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Factors Affecting Domestic Price Differentials in the Japanese Electric and Electronic Machinery Products

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Chapter 1 Introduction

The main purpose of this research paper is to find out domestic price differentials of electric and electronic machinery products and to examine factors affecting such price differentials. The research suggests in this category more than six items out of 30 comparable product items indicate more than six folded price differentials. In other words, for 20% of products out of 30 comparable products, domestic production prices are more than six times higher than imported products.

As is discussed in the following part of this paper, we can attribute these price differentials, for the most part, to the final consumers' preference to the quality of products in these specific fields, rather than to institutional impediments such as tariffs and non tariff barriers. Additionally, it can also be pointed out that the product differentiation derived from the above-mentioned preference of the consumers accounts for a considerable part of the price differentials. In addition to those final consumers' preference factors, however, some possible features which have been establishing the price differentials are still indicated.

The general structure of the paper is as follows. First in Chapter 2, an outline of activities of Japanese electric and electronic industries will be described, especially regarding international trade and domestic consumption. In Chapter 3, some statistics showing price differentials will be initially observed after illustration of the ways of its measurement. They present us several aspects of price differentials. Finally in Chapter 4, we will examine the main factors affecting the differentials with regard to items whose domestic price differentials are over two times. The examinations in this chapter will include traded forms, the distribution system, quality of products, existence of institutional impediments such as tariffs and non tariff barriers, and others.

Chapter 2 Basic Characteristics of Japanese Electric and Electronic Industries

1. Environmental Changes and Present Status of Japanese Industries of Electric and Electronic Products

Since the end of World War, electric industry in Japan has been making effort to catch up with European or American industries especially in terms of technology innovation. With this goal, Japanese electric and electronic industries have made some achievements. In 1990s, however, they stands in the threshold of another critical stage. Some of the main aspects showing these environmental changes are (1)the collision of domestic "bubble economy", (2)a new phase of trade friction against other industrial countries, and (3)the continuation of foreign exchange rate fluctuation.

Under these circumstances, let us examine the recent status of the industries by statistics on manufacturing activities. Table 1 shows the 1992 shipments of major manufacturing industries in Japan including electric and electronic industries. On the other hand, according to 1960 statistics, total shipments by all manufacturing industries were 15.6 trillion yen and that of electronic machines and equipment was 6 trillion yen (3.8% share of total industries). Therefore, during the term of 32 years, total of all manufacturing industries grew up to 21 times, and electronic industry grew up to 60 times. It can be said that electric and electronic industries are the leading industries which contributed significantly to post war dramatic advancement of Japanese industries.

Table 1. Shipment of Manufacturing industries in 1992

(in billion yen)

electric and electronic machines and equipment:	54,520	(16.5%)
electronic machine and equipment:	35,990	(10.9%)
transportation machines and equipment:	49,610	(15.0%)
automobile and parts:	44,480	(13.5%)
general machines and equipment:	33,720	(10.2%)
steel industry:	16,590	(5.0%)

total of all manufacturing industries: 329,640 (100.0%)

2. Outline of Electronic Manufacturing Industries in Japan

Electronic manufacturing industries in Japan mainly consist of (1) electronic machines for final consumers, (2) industrial machines and equipment, and (3) electronic parts and devices. Each of the three groups includes the following items.

(1) color TV, video tape recorder, CD player, video camera, stereo sets, and others.

(2) electronic calculator and its peripheral equipment, wired and wireless tele-communication equipment, medical equipment, electric measurement instrument, stationary equipment, and others.

(3) electronic parts, semiconductor element, integrated circuit, liquid crystal, electronic tube, and others.

The production activities by the categories above during the last decade are shown in Figure 1.

Figure 1. Production of Japanese Electronic Industry

(Figure 1 cannot be reprinted for a technical reason.)

From 1983 to 1991, the total production almost doubled. However, in 1992 and 1993, it decreased in two consecutive years. It was mainly because of depression of domestic consumption and manufacturer's out-sourcing practices including FDI (foreign direct investment).

Figure 2 and 3 show import and export of electronic products in Japan. As for import, it has been increasing dramatically especially since 1989. Main increasing items are micro computer, integrate circuit, semiconductor, calculating equipment and its peripheral devices. On the other hand, export decreased considerably in 1986 and in 1993. 1986 was the year when yen was appreciated drastically against US dollar, and in the consequence,

Japanese electric and electronic industries abruptly lost their comparative advantage in international trade. We also experienced rapid yen appreciation in 1993.

These situations forced electronic and electric industries to develop out-sourcing and globalization. Especially, many firms in these industries have worked on FDI enthusiastically, and as a result, the rate of production abroad against domestic production is much higher than those of total manufacturing industries (Figure 4).

We can also see the rapid globalization features in these industries by examining import penetration rate. Figure 5 shows import penetration of major products in these industries.

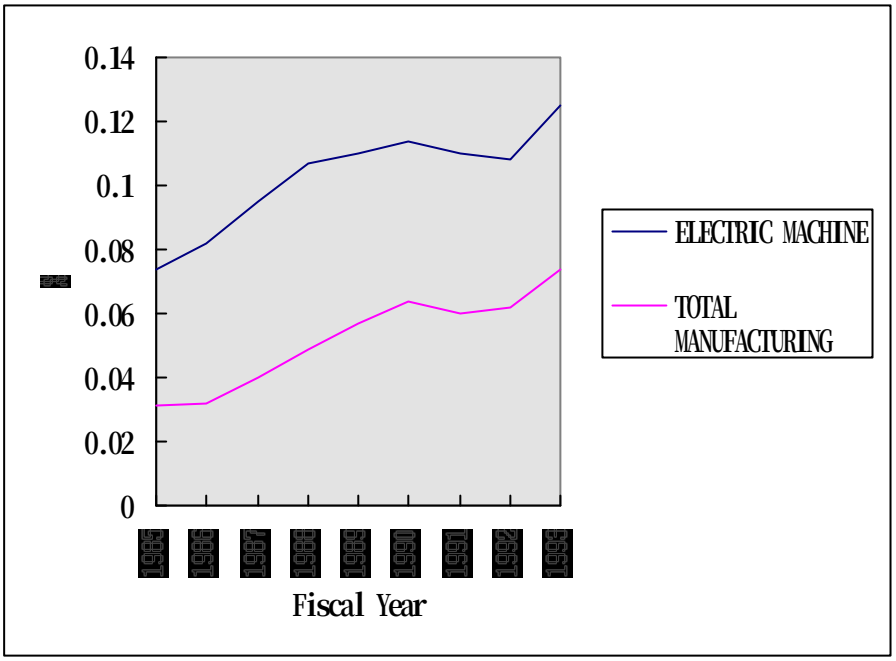
Figure 2. Import of Japanese Electronic Industry

(Figure 2 cannot be reprinted for a technical reason.)

Figure 3. Export of Japanese Electronic Industry

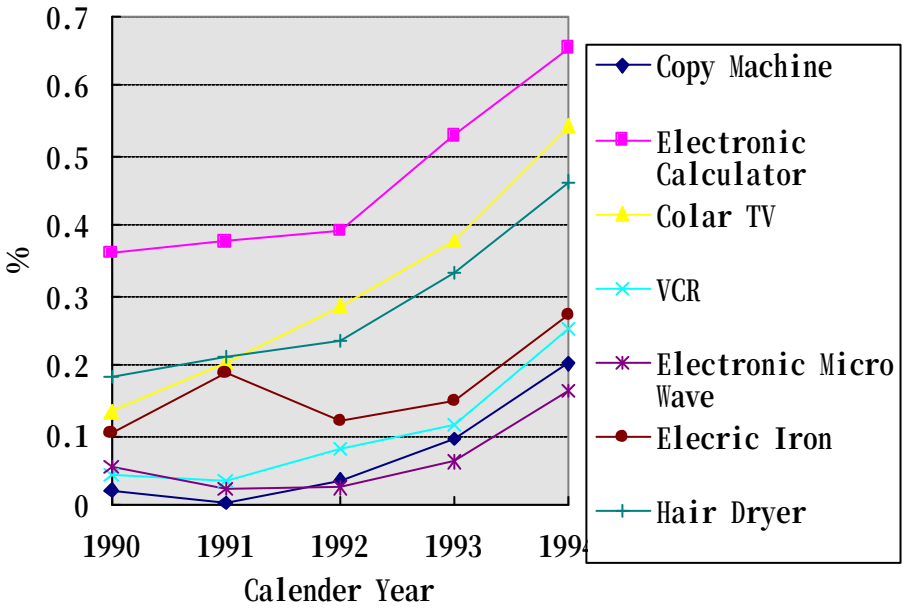
(Figure 3 cannot be reprinted for a technical reason.)

Figure 4. Rate of Production Abroad of Japanese Electric Industry



Source: MITI

Figure 5. Import Penetration of Electric and Electronic Products



Source: MITI, MOF

Chapter 3 Measurements of Domestic Price Differentials of Electric and Electronic Products

1. Outline of Recent Price Changes of Electric and Electronic Products

In order to obtain preliminary information of price differentials, let us observe a general trend of domestic prices regarding electric and electronic products. Figure 6 shows the recent movement of domestic wholesale prices and related statistics. The downward trend of price of electric products can be clearly seen. Especially from 1989 until 1991, when total price index showed upward changes, the price of electric products lowered. One of the main factors of the downward trend is the development by Japanese firms in the industries of out-sourcing and globalization, and another additional factor is the increasing penetration of import products into Japanese market of electric products, as was already discussed in the former chapter.

2. Several Measurements of Domestic Price Differentials

There are some measurements of domestic price differentials indicating the possible high price of Japanese domestic products in comparison with international products. Table 2 and 3 are comprehensive matrices containing several figures showing price differentials.

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Figure 6. Wholesale Price Index (change from previous year at annual rate)

(Figure 6 cannot be reprinted for a technical reason.)

Table 2. Domestic Price Differentials from several researches (1)

(comparison by producers price level)

Domestic Price / Foreign Price

Input-Output table(1990) items	(1)	(2)	(3)
333 miscellaneous electric stationary equipment	-	-	1.163
338 radio and TV set	-	-	1.381
340 miscellaneous electric machine for household	3.386	-	-
343 calculator	-	1.245	-
350 semiconductor element	1.606	-	-
351 integrated circuit	1.682	0.982	1.057
355 motor	-	1.500	-
361 electric bulb	3.554	-	-
363 electric equipment for internal combustion engine	-	-	1.257

note: (1) comparison by unit price.

(2) from the research by MITI

(3) comparison with price in particular cities

Table 3. Domestic Price Differentials from several researches (2)

(comparison by purchasing price level)

Domestic Price / Foreign Price

Input-Output table(1990) items	(1)	(2)
330 copy machine	6.875	-
331 electronic personal calculator	6.875	-
332 word processor	6.875	-
333 miscellaneous electric stationary equipment	6.875	-
334 vending machine	1.304	-
335 amusement equipment	1.304	-
336 miscellaneous equipment for service	1.304	-
337 electric audio equipment	1.237	-
338 radio and TV set	0.813	1.540
339 video equipment	1.237	1.540
340 miscellaneous electric machine for household	0.814	-
341 magnetic tape and floppy disk	0.775	1.540
342 miscellaneous parts for audio equipment	1.090	-
343 calculator	6.857	-
344 peripheral devices of calculator	6.875	-

345 wired telecommunication equipment	0.795	-
346 wireless telecommunication equipment	0.795	-
347 other miscellaneous telecommunication equipment	0.795	-
348 electronic applied equipment	1.304	-
349 electric measurement equipment	1.304	-
353 other miscellaneous parts of telecommunication equipment	0.795	-
354 electric generator	1.420	-
355 motor	1.420	-
357 miscellaneous electric distributing equipment	1.420	-
358 other miscellaneous industrial heavy equipment	1.420	-
359 electric illuminating equipment	0.886	-
360 battery	0.886	-
361 electric bulb	0.886	-
362 electric code and related device	1.337	-

note: (1) from the research by OECD
(2) from the research by related ministries in Japan

Table 4 is a matrix indicating purchasing power parity (PPP) (yen / US dollar) calculated by each main electric and electronic products. This measurement also clarify price

differentials. For an item whose domestic price is comparably high, the figure of its purchasing power parity indicates a large number. Therefore, the bigger the PPP is, the higher the domestic price is.

Table 4. PPP rate by Product (comparison between Japan and the US)

PPP range (Yen/US Dollar)	item
～80	*pressure measuring instrument
81～100	*integrated circuit
101～110	*electric sawing machine
131～140	*transistor
141～150	*motor
151～200	*compressor *electric drill

Source: MITI

3. Difference in Quality of Products

The above stated statistics indicate considerable price differentials of domestic products in Japanese electric and electronic industries. However, one of the characteristics of electric and electronic products is product diversification, which means even products of the same item have different qualities. This point has to be taken into consideration when "real" price differentials, which means price differentials between products with the same quality, are discussed.

In 1995, Economic Planning Agency (EPA) made investigations on prices of consumer products to make international comparison in major populous cities in industrial countries

including Tokyo, New York, London, and so forth. This investigation put stress on price comparison of products with equal or close specifications (brand, function, size, etc.). A part of the result on electric and electronic products are shown in Figure 7. According to it, for some items, price differentials between domestic products and products manufactured abroad can not be observed.

Figure 7. Domestic Price Differentials of Products with the Same Specifications

(price in Japan/price in abroad, mean value)

(Figure 7 cannot be reprinted for a technical reason.)

Chapter 4 Factors Affecting Price Differentials

In chapter 3, significant differentials in domestic price and international price are seen. Additionally, there are implications that some part of the differentials are reflections of product's quality differences. When the product price are compared internationally, it might be very difficult to isolate price difference derived from quality difference. Basically, in electric and electronic industries, the speed of technological innovation is extremely fast, especially compared with other manufacturing industries, and the international market becomes more competitive. Generally, therefore, the product price tends to lower more than the lowering of price of input materials. It can be said, followingly, that domestic price differentials are difficult to indicate compared with product of other industries.

Even so, however, there are items whose domestic price is much higher than that in abroad. In accordance with investigation on firms in electric and electronic industries, including some interviews, some possible factors affecting the price differentials are suggested in this chapter.

1. Factors of Trade Forms

For the product in these industries, one characteristics is diversified manufacturing, which means that there are many sort of brand or specifications. This feature of manufacturing style is partly the result of recent diversification of final consumers' preference. Firms manufacture variety of products, in small numbers for each diversified brand or specifications. This practice leads to inefficient manufacturing or inventory control systems, which eventually cause high domestic price of products.

Product distribution systems have some problems. One typical feature is inefficient delivery service. Because of the diversification of consumer's styles, higher frequency is required for product delivery. It is another factor of cost push.

2. Factor of Contractual and Pricing Form

Generally in manufacturing industries, distribution cost is contractually included in the wholesale price and this charge is not clarified. Therefore, retail operators are not conscious of the specific cost. This often lead to excessive delivery services by the wholesale operators, and efficiency are hard to obtain on distributing cost.

Especially for appliances, wholesale operators and retailers trade on special contract system, on which individual retailer belongs to unique wholesaler. This system can reduce the independent pricing by retailers.

Another contractual factor is rebate trading. The rebate tend to complicate trading form and promote the ambiguity of the market pricing style. As a result, rebate can be used to sustain high price, which is often advantageous to conservative firms.

3. Institutional Factors

In regard to electric and electronic products, there is little institutional impediment against free trade, such as tariffs. However, some non tariff barrier are observed. As the main aspect of the possible impediments, public regulations on product safety or product standardization can be pointed out. Especially, the general standard of product safety has been getting high in Japanese Market. In order to prevent accidents caused by defective products, standards are set by regulations, and manufacturers have to work on accident prevention.

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