IDE-APEC STUDY CENTER
Working Paper Series 95/96-No. 3

Factors Affecting Domestic Price Differentials in the Japanese Fisheries and Marine Products

March 1996

Haruko Yamashita

Assistant Professor
Department of Economics
Meikai University

Chapter 1 Introduction

The Purpose of this paper is to discover the Domestic Price Differentials of live, fresh and frozen fish and processed marine products (note 1) and to examine factors affecting such price differentials (note 2). The research suggests that 25% of marine products taken from 52 items of comparable products display more than two fold price differentials. In other words, for 13 items, domestic production prices are more than twice as high as imported prices. Such differentials are mostly derived from the final consumers preference to the quality and freshness rather than institutional impediments such as tariffs and non tariff barriers. In Chapter 2, we will describe an outline of Japanese fisheries and marine product consumption in relation to international trade. In Chapter 3, we will first illustrate measurement methods. Following that, the resulted Domestic Price Differentials are indicated. For those items whose Domestic Price Differentials exceed 2.00, factors possibly affecting such price differentials are examined. Examination in Chapter 4 include traded form, distribution, quality measure and the existence of tariffs and non tariff barriers. Lastly in Chapter 5, conclusion and future perspectives are suggested.

Chapter 2 The outline of Japanese fisheries

Japan is the second biggest producer of marine product as well as the world largest marine product importer, both in weight and value. Japanese per capita edible fish consumption is also the largest. It is as large as 67.8 kilograms per year overwhelming the world average of 13.4 kilograms.

(1) *Production and import*

Japanese Fisheries production in 1990 was 10,278 tons (8,013 tons in 1993). It is the second biggest next to China who produced nearly 18,000 tons in that year. In fact, Japan was the first until 1988: Rapid increase in Chinese production at the same time rapid

decline in Japanese production in these years switched the countries' positions (Figure 1).

The increment of domestic production shortage is well compensated by the increase in import as well as the decrease in export. The country's export, having been the largest in the world until 1972, was reduced to 1,140 tons (572 tons in 1993) by two factors; the establishment of 200 miles of exclusive fishing zone and an oil crisis. As an importer, on the other hand, Japan has been the largest both in weight and value since 1982. In 1990, 3,823 tons (4.788 tons in 1993) are imported and it is still increasing (Figure 2). The value of fisheries import is the second largest within Japanese overall importing items (Figure 3).

As a result, one-third of the total supply of edible marine products, i.e., 8,798 tons (8,464 tons in 1993), or 28% (36% in 1993) of total supply is imported.

(2) *Popular marine products*

Marine products that are popularly caught by Japanese fishermen are Sardine, which occupies 43% of total production in weight, Walleye Pollack, Japanese Common Squid, Tuna, and Striped Jack. In terms of the value of production, they are Tuna, Japanese Common Squid, Sardine, and Salmon (Figure 4).

Popular imported items are partially overlapping with Japanese popular catches: They are Shrimp, Tuna, and Walleye Pollack/Cod in weight, and Shrimp, Tuna, Salmon and Crab by value (Figure 5). The characteristics of recent trade is a shift from traded fish to more processed form, i.e. peeled, cut and seasoned. Shrimp, Eel, Sea Urchin and Pollack Roe are the examples.

(3) *Consumption*

One of the notable characteristics for Japanese fish consumption is to eat in raw (Sashimi and Sushi). Japanese consumers are willing to compensate flight fee of Tuna promptly iced or chilled when it is caught in South pacific Sea and the West Coast of the United States. Even some of the frozen fishes are consumed in raw, otherwise, they are lightly boiled and brought to dining table without seasoning. Freshness, therefore, is essential for all kind of fish. Average household expenditure for marine products was 37,776 yen in

1990: It is 13% of total food expenditure (Figure 6). Above all, Tuna, Shrimp, Squid, Yellow Tail, and Salmon are the items of heavy expenditures.

The second characteristics of consumption is the fact that high-grade Japanese restaurants consume more fish than anything else. Particularly, they try to offer customers high quality fresh fish that cannot be purchased in consumers market. Price of such fish is high due to the price inelasticity of these restaurants.

(4) *Unrestrictive government policy*

Government policy toward fisheries import is non-restrictive. An interesting contrast can be made with that of agricultural products where heavy protection for domestic products are associated with import tariff and non tariff institutional barriers. Such generosity in fish trade is derived from the historical fact that Japanese fisheries had not only been self sufficient but also been a room for exporting so as to bring foreign currency to Japan at its stage of economic growth. Tariff as a barrier, therefore, is negligible: As we see later, they are at most 10% in General level. It cannot be counted as a factor affecting domestic price differentials.

Chapter 3 The Survey and the results

Our study is based on the comprehensive survey of Domestic Price Differentials conducted by Kawai et.al.[1995](note 3)(Figure 7). In this survey, Frshwater fishery/ aquaculture (1.685) and Processed marine products (2.070) hit high Domestic Price Differentials. Neither of them, however, provides further breakdown.

(1) *Similarities and differences with Kawai et.al.[1995]*

In this paper, more detailed item-by-item price comparison is conducted while keeping its base on the contribution of Kawai et.al.[1995]. In practice, we compare prices as of 1990, production price for domestic products and import CIF price for imported

products. For the reference of imported product prices, we refer Japan Exports & Imports (1990). Up to this procedure, it is the same as what Kawai et.al.[1995] have done. For the reference of domestic production prices, we refer original statistics such as Ministry of Agriculture, Forestry and Fisheries[1990] & [1995a] and Tokyo Prefectural Government[1990]. These are the data from where data for "1990 Input-Output Tables" are originated. Other statistics are also utilized to reinforce data credibility.

Domestic Price Differentials indicated in Kawai et.al.[1995] are categorized according to middle-stage industrial classification. In that, Domestic Price Differentials are calculated in the following order. Let us take an example of Freshwater Fishery/ Aquaculture (Figure 8). There are a number of marine product in this category. Comparable imported products are taken from Japan Tariff Association[1990], and are compared with domestic product prices derived from Management and Coordination Agency[1990]. Good matches are found in only three products: Carp, Eel, and Fresh Water Cram. Weighted average of those three prices are finally compared to derive Domestic Price Differentials as 1.685. Resulting Domestic Price Differentials, however, contains controversial differences. For example, price differentials of Carp gives us a sign that imported carp is more expensive than domestic carp: In fact it is because imported Carp is live.

As we see in this example, price comparison at middle-stage industrial classification does not reflect "true" differentials as far as marine products are concerned. In our paper, we set ourselves free from these industrial classification. Instead, we match product-to-product as precisely as possible and pay careful attention to such fish product that show a price differencial greater than two.

(2) *The results*

We compare the following 52 marine products. Domestic Price Differentials were 1.76 on average, with the highest of 10.29 and the lowest of 0.27 (Figure 9). Frequency distribution figure (Figure 10) shows some concentration in Domestic Price Differentials 1.2-1.3. On the other hand, Import Ratio, i.e.the share of import in total domestic supply in weight, varies from almost zero (0.20% for salted salmon (43)) to almost 100% (99.47% for

frozen peeled Shrimp (30)). The following equation suggests that no significant correlation exists between Domestic Price Differentials and import ratio.

Domestic Price Differencials = 1.58 + 0.39 R2 = 0.01

(4.02)

We will closely examine characteristics of the products whose Domestic Price Differentials are over 2.00. 25% or 13 items out of 52 are therefore in question. Before we start examining those products individually, let us note the following four factors that may influence on the price differentials simply due to the nature of statistics itself.

First, data showed here does not represent "all" the products that are imported. Instead, they are the result of our best effort that we could sort out comparable prices.

Second, some product prices, e.g. Spanish Mackerel (13) and Pacific Herring (14) represent a mixture of fresh and frozen products. There are a great possibility that, in these cases, domestic fresh product prices are compared with frozen imported product prices. In general, fresh products are valued more than frozen products. Price differentials between fresh and frozen imported Tunas will give us a reference on how much they differ: Four groups of imported Tuna (1&2, 3&4, 5&6, 7&8) indicate that fresh tunas are valued 1.5to 3.1 times more than frozen tunas. Domestic Price Differentials may be caused by such factor.

Third, some of the successive products on the list are not independent but subsets. For instance, Fresh Sea Bream (16) is a subset of Sea Bream (15). Although Sea Bream (15) indicate 2.98 of Domestic Price Differentials, it does not exist as long as fresh ones concerned. Such information will reinforce our examination on what causes Domestic Price Differentials.

Fourth, both domestic prices and imported prices without notes indicate prices at production sites, (i.e. auctioned price at fish ports), and reported price at customs duty, respectively. In other words, when it is noted as "wholesale price", it is auctioned price at Tokyo Central Wholesale Market (note 4), that should be higher than that of production sites or customs duty. Particularly, special attention should be paid for those products, such as

Fugu (21), where significant local price differentials exist.

Chapter 4 Product Examination

(1) *Frozen Bluefin Tuna*

(Table cannot be reprinted for a technical reason.)

(2) *Frozen Skipjack*

(Table cannot be reprinted for a technical reason.)

(3) *Fresh Striped Jack*

(Table cannot be reprinted for a technical reason.)

(4) *Pacific Herring*

(Table cannot be reprinted for a technical reason.)

(5) *Sea Bream*

(Table cannot be reprinted for a technical reason.)

(6) *Fugu*

(Table cannot be reprinted for a technical reason.)

(7) *Fresh Butterfish*

(Table cannot be reprinted for a technical reason.)

(8) *Japanese Spiny Lobster*

(Table cannot be reprinted for a technical reason.)

(9) *Fresh Shrimp*

(Table cannot be reprinted for a technical reason.)

(10) *Sea Urchin*

(Table cannot be reprinted for a technical reason.)

(11) *Hard Clam*

(Table cannot be reprinted for a technical reason.)

(12) *Fresh Water Clam*

(Table cannot be reprinted for a technical reason.)

(13) *Freshwater Aquaculture Pearl*

(Table cannot be reprinted for a technical reason.)

Source: Japan Tariff Association [1992], Ministry of Agriculture, Forestry and Fisheries [1993], Research Institute of Food Distribution [1995], Research Institute of Imported Food [1994].

Chapter 5 Conclusion and future perspectives

The research we have conducted on Domestic Price Differentials for fisheries industry in Japan is virtually the first trial in this field. There are a number of works on the examination of increasing fisheries import such as Horiguchi [1992] and Taya [1991] for overall imports, Akiya [1995] for salmon and Hiroyoshi [1995] for Tuna. These works, however, focus on the examination of the change in domestic production/ market, than on the state of prices themselves. lastly in this paper, we will point out the following six factors that, we believe, may cause price differentials. Further close examination by products is left out

for future continuing study.

(1) *Freshness and quality measurement*

Freshness and quality no doubt are reflected in prices. Premature frozen technology or a lack of refrigeration facility on the catching boat in the country of origin is reported for those products such as Tuna (22), Skipjack (11) and Fugu (21). Quantitative verification of freshness and quality is left for future study.

(2) *Difference in usage as a candidate of Domestic Price Differentials*

Difference in usage may reflect on price. For instance, imported Frozen Skipjack (11) is eventually dried and shredded to be used as a seasoning while domestic Frozen Skipjack is served in raw or broiled. The Domestic Price Differentials is 5.89. We could not distinguish how much of such price differentials are apportioned to the difference in freshness and quality and to that of usage. Or, the difference in usage itself may be the reflection of the difference in freshness and quality. However, Mackerel (22) gives us a hint: the size of imported mackerels (mostly from Norway) are standardized and they are large enough to be cut and sold in the form of fillet in supermarket chains. While, the size of domestic Mackerels are small on average; they are mostly milled for cattle/fish food (Taya [1995]). Domestic Price Differentials of 0.27 suggests that imported Mackerel is valued four times more than domestic Mackerel. Closer examination of such factor is also left for future study.

(3) *The possibility of monopsony*

If the importer of a product is a monopsonist, (i.e. a single demander versus many supplier), the price of imported goods should be lower than otherwise. Hard Clam (38) is imported by a local buyer in Mie prefecture where Hard Clam is put back in the sea again to mature. Fresh Water Clam (39) is also reported to be imported mainly by buyers in Mie and Ibaraki prefecture. Even other products where a monopsony is not observed, the possibility of collusion cannot be denied. Further examination into the importing procedure of each product is required for definitive answer. In that instance, the competitiveness of the product

in the world market should be taken into account. Although Japanese demand is large enough to control the world market price, the existence of a competing demand may weaken such power. Tuna, as an international product is an example. A counter example is Fugu (21), a fish with poison, that may not be appreciated in the rest of the world.

(4) *Prices of storable / non storable products*

Unlikely with industrial products or aquaculture in the case of marine product, the volume of natural fish caught at a time is uncontrollable It always results in either over production or shortage. Moreover, fresh fish is non storable. For such product, auction prices fluctuates as it adjusts with the volume and price of final demand. On the other hand, with a storable product such as frozen fish, either exporter or importer can store fish and observe the market price: Frozen fish may work as a substitute for fresh fish. These factors may influence prices, and it may be particularly so for imported products because they are treated as a supplement of domestic production. The issue of how these factors relate to each other and affect on prices is left for future studies.

(5) *Adequacy of statistics*

For those products whose market price at production site was not available, we instead used the wholesale market price at Tokyo Central Wholesale Market. As we noted in Fugu (21) in the previous chapter, Fugu in Tokyo is considered as a special cuisine, supplied only in exclusive high-class restaurants. Much of the price differentials out of 10.29 could be therefore caused by the inadequacy of these statistics. Furthermore, the distribution process of marine products is undergoing dynamic restructuring at the moment, where the large volume demanders such as family restaurant and supermarket chains purchase directly from local suppliers and importers, or even directly from exporters, without going through central wholesale markets. Central markets on the other hand are shifting to specialize in high-quality products purchased by high-grade restaurants (Tasaka [1995]). Close examination of distribution process therefore is necessary.

(6) *Production-retail price differentials*

In this paper, we did not examine retail price nor Domestic Price Differentials in retail prices. A large price differential, in fact, exists between imported price/ wholesale price and retail price: They are three to five folded(Figure 11). Price differentials with retail prices overwhelms that of Domestic Price Differentials, and it is consistently so for all the products so far which data is available. Therefore, we suggest that future study is required in the distribution process including delivery cost and its margin (Note 5).

Notes

(1) We use the term "marine products" or "products" interchangeably. For the reference of English-Japanese names of marine products, see appendix.

(2) This paper stands as "Fisheries Industry" within a series of papers on domestic Price Differentials studied by a group of researchers under the name of "Economic Policies in APEC" organized under the IDE (Institute of Developing Economies). The author wishes to express appreciation to Ippei Yamazawa, the group leader, and its members for giving her an opportunity to conduct the research.

(3) Our study corresponds with No.44-47, 71-76 of Kawai et.al. [1995].

(4) Average price of the following three wholesale markets: Tsukiji, Adachi and Ohta, is used.

(5) Most of the marine products at retail markets (such as supermarket) do not indicate originating country: Consumers are not aware whether a product is imported or domestically produced. There is a possibility that identical domestic and imported products are put on the shelf at the same price even though imported price was lower than production price.

References

Akiya, Shigeo[1995], "Consumption, Distribution and and Producing districts-Imported Salmon and Akisake- (Shohi Ryutsu, soshite Sanchi- Yunyumono, Yoshokumononо Zokato Akisake)", Journal of Fisheries Economy, Vol.39, No.4.

Hiroyoshi, Katsuji[1995], "The Prospects for a Restructuring of Japanese Tuna Fishery and Marketing (Magurono Jukyu Kozono Henkato Seisankozono Tenbo)", Japanese Journal of Fisheries Economics, Vol.49, No.2.

Horiguchi, Kenji[1992], "Fisheries Trade (Suisanbutsu Boeki) (Section 4 of Chapter 1)" in Ono, Horiguchi(ed.), Economic Analysis of Japanese Fisheries (Nihon Gyogyono Keizai Bunseki), Norin Tokei Kyokai.

Japan Tariff Association[1990], Japan Exports & Imports, Commodity by Country.

Japan Tariff Association[1992], Customs Tariff Schedules of Japan.

Kawai, Hiroki and Iwao Tanaka[1995], "Domestic Price Differentials of Japanese Products" (Working Paper submitted to APEC Economic Policy Study Group of IDE).

Management and Coordination Agency[1985], Historical Statistics of Japan, Japan Statistical Association.

Management and Coordination Agency[1990], 1990 Input-Output Tables.

Ministry of Agriculture, Forestry and Fisheries[1990], Yearbook of Fisheries and Aquaculture Production (Gyogyo/ Yoshokugyo Seisan Tokei Nenpo), Heisei 2.

Ministry of Agriculture, Forestry and Fisheries[1993], Report on the Distribution of Imported Vegetable, Cattle, and Fish (Yunyu Seika/ Chikusan/ Suisanbutsu Ryutsu Chosa Hokoku), Heisei 5.

Ministry of Agriculture, Forestry and Fisheries[1995a], Distribution Statistics for Agricultural, Forestries and Fisheries Products (Norin Suisanbutsu Ryutsu Tokei), Heisei 7FY.

Ministry of Agriculture, Forestry and Fisheries[1995b], White Paper on Fisheries (Gyogyo Hakusho), Heisei 6FY, Norin Tokei Kyokai.

Research Institute of Food Distribution[1995], Food Production Import and Consumption (Shokuhin Seisan Yunyu Shouhi), Fisheries and Marine Products (Suisan/Suisan Kakohin Hen), Research Institute of Food Distribution.

Research Institute of Imported Food[1994], Cyclopedia of Imported Food by Products

(Hinmokubetsu Yunyu Shokuhin Jiten), Science Forum.

Tasaka, Yukio[1995] "Characteristics of the Demand for fishery Products and Corporate Behavior in the Food Processing Industry (Shokuhin Kako Sangyoni okeru Suisanbutsu Juyono Tokuseito Kigyo Kodo)", Journal of Fisheries Economy, Vol.39, No.4.

Taya, Katsuo[1991], Fisheries Market in International Era (Kokusaika Jidaino Suisanbutsu Shijo), Hokuto Shobo.

Taya, Katsuo[1995], "Realignment of Marine Product Market and Adjustments within the Mackerel Market (Sabarui Shijono Henboto Sanchi Taio)", Japanese Journal of Fisheries Economics, Vol.49, No.2.

Tokyo Prefectural Government[1990], Yearbook of Tokyo Central Wholesale Market, Fisheries (Tokyoto Chuo Oroshiuri Shijo Nenpo, Suisanbutsu Hen), Heisei 2.

(The end of the paper)