論　説

Retailers' Countervailing Power within Marketing Channels: An Empirical Analysis by National Brand

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Abstract: Using the National Survey of Prices that reports detailed wholesale prices of representative national-brand consumer products in Japan, this paper explores retailers' countervailing power over upstream suppliers within marketing channels. Specifically, we estimate the impact of suppliers' concentration on purchasing prices for retailers by format to measure the power. Statistical analysis where the wholesale price by brand is regressed on the Herfindahl index of wholesalers reveals that a large retail format is able to wield stronger countervailing power than a small one.

1 Introduction

Recently, the retail industry in advanced economies is moving towards concentration, both at the national and at the international level. New forms of competition are emerging, related chiefly to the growth of on-line electronic commerce and the internationalization of large retail groups. This trend is particularly marked in food distribution, which consumers most frequently purchase daily (Boylaud and Nicoletti, 2001).[1] Given the rapid concentration in the retail industry, the aim of this paper is to determine whether large retailers' countervailing power has a substantial impact on their upstream concentrated suppliers especially in the categories related to consumer products. To achieve this goal, we empirically examine the 1992 National Survey of Prices (NSP) in Japan, which includes the wholesale prices for various consumer products. The NSP reports the average wholesale prices for 134 specifications of 38 items, which are composed of national brand goods produced by leading Japanese companies from specific-format wholesalers to specific-format retailers in 49 major Japanese cities.[2] Using this official dataset, we

[1] In the United States, the Federal Trade Commission has been concerned with the power of giant retailers such as Wal-Mart dealing in a variety of consumer products and how that impacts the competition among suppliers rather than among retailers themselves (Bloom and Perry, 2001).

[2] Prior retailing studies provide useful perspectives on Japanese distribution systems, trade practices and regulations (e.g., Ariga, Ohkusa and Namikawa, 1991; Goldman, 1991; Goldman, 1992; Ariga, 1993; Nariu, 1994; Ariga, 1995). Japanese consumers particularly favor "mom and pop" or convenience stores in close proximity to their homes. The lower prevalence of passenger cars and the resulting higher distribution costs for Japanese consumers significantly generate this consumer behavior (e.g., Flath, 1990; Flath and Nariu, 1996; Flath, 2004; Matsui and Yukimoto, 2004; Matsui, Lu, Nariu and Yukimoto, 2005; Matsui, 2009a).

investigate whether the countervailing power varies among retail formats. Specifically, we measure the elasticities of the purchasing prices for retailers to the suppliers' degree of concentration by retail format using the regression analysis method. As expected, regression of the wholesale price by brand against the Herfindahl index of wholesalers reveals that the price increases with the suppliers' concentration. However, a more important finding is that the elasticity of the purchasing price to the degree of concentration of suppliers tends to be lower, on average, for large supermarkets than for small ordinary retail stores. This empirical result reflects the fact that large retailers have stronger countervailing power against a concentration of their suppliers.[3]

There have been several streams of marketing research investigating how the power of retailers is exerted and whether it has a substantial impact on other distributive channel members. The classic work of Stern (1969) has spawned vast empirical retailing research (e.g., Brown, Johnson and Koenig, 1995; Brown, Lusch and Nicholson, 1995; Chatterjee, Hyvönen and Anderson, 1995; Lusch and Brown, 1996; Chung, Sternquist and Chen, 2006).[4] Previous studies have documented that one channel member can gain power over another by constructing a dependency relationship. For example, if a manufacturer or a wholesaler depends highly on a dominant retailer to maintain its share of sales, the retailer is in a superior position to the supplier. However, the power relationship between a supplier and a large retailer will be balanced if the supplier can exert countervailing power through a well-known brand or customer loyalty.

In the retailing literature, several studies have investigated the relationship between retailers' power and the economic profitability for manufacturers that rely on large retailers. Using Compustat data, Kalwani and Narayandas (1995) demonstrate that suppliers in long-term relationships with manufacturers tend to enjoy better financial performance. Comparing the cross-sectional financial performance of 14 consumer goods industries, Ailawadi, Borin and Farris (1995) find that only a few industries illustrate a significant shift in the power to retailers. They also reveal that while grocery manufacturers have improved their financial performance during the 10 years between 1982 and 1992, retailers have improved less than their counterparts during the same period. Highlighting Wal-Mart, Bloom and Perry (2001) examine whether the "giant" retailer has a significant impact on the financial performance of its suppliers. While previous academic research on retailer power has looked largely at grocery stores, they extend the investigation to other consumer product categories because Wal-Mart transacts with a variety of manufacturers and wholesalers. They conclude that manufacturers who tend to rely on the powerful retailer do not necessarily have higher profitability, except when they hold a large industry share. Ailawadi (2001) summarizes that previous studies in this research stream have not supported the hypothesis that retailers grow more powerful relative to manufacturers in terms of profits in the packaged goods industry.

The above overview suggests that empirical research investigating retailers' countervailing power by examining brand-level wholesale prices for many consumer goods is missing in the literature, primarily

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[3] The low sensitivity of purchase prices for retailers to wholesale concentration may prevent successive monopoly and the resulting double marginalization problem (Betancourt and Gautschi, 1998) and is desirable in that it finally leads to a reduction in the selling prices for end consumers.

[4] In reality, retailers strategically use their increased power to extract concessions, such as merchandising support and slotting allowances, from their suppliers. Given the transaction practice, marketing science studies that construct analytical models describing the role of slotting fees or allowances from manufacturers also appear in the literature (e.g., Lariviere and Padmanabhan, 1997; Kim and Staelin, 1999).

due to data unavailability. Exceptionally, however, Matsui (2009b) has conducted pooled regression analysis using the NSP, demonstrating that the average impact of wholesaler concentration on purchase prices is significantly smaller for supermarkets than for ordinary stores. This paper further gives richer and more detailed empirical results based on an analysis by national brand, providing additional insights into the nature of the countervailing power. In this respect, the current study contributes to the literature by directly examining wholesale prices rather than financial performance of distributive channel members to assess the power.

The remainder of the paper is structured as follows. The next section investigates whether the increase in the purchasing price due to the suppliers' concentration differs between the retail formats, and it is followed by some concluding remarks in the final section.

2 Empirical analysis

2.1 Data description

The present research employs the Wholesale Survey of the 1992 NSP as a central dataset, providing a sample of transaction prices between wholesalers and retailers for 134 specifications of 38 items composed of national brands. The dataset is unique because they include the average wholesale prices and quantities shipped from a specific wholesale format to a specific retail format in each of 49 major cities at the brand level. Table 1 gives a summary of items and specifications, suggesting that the data cover a broad range of consumer product categories supplied by famous manufacturers.[5]

Table 1 Items and specifications surveyed

ID	Item	Specification
1	Gasoline	Regular gasoline 1 kl
2	Kerosene	White kerosene 1 kl
3	Liquefied propane	For domestic use I-gou 1 kg
4		Ro-gou 1 kg
5	Electric rice cookers	ZOUJIRUSHI NSA-A18
6		TIGER JNT-R180
7		TOSHIBA RCK-18LMX
8		National SR-IH18X2
9	Refrigerators	TOSHIBA GR-S45MI
10		National NR-F46K2
11		HITACHI R-D41X2
12	Kerosene stoves	SHARP HSR-CS1
13		TOSHIBA KSR22C
14		National OS-22CD
15		HITACHI OVH-H22
16	Video tape recorders	TOSHIBA ARENA A-F26
17		Panasonic Macroad NV-H30
18		Victor HR-F1

[5] In the NSP, goods such as instant noodles or cheese are defined as an "item", whereas brands, such as "Sapporo Ichiban" or "Chicken Ramen" in the instant noodles in pouch category, are defined as a "specification".

19	TV Set 21 inches, color (without BS tuner)	SONY KV-21ST10
20		TOSHIBA 21S8
21		Panasonic 21VA2
22		MITSUBISHI 21C-SS10
23	Word processors	NEC Bungo Mini PWP-5SC
24		SHARP Pen Shoin WD-A760
25		TOSHIBA Rupo JW95KVII
26		Panasonic Su.Ra.Ra FW-U1P611
27		FUJITSU OASYS 30-LX401
28	Men's undershirts Short sleeves, knitted (100% cotton), [size] M, [color] white	GUNZE
29		NAIGAI
30		FUKUSUKE
31		RENOWN
32	Slips Nylon tricot (100% nylon), [color] white or beige, medium quality	TRIUMPH INTERNATIONAL Japan
33		WACOAL
34	Pantyhose full supported type, mixed nylon and polyurethane, medium quality, containing 1 pair	ATSUGI FP-5040
35		GUNZE SP-3050
36		FUKUSUKE 5610-11
37		Imports, Hanes
38	Pantyhose full supported type, mixed nylon and polyurethane, medium quality, containing 2 pairs	ATSUGI FP-705
39		GUNZE SP-2860
40		FUKUSUKE 5400-25
41	Canvas shoes deck type, cotton, plain-colored, with shoe laces, synthetic resin sole, about 24.5cm in size	ACHILLES
42		ASAHI
43		SEKAICHO
44		MOON STAR
45	Canvas shoes for school children, jogging type, nylon, with magic tape, synthetic resin sole, about 20cm in size	ACHILLES
46		ASAHI
47		SEKAICHO
48		MOON STAR
49	Soy sauce JAS, Highest quality, in polyurethane container, 1,000 ml	KIKKOMAN, thick
50		HIGASHIMARU, weaker
51		HIGETA, thick
52		YAMASA, thick
53	"Sake" Bottled, 1.8 *l*, alcoholic content over 15% under 16%	GEKKEIKAN, high quality
54		NIHONSAKARI, high quality
55		HAKUTSURU, high quality
56	Beer, Domestics, Canned, 350 ml	ASAHI SUPER DRY
57		ORION DRAFT
58		KIRIN LAGER
59		SAPPORO BLACK LABEL
60		SUNTORY MALT'S
61	Beer, Imports, Canned, 355 ml	Budwiser
62		Miller Genuine Draft
63	Canned tuna fish	INABA Light Tuna Flake-I, P.No.4 can, 80 g
64		Hagoromo Foods Light Meat Sea Chicken-L Flake, P.No.4 can, 80 g

65	"Shio senbei", Japanese rice crackers	KAMEDA Soft Salad
66		BOURBON Aji Salon
67	Potato chips	CALBEE POTATO CHIPS, 95 g or 100 g
68		KOIKEYA POTATO CHIPS, 86 g or 90 g
69	Chocolate	MORINAGA Koeda, M15
70		LOTTE Ghana Milk Chocolate, 50 g
71	Fruit Drinks	KIRIN Orange
72		SUNTORY Orange Ade
73		Hi-C Orange
74		Bireley's Orange
75		Ribbon Orange
76	Instant coffee	AGF Blendy, 250 g
77		NESCAFE GOLD BLEND, 100 g
78	Cheese	MEIJI Cheese, 225 g
79		MEIJI Hokkaido Tokachi Slice Cheese, 190 g
80		MORINAGA Kraft Slice Cheese (Gouda), 180 g
81		SNOW BRAND Hokkaido Cheese, 225 g
82		SNOW BRAND Slice Cheese, 190 g
83		SNOW BRAND Hokkaido Camembert Cheese, 100 g
84		CLAUDEL Camembert Cheese, made in France, 125 g
85		GERARD Camembert Cheese, made in France, 125 g
86		DOFO Camembert Cheese, made in Denmark, 125 g
87		PHILADELPHIA Cream Cheese, made in Australia, 250 g
88	Instant noodles In pouch	Sapporo Ichiban
89		Chicken Ramen
90		Myojo Charumera
91	Instant noodles In cup	Super Cup 1.5, 116 g
92		Akai Kitsune-udon, 92 g
93		Cup Noodle, 75 g
94	Mayonnaise	AJINOMOTO Mayonnaise, 400 g
95		KEWPIE Mayonnaise, 500 g
96	Liquid condiments	EBARA Yakiniku-no-tare Ogon-no-aji, bottled, 210 g
97		MORANBON Jan Nama Pack, packaged, 80 g
98	Medicines for cold	SANKYO Shin Lulu A tablets, 100 tablets
99		TAISHO Pabron S, 10 wraps
100		TAKEDA Benza Ace Caplet, 30 caplets
101	Vitamin preparations	EISAI JUVELUX, 120 capsules
102		TAKEDA Alinamin A25, 60 tablets
103		SANKYO Minevital A, 100 tablets
104	Health drinks	SATO Yunkel Kotei-eki 30 ml
105		TAISHO Ripobita D, 100 ml
106		TAIHO Tiovita, 100 ml
107		CHUGAI Guronsan DX, 50 ml
108	Chinese medicines	KANEBO Kakkonto EKisu Karyu A Kanebo, 10 wraps
109		KOTARO Kakkon A Kotaro, 100 Tablets
110		JPS Kakkonto Ekisu Sairyu, 16 wraps

111	Disposable diapers	For infant, size L, 36 sheets KAO New Meliese
112		P&G Pampers
113		UNI CHARM Ultra Moony
114	Astringent lotion	KANEBO Faircrea Whitening Lotion (M), 150 ml
115		SHISEIDO ELIXIR Essence Water (2), 200 ml
116	Liquid washing up detergent	KAO Family Fresh, 600 ml
117		LION Charmy Green, 600 ml
118	Detergent for laundry	KAO Attack, 1.5 kg
119		LION Hi-top, 1.5 kg
120	Shampoo	KAO Merit Shampoo, 750 ml
121		SHISEIDO Super Mild Shampoo. floral green,700m
122		LION Aqua Me Shampoo Light, 750 ml
123	Toilet tissue (Rolled toilet paper, recycled paper, a 12-roll set)	[Size] 114mm×55m (double type 27.5 m)
124		[Size] 114mm×60m (double type 30 m)
125	Facial tissue, 400 sheets (200 double sheets), a 5-box set	Elleair
126		Kleenex
127		Scottie
128		Nepia
129	Notebooks (High quality paper, JIS No.6) (179mm×252mm), ruled, 30 sheets padded	Apica
130		Kyokuto
131		Kokuyo
132		Nakabayashi
133	Building blocks	KAWADA Daiya Block Junior, B-1 (GIANT BLOCK BASIC B-1), packaged
134		LEGO Japan Dupro Mini Bucket (1591)

To conduct the wholesale price survey, the Japanese government distributes questionnaires that require wholesale store managers to report accurately the net prices and quantities sold for each specification. Figure 1 presents one of the questionnaire forms directly scanned from the survey, indicating that the wholesalers should take into account current trade practices such as quantity discounts or consignment sales. The government conducted the survey on November 9, 1992. The selling prices of each item or specification at which the item was transacted most frequently from October 1 to 31 were collected. The total number of wholesale stores surveyed amounts to approximately 12,000.

The survey categorizes wholesalers into five types of formats, and retailers into three types of formats.[6] Figure 2 illustrates the classification method for retail formats. The figure shows that supermarkets are defined as stores with a ratio of "floor space for a self-service system" to "selling floor space" of 50 percent or more. Department stores are those with a ratio of "floor space for a self-service system" to "selling floor space" of less than 50 percent, with 50 or more persons engaged in the business, and handling commodities relating to food, clothing and furniture. Stores falling into neither category are defined as ordinary retail stores. According to this classification, supermarkets are regarded as providing a

[6] The NSP classifies wholesalers into the following types: (1) original general wholesaler, (2) intermediate general wholesaler, (3) sales company established by producer, (4) producer's branch, and (5) other wholesaler.

Figure 1 Extract from Questionnaires for Wholesale Stores

Designated Statistics No.108

Your answers are strictly Confidential

This questionnaire will be used only for statistical purposes and never be used for other purposes such as taxation. Please answer the questionnaire to the best of your knowledge.

1992 National Survey of Prices

QUESTIONNAIRE FOR WHOLESALE PRICES AND QUANTITIES

Statistics Bureau, Management and Coordination Agency

November 9th, 1992

29 Instant Noodles(1)

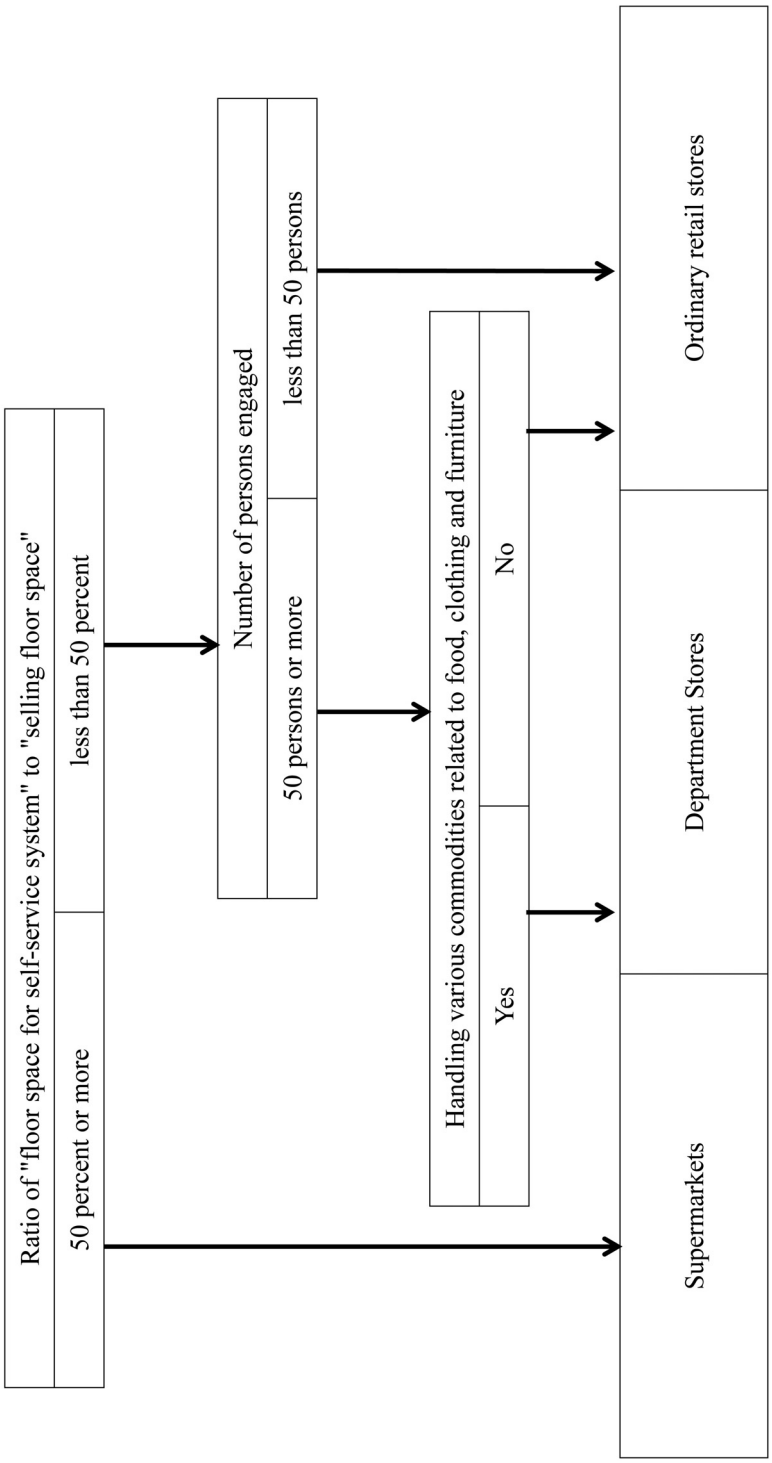
Municipality code	Enumerator No.	Store No.

1 Specification • Please answer the questions from 2 to 5 about each specification mentioned below.		Code	2 Selling prices • Enter actual selling prices at which the commodities were transacted most frequently from 1st to 31st October. • Report the actual prices, such as discount prices, not official quotations. In case quantity discount is employed for the commodity, enter the unit price, inclusive of its supplemental amount.				3 Quantity of sales • Enter the quantity of sales during the past one month for each type of the customers. • Include the quantity of sales by consignment.	4 Main supplier • please circle the most applicable number.	5 Place of purchase (Prefecture) • Enter the name of the prefecture where the main supplier is located.	To be filled by M.C.A.
			Unit	By type of customers						
In pouch	"Sapporo Ichiban Miso Ramen"	01	1 pouch	(1) To wholesalers		yen	sen	pouch	1 Producers (including branch) 2 Sales companies established by producers 3 Ordinary wholesalers 4 Other wholesalers (agricultural or livelihood cooperative association, etc.)	Name of prefecture ———	
				(2) To retail stores	Department stores			pouch			
					Supermarkets			pouch			
					Ordinary retail stores			pouch			
	"Chicken Ramen"	02	1 pouch	(1) To wholesalers		yen	sen	pouch	1 Producers (including branch) 2 Sales companies established by producers 3 Ordinary wholesalers 4 Other wholesalers (agricultural or livelihood cooperative association, etc.)	Name of prefecture ———	
				(2) To retail stores	Department stores			pouch			
					Supermarkets			pouch			
					Ordinary retail stores			pouch			
	"Myojo Charumera"	03	1 pouch	(1) To wholesalers		yen	sen	pouch	1 Producers (including branch) 2 Sales companies established by producers 3 Ordinary wholesalers 4 Other wholesalers (agricultural or livelihood cooperative association, etc.)	Name of prefecture ———	
				(2) To retail stores	Department stores			pouch			
					Supermarkets			pouch			
					Ordinary retail stores			pouch			

Source: 1992 National Survey of Prices

Note: This questionnaire is distributed to wholesale stores surveyed.

Figure 2 Definition of Retail Formats



Source: 1992 National Survey of Prices

wide range of goods and brands because they employ self-service systems and enable consumers freely to choose their favorite brand. Additionally, the classification indicates that on average the number of workers in department stores or supermarkets is larger than that in ordinary stores.

In addition to the NSP, we use the 1991 Census of Commerce as a supplementary dataset to obtain the degree of concentration in each wholesale business category.

2.2 Regression results

This section statistically investigates whether the increase in purchasing prices arising from the concentration of wholesalers is smaller for large retail formats, such as supermarkets, than for small retail formats, or stores. Because mean values of wholesale prices averaged across several stores surveyed are observed from the NSP, we estimate the following log-linear equation with generalized least squares (GLS) for each specification by retail format, where the number of wholesale stores surveyed is the weight for each observation, to derive an efficient estimator.

$$\ln \overline{P}_i = \alpha + \beta \ln HF_i + \sum_j \delta_j D_{Wji} + \varepsilon_j, \tag{1}$$

where subscript i represents the i_{th} observation in the NSP, $\overline{P}$ is the average transaction price between wholesalers and retailers for a specification in a certain area, D_{Wj} is the j_{th} type wholesale format dummy, and ε is the error term. A wholesale format dummy, D_{Wj}, is added as an explanatory factor because selling prices usually vary across different wholesale formats. HF is defined as the Herfindahl index of wholesalers that are mostly expected to transact in the respective specification.[7] It should be noted that the Herfindahl indices calculated are based on the number of workers reported in the Census of Commerce instead of the amount of sales. Although it would be more favorable to capture the degree of concentration on the basis of the amount of sales, the census only reports the frequency distribution of wholesalers classified by the number of employees. Thus, a second-best approach is taken to calculate the degree of concentration based on the number of workers.

Table 2 presents the estimated β for each specification. The left column presents the results for department stores, the middle column for supermarkets, and the right column for ordinary retail stores. Note that space limitations preclude reporting the estimated coefficients for δ_j in Equation (1). For an understanding of the regression results, note that the estimated coefficient signifies the elasticity because the regression equation takes a log-linear form. In Table 2, we find more significant positive signs in the estimation results for ordinary retail stores than for the other two retail formats. Among the items, the results for convenience goods centering on food categories appear to exhibit such a tendency. By contrast, the estimated coefficients for supermarkets in several categories exhibit negative signs. In addition, many of the coefficients for department stores are insignificant, arguably because the number of observations and the degrees of freedom are insufficient to derive an efficient estimator.

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[7] Taking "soy sauce" as an example, we match the business category of "Miso and Soy Sauce Wholesalers" in the Census of Commerce to the soy sauce prices observed in the NSP.

Table 2 Estimated coefficients from the regressions by retail format for each specification

ID	Estimated coefficients for department stores	p-value	N*	Estimated coefficients for supermarkets	p-value	N*	Estimated coefficients for ordinary retail stores	p-value	N*
1	NA	NA	NA	NA	NA	NA	0.0288	0.000	128
2	NA	NA	NA	0.0835	0.407	9	0.0549	0.000	141
3	NA	NA	NA	0.1580	0.160	10	0.0291	0.115	115
4	NA	NA	NA	NA	NA	NA	0.0397	0.721	14
5	NA	NA	NA	–0.0135	0.895	9	0.0096	0.612	44
6	NA	NA	NA	–0.0128	0.904	9	0.0183	0.519	32
7	0.0185	0.605	9	0.0699	0.000	6	0.0248	0.055	51
8	0.0106	0.640	19	–0.0258	0.279	23	0.0047	0.699	59
9	0.0177	0.706	12	0.0256	0.568	22	0.0213	0.080	69
10	0.0202	0.233	13	–0.0272	0.171	17	0.0051	0.639	56
11	0.1056	0.135	8	0.0429	0.113	17	0.0213	0.169	52
12	–0.0713	0.159	10	0.0086	0.802	13	0.0414	0.001	50
13	0.0523	0.232	11	0.0332	0.314	19	0.0170	0.231	52
14	0.0055	0.849	18	–0.0110	0.644	21	0.0112	0.457	47
15	–0.0051	0.000	6	0.0240	0.680	7	0.0051	0.709	50
16	0.0828	0.078	12	0.0480	0.165	22	0.0237	0.023	59
17	0.0091	0.675	19	–0.0031	0.843	25	0.0034	0.726	63
18	NA	NA	NA	NA	NA	NA	0.0021	0.956	26
19	0.0016	0.935	12	0.0113	0.602	13	–0.0093	0.492	39
20	0.0316	0.542	9	0.0578	0.172	17	0.0223	0.048	55
21	0.0120	0.621	11	–0.0326	0.162	17	0.0005	0.966	49
22	–0.0273	0.723	9	0.0397	0.438	10	–0.0078	0.754	49
23	NA	NA	NA	NA	NA	NA	0.0599	0.182	27
24	–0.0161	0.000	6	NA	NA	NA	0.0119	0.195	51
25	0.0123	0.700	8	0.0389	0.472	11	0.0525	0.002	43
26	0.0175	0.605	8	–0.0215	0.429	17	–0.0015	0.902	45
27	NA	NA	NA	0.0507	0.398	12	0.0614	0.006	33
28	–0.2471	0.001	13	0.0121	0.352	43	0.0086	0.517	69
29	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	–0.0175	0.734	17	–0.0064	0.865	26
31	NA	NA	NA	0.0609	0.598	10	0.0443	0.818	8
32	NA	NA	NA	–0.2545	0.581	7	0.0475	0.516	18
33	–0.1262	0.000	6	–0.3343	0.000	6	–0.1139	0.098	15
34	0.0331	0.100	17	0.0206	0.236	28	0.0065	0.588	22
35	0.0418	0.002	12	0.0308	0.013	41	0.0073	0.382	55
36	NA	NA	NA	0.0217	0.119	16	0.0011	0.821	30
37	NA	NA	NA	NA	NA	NA	–0.4252	0.153	9
38	–0.1005	0.392	11	–0.0678	0.217	22	–0.0211	0.553	20
39	0.0226	0.000	6	0.0270	0.086	40	–0.0089	0.358	55
40	NA	NA	NA	0.0164	0.242	13	–0.0001	0.992	21
41	NA	NA	NA	–0.1672	0.383	22	–0.1114	0.172	31
42	0.0645	0.322	14	–0.0057	0.879	28	0.0251	0.437	51
43	NA	NA	NA	–0.1149	0.367	9	–0.0510	0.386	25
44	0.0588	0.434	16	0.0144	0.767	31	0.0355	0.455	42
45	–0.0931	0.479	9	–0.1827	0.247	21	–0.1549	0.004	38
46	–0.0404	0.686	17	–0.0766	0.133	25	–0.0598	0.212	43

47	NA	NA	NA	0.0103	0.936	10	–0.0168	0.777	23
48	0.0197	0.698	21	–0.0112	0.868	29	–0.0912	0.048	46
49	–0.0523	0.049	28	0.0001	0.990	96	–0.0048	0.351	120
50	–0.0001	0.999	8	–0.0030	0.787	44	0.0182	0.027	61
51	NA	NA	NA	0.1483	0.069	9	0.0496	0.059	19
52	0.0598	0.025	8	0.0398	0.002	50	0.0009	0.902	64
53	0.0032	0.620	40	0.0004	0.964	39	0.0121	0.053	104
54	0.0219	0.027	16	0.0176	0.257	16	0.0224	0.004	81
55	0.0029	0.669	20	0.0011	0.939	26	0.0199	0.017	82
56	0.0127	0.014	40	0.0019	0.694	45	0.0067	0.048	106
57	NA	NA	NA	–0.0716	0.000	6	0.0096	0.517	24
58	0.0092	0.010	42	0.0055	0.272	44	0.0046	0.106	105
59	0.0151	0.003	31	0.0005	0.940	38	0.0063	0.134	101
60	0.0081	0.075	36	0.0088	0.061	43	0.0096	0.016	99
61	0.0130	0.228	37	0.0454	0.000	40	0.0257	0.000	100
62	–0.0179	0.596	10	0.0212	0.716	10	0.0198	0.124	54
63	NA	NA	NA	0.0271	0.188	41	0.0468	0.017	45
64	0.0258	0.600	10	0.0376	0.002	83	0.0463	0.000	92
65	0.1636	0.406	10	0.0456	0.059	65	0.0288	0.074	82
66	0.0942	0.221	11	0.0192	0.073	83	0.0192	0.008	99
67	0.0594	0.531	10	0.0087	0.380	93	0.0165	0.019	108
68	0.1028	0.461	11	–0.0250	0.273	61	0.0274	0.188	82
69	0.0679	0.166	12	0.0105	0.162	85	0.0096	0.196	107
70	0.0302	0.340	12	0.0132	0.069	85	0.0058	0.342	106
71	–0.0017	0.970	8	–0.0194	0.189	59	0.0105	0.105	92
72	–0.0099	0.910	7	0.0211	0.149	44	0.0157	0.013	95
73	–0.0027	0.888	12	0.0123	0.178	33	0.0094	0.046	45
74	0.0537	0.126	13	0.0024	0.828	77	0.0077	0.216	109
75	NA	NA	NA	–0.0396	0.878	7	–0.0071	0.634	49
76	0.0282	0.430	11	0.0135	0.387	82	0.0567	0.000	77
77	0.0002	0.991	30	0.0225	0.012	99	0.0243	0.000	109
78	NA	NA	NA	0.1438	0.005	28	0.0839	0.056	17
79	–0.0075	0.941	7	0.0503	0.019	62	0.0630	0.017	46
80	NA	NA	NA	0.1455	0.174	11	NA	NA	NA
81	0.0225	0.218	32	0.0219	0.085	94	0.0227	0.023	102
82	0.0193	0.392	31	0.0216	0.187	87	0.0219	0.221	100
83	0.0284	0.199	33	0.0137	0.369	74	0.0312	0.012	72
84	–0.0194	0.764	17	0.0692	0.055	38	0.0477	0.348	19
85	–0.0002	0.996	17	0.0619	0.015	35	–0.0187	0.738	22
86	0.0660	0.262	13	–0.0015	0.968	30	0.0608	0.079	11
87	0.0127	0.753	8	0.0304	0.345	28	0.0313	0.606	10
88	0.0129	0.737	10	0.0138	0.083	101	0.0123	0.046	112
89	0.0214	0.681	10	0.0034	0.724	95	0.0140	0.040	108
90	0.0346	0.000	6	0.0141	0.260	81	0.0065	0.444	96
91	0.0258	0.670	7	0.0169	0.046	99	0.0211	0.001	109
92	0.0024	0.969	9	0.0199	0.031	93	0.0207	0.001	103
93	0.0055	0.848	19	0.0018	0.791	101	0.0110	0.062	118
94	–0.0254	0.252	17	–0.0184	0.148	89	–0.0045	0.669	103
95	–0.0106	0.839	17	–0.0037	0.660	95	–0.0029	0.626	115
96	–0.0157	0.545	10	–0.0200	0.062	99	–0.0031	0.666	110
97	NA	NA	NA	–0.0037	0.944	10	NA	NA	NA

98	NA	NA	NA	–0.0098	0.758	25	0.0342	0.019	79
99	NA	NA	NA	NA	NA	NA	0.0622	0.138	40
100	0.0464	0.462	8	0.0236	0.554	28	0.0520	0.012	74
101	NA	NA	NA	–0.0068	0.848	14	0.0159	0.118	65
102	0.0170	0.100	9	0.0111	0.148	26	0.0203	0.010	72
103	NA	NA	NA	NA	NA	NA	0.0102	0.602	48
104	NA	NA	NA	NA	NA	NA	0.0549	0.023	34
105	NA	NA	NA	NA	NA	NA	0.0317	0.025	38
106	0.0289	0.374	7	0.0048	0.848	20	0.0323	0.005	83
107	0.0106	0.815	7	–0.0145	0.605	19	0.0206	0.016	70
108	NA	NA	NA	–0.1081	0.000	6	0.1244	0.208	22
109	NA	NA	NA	NA	NA	NA	0.0030	0.855	31
110	NA	NA	NA	NA	NA	NA	NA	NA	NA
111	NA	NA	NA	NA	NA	NA	NA	NA	NA
112	NA	NA	NA	NA	NA	NA	NA	NA	NA
113	NA	NA	NA	NA	NA	NA	NA	NA	NA
114	–0.0035	0.643	29	0.0047	0.299	31	0.0053	0.224	32
115	0.0010	0.661	35	–0.0009	0.731	29	0.0029	0.697	38
116	0.0123	0.727	15	0.0281	0.065	69	0.0199	0.008	106
117	0.0125	0.703	16	0.0164	0.106	77	0.0347	0.000	96
118	–0.0046	0.823	20	–0.0003	0.979	73	0.0137	0.007	111
119	0.0263	0.294	16	0.0141	0.170	76	0.0263	0.000	96
120	0.0217	0.466	10	0.0041	0.747	64	0.0169	0.100	98
121	–0.0130	0.864	21	0.0101	0.490	68	0.0333	0.001	88
122	–0.1002	0.870	7	0.0493	0.075	54	0.0508	0.000	73
123	0.0350	0.864	7	–0.0083	0.778	40	–0.0007	0.966	84
124	NA	NA	NA	0.0543	0.010	53	0.0311	0.183	80
125	–0.1636	0.211	10	0.0025	0.771	54	0.0439	0.004	82
126	–0.0631	0.208	14	–0.0031	0.756	57	0.0418	0.010	82
127	0.0289	0.000	6	0.0122	0.245	56	0.0466	0.021	75
128	–0.0394	0.763	8	0.0125	0.577	57	0.0296	0.106	80
129	NA	NA	NA	0.0064	0.701	14	0.0291	0.191	46
130	–0.0131	0.734	10	0.0795	0.122	22	0.0598	0.022	45
131	0.0263	0.426	20	0.0451	0.023	47	0.0169	0.269	86
132	NA	NA	NA	–0.0334	0.189	15	–0.0010	0.984	27
133	–0.0325	0.110	16	0.0129	0.074	21	0.0121	0.093	39
134	0.0017	0.852	12	0.0324	0.022	13	0.0255	0.052	25

Note: The natural logarithm of wholesale prices for each specification is regressed on the natural logarithm of the Herfindahl index and dummies for the wholesale formats. Only the estimated coefficients on the Herfindahl index are presented due to space limitations. Each coefficient represents the elasticity of the wholesale price to the degree of wholesalers' concentration. N* is the number of observations for each specification. "NA" indicates that the regression cannot be estimated because of scarce observations. For the specification IDs, see Table 1.

To obtain a clearer picture of the results, Table 3 classifies the goods into convenience goods and others, counting the estimated coefficients for β for each specification by their sign and significance based on Table 2. Panels B and C of Table 3 indicate that the difference in the impact of wholesale concentration on purchasing prices between supermarkets and ordinary retail stores is greater particularly for convenience goods, because the proportion of "positive and significant coefficients" in ordinary retail stores to supermarkets is greater in Panel B than in Panel C.

Table 3 Number of coefficients on the Herfindahl index in regression by item and specification

Panel A: All goods

Number of:	Department Stores	Supermarkets	Ordinary Retail Stores
Positive and significant coefficients	9	14	45
Negative and significant coefficients	5	3	2
Insignificant coefficients	79	101	80

Panel B: Convenience goods (Specification ID: 49~113 and 116~128)

Number of:	Department Stores	Supermarkets	Ordinary Retail Stores
Positive and significant coefficients	7	10	37
Negative and significant coefficients	1	2	0
Insignificant coefficients	50	57	35

Panel C: Other goods (Specification ID: 1~48, 114~115 and 129~134)

Number of:	Department Stores	Supermarkets	Ordinary Retail Stores
Positive and significant coefficients	2	4	8
Negative and significant coefficients	4	1	2
Insignificant coefficients	29	44	45

Note: The estimated coefficients presented in Table 2 are classified into each row by testing their significance at the 5% level. The specification ID is provided in Table 1. The panels indicate that the difference in the impact of wholesale concentration on purchasing prices between large retail formats and ordinary retail stores is particularly greater for convenience goods.

3 Concluding remarks

Focusing on the brand-level transaction prices between wholesalers and retailers, this paper has explored the retailers' countervailing power by measuring the sensitivity of wholesale prices to the degree of wholesale concentration. The results of the empirical analysis based on Japanese official data shows that the increase in purchasing prices caused by wholesalers' concentration tends to be less for the large retail format than the small retail format. The lower elasticity of the purchasing price to the degree of concentration of suppliers for supermarkets indicates that large retailers receive advantageous purchase prices.

As reviewed, past marketing research has largely measured the financial performance of distributive channel members rather than transaction prices between them to investigate the power of retailers over their suppliers. Given the research strand, the present paper has contributed to the current body of literature by exploring the relationship between the degree of wholesale concentration and wholesale prices for a wide range of consumer product categories.

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