Incumbent's Price Response to New Entry: The Case of Japanese Supermarkets[1]

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November 18, 2008

Abstract

Large-scale supermarkets have rapidly expanded in Japan over the past two decades, partly because of zoning deregulations for large-scale merchants. This study examines the effect of supermarket openings on the price of national brand products sold at local incumbents, using scanner price data with a panel structure. Detailed geographic information on store location enables us to define treatment and control groups to control for unobserved heterogeneity and temporary demand shock. The analysis reveals that stores in the treatment group lowered their prices of curry paste, bottled tea, instant noodles, detergent, and toothpaste by 1 to 2 percent more than stores in a control group in response to a large-scale supermarket opening. The price response is larger in the market where the pre-entry market condition is more monopolistic and for stores with similar floor size as new entrants. These additional findings are consistent with theoretical predictions.

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Introduction

The retail sector has been regarded as one of Japan's least productive industries. In 2000, the McKinsey Global Institute issued a very influential report, which found Japan's overall retail productivity is half of the US's; in particular, the productivity of small-scale retail stores is only 19 percent of that in the US. The report points out that the large share of unproductive small retail shops was the main cause of overall low productivity. The report claims that this lower productivity hurt Japanese consumers through high prices.

Since the report's issuance in 2000, the industrial structure of Japanese retail industries has changed dramatically. Figure 1 displays the recent changes of the share by medium-large scale food stores, as well as total sales overall in Japan.[4] The figure clearly shows that medium- to large-scale food stores increased their presence in Japan. The numbers of large food stores and mom-and-pop shops are reported in Figure 2. From the figure, we can observe that since 1991, small food stores have decreased their number by about 50%, while the medium-large stores have increased by about 20 percent.

Although there are various reasons behind the changes, one of the most influential causes was the deregulation of store locations at the national level. Small retail shops in Japan had been protected from competition with large retail shops by governmental regulation. Under the large-scale retail store law (*Daikibo Kouri Tenpo Ho*), which was enacted in 1974, potential supermarkets entrants with 500 or more square meters had to obtain permission from local incumbent merchants, as well as

[4] In Figure 1, medium-large food shops include food stores that are larger than 250 square meters. In the total sales (solid line), we did not include sales by large department stores because we could not separate sales of foods from sales of other items in large department stores. The data come from the Current Survey of Commerce, The Ministry of Economy, Trade and Industry.

confirmation from local authorities. That is, the entry of large retail shops that would compete with local stores was heavily regulated. In 2000, the Large-Scale Retail Store Law was replaced by the Large-Scale Retail Store Location Law (*Daikibo Kouri Tenpo Ricchi Ho*). This new law dropped the requirement for the local merchant union's agreement for approval, and local authorities almost automatically approved new stores if the applications proved that the new stores would not deteriorate the local community's environment, for example as a result of noise or traffic jams, through an environmental assessment report. In response to this deregulation, the new opening of large retail stores increased dramatically. Whether this rapid expansion of large retail shops benefited consumers through lower prices remains an empirical question.

Studies on the effect of large supermarket entry on local pricing are rapidly emerging. Basker (2005) examines the effect of Wal-Mart openings on the pricing of local incumbents, using a city-level quarterly panel price survey from the US. She selected 10 national brand items and found that Wal-Mart openings reduced the city's average price of several products by 1.5 to 3 percent. A follow-up study by Basker and Noel (2007), based on panel data, again reports a price reduction effect of 1 to 2 percent. Hausman and Leibtag (2005) report that Wal-Mart sells identical food items 15 to 25 percent lower than traditional supermarkets. Lira, Rivero and Vergara (2007) examine the opening of supermarkets on the local price index of 15 food-related items and find that the local price is reduced by 7 to 11 percent based on Chilian data. Manuszak and Moul (2008) examine the case of office supply stores in the US and report that a higher density of store locations in a local area results in lower prices, after controlling for the endogeneity of store locations. They point out the endogeneity of local store density because stores are located in areas with higher demand and correct for the endogeneity using distance from the supply chain headquarters as an instrumental variable.

Matsuura and Motohashi (2005) document the establishment-level dynamics of entry and exit for the Japanese retail sector and report the exit of establishments with lower labor productivity and the entry of establishments with higher potential for growth in labor productivity between 1997 and 2002. Their study clearly suggests that deregulation was efficiency enhancing, but it does not address its effect on prices that potentially leads to consumer welfare improvement because their data set does not contain detailed information on prices.

This study examines the effect of supermarket openings on incumbents' pricing of national-brand products based on weekly scanner data compiled by a marketing company that precisely records the name of each product with a scanner bar code, the time of sale, the price, and the amount of units sold. The sales information is accompanied with the exact address of the store location. These features of the data enable us to implement the study without paying too much attention to measurement error of the price, timing, and product that are major concerns in previous studies. In addition, the detailed geographic information enables us to control for unobserved market heterogeneity across regions over time. Stores located within a 15-minute driving distance are defined as treatment stores, while those located a 30- to 60-minute driving distance are defined as control stores. This fine definition of treatment and control groups presumably controls for common unobserved local demand shocks.

The analysis results reveal that stores in the treatment group reduce the prices of national brand curry paste, bottled tea, instant noodles, detergent, and toothpaste by 0.9 percent to 1.8 percent after the opening of a new supermarket compared with stores in the control groups. We further confirm that these price reductions are pronounced for stores in monopolistic markets and stores of a size similar to the entrants.

The rest of the paper is organized as follows. Section 2 describes the data and introduces descriptive statistics. Section 3 explains the empirical method used to identify the causal effect of new supermarket opening on the prices of incumbent stores. Section 4 introduces the basic results and discusses additional results. The last section provides conclusions and proposes possible extensions for future research.

Data

We use two data sources for this study. The first source relates to new store openings. The Large-Scale Store Location Law requires potential supermarket entrants to obtain the city office's permission for store openings. The application-related information is accessible to the public and available from the Ministry of Economy, Trade and Industry's webpage. This information includes the street addresses of new supermarkets, as well as the dates of application and planned opening, which enable us to identify the presumable dates of new store openings and their street addresses.

Since there are too many store openings in this data set, this study focuses on new store openings of two large supermarket chains: Ito-Yokado and the Eion group. Founded in 1920, Ito-Yokado is the largest supermarket chain in Japan and is characterized as mega-scale shopping mall. The Eion group holds several medium- to large-scale supermarket chains, such as Jusco, Yaohan, and Maxvalu. There are 20 new store openings by Ito-Yokado and 206 by Eion between the enactment date of the Large-Scale Retail Store Location Law (June 1, 2000) and the last week of 2007. Among these 226 stores, 16 stores of Ito-Yokado and 166 stores of Eion could be matched with stores with scanner data, as described in the next paragraph. Figure 3 shows the geographic distribution of these 182 stores. Among the 182 stores in our analysis sample, the median sales floor area of Ito-Yokado is 24,500 square meters and that of Eion is 7,569 square meters.

The second data source is price information from the incumbent stores collected through the scanner record compiled by the INTAGE Corporation. These data are designed for marketing purposes, and item name, price, and sales timing are precisely recorded. Store-level weekly average prices of national brand items are available from this data set. The street address of the store location, also included in the data set, is used to determine the stores that are affected by new supermarket openings (treatment group) and the stores located nearby but arguably not directly affected by new store openings (control group).

The analysis sample constructed from INTAGE scanner data covers the period between the first week of 1999 and the last week of 2007 and supermarket stores with sale floors of 500 square meters or more. The treatment and control groups comprise 776 stores. Among these, 93 serve as treatment stores, 495 serve as control stores, and 188 serve as both treatment and control stores corresponding to different new openings. The stores are classified into one of three categories by size: General merchandise stores have a sales floor of 3,000 or more square meters with more than 50 employees; large super markets has 1000 square meter or above; and small supermarket have between 500 and 1,000 square meters.

An examination of new supermarket entry on incumbent supermarkets' pricing requires careful control for local market conditions because new supermarkets are presumably more likely to be located in areas with growing demand (Manuszak and Moul (2008)). To deal with this potential endogeneity of new store location, two groups of incumbent stores are defined. The first group consists of stores located less than a 15-minutes driving distance from a new supermarket and this group of stores is called the treatment group because these stores' pricing is presumably affected by the entry of a new supermarket. The second group consists of stores that are located between a 30- and 60-minute driving distance from a new supermarket. This group of stores is called the control group, which presumably shares the local market demand condition with the treatment group, but its pricing strategy is not directly affected by new store openings.

One may argue that the treatment group and control group may not share the same local market demand condition, or, that the control group is also affected by new store openings. Thus, the choice of control group is critical to the success of our research design, and we check the robustness of our results based on several definitions of control groups.

Table 1 tabulates the items used for this study, and Table 2 tabulates descriptive statistics of supermarkets' prices by treatment status of the stores and timing before and after the opening of new stores. The six commodities we use in this paper are national brands that are sold throughout Japan.[5] The means of prices clearly indicate a price drop in the "after" period, reflecting that the sample period covers a deflation period in the Japanese economy. The question is: How much of this price reduction can be attributed to competition induced by deregulation?

Empirical Methodology

[5] There is a possibility that the prices of popular items react to competitors' prices more than those of less popular items because of large advertisement effects. In this case, our estimates of price elasticity should be interpreted as the upper bound. However, it is also possible that to attract customers, a retailer does not have to cut the prices of popular items as much as those of less popular items because many people know the market level. Therefore, it is not certain whether our estimates have upper or lower biases.

Our empirical strategy is a difference-in-differences approach that compares the price change of stores in the treatment and control groups before and after new supermarket openings. Because there are 182 observations of new supermarket openings and 469 sample weeks, there are 85,358 (=182×469) pairs of treatment and control groups.

To deal with this many observations in a systematic way, we model the price of a good sold at an incumbent store *i* in a market *j* in week *t* as:

$$\ln(p)_{ijt} = \alpha T_i + \beta \left(T_i \times A_{jt}\right) + d_{jt} + u_{ijt}. \quad (1)$$

The dummy variable T_i takes one if a new supermarket opens at week *t* within a 15-minute driving distance from store *i*. Note that stores located a 30- to 60-minute driving distance serve as control stores. The dummy variable A_{jt} takes one after a new supermarket opening in region *j*. If the new entry of a supermarket reduces the price of treatment group incumbent stores but does not affect that of the control group, parameter β is expected to have a negative sign. The vector of dummy variables d_{jt} captures the region-week-specific shock common across all stores.

The key identification assumption is that the price shock u_{ijt} is not correlated with T_i and $T_i \times A_{jt}$ conditional on region-week-specific shock, more explicitly, $E(u_{ijt} \mid T_i, A_{jt}, d_{jt}) = 0$. Price shock typically includes demand or marginal cost shocks. If stores in the treatment and control groups share the systematic part of these shocks, then the systematic shocks are captured by the dummy variables d_{jt} and the remaining shocks become uncorrelated with T_i and $T_i \times A_{jt}$, thus the exogeneity assumption holds.

Results

Table 3 reports the regression coefficients of the price equation. The negative and statistically significant coefficients of (Treatment×After) dummy variables for all products except for instant coffee imply that supermarket openings decrease neighborhood incumbent supermarket prices. The prices of stores located close to newly opened supermarkets are reduced by 0.9 percent to 1.8 percent compared with other stores in the same region. The positive coefficients for straight treatment dummy variables for products except for instant coffee and detergent, in addition, imply that new supermarkets are likely to open in areas with high prices. This finding is consistent with the prior prediction that newly opened stores are located in high demand areas. The dummy variables for store sizes show that smaller stores generally charge higher prices than larger stores.

The choice of control group stores, which are within a 15-minute driving distance, and treatment group stores, which are located within a 30- to 60-minute driving distance, are arbitrary, and thus the results obtained in Table 3 could be sensitive to the choice of these groups. In particular, one may point out that the current definition of the control group covers too large an area to define a market that shares the same market demand condition. To address this concern, Table 4 estimates the identical price equation with an alternative sample of control group stores that is located less than the median distance of newly opened stores among control group stores. The estimated coefficients become imprecise, reflecting the smaller sample size, but the results are essentially unchanged from Table 3. Stability of the results regardless of how the control group is defined assures that the previous results are not driven by an arbitrary choice of control group.

The analysis so far assumes the constancy of price response to new store entry into the market by treatment group incumbent stores, but the price response could be heterogeneous depending on preexisting market conditions. If the market is not competitive before the opening of a new store, then the incumbent store is expected to have charged high prices and to significantly reduce the price in response to the new store entry. However, if the new store opens in a competitive market, incumbent stores are expected to have had near-marginal cost pricing and are less likely to change prices in response to the new entry. In particular, if we assume Cournot competition among stores in a market with a linear demand function and a constant marginal cost, the Nash equilibrium prices are inversely related to the number of stores in a market. The marginal effect of an additional store on equilibrium price declines at quadratic speed. Thus, the theory predicts a significant marginal effect of a new store opening on price in monopolistic markets, but a trivial effect in markets with many existing stores. Tables 5 and 6 test these predictions.

Table 5 restricts the analysis sample to the markets with only one store in the control group, which are presumably monopolistic markets. The much larger coefficients for the (Treatment × After) dummy variables than those reported in Table 3 confirm the prediction that price responses are larger in monopolistic markets. New entry of supermarkets into a monopolistic market reduces prices by between 2.3 and 9.5 percent.

In contrast, Table 6 restricts the sample to markets with four or more supermarkets in the control group, which are presumably competitive markets.

Statistically non-significant or even positive coefficients for the Treatment × After dummy variables do not contradict the prediction that a new entry does not change the pricing behavior of incumbents in competitive markets.

Overall, Tables 5 and 6 show that the incumbents' prices are responsible in monopolistic markets while not responsible in competitive markets, as the theory predicts. This result also suggests that stores located in non-competitive markets exercise market power in price determination. We further derive a theoretical prediction for the heterogeneity of price responses depending on store types and test the prediction.

Table 3 indicates that smaller stores on average charge more than their larger counterparts, and this implies that identical items sold at different-size stores are not perfectly substitutable. Among the 182 new store openings in the analysis data, 166 openings were by Eion, whose new openings mostly consist of large supermarkets that mainly sell food items. The opening of large supermarkets is expected to have a stronger influence on prices of similar-size stores because the cross-price elasticity with those newly opened stores and incumbent large stores is expected to be high. In contrast, the opening of large supermarkets is expected to have less impact on the pricing of large general merchandize stores and small supermarkets. Accordingly, we predict that large incumbent supermarkets respond the most to the opening of new supermarkets. Table 7 tests this prediction by estimating price equation (1) based on the sample whose treatment group consists of specific size stores while the control group consists of all size stores.

Panel A shows that the price responses by general merchandise stores are heterogeneous across items and there is no systematic pattern of price responses. Similar findings are obtained for small supermarkets, as reported in panel C. In contrast, Panel B reports that large supermarkets, which are a close substitute to new entrants, lower prices for all goods except detergent. Large supermarkets reduce their prices by 2.9 to 4.4 percent in response to the entry of new supermarkets that are presumably close substitutes. This result further assures that the findings in Table 3 are not caused by a spurious correlation.

Conclusion

This paper reports evidence on how the entry of new supermarkets in a local market changes the prices of selected national brand items, such as processed food and groceries, at incumbent stores. We have contrasted the price changes of supermarkets that are closely located to the entrant and ones at a distance, based on scanner data with detailed geographic locations of supermarkets. We have found that stores located within a 15-minute driving distance reduce prices of curry paste, bottled tea, instant noodles, detergent, and toothpaste by 1 to 2 percent. These results suggest that the entry of new supermarkets in a geographic region cuts the market power of incumbent supermarkets and leads them to lower prices.

We also found that the price reduction in response to the new entry is larger in markets with only one incumbent than the markets with many stores. This heterogeneity of price responses is consistent with the theoretical prediction that the entry cuts the market power of incumbent stores where the pre-existing market structure was less competitive. Moreover, only stores of a similar size to new entrants systematically reduce prices after the new entry, presumably because pf the high cross-price demand elasticity to the prices of the new entrant. This additional finding suggests that stores with different sizes offer heterogeneous services to consumers. Heterogeneous price responses by pre-existing market conditions and presumable cross-price elasticity assure that the basic findings of this paper are not products of a spurious correlation.

The price reduction induced by competition with a new entrant enhances consumer surplus. Our data set does not allow us to calculate the size of the consumer surplus triangle because of a lack of quantity information at the market level. A data set with a wider coverage of stores would enable us to quantify the consumer surplus. This would be a useful extension of this paper to derive implications for merchandise location policy.

Acknowledgment

This paper is a part of research project, “Understanding Inflation Dynamics of the Japanese Economy” (PI: Tsutomu Watanabe) supported by JSPS Grants-in-Aid for Creative Scientific Research. We are grateful to the INTAGE Corporation for providing us with the scanner data. We would like to thank Rachel Griffith and participants at the seminar at RIETI for their helpful comments. We also thank Akiko Togawa for her research assistance.

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Table 1: Items for Analysis

Item	Brand and Product	Description	JAN code
Curry Paste	S&B, Golden Curry	Medium Hot, 240g	4901002011604
Bottled Tea	Coca-Cola, Sokenbi Cha	Pet Bottle, 2000ml	4902102016513
Instant Coffee	Nestle, Nescafe gold blend	100g	49681123
Instant Noodles	Nisshin, Cup Noodle	Regular size, soy sauce flavor	49698114
Detergent	Kao, Attack	Powder, 1.1kg	4901301463111
Toothpaste	Sunstar, GUM	180g	4901616007673 4901616008250

Note: The JAN code is the abbreviation for Japanese Article Number code, which is compatible with the Universal Product Code (UPS).

Table 2: Descriptive Statistics

Item	Curry Paste	Bottled Tea	Instant Coffee	Instant Noodles	Detergent	Toothpaste
Treatment						
Before	207.60	202.10	640.11	103.12	367.74	407.36
	(42.08)	(30.58)	(122.73)	(19.46)	(57.55)	(40.29)
After	200.48	180.75	570.80	98.22	337.06	407.78
	(37.56)	(15.68)	(114.58)	(18.28)	(46.83)	(42.57)
Control						
Before	218.33	200.80	628.39	103.39	366.36	421.95
	(40.62)	(29.00)	(131.30)	(20.20)	(58.56)	(42.52)
After	204.69	181.62	591.59	99.83	334.18	416.07
	(37.10)	(15.56)	(116.79)	(20.15)	(43.65)	(40.64)
Total	207.18	194.30	614.71	101.48	359.44	410.62
	(40.62)	(27.77)	(125.21)	(19.46)	(56.70)	(41.84)

Note: Means are reported, and standard deviations are reported in parentheses.

Table 3: The Effect of New Entry on Incumbent Pricing

Dependent Variable: Log Price

	(1)	(2)	(3)	(4)	(5)	(6)
	Curry Paste	Bottled Tea	Instant Coffee	Instant Noodles	Detergent	Toothpaste
Treatment	0.008	0.008	-0.003	0.011	-0.002	0.008
	(0.004)	(0.002)	(0.004)	(0.003)	(0.002)	(0.002)
Treatment×After	-0.015	-0.009	0.003	-0.009	-0.013	-0.018
	(0.006)	(0.003)	(0.006)	(0.005)	(0.005)	(0.004)
Large supermarket	0.018	0.029	-0.002	-0.007	0.037	0.022
	(0.003)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Small supermarket	0.036	0.029	0.022	0.008	0.069	0.021
	(0.003)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Area×Week Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47541	52624	47613	50301	41446	27519
Number of Groups	20902	21800	20623	21361	18297	11725
R-squared	0.007	0.022	0.004	0.002	0.051	0.015

Note: Standard errors are in parentheses. Fixed effects for (shopping area for newly opened store) × week are controlled for. The base category for store size is a general merchandise store that has 3,000 square meters or more for sales floors with more than 50 employees. Large supermarkets have sales floors of 1,000 square meters or more, and small supermarkets have between 500 and 1,000 square meters.

Table 4: Regression with Alternative Choice of Control Groups

Dependent Variable: Log Price

	(1)	(2)	(3)	(4)	(5)	(6)
	Curry Paste	Bottled Tea	Instant Coffee	Instant Noodles	Detergent	Toothpaste
Treatment	0.019	0.009	-0.010	0.005	0.002	0.008
	(0.005)	(0.002)	(0.005)	(0.004)	(0.003)	(0.003)
Treatment×After	-0.012	-0.010	-0.011	-0.002	-0.005	-0.013
	(0.008)	(0.004)	(0.008)	(0.007)	(0.006)	(0.004)
Large supermarket	0.030	0.028	-0.043	0.007	0.045	0.030
	(0.004)	(0.002)	(0.004)	(0.004)	(0.003)	(0.002)
Small supermarket	0.016	0.028	-0.017	0.015	0.074	0.033
	(0.004)	(0.002)	(0.004)	(0.003)	(0.002)	(0.002)
Area×Week Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	29466	32977	29453	31094	25245	17987
Number of Groups	14588	15427	14270	14942	12633	8386
R-squared	0.005	0.019	0.010	0.001	0.068	0.030

Note: Standard errors are in parentheses. Fixed effects for (shopping area for newly opened store) × week are controlled for. The base category for store size is a general merchandise store that has 3,000 square meters or more for sales floors with more than 50 employees. Large supermarkets have sales floors of 1,000 square meter or more, and small supermarkets have between 500 and 1,000 square meters. The control group only includes stores located within 16.447 km (median distance among control group stores) of newly opened stores.

Table 5: The Impact in a “Monopolistic” Market

Dependent Variable: Log Price

Sample: Market with One Treatment Store

	(1)	(2)	(3)	(4)	(5)	(6)
	Curry Paste	Bottled Tea	Instant Coffee	Instant Noodles	Detergent	Toothpaste
Treatment	-0.032	0.009	0.039	0.028	0.036	0.054
	(0.006)	(0.003)	(0.006)	(0.005)	(0.004)	(0.004)
Treatment×After	-0.068	-0.023	-0.095	-0.043	-0.068	-0.037
	(0.011)	(0.005)	(0.012)	(0.008)	(0.008)	(0.007)
Large supermarket	0.033	0.053	0.058	0.020	0.000	0.017
	(0.007)	(0.003)	(0.007)	(0.006)	(0.005)	(0.005)
Small supermarket	0.045	0.036	0.068	0.008	0.035	-0.002
	(0.008)	(0.003)	(0.008)	(0.006)	(0.005)	(0.005)
Area×Week Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8003	8543	7809	8521	7327	4193
Number of Groups	4283	4589	4166	4477	3935	2362
R-squared	0.043	0.070	0.039	0.015	0.050	0.104

Note: Standard errors are in parentheses. Fixed effects for (shopping area for newly opened store) × week are controlled for. The base category for store size is a general merchandise store that has 3,000 square meters or more for sales floors with more than 50 employees. Large supermarkets have sales floors of 1,000 square meters or more, and small supermarkets have between 500 and 1,000 square meters. The sample includes only those from the market defined by region×week with one treatment store.

Table 6: The Impact in a “Competitive” Market

Dependent Variable: Log Price

Sample: Market with Four or More Treatment Stores

	(1)	(2)	(3)	(4)	(5)	(6)
	Curry Paste	Bottled Tea	Instant Coffee	Instant Noodles	Detergent	Toothpaste
Treatment	-0.024	-0.021	-0.067	-0.053	-0.026	0.011
	(0.008)	(0.004)	(0.009)	(0.008)	(0.005)	(0.005)
Treatment×After	0.005	0.017	-0.014	0.007	0.024	0.017
	(0.012)	(0.006)	(0.015)	(0.012)	(0.012)	(0.008)
Large supermarket	-0.029	-0.014	-0.022	-0.006	0.075	0.027
	(0.007)	(0.004)	(0.010)	(0.008)	(0.006)	(0.005)
Small supermarket	0.013	0.007	-0.010	0.051	0.086	0.036
	(0.007)	(0.003)	(0.009)	(0.007)	(0.006)	(0.005)
Area×Week Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4755	5307	5128	5198	3897	3255
Number of Groups	777	777	777	777	620	621
R-squared	0.020	0.024	0.024	0.047	0.068	0.036

Note: Standard errors are in parentheses. Fixed effects for (shopping area for newly opened store) × week are controlled for. The base category for store size is a general merchandise store that has 3,000 square meters or more for sales floors with more than 50 employees. Large supermarkets have sales floors of 1,000 square meters or more, and small supermarkets have between 500 and 1,000 square meters. Sample includes only those from the market defined by region×week with four or more treatment stores.

Table 7: Heterogeneous Effects by Store Sizes

	(1)	(2)	(3)	(4)	(5)	(6)
	Curry Paste	Bottled Tea	Instant Coffee	Instant Noodles	Detergent	Toothpaste
Panel A: Effect on General Merchandise Store (3000 sq. meters or more + 50 employees or more)						
Treatment	-0.032	-0.024	-0.048	-0.017	-0.036	0.023
	(0.008)	(0.003)	(0.007)	(0.007)	(0.005)	(0.005)
Treatment×After	0.062	0.019	0.083	0.045	-0.013	-0.053
	(0.012)	(0.006)	(0.012)	(0.011)	(0.009)	(0.007)
Observations	38545	42568	38648	40617	33259	22608
Number of Groups	18803	19599	18632	19230	16352	10806
R-squared	0.001	0.002	0.003	0.001	0.005	0.005
Panel B: Effect on Large Super Market (1000 sq. meters or more, food more than 50%)						
Treatment	0.014	0.021	0.001	0.011	-0.010	0.015
	(0.005)	(0.003)	(0.005)	(0.005)	(0.004)	(0.004)
Treatment×After	-0.044	-0.029	-0.036	-0.039	0.000	-0.032
	(0.010)	(0.005)	(0.009)	(0.008)	(0.008)	(0.006)
Observations	39977	44052	40030	42051	34641	22694
Number of Groups	18709	19342	18441	18931	16299	10311
R-squared	0.001	0.003	0.001	0.001	0.000	0.002
Panel C: Effect on Small Super Market (500 - 999 sq. meters, food more than 50%)						
Treatment	0.020	0.005	0.003	0.014	0.019	-0.011
	(0.006)	(0.003)	(0.005)	(0.005)	(0.004)	(0.003)
Treatment×After	-0.022	0.002	0.015	0.005	-0.020	0.016
	(0.009)	(0.004)	(0.009)	(0.008)	(0.007)	(0.005)
Observations	39818	44294	39913	42342	34613	22925
Number of Groups	18649	19504	18272	19100	16343	10250
R-squared	0.001	0.000	0.000	0.001	0.001	0.001

Note: Standard errors are in parentheses. Fixed effects for (shopping area for newly opened store) × week are controlled for. Control groups include stores of all sizes.

Figure 1: Annual Sales of Retail Food Shops

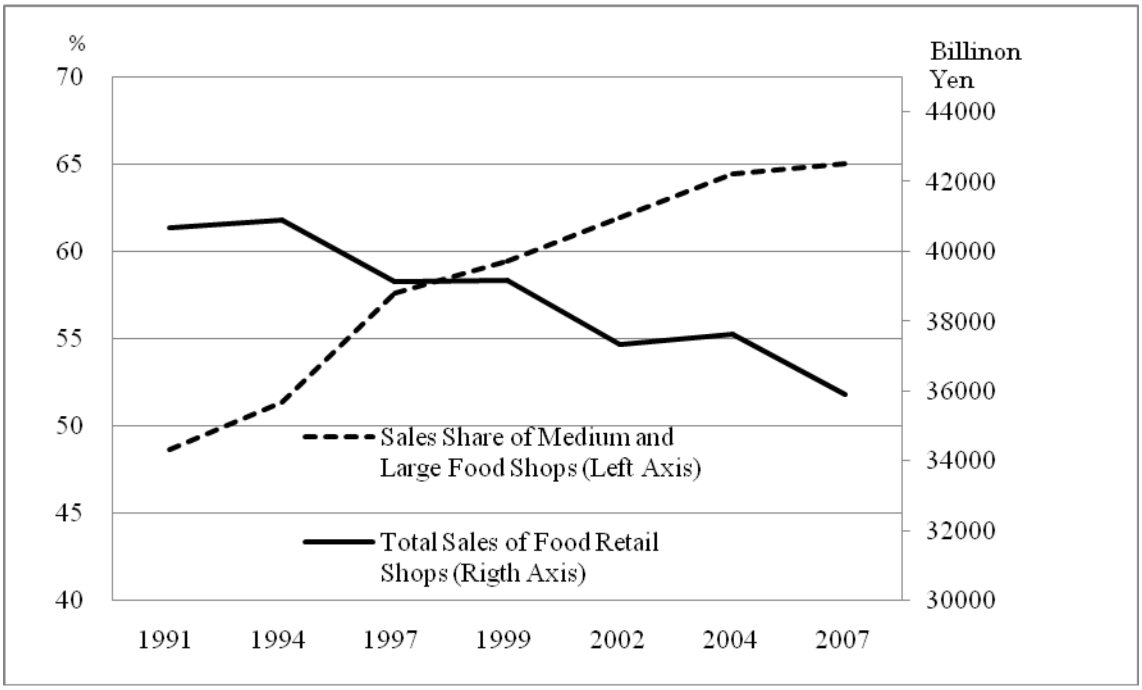


Figure 2: Number of Food Retail Shops

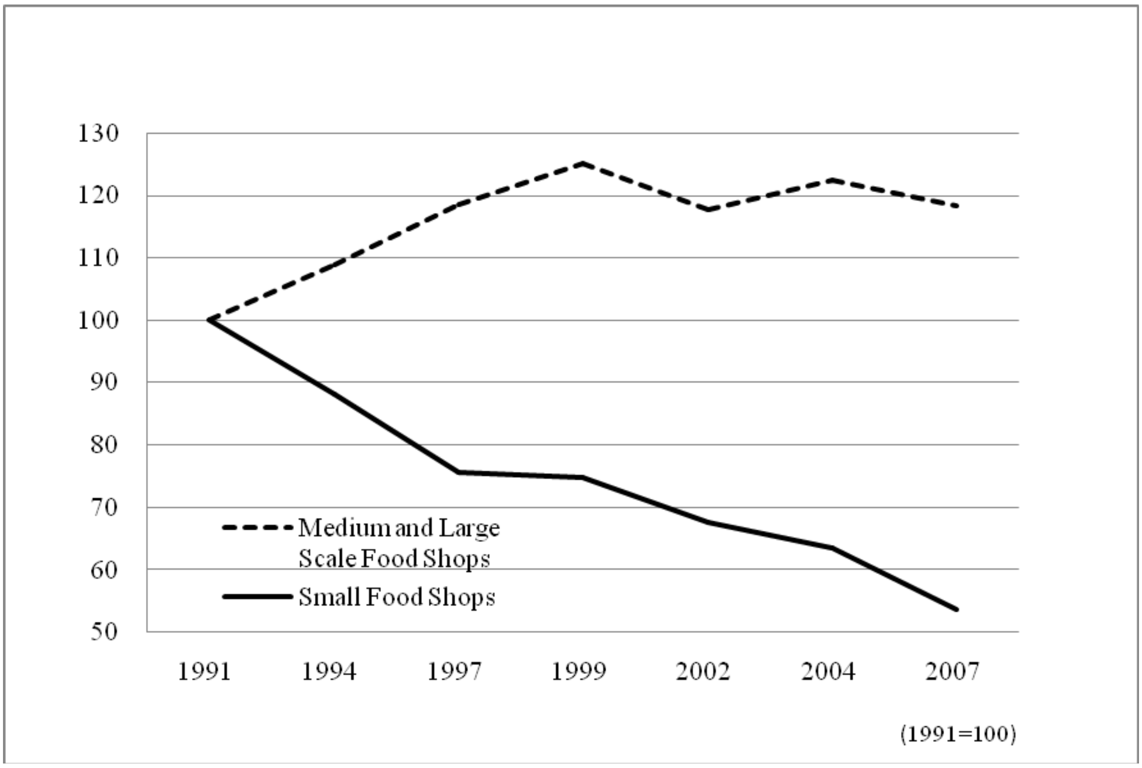
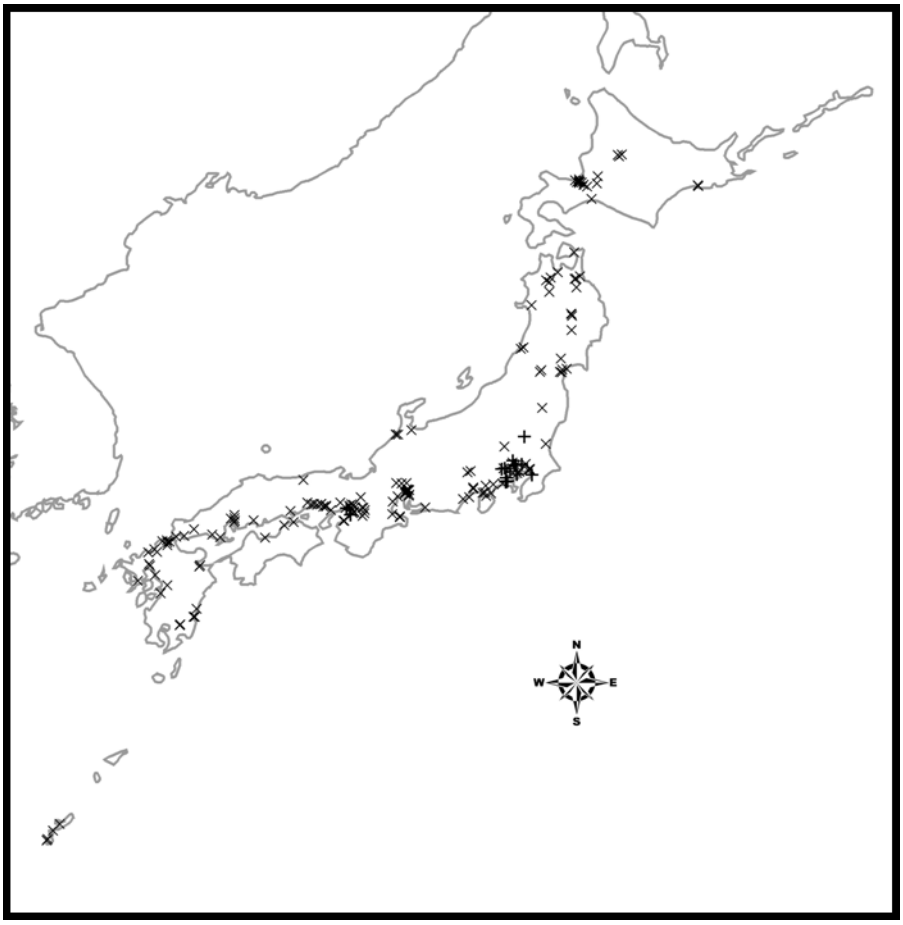


Figure 3: The Location of New Openings of Ito-Yokado and Eion Groups, 2000-2007



+ : Large Retail Shops that belong to the Ito-Yokado group (166)

x: Large Retail Shops that belong to the Eion group (16)