# PRICE LEADERSHIP AND THE ANTIMONOPOLY LAW IN JAPAN
## -A STATISTICAL STUDY-

Tatsuyoshi Masuda

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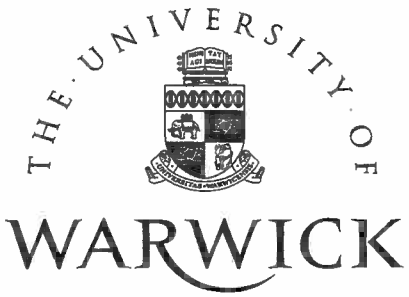


DEPARTMENT OF ECONOMICS

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# Price Leadership and the Antimonopoly Law in Japan
## - A Statistical Study -

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**Abstract**

In 1977 the Japanese Antimonopoly Law introduced the report collecting system on parallel price increases, i.e., price leadership. The substantial aim of this system is to encourage self-restraint with regard to irrational parallel price increase. We investigate some features of price leadership and then assess the regulation effects of the Law. (1) We can judge such price leadership as an effective one that the leading companies played a leading role in both increase date and ratio and then other subordinate companies followed soon after the leading one. (2) Intermediary goods producers shifted fully their cost increase on to their selling price. (3) After this system was enacted, there was a considerable possibility that major companies have practiced discretionary parallel price increases.We conclude that price reporting systems do not always have regulation effects on parallel price increase contrary to the aim of Law.

## 1. Introduction

There has been a steady flow of papers on price leadership since first appears in a paper by Stigler (1947). His study was elaborated by Markham (1951) and further was expanded by Lanzillotti (1957) and Bain (1960). The literature of industrial organization has attempted to distinguish the various types according to differences in market structure, behavioural and even historical conditions (Monopolies and Mergers Commission, 1973, Schere, 1980). Three types of price leadership are commonly distigusihed along with several case studies:dominant price leadership, barometric price leadership and collusive price leadership.

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Dominant price leadership shows that the biggest firm or group sets price " allows the minor firm to sell what they wish at this price, and supplies the remainder of the quantity demanded " (Stigler, 1947, p.444).

Barometric price leadership refers to " the existence of a firm that conventionally first announces price charges that are usually followed by the remainder of the industry, even though this firm may not occupy a dominant position " (Stigler, ibid., p.445). That is, " The barometric firm possesses no power to coerce the rest of the industry into accepting its price - - - it simply passes along information to the 'Big Three' or 'Big Four' "(Markham, 1951, pp.898-899).

Collusive price leadership refers to the market structure that there are only a few firms, with high market shares and similar cost functions. The collusion implies that the price lead by a particular firm or group accepts the other firms.

Although close examination shows the distinction to be rather hazy, such three types have been distincted to theoretically analyze. The dominant price leadership model has been employed to estimate the welfare losses resulant from monopoly power. However, according to Young (1997) the standard dominant price leadership model is not in keeping with a position of relative market power. Since Harberger's (1954) seminal article, there have been numerous estimates to assess welfare loss due to monopoly power. The majority of these estimates suggest that the welfare loss due to monopoly might be regarded as trivial. For example in the case of U.S. estimates according to Harberger (1954), monopoly welfare losses as a percentage of gross output was less than 0.1%. Recent estimate by Gisser (1986) suggested that this losses in U.S. manufacturing are slightly greater than 0.1% of GNP. As a cause that the social costs of monopoly has been estimated as trivial, Young (1997) appointed that such a model has not implied the effects of ' fringe ' firm's behaviour on dominant firm's power.

Barometric price leadership draws its name from the information-sharing in the industry which Markham (1954) said. Thereafter, Stigler (1964) analyzed the importance of information. The literature after Stigler's paper has mostly been attempted with refining the limits of Stigler's thesis (see, e.g., Jacquemin and Slade,1989, Shapiro,1989, and Tirole,1988). However, there are another papers which analyze relationships between price leadership and information-sharing. Rotemberg and Saloner (1990) analyzes that the firms play a supergame and barometric price leadership is explained as just one of many collusive outcomes. Cooper (1996) analyzes potential information asymmetries as a cause of price leadership.

There are another anlysises of its stability and potential causes for price leadership. Judging from some established studies which analyzed theoretically and empirically price leadership, the price leadership's stability depended on market structures (e.g., market share and cost conditions etc.) of the industry concerned (Ono,1980, Uekusa,1982, Aspremont, Jacquemin, Gabszewicz and Weymark,1983). As a cause of price leadership Deneckere *et al.* (1992) and Deneckere and Kovenok (1992) had anlyzed the brand loyalty by consumer and the differences in capacity respectively.

On the other hand, Holthausen (1979) used the risk aversion degree and analyzed theoretically why a particular company is able to play the price leadership role. His conclusion was that the company with a small risk aversion degree (or with higher market share) was able to more easily act as the leader than the company with a large one. When we consider this fact from a realistic viewpoint, his conclusion was that the company with higher market share is able to easily act as the leader. Since, as a company with higher market share has many profitable opportunities in the other commodity markets, the risk aversion degree in

a particular commodity market is usually small. However, we consider that the determination factors of risk aversion degree are market structure factors, e.g., the diversification degree of commodity (or specialization degree), difference of cost, and market share.

The best way to enforce a price leadership is that competing firms can directly observe each other's price information. Even if firms do not co-operate in the usual sense of the word, observing each other's price information may clearly reduce the strength of competition. Because price competition in oligopoly market frequently results in destructive competition. If we can prove that such price leadership was practiced through a negotiation or agreement among companies, we can punish them as a price cartel. As we could not prove without evidence of explict information exchange, hitherto price increases through price leadership[1] were difficult to regulate legally. However, price leadership have the same economic abuses as a price cartel, and furthermore the fact that price leadership occurs among companies with essentially different cost structure, intimates that it is an implict price cartel. The Japanese Fair Trade Commission (JFTC in the following) introduced newly the price increase reporting system [Article 18-2] to oversee such price leadership in the 1977 amendment, which was also the year when the Japanese Antimonopoly Law (JAML in the following) was amended in order to strengthen the regulation effects[2]. Before this system was enacted, in the 1973 oil shock many hidden cartel[3] (*Yami Karuteru* in Japanese) frequently were formed by large companies.

Generally speaking, it is said that price reporting system or price notification system " by converting otherwise 'closed price' markets into 'open price' markets, cause the pricing policies that they influence to conform to the general pattern" (Richardson, 1967, p.362). Antimonopoly authority hopes that gathering and publishing firm-specific transactions prices would improve information on the buyer side through the market transparency whereby seller competition would be stimulated and average transactions prices pushed down ( see Albæk, Møllgaard and Overgaard, 1997, p.432). In 1993 the Danish antitrust authority, the Competition Council introduced the system to gather and regularly publish such transactions prices for the concrete industry. Albæk, Møllgaard and Overgaard (1997) investigated whether such a system stimulated price competition in the industry concerned or not. As a result of investigation[4], they concluded that " publication of prices allowed firms to reduce the intensity of oligopoly price competition and, hence, led to increased prices contrary to the aim of the authority " (p.429).

The purpose of this paper is to investigate the features of price leadership under the price reporting system in JAML and to assess the regulation effects by the JFTC. In section 2, we survey the contents and features of reporting system. In section 3, we examine the market structure of the report collected items. In section 4, we investigate the features of price leadership. In section 5, we investigate whether many items have shifted the cost increase on to the selling price. Finally, section 6 discuss the regulation effects by the JFTC and point out a defect of this system.

## 2. The Details and Implications of Reporting System

Part of this system is explained as follows, " when, in an oligopolistic market, major companies raise prices simultaneously, the JFTC can order such companies to provide the JFTC with reasons justifying the price increase. This is simply a reporting system which does not involve any substantial control over corporate behaviour. However, in view of the fact that companies usually do not wish to submit detailed financial data to the JFTC, this system serves as a deterrent to simultaneous price increases by companies in an oligopolistic market

" (Matsushita, 1990, p.5). The JFTC specifies in advance the items covered every fiscal year, and when any of those items have parallel price increases, the JFTC gathers reasons relating to such pricing from the companies concerned, and then send its outline as the *Annual Report* (*Nenji Hokoku* in Japanese) to the Diet and thereafter publishes a white paper open to the public. Through this procedure, the JFTC exposes the companies concerned to social criticism and encourages self-restraint with regard to irrational parallel price increase.

## 2.1 The Details of the Report Collecting System

The report collecting system was ruled in Article 18-2 and consists of the two requirements[5], which is quoted in the following author's translation. In the event the market structure requirements are satisfied, and when major companies raised their price simultaneously and satisfied the report collecting requirements, the JFTC can order such companies to provide the JFTC with reasons justifying the price increase.

(i) The Market Structure Requirements
The total prices of goods or the total prices of services of the same description supplied in Japan during a one-year period designated by the Cabinet Ordinance, is in excess of 30 billion yen[6], and the ratio of the total amount of such goods or services supplied by the three largest companies in terms of volume of supply to the aggregate volume of such goods or services of the same description supplied in Japan during such one-year period exceed 70%.

(ii) Report Collecting Requirements
Two or more major companies including the largest one (this term means the five companies each of which account for 5% or more of the aggregate volume and rank among the five largest companies in Japan) raise the price they use as the basis of their transactions in such goods or services of the same description by an identical or similar amount or percentage within a period of 3 months.

## 2.2 Implication of Requirements

Market structure requirements prescribes, in advance, such a market that price leadership can be easily practiced. Companies that this requirement apply to are mainly big companies which belong to highly concentrated oligopolistic industry, in which effective competition does not fully work.

For the report collecting requirements which shows the contents of parallel action in Economics, a significant feature is that it is not necessary for the leading company to first raise its price. For example, after a subordinate company first raised its price, if the leading company followed such a subordinate, the period covered will be a period of 6 months before and after this date as we standardize the date which the leading company raised its price. That is to say, this provision regulates not only dominant price leadership, but also the barometric one. As a reason why this provision accounts for much of the leading company's price increase, we can consider as follows. Even if a subordinate company expresses its price increase, when the leading company which occupies the largest market share and thus holds substantial pricing power in the industry concerned does not follow the subordinate, this provision assumes that price competition still exists in the market. This thinking corresponds with Holthausen's (1979) conclusion.

In addition to the current quotation, wholesale and retail prices, the following cases also will be covered. When the transaction is performed through an alteration of the discount rate from current quotation, it is often the case that the current quotation is still fixed, but the discount rate is reduced. In such a case, this provision regard this reduction of discount rate as the price increase. In another case, when the standard price is fixed and then the volume is reduced, this provision regards this reduction as the essential price increase. However, when an objective cause of price increase is obvious, such cases are excluded (for example, the price increases incident to the increase of the authorized price in which the increase is admitted by law or to the increase of commodity and liquor taxes). Furthermore, when the domestic market is directly connected with the market price of an internationally traded commodity and where a price increase in the former market is an identical or similar amount or percentage with an increase in the latter one, this provision does not regard such an increase as a parallel increase.

An identical or similar amount or percentage is said to make up the following difference. Comparing the amount or percentage of increase of the leading company with that of subordinate one, the difference is the degree[7] that it did not cause customer movement to occur.

When the price increases satisfied the above report collecting requirements, the companies concerned must report the reasons for the increase to the JFTC. The JFTC will concretly order the price informations (price increase ratio or amount, price increase date, and the reasons for increase). In such a case, the JFTC merely asks for the reasons for the price increase and do not inquire whether the companies concerned came to a mutual understanding or not and furthermore do not force them to return to the previous price level. Through pressure exerted on the companies concerned in the process of fact-finding, this provison merely expects to make the parallel price increase self-restraining.

## 3. The Market Structure of Report Collected Items

The period of analysis is from 1977 to 1991. In 1991 the number of the items covered was 83 items. The accumulated numbers that the JFTC collected as reasons for the price increase was 53 items, and the number of campanies was 177. Of which, we will analyze 31 items[8]. We call the repeated offence items such 19 items which the JFTC collected over twice. That is to say, during the period of analysis, the items that the JFTC collected three times were 9, and those that the JFTC collected twice were 10. The items that the JFTC collected once were 12. Hereafter, we call these 12 items the single offense items. We can obtain data (e.g., price increase ratio or amount, price increase date, cost increase ratio or amount, total supply value, and the top three companies concentration) on these items from the *Annual Report*.

We can consider the following hypothesis with regard to repeated offense items. As many of these items have a low growth rate, its demand curve is usually fixed and furthermore its elasticity is small. The concentration ratio difference between leading company and subordinate is large, when marginal cost conditions alter and the leading company exhibits profit maximization behaviour, and in the event a subordinate company needs to increase its price, if the leader refrains from raising its price simultaneously, customers of the subordinate may be drawn to the leader, thereby it is very likely that market share differences among companies enlarge even more and thus the leading company comes to monopolize the industry concerned. Under such a market structure, in order to evade to arouse public attention in relation to antimonopoly policy, the leading company must follow the subordinate's price increase to continue to exist them within the business sector. Provided

that the leading company does not follow the subordinate, the leader, by thus acquiring a larger market share, would then find itself in a position where raising prices is even more difficult. Such a parallel price increase is frequently called ' the live and let live policy '. It is assumed that through this policy, major oligopolistic companies increase the total supply value in the business sector.

In this section, to examine the above hypothesis we calculate the production concentration ratio and the growth rate of domestic total supply value, and then consider some features on market structure of repeated offense items.

Table 1 shows the production concentration ratio type, and many items belonged to the oligopoly types [ I ] and [ II ]. Of which, many items had a large concentration ratio difference between the leading company and the second ranked one. This feature was particularly true in repeated offense items. That is to say, judging from the concentration ratio type, many of the price leaderships were carried out under circumstances in which the concentration ratio difference between leading company and subordinate was large.

Table 2 shows the growth rate of domestic total supply value. The majority of repeated offense items belonged to the low growth rate. Next, we examined the repeated offense items on the trends of domestic total supply value and the top three companies concentration ratio ($CR_3$) after every price increase. Every value for the second increase were larger than previous increase. Comparing previous increase of the top three companies concentration ratio, 3 items had identical ratios, 3 items had increased ratios, and 4 items had lower ratios. On the other hand, the three increase (9) items had the following trend. The value of 2 items repeatedly fluctuated. The value of one item increased in the first increase, and became an identical value at the time of second increase. Comparing every previous increase of the top three companies concentration ratio, one item always had a larger ratios than in the previous increase, 5 items had a reduced ratio, the ratio for one item repeatedly fluctuated, and 2 items had identical (a decrease) and decrease (an identical) ratios.

Generally speaking, most items have a larger supply value after every price increase, but the top three companies concentration ratios tend to decline more after every price increase. We can assume that the decline of the concentration ratio suggests that there is an inferiority of competitive advantage over the other markets and that the parallel price increase in order to supplement this inferiority results in an increase of the total supply value. We can judge that the above hypothesis was supported through these data.

Table 1.
Table 2.

# 4. The Current Situation of Price Leadership

The roles of price leader vary with the types, i.e., price increase ratio (or amount) and price increase date. This section examines the roles of price leader to distinguish the four cases (see Table 3). First, a particular company acts as a leader both price increase ratio and price increase date. Second, a particular company acts as a leader of price increase ratio and acts as a follower of price increase date. Third, a particular company acts as a follower of price increase ratio and acts as a leader of price increase date. And fourth, a particular company acts as a follower both increase ratio and increase date.

Furthermore we divide companies into two classes according to the market share, i.e., the company with the largest market share within each industry is the leading company and all the other companies are the subordinates.

Table 3.

## 4.1 The Price Leadership Types

We classify price leaderships into dominant and barometric price leadership. Dominant price leadership shows that, on the price increase date, the leading company raises its price first and then the subordinate follows the leader's increase date. On the other hand, barometric price leadership indicates that a subordinate company takes the leadership role and then the leading one follows the subordinate's increase. Similarly, with regard to the price increase ratio, dominant price leadership (●) indicates that the increase ratio of the leading company is larger than the subordinate's ratio, and barometric price leadership (Δ) indicates the opposite relationship.

Table 4 shows that the increase types distinguished between date and ratio. On the increase date, the two types of price leadership were nearly the same in total numbers. In the increase ratio case, the barometric price leadership type (Δ) was extremely numerous in total. With regard to repeated offense items, the barometric type (Δ) was about twice as many as the dominant one (●).

Tabel 4.

Table 5 shows the case where the increase date and the increase ratio are combined into one. We notice that even if the leading company raises faster than a subordinate, many of its increase ratios were lower than the subordinate (dominant, Δ). On the other hand, when the subordinate companies raise faster than the leading one, many of their increase ratios were higher than the leading one (barometric, Δ). This fact was particularly prevalent in the three times increase items.

From the above analysis, we reach the following conclusion. The leading company usually takes the leadership role on the increase date, but the companies which actually necessitate the price increase are frequently the subordinate companies rather than the leading ones.

Table 5.

## 4.2 The following of Price Increase Date and Ratio

We can investigate the effectiveness of price leadership by calculating the differences between leader and follower in the increase date[9] and the increase ratio. That is to say, in order to make price leadership effective, the industry concerned had better reduce the follower's differences. This is because, as the differences enlarge, market uncertainty also increases and thus order within the business sector will change for the worse.

Table 6 shows the differences of price increase date and ratio. On the increase date, many cases followed with a difference of 16-20 days. Especially, when the leading company played a leadership role, the subordinates followed mostly within this period. When the leading company played a leadership role, the average following day was shorter than when the subordinate did so. In the increase ratio, many cases followed with a difference of 0.1-0.5%. When the leading company played a leadership role (●), the difference fell within the largest width 2.5%. However, when the subordinate took a leadership role (Δ), the differences varied. When the leading company played a leadership role, the average following ratio was smaller than when the subordinate did so.

Table 6.

Table 7 shows the trend for repeated offense items. The increase dates did not show any definite features, but in the increase ratios many cases became Δ after every increase. It is obvious that we can not observe a rhythmical change after every increase. For example, in the beer industry[10] before this system was enacted, except for when every company raised the beer price all at once such as in raising the liquor tax, the barometric price leaderships which Sapporo and Asahi Breweries played in rotation were a typical pattern. However, when we observed the three times increases after this system was enacted, the increase date pattern changed as follows, i.e., barometric→dominant→dominant, and the increase ratio pattern changed as follows, i.e., Δ → ● → Δ (wholesaler's recommended price) and ● → ● →● (retailer's recommended price). Obviously, the increase pattern caused the leading company Kirin Brewery (dominant, ●) to openly take the leadership role.

This finding suggests evidence that, when the company concerned reported the rational reasons (e.g., the majority of reasons are an increase of productive factor prices) for an increase in the price under Article 18-2 and they were admitted not be illegal, as the parallel price increase is not judged to be illegal, the company can carry out price leadership without any unlawful intent.

Table 7.

When we observed the increase year interval from Table 8, 8 items increased two years later and 5 items increased three years after the first year of increase. In total, 16 items increased within three years, of which 13 items were raised for a second time. This finding suggests that the learning effect of price leadership is greater prior to the second increase. On the other hand, only 2 items (ham & sausage and daily newspaper) reduced their interval for the third increase.

Table 8.

From the above investigation, we can understand the features of price following trend as follows. When the leading company played the leadership role in both date and ratio and then the other companies followed quickly after the leading one, we can judge such a price leadership as an effective one. When we examine the change of following trend in repeated offense items, we can see that the learning effect worked until the second increase, and after that change there were many cases in which the subordinate company's increase ratio became larger than the leading company's ratio.

## 5. The Shifting Power of the Cost Increase on the Selling Price

Many companies which the JFTC filed a report answered that many of the reasons[11] for a rise of price are to control a reduction of revenue due to the increase of productive factor prices (e.g., raw material, processing costs, and wages). In this section, we estimate the following model to examine the shifting power of cost increase on the selling price.

$$Log\,(Y_i) = a_0 + a_i\,Log\,(X_i) + U_i.$$

The dependent variable ( $Y_i$ ) is the price increase ratio relative to previous year. The explanatory variable ( $X_i$ ) is the cost price increase ratio relative to previous year. We can obtain these data from the *Annual Report*.

From Table 9, we can understand that the total items (122 cases), the once increase items (30 cases), and the two increases items (33 cases) had a considerable shifting power. The three times increase items (59 cases) did not always have a significant correlation. Of which intermediary goods only, the tire & tube and the cast iron pipe, had positive and significant correlations. Furthermore, when we carried out the same analysis on the steel materials, all items except for one also had positive and significant correlations (see Table 10). From these regression analysis, we can conclude that intermediary goods producers shifted their cost increase fully on to their selling price.

Table 9.

Table 10.

# 6. Concluding Remarks

As for the features of price leadership, we reached the following results. (1) The leading company often took a leadership role on the increase date, but the companies that actually necessitated the price increases were frequently the subordinate companies rather than the leading ones. (2) When the leading company acted in a leadership role, the following date and ratio differences were smaller than when the other companies did so. That is to say, we can judge such price leadership as an effective one. We can imply from this fact finding that an equilibrium price level in the industry concerned depended essentially on the pricing of leading company. This fact corresponded with the meaning of report collecting requirements. (3) Intermediary goods producers shifted fully their cost increase on to their selling price. (4) As the order of leadership did not generate a rhythmical change after this system was enacted, contrary to the substantial aim of law, there was a considerable possibility that major companies have practiced discretionary parallel price increases.

Since this system was enacted, it had often been appraised as follows. As this system has not regulated an oligopolistic market structure itself or market conduct itself, it is not necessarily clear what meaning and effect it has. The JFTC merely asks for the reason for price increase, and many reasons for price increases were due to the increase of productive factor prices. However, such cost increases are able to be often absorbed through the rationalization effort within company. This effort results in stimulating competition among companies, and this is the substantial aim of JFTC. Therefore, in the event the JFTC simply admits to shifting the cost increase on the selling price, he fails to achieve that aim.

When the JFTC examines an effectiveness of price leadership and then he can confirm an effectiveness, the JFTC ought to investigate an existence of any communication of intention among companies. Because if the JFTC can prove such an existence, such pricing will be punished as an illegal action, i.e., price cartel. If the JFTC does not such an investigation, this system merely justifies the companies to increase their prices cooperatively.

## Notes

1) Imamura (1992) analyzed the limits in both cartel regulation under the law and cartel regulation under consciou parallelism. See Posner (1976, pp.42-47) for the consciou parallelism.

2) On the history and content of antimonopoly policy in Japan, see the Executive Bureau of the Fair Trade Commission (1997), Matsushita (1990, Chapter 1), and Nakagawa (1984, Chapter 5).

3) It was often considered that this system has an indirect aim to control price upswings, but Ide (Hatta and Ide, eds., 1989, Chapter 3) found that the JFTC did not always achieve this aim.

4) Fuller *et al.* (1990) and Schmitz and Fuller (1995) supported this finding. They have examined the effects of contract disclosure legislation passed by the US Congress on US railroad freight rates. They conclude that contract disclosure facilitated rate coordination and , hence, led to increased rate. See Albæk, Møllgaard and Overgaard, 1997, p.441. The above two papers (1990 and 1995) were given to me by Per B. Overgaard.

5) For a view of the JFTC on these requirements, see Shoji Homu Kenkyukai (1977).

6) This amount was raised 60 billion yen after 23 July 1993.

7) According to the JFTC's practical affairs, in manufactured goods where the difference of quality is less, it is said to be about 10 %. In consumer's goods where the product differentiation is significant, it is said to be about 20-30 %. However, these differences depend entirely upon the circumstances.

8) The following is the items covered.

Three increases items: Tire and Tube for motor vehicle, Cast Iron Pipe, Cold-Rolled Electrical Steel Belting, High-Strength Tention Steel, Tin Plate, Ham and Sausage (Fish meat), Daily Newspaper (Nationwide), Beer, Automobile.

Two increases items: Glass Bulbs for Cathode-ray Tubes, Mayonaise and Dressing, Instant Coffee, Photograhic Color Film (Popular), Whiskey, Welding Rods, Cold-Rolled Wide Strip, Steel Rail, Synthetic Washing Preparation, Condensed Milk.

Single increase items: Bus and Truck Chassis, Ordinary Steel and Piping Steel Pipe, Coke (Casting), Steel Belting, Butter, Canning (Food), Tractors (Construction), Bearing Steel, Photographic Paper, Wide Strip, Plate Glass, Motorcycles.

9) Lanzillotti (1957) assumed that " A ' successful ' price lead is defined as one which most sellers follow upward or downward within a period of thirty days "(p.58, footnote 13).

10) See Uekusa (1982, pp.242-244) and Konishi and Hashimoto (1976, pp.88-90). The plate glass industry has practiced rotational price leadership in which leadership changed rhythmically (Uekusa, ibid., pp.245-246).

11) During the period from December 1977 to February 1992 parallel price increases were 250 cases, and we can classify reasons for increases by causes as follows. Many reasons for price increases were due to cost increases, which held first rank, and occupied 54.4% (138 cases) of the total cases. Improvement of revenue and revision of profit rate, which require an increase in the mark-up ratio to secure nomal profit, held 11.2% (28 cases). Including other costs, reasons for cost increases held 94.8% (237 cases) of the total cases.

However, there were peculiar reasons related to the industry concerned. For example, in 1988 the beer industry, which equipped fully the distribution network, had raised the beer price to assure the margin in distribution sector, or had raised in compliance with a distribution sector's request. We can understand that these were unavoidable reasons. On the other hand, in 1979 the plate glass industry had raised its price to necessitate altering the price system, which had coped with the change of demand incidental to the change of cost formation. In 1984, Konishiroku Shashin Kogyo, a maker of photographic color film raised its price for the reason that if other companies raised their prices and only Konishiroku did not so, the latter's commodity image strategy would be in a disadvantage position. We consider the latter two cases as examples of where the reasoning is not always rational.

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Table 1. The Production Concentration Ratio Types of Report Collected Items

| Concentration Ratio | | Item Numbers | (of which Twice and Three Times) |
|---|---|---|---|
| Oligopoly Type [I] | (1) | 13 | (6, 3) |
| | (2) | 1 | (1, -) |
| | (3) | 2 | (1, -) |
| | (4) | 2 | (-, 1) |
| Oligopoly Type [II] | (1) | 5 | (1, 2) |
| | (2) | 2 | (1, 1) |
| | (3) | 1 | (-, 1) |
| | (4) | 2 | (-, -) |
| Oligopoly Type [III] | (1) | 1 | (-, 1) |
| | (2) | 1 | (-, -) |
| Total | | 30 | (10, 9) |

Notes: 1) The bus · truck chassis and the coke ( single increase items ) are not included as we can not confirm their figures. The Motor Cycles are divided into over 125cc and under 125cc classes [I](3) and [II](4), respectively.

2) The standard types (Standard year : 1980, Senoo, 1983, pp.76-77).

(A) Oligopoly Type [I] (Over H.I. 3,000).

(1) $CR_1$ is 50%, and the difference between leading company and second ranked one is large.

(2) $CR_2$ is over 75%, and the difference between second and third ranked companies is large.

(3) $CR_3$ is over 90%, and the difference between third and fourth ranked companies is large.

(4) $CR_4$ is 100% or $CR_3$ is 100%, and the differences among companies are small.

(B) Oligopoly Type [II] (H.I. 1,800 - 3,000).

(1) $CR_1$ is 35%, and the difference between leading company and second ranked one is large.

(2) $CR_2$ is over 50%, and the difference between second and third ranked companies is large.

(3) $CR_3$ is over 70%, and the difference between third and fourth ranked companies is large.

(4) $CR_2$ is over 50%, and the differences among companies under this concentration ratio are small.

(C) Oligopoly Type [III] (H.I. 1,000 - 1,400).

(1) $CR_3$ is over 50%, and the difference between third and fourth ranked companies is large.

(2) $CR_4$ is over 40%, and the differences among companies under this concentration ratio are small.

Table 2. Growth Rate of Domestic Total Supply Values (Nominal)

| | Twice (10 Items) (i) | Three Times (9 Items) (i) | (ii) |
|---|---|---|---|
| Growth (a) | 1 | - | - |
| Rate (b) | 1 | - | - |
| (c) | 8 | 9 | 7 |
| (d) | - | - | 1 |
| (e) | - | - | 1 |

Notes: 1) Classification of Growth Rate (Senoo, ibid., p.67).

| | |
|---|---|
| (a) High Growth Rate Items | 2.99-2.00. |
| (b) Stable Growth Rate Items | 1.99-1.50. |
| (c) Low Growth Rate Items | 1.49-1.00. |
| (d) Stagnation Items | 0.99-0.75. |
| (e) Declining Items | under 0.74. |

2) (i) : Value in the first increase / Value in the second increase.
(ii): Value in the second increase / Value in the third increase.

Table 3. Roles of A Particular Company

| Types | Roles (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Price increase ratio | L | L | F | F |
| Price increase date | L | F | L | F |

L: Leader, F: Follower

Table 4. Price Leadership Types (The number of increases)

| | Repeated Offense Items | | Single Offense | Total |
|---|---|---|---|---|
| | Twice | Three Times | | |
| <Increase Date> | | | | |
| Dominant | 7 | 7 | 5 | 19 |
| Barometric | 7 | 8 | 7 | 22 |
| Identical Day | 2 | 1 | 1 | 4 |
| Unknown | 4 | 13 | 4 | 21 |
| Total | 20 | 29 | 17 | 66 |
| <Increase Ratio> | | | | |
| ● | 7 | 8 | 6 | 21 |
| △ | 12 | 16 | 7 | 35 |
| Identical Ratio | 5 | 6 | 2 | 13 |
| Unknown | - | 3 | 1 | 4 |
| Total | 24 | 33 | 16 | 73 |

Notes: 1) Many of unknowns and identical ratios are the steel products.
2) Dominant: the leading company raises price faster than the subordinates.
Barometric: the subordinate company raises price faster than the leading.
●: the leading company's increase ratio is larger than the subordinate company's one.
△: the subordinate company's increase ratio is larger than the leading company's one.

Table 5. Increase Date and Ratio Types (The number of increases)

| Date · Ratio | Repeated Offense Items | | Single Offense | Total |
|---|---|---|---|---|
| | Twice | Three Times | | |
| Dominant · ● | 3 | 4 | 2 | 9 |
| · △ | 5 | 6 | 3 | 14 |
| Barometric · ● | 2 | 1 | 3 | 6 |
| · △ | 6 | 9 | 5 | 20 |
| Identical Day · ● | 1 | 1 | 2 | 4 |
| · △ | 1 | 1 | - | 2 |
| Unknown · ● | - | 4 | 1 | 5 |
| · △ | - | 1 | - | 1 |
| · Identical Ratio | 4 | 6 | 2 | 12 |
| Total | 22 | 33 | 18 | 73 |

Table 6. Following of Increase Date and Ratio

| <Differences of Date> | The Leading Company's Leadership Role | | | The Subordinate Company's Leadership Role | | | Total |
|---|---|---|---|---|---|---|---|
| | Repeated Offense Items | Single Increase Items | Subtotal | Repeated Offense Items | Single Increase Items | Subtotal | |
| 1 - 2 days | -/1 | - | 1 | - | - | - | 1 |
| 3 - 6 | 2/- | - | 2 | - | - | - | 2 |
| 7 - 10 | 3/1 | 1 | 5 | - | - | - | 5 |
| 11 - 15 | -/2 | - | 2 | 3/- | - | 3 | 5 |
| 16 - 20 | 4/1 | - | 5 | 2/- | 1 | 3 | 8 |
| 21 - 30 | - | - | - | -/1 | 1 | 2 | 2 |
| 31 - 36 | -/1 | 1 | 2 | -/3 | - | 3 | 5 |
| 37 - 42 | - | 1 | 1 | -/1 | - | 1 | 2 |
| 50 - 65 | - | - | - | 1/1 | 3 | 5 | 5 |
| 80 - 100 | - | 1 | 1 | -/2 | - | 2 | 3 |
| 101 - 110 | - | 1 | 1 | - | 1 | 1 | 2 |
| 120 - 125 | -/1 | - | 1 | - | 1 | 1 | 2 |
| Total | 9/7 | 5 | 21 | 6/8 | 7 | 21 | 42 |
| Average Following Day | 13.1/30 | 57 | 29.2 | 22.2/49.1 | 62.9 | 46 | 37.6 |

| <Differences of Ratio> | The Leading Company's Leadership Role | | | The Subordinate Company's Leadership Role | | | Total |
|---|---|---|---|---|---|---|---|
| | Repeated Offense Items | Single Increase Items | Subtotal | Repeated Offense Items | Single Increase Items | Subtotal | |
| 0.1-0.5 % | 5/3 | 3 | 11 | 3/5 | 2 | 10 | 21 |
| 0.6-1.0 | -/2 | 1 | 3 | 5/2 | 2 | 9 | 12 |
| 1.1-1.7 | 1/1 | 1 | 3 | 1/3 | - | 4 | 7 |
| 2.0-2.5 | 1/2 | 1 | 4 | 1/- | - | 1 | 5 |
| 2.6-3.0 | - | - | - | 1/1 | - | 2 | 2 |
| 3.1-4.0 | - | - | - | 1/2 | 1 | 4 | 4 |
| 7.0-9.0 | - | - | - | -/3 | - | 3 | 3 |
| 9.1-10.1 | - | - | - | - | 2 | 2 | 2 |
| Total | 7/8 | 6 | 21 | 12/16 | 7 | 35 | 56 |
| Average Following Ratio | 0.6/1.03 | 0.9 | 0.8 | 1.3/2.7 | 3.6 | 2.4 | 1.8 |

Notes: (1) This table does not include the identical date and ratio.
(2) The difference of date is " the last increase date - the first increase one " .
The difference of ratio is " the highest increase ratio - the lowest increase one " .
(3) */*: The upper column shows the two increase items. The lower column shows the three increase items.

Table 7. Change of Increase Date and Ratio Types in Repeated Offense Items

| Change of Increase Date Types · The Number of Times | | Change of Increase Ratio Types · The Number of Times | |
|---|---|---|---|
| <Three Increases> | | | |
| Barometric → Dominant → Dominant | 1 | △ → ● → △ | 1 |
| Dominant → Dominant → Dominant | 1 | △ → ● → ● | 2 |
| Barometric → Barometric → Barometric | 1 | △ → △ → △ | 3 |
| Barometric → Barometric → Dominant | 1 | ● → ● → △ | 2 |
| | | ● → △ → △ | 1 |
| Total | 4 | | 9 |
| <Two Increases> | | | |
| Dominant → Barometric | 2 | △ → △ | 4 |
| Barometric → Dominant | 2 | △ → Identical Ratio | 1 |
| Dominant → Dominant | 1 | ● → ● | 2 |
| Barometric → Barometric | 1 | △ → ● | 2 |
| Dominant → Identical Day | 1 | ● → △ | 2 |
| Barometric → Identical Day | 1 | Identical Ratio → Identical Ratio | 2 |
| Total | 8 | | 13 |

Notes: 1) For example, when the changes of increase ratio types are ● → ●/△, we calculated the changes twice as ● → ● and ● → △. Similarly, when the changes are △ → △/Identical, we calculated the changes twice as △ → △ and △ → Identical.

2) We excluded an unknown date and ratio in the second and third increases.

Table 8. Price Increase Year Interval

| Interval | Two Increase Items (10) | Three Increase Items (18) | | Total (28) |
|---|---|---|---|---|
| | | Second Time (9) | Third Time (9) | |
| 1 Year Later | 1 | 1 | 1 | 3 |
| 2 | 3 | 4 | 1 | 8 |
| 3 | 2 | 2 | 1 | 5 |
| 4 | 1 | - | - | 1 |
| 5 | 2 | 1 | - | 3 |
| 6 | - | - | 1 | 1 |
| 7 | - | - | 1 | 1 |
| 9 | - | - | 3 | 3 |
| 10 | - | 1 | - | 1 |
| 11 | 1 | - | 1 | 2 |

Table 9. The Shifting Power of the Cost Increases on the Selling Price

| | a0 | a1 | $R^2$ | D.W. |
|---|---|---|---|---|
| Total 19 Items (122 Cases) | 0.932*<br>(4.338) | 0.507*<br>(6.176) | 0.235 | 0.506 [38.143*] |
| Single Increase 6 Items (30 Cases) | -0.789***<br>(-1.947) | 1.136*<br>(8.494) | 0.71 | 0.573 [72.155*] |
| < Repeated Offense Items > | | | | |
| Twice Increase 8 Items (33 Cases) | 1.225*<br>(3.469) | 0.321**<br>(2.341) | 0.123 | 1.172 [5.482**] |
| Three Times Increase Items (59 Cases) | 2.017*<br>(6.999) | 0.018<br>(0.144) | -0.017 | 0.365 [0.021] |
| of which Daily Newspaper (13 Cases) | 2.57*<br>(10.3) | -0.041<br>(-0.318) | -0.081 | 1.331 [0.101] |
| Ham and Sausage (14 Cases) | 2.34*<br>(6.87) | 0.126<br>(0.974) | -0.004 | 0.626 [0.948] |
| Beer (12 Cases) | 0.236<br>(0.273) | 0.506<br>(1.612) | 0.127 | 0.585 [2.6] |
| Tire and Tube (11 Cases) | 1.126*<br>(6.0) | 0.223**<br>(2.54) | 0.353 | 1.725 [6.45**] |
| Cast Iron Pipe (9 Cases) | 0.926**<br>(2.83) | 0.546*<br>(4.01) | 0.653 | 2.014 [16.076*] |

Note: The price increase ratios are the wholesale or production prices.
$R^2$ : Coefficient of determination adjusted for degrees of freedom.
( ): t-values, [ ]: F-values.
*, **, ***: Significant at the1%, 5%, and 10% level (two-tailed test) , respectively.

Table 10. The Shifting Power of the Cost Increases on the Selling Price in the steel Materials (Repeated Offense Items)

| | a0 | a1 | $R^2$ | D.W. |
|---|---|---|---|---|
| Total 5 Items (48 Cases) | -0.442<br>(-0.237) | 1.02*<br>(4.9) | 0.329 | 0.936 [24.014*] |
| Two Increases 2 Items (18 Cases) | 603.838**<br>(2.428) | 0.734*<br>(26.976) | 0.977 | 2.762 [727.713* ] |
| of which Cold-Rolled Wide Strip (10 Cases) | 0.802***<br>(2.008) | 0.889*<br>(20.11) | 0.978 | 2.079 [404.398* ] |
| Steel Rail (8 Cases) | 0.196<br>(0.617) | 0.952*<br>(27.176) | 0.991 | 2.608 [738.525* ] |
| Three Increases 3 Items (30 Cases) | -1.771<br>(-0.549) | 1.167*<br>(3.231) | 0.246 | 0.887 [10.437* ] |
| of which Cold-Rolled Electrical Steel Belting ( 7Cases) | 5.321<br>(1.711) | 0.404<br>(1.154) | 0.052 | 1.148 [1.332] |
| High-Strength Tension Steel (11 Cases) | -6.636<br>(-1.173) | 1.681**<br>(2.657) | 0.377 | 0.645 [7.06] |
| Tin Plate (12 Cases) | -2.524<br>(-0.483) | 1.26***<br>(2.154) | 0.249 | 1.212[4.642] |

Notes: 1) On the prices of steel materials, the FTC publishes the price increase or cost price increase amounts.
2) $R^2$ : Coefficient of determination adjusted for degrees of freedom.
( ):t-values, [ ]: F-values.
*,**,*** : Significant at the 1%, 5%, and 10% level, respectively.