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A Study of Prices in the Successive Transactions in the Channels of Distribution of Manufacturers' Sales Subsidiaries in Japan based on a Survey*

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I INTRODUCTION

This paper involves a statistical investigation into the marketing channels or channels of distribution of the manufacturers who own their sales subsidiaries in Japan. The channels will be investigated as successive stages of transactions. If a manufacturer puts his retail price (or final price to users) so that he expect retailers or final distributors to sell to users at a price equal to 100, how much are the following sales prices at the various stages of transactions?

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We can usually show values of sale prices (or prices to sell) at various stages as the mean values computed from our sample. We practise such an ordinary computation in the paragraph III. 2. 1. Such a computation, however, will also be improved into the regression analysis. Our sample consists of two groups of sample points. In one group channels are such as manufacturers — manufacturers' local sales subsidiaries (— secondary wholesalers) — retailers — users. In another group channels are such as manufacturers — manufacturers' local sales subsidiaries — users. The length of the latter channels are shorter than the former. The ordinary computation involves the sum of two groups. The gross margins of manufacturers' local sales subsidiaries in the latter channels should consist of the gross margins of manufacturers' local sales subsidiaries, (of secondary wholesalers, if they exist) and of retailers in the former.

Let us call the sum of the gross margins of manufacturers' local sales subsidiaries and secondary wholesalers "gross margins in wholesale" and the gross margins of retailers "gross margins in retail". If we put gross margins in wholesale on the x-axis and gross margins in retail on the y-axis, and we plot the dots on the x-y plane, we may estimate the values of y by the linear regression analysis. Then if we put gross margins in retail (when we put gross margins in wholesale equal to zero) on the x-axis, or gross margins in wholesale (when we put gross margins in retail equal to zero) on the x-axis, and manufacturers' gross margins on the y-axis, we may estimate the values of y by linear regression analysis. Hence, the perspective of this paper is expressed in the linear regression analysis mentioned above.

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II INTRODUCTORY STATISTICS OF MANUFACTURERS AND MANUFACTURERS' SALES SUBSIDIARIES IN JAPAN

II. 1 The definition of Manufacturers' Sales Subsidiaries

Definition 1 : *National Survey of Prices*, Bureau of Statistics, Office of the Prime Minister, Japan defines Manufacturers' Sales Subsidiaries as the companies incorporated by manufacturers with their own capital, which is more than 50% in capital of manufacturers' sales subsidiaries, for the purpose that the latter sell their products through the former in the domestic market.

Definition 2 : The author of this paper defines Manufacturers' Sales Subsidiaries as companies incorporated by manufacturers with their own capital for the purpose that the latter sell their products through the former in the domestic market. In the author's definition, it is not important to specify the volume of capital shared by parent manufacturers. Actually, some parent manufacturers share capital in sales subsidiaries with wholesalers, who are incorporated into manufacturers' sales subsidiaries, in the ratio of 1 : 9, namely, parent manufacturers' investment are only 10% of subsidiaries' capital.

We will use the definition by the author in this paper hereafter.

II. 2 Strata, Industries, Scales

We can classify manufacturers' sales subsidiaries according to the strata, industries and scales to which the parent manufacturers belong. We will abridge manufacturers' sales subsidiaries to MSS.

Strata

1. Sole MSS exclusively dealing with all or almost all products manufactured by their parent manufacturers or by the divisions of their parent manufacturers.

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2. Local (territorial) MSS covering the national market, through each of them covers a prefecture or a smaller area than it.

Industries

1. Foods and Drinks 2. Textile fibres and Related 3. Fabric and Apparel 4. Lumber and Wood products 5. Pulp & Paper 6. Chemicals 7. Petroleum refinery products and Coal products 8. Ceramics, Stone & Clay 9. Iron & Steel 10. Nonferrous Metals 11. Fabricated Metals 12. Machinery 13. Electrical Machinery 14. Transport Equipment 15. Precision instruments 16. Ship and its repairing 17. Other industrial products

Scales (*capital stocks*) millions, May 14, 1982

A Equal to or more than £0.233~Less than £2.328

B Equal to or more than £2.328~Less than £11.639

C Equal to or more than £11.639

Data : IMF Treasurer's Department

Table II-1 shows the numbers of manufacturers which own MSS and Table II-2 shows the proportions of manufacturers owning MSS in all the manufacturers whose capital stocks are equal to or more than 0.233 million pound. The proportion in Scale C is the greatest. The values of three scales, A, B and C are 0.13, 0.26 and 0.48. The value of the sum total is 0.17.

The proportion of responses for Table II-1 and Table II-2 is 0.83 (= 4713/5654). The survey was conducted from November 1981 to December 1981 by post. Subjects were drawn from the List of all companies, which *Statistics of Incorporated Enterprises*, Ministry of Finance are based on. The Minister of Administrative Management

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Agency permitted the author to use the List.

TABLE II-1 MANUFACTURERS OWNING MSS, 1980

	Sum	A	B	C
Sum	802	492	179	131
1	89	64	14	11
2	28	12	13	3
3	16	13	1	2
4	10	8	1	1
5	22	13	5	4
6	101	60	20	21
7	9	3	1	5
8	50	34	11	5
9	26	9	10	7
10	28	13	5	10
11	58	47	9	2
12	79	45	20	14
13	92	43	31	18
14	55	24	17	14
15	33	21	8	4
16	6	2	0	4
17	100	81	13	6

TABLE II-2 THE PROPORTIONS OF MANUFACTURERS OWNING MSS, 1980

	Sum	A	B	C
Sum	0.17	0.13	0.26	0.48
1	0.18	0.15	0.22	0.44
2	0.11	0.05	0.45	0.38
3	0.17	0.16	0.17	0.67
4	0.11	0.10	0.17	0.50
5	0.13	0.10	0.19	0.44
6	0.15	0.12	0.15	0.36
7	0.16	0.14	0.07	0.26
8	0.17	0.14	0.29	0.45
9	0.11	0.05	0.22	0.41
10	0.17	0.11	0.25	0.42
11	0.19	0.17	0.29	0.50
12	0.16	0.11	0.30	0.64
13	0.18	0.11	0.36	0.56
14	0.20	0.12	0.31	0.82
15	0.27	0.22	0.47	0.57
16	0.11	0.05	0.0	0.57
17	0.25	0.23	0.37	0.86

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II 3 Manufacturers' Sole Sales Subsidiaries and Manufacturers' Local Sales Subsidiaries

II 3 1 The roles of Sole Sales Subsidiaries and Local Sales Subsidiaries

The roles of manufacturers' local sales subsidiaries (MLSS), which belong to Strataum 3, are different from those of manufacturers' sole sales subsidiaries (MSSS), which belong to Strata 1 or 2. MSSS will be expected to shorten the turnover periods of parents' accounts & notes receivable whilst MLSS will be expected to strengthen the channels of distribution in domestic markets (in the case of manufacturers superior in markets) or to defend the channels of distribution (in the case of manufacturers inferior in markets).

Sample surveys of personal interviews

MSSS

A random sample was drawn from the population in the proportion of 1/3 to Scales A and B, and 1/1 to Scale C in 1970. The author conducted the surveys of the same sample in 1970, 1975 and 1980.

TABLE II-3 THE SIZE OF SAMPLE, 1970

Strata \ Scales	A	B	C
1	18	6	11
2	8	10	16

TABLE II-4 NON-RFSPONSES, 1970

Strata \ Scales	A	B	C
1	3	2	0
2	0	2	1

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TABLE II-5 THE SIZE OF THE SAME SAMPLE, 1975

Strata \ Scales	A	B	C
1	12	4	10
2	7	6	14

TABLE II-6 THE NUMBER OF SAMPLE POINTS CEASED THEIR OPERATIONS FROM 1971 TO 1975

Strata \ Scales	A	B	C
1	3	0	1
2	1	2	1

TABLE II-7 THE SIZE OF THE SAME SAMPLE, 1980

Strata \ Scales	A	B	C
1	9	4	9
2	5	6	11

TABLE II-8 NON-RESPONSES, 1980

Strata \ Scales	A	B	C
1	2	0	0
2	1	0	0

TABLE II-9 THE NUMBER OF SAMPLE POINTS CEASED THEIR OPERATIONS OR TRANSFERED TO STRATUM 3 FROM 1976 TO 1980

Strata \ Scales	A	B	C
1	3	0	0
2	1	0	2

MLSS

A sample was drawn from the population in the proportion of 1/1 to Stratum 3. The author conducted the surveys to the sample in 1975 and 1980.

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TABLE II-10 THE SIZE OF STRATUM 3, 1975

Stratum \ Scales	A	B	C
3	10	11	13

TABLE II-11 NON-RESPONSES, 1975

Stratum \ Scales	A	B	C
3	4	8	6

TABLE II-12 THE SIZE OF STRATUM 3, 1980

Stratum \ Scales	A	B	C
3	9	9	16

TABLE II-13 NON-RESPONSES, 1980

Stratum \ Scales	A	B	C
3	3	6	5

TABLE II-14 THE NUMBER OF MLSS CEASED THEIR OPERATIONS FROM 1976 TO 1980, IN STRATUM 3

Stratum \ Scales	A	B	C
3	1	0	1

TABLE II-15 TURNOVER PERIODS, RATIO→SUM, 1980, SCALE C

(month)

Accounts \ Strata	1·2 (Channels of MSSS)		3 (Channels of MLSS)	
(1) MSS' accounts & notes receivable	4.821		2.558	
(2) MSS' notes receivable discounted by banks	0.320	5.141	0.385	2.943
(3) Parents' accounts & notes receivable drawn by MSS	4.515		2.758	
(4) Parents' notes receivable drawn by MSS discounted by banks	0.494	5.009	0.506	3.264
(5) {(1)+(2)}−{(3)+(4)}=advantage I	0.132		−0.321	
(6) Commodities in stock in MSS	0.773		1.098	
(7) (5)+(6)=advantage II	0.905		0.777	

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TABLE II-16 TURNOVER PERIODS, SUM→RATIO, 1980, SCALE C

(month)

Accounts \ Strata	1·2 (Channels of MSSS)		3 (Channels of MLSS)	
(1) MSS' accounts & notes receivable	2.188		3.402	
(2) MSS' notes receivable discounted by banks	0.110	2.298	0.151	3.553
(3) Parents' accounts & notes receivable drawn by MSS	2.447		2.859	
(4) Parents' notes receivable drawn by MSS discounted by banks	0.116	2.563	0.164	3.023
(5) {(1)+(2)}−{(3)+(4)}=advantage I	−0.265		0.530	
(6) Commodities in stock in MSS	0.503		0.954	
(7) (5)+(6)=advantage II	0.238		1.484	

TABLE II-17 TURNOVER PERIODS, SCALE C, STRATUM 3, 1980

(month)

	Sum→Ratio		Ratio→Sum	
(1) Accounts & notes receivable in MLSS and MSFS*	4.356		3.090	
(2) MLSS' notes receivable discounted by banks	0.151	4.507	0.385	3.475
(3) Parents' accounts & notes receivable drawn by MLSS	2.859		2.758	
(4) Parents' notes receivable drawn by MLSS discounted by banks	0.164	3.023	0.506	3.264
(5) {(1)+(2)}−{(3)+(4)}=advantage I	1.484		0.211	
(6) Commodities in stock in MLSS	0.954		1.098	
(7) (5)+(6)=advantage II	2.438		1.309	

* Manufacturers' Sales Finance Subsidiaries are abridged to MSFS.

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TABLE II-18 TURNOVER PERIODS, RATIO→SUM, SCALE C, 1970

(month)

Accounts \ Strata	1	2
(1) MSSS' accounts & notes receivable	4.269	4.380
(2) MSSS' notes receivable discounted by banks	0.251 4.520	0.380 4.760
(3) Parents' accounts & notes receivable drawn by MSSS	2.522	3.222
(4) Parents' notes receivable drawn by MSSS discounted by banks	1.657 4.179	1.473 4.695
(5) {(1)+(2)}−{(3)+(4)}=advantage I	0.341	0.065
(6) Commodities in stock in MSSS	0.539**	*
(7) (5)+(6)=advantage II	0.880	

* The data is lacking.
** This value is of 1971.

TABLE II-19 TURNOVER PERIODS, SUM→RATIO, SCALE C, 1970

(month)

Accounts \ Strata	1	2
(1) MSSS' accounts & notes receivable	4.004	4.237
(2) MSSS' notes receivable discounted by banks	0.064 4.068	0.195 4.432
(3) Parents' accounts & notes receivable drawn by MSSS	2.436	3.426
(4) Parents' notes receivable drawn by MSSS discounted by banks	0.810 3.246	0.937 4.363
(5) {(1)+(2)}−{(3)+(4)}=advantage I	0.822	0.069
(6) Commodities in stock in MSSS	0.466**	*
(7) (5)+(6)=advantage II	1.288	

* The data is lacking.
** This value is of 1971.

The roles of MSSS to their parent manufacturers can be embodied into the advantageous values, such as in Table II-15 to Table II-19.

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We can use two ways of computation for estimating the values concerned of the population in these Tables as follows :

Way of computation I RATIO →SUM

$$\frac{\sum_{i=1}^{n} x_i}{\sum_{i=1}^{n} y_i}$$

for example,

x_i : accounts & notes receivable in each manufacturer to MSS

y_i : average monthly sales in each manufacturer to MSS

Way of computation II SUM → RATIO

$$\sum_{i=1}^{n} \frac{x_i}{y_i}$$

for example,

x_i : the same as in the way of computation I

y_i : the same as in the way of computation I.

The values of 1980 in Tables II-15 and II-16 are computed of the same sample of 1970 except the sample points ceased their operations from 1971 to 1980.

If we compare Table II-15 with Table II-18, we feel that the advantages supplied by MSSS have greatly decreased for these ten years of Strata 1 and 2. The parent manufacturers which belong to Stratum 3, however, take the advantages by means of their own sales finance subsidiaries MSFS, which are given in Table II-17.

II.3.2 Marketing Channels or Channels of Distribution

Marketing channels or channels of distribution are shown in Table II-20 (of MSSS) and Table II-21 (of MLSS) with the proportions respectively.

We will mainly use the data from MLSS, of which channels of dis-

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tribution are shown in Table II-21. However, the data from MSSS, of which channels of distribution are shown in Table II-20, are also used to improve the estimation of the gross margins of distribution, which will be defined in the following Section III.

TABLE II-20 CHANNELS OF DISTRIBUTION, MSSS, 1970

		proportions (ratio→sum)
1	MSSS — Wholesalers — Retailers — users	0.15
2	MSSS — MLSS — Retailers — users	0.05
3	MSSS — MLSS — users	0.06
4	MSSS — users	0.13
5	MSSS — Retailers — users	0.18
6	MSSS — Local Agencies — Retailers — users	0.24
7	MSSS — Wholesalers — Local Wholesalers — Retailers — users	0.05

TABLE II-21 CHANNELS OF DISTRIBUTION, MLSS, 1980

		proportions (ratio→sum)
1	MLSS — Retailers — users	0.50
2	MLSS — Secondary Wholesalers — Retailers — users	0.125
3	MLSS — users	0.375

III PRICES IN THE SUCCESSIVE TRANSACTIONS IN THE CHANNELS OF DISTRIBUTION OF MANUFACTURERS' SALES SUBSIDIARIES IN JAPAN

— RETAIL PRICES SO THAT MANUFACTURERS EXPECT RETAILERS OR FINAL DISTRIBUTORS TO SELL TO USERS AT A PRICE BEING PUT EQUAL TO 100 —

III. 1 The Nature of Data

Data used in this paper was collected by the author's survey of personal interviews to the manufacturers who own MSS. The survey was

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conducted from May 1981 to March 1982. Some manufacturers presented the author values with intervals, varying from a value to another value. The author requested the respondents to make the intervals narrow. The values are assumed to be distributed uniformly in the narrow intervals. Consequently, we will be able to adopt mean values as values answered.

The author adopted the sum of the costs of materials, the wages in the factories and expenses, which consist of depreciations, the charges for insurance, the charges for electric power and so on, as the cost of manufacture.

III 2 The Gross Margins in the Channels of MLSS

III 2.1 The Gross Margins in Retailers, Wholesalers and Manufacturers — the arithmetic mean —

This paragraph is related to Table II-21 in the channels of distribution. We should, however, sum up ten sample points which belong to channel (1) and channel (2) except channel (3), because there are no retailers in channel (3).

TABLE III-1 GROSS MARGINS IN SUCCESSIVE TRANSACTIONS, ARITHMETIC MEANS, MLSS, 1980

	A.M.*	S.D.**
Gross margins in retailers	26.11	5.38
Gross margins in wholesalers (including MLSS)	+)12.04	3.55
Gross margins in distribution	38.15	2.90
Gross margins in manufacturers	28.21	13.19
Cost of manufacture	33.65	

*Arithmetic Means
**Standard Deviations

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III. 2.2 The Gross Margins in Retailers and Wholesalers -- A Regression Analysis —

Table III-1 shows the gross margins in the successive transactions in the channels of distribution of MLSS, if we put our retail price so that we expect retailers to sell to users at a price equal to 100. The gross margins in retailers, wholesalers (including MLSS) and manufacturers are 12.04, 26.11 and 28.21 in arithmetic mean respectively.

If we want to know how we estimate the gross margin in retailer when the gross margin in wholesaler is fixed at a value, we can use the linear regression analysis. We may attain a good estimation of the gross margin in retailers, which is called y, if correlation coefficient is nearer 1. The variance of y_i will be improved by $a+bx_i$ instead of y.

Figure III-1 shows the scatter diagram between the gross margins in retailers and the gross margins in wholesalers including MLSS. In the diagram it appears that X, which represents the gross margins in wholesalers including MLSS, and Y, which represents the gross margins in retailers, are approximately linearly related for this range of X values. Regression line (1) consists of ten sample points of eight *s and two +, where six sample points belonging to channel (3) are excluded. Regression line (2) consists of sixteen sample points of fourteen *s and two +, where six sample points belonging to channel (3) are included.

Regression line (1) :

$$Y=41.95324-1.31588X \qquad (1)$$

$$(12.53) \quad (4.93)$$

$$r_{xy}=-0.87, \quad \bar{R}^2=0.72$$

The values in the brackets are t-values. The critical region of 5%

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for t-test with the degrees of freedom 8 is 1.860. Hence, the coefficient value of X is meaningful. The correlation coefficient is −0.87. The square of correlation coefficient modified by the degrees of freedom is denoted by $\bar{R}^2$. $\bar{R}^2$ is 0.72. We will be able to describe the following two evaluations from regression line (1).

(1) The gross margins in wholesalers are as valuable as 1.32•the gross margins in retailers. That is to say, the increment in the gross margin in wholesalers by 1 unit influences on the decrement in the gross margin in retailers by 1.32 units.

(2) If we put the value of the gross margin in wholesalers as zero, the value of the gross margin in retailers equals 41.95.

We can estimate existence of the approximately linear substitution relationship between two gross margins of wholesalers and retailers. Hence, we can say that the gross margin in distribution is constant in the channels (1) and (2) of MLSS.

The estimation of such an approximately linear relationship depends largely upon two sample points, which are denoted by +. These two points have the channel of manufacturer — MLSS — secondary wholesalers — retailers — users. The values of the gross margins in wholesalers consist of the gross margin in MLSS and the gross margin in secondary wholesalers. If we remove the gross margin in secondary wholesalers into the gross margins in retailers, the sum of the values of the gross margins in retailers and secondary wholesalers are denoted by • in Graph III-1. The localities of two •s are even more under the line (1), and under the line (2) as we will soon see in the following paragraph, than the localities of •s under the line (2). The manufacturers of those two sample points will adopt independent wholesalers as secondary wholesalers, if the sum of the gross margins

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of MLSS and secondary wholesalers are less than the sum of retailers and secondary wholesalers. We assume, of course, that the volume of sales in case of manufacturers — MLSS — retailers are equal to the volume of sales in case of manufacturers — MLSS — secondary wholesalers — retailers. Thus, the approximately linear relationship holds by virtue of the localities of those two sample points.

Using regression analysis, we can add six sample points which have no retailers in their channels of distribution to ten sample points.

Regression line (2) :

$$Y = 45.85026 - 1.80759X \qquad (2)$$
$$(11.40) \quad (7.93)$$
$$r_{xy} = -0.90, \quad \bar{R}^2 = 0.80$$

The values in the brackets are t-values. The critical region of 5% for t-test with the degrees of freedom 14 is 1.761. We will be able to describe the following two evaluation from regression line (2).

(1) The gross margins in wholesalers are as valuable as 1.81·the gross margins in retailers.

(2) If we put the value of the gross margin in wholesalers as zero, the value of the gross margin in retailers equals 45.85.

III. 2.3 The Gross Margins in Distribution and Manufacturers

Let us call the sum of two gross margins, retailers and wholesalers, as the gross margins in distribution. We may estimate the gross margins in manufacturers (Y) using the sample regression line of Y on X. We use, however, data of fourteen sample points, because residual two are outliers. The author estimated four values of fourteen sample values of the gross margins in manufacturer using their financial statements. Those four values (#) may be less than the true values. The scatter diagram are given in Figure III-2.

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Regression line (3) :

$$Y = -1.84375 + 0.79811X \qquad (3)$$
$$(1.84) \quad (2.58)$$
$$r_{xy} = 0.60, \quad \bar{R}^2 = 0.30$$

The values in the brackets are t-values. The critical region of 5% for t-test with the degrees of freedom 12 is 1.782. Hence the coefficient value of X is meaningful. The correlation coefficient is 0.60. The positive sign of correlation coefficient is characteristic of the relationship between the gross margin in distribution and the gross margin in manufacturers. We will be able to improve the estimation of the gross margins in manufacturers using regression line (3). If we put the gross margin in wholesalers equal to zero in regression line (2), we attain x equal to 45.85. Using the value 45.85, the gross margin in distribution, we attain y equal to 36.59. Hence the cost of manufacturer will be estimated as $17.56 = 100 - (45.85 + 36.59)$. Those estimates reflect the behaviour of sample points in the industries of, for example, toilet preparations, dentifrice and soap. Those industries are very competitive and various kinds of advertisement are injected into markets by means of mass media on account of manufacturers.

If we exclude such industries as toilet preparations, dentifrice and soap and an outlier from computation, regression line (4) of ten sample points will be presented. The scatter diagram are given in Figure III-3.

Regression line (4) :

$$Y = 10.76899 + 0.29896x \qquad (4)$$
$$(1.86) \quad (1.54)$$
$$r_{xy} = 0.49, \quad \bar{R}^2 = 0.13$$

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The values in the brackets are t-values. The critical region of 5% for t-test with the degrees of freedom 8 is 1.860. Hence the coefficient value of X is meaningless. However, the combination of (38.15, 22.17), which are the values of the arithmetic mean for the gross margins in distribution and the estimate of the gross margin in manufacturers from regression line (4), reflects the actual figure in inactual industries, where the gross margins in retailers are slightly more than in household electric appliance industries, such as refrigerators, washing machines, colour televisions, air conditioners and so on.

III. 2.4 The Channels of MSSS

The author supposes the gross margins in manufacturers can be divided into two parts, one part for manufacture and another part for distribution. For such a division we will use the gross margin in MSSS corrected by the regression line (2). There are various kinds of channel in MSSS' channels as we have considered in the paragraph II. 3.2. We must reduce those kinds of channels into such an ordinary channel as manufacturer — MSSS — MLSS (—secondary wholesalers) — retailers — users. Let us call the gross margin in MSSS in reduced channels as the gross margin proper to MSSS, which should be add to the gross margin in distribution. Thus we will reach the improved estimations of the gross margins in distribution. We will be able to estimate the gross margins proper to MSSS for every sample points by way of this.

If the gross margins in MSSS and retailers are known, regression line (2) can be applied. We compute X from formula (2),

the gross margins in retailers = 45.85026 − 1.80759X (2),

then we attain the values of such gross margins proper to MSSS as the gross margin proper to MSSS = the gross margin in MSSS − X.

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Example 1: manufacturer — MSSS — retailers

If the gross margins in retailers and MSSS are 27.5 and 22.5 respectively, we get

$$27.5 = 45.85026 - 1.80759X$$

$$X = 10.15$$

$$12.35 = 22.5 - 10.15$$

The estimated gross margin proper to MSSS is 12.35.

Example 2: manufacturer — MSSS — wholesalers — retailers

If the gross margins in retailers, MSSS and wholesalers are 17.5, 15 and 11 respectively, we get

$$17.5 = 45.85026 - 1.80759X$$

$$X = 15.68.$$

Although the gross margin in MLSS including wholesalers is 15.68, the wholesalers have already received 11 out of 15.68.

$10.32 = 15 - (15.68 - 11)$ is proper to MSSS.

Figure III-4 shows the distribution of the gross margins in MSSS and Figure III-5 shows the scatter diagram between the gross margins proper to MSSS and the gross margins in distribution from MLSS to retailers in the reduced channel of MSSS. In Figure III-5 we, roughly speaking, observe the scattered sample points (or dots) in two groups. The dots of one group are scattered in the left-hand corner, which belong to the industries producing goods for production, and the dots of another group are scattered in the neighbourhood of $y = 10$, which belong to the industries producing goods for consumption. Let us call the value of 10 as the average gross margin proper to MSSS.

III. 3 Prices in the Successive Transactions in the Channels of Distribution of MSS in Japan — Retail Prices So That Manufacturers Expect Retailers or Final Distributors to Sell to Users at Some Prices Being Put Equal to 100 —

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Using the average gross margin proper to MSSS we can improve the estimation of "prices in the successive transactions in the channels of distribution of MSS" in Japan.

Estimation (1) :

Using the regression lines (2) and (3), we can estimate prices in the successive transactions as follows.

Cost of manufacture	17.61
Gross margin belonging to manufacture	26.59
Gross margin belonging to distribution in manufacturers	10.0
Price to sell to retailers	54.2
Gross margin belonging to retailers	45.8
Price to consumers	100

Estimation (1) will be applicable to such industries as toilet preparations, dentifrice and soap.

Estimation (2) :

Using the regression lines (2) and (4), we can estimate prices in the successive transactions as follows.

Cost of manufacture	39.68
Gross margin belonging to manufacture	12.17
Gross margin belonging to distribution in manufacturers	10.0
Price to sell to MLSS	61.85
Gross margin belonging to MLSS, secondary wholesalers and retailers	38.15
Price to consumers	100

Estimation (2) will be applicable to some industries in which the gross margins belonging to retailers are slightly more than in household electric appliance industry.

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FIGURE III-1 SCATTER DIAGRAM BETWEEN THE GROSS MARGINS IN RETAILERS (Y) AND THE GROSS MARGINS IN WHOLESALERS INCLUDING MLSS (X)

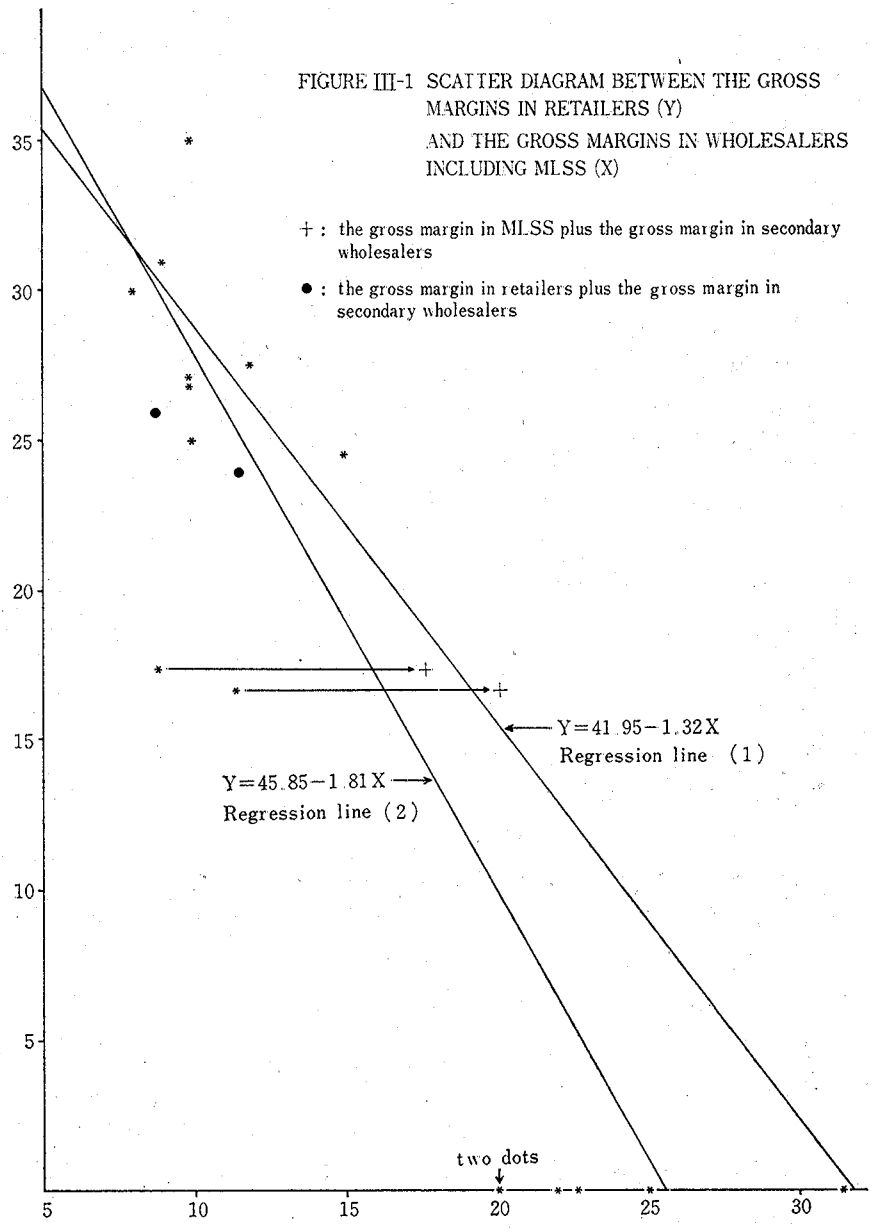

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FIGURE III-2 SCATTER DIAGRAM BETWEEN THE GROSS MARGINS IN MANUFACTURERS (Y) AND THE GROSS MARGINS IN DISTRIBUTION (X)

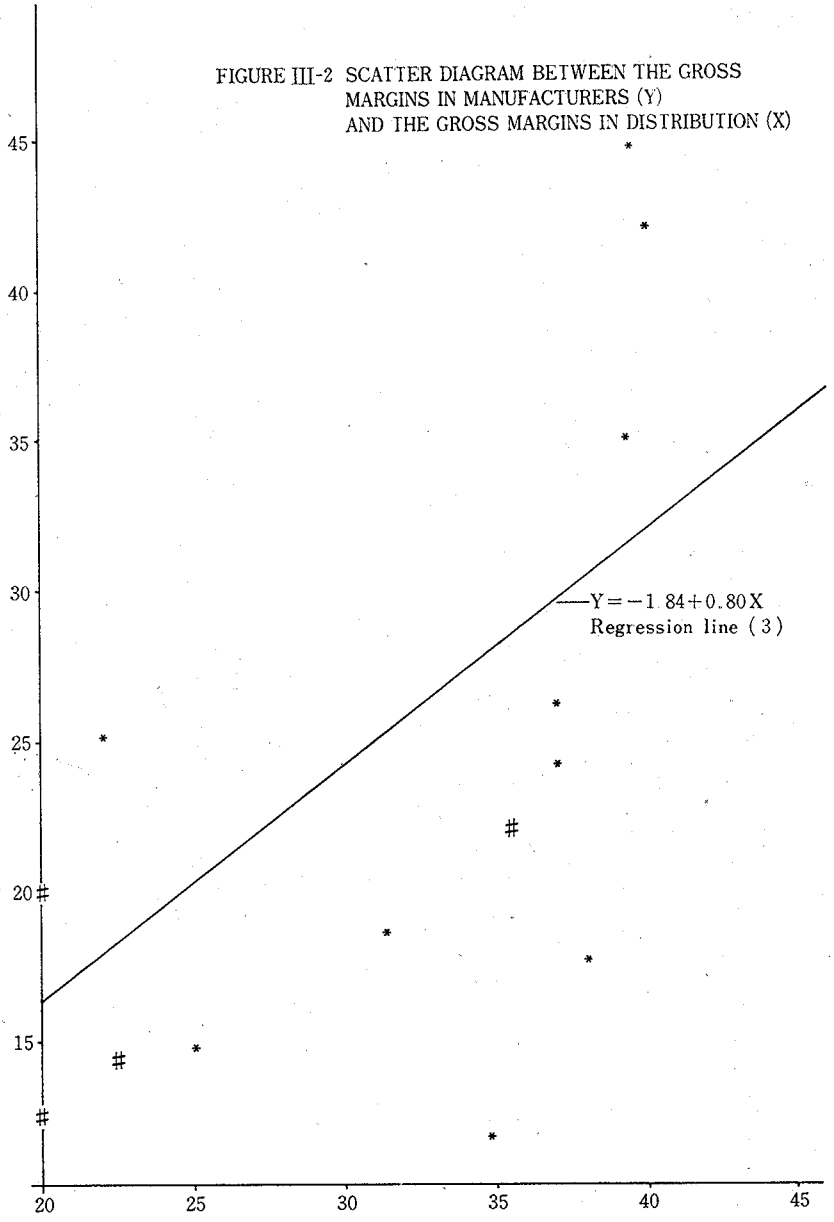

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FIGURE III-3 SCATTER DIAGRAM BETWEEN THE GROSS MARGINS IN MANUFACTURERS (Y) AND THE GROSS MARGINS IN DISTRIBUTION (X), TEN SAMPLE POINTS

#: Data from financial statements

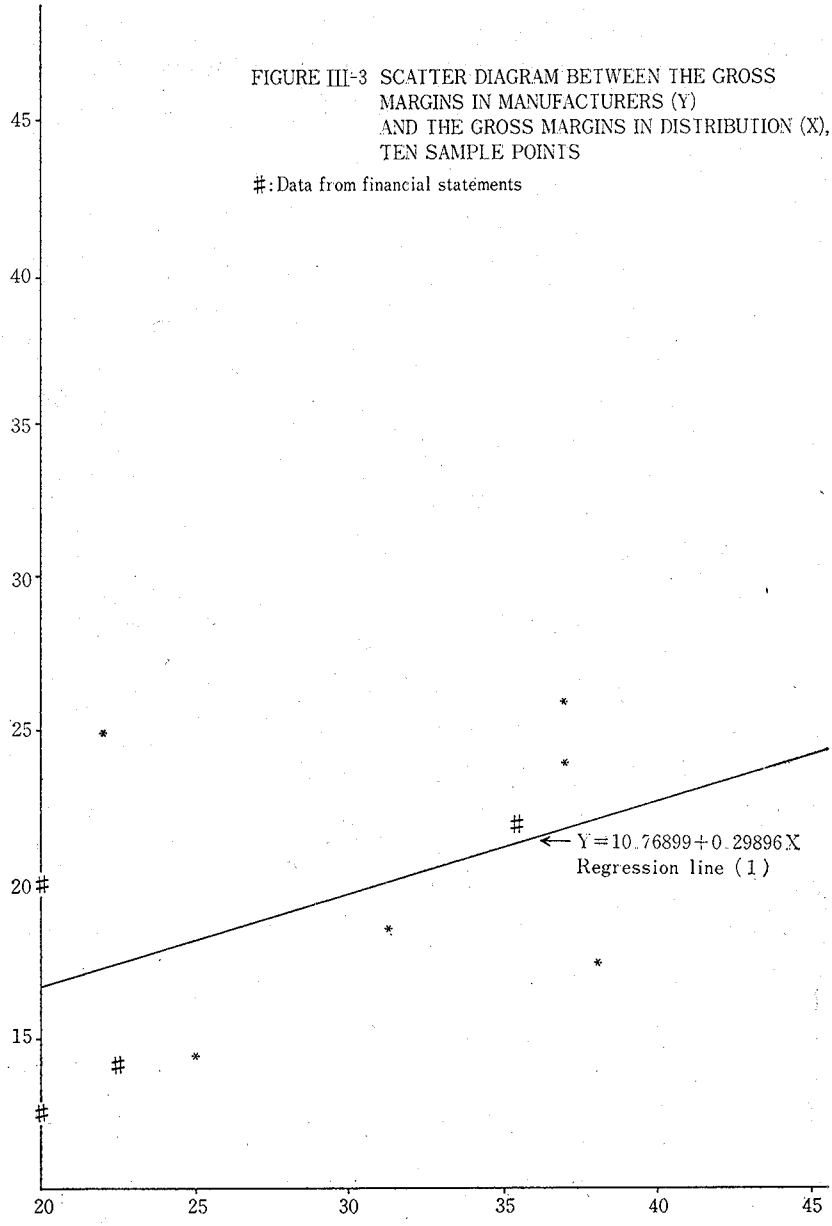

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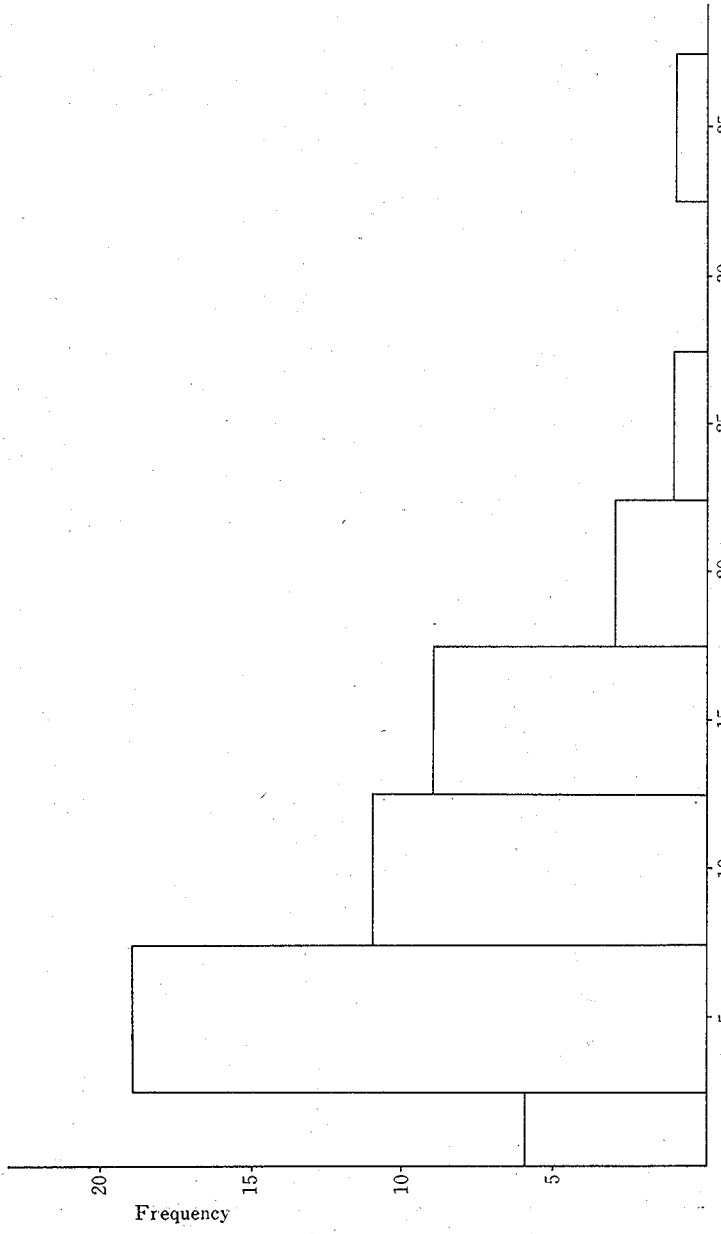
FIGURE III-4 THE DISTRIBUTION OF THE GROSS MARGINS IN MSSS



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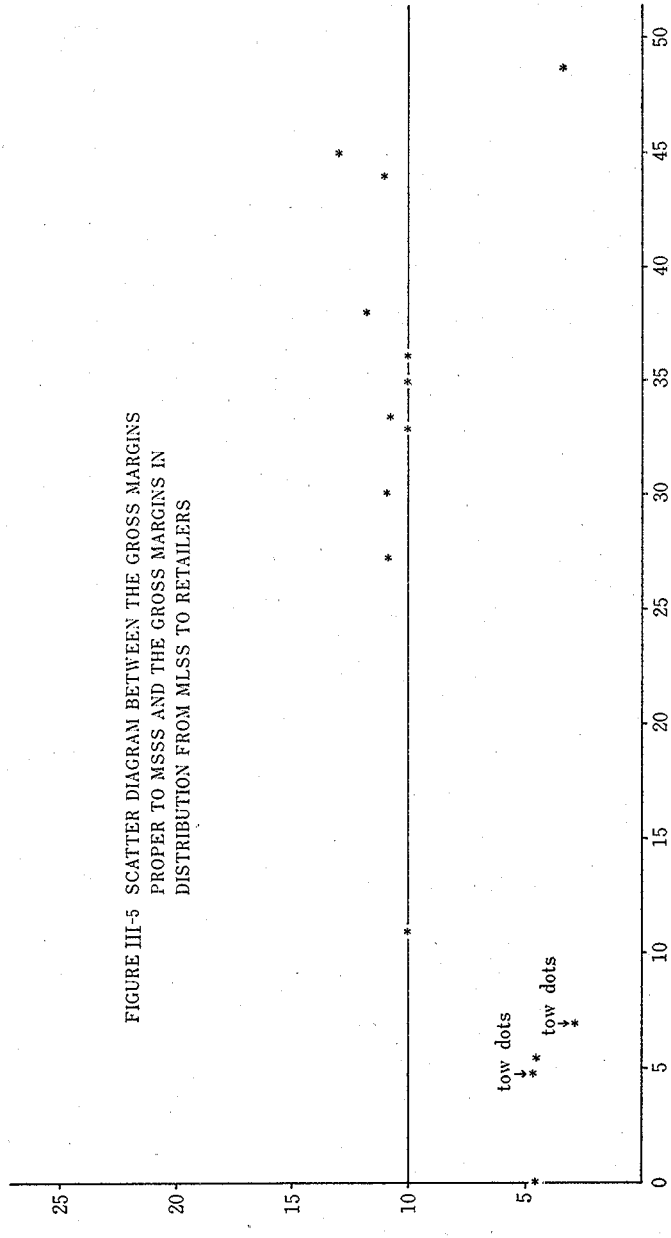

FIGURE III-5 SCATTER DIAGRAM BETWEEN THE GROSS MARGINS PROPER TO MSSS AND THE GROSS MARGINS IN DISTRIBUTION FROM MLSS TO RETAILERS