)
Japan	2.7	3.7	2.6	2.6	5.9	(2)
Egypt	0.0	6.0	3.6	2.3	5.3	(2)
Russia	6.5	13.8	0.0	0.0	4.0	(2)
Ghana	0.0	1.4	5.8	5.0	1.7	(2)
Subtotal	29.0	47.4	21.6	20.1	29.7	(2)
Total Ireland	83.5	89.7	49.8	56.5	63.5	(2)
Grand total	440.9	423.4	439.6	357.7	401.5	(2)

[1] Jan.-Sept. only.
[2] Not available.

Source: United Nations Food and Agriculture Organization.

Table D-9
Atlantic mackerel: EC fishing quotas, by member states and zones, 1993

(Metric tons)

Country	Zones: IIA, IV, and IIIabcd	Zones: II, Vb, VI, VIIIabde, VII, XII, and XIV	Zones: VIIIc, IX, and X	Total
United Kingdom	1,930	255,980	0	257,910
Ireland	0	93,090	0	93,090
Netherlands	2,070	40,720	0	42,790
Spain	0	20	30,140	30,160
Germany	680	27,930	0	28,610
France	2,070	18,620	200	20,890
Denmark	17,290	0	0	17,290
Portugal	0	0	6,230	6,230
Belgium	660	0	0	660
Total	24,700	436,360	36,570	497,630

[1] International Council for the Exploration of the Seas. A map of ICES zones in the Northeast Atlantic Ocean is presented in figure 3-2.

Source: Commission for the European Communities.

Table D-10
Mackerel: Norwegian harvest, disposition, and exports, by product forms, 1987-91

Item	1987	1988	1989	1990	1991
Harvest:[1]					
Quantity (metric tons)	157,174	162,139	143,310	149,846	179,897
Value (1,000 Norwegian kroner)	245,731	320,344	277,025	409,219	514,412
Value (1,000 U.S. dollars)[2]	36,469	49,155	40,119	65,370	79,348
Disposition:					
Fresh:					
Quantity (metric tons)	31,016	5,918	5,158	6,726	107,742
Value (1,000 Norwegian kroner)	57,485	18,197	18,038	26,970	290,206
Value (1,000 U.S. dollars)[2]	8,531	2,792	2,612	4,308	44,764
Frozen:					
Quantity (metric tons)	58,065	87,946	84,700	124,515	64,390
Value (1,000 Norwegian kroner)	126,843	218,816	202,375	352,089	217,418
Value (1,000 U.S. dollars)[2]	18,825	33,576	29,308	56,244	33,537
Salted:					
Quantity (metric tons)	3	0	4	([4])	0
Value (1,000 Norwegian kroner	9	0	23	1	0
Value (1,000 U.S. dollars)[2]	1	0	3	([5])	0
Canned:					
Quantity (metric tons)	1	3	3	28	140
Value (1,000 Norwegian kroner	1	12	8	89	418
Value (1,000 U.S. dollars)[2]	([5])	2	1	14	64
Meal/oil:					
Quantity (metric tons)	57,579	61,231	46,944	8,854	7,217
Value (1,000 Norwegian kroner)	41,001	64,609	41,175	6,292	5,359
Value (1,000 U.S. dollars)[2]	6,085	9,914	5,963	1,005	827
Animal feed:					
Quantity (metric tons)	700	741	141	52	38
Value (1,000 Norwegian kroner)	2,047	1,826	272	85	26
Value (1,000 U.S. dollars)[2]	304	280	39	14	64
Miscellaneous:[3]					
Quantity (metric tons)	9,812	6,299	6,360	9,671	370
Value (1,000 Norwegian kroner)	18,346	16,885	15,133	23,693	986
Value (1,000 U.S. dollars)[2]	2,723	2,591	2,192	3,785	152
Exports:					
Fresh or chilled:					
Quantity (metric tons)	9,931	5,156	7,651	3,568	3,542
Value (1,000 Norwegian kroner)	15,005	11,434	16,968	14,195	12,516
Value (1,000 U.S. dollars)[2]	2,227	1,755	2,457	2,268	1,931
Frozen:					
Quantity (metric tons)	59,930	74,621	87,903	155,367	242,512
Value (1,000 Norwegian kroner)	235,721	319,929	366,153	664,331	1,170,256
Value (1,000 U.S. dollars)[2]	34,984	49,091	53,027	106,123	180,511
Prepared or preserved:					
Quantity (metric tons)	3,152	2,943	2,835	3,261	4,493
Value (1,000 Norwegian kroner)	38,764	36,111	33,287	39,512	52,196
Value (1,000 U.S. dollars)[2]	5,753	5,541	4,821	6,312	8,051

[1] Harvest data include landings abroad.
[2] Converted from Norwegian kroner using the average annual exchange rate published in International Financial Statistics, International Monetary Fund.
[3] Includes bait.
[4] Less than 0.5 metric ton.
[5] Less than $1,000.

Sources: All items except exports: The Directorate of Fisheries, Bergen, Norway. Data for exports are derived from Central Bureau of Statistics of Norway.

Table D-11
Mackerel: Norwegian exports of frozen mackerel, by markets, 1991-92

Market	1991			1992		
	Quantity (Metric tons)	Value (1,000 dollars)	Unit value (Per ton)	Quantity (Metric tons)	Value (1,000 dollars)	Unit value Per ton)
Japan	139,922	128,931	$921	137,835	85,791	$622
Nigeria	21,443	8,721	407	34,099	13,122	385
Turkey	13,957	7,438	533	26,218	11,652	444
Poland	9,746	4,262	437	11,473	4,444	387
Egypt	6,739	2,824	419	9,859	3,769	382
Germany	8,296	4,207	507	6,162	2,528	410
USA	397	386	972	3,769	2,502	664
Netherlands	3,936	2,647	673	4,516	2,311	512
Ghana	5,525	2,177	394	4,822	1,997	414
Singapore	1,065	1,101	1,034	2,715	1,721	634
Other	31,696	17,862	564	19,894	10,446	525
Total	242,722	180,556	.74	261,362	140,274	537

Source: The Norwegian Pelagic Fish Marketing Council.

Table D-12
Mackerel: Production and export prices in Norway, 1987-91

Item	(Per metric ton)				
	1987	1988	1989	1990	1991
Production:					
Fresh	$275	$472	$506	$641	$416
Frozen	324	382	346	452	521
Salted	445	-	833	40	-
Canned	148	614	386	508	461
Meal and oil	106	162	127	114	115
Animal feed	434	378	279	261	106
Miscellaneous	278	411	345	391	411
Exports:					
Fresh	224	340	321	635	545
Frozen	584	658	603	683	744
Prepared or preserved	1,825	1,883	1,700	1,936	1,792

Source: Table D-10 and D-11.

Table D-13
Mackerel: Production in the former Soviet Union, Poland, and Bulgaria, by species, 1986-90

(1,000 metric tons)

Nation and species	1986	1987	1988	1989	1990
Former Soviet Union:					
Chub mackerel (S. japonicus)	363.9	229.9	325.3	314.6	208.1
Atlantic mackerel (S. scombrus)	13.6	15.3	30.2	19.7	32.2
Indian mackerels (Rastrelliger spp.)	17.7	17.8	12.5	2.9	(1)
Total	395.2	263.0	368.0	337.1	240.3
Poland:					
Chub mackerel (S. japonicus)	0.3	0.5	0.0	0.0	0.0
Atlantic mackerel (S. scombrus)	6.5	5.7	9.8	7.7	0.5
Total	6.9	6.2	9.8	7.7	0.5
Bulgaria:					
Chub mackerel (S. japonicus)	(2)	(2)	0.0	0.0	0.2
Atlantic mackerel (S. scombrus)	0.4	0.6	0.3	0.8	2.4
Total	0.5	0.6	0.3	0.8	2.6

[1] Not available.
[2] Less than 50 metric tons.

Note.--Totals may not add because of rounding.

Source: UN Food and Agriculture Organization.

Table D-14
Mackerel: Foreign catch of selected species in the U.S. exclusive economic zone, by countries, 1987-91[1]

(Metric tons, round weight)

Species/country	1987	1988	1989	1990	1991
Atlantic mackerel:					
Italy	15.1	0	0	0	0
Netherlands	10,789.7	12,347.3	([2])	0	5,348.9
GDR	18,488.9	20,909.9	17,909.8	8,670.6	0
Poland	0	9,261.5	7,49.1	0	0
USSR	0	0	11,414.1	0	0
Total	29,293.7	42,878.7	36,823.0	8,670.6	5,348.9
Jack mackerel:					
China	0.1	0	0	0	0
Poland	308.7	48.5	0	0	0
South Korea	11.8	0	0	0	0
Total	320.6	48.5	0	0	0

[1] The catch was zero for 1992.
[2] Included with USSR catch.

Source: U.S. Department of Commerce, National Marine Fisheries Service, Fisheries of the United States, 1992 (annual), and earlier issues.

Table D-15
Mackerel: Imports by major countries, by types, 1990

(Metric tons)

Country	Fresh	Frozen	Prepared	Total
Japan	60	72,869	(1)	72,929
Netherlands	5,240	52,491	(1)	57,731
Nigeria	(1)	36,749	(1)	36,749
Germany	1,727	13,215	4,370	19,312
France	11,722	20,295	1,538	33,555
Papua New Guinea	(1)	(1)	26,387	26,387
Côte d'Ivoire	(1)	25,660	(1)	25,660
Italy	2,670	6,465	7,263	16,398
All other	74,721	98,042	37,957	210,720
Total, world	96,140	325,786	77,515	499,441

[1] Less than 1 metric ton

Note.--Data for Côte d'Ivoire were reported as fresh; however it is believed that the data should be reported as frozen as presented in this table.

Source: Food and Agriculture Organization of the United Nation, 1990.

Table D-16
Mackerel: Japanese landings, 1978-91

Year	Total	Northwest Pacific	
		Quantity	Percent of total
	------Metric tons------		
1978	1,625,866	1,625,753	100.00
1979	1,491,033	1,491,006	100.00
1980	1,301,121	1,300,994	99.9
1981	908,904	908,478	99.96
1982	717,840	717,512	99.96
1983	804,849	804,478	99.96
1984	813,514	813,261	99.97
1985	772,699	771,419	99.84
1986	944,809	944,340	99.95
1987	701,406	700,686	99.90
1988	648,559	646,196	99.64
1989	527,486	524,809	99.50
1990	273,006	([1])	([1])
1991	251,000	([1])	([1])

[1] Not available.

Source: Japan Ministry of Agriculture, Forestry and Fisheries, and Food and Agriculture Organization of the United Nation.

Table D-17
Japanese imports of fresh, frozen, and prepared mackerel, 1985-91

Year	Quantity	Value
	Metric tons	*1,000 dollars*
1985	1,155	848
1986	11,266	7,963
1987	24,209	23,065
1988	39,355	43,945
1989	60,841	70,538
1990	70,989	88,094
1991	195,207	242,339

Source: Japan Marine Products Importers Association, 1986-92.

Table D-18
Mackerel: Japanese supply and apparent consumption, 1986-91

(1,000 metric tons)

Item	1986	1987	1988	1989	1990	1991
Inventory, Jan. 1	82	126	96	106	87	50
Catch	945	701	649	527	273	251
Imports	11	24	39	61	71	195
Supply[1]	1,038	851	784	694	431	496
Inventory, Dec. 31	126	96	106	87	50	120
Consumption[2]	912	755	678	607	381	376

[1] Supply = inventory on Jan. 1, plus the domestic catch plus imports.
[2] Consumption = supply less the Dec. 31 inventory.

Sources: U.S. Department of Commerce and Japan Ministry of Agriculture, Forestry and Fisheries.

Table D-19
Japanese annual per household consumption of mackerel, 1986-91

Years	Expenditure	Quantity	Unit price
	Per household	*Kilograms*	*Per kilogram*
1986	$6.11	1.812	$3.37
1987	6.37	1.631	3.91
1988	6.41	1.465	4.38
1989	7.01	1.707	4.11
1990	5.17	1.232	4.20
1991	3.95	.797	4.96

Source: Japan Ministry of Agriculture, Forestry and Fisheries.

Table D-20
Mackerel: Japanese imports, by product forms, 1990-91

Product form	Quantity		Value	
	1990	1991	1990	1991
	---Metric tons---		*--1,000 dollars--*	
Frozen	70,753	194,054	87,053	236,633
Prepared	235	1,142	1,035	5,672
Fresh	1	11	6	34
Total	70,989	195,207	88,094	242,339

Source: Japan Marine Products Importers Association, 1991-92.

Table D-21
Japanese imports of frozen mackerel, by major sources, 1988-92

Source	1988	1989	1990	1991	1992
	Quantity (metric tons)				
Norway	32,715	53,011	60,768	144,224	117,863
Denmark	643	1,496	6,209	9,814	7,286
United Kingdom	1,182	640	1,161	8,562	4,957
Netherlands	1,181	1,544	1,010	6,707	2,244
Ireland	613	651	27	9,814	1,372
Canada	945	610	434	2,691	1,191
United States	0	23	0	7,314	1,537
Germany	0	0	214	2,313	568
New Zealand	2	0	178	761	251
All other	2,047	2,704	753	1,851	0
Total	39,328	60,679	70,753	194,054	137,270
	Value (1,000 dollars)				
Norway	36,262	59,191	69,528	171,498	114,255
Denmark	811	1,653	8,137	13,867	9,739
United Kingdom	1,482	608	1,189	9,848	5,676
Netherlands	1,106	1,402	981	9,135	2,570
Ireland	709	570	24	11,949	1,783
Canada	919	560	403	3,453	1,536
United States	0	20	0	7,324	1,004
Germany	0	0	257	2,800	639
New Zealand	3	0	88	531	243
All other	2,877	4,144	906	3,126	0
Total	44,169	68,149	81,512	233,530	137,447
	Unit value (dollars/metric ton)				
Norway	1,108	1,117	1,144	1,189	969
Denmark	1,262	1,105	1,310	1,413	1,337
United Kingdom	1,255	949	1,024	1,150	1,145
Netherlands	936	908	971	1,362	1,145
Ireland	1,156	876	897	1,217	1,300
Canada	973	918	928	1,283	1,290
United States	(2)	885	(2)	1,001	654
Germany	(2)	(2)	1,204	1,210	1,125
New Zealand	1,385	(2)	496	697	971
All other	1,406	1,533	1,203	1,688	(2)
Total	1,123	1,123	1,152	1,203	1,001

[1] Less than 100 metric tons.
[2] Not available.

Source: Japan Exports and Imports, Japan Tariff Association, various years.

Table D-22
Annual landings and average exvessel prices of fresh mackerel at 51 major landing ports in Japan, 1979-91

Year	Landings	Ex-vessel prices	
	Metric tons	Yen/kg	Per metric ton
1979	1,220,770	45	$ 205
1980	1,078,585	55	243
1981	657,113	101	458
1982	552,739	118	474
1983	641,979	88	371
1984	733,164	77	324
1985	609,102	89	373
1986	816,083	60	356
1987	507,521	81	560
1988	519,271	67	523
1989	453,647	70	507
1990	220,194	118	815
1991	214,576	160	1,188

Source: U.S. Department of Commerce, 1980-1991; Japan Ministry of Agriculture, Forestry, and Fisheries, 1979-1991. Suisan Tsushin Sha, Feb. 3, June 3, 1992.

Table D-23
Arrivals and average wholesale prices of mackerel at 6 major central wholesale markets in Japan, 1983-91

Year	Fresh			Frozen		
	Metric tons	Yen/Kg	Per metric ton	Metric tons	Yen/Kg	Per metric ton
1983	35,459	343	$1,444	20,300	342	$1,440
1984	37,950	336	1,415	19,853	340	1,431
1985	39,185	337	1,413	16,451	325	1,362
1986	38,303	339	2,012	16,606	340	2,018
1987	38,405	332	2,295	15,814	379	2,620
1988	34,655	329	2,567	15,259	365	2,848
1989	38,923	300	2,175	12,889	322	2,334
1990	30,631	394	2,721	15,264	318	2,196
1991	25,037	565	4,194	17,907	384	2,851

Source: Suisan Tshushin Sha, Feb. 13, 1991; June 3, 1992, Japan Ministry of Agriculture, Forestry, and Fisheries.

Table D-24
Fish and fishery products: Provisional food balance sheets for selected West African markets, Egypt, and Jamaica, average 1987-89

Market	Catch	Nonfood uses	Imports	Exports	Food supply	Per capita consumption
	Metric tons, live weight					Kilograms
Nigeria	260,499	0	517,139	4,448	773,190	7.6
Ghana	373,173	0	21,616	27,985	372,820	26.4
Côte d'Ivoire	97,969	16,300	198,151	102,164	177,656	16.0
West Africa[1]	1,343,601	17,974	859,815	376,955	1,817,258	10.0
Egypt	250,000	20	122,361	2,129	370,212	7.4
Jamaica	10,321	0	34,961	588	44,813	18.7

[1] Includes Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, St. Helena, Senegal, Sierra Leone, and Togo.

Source: Food and Agriculture Organization of the United Nations, Food and Agriculture Organization of the United Nation, yearbook, Fishery Statistics, Commodities, 1990.

Table D-25
Fish products: Imports, by selected African markets, 1986-90

Market	1986	1987	1988	1989	1990
	Value (1,000 dollars)				
Nigeria	89,984	165,856	116,505	145,408	155,850
Côte d'Ivoire	78,673	106,750	139,236	127,884	136,700
Ghana	17,590	15,470	27,490	24,970	30,310
Subtotal	186,247	122,220	283,231	298,262	322,860
Total, Africa	715,531	800,254	818,530	860,626	886,454
	Share of total (percent)				
Nigeria	12.6	20.7	14.2	16.9	17.6
Côte d'Ivoire	11.0	13.3	17.0	14.9	15.4
Ghana	2.5	1.9	3.4	2.9	3.4
Subtotal	26.0	36.0	34.6	34.7	36.4
Total, Africa	100.0	100.0	100.0	100.0	100.0

Source: United Nations Food and Agriculture Organization, Food and Agriculture Organization of the United Nation, Yearbook, Fishery Statistics, Commodities, 1990.

Table D-26
Frozen mackerel: Imports, by selected West African markets, 1986-90

Market	1986	1987	1988	1989	1990
	Quantity (metric tons)				
Côte d'Ivoire	24,636	23,402	27,642	21,335	25,660
Nigeria	83,700	75,907	64,274	44,577	36,749
Total	108,336	99,309	91,916	65,912	62,409
	Value (1,000 dollars)				
Côte d'Ivoire	11,043	12,575	15,331	11,003	13,627
Nigeria	29,290	31,980	27,550	17,570	14,450
Total	40,333	44,555	42,881	28,573	28,077

Note.--Data for Côte d'Ivoire are labelled as fresh or chilled in the FAO Yearbook; these are believed to be frozen mackerel.

Source: United Nations Food and Agriculture Organization, Food and Agriculture Organization of the United Nation, Yearbook, Fishery Statistics, Commodities, 1990.

Table D-27
Mackerel: EC exports to selected West African markets, 1987-91

Market	1987	1988	1989	1990	1991
	Quantity (metric tons)				
Nigeria	63,584	63,614	36,454	21,224	45,883
Côte d'Ivoire	16,584	20,647	21,727	9,003	14,342
Ghana	448	3,075	11,644	11,549	7,695
Total	80,616	87,336	69,825	41,776	67,920
	Value (1,000 dollars)				
Nigeria	27,028	23,967	14,175	9,535	22,204
Côte d'Ivoire	6,935	10,656	9,546	4,566	3,162
Ghana	1,045	1,378	5,175	5,456	3,344
Total	35,008	36,001	28,896	19,557	28,710
	Unit value (per metric ton)				
Nigeria	$425	$377	$389	$449	$484
Côte d'Ivoire	418	516	439	507	220
Ghana	2,332	448	444	472	435
Average	434	412	414	468	423

Source: NIMEXE.

Table D-28
Mackerel: EC exports to selected West African markets,[1] by product form, 1987-91

Product form	1987	1988	1989	1990	1991
	Quantity (metric tons)				
Fresh or chilled	6,722	0	3,563	0	1,064
Frozen	73,446	87,336	66,262	41,776	66,852
Canned	448	0	0	0	4
Total	80,616	87,336	69,825	41,776	67,920
	Value (1,000 dollars)				
Fresh or chilled	2,297	0	665	0	216
Frozen	31,666	36,001	28,923	19,557	28,482
Canned	1,045	0	0	0	12
Total	35,008	36,001	28,896	19,557	28,710
	Unit value (per metric ton)				
Fresh or chilled	$342	([2])	$187	([2])	$203
Frozen	431	412	468	446	426
Canned	2,333	-	-	-	3,101
Average	434	412	414	468	423

[1] Nigeria, Côte d'Ivoire, and Ghana.
[2] Not available.

Source: NIMEXE.

Table D-29
Key economic indicators for selected West African countries and indicators, 1987-90

(Millions of dollars, unless otherwise noted)

Country and indicator	1987	1988	1989	1990
Nigeria:				
Domestic economy:				
GNP[1]	38,138	32,726	30,308	33,482
GNP per capita (dollars)	360	300	270	290
CPI (1987=100)	100.0	154.5	232.5	249.6
Trade and balance of payments:				
Exports (merch, fob)	7,365	6,875	7,871	13,671
Imports (merch, cif)	3,908	4,727	4,190	5,688
Terms of trade (1987=100)	100.0	74.5	85.8	100.2
Current account balance before official transfers (percent share of GDP)	-0.2	-0.7	3.0	6.3
External debt:				
Long term	29,249	29,858	32,067	34,100
Short term	1,644	1,682	701	1,968
Social:				
Population (thousands)	105,938	109,087	112,253	115,456
Life expectancy (years)	50.5	50.8	51.2	51.5
Urban population (percent share of total)	33.1	33.8	34.5	35.2
Food production (per capita, 1987=100)	100.0	103.0	105.7	103.4
Côte d'Ivoire:				
Domestic economy:				
GNP	8,227	9,333	9,261	8,926
GNP per capita (dollars)	780	850	810	750
CPI (1987=100)	100.0	107.0	NA	NA
Trade and balance of payments:				
Exports (merch, fob)	3,092	2,775	2,800	2,600
Imports (merch, cif)	2,242	2,081	2,000	2,100
Terms of trade (1987=100)	100.0	105.7	91.2	79.7
Current account balance before official transfers (percent share of GDP)	-10.7	-11.5	-13.2	-12.2
External debt: ($mil)				
Long term	12,177	12,155	12,790	14,853
Short term	1,377	1,839	2,823	3,103

See footnote at end of table.

Table D-29--Continued
Key economic indicators for selected West African countries and indicators, 1987-90

(Millions of dollars, unless otherwise noted)

Country and indicator	1987	1988	1989	1990
Social:				
Population (thousands)	10,548	10,980	11,433	11,902
Life expectancy (years)	55.9	55.7	55.5	55.3
Urban population (percent share of total)	39.0	39.5	39.9	40.4
Food production (per capita, 1987=100)	100.0	107.9	99.4	95.4
Ghana:				
Domestic economy:				
GNP	5,275	5,591	5,482	5,799
GNP per capita (dollars)	390	400	380	390
CPI (1987=100)	100.0	131.4	164.5	225.8
Trade and balance of payments:				
Exports (merch., fob)	826.8	881.0	807.2	890.6
Imports (merch., cif)	951.5	993.4	1,002.2	1,198.9
Terms of trade (1987=100)	NA	NA	NA	NA
Current account balance before official transfers (percent share of GDP)	-4.3	-5.0	-6.1	-7.1
External debt:				
Long term	3,152	2,987	3,105	3,448
Short term	119	72	47	50
Social:				
Population (thousands)	13,526	13,977	14,425	14,870
Life expectancy (years)	54.0	54.2	54.4	54.6
Urban population (percent share of total)	32.3	32.5	32.8	33.0
Food production (per capita, 1987=100)	100.0	105.2	101.8	87.4

[1] GNP is calculated using the World Bank's "Atlas Methodology". This methodology adjusts current GNP estimates for relative price movements between the U.S. and foreign currency and then converts this estimate into U.S. dollars using a 3-year average of exchange rates.

Source: World Bank, World Tables 1992, Baltimore, 1992.

Table D-30
Mackerel: Catch by selected West African countries, 1986-90

(Metric tons)

Country	1986	1987	1988	1989	1990
Morocco	101,841	28,589	37,981	35,574	27,728
Mauritania	4	9	33	30	30
Senegal	4,454	7,455	2,023	1,922	2,498
Gambia	127	69	122	80	175
Guinea-Bissau	0	0	0	0	0
Guinea	0	0	0	0	0
Sierra Leone	0	0	0	0	0
Liberia	339	279	150	162	156
Côte d'Ivoire	397	11	373	1,084	1,330
Ghana	20,136	746	7,604	13,565	7,654
Togo	171	240	237	111	126
Benin	369	434	428	519	519
Nigeria	0	0	0	0	0
Zaire	720	720	720	720	720

Source: Food and Agriculture Organization of the United Nations, Food and Agriculture Organization of the United Nation, yearbook, Fishery Statistics, Catches and landings, 1990.

Table D-31
Nigerian fresh or frozen fish imports, by country of origin, 1987-90

(1,000 metric tons)

Country	1987	1988	1989	1990
Netherlands	76.6	43.0	30.8	97.0
Norway	14.0	12.5	8.3	13.7
United Kingdom	15.8	19.9	12.8	12.4
Bulgaria	7.0	12.6	8.0	6.3
Ireland	18.3	22.6	6.8	3.4
Angola	3.9	21.1	9.6	2.2
Former Soviet Union	3.3	7.2	1.8	0.3
All others	26.7	21.7	40.7	49.2
Total	165.6	160.7	118.8	184.5

Source: Federal Office of Statistics, Lagos

Table D-32
Mackerel: EC and Norwegian exports,[1] by product forms to Nigeria, 1987-92

Product form and source	1987	1988	1989	1990	1991	1992
	Quantity (metric tons)					
Fresh or chilled:						
United Kingdom	5,770	0	3,563	0	1,064	(2)
Ireland	952	0	0	0	0	(2)
Total, fresh or chilled	6,722	0	3,563	0	1,064	(2)
Frozen:						
EC:						
Netherlands	35,999	39,351	21,470	9,955	26,990	(2)
Ireland	19,828	22,479	9,649	10,170	12,802	(2)
United Kingdom	400	1,784	200	1,099	5,001	(2)
Germany	0	0	1,572	0	23	(2)
France	635	0	0	0	0	(2)
Total, EC	56,862	63,614	32,891	21,224	44,816	(2)
Norway	(2)	10,660	11,686	15,525	21,443	34,099
Total, frozen	(2)	74,274	44,577	36,749	66,259	34,099
Canned:						
United Kingdom	0	0	0	0	2	(2)
Italy	0	0	0	0	1	(2)
Total, canned	0	0	0	0	3	(2)
Total, all forms	(2)	74,274	48,140	36,749	67,326	(2)
	Value (1,000 dollars)					
Fresh or chilled:						
United Kingdom	1,098	0	665	0	216	(2)
Ireland	1,199	0	0	0	0	(2)
Total, fresh or chilled	2,297	0	665	0	216	(2)
Frozen:						
EC:						
Netherlands	15,681	13,737	8,994	4,547	13,513	(2)
Ireland	8,601	9,425	3,891	4,538	6,550	(2)
United Kingdom	169	805	82	449	1,908	(2)
Germany	0	0	542	0	7	(2)
France	279	0	0	0	0	(2)
Total, EC	24,731	23,967	13,510	9,535	21,978	(2)
Norway	(2)	3,651	4,069	6,505	8,721	12,222
Total, frozen	(2)	27,618	17,579	16,040	30,699	(2)
Canned:						
United Kingdom	0	0	0	0	5	(2)
Italy	0	0	0	0	5	(2)
Total, canned	0	0	0	0	10	(2)
Total, all forms	(2)	27,618	17,244	16,040	30,925	(2)

See footnote at end of table.

Table D-32--Continued
Mackerel: EC and Norwegian exports,[1] by product forms to Nigeria, 1987-92

Product form and source	1987	1988	1989	1990	1991	1992
	Unit value (dollars per metric ton)					
Fresh or chilled:						
United Kingdom	$190	(2)	$187	(2)	$203	(2)
Ireland	1,260	(2)	(2)	(2)	(2)	(2)
Average, fresh or chilled	342	(2)	187	(2)	203	(2)
Frozen:						
EC:						
Netherlands	436	349	419	457	501	(2)
Ireland	434	419	403	446	512	(2)
United Kingdom	421	451	408	409	382	(2)
Germany	(2)	(2)	345	(2)	324	(2)
France	440	(2)	(2)	(2)	(2)	(2)
Average, EC	435	377	411	449	490	(2)
Norway	(2)	342	348	419	407	$358
Average, frozen	(2)	372	394	436	470	(2)
Canned:						
United Kingdom	(2)	(2)	(2)	(2)	2,481	(2)
Italy	(2)	(2)	(2)	(2)	4,962	(2)
Average, canned	(2)	(2)	(2)	(2)	3,308	(2)
Average, all forms	(2)	372	379	436	622	(2)

[1] As reported by export data from sources.
[2] Not available.

Source: EC data from NIMEXE, Norwegian data from U.S. Embassy, Oslo, facsimile message, Mar. 10, 1993.

Table D-33
Mackerel: Côte d'Ivoire production, imports, exports, and consumption, 1988-91

(Metric tons)

Item	1988	1989	1990	1991
Production[1]	373	1,084	1,330	([2])
Imports	27,669	28,224	22,477	20,765
Exports	32	28	47	226
Apparent consumption	28,010	29,280	23,760	[3]21,500

[1] Catch.
[2] Not available.
[3] Estimated by the staff of the U.S. International Trade Commission.

Source: Data for production are derived by Food and Agriculture Organization of the United Nation; data for imports and exports from U.S. Embassy, Abidjan.

Table D-34
Frozen fish: Côte d'Ivoire imports, by country of origin, 1988-91

(1,000 metric tons)

Country	1988	1989	1990	1991
Mauritania	54.2	57.8	62.6	40.8
Netherlands	19.6	26.7	15.2	17.8
USSR/Russia	28.5	20.2	22.0	15.1
Guinea	6.1	5.2	6.8	12.6
Guinea Bissau	0.0	0.0	1.0	7.2
Senegal	7.5	14.8	8.1	7.1
United Kingdom	0.0	4.3	4.2	3.1
Ireland	3.8	1.9	0.0	1.6
Norway	0.0	2.7	2.1	1.4
Sierra Leone	4.4	3.8	5.6	.6
All others	16.4	16.0	11.1	7.3
Total	140.4	153.3	138.6	114.6

Source: Direction des Peches, Abidjan.

Table D-35
Frozen Fish: Côte d'Ivoire imports, by major species, 1988-91

(1,000 metric tons)

Species	1988	1989	1990	1991
Horse mackerel	50.4	65.2	67.2	49.6
Mackerel	15.7	21.3	25.7	22.6
Sardinella	18.9	24.7	22.4	21.4
Croaker	1.8	2.2	2.1	1.0
Catfish	.7	1.5	.9	.8
Seabream	1.7	2.0	.7	.6
Threadfin	1.2	1.7	1.6	1.0
Carp	1.6	1.1	.8	.4
Cutlassfish	.1	.1	.1	.1
All others	48.3	33.4	17.2	17.2
Total	140.4	153.3	138.6	114.6

Note.--Figures may not add to the total shown because of rounding.

Source: Direction des Peches, Abidjan.

Table D-36
Mackerel: Côte d'Ivoire imports, by product forms and selected sources, 1988-92

Product form and source	1988	1989	1990	1991	1992
	Quantity (metric tons)				
Fresh, chilled, or frozen:					
EC:					
United Kingdom	2,448	0	2,626	2,767	5,866
Netherlands	16,141	16,514	12,238	12,160	11,085
Ireland	4,748	2,474	300	1,584	0
Germany	3,510	6,124	2,239	0	0
France	0	0	0	1	48
Total, EC	26,847	25,112	17,403	16,512	16,999
Norway	0	2,651	2,870	0	0
U.S.S.R./Russia	538	13	1,230	1,470	72
Romania	0	0	0	280	0
Bulgaria	0	0	673	0	0
Mauritania	137	0	0	57	705
Sierra Leone	119	430	0	0	0
Guinea	0	0	0	1,324	312
All other	0	1	0	0	0
Total, fresh, chilled, or frozen	27,641	28,207	22,176	19,643	18,088
Canned:					
EC:					
Netherlands	0	0	0	405	0
Ireland	11	0	0	0	0
France	7	0	0	3	1
Total, EC	18	0	0	408	1
Norway	0	0	56	552	0
Sweden	0	0	240	0	0
Denmark	0	0	0	2	0
Morocco	6	12	0	0	0
All others	4	5	5	0	0
Total, canned	28	17	301	962	1
Total, all forms	27,669	28,224	22,477	20,605	18,089

Table continues next page.

Table D-36--Continued
Mackerel: Côte d'Ivoire imports, by product forms and selected sources, 1988-92

Product form and source	1988	1989	1990	1991	1992
	Value (1,000 dollars)				
Fresh, chilled, or frozen:					
EC:					
United Kingdom	1,229	0	1,407	1,659	3,865
Netherlands	9,085	8,617	7,056	7,494	6,676
Ireland	2,515	1,182	136	830	0
Germany	2,068	3,307	1,194	0	0
France	0	0	0	4	30
Total, EC	14,897	13,106	9,793	9,987	10,571
Norway	0	1,292	1,723	0	0
U.S.S.R./Russia	272	6	606	705	34
Romania	0	0	0	174	0
Bulgaria	0	0	433	0	0
Mauritania	67	0	0	25	336
Sierra Leone	57	194	0	0	0
Guinea	0	0	0	603	132
All other	0	3	0	0	0
Total, fresh, chilled, or frozen	15,293	14,602	12,554	11,492	11,081
Canned:					
EC:					
Netherlands	0	0	0	1,046	0
Ireland	20	0	0	0	0
France	30	0	0	14	4
Total, EC	50	0	0	1,060	4
Norway	0	0	147	227	0
Sweden	0	0	661	0	0
Denmark	0	0	0	4	0
Morocco	10	28	0	0	0
All others	7	19	22	0	0
Total, canned	67	47	830	1,291	4
Total, all forms	15,360	14,649	13,384	12,783	11,085

Table continues next page.

Table D-36--Continued
Mackerel: Côte d'Ivoire imports, by product forms and selected sources, 1988-92

Product form and source	1988	1989	1990	1991	1992
	Unit value (per metric ton)				
Fresh, chilled, or frozen:					
EC:					
United Kingdom	$502	(1)	$536	$600	$659
Netherlands	563	522	577	616	602
Ireland	530	478	453	524	(1)
Germany	589	540	533	(1)	(1)
France	(1)	(1)	(1)	4,000	625
Average, EC	555	522	563	605	622
Norway	(1)	487	600	(1)	(1)
U.S.S.R./Russia	506	462	493	480	472
Romania	(1)	(1)	(1)	621	(1)
Bulgaria	(1)	(1)	643	(1)	(1)
Mauritania	489	(1)	(1)	439	477
Sierra Leone	479	451	(1)	(1)	(1)
Guinea	(1)	(1)	(1)	455	423
All other	(1)	3,000	(1)	(1)	(1)
Average, fresh, chilled, or frozen	553	518	566	585	613
Canned:					
EC:					
Netherlands	(1)	(1)	(1)	2,583	(1)
Ireland	1,819	(1)	(1)	(1)	(1)
France	4,286	(1)	(1)	4,667	4,000
Total, EC	2,778	(1)	(1)	2,598	4,000
Norway	(1)	(1)	2,625	411	(1)
Sweden	(1)	(1)	2,754	(1)	(1)
Denmark	(1)	(1)	(1)	2,000	(1)
Morocco	1,667	2,333	(1)	(1)	(1)
All others	1,750	3,800	4,400	(1)	(1)
Average, canned	2,393	2,765	2,758	1,342	4,000
Average, all forms	555	519	596	620	613

[1] Not available.

Source: U.S. Department of State, report from the U.S. Embassy, Abidjan, Feb. 26, 1993.

Table D-37
Mackerel: Ghanaian production, imports, exports, and consumption, 1988-90

(Metric tons)

Item	1988	1989	1990
Production[1]	7,604	13,565	7,654
Imports	6,087	7,445	9,466
Exports	(2)	(2)	(2)
Apparent consumption[3]	13,691	21,010	17,120

[1] Catch.
[2] Not available; believed to be minor.
[3] Estimated by the staff of the U.S. International Trade Commission.

Source: Data for production are derived by Food and Agriculture Organization of the United Nation; data for imports from Fisheries Research and Utilization Branch, Tema.

Table D-38
Frozen fish: Ghanaian imports, by major species, 1988-91

(Metric tons)

Species	1988	1989	1990	1991
Mackerel	6,087	7,445	9,466	(1)
Horse mackerel	6,640	9,300	6,614	(1)
Herring	1,295	6,504	6,418	(1)
All others	98	199	290	(1)
Total	14,120	23,448	22,788	26,576

[1] Not available.

Source: Fisheries Research and Utilization branch, Tema.

Table D-39
Frozen fish: Ghanaian imports, by major sources, 1990

Source	Quantity (Metric tons)	Share of total (Percent)
Netherlands	8,789	38.6
Ireland	4,982	21.9
Bulgaria	2,350	10.3
Senegal	1,504	6.6
Angola	1,066	4.7
United Kingdom	799	3.5
Mauritania	549	2.4
Gambia	357	1.6
All other	2,392	10.4
Total	22,788	100.0

Source: Fisheries Research and Utilization branch, Tema.

Table D-40
Frozen mackerel: Ghanaian imports, by selected sources, 1988-92

Source	1988	1989	1990	1991	1992
	Quantity (metric tons)				
EC:					
United Kingdom	0	0	950	1,850	(1)
Netherlands	1,717	5,312	5,600	4,125	(1)
Ireland	1,358	5,767	4,999	1,720	(1)
Germany	0	565	0	0	(1)
France	0	0	0	0	(1)
Total, EC	3,075	11,644	11,549	7,695	(1)
Norway	813	660	0	5,525	4,822
Total	3,888	12,304	11,549	13,220	(1)
	Value (1,000 dollars)				
EC:					
United Kingdom	0	0	369	1,171	(1)
Netherlands	699	2,268	2,647	1,373	(1)
Ireland	680	2,710	2,440	800	(1)
Germany	0	197	0	0	(1)
France	0	0	0	0	(1)
Total, EC	1,378	5,175	5,456	3,344	(1)
Norway	289	232	0	2,177	1,997
Total	1,667	5,407	5,456	5,521	(1)
	Unit value (per metric ton)				
EC:					
United Kingdom	(1)	(1)	$389	$633	(1)
Netherlands	$407	$427	473	333	(1)
Ireland	500	470	488	465	(1)
Germany	(1)	349	(1)	(1)	(1)
France	(1)	(1)	(1)	(1)	(1)
Average, EC	448	444	472	435	(1)
Norway	355	352	-	394	$414
Average	429	439	472	418	(1)

[1] Not available.

Source: U.S. Department of State, report from the U.S. Embassy, Abidjan, Feb. 26, 1993.

Table D-41
Key economic indicators for Egypt, 1987-90

(Millions of dollars, unless otherwise noted)

Indicator	1987	1988	1989	1990
Domestic economy:				
GNP	33,671	32,940	32,639	31,757
GNP per capita	690	660	640	610
CPI (1987=100)	100.0	117.7	142.7	166.6
Trade and balance of payments:				
Exports (merch, fob)	2,037	2,120	2,648	2,985
Imports (merch, cif)	7,596	8,657	7,448	10,340
Terms of trade (1987=100)	100.0	97.2	81.8	75.4
Current account balance before offical transfers (percent share of GDP)	-5.2	-4.0	-8.1	-7.2
External debt: ($mil)				
Long term	44,460	45,326	43,513	35,367
Short term	6,323	6,700	7,646	4,518
Social:				
Population (thousands)	48,798	49,910	50,999	52,061
Life expectancy (years)	59.0	59.4	59.8	60.2
Urban population (percent share of total)	45.0	45.6	46.1	46.7
Food production (per capita, 1987=100)	100.0	100.1	97.6	100.5

Source: World Bank, World Tables 1992, Baltimore, 1992

Table D-42
Frozen mackerel: Egyptian imports, by selected sources, 1987-92

Source	1987	1988	1989	1990	1991	1992
	Quantity (metric tons)					
EC:						
Ireland	0	6,030	3,573	2,331	5,337	(1)
Netherlands	0	3,257	9,891	15,037	7,126	(1)
United Kingdom	0	773	550	1,545	0	(1)
Total, EC	0	10,060	14,014	18,913	12,463	(1)
Norway	(1)	978	5,927	5,811	6,739	9,859
Total	(1)	11,038	19,941	24,724	19,202	(1)
	Value (1,000 dollars)					
EC:						
Ireland	0	2,445	1,180	1,366	2,265	(1)
Netherlands	0	1,332	4,284	6,884	3,597	(1)
United Kingdom	0	398	216	640	0	(1)
Total, EC	0	4,175	5,680	8,890	5,862	(1)
Norway	(1)	344	1,985	2,474	2,824	3,769
Total	(1)	4,519	7,665	11,364	8,686	(1)
	Unit value (per metric ton)					
EC:						
Ireland	(1)	$405	$330	$586	$424	(1)
Netherlands	(1)	409	433	458	505	(1)
United Kingdom	(1)	515	393	414	(1)	(1)
Average, EC	(1)	415	405	470	470	(1)
Norway	(1)	352	335	426	419	(1)
Average	(1)	409	384	460	452	382

[1] Not available.

Source: EC data from NIMEXE; Norway data from U.S. Department of State, report from the U.S. Embassy, Oslo, Mar. 10, 1993.

Table D-43
Key economic indicators for Jamaica, 1987-90

(Millions of dollars, unless otherwise noted)

Indicator	1987	1988	1989	1990
Domestic economy:				
GNP	2,246	2,719	3,342	3,630
GNP per capita	950	1,140	1,390	1,500
CPI (1987=100)	100.0	108.3	123.8	151.0
Trade and balance of payments:				
Exports (merch, fob)	692.3	811.6	969.7	1,347.2
Imports (merch, cif)	1,233.9	1,434.3	1,805.0	1,685.2
Current account balance before offical transfers (percent share of GDP)	-6.5	-1.1	-11.6	-9.7
External debt: ($mil)				
Long term	4,465.2	4,244.3	4,152.0	4,263.8
Short term	231.2	288.1	384.5	334.4
Social:				
Population (thousands)	2,364	2,385	2,404	2,420
Life expectancy (years)	72.5	72.8	73.0	73.2
Urban population (percent share of total)	50.6	51.1	51.7	52.3
Food production (per capita, 1987=100)	100.0	100.2	93.7	95.9

Source: World Bank, World Tables 1992, Baltimore, 1992.

Table D-44
Fresh or frozen mackerel: European Community exports to Eastern Europe, 1988-91

Country	1988	1989	1990	1991
	Value (1,000 dollars)			
Soviet Union:				
Fresh whole	10,724	14,250	11,950	11,671
Frozen whole	3,172	1,690	228	352
Total	13,896	15,940	12,178	12,023
Poland:				
Fresh whole	392	804	395	165
Frozen whole	418	184	2,872	11,869
Frozen fillets	0	87	113	903
Total	810	1,075	3,380	12,937
Yugoslavia:				
Frozen whole	1,944	1,348	1,862	1,894
Frozen fillets	0	71	87	120
Total	1,944	1,419	1,949	2,014
Czechoslovakia:				
Frozen whole	5,787	3,335	2,470	1,263
Frozen fillets	768	804	1,139	167
Total	6,555	4,139	3,609	1,430
Bulgaria:				
Fresh whole	2,396	3,287	1,978	1,042
Total	2,396	3,287	1,978	1,042
Romania:				
Fresh whole	0	0	457	586
Total	0	0	457	586
Grand total	25,601	25,860	23,551	30,032
	Quantity (metric tons)			
Soviet Union:				
Fresh whole	51,895	55,489	51,215	50,846
Frozen whole	13,958	7,922	1,099	605
Total	65,853	63,411	52,314	51,451
Poland:				
Fresh whole	1,918	3,469	1,742	364
Frozen whole	754	618	4,770	20,557
Frozen fillets	0	144	160	1,200
Total	2,672	4,231	6,672	22,121
Yugoslavia:				
Frozen whole	3,172	2,305	2,712	2,648
Frozen fillets	0	105	180	218
Total	3,172	2,410	2,892	2,866

Table continues on next page.

Table D-44--Continued
Fresh or frozen mackerel: European Community exports to Eastern Europe, 1988-91

Country	1988	1989	1990	1991
	Unit value (dollars per metric ton)			
Czechoslovakia:				
Frozen whole	8,246	6,428	3,771	1,906
Frozen fillets	888	1,092	1,838	226
Total	9,134	7,520	5,609	2,132
Bulgaria:				
Fresh whole	11,918	14,378	8,910	5,350
Total	11,918	14,378	8,910	5,350
Romania:				
Fresh whole	0	0	1,184	2,814
Total	0	0	1,184	2,814
Grand total	92,749	91,950	77,581	86,734
Soviet Union:				
Fresh whole	207	257	233	230
Frozen whole	227	213	207	582
Average	211	251	233	234
Poland:				
Fresh whole	204	232	227	453
Frozen whole	554	298	602	577
Frozen fillets	0	604	706	753
Average	303	254	507	585
Yugoslavia:				
Frozen whole	613	585	687	715
Frozen fillets	0	676	483	550
Average	613	589	714	703
Czechoslovakia:				
Frozen whole	702	519	655	663
Frozen fillets	865	736	620	739
Average	718	550	643	671
Bulgaria:				
Fresh whole	201	229	222	195
Average	201	229	222	195
Romania:				
Fresh whole	0	0	386	208
Average	0	0	386	208
Average	276	281	304	346

Source: Directorate General for Fisheries, Commission of the European Communities.

APPENDIX E

Commerce Department notice of specifications
for the 1992 Atlantic mackerel fishery

ACTION: Technical amendment.

SUMMARY: The Commission is issuing this technical amendment to conform the effective date in the regulations issued in this proceeding to a delayed effective date issued in a later notice. In this proceeding the Commission issued final rules providing for prior Commission review of certain classes of undercharge claims by nonoperating and certain other motor carriers.

EFFECTIVE DATE: This technical amendment is effective on November 17, 1992.

FOR FURTHER INFORMATION CONTACT: Thomas Dahl (202) 927-5289 or Richard Felder (202) 927-5610 [TDD for hearing impaired: (202) 927-5621.]

SUPPLEMENTARY INFORMATION: On September 8, 1992 the Commission published final rules in this proceeding (57 FR 40857) making these regulations effective on September 23, 1992. On September 23, 1992 the Commission issued a notice (57 FR 43925) delaying the effective date of these regulations to October 8, 1992.

Certain revisions to the regulations are necessary to reflect the correct effective date of October 8, 1992. These revisions are set forth below.

List of Subjects in 49 CFR Part 1321

Claims, Motor carriers, Undercharges.

Dated: November 12, 1992.

By the Commission.

Sidney L. Strickland, Jr.,

Secretary.

For the reasons set forth in the preamble, title 49, chapter X, part 1321 is amended as follows:

PART 1321—NONOPERATING MOTOR CARRIERS—COLLECTION OF UNDERCHARGES

1. The authority citation for part 1321 continues to read as follows:

Authority: 49 U.S.C. 10101, 10102, 10321, 10521, 10701, 10702, 10704, 10741, 10743, 10761, 10762, 10764, 10921, 10923, 11144, 11901, 11903, 11904, 11906; 5 U.S.C. 553.

§§ 1321.1, 1321.5 [Amended]

2. In the fifth sentence of § 1321.1 and the introductory text of § 1321.5, the date "September 23, 1992" is revised to read "October 8, 1992".

[FR Doc. 92-27831 Filed 11-16-92; 8:45 am]

BILLING CODE 7035-01-M

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 655

[Docket No. 920246-2270]

Atlantic Mackerel, Squid, and Butterfish Fisheries

AGENCY: National Marine Fisheries Service (NMFS), NOAA, Commerce.

ACTION: Final initial specifications for the 1992 Atlantic mackerel fishery.

SUMMARY: NMFS issues these final initial specifications for the 1992 fishing year for Atlantic mackerel. Regulations governing this fishery require the Secretary of Commerce (Secretary) to publish specifications for the current fishing year This action is intended to fulfill this requirement and to promote the development of the U.S. Atlantic Mackerel fishery.

EFFECTIVE DATE: November 16, 1992.

ADDRESSES: Copies of the Mid-Atlantic Fishery Management Council's "quota paper" and recommendations are available from John C. Bryson, Executive Director, Mid-Atlantic Fishery Management Council, room 2115, Federal Building, 300 South New Street, Dover, DE 19901.

Copies of the environmental assessment prepared by the Northeast Regional Office for this action are available from Richard B. Roe, Regional Director, Northeast Region, NMFS, 1 Blackburn Circle, Gloucester, MA 01930.

FOR FURTHER INFORMATION CONTACT: Myles Raizin, 508-281-9104 or Richard Seamans, 508-281-9244.

SUPPLEMENTARY INFORMATION: Regulations implementing the Fishery Management Plan for Atlantic Mackerel, Squid, and Butterfish Fisheries (FMP) prepared by the Mid-Atlantic Fishery Management Council (Council), appear at 50 CFR part 655. These regulations stipulate that the Secretary will publish a notice specifying the initial annual amounts of the initial optimum yield (IOY) as well as the amounts for allowable biological catch (ABC), domestic annual harvest (DAH), domestic annual processing (DAP), joint venture processing (JVP), and total allowable levels of foreign fishing (TALFF) for the species managed under the FMP. No reserves are permitted under the FMP for any of these species. Procedures for determining the initial annual amounts are found in § 655.21. The proposed specifications for the 1992 Atlantic Mackerel, Squid, and Butterfish Fisheries were published on February 27, 1992 (57 FR 6699).

The following table contains the final initial specifications for Atlantic mackerel. These specifications are based on the recommendations of the Council, the environmental assessment prepared for this action, and public comment.

TABLE.—INITIAL ANNUAL SPECIFICATIONS FOR ATLANTIC MACKEREL JANUARY 1 THROUGH DECEMBER 31, 1992

[In metric tons (mt)]

Max OY	[1] N/A
ABC	850,000
IOY [2]	95,000
DAH	[3] 95,000
DAP	55,000
JVP	26,000
TALFF	0

[1] Not applicable; see the FMP.
[2] IOY can rise but not exceed 200,000 mt.
[3] Contains 14,000 mt projected recreational catch based on the formula contained in the regulations (50 CFR part 655).

The Director, Northeast Region, NMFS, (Regional Director), also imposes four special conditions for the 1992 Atlantic mackerel fishery as follows:

(1) Joint ventures are allowed, but river herring bycatch south of 37°30' N. latitude may not exceed 0.25 percent of the over-the-side transfers of Atlantic mackerel;

(2) The Regional Director will monitor fishing operations and manage harvest to reduce impacts on marine mammals in prosecuting the Atlantic mackerel fisheries;

(3) IOY may be increased during the year, but the total will not exceed 200,000 mt; and

(4) Applications from a particular nation for joint ventures for 1992 will not be approved until the Regional Director determines, based on an evaluation of performances, that the nation's purchase obligations for 1991 and previous years have been fulfilled.

Comments and Responses

Six sets of comments on the proposed specifications were received. One was an ex-parte communication from the Agricultural and Emigration Counselor of the Royal Netherlands Embassy. All commenters addressed the proposed zero TALFF specification for Atlantic mackerel; four of the commenters opposed this proposed specification, while one commenter supported it.

One commenter opposed the 3,000 MT specification for JVP in the *Illex* squid fishery. Comments on the proposed *Illex* squid JVP specifications are addressed in a separate notice dated July 24, 1992.

(57 FR 32923) that includes the final specifications for *Illex* and *Loligo* squid and butterfish.

Comment: Zero TALFF for Atlantic mackerel means that a joint venture does not have the possibility to average its lower cost of direct fishing poundage fees with prices for over-the-side and/or shore side purchases. To be economically competitive, a venture must, therefore, pay a much lower price to U.S. fishermen.

Response: In recent years several joint ventures and Internal Waters Processing operations (IWPs) for Atlantic mackerel have been applied for and successfully executed without TALFF. Prices have been competitive with those offered by foreign participants who have also been granted TALFF.

Comment: Foreign vessels on the fishing grounds assist U.S. fishermen with locating mackerel schools and should be encouraged.

Response: U.S. fishermen now have the technological capability and expertise to locate schools without foreign assistance.

Comment: Biologically, mackerel need to be harvested to allow higher value species to rebuild.

Response: To the best of our knowledge, there have been no published studies to defend this hypothesis. Alternatively, one could argue that many species of fish and marine mammals that prey on Atlantic mackerel have benefitted from large stocks, i.e., whales, striped bass, and bluefish.

Comment: Foreign markets need our Atlantic mackerel and will buy it only if our prices and quality are competitive.

Response: NMFS recognizes that Atlantic mackerel may provide a relatively inexpensive protein source for many countries. However, while these countries may want or desire U.S.-harvested mackerel, there is no evidence that a need exists, especially given the large amount of protein substitutes available at lower prices. It is also noted that there is currently a large surplus of Atlantic mackerel on the market from the United Kingdom and other parts of Europe.

Comment: Zero TALFF largely underestimates current fishing possibilities which could be allocated by applying the U.S. overfishing definition. Given the estimated large spawning stock biomass and associated large ABC at 850,000 MT, it follows that the initial annual yield can rise to this amount. Foreign fishermen should be allocated this surplus since substantial arguments for nonallocation have not been supplied.

Response: NMFS recognizes that the estimated stock could support a much larger Atlantic mackerel fishery than these specifications allow without a detrimental biological or ecological effect. However, the IOY represents a modification of ABC based on economic factors and is intended to provide the greatest overall benefit to the nation. The intent of the IOY is to foster the development of the U.S. mackerel fishery.

Comment: We are disappointed by the statement that a continuation of TALFF would impede the continued growth of the U.S. fishery. The main effect of economic and political restructuring in Eastern Europe in the fisheries sector has been a reduction in the consumption of fish such as herring and mackerel. Consequently, market prices have been put under pressure. Over-the-side sales carried out in connection with foreign fishing would, therefore, allow the U.S. to export additional quantities.

Response: The statement regarding the effects of TALFF on the growth of the U.S. industry is taken directly from the testimony of members of the U.S. industry before the Council. It has been considered in the analysis of the effects of a zero TALFF. NMFS will be carefully monitoring the progress of the industry during the 1992 fishing year and will use this information in evaluating specifications proposed for the 1993 fishery and beyond.

Comment: The quantity of over-the-side purchases by European Economic Community (EC) fishermen is not intended for the Japanese market but rather for markets where the United States has no traditional exports.

Response: NMFS recognizes the practical difference between intentions and actions. It is not likely that the member states of the EC would forego competing in the lucrative Japanese market if conditions were favorable. Furthermore, if the U.S. industry develops to a point where it becomes cost-effective to compete in nontraditional markets, it will take advantage of this position.

Comment: Limiting foreign access to Atlantic mackerel would set a bad precedent under international law.

Response: The Magnuson Fishery Conservation and Management Act (Magnuson Act) invests the specification setting process with a great deal of discretion. NMFS believes that these final specifications are consistent with the Magnuson Act and will produce the greatest overall benefit to the Nation.

Comment: The real obstacle to market development is potential foreign competition from a TALFF allocation. The Netherlands fishing industry (the Dutch) are the most likely recipients of a mackerel TALFF. Such mackerel would be offered by the Dutch in the foreign markets that our industry is trying to develop—Jamaica, Japan, Eastern Europe, north and west Africa, and the Middle East. The commenter believes that it is critical to eliminate TALFF in order to stimulate the markets for U.S. harvested and processed product abroad.

Response: Comment noted.

Comment: NMFS has a substantial body of data that demonstrates the nexus between the elimination of TALFF and the dramatic growth in JVPs in other regions of the country. The Council was correct in assuming that further growth in joint ventures would occur even after the elimination of TALFF. The Council feels strongly that both the harvesting and processing industry would benefit from the elimination of TALFF because it would result in the growth of both the DAP and the JVP over time. TALFF no longer provides benefits to the Nation because it is not necessary to sustain the DAP and JVP production. TALFF instead acts as a severe damper on the ability of domestic processors and harvesters to expand direct and joint venture markets.

Response: While NMFS realizes that comparisons between different regions and alternative species are difficult to analyze, we believe that the concerns regarding TALFF that are voiced by members of the industry are addressed by this action.

Classification

This action is authorized by 50 CFR part 655 and complies with Executive Order 12291 and the National Environmental Policy Act.

16 U.S.C. 1801 *et seq.*

List of Subjects in 50 CFR Part 655

Fisheries, Reporting and recordkeeping requirements.

Dated: November 10, 1992.

Samuel W. McKeen,

Acting Assistant Administrator for Fisheries, National Marine Fisheries Service.

[FR Doc. 92-27764 Filed 11-16-92; 8:45 am]

BILLING CODE 3510-22-M

APPENDIX F

Governing International Fishery Agreement (GIFA) between the United States and the European Community

FISHERIES OFF THE UNITED STATES COASTS

Agreement Between the
UNITED STATES OF AMERICA
and the EUROPEAN ECONOMIC
COMMUNITY

Signed at Washington October 1, 1984

EUROPEAN ECONOMIC COMMUNITY

Fisheries Off the United States Coasts

Agreement signed at Washington October 1, 1984;
Entered into force November 14, 1984.

AGREEMENT
BETWEEN THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE EUROPEAN ECONOMIC COMMUNITY CONCERNING FISHERIES OFF THE COASTS OF THE UNITED STATES

THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE EUROPEAN ECONOMIC COMMUNITY (hereinafter referred to as "the Community"),

CONSIDERING their common concern for the rational management, conservation and achievement of optimum yield of fish stocks off the coasts of the United States;

RECOGNIZING that the United States has established by Presidential Proclamation of 10 March 1983[1] an exclusive economic zone within 200 nautical miles of its coasts within which the United States has sovereign rights to explore, exploit, conserve and manage all fish and that the United States also has such rights over the living resources of the continental shelf appertaining to the United States and anadromous species of fish of United States origin;

RECOGNIZING that the Community has been co-operating for the rational management and conservation of the living resources off the coasts of the United States and that Community fishermen traditionally have been co-operating in the development of these resources under the Agreement between the Government of the United States and the European Economic Community concerning fisheries off the coasts of the United States, signed 15 February 1977;[2] and

DESIROUS of establishing reasonable terms and conditions pertaining to fisheries of mutual concern over which the United States has sovereign rights to explore, exploit, conserve and manage;

HAVE AGREED AS FOLLOWS:

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[1] *Federal Register*, Vol. 48, No. 50, Mar. 14, 1983.

[2] TIAS 8598; 28 UST 3787.

ARTICLE I

The purpose of this Agreement is to promote effective conservation, rational management and the achievement of optimum yield in the fisheries of mutual interest off the coasts of the United States, to facilitate the rapid and full development of the United States fishing industry and to establish a common understanding of the principles and procedures under which fishing may be conducted by nationals and vessels of the Member States of the Community for the living resources over which the United States has sovereign rights to explore, exploit, conserve and manage.

ARTICLE II

As used in this Agreement, the term:

1) "living resources over which the United States has sovereign rights to explore, exploit, conserve and manage" means:

   all fish within the exclusive economic zone of the United States (except highly migratory species of tuna), all anadromous species of fish that spawn in the fresh or estuarine waters of the United States and migrate to ocean waters while present in the United States exclusive economic zone and in areas beyond national fisheries jurisdictions recognized by the United States and all living resources of the continental shelf appertaining to the United States;

2) "fish" means:

   all finfish, molluscs, crustaceans, and other forms of marine animal and plant life, other than marine mammals, birds and highly migratory species;

"fishery" means:

a) one or more stocks of fish that can be treated as a unit for purposes of conservation and management and that are identified on the basis of geographical, scientific, technical, recreational and economic characteristics; and

b) any fishing for such stocks;

"exclusive economic zone" means:

a zone contiguous to the territorial sea of the United States, the seaward boundary of which is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the breadth of the territorial sea of the United States is measured;

"fishing" means:

a) the catching, taking or harvesting of fish;

b) the attempted catching, taking or harvesting of fish;

c) any other activity that can reasonably be expected to result in the catching, taking or harvesting of fish;

d) any operations at sea, including processing, directly in support of, or in preparation for, any activity described in subparagraphs a) through c) above, provided that such term does not include other legitimate uses of the high seas, including any scientific research activity;

6) "fishing vessel" means:

any vessel, boat, ship, or other craft that is used for, equipped to be used for, or of a type that is normally used for:

a) fishing, or

b) aiding or assisting one or more vessels at sea in the performance of any activity relating to fishing, including preparation, supply, storage, refrigeration, transportation or processing;

7) "highly migratory species" means:

species of tuna which in the course of their life cycle, spawn and migrate over great distances in waters of the ocean; and

8) "marine mammal" means:

any mammal that is morphologically adapted to the marine environment, including sea otters and members of the orders Sirenia, Pinnipedia, and Cetacea, or primarily inhabits the marine environment such as polar bears.

ARTICLE III

1. The Government of the United States is willing to allow access for fishing vessels of the Member States of the Community to harvest, in accordance with terms and conditions to be established in permits issued under Article VII, that portion of the total allowable catch for a specific fishery that will not be harvested by United States fishing vessels and is determined to be available to fishing vessels of Member States of the Community in accordance with United States law.

2. The Government of the United States shall determine each year, subject to such adjustments as may be necessitated by unforeseen circumstances affecting the stocks and in accordance with United States law:

a) the total allowable catch for each fishery based on optimum yield, taking into account the best available scientific evidence, and social, economic and other relevant factors;

b) the harvesting capacity of United States fishing vessels in respect of each fishery;

c) the portion of the total allowable catch for a specific fishery to which access will be provided, on a periodic basis each year, to foreign fishing vessels; and

d) the allocation of such portion that may be made available to the Community.

3. The United States shall determine each year the measures necessary to prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery in accordance with United States law.

Such measures may include, inter alia:

a) designated areas where, and periods when, fishing shall be permitted, limited, or conducted only by specified types of fishing vessels or with specified types and quantities of fishing gear;

b) limitations on the catch of fish based on area, species, size, number, weight, sex, incidental catch, total biomass or other factors;

c) limitations on the number and types of fishing vessels that may engage in fishing and/or on the number of days each vessel or the total fleet may engage in a designated area for a specified fishery;

d) requirements as to the types of gear that may, or may not, be employed; and

e) requirements designed to facilitate enforcement of such conditions and restrictions, including the maintenance of appropriate position-fixing and identification equipment.

4. The Government of the United States shall notify the Community of the determinations provided for by this Article on a timely basis.

ARTICLE IV

In determining the portion of the surplus that may be made available to the Community, and to other countries, the Government of the United States will decide on the basis of the factors identified in the Magnuson Fishery Conservation and Management Act,[1] as amended, that is:

" i) whether, and to what extent, such nation imposes tariff barriers or non-tariff barriers on the importation, or otherwise restricts the market access, of United States fish or fishery products;

[1] 16 U.S.C. §1801 *et seq.*

ii) whether, and to what extent, such nation is co-operating with the United States in the advancement of existing and new opportunities for fisheries trade, particularly through the purchase of fish or fishery products from United States processors or from United States fishermen;

iii) whether, and to what extent, such nation and the fishing fleets of such nation have co-operated with the United States fisning regulations;

iv) whether, and to what extent, such nation requires the fish harvested from the fishery conservation zone for its domestic consumption;

v) whether, and to what extent, such nation otherwise contributes to, or fosters the growth of, a sound and economic United States fishing industry, including minimizing gear conflicts with fishing operations of United States fishermen, and transferring harvesting or processing technology which will benefit the United States fishing industry;

vi) whether, and to what extent, the fishing vessels of such nation have traditionally engaged in fishing in such fishery;

vii) whether, and to what extent, such nation is co-operating with the United States in, and making substantial contributions to, fishery research and the identification of fishery resources; and

viii) such other matters as the Secretary of State, in co-operation with the Secretary, deems appropriate.".

ARTICLE V

The Community shall co-operate with and assist the United States in the development of the United States fishing industry and the increase of United States fishery exports by taking such measures as facilitating the importation and sale of United States fishery products, providing information concerning technical and administrative requirements for access of United States fishery products into the Community, providing economic data, sharing expertise, facilitating the transfer of harvesting or processing technology to the United States fishing industry, facilitating appropriate joint venture and other arrangements, informing its industry of trade and joint venture opportunities with the United States, and taking other actions as may be appropriate.

ARTICLE VI

The Community shall take all necessary measures to ensure:

1) that nationals and vessels of the Member States of the Community refrain from fishing for living resources over which the United States has sovereign rights to explore, exploit, conserve and manage except as authorized pursuant to this Agreement;

2) that all such vessels so authorized comply with the provisions of permits issued pursuant to this Agreement and applicable laws of the United States, and

3) that the total allocation referred to in Article III, paragraph 2 d) of this Agreement is not exceeded for any fishery.

ARTICLE VII

The Community may submit an application to the Government of the United States for a permit for each fishing vessel of a Member State of the Community that wishes to engage in fishing in the exclusive economic zone pursuant to this Agreement. Such application shall be prepared and processed in accordance with the Annex, which constitutes an integral part of this Agreement. The Government of the United States may require the payment of fees for such permits and for fishing in the United States exclusive economic zone. The Community undertakes to keep the number of applications to the minimum required, in order to aid in the efficient administration of the permit program.

ARTICLE VIII

The Community shall ensure that nationals and vessels of Member States of the Community refrain from harassing, hunting, capturing or killing, or attempting to harass, hunt, capture or kill, any marine mammal within the United States exclusive economic zone, except as may be otherwise provided by an international agreement respecting marine mammals to which the United States is a party, or in accordance with specific authorization for and controls on incidental taking of marine mammals established by the Government of the United States.

ARTICLE IX

The Community shall ensure that in the conduct of the fisheries under this Agreement:

1) the authorizing permit for each vessel of a Member State of the Community is prominently displayed in the wheel house of such vessel;

2) appropriate position-fixing and identification equipment as determined by the Government of the United States, is installed and maintained in working order on each vessel;

3) designated United States observers are permitted to board, upon request, any such fishing vessel, and shall be accorded the courtesies and accommodations provided to ship's officers while aboard such vessel, and owners, operators and crews of such vessel shall co-operate with observers in the conduct of their official duties, and, further, the Government of the United States shall be reimbursed for the costs incurred in the utilization of observers;

4) agents are appointed and maintained within the United States possessing the authority to receive and respond to any legal process issued in the United States with respect to an owner or operator of a vessel of a Member State of the Community for any cause arising out of the conduct of fishing activities for the living resources over which the United States has sovereign rights to explore, exploit, conserve and manage; and

5) all necessary measures are taken to minimize fishing gear conflicts and to ensure the prompt and adequate compensation of United States citizens for any loss, or damage to, their fishing vessels, fishing gear or catch, and resultant economic loss, that is caused by any fishing vessel of a Member State of the Community as determined by applicable United States procedures.

ARTICLE X

The Community shall take all appropriate measures to assist the United States in the enforcement of its laws pertaining to fishing in the exclusive economic zone and to ensure that each vessel of a Member State of the Community that engages in fishing for living resources over which the United States has sovereign rights to explore, exploit, conserve and manage shall allow and assist the boarding and inspection of such vessel by any duly authorized enforcement officer of the United States and shall co-operate in such enforcement action as may be undertaken pursuant to the laws of the United States.

ARTICLE XI

1. The Government of the United States will impose appropriate penalties, in accordance with the laws of the United States, on vessels of Member States of the Community or their owners, operators, or crews that violate the requirements of this Agreement or of any permit issued hereunder.

2. Arrested vessels and their crews shall be promptly released, subject to such reasonable bond or other security as may be determined by the court.

3. In any case arising out of fishing activities under this Agreement, the penalty for violation of fishery regulations shall not include imprisonment except in the case of an enforcement related offense such as assault on an enforcement officer or refusal to permit boarding and inspection.

4. In cases of seizure and arrest of a vessel of a Member State of the Community by the authorities of the Government of the United States, notification shall be given promptly through diplomatic channels informing the Community and the Member State concerned of the action taken and of any penalties subsequently imposed.

ARTICLE XII

1. The Government of the United States and the competent agencies of the Community shall co-operate in the conduct of scientific research required for the purpose of managing and conserving living resources over which the United States has sovereign rights to explore, exploit, conserve and manage, including the compilation of the best available scientific information for management and conservation of stocks of mutual interest.

2. The competent agencies of the two Parties shall co-operate in the development of a periodic research plan on stocks of mutual concern through correspondence or meetings as appropriate, and may modify it from time to time by agreement. The agreed research plans may include, but are not limited to, the exchange of information and scientists, regularly scheduled meetings between scientists to prepare research plans and review progress, and jointly conducted research projects.

3. The conduct of agreed research during regular commercial fishing operations on board of a fishing vessel of a Member State of the Community in the United States exclusive economic zone shall not be deemed to change the character of the vessel's activities from fishing to scientific research. Therefore, it will still be necessary to obtain a permit for the vessel in accordance with Article VII.

4. The Community shall co-operate with the Government of the United States in the implementation of procedures for collecting and reporting biostatistical information and fisheries data, including catch and effort statistics, in accordance with procedures which will be stipulated by the United States.

ARTICLE XIII

In the interest of conservation, restoration, enhancement and rational management of salmon stocks of United States origin as well as of Community origin, both Parties shall consult and co-operate under the Convention for the Conservation of Salmon in the North Atlantic Ocean.[1]

[1] Done at Reykjavik Mar. 2, 1982. TIAS 10789.

ARTICLE XIV

1. The Government of the United States and the Community shall carry out periodic bilateral consultations regarding the implementation of this Agreement and the development of further co-operation in the field of fisheries of mutual concern, including co-operation within the framework of appropriate multilateral organizations for the collection and analysis of scientific data respecting such fisheries.

2. At the request of either Party any dispute concerning the interpretation or application of this Agreement shall be the subject of consultations between the Parties.

ARTICLE XV

The Government of the United States undertakes to authorize fishing vessels of Member States of the Community allowed to fish pursuant to this Agreement to enter ports in accordance with United States laws for the purpose of purchasing bait, supplies, or outfits, or effecting repairs, changing crews, or for such other purposes as may be authorized.

ARTICLE XVI

Should the Government of the United States indicate to the Community that nationals and vessels of the United States wish to engage in fishing in the Community's fishing zone the Community shall, in accordance with the provisions of the Common Fisheries Policy, allow such fishing on terms not more restrictive than those established in accordance with this Agreement.

ARTICLE XVII

Nothing contained in the present Agreement shall prejudice:

1) the views of either Party with respect to the existing territorial or other jurisdiction of the coastal State for all purposes other than the conservation and management of fisheries; or

2) any other international rights and obligations of either Party.

ARTICLE XVIII

The Agreement shall apply to the territories in which the Treaty establishing the Community applies, under the conditions of that Treaty, and to the United States, its territories and its possessions.

ARTICLE XIX

1. This Agreement, together with the Agreed Minutes which form an integral part thereof, shall enter into force on a date to be agreed upon by exchange of notes, following the completion of internal procedures of both Parties, and remain in force until 1 July 1989, unless extended by exchange of notes between the Parties.[1] Notwithstanding the foregoing, either Party may terminate this Agreement after giving written notice of such termination to the other Party six months in advance.

2. At the request of either Party, this Agreement shall be subject to review by the two Parties two years after its entry into force.

[1] Nov. 14, 1984.

APPENDIX G
Economic effects of trade barriers

To quantitatively evaluate the extent to which foreign tariffs or nontariff barriers reduce U.S. mackerel exports, certain assumptions must be made about the relevant price elasticities of import supply and export demand. The Commission reviewed the econometric literature for estimates of elasticities pertaining to mackerel. Only limited research was uncovered, the range of elasticities uncovered in this review was found to be very wide.[28] Econometric estimates of such elasticities in foreign markets wre found.

The following tabulation presents the range of assumed price elasticities of import demand and export supply:

	Price elasticity of--	
	Import demand	Export supply
Low	-0.5	0.5
Medium	-2.5	2.5
High	-10.0	10.0

The low, medium, and high elasticities are based on those found in the limited studies that have estimated such elasticities for mackerel or other species of fish. The elasticities are used here to illustrate the likely impacts of eliminating foreign tariffs on U.S. exports to selected foreign markets.

The trade-distorting effects of import tariffs are shared by importers (or consumers) and foreign exporters (or producers). That is to say, a tariff puts upward pressure on internal (domestic) prices in the importing country and downward pressure on foreign prices received by exporters. The relative burdens on importers and exporters depend on the relevant price elasticities. It can be shown[29] that the foreign (U.S.) exporter's burden (the decline in export price) is given by the following formula:

$$t \cdot s = t \cdot (1+\Sigma_s/\Sigma_d)^{-1}$$

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[28] M.P. Burton ("The Demand for Wet Fish in Britain," Marine Resource Economics, Vol. 2 (1992), pp. 57-66), who found a price elasticity of demand for mackerel and other pelagic species in the United Kingdom of about -2.5; J.O.S. Kennedy ("The Determination of the Optimal Exploitation Pattern of Western Mackerel Stocks," Seafish Report 3001 (1989), Seafish Industry Authority, Edinburgh), who estimated a short-run (monthly) price elasticity of demand for Scottish-harvested mackerel of -10; and, in the U.S. market, demand for various fish species (but not mackerel) was examined by Hsaing-tai Cheng and Oral Capps, Jr. ("Demand Analysis of Fresh and Frozen Finfish and Shellfish in the United States," American Journal of Agricultural Economics, Vol. 70 (1988), pp. 533-42), who found price elasticities ranging from -0.45 for flounder and sole to -0.97 for snapper.

[29] Mordechai E. Kreinin, International Economics: A Policy Approach, 5th ed. (New York: Harcourt, Brace and Jovanovich, 1987), app. VIII.

where t is the ad valorem tariff rate (or ad valorem tariff equivalent of a nontariff barrier), s is the exporter's share of the price-distorting burden of the tariff, Σ_s is the price elasticity of export supply, and Σ_d is the price elasticity of import demand. This formula, $t \cdot s$, is the percentage reduction in the exporter's price caused by the tariff; as shown below, when multiplied by the price elasticity of export supply, it yields the percentage reduction in the quantity of exports.

Tariff barriers

The following tabulation shows the estimated declines in the price received by U.S. exporters when foreign tariffs are imposed, under a variety of assumptions about price elasticities. The countries and tariff rates are drawn from the information contained in chapter 4:[30]

Country	Tariff rate	Low estimate	Moderate estimate	High estimate
		(percent)		
Nigeria	5.0	-0.2	-2.5	-4.8
Côte d'Ivoire	0.0	0.0	0.0	0.0
Ghana	32.0	-1.5	-16.7	-30.5
Egypt	1.0	-0.1	-0.5	-1.0
Russia	10.0	-0.5	-5.0	-9.5

For example, the 5-percent tariff on Nigeria's mackerel imports causes the price received by U.S. exporters to decline by anywhere from 0.24 to 4.8 percent, depending on the assumed price elasticities of import demand and export supply. In general, the price effects on U.S. exporters will be relatively large when the U.S. share of the importing country's total imports is relatively small (i.e., the price elasticity of import demand is large) and/or the importing country's share of total U.S. production is relatively large (i.e., the price elasticity of export supply is small).

Multiplying these estimated price effects by different assumed price elasticities of export supply yields the estimated percentage changes in U.S. export volume:[31]

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[30] For the low estimate, $\Sigma_s = 10.0$ and $\Sigma_d = 0.5$; for the moderate estimate, $\Sigma_s = \Sigma_d = 2.5$; for the high estimate, $\Sigma_s = 0.5$ and $\Sigma_d = 10.0$.

[31] For the low estimate, $\Sigma_s = \Sigma_d = 0.5$; for the moderate estimate, $\Sigma_s = \Sigma_d = 2.5$; for the high estimate, $\Sigma_s = \Sigma_d = 10.0$. Note that these assumed price elasticities are not the same as in the previous tabulation. In both tabulations, the elasticities are chosen to obtain the smallest, moderate, and largest effects.

Country	Tariff rate	Low estimate	Moderate estimate	High estimate
		(percent)		
Nigeria	5.0	-1.3	-6.3	-25.0
Côte d'Ivoire	0.0	0.0	0.0	0.0
Ghana	32.0	-8.0	-40.0	-100.0[1]
Egypt	1.0	-0.3	-1.3	-5.0
Russia	10.0	-2.5	-12.5	-50.0

[1] Mathematically this number exceeds 100.0, but in reality exports cannot decline by more than 100 percent.

Thus, for example, the Ghanaian tariff of 32 percent causes the volume of U.S. exports to decline from anywhere between 8 and 100 percent, depending on the assumed price elasticities of import demand and export supply.

Nontariff barriers

The economic effects of NTBs are similar to those created by tariffs: prices paid by consumers in the importing country are higher, prices received by foreign producers are lower, and the quantity traded per time period is lower. Evaluating the magnitude of these changes, however, is more complicated with NTBs than with tariffs because, unlike tariffs, most NTBs (other than quotas) may not be quantitatively measured. In the case of quotas the economic effects are straightforward; one works backward from the quantity effect to evaluate the price effects, whereas with tariffs price is the targeted economic variable.[32] Less transparent NTBs, however, are much harder to quantify, although in principle their price and quantity effects are similar to tariffs and quotas.[33] In all cases, trade barriers in foreign importing countries serve to reduce both the price and the volume of U.S. mackerel exports.

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[32] The relative burden of quotas is less easily determined than with tariffs. The extent to which the price paid by the importer rises or that received by the exporter falls depends on the relative bargaining power wielded by each party. The greater the power held by the importer the greater will be the decline in price received by the foreign exporter, and vice versa.

[33] For detailed discussion of the issues and problems involved with quantifying NTBs, see U.S. International Trade Commission (USITC), Estimated Tariff Equivalents of U.S. Quotas on Agricultural Imports and Analysis of Competitive Conditions in U.S. and Foreign Markets for Sugar, Meat, Peanuts, Cotton and Dairy Products (investigation No. 332-281), USITC publication 2276, Mar. 1990, and USITC, Estimated Tariff Equivalents of Nontariff Barriers on Certain Agricultural Imports in the European Community, Japan, and Canada (supplement to investigation No. 332-281), USITC publication 2280, Apr. 1990.

Nontariff barriers tend to place a price wedge between the foreign supply price and the wholesale price in the importing market. The following tabulation compares wholesale prices in importing countries (see chapter 4) and export prices from Norway (see chapter 3) for frozen mackerel in 1991:[34]

Market	Price	
	f.a.s. Norway	Wholesale importer
	--(cents/kilogram)--	
Japan	0.92	2.85
Nigeria	0.41	0.48-0.52
Egypt	0.42	0.42
Ghana	0.39	0.44

In each case, there is a wedge between the prices, which typically are greater for countries with larger barriers (compare, for example, Japan, which has an import quota on mackerel, with Ghana, Nigeria, and Egypt, which maintain lower trade barriers. Because other explanations include product quality and local market conditions, as well as transportation costs affect this price wedge, it cannot be attributed completely to tariffs and NTBs. However, the comparison is still broadly consistent with the expected price effects of nontariff trade barriers.

[34] Norway is chosen because, unlike the United States, Norway exported frozen mackerel to each of the listed countries in 1991.

APPENDIX H

Economic effects of EC fishery management

The details of the EC's Common Fisheries Policy (CFP) were described in chapter 3. The two significant elements of the CFP are a system of annual harvest quotas and an ex vessel price-support regime. EC mackerel harvests are regulated at the national level by systems of vessel licenses and harvest quotas. This appendix describes the likely economic effect of the CFP on EC harvesting effort.

The economic effects of EC restrictions on EC harvesting effort are shown geometrically in figure H-1, in which the horizontal axis measures harvesting effort (e.g., the number of vessels) and the vertical axis measures both the volume and value (assuming, for now, a fixed price of $1.00 per unit) of the harvest. The inverted U-shaped curve labeled TR^L represents the long-term total revenue (at the fixed price) received for various levels of fishing effort (measured along the horizontal axis). The shape of the total revenue curve illustrates the diminishing productivity of the fishery as effort increases; at high-effort levels, the resource is so depleted that the long-term (sustainable) harvest actually declines.

In the short term, the resource does not have enough time to react to changes in fishing effort, and so the harvest rises and falls as effort rises and falls. In figure H-1, this short-term total revenue is illustrated by the concave, upward-sloping curve labeled TR^S.

The total cost of "producing" harvesting effort is shown by the total-cost curve labelled TC in figure H-1. For simplicity, total cost is assumed to rise linearly with effort (e.g., the cost of operating a vessel does not change with the number of vessels).[1]

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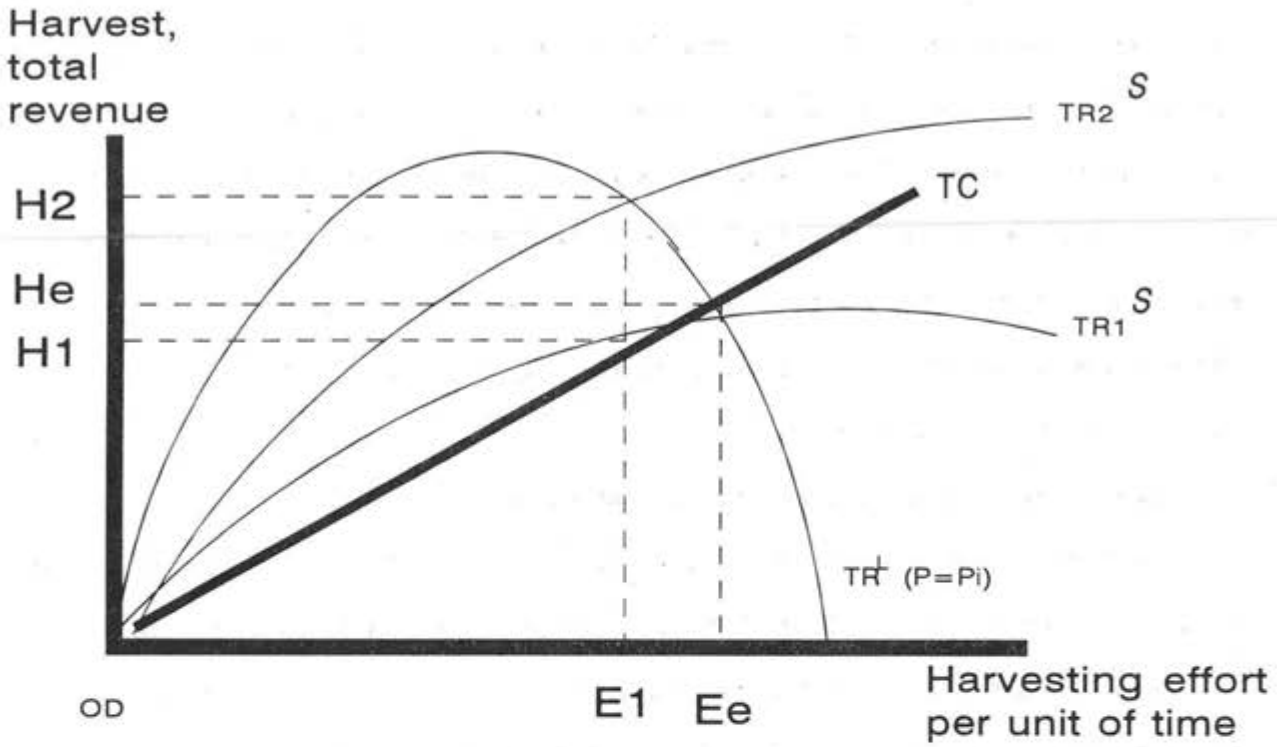
[1] Fixed costs are ignored for the time being because they do not affect the results of the present discussion.

Figure H-1: Economic effects of the EC Common Fisheries Policy



If the cost of harvesting is low enough, the fishery is likely to become overexploited, as is the case both in the EC mackerel fisheries and in figure H-1. The "equilibrium" effort level is E_e, where total revenue equals total cost and no additional harvesting effort is attracted into or diverted from the fishery. However, this is an economically inefficient result, for the same (or greater) amount of fish could be harvested in the long term with a smaller amount of harvesting effort. Therefore, the appropriate policy is to reduce harvesting effort, as through the CFP quotas, which in figure H-1 reduces effort from E_e to E_1.

The short-term effect of the CFP quota restriction is shown by the short-term total revenue curve, TR^S. With reduced effort the harvest quantity and total revenue decline from H_e to H_1. In the long term, however, the lighter fishing pressure on the resource enables its population to grow, so that with the same (restricted) effort the long-term harvest rises to H_2, above the sustainable harvest that was possible with unrestricted effort.[2] As noted in chapter 5, the effects on the U.S. industry of the CFP depend on the likely price changes that could result from changes in EC harvesting effort.

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[2] Another possible short-term effect of vessel-specific harvest quotas is a reduction in the vessel's annual harvest below the quota level. "Because fishing is, to a certain degree, a random process, it follows that a quota constraint on individual vessels will, by removing the chance of a large catch, reduce the expected catch per vessel to a value less than the actual quota. The greater the (random) variability in catches, the greater will be the reduction." Colin W. Clark, "The Effect of Fishermen's Quotas on Expected Catch Rates," Marine Resource Economics, vol. 1 (1985), pp. 426. This effect cannot be further examined here because of lack of vessel-level data; however, to the extent that commercial mackerel harvests are unpredictable, Clark's results suggest that per vessel quotas in the EC industry (and, as seen below, in Norway) further reduce harvests, which reduces production and puts upward pressure on prices.

APPENDIX I
Economic effects of financial assistance for fixed costs

As noted in chapter 5, mackerel harvesting vessels and processing plants in the European Community, Norway, Eastern Europe, the United States, and elsewhere often were constructed with government assistance, typically in the forms of grants or low-interest loans. Even though most such sources of fixed-cost assistance to the industry have been cut back or eliminated, the past assistance received by vessel and plant owners continues to benefit the owners and operators of such vessels and plants. Current mortgage and loan payments, for example, are lower because grants and loan guarantees covered part of the original cost of construction or acquisition.

The likely effects of these continuing benefits can be seen more clearly in a representative, but hypothetical example. Consider a freezer trawler (an onshore processing plant can also be considered, for the financial principles are identical), built at a total cost of $10 million, excluding gear.[35] The government assistance available to the intended owner of the vessel is assumed to include a nonrepayable grant of 35 percent of the construction cost of the vessel and a guaranteed loan at an interest rate of 8 percent.[36] The prevailing market rate for an unguaranteed private loan to the same borrower is assumed to be 10 percent. In addition to interest, fixed costs are assumed to include depreciation of 6.67 percent of the total cost net of the government grant, and a return on owner's equity of 10 percent.[37] Owner's

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[35] This figure, according to European industry sources, would apply to a moderately large factory-trawler or purse seiner. The cost of a very large vessel can range between $15 and $20 million.

[36] These terms are not inconsistent with terms of assistance programs provided in recent years by the EC and various member states. According to the OECD (Fisheries Issues: Trade and Access to Resources (Paris, 1989)), the EC provides grants of 10 to 35 percent (plus a 10- to 30-percent contribution from the respective member state) for "modernization or conversion work on fishing vessels in use (which) must be substantial, be undertaken to rationalize fishing operations, improve conditions of storage of catches, or save energy. With respect to purchase or construction of new vessels priority is given to vessels (that) replace vessels more than 15 years old as well as vessels lost or permanently withdrawn." Grants from the EC for processing plants consist of 25 to 50 percent of total investment (with at least 5 percent from the member state) "to develop new products or to help already existing products to conquer new markets (and) to improve the processing and marketing structure." Member-state contributions are in addition to the EC assistance; examples include Ireland, which provides 25-percent grants for vessel construction or improvement and loan guarantees for 65 to 70 percent of vessel cost; and the United Kingdom, which provides grants of 10 to 30 percent of approved costs of vessel construction or modernization, to a maximum of £250,000 (about $360,000).

[37] Although it would be unrealistic to expect a vessel or plant owner to always receive a given competitive return under all market conditions, a rational investor would expect ex ante to receive a competitive return, at least on average, over the economic life of the investment.

equity is assumed to be 50 percent of the total cost for an unsubsidized vessel and 33 percent for a subsidized vessel.

The following tabulation compares the financing elements of a subsidized vessel with that of an (otherwise identical) unsubsidized vessel:

Vessel with subsidy: Financing	Value	Vessel with no subsidy: Financing	Value
Government grant	$3,500,000	Commercial bank loan	$5,000,000
Guaranteed loan	3,166,667	Equity	5,000,000
Equity	3,333,333	Total	$10,000,000
Total	$10,000,000		

The subsidized vessel is financed with the 35-percent grant, owner's equity of 33 percent of the total cost of the vessel, and a loan for the remainder. The unsubsidized vessel is financed by a commercial loan at the market rate of interest and the owner's equity of 50 percent of the total cost.

The next tabulation compares the itemized annual fixed costs of each vessel:[38]

Annual costs	Vessel with subsidy	Vessel with no subsidy
Interest	$253,333	$500,000
Depreciation	433,333	666,667
Return on equity	333,333	500,000
	$1,020,000	$1,666,667

From this tabulation the estimated subsidy can be determined by subtracting the total annual fixed cost of the subsidized vessel from that of the unsubsidized vessel; this estimated subsidy is $646,667 ($1,666,667 - $1,020,000).

The potential effects of the subsidy on the operation of this vessel can be seen by dividing the total subsidy by the quantity of the vessel's harvest. Different levels of harvest are shown in the following tabulation because of the wide range of possible harvest rates by the vessel, depending on the number of days fished in a year and the average daily harvest:[39]

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[38] Totals may not add due to rounding.

[39] It should be noted that the vessel would not fish mackerel year-round. In the U.S. industry as elsewhere, mackerel-harvesting vessels typically fish other species during the mackerel "off-season." Therefore, the assumption of an annual harvest of, for example, 16,000 tons would normally include mackerel, herring, and other species.

Annual harvest rate	Subsidy/ton
200 days @ 80 tons/day = 16,000 tons	$40
200 days @ 100 tons/day = 20,000 tons	$32
200 days @ 120 tons/day = 24,000 tons	$27
200 days @ 140 tons/day = 28,000 tons	$23

This calculation gives the subsidy per unit (ton) of output and can be interpreted as the maximum downward effect on the selling price of the vessel's harvest. Based on an average annual ex vessel price of mackerel of $300 per ton, this hypothetical per-unit subsidy allows for a decline in price ranging between 8 percent (for a per-unit subsidy of $23) to 13 percent (for a per-unit subsidy of $40).

It is important to note that this is the maximum likely effect on the mackerel price. The actual effect could be smaller, depending on the number of new mackerel-fishing vessels attracted by the potential profits created by the vessel subsidy and, more important, on the increase in the harvest by the fleet as a whole.

This latter factor depends in turn on the condition of the mackerel resource, i.e., whether the resource is under- or overutilized before the construction subsidy is provided. It also depends on whether one views the changes in a short- or long-term context. In the short term (before the mackerel population adjusts to the increase in fishing effort), the mackerel harvest will increase as newly constructed vessels enter the fishery; the increased harvest, in turn, puts downward pressure on market prices until the profit created by the construction subsidy disappears.

In the long term, however, this increased harvest depletes the resource, which--if the resource is overutilized, as is the case in the northeast Atlantic--reduces the long-term (sustainable) harvest to or below the presubsidy level. Therefore, if the total harvest does not change (and assuming nothing has caused market demand to change), then the construction subsidy causes no net effect on market prices for mackerel in the long term.

Finally it should be emphasized that the above results depend on many factors, most importantly the assumptions about the grant proportion, the interest rates, the expected return on owner's equity, and other variables. To see how sensitive the above results are to our assumptions, alter one or more of the assumed variables. For example, suppose that in the time since the vessel was constructed the loan program has been eliminated and now the owner must pay the market rate of interest. In that case the interest cost for the vessel with subsidy in the above tabulation rises from $253,333 to $316,667, raising the total cost for the subsidized vessel from $1,020,000 to $1,083,333. The net subsidy to the subsidized vessel falls from $646,667 to $583,334 and the per-unit subsidy for each output also declines, to the levels shown in the tabulation below:

Annual harvest rate	Subsidy/ton
200 days @ 80 tons/day = 16,000 tons	$36
200 days @ 100 tons/day = 20,000 tons	$29
200 days @ 120 tons/day = 24,000 tons	$24
200 days @ 140 tons/day = 28,000 tons	$21

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