

Research in Global Groundfish Markets: An Exercise in International Cooperation

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Introduction

Over roughly the last decade, most of the fishery resources of the continental shelf and nearshore areas of the world's oceans have come under the control of coastal nations. One consequence of this extension of fisheries jurisdiction (EFJ) by any individual state has been the expansion of its production possibilities. That is, with strengthened property rights in the ocean resources off its shores, a coastal nation experiences increased opportunities to produce goods and services from its newly enlarged pool of resources. Such a nation, then, would appear to be a potential gainer from EFJ.

On the other hand, one would tend to identify as "losers" those countries whose distant-water fleets fished in those same waters prior to EFJ, especially if their access to these waters were restricted by the new "owners." Thus one would expect to see new production levels, new patterns of international trade, and new institutional structures (i.e., management regimes, international cooperative arrangements) to emerge from EFJ. In this paper we explore some of these issues from a conceptual point of view and briefly describe a research project designed to test several of the hypotheses that emerge. Our theme is that EFJ has not only spawned new international relationships in the commercial and public sectors; it has also provided incentives to cooperate inter-

nationally in research activity. Fear of the cost of disclosing valuable information to potential foreign competitors appears to be overshadowed by the recognition of potential benefits from new insights to be gained through shared research experience. Our laboratory is the world groundfish fishery.

EFJ and Production Possibilities

Consider the coastal nation that has declared an EFJ zone. There are two sources of increased production available to it. The first is associated with expanded production possibilities through increased ownership claims to resources. (In the parlance of the economist, this is characterized as an outward shift in the production possibilities frontier.) The second is through more efficient use of resources which, prior to EFJ, were characterized by open access, or "common property," conditions (Anderson, 1986). As suggested above, this would appear to be a reasonably clear-cut case of potential gain for the coastal state initiating the EFJ zone. That is, with the resulting increases in output, the country's real income should rise.

However, there are exceptions. The literature on economic growth suggests that expanded production, if it is concentrated in a nation's export sector, may so depress the prices of the products whose output has been expanded that the country's real income declines, a case of "immiserizing" growth (Bhagwati, 1958; Johnston and Siaway, 1985). While the redistribution of resources is, in itself, unlikely to affect total production directly,¹ the more efficient use of those resources afforded by new managerial authority could raise production sufficiently to

induce prices to fall enough to effectively convert a "gainer" country into a "loser" country. Whether this, in fact, occurs depends to a large degree on 1) what happens to production and 2) prevailing price elasticities of demand. If, for example, a coastal country is a net exporter of groundfish and faces a highly price-inelastic export demand, increased production may lead to an abrupt deterioration in its prevailing terms of trade. Knowledge of price elasticities of demand for groundfish then, is of more than passing academic interest in such circumstances.

Furthermore, even if groundfish management in any one country did not have such an impact on prices, effective implementation of management measures on a global scale could lead to the same result, a case of pecuniary externalities. This raises additional empirical questions calling for resource assessment and improved understanding of the characteristics of both groundfish demand and supply response. For any country forecasting the consequences of its own management strategies, there will also be an interest in the cost of management.

Let us now turn our attention to the other side of this issue. That is, what of the impact of EFJ on a country whose distant-water fishing fleets have been moved away from their "traditional" fishing grounds? Here the case would appear to be less ambiguous.

¹If it did, a version of the "transfer problem" could arise, in which terms of trade are affected by a change in output following a transfer of resources from one country to another, resulting in adverse effects on the recipient country. For fishery resources this is unlikely in the short run. As alternative uses of the oceans are explored (e.g., ocean mining), this could emerge as a long-run consequence of EFJ, however. R. W. Jones, 1975 Presumption and the transfer problem. *J. Int. Econ.* 5:263-274.

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Denied access to resources, such a country must surely experience a loss in real income. Even under these circumstances, however, the situation is far from clear. Even in the absence of various cooperative possibilities designed to regain at least partial access (a topic explored in a later section of this paper), such a country may find that EFJ has actually resulted in the opportunity to import groundfish at a price below its own unit cost of production.² This could result from increased output accompanying management (outlined above) and a consequent decline in price. Just as growth may effectively work against the growing country, so may contraction actually favor the contracting country, although the argument is not symmetrical. That is, we are not suggesting that EFJ would lead to an increase in the price of groundfish, so that an exporting country with fewer resources could be made better off. Because the resources are being transferred to other producers, prices could fall, but are unlikely to increase. Again, the question calls for empirical research on production possibilities, demand elasticities, and the trade position of the market participants. Growth would not be "immiserizing," in the sense described above, for a coastal country which was a net importer of groundfish and which gained groundfish resources through EFJ. Such a country could always return to pre-EFJ fishing patterns. Similarly, a country whose distant-water fleets produced groundfish for export would not likely gain from forced exodus from groundfish resources, unless it continued to be an exporter and simply experienced a lower cost of inputs from importation than from own-production.

²Perhaps as a result of a successful "infant industry" argument by the coastal state and the emergence of a low-cost domestic industry in the new EEZ. Indeed, an often overlooked dimension of the infant industry argument for short-term protection from foreign competition is that, if the infant matures, gains may accrue to countries in addition to the one protected. G. R. Munro. 1982. Cooperative fisheries arrangements between Pacific coastal states and distant water nations. In H.E. English and A. Scott (editors), *Renewable resources in the Pacific*, Proceedings of the 12th Pacific Trade and Development Conference, 7-11 September 1981, Vancouver, B.C., Can. Int. Develop. Res. Cent., Ottawa, Ont., Can., p. 247-254.

From Potential to Actual Gains Coastal States

In the previous section, we argued that there may be potential gains to coastal countries establishing EFJ zones, although there also exists the possibility that terms of trade effects convert gains into losses. Consider the case where real gains could be realized and where decision-makers have a number of options from which to choose in capturing these gains.

Economists have explored several dimensions of this issue. Munro (1985) pointed out that, whereas sentiments a decade ago favored exploiting the resource exclusively by the fleets and processors of the newly endowed coastal nation (perhaps by phasing foreign distant-water fleets out of the coastal country's exclusive economic zone), there is now consensus that some foreign participation may make sound economic sense to the coastal country, even on a long-term basis. The latter position rests on comparative advantage notions under which, if costs of production, harvesting, and/or marketing are lower for the distant-water fleet(s) than for the coastal country, over some range of output, all participants could gain if the coastal country "imported" those services in which it has a comparative disadvantage.

Johnston and Wilson (1989) extended the argument to include the possibility that managerial services could be more efficiently provided by foreign nations than by the coastal state, especially if the visitor shared in the resulting rent and, thus, had an incentive to manage the resource optimally. As pointed out by Hemmi (1982), however, all such "free trade" arguments rest on conditions of full information by all parties, a point to which we turn below.

Several economists have focused on the design of structures that will maximize net benefits to the individual coastal country. Chen and Hueth (1983:461), for example, examine the welfare implications of various joint venture arrangements in a paper "concerned with determining an allocation which maximizes the potential economic benefits to the U.S."

At the conceptual level, then, some

attention has been given to how the coastal country can take advantage of its newly-acquired resources. To quote Munro (1985:272), ". . .if there is to be a distant water nation presence within the coastal state's EEZ over the long run, then it must be because it is in the selfish interest of the coastal state for there to be such a presence." Design of the appropriate policy calls for empirical estimates of costs of harvesting, processing, marketing, and management (surveillance and enforcement) by the coastal country, in order to compare these with offers to supply these services by foreign countries. Willingness by foreigners to pay for participation could be revealed by market devices, such as competitive bidding but, in their absence, can be estimated by empirical measures of demand for the products of the EFJ zone and potential producer surpluses abroad, as suggested by the work of Crutchfield (1983) and others.

Distant-water Fishing Nations

Much of the research in the public domain has focused on potential benefits of EFJ to coastal nations. Particular emphasis has been on problems of realizing potential gains by developing nations with newly acquired coastal resources. Little has been said about the "loser" countries, whose distant-water fleets have lost access to fishing grounds, and "optimal" strategies from their perspective. As a result, an important consequence of EFJ has been overlooked, as far as we can determine. Namely, while some distant-water fleets may suffer losses in real income as a result of EFJ, others may actually realize substantial gains.

How can this be? The answer is that some distant-water fleets may have gained from EFJ, through finding themselves competing in the marketplace, rather than on the ocean. That is, under EFJ, a distant-water fishing nation which previously faced the risk and uncertainty associated with competition for an open-access resource, may now find that, with the extension of ownership control over the resource by a third party coastal nation, operating risks, and therefore costs, have been significantly diminished. Competitive advantage at the negotiating

table may replace competitive advantage on the fishing grounds. This is the case even in the absence of positive terms of trade impacts.

It has been argued that, because of favorable endowments of capital and labor, mobility (or malleability) of capital, preferred access to markets, etc., foreign fleets may offer decided advantages to coastal countries with new exclusive economic zones (EEZ) (Munro, 1985). These advantages could be realized through various cooperative arrangements, ranging from fee fishing to joint ventures. For the distant-water nation to be willing to participate in such arrangements, it must be to its economic advantage to do so. We conjecture that, where a distant-water fishing nation holds cost or market access advantages over other competing distant-water nations, these economic advantages will more likely be realized after EFJ than before. The reason for this is that, while, in the pre-EFJ, open access fishery, cost advantages may generate inframarginal rents (Copes, 1972), these rents are smaller than could be realized through successful resource management. In the extreme, if such management calls for effort restriction, the country with the most "efficient" distant-water fleet may be the only successful bidder for participation in the post-EFJ fishery.

Even if it is only one of several distant-water participants, its share of the resource rent, when added to its inframarginal rents, could exceed its earlier net earnings. Whether this will be the case for any particular distant-water nation is an empirical question, but it is significant that Japan increased its landings by six percent between 1973 and 1985; for the Republic of Korea, the increase was an astounding 59 percent. The distant-water fishing nations of East Germany, West Germany, and the U.K. are among those whose total landings declined over this period.

Sommer (1983), has argued that, in the case of the Federal Republic of Germany, "...the fishing grounds of the high sea trawlers were mainly in national waters of third countries, which became inaccessible by the new

law of the sea. Thus, the extension to 200 miles and catch prohibitions have had greater influence on the German fishing fleet than on any other within the EEC. . . (A) reincrease of landings . . . cannot be expected, because the limited catch quota in the EEC fishing zone and successful joint ventures will make a further reduction of the high sea fishing fleet inevitable in the near future." (pp. 284-285).

In the case of Korea, Rhee (1982:71) argued that "... the South Koreans exploited the profitability that existed in the fishery industry because of low wages. As soon as the developing countries obtained access to world capital for securing fishing vessels and fishing technology, they began to move into distant-water fishing." Cost advantages enjoyed by some distant-water fleets in the presence of open access conditions may have yielded even greater advantages during the post-EFJ era.

These data may or may not reflect existing or potential cost or market advantages and, thus, successful competition for access to the new EFJ zone. However, new cooperative arrangements are unfolding, as both coastal and distant-water nations explore potential gains.

Munro (1985:278), however, holds different views. He argued that, while there were costs associated with the uncertainties of competing with rival distant-water fleets in open access fisheries, "... this has been more than offset by negative uncertainties arising from coastal state allocation policy." He pointed out that Japan's distant-water harvests fell by almost 50 percent between 1974 and 1980, and suggested that the long-run viability of contractual arrangements between coastal states and distant-water nations requires reinvestment in distant-water fleet capacity. His arguments make sound economic sense, although we point out that the Japanese situation seems to have changed since 1980. Whether the economic forces he enumerates, or those we suggest, prevail for any given distant-water nation can be determined only by empirical investigation.

It is hardly surprising that there exists substantial interest in economic analysis of demand and cost conditions to determine the extent of the benefits from such participation. Even those countries that have "lost" from EFJ may be able to reduce these losses by exploring the costs and benefits of partnership arrangements with coastal states.

Americanization

The United States extended jurisdiction over the fishery resources adjacent to its coasts in 1976 with the passage of the Magnuson Fishery Conservation and Management Act. Since then, U.S. fisheries policy has gone through several stages, especially with respect to the nature and extent of foreign vs. wholly domestic participation. The popular term for this progression toward exclusive domestic utilization of the EEZ is "Americanization." Focusing on a single example, which is characteristic in kind if not in scale in the U.S. EEZ, we may consider the walleye or Alaska pollock, *Theragra chalcogramma*, fishery. In the current stage, foreign involvement is to be phased out, including joint-venture "over-the-side" sales of Alaska pollock to foreign processors, and the fishery is to be converted to a wholly domestic operation at the most rapid pace possible. What are the implications of the argument advanced above for this accelerated Americanization policy?

Consider the data. Over 70 percent of foreign finfish catch in 1986 in the U.S. EEZ off Alaska (the Gulf of Alaska and, more importantly, the Eastern Bering Sea), was Alaska pollock. The 1986 joint venture harvest of Alaska pollock accounted for almost 69 percent of the joint venture landings in the entire U.S. EEZ. The directed foreign fishery catch of Alaska pollock in 1984 was 1.032 million metric tons (t). By 1986, this had fallen to 353,000 t. The bulk of the landings were by Japan, with Korea a distant second. The joint venture catch of Alaska pollock in 1986 was 904,000 t, more than double its 1984 level. Again, Japan and Korea were the leading U.S. partners, in that order.

As we interpret the current U.S. attitude, in both the public and private sectors, it is that the success of the Americanization policy will depend upon the ability of the U.S. industry to supply the important Japanese markets, especially with respect to Alaska pollock. If the United States displaces the Japanese and Korean fleets and processors, will it automatically replace these countries in their respective markets? Perhaps. But not all countries with new EFJ's have adopted the U.S. attitude toward foreign participation, and thus, as suggested above, it is not unreasonable to expect that Japan and Korea will seek—and find—opportunities elsewhere. The consequences for the emerging U.S. industry, and the nation as a whole, could be enormous.

At the present time, in anticipation of serving these major world markets, the State of Alaska is aggressively pursuing development policies in the groundfish fishery off its shores, intended to induce rapid expansion of onshore processing capacity of groundfish. There are obvious short term and provincial reasons for Alaska to advocate this position. However, the evidence strongly suggests that onshore processing capacity, particularly in remote areas of Alaska which do not possess even the most rudimentary infrastructure needed to support this industry, may not be in the collective best interest of the nation, from an economic perspective.

Floating capacity, capable of self-contained mobile operation has a clear economic advantage in the high volume, relatively low unit value groundfish processing sector. And yet, significant political pressure, at virtually every level of decision making, and financial subsidies, both Federal and state, disproportionately favoring onshore facilities, have characterized the development of this industry in recent years. It has been suggested that these programs have induced the construction of facilities in locations of the state that cannot be sustained on an unsubsidized joint competitive basis. This has already resulted in the complication of fishery management allo-

cation decisions in the Bering Sea groundfish fishery, owing to the shore-side facilities' reported inability to acquire raw material, i.e., groundfish, for processing at prices which make operation profitable, confronted as they are with competition from floating capacity.

To the extent that onshore processing development is artificially induced, whether through direct subsidy or political manipulation of the regulatory environment, the resulting expansion of U.S. utilization of the groundfish resources in the EEZ will be more costly than would be the case if alternative development strategies had been employed. In practice, the exercise has been instructive. It has generated new information on development and production costs, which will be invaluable in assessing, in retrospect, the merits of the Americanization policy to displace foreign fisheries and processors. But what if the markets, anticipated by the advocates of an accelerated Americanization of the U.S. EEZ, fail to materialize?

After all, even in the absence of the Americanization policy, Japanese and Korean interests may better be served by negotiating long-term contracts with other coastal countries that recognize the mutual benefits of such arrangements. The international Organization for Economic Cooperation and Development (OECD, 1986:137) has reported that, in addition to agreements with the United States and Morocco, "negotiations on fishery agreements . . . have been conducted by Japan with Canada, China, the Republic of Korea, Australia, New Zealand, and South Pacific countries. . . The main species sought are squid, bottomfish, etc." This understates Japanese participation in foreign fisheries including recent agreements in South America, among others, although some setbacks have reportedly been experienced, especially in U.S. waters, as cited above, and in Soviet waters.

Nonetheless, Japan continues to rely on its own fleets and processors to supply the domestic market,³ although we do not know that these new ar-

rangements are designed to substitute for Alaska pollock, in the large but declining Japanese surimi market. If they are, the consequences of the Americanization policy could be much different than expected.

Cooperative Research

It is precisely this environment of uncertainty that is, in our opinion, generating worldwide interest in cooperative research on international groundfish markets. With such dramatic changes in ownership of the ocean's living marine resources, there are new participants in these markets, especially new holders of resource wealth. As discussed above, this had led to some displacement of foreign fishing fleets and, hence, to interest in how to recoup apparent losses. Coastal countries with new EFJ zones, but in large part infant commercial groundfish sectors, seek ways to convert potential to realized gains. All of this is being contemplated in an environment of uncertainty about 1) the extent to which previously underutilized species may command economic attention, 2) the nature of the market for the many products of the groundfish fishery, and 3) the benefits and costs associated with cooperative fishing and processing arrangements.

One thing that has clearly emerged from this growing competition for access to, and control over, heretofore undesirable or uneconomic fisheries resources, is the image of a highly integrated and interdependent world market for seafood, particularly whitefish, commodities. In combination with declining availability of some important traditional groundfish products (including high valued Atlantic cod *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, fillets), lower valued block and minced block made from pollock, hakes, and any

³T.-N. Chen and D. L. Hueth. 1983. Welfare considerations in the development of a joint venture policy. In B. Melteff (editor), Proceedings of the International Seafood Trade Conference, 8-12 September 1982, Anchorage, Alaska, p. 461-471. Sea Grant Coll. Program, Univ. Alaska, Fairbanks, AK 99701.

number of other relatively abundant species, and growing worldwide demand for whitefish products (including fresh and frozen fillets, blocks, headed and gutted, and surimi), prospects for groundfish development appear bright, if as of now somewhat uncertain.

To aid in the resolution of some of this uncertainty regarding the anticipated growth in world whitefish production and trade, an international cooperative study of groundfish resource capabilities, trade flows, product forms, market characteristics, and demand was initiated in early 1987. The study, supported in part by the U.S. National Marine Fisheries Service, is intended to provide a comprehensive overview of the major worldwide groundfish resources. The study is designed in three phases. Phase one involves a global inventory of significant unutilized and underutilized groundfish species. This inventory will seek to identify 1) the species complex, 2) geographic distribution, 3) total size, 4) annual harvestable surplus, and 5) jurisdictional control, associated with significant populations which are perceived to have commercial potential.

Simultaneously, data on international seafood trade arrangements are being developed. These include 1) documentation of trade practices designed to establish and maintain markets, and 2) product flows in high-volume whitefish commodities. These could include indirect and direct subsidies, geopolitical arrangements, countertrading relationships, capital and/or technology transfers, etc. The purpose here is to establish a contextual framework for understanding existing seafood trade patterns and to assess the potential characteristics of future trading opportunities. Included in this portion of the phase-one analysis is a descriptive summary of the existing international joint venture arrangements, including their number, the participating partner nations,

species complex targeted, and their institutional configuration.

Subsequent phases of the study will draw upon the data compiled in phase one to 1) quantitatively evaluate supply and demand relationships for whitefish commodity groups in the world market, 2) assess the sensitivity of demand to variations in total world production, and 3) examine the influence of macroeconomic, political, and resource management policy on world groundfish trade patterns. Perhaps the research addresses the point of Hemmi (1982), referred to earlier, about the need for full information.

In view of the many uncertainties surrounding the nature of supply and demand conditions for groundfish, it is not surprising that the response to the call for cooperative international research has been so resoundingly positive. Apparently the expected benefits from the insights generated are perceived to exceed costs of disclosing proprietary information.

Phase one of the study began in spring 1987 and involved more than 40 scientists from 23 nations around the world. Preliminary results of this phase of the study were to be available by spring 1988, and, assuming continued funding support, phase two was to begin then.

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