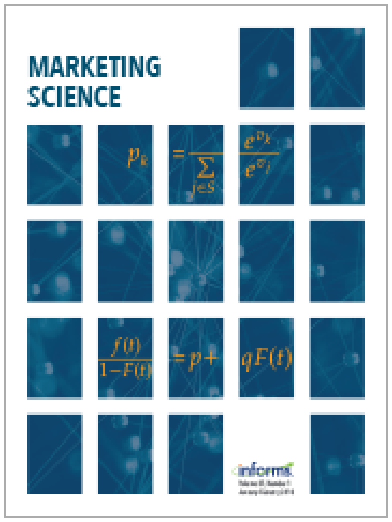

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First-Mover Advantage Through Distribution: A Decomposition Approach

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Abstract. Whereas the extant literature on entry-order effects establishes that first entrants often earn higher market shares ("market-share advantage"), the literature on distribution suggests that increased distribution has a positive effect on sales. Can distribution help us better understand entry-order effects on market shares? This paper examines how the first entrant in a geographical market achieves a market-share advantage through distribution. For this purpose, I propose a simple method of decomposing sales into physical distribution and sales performance. The data come from a manually collected panel on six major Japanese convenience-store chains from 47 geographical markets between 1991 and 2007. Using an instrumental variable approach to address the potential endogeneity of entry order, I find first entrants have a positive market-share advantage over later entrants. Specifically, the physical distribution, measured by the number of outlets in a market, drives most of the advantage. Meanwhile, the positive effect on sales performance for the first chain brand becomes nonexistent when I control for the outlet density. This paper further finds that the density of own outlets is nonmonotonically (inverted U) related to sales performance per outlet, suggesting dynamic outlet expansion faces a trade-off between the business-stealing effect in a chain ("cannibalization") and the advertising effect through repetition.

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1. Introduction

The extant literature on entry-order effects on performance, typically termed "first-mover advantage" or "pioneering advantage," establishes that first entrants often earn higher market shares ("market-share advantage;" see, e.g., Lieberman and Montgomery 1988, Kalyanaram et al. 1995). At the same time, the literature on the effects of marketing mix on performance provides empirical evidence that increased distribution has a positive effect on sales (see, e.g., Reibstein and Farris 1995). Of course, if a product or service is less accessible because of increased search costs or transportation costs, people might be less likely to purchase it. So, can distribution help us better understand entry-order effects on market shares?

This question is of concern to academics and marketing practitioners. Consider, for example, chain retailers that aim to grow rapidly in size. Does entering a geographical market earlier than one's competitors lead to higher sales? If so, does this advantage come from increased physical distribution because entering early often leads to a higher number of outlets? Does this advantage come from a higher sales performance per outlet because consumers are more favorable toward earlier entrants' brands?

This paper takes a first step toward empirically assessing how a pioneering firm entering a geographical market might (or might not) achieve a market-share advantage through increased distribution and sales performance per distribution. To separately quantify the role of distribution from sales performance, I propose a simple decomposition of market shares, such that I only need aggregate information on distribution at the market level. Acknowledging that physical outlets in retailing and service industries characterize distribution, this paper decomposes sales into the number of outlets (i.e., stores) and average sales per outlet in a market, both of which are important measures of performance for marketing practitioners and scholars.[1,2] Because market sales are a product of the number of outlets and average sales per outlet, the decomposition resembles the literature on decomposition of sales elasticities into elasticities of category purchase timing, brand choice, and purchase quantity (Gupta 1988, van Heerde et al. 2003).

This paper produces two key substantive findings. First, using an extensive data set of store counts and sales for 47 geographical markets for the Japanese convenience-store industry between 1991 and 2007, this paper finds that first entrants have a market-share advantage of 115.3% over later entrants, after addressing the potential endogeneity of entry order using the distance from the largest shareholder company's headquarters as the instrumental variable. Specifically, the effects are driven by distribution, measured by the number of outlets in a market: Of the 115.3%, 101.7% comes directly from higher outlet shares ("outlet-share advantage") for first entrants, and the remaining 13.6% comes from better sales performance at the store level ("sales-per-outlet advantage") for first entrants. The significant outlet-share advantage for first entrants is qualitatively consistent with a strand of literature that argues a multistore incumbent may deter late entrants by credibly preempting a product space through product proliferation in the geographical space. On the other hand, this paper finds that the observed sales-per-outlet advantage does not exist with a set of controls for the density of own outlets. This finding is consistent with the repetition effect, and contrasts with the strand of literature that argues early entrants may permanently benefit from higher store-level sales performance through various mechanisms, such as prototypicality.

Second, this paper investigates the effect of distribution on sales performance, and finds that density of own outlets is nonmonotonically (inverted U) related to average sales per store. The results suggest that dynamic outlet expansion is associated not only with entry order but also with a trade-off between the business-stealing effect in a chain ("cannibalization") and the repetition effect. Two cross-sectional survey data sets on consumer perception of chain brands confirm this interpretation. To rule out alternative explanations, I use two cross-sectional data sets on outlet-level geographical location to verify whether multistore retailers entering earlier than competitors obtain prime locations.

This paper contributes to the marketing literature by synthesizing the existing work on first-mover advantage and on the relationship between market shares and distribution through a simple decomposition of market shares. Despite the extant empirical literature on the first-mover advantage and the literature on the relationship between market shares and distribution, scant evidence assesses the relative importance of an outlet's sales performance and distribution as mechanisms for first-mover advantage. By proposing a market-share decomposition, this work quantifies entry-order effects on market shares through distribution. Accordingly, the decomposition yields two substantive findings on the sources of the entry-order effects on market shares that are, to our knowledge, unique in the literature of entry-order effects on performance, i.e., (1) a strong role of distribution in market-share advantage and (2) a nonmonotonic relationship between sales performance at the store level and distribution. The first finding corresponds to evidence of the product proliferation for market pioneers (e.g., Robinson and Fornell 1985, Robinson 1988) in the context of the geographical space. The managerial implications are potentially significant because practitioners should be aware of the magnitudes of the trade-off between rushing into a new market and increasing its outlet density in existing markets. By entering new markets earlier than its competitors, a firm may increase the total sales from the market via a higher number of outlets. Alternatively, a firm may want to develop its existing markets to have a higher density of outlets, which leads to a higher sales performance at the store level. The optimal decision hinges on how many outlets a chain has developed in existing markets because of a nonmonotonic (inverted-U) relationship between density of own outlets and sales per outlet.

The rest of the paper is organized as follows. The remainder of this section discusses related literature. Section 2 describes the empirical model of market shares and their decomposition, and presents several theoretical models to examine the sources of market-share advantage (if any). Section 3 describes the data and the convenience-store industry. Section 4 provides empirical results on the first entrants' advantage in market shares, and decomposes this advantage into outlet-share and per-outlet-sales advantages. This section also identifies the potential mechanisms for higher per-outlet sales for the first entrant. Section 5 discusses alternative explanations, explores the robustness analysis, and develops the managerial implications. Section 6 concludes.

1.1. Related Literature

This research is related to four strands of marketing literature. First, this work builds on extensive research on the relationship between order of entry and performance (see, e.g., Lieberman and Montgomery 1988, Golder and Tellis 1993, Kalyanaram et al. 1995, Bohlmann et al. 2002, Boulding and Christen 2003, and papers listed in Table 1 of Lieberman and Montgomery 1998). The two closest papers are Brown and Lattin (1994) and Bronnenberg et al. (2009), who analyze the entry-order effects on market shares in geographic markets. The former provides empirical evidence of the effect of entry order on market shares, using cross-sectional data of two major brands in the pet food market. The latter uses historical entry-order information from 50 geographical markets and a panel data set of 39 months of market shares for the brands in 34 consumer packaged goods (CPG) industries. The authors statistically document entry orders and market shares through the distance from the first market of entry, where a "brand" is defined as all stock keeping units (SKUs) sold under a given brand name. By including an identity of retailers (i.e., groceries) as a regressor when regressing market shares on a first-entrant index, they find that a retail-account component explains 20% of the CPG brands' variation in market shares. This paper documents and investigates the mechanisms of market-share (dis-) advantages at the chain-brand level through decomposition of market shares into outlet shares and per-outlet sales.

Second, this work is related to the strand of literature on the market-share advantage for early entrants in the retailing sector. Denstadli et al. (2005) study entry-order effects on consumers' evaluations on prices and quality using survey data in the discount retail grocery industry. Michael (2003) explains the performance differences between restaurants by focusing on years since a firm adopted a franchising format. Unlike this work, however, both approaches lack the interplay between total sales and physical outlets and the consideration of endogeneity issues, which characterize distribution in retailing sectors. Gielens and Dekimpe (2001) study the effect of start-up scale and entry order on the performance in the context of expansion of grocery retailing chains into multiple foreign countries. This paper, by leveraging disaggregated data in a single country, studies the decomposition of sales into distribution and sales performance while addressing the endogeneity of entry timing.

Third, this work is related to the strand of literature on order of entry and product proliferation. Whereas existing empirical research has focused on how the first entrant benefits from its proliferation in product space (e.g., Tellis and Golder 1996, Boulding and Christen 2009), this work examines the first entrant's market-share advantage in the context of outlet proliferation in the geographical space.

Finally, this paper is related to the literature on the effects of distribution on performance in sales. Previous empirical research has largely analyzed the performance of brands at the product level. Ataman et al. (2010) find the positive and significant effects of distribution breadth on sales for 70 brands at the SKU level. Bucklin et al. (2008) report the positive effect of distribution intensity on a consumer's choice of a new car from eight midsize premium sedan models. Kumar et al. (2009) find that the distribution level has a positive influence on sales of Proctor & Gamble's 11 brands at the SKU level. By contrast, the empirical evidence of the effect of distribution on sales of brands at the aggregated level, such as the retailer chain, has received scant attention. This paper fills this gap by evaluating the effect of distribution on brands' market shares at the chain level.

2. Modeling Approach

2.1. Empirical Framework

Market share, outlet share, and sales-per-outlet share. This section begins by revisiting a market share, which is constructed by observed sales for a given chain, market, and time. In addition to sales, I observe the number of outlets for each chain in market m at time t. Then I can back out the average sales per outlet in market m at time t by dividing sales by the number of outlets.

I formalize the model as follows. Consider a market share of a chain that enters a geographical market. By definition, the market share of chain i in the geographical market m at time t is the sales of chain i in market m at time t divided by the total sales of all outlets in market m in year t. That is,

$$\begin{aligned}
&\text{Market Share}_{i,m,t}\\
&\quad= \frac{\text{Sales}_{i,m,t}}{\text{Sales}_{m,t}} = s_{i,m,t}\\
&\quad= \frac{\text{Number of Outlets}_{i,m,t}\cdot \text{Per Outlet Sales}_{i,m,t}}{\text{Number of Outlets}_{m,t}\cdot \text{Per Outlet Sales}_{m,t}}\\
&\quad= n_{i,m,t}\cdot v_{i,m,t},
\end{aligned}$$

where $n_{i,m,t}$ = (Number of Outlets$_{i,m,t}$)/(Number of Outlets$_{m,t}$) and $v_{i,m,t}$ = (Per Outlet Sales$_{i,m,t}$)/(Per Outlet Sales$_{m,t}$) are an outlet share and a per-store-sales share, respectively. What do these variables mean? For example, consider a market in which two chains, A and B, exist and have 10 and 30 outlets, respectively. Then the outlet shares of chains A and B will be $n_{A,m,t} = 0.25(= 10/40)$ and $n_{B,m,t} = 0.75(= 30/40)$, respectively. This outlet share measures chain i's physical distribution in market m. Note that one of the three measures of distribution in the literature is percent of physical distribution, which measures the percent of outlets carrying the product (Reibstein and Farris 1995). Because the product is a chain's brand in this paper, one may interpret an outlet share as percent of physical distribution. The per-outlet-sales share of chain i in market m at time t is defined as the sales per outlet of chain i in market m at time t divided by the sales per outlet of all outlets in market m in year t. This share represents relative store sales. For instance, if chain i's average per-outlet sales in a given market are \$1.5 million annually and the average per-outlet sales of all outlets in the market are \$1 million annually, $v_{i,m,t} = 1.5(= 1.5/1)$. This per-outlet-sales share $v_{i,m,t}$ represents chain i's individual store performance benchmarked against the market's average, i.e., how much an average outlet of chain i earns in sales relative to the average individual store sales of all chains in the market.

Entry-order-effect decompositions. Following the literature that measures the market-share advantage for the first entrant, such as Bronnenberg et al. (2009), the log market share of chain i in market m at time t is modeled, in its simplest form, as

$$\ln s_{i,m,t} = \beta^{s}_{\text{first}} \text{First Entrant}_{i,m} + \gamma^{s} \ln(\text{Year}_{i,m,t}) + \mu + \theta_i + \kappa_m + \varepsilon_{i,m,t}, \quad (1)$$

where First Entrant$_{i,m}$ is an indicator variable of 1 if chain i is the first entrant in market m, and 0 otherwise. Online Appendix A details the choice of a market-share model. The coefficient β^{s}_{first} captures how being the first entrant in market m permanently affects that firm's market share, all else being equal. If, alternatively, we are interested in order-of-entry effects, the first term becomes β^{s}_{order}Entry Order$_{i,m}$, where Entry Order$_{i,m}$ represents the historical order of entry of chain brand i in market m. The subscript for parameter β, *first* and *order*, displays whether the specification uses the first-entrant indicator variable (First Entrant$_{i,m}$) or historical entry-order variable (Entry Order$_{i,m}$). Because Year$_{i,m,t}$ is years since entry into market m at time t for firm i, γ^{s} captures the time-in-market effect, i.e., how the absolute duration of firm i in market m affects its market share, regardless of the timing of entry relative to other competitors. Last, $\varepsilon_{i,m,t}$ is the unobserved disturbance, such as a demand shock that affects the sales of the chain, μ is an intercept, θ_i is chain-brand fixed effects, and κ_m is market fixed effects.

I construct regression equations of $\ln n_{i,m,t}$ and $\ln v_{i,m,t}$ on the same controls used in Equation (1). That is,

$$\begin{aligned}\ln n_{i,m,t} &= \beta^{n}_{\text{first}} \text{First Entrant}_{i,m} + \gamma^{n} \ln(\text{Year}_{i,m,t}) \\ &\quad + \mu^{n} + \theta^{n}_i + \kappa^{n}_m + \varepsilon^{n}_{i,m,t}, \qquad (2)\\ \ln v_{i,m,t} &= \beta^{v}_{\text{first}} \text{First Entrant}_{i,m} + \gamma^{v} \ln(\text{Year}_{i,m,t}) \\ &\quad + \mu^{v} + \theta^{v}_i + \kappa^{v}_m + \varepsilon^{v}_{i,m,t}.\end{aligned}$$

Decomposition of Equation (1), similar to the sales-elasticity decomposition with respect to marketing mix (Cooper and Nakanishi 1988), reveals that in the population model, the sum of the parameters from these two separate equations is equal to the corresponding parameters of the market-share equation. That is,

$$\beta^{s}_{l} = \beta^{n}_{l} + \beta^{v}_{l}, l \in \{\textit{first}, \textit{order}\}, \quad (3)$$

and $\gamma^{s} = \gamma^{n} + \gamma^{v}$ (see Online Appendices B-1–B-3). This relationship enables a researcher to assess how much of a chain's higher market share over rival chains comes from the outstanding distribution, reflected in the number of outlets ("outlet-share advantage"), or from the superior sales at the individual store level relative to the market average ("sales-per-outlet advantage").

Per-outlet-sales regressions. The decomposition above leads to an empirical question about whether the first entrants tend to earn higher performance at the store level, such as sales per outlet. On one hand, Klemperer (1987) argues that if consumers may incur substantial costs when they switch to buying other products from competitors, consumers show brand loyalty even when products are ex-ante functionally homogeneous. Early entrants may permanently enjoy higher performance than later entrants by deterring their entry. On the other hand, a strand of behavioral marketing research suggests that the repetition of exposures, not entry order per se, affects consumers' purchase intention ("repetition effects"). I therefore include several controls for variables that relate to the repetition of purchase, i.e., density of own-chain brand's and competitors' outlets. The regression equation is

$$\begin{aligned}&\ln \text{Per Outlet Sales}_{i,m,t}\\ &= \beta^{\text{sales}}_{\text{first}} \text{First Entrant}_{i,m} + \gamma^{\text{sales}} \ln(\text{Year}_{i,m,t})\\ &\quad + \lambda^{\text{own}}_1 (\text{Outlet Density})_{i,m,t} + \lambda^{\text{own}}_2 (\text{Outlet Density})^2_{i,m,t}\\ &\quad + \lambda^{\text{rival}} (\text{Outlet Density})_{-i,m,t}\\ &\quad + \mu^{\text{sales}} + \theta^{\text{sales}}_i + \kappa^{\text{sales}}_m + \nu^{\text{sales}}_t + \varepsilon_{i,m,t}, \qquad (4)\end{aligned}$$

where (Outlet Density)$_{i,m,t}$ is the outlet density of own chain, defined as the number of chain i's outlets at time t in market m divided by the population in that market, and (Outlet Density)$_{-i,m,t}$ is the outlet density of competitor chains, defined as the number of chain i's competitor chains' outlets at time t in market m divided by the population in that market. To allow for the presence of a non-linear relationship between the density of own outlets and the sales per outlet due to a trade-off between the business-stealing effect in a chain and the repetition effect, which I detail in Section 2.2.2, the specification has a squared term. Finally, ν^{sales}_t is year fixed effects to control for the level of sales per outlet across years.

I now turn to the theoretical models that assess the sources of market-share, outlet-share, and sales-per-outlet advantage (if any).

2.2. Theoretical Framework

This section focuses on the theoretical framework to guide the empirical analysis. Specifically, based on the previous research that has proposed various mechanisms to explain the first entrant's higher (or lower) performance, I examine several models that may have different predictions on how entry order affects market shares and their components, i.e., outlet shares and sales per outlet.

2.2.1. Outlet-share advantage via outlet proliferation.

How do theory models predict the entry-order effects on the number of outlets? There are two distinct predictions. First, a strand of theoretical literature argues that an incumbent may deter late entrants by credibly preempting a product space through product proliferation, such as increasing the number of outlets in a geographical location. A model of sequential-move games predicts that in a subgame perfect equilibrium, the "leader," or the first entrant, produces a larger quantity and obtains a higher payoff than the followers (von Stackelberg 1934). In the context of spatial competition, Prescott and Visscher (1977), Schmalensee (1978), Eaton and Lipsey (1979), and Bonanno (1987) echo this conclusion. For instance, a monopolist may deter entry through relocation of outlets or an increase in the number of outlets (Bonanno 1987). Overall, many variants of the leader-and-follower model in this direction, including Peng and Tabuchi (2007), predict that the early entrant is likely to obtain a higher number of outlets than later entrants. A supply-side mechanism, such as economies of density, i.e., additional cost savings through logistics from having sufficient density in a market (see, e.g., Jia 2008, Holmes 2011, Nishida 2015) may provide an alternative perspective on outlet-share advantage for early entrants.

By contrast, another strand of literature predicts that the sequential move by players may not allow the incumbents to proliferate outlets. For instance, unless the incumbent's exit costs are not too high, entry deterrence against new entrants through product proliferation may not be credible for incumbents (Judd 1985). Moreover, if each firm increases the number of outlets over time at an approximately similar speed, even a simpler model with no strategic interaction would predict that a spurious negative correlation emerges between order of entry and number of outlets. The order of entry would then not be associated with the outlet share, after controlling for the duration of firms in a given market. Given these two strands of literature, whether the first entrant tends to have a higher outlet share than those of non-first entrants is an empirical question.

2.2.2. Sales-per-outlet advantage via repetition effect, prototypicality, and prime location. How do theory models explain the entry-order effects on individual store performance, such as sales per outlet? Three major explanations, i.e., repetition effect, prototypicality, and prime location, are available, and I discuss them in order.

First, the behavioral marketing research suggests two competing explanations, i.e., repetition effect and prototypicality, i.e., for whether and why entry order may have a significant positive impact on consumers' preferences. On one hand, a strand of literature argues that the repetition of exposures affects consumers' attitude and purchase intentions ("repetition effect"). A typical finding is that purchase intentions are nonmonotonically (inverted U) related to repetition (see, e.g., Batra and Ray 1986). This mechanism would predict that the sales per store would be nonmonotonically related to the density of own outlets (i.e., number of own outlets per population) in the market, but not to the entry order. That is, increased "visibility" of a chain brand through a higher density of own outlets initially increases the probability of consumers purchasing from the chain brand's outlets, but the marginal effect of this repetition effect starts to level off after a certain level of the density of outlets. On the other hand, another strand of literature argues that an entry order permanently affects consumers' preferences. Carpenter and Nakamoto (1989) show in a laboratory setting that early entrants set the standard for the individual's preference for a set of particular items, thereby shifting the preferences to favor the product that an early entrant produces, and yielding a higher market share in the long run. This so-called prototypicality mechanism would predict that the sales per store would be permanently higher for the first entrant, after controlling for several factors, including the density of own outlets because a particular chain brand would preempt a consumer's perceptual space. Similarly, Kardes et al. (1993) provide experimental evidence that entry order affects consumer learning and judgment, leading to a pioneering advantage that later entrants will have difficulty overcoming with the same level of advertising. Alpert and Kamins (1995), using a survey-based approach, find support for the persistent advantage for early entrants through more favorable perceptions for pioneering brands than nonpioneering brands. In either case, a pioneer chain brand may preempt a consumer's perceptual space, thereby leading to higher average store sales for the first entrant, ceteris paribus. Note that a strand of literature argues how brand loyalty extends to chain loyalty. For instance, Carman (1970) reports a positive correlation between chain loyalty and brand loyalty. Given these two competing explanations, whether the first entrant does not have higher sales per outlet than those of non-first entrants, when controlling for the density of own outlets in the market, is an empirical question.

Second, this paper examines prime location as an alternative explanation for higher sales per outlet for first entrants. The first entrant may be able to preempt scarce assets, such as prime retailing location (Lieberman and Montgomery 1988). Using land prices as the proxy for the attractiveness of a location, and denoting the parameter for this proxy in the regression equation as β^{location}, we may expect that the first entrant tends to locate where rent is higher than what non-first entrants pay ($\beta^{\text{location}}_{\text{first}} > 0$).

To see with which theoretical predictions the actual data would be consistent, I turn to the description of the industry and data sets.

3. Industry and Data

The convenience-store industry in Japan. The convenience-store industry has been expanding successfully in many countries. For instance, 7-Eleven, which started its business in 1927 in Dallas, Texas, has become the world's largest convenience-store chain, operating in more than 16 countries with more than 44,700 outlets in 2012. The current parent company is Seven & i Holdings Co., Ltd. in Japan. The total number of 7-Eleven stores in the world exceeds the number of Walmart stores or McDonald's by approximately 34,000 and 11,000, respectively. Despite the convenience stores' presence in retailing, little research has analyzed the industry.

The Census of Commerce, which this paper uses, defines a convenience store as a retail outlet that (1) is open at least 14 hours per day, (2) has sales floor space of between 30 square meters (m^2) and 250 m^2, (3) deals with food and beverages, and (4) adopts the self-service system in 50% or more of the sales floor space.[3]

According to Goldman's (1991) summary of the early history of the convenience-store industry in Japan, convenience stores started as a business category in Japan in the 1970s, and the format was originally transferred from the U.S. convenience-store chains via Japanese large-scale retailers. Originally, several nationwide supermarket and hypermarket (general-merchandise-store (GMS)) chains faced difficulty in opening large-size stores due to a newly enforced Large-scale Retail Stores Law, enacted at the national level in 1973, and which intended to prevent the opening of large-scale retail stores to protect small- and medium-sized traditional retail stores. To address this challenge, GMS chains sought to introduce the convenience-store business category. Their intent was to increase retail sales by opening small-size convenience-store outlets, while reducing the capital costs of such expansion by recruiting existing small-size retail outlets' owners, who were mostly independent, as franchise owners. Independent or non-chain-affiliated convenience stores later emerged as fringe firms in the industry, but they have not become dominant in size in sales or number of outlets (see Table 1 for data in 2001).

This business format was perceived to be different from traditional small-size independent retailers in Japan.[4] To introduce this business format, some retailers made a license agreement with convenience-store chains in the United States. For instance, Ito-Yokado, a general merchandise store established in 1920, partnered in 1973 with the Southland Ice Company, which established the first convenience store in 1927 in Dallas, Texas, to open 7-Eleven outlets in Japan. Similarly, Daiei, a supermarket chain, signed a contract with Consolidated Foods in 1974, which was established in 1939 and opened a chain of stores ("Lawson's Milk Company") in Ohio, to open LAWSON outlets in Japan. In 1979, UNY Co., Ltd. signed an agreement with Circle K in Arizona to open Circle K outlets in Japan. Therefore, some of the uncertainty inherent in a new category had already been resolved in the United States. The remaining chains, such as Family Mart, sunkus, and ministop, were developed by Seiyu, Nagasakiya, and JUSCO, respectively, all of which were domestic large retail companies.

Since then, these major convenience-store chains in Japan have enormously expanded their businesses, and independent or non-chain-affiliated convenience stores have been fringe firms in the industry. The business category has been expanding, and the failures of the convenience-store chains are quite limited in Japan during the data period. The store density (i.e., number of stores per population) has become tremendously high in most areas as described below, and they offer a wide range of products and services, including lunchboxes, soft drinks, alcohol, cosmetics, books and magazines, ATMs, ticket reservations, bill payments, delivery services, etc. Online Appendix C covers more detailed descriptions of the data and the industry's features.

Table 1 shows that the industry is concentrated in Japan: It comprises a small number of nationwide large multistore firms. 7-Eleven, the largest chain, represents 21% and 31% of the total number of outlets and sales in 2001, respectively. LAWSON Inc., the second-largest chain, originally started its business in 1975 and has 19% of outlets and sales in 2001. The six-firm concentration ratio is 82%. A large number of outlets allow chains to achieve the economies of scale in distribution, advertising, product developments, and purchasing power, as in the case of discount retailers or supermarket chains.

Figure 1 presents the market shares by prefectures for 7-Eleven and LAWSON. Together with Figure 2, Figure 1 illustrates that the market shares in the prefectures each chain entered as the first entrant indeed tend to be the highest among all chains. These two figures suggest a negative correlation between entry order and the market shares, which I investigate in Section 4.1.

The six major chains are similar in terms of store size in floor space, number of SKUs in a store, services, and pricing. Online Appendix C presents the evidence of this similarity, and Table A1 confirms that no major systematic differences exist across chains in the sales floor space per outlet. All six chains adopt uniform pricing across outlets in a chain. This feature of uniform product assortments and pricing allows us to avoid the issue of confounding the price and volume effects, which is a typical drawback of using market shares as the performance metric. The fraction of corporate outlets is not high in this industry. For instance, the fraction of corporate outlets to all outlets

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Table 1. The Number of Convenience-Store Outlets and Total Sales in 2001

Chain	Number of outlets	Percent	Cumulative	Sales (in thousand US$)	Percent	Cumulative
7-Eleven	8,416	21.0	21.0	204,664	30.5	30.5
LAWSON	7,419	18.5	39.5	127,536	19.0	49.5
Family Mart	5,805	14.5	54.0	94,607	14.1	63.6
sunkus	2,744	6.8	60.8	49,702	7.4	71.0
Circle K	2,696	6.7	67.5	47,854	7.1	78.1
ministop	1,491	3.7	71.2	21,676	3.2	81.3
Others	11,541	28.8	100.0	125,330	18.7	100.0
Total	40,112	100		671,369	100	

Note. Others include chain and non-chain (i.e., independent) convenience-store outlets.

Figure 1. (Color online) Market Shares by Prefecture for 7-Eleven (Left) and LAWSON (Right)

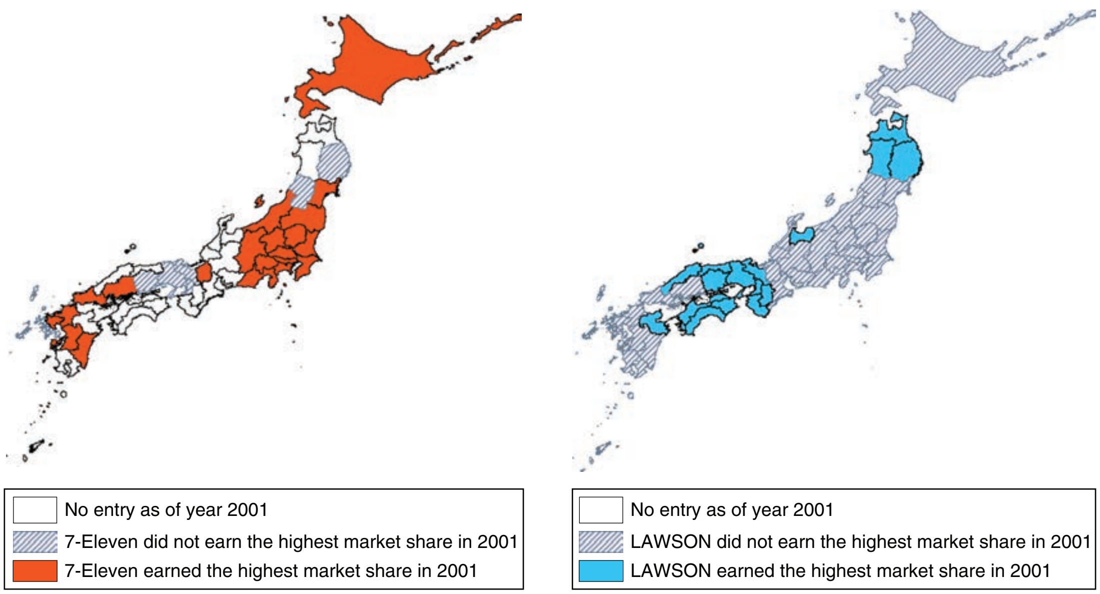
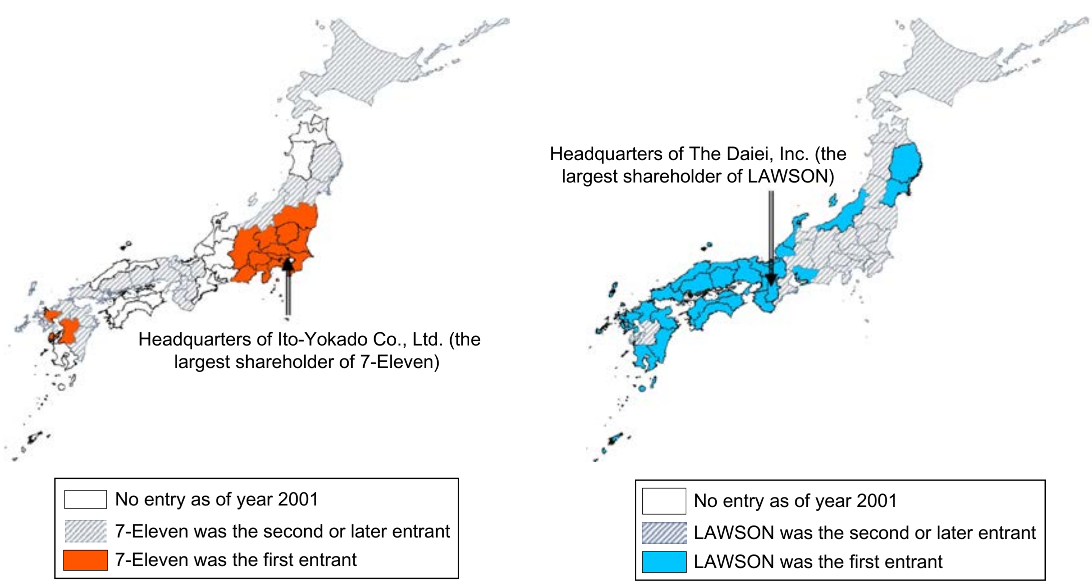


Figure 2. (Color online) Entry Order by Prefecture for 7-Eleven (Left) and LAWSON (Right)



was 4.6%, 9.3%, and 4.6% for 7-Eleven, LAWSON, and Family Mart, respectively, in 2001. The remaining percentage is franchise outlets. Those convenience-store chains mostly rent their store locations. According to the estimates based on chains' financial statements in fiscal year 2006 and store development guidelines, the three major chains, 7-Eleven, LAWSON, and Family Mart, own their outlets' locations for 2%–11% of all stores. For the remaining stores, those chains lease the space from a third party.

Japanese and U.S. convenience stores differ in two dimensions. First, unlike convenience stores in North America, most outlets in Japan do not sell motor fuels. For instance, in 2010, only 0.2% of all 7-Eleven stores in Japan had gas stations, whereas 28% of 7-Eleven stores in the United States sold gasoline.[5] In 2010, the total number of convenience stores in Japan was 43,372, and was 149,220 (25,931 without gas stations and 123,289 with gas stations) in the United States.[6] As a result, the density of stores measured by the number of convenience stores per population is quite high in Japan (3,387 stores per million people) compared to the store density in the United States (840 stores without gas stations). This outlet density of 3,387 stores is also strikingly high compared to other businesses in the United States, such as drug stores (1,319), supermarkets (1,075), and dollar stores (780). Second, the average store's floor space in Japan is around 1,743 square feet (ft^2), which is smaller than the average space in the United States (2,800 ft^2). Meanwhile, the number of SKUs a typical Japanese store carries is approximately 3,000, which is similar to that of a convenience store in the United States.[7] Each convenience-store chain in Japan strives to increase the fraction of sales from its unique private-label products of food and drinks against the national-brand products, such as Coca-Cola, and the fraction reached 55% of total sales for 7-Eleven Japan in 2007.[8]

Dependent variables. I use various sources to construct the dependent variables, such as market shares, outlet shares, and sales per outlet. The primary source of market-share data is the annual financial statements from the six largest convenience-store chains, which provide the prefecture-level annual sales and the number of stores for each chain. The coverage ranges from 1991 through 2007, and the data are an unbalanced panel because there are several markets in which certain chains have not entered. These sales at the prefecture level serve as the numerator when calculating a particular chain's market share in a given prefecture. I deflate the nominal sales across years using the Consumer Price Index from the Cabinet Office. The Census of Commerce from the Ministry of Economy, Trade and Industry provides the prefecture-level aggregate sales and store counts of all convenience stores, including regional chain and non-chain independent outlets, for the years 1991, 1994, 1997, 1999, 2002, 2004, and 2007. These aggregate sales at the prefecture level do not have a breakdown by chains, and they serve as the denominator when calculating the market share or outlet share of a particular chain. Japan has 47 prefectures, and each is a governmental body with a governor. This paper treats these prefectures as 47 independent geographic markets in the market-share regressions.

Spillovers across markets in demand or costs or both may make observations non-independently. For instance, people may travel across the boundary of prefectures (demand), and a distribution center may serve stores in different prefectures (costs). The spillover effects on the demand side might not pose an immediate concern for this industry because the trade area for a convenience store is typically confined within a 2,000–3,000-meter radius in rural areas and a 500-meter radius in residential areas.[9] Online Appendix F explores the main specification's robustness checks to include the density of outlets in adjacent markets. The results show no evidence of dependence of markets in sales.

In addition to sales and store counts, I use consumers' brand-loyalty data from two distinct surveys. The first survey in 2005 comes from the NTT Navispace Corporation, and the second in 2010 comes from the Interwired Corporation. Although these six chains are nationwide, consumers' preferences for their favorite chain brands vary widely across regions, which this paper exploits in Section 5. Finally, this paper uses the cross-sectional data on outlet-level location from the 2002 Convenience Store Almanac (TBC 2002), which provides chain affiliations and physical addresses for all 40,112 convenience-store outlets in Japan in 2001, including non-chain outlets. I translated each outlet's physical address into a latitude and longitude.

Variables of interest: entry timing and density of outlets. For the entry timing, I manually collected the historical data on each chain's roll-out year at a given prefecture from the financial statements, direct communication with each chain's headquarters, or past local Yellow Pages obtained from the National Diet Library. I do not distinguish the entry timing within a year: If multiple chains enter a market in the same year, these chains' entry order will be the same.

Table 2 presents the number of prefectures by entry order for each chain as of 2011. The table shows that entry orders vary within a chain for all chains. Whereas LAWSON and Family Mart have been the fourth entrant at the latest in every prefecture, the largest chain, 7-Eleven, is the fifth or sixth entrant in 10 prefectures, and still has eight prefectures with no outlet. Furthermore, the table shows that 7-Eleven was the first entrant less than 30% of the time in Japan (i.e., in 14 out of 47 markets). This entry-order information is at the market level; I do not have store-level information on the entry timing for a given market.

Table 2. Number of Prefectures by Historical Entry Order, 2011

	Entry order							
Chain	1st	2nd	3rd	4th	5th	6th	No entry	Sum
7-Eleven	14	4	6	5	5	5	8	47
LAWSON	27	16	4	0	0	0	0	47
Family Mart	2	13	20	12	0	0	0	47
sunkus	2	6	6	9	11	1	12	47
Circle K	6	5	10	2	1	2	21	47
ministop	0	0	1	10	9	5	22	47
Total	51	44	47	38	26	13		

Notes. The sum of first entrants, 51, exceeds the total number of markets (47) because there were some "ties." That is, some chains entered a market in the same year.

Table 3 presents the sample descriptive statistics by market. As the bottom row of Table 3 shows, the market population differs across prefectures and years. To measure the density of outlets in a given market, I construct the density of own (rival) outlets as the number of own (rival) outlets divided by the thousand population in the market. This table also summarizes market-level descriptive statistics for the six largest chains. The table excludes observations with no outlet in a given prefecture. Both the market share and the number of outlets vary widely across prefectures within a chain and across chains. By contrast, the average per-outlet sales are reasonably similar across chains except 7-Eleven, which exhibits around 30% higher sales per outlet than the per-outlet sales of the remaining five chains. For first entrants, we observe higher sales per outlet than non-first entrants' sales per outlet. The maximum and minimum values in the years since a firm's first outlet in a given market show that six chains started to operate in Japan 26–32 years ago, and these chains were still entering a prefecture as of 2007, which is the last year in our sample.

4. Empirical Evidence of First Entrant's Advantage

This paper's empirical investigation begins with formally establishing the (non-) existence of market-share advantage for the first entrant. I then decompose the observed market-share advantage for the first entrant into the outlet-share and per-outlet-sales advantages.

4.1. Effects of Entry Order on Market Shares

This section examines the entry-order effects on market shares using the empirical specification outlined in Equation (1).

Addressing endogeneity of entry order. A typical concern when estimating entry-order effects on market shares is that entry timing may be endogenous. For instance, chains that enter a geographical market earlier than competitors are systematically different from later-mover chains, such that the parameters on an entry-order variable do not necessarily measure the entry-order effects on market shares, but rather some other factors about type at the chain level and chain-market level.

To see this endogeneity problem in this work's specific context, consider, for instance, estimating Equation (1) through ordinary least squares (OLS). OLS would treat the regressors, including entry-order indicators, First Entrant$_{i,m}$ or Entry Order$_{i,m}$, as exogenously given. Chains may, however, deliberately choose the entry timing and which market to enter, depending on unobservables in the market that affect sales, such as a demand shock at the chain-market level. For example, if a chain anticipates consumers' market-chain-specific taste or goodwill over the chain's brand that would positively affect chain i's sales in that market m, such as a potential good match between chain i's horizontal differentiation in products and the market-specific taste, the chain may choose to enter market m earlier than the case in which a chain receives a negative demand shock. Because the entry-order indicator is no longer independent of the error term, the coefficient on the endogenous variable may be biased and inconsistent.

This paper addresses the endogeneity issue in the following two ways. First, I include chain-brand fixed effects in all specifications to control for the unobserved chain-brand type. In addition, Table 2 confirms the order of entry varies across markets for all chains, suggesting that no particular chain dominantly behaves as the first entrant. Second, to control for the endogeneity at the chain-market level, this paper uses an instrument variable (IV) that affects a chain's entry-timing decisions but does not affect unobservables, following the IV approach in the literature by Moore et al. (1991), Boulding and Staelin (1993), and Boulding and Christen (2003). Because the dependent variable is sales (market share), ideally we would like to have a cost shifter (hence affecting the entry-timing decision) that varies across chains and markets. Given the availability of multiple geographical markets, I exploit the distance to the headquarters of the largest shareholding company for each convenience-store chain as the instrument for this paper. Use of this instrument is related in spirit to Neumark et al. (2008), Jia (2008), Zhu and Singh (2009), and Nishida (2014, 2015) who use the geographical distance to the headquarters of the firm as an instrument or exclusion restriction.

I now discuss the three conditions for the validity of instruments and how this instrument is likely to work for the convenience-store industry in Japan. The first condition is that the instrument needs to be correlated with the endogenous variable that is instrumented, conditioning on other exogenous variables. This paper presents three reasons that the instrument is related to

Table 3. Sample Descriptive Statistics by Prefecture, 1991–2007

Variable	Mean	Std. dev.	Min	Max	Number of obs.
Market share					
7-Eleven	0.43	0.19	0.02	0.80	150
LAWSON	0.25	0.15	0.07	0.93	188
Family Mart	0.17	0.09	0.00	0.54	193
sunkus	0.11	0.08	0.00	0.34	106
Circle K	0.19	0.16	0.00	0.73	93
ministop	0.05	0.03	0.00	0.18	93
Overall	0.22	0.18	0.00	0.93	823
Number of outlets					
7-Eleven	290.6	253.8	6	1,328	150
LAWSON	165.6	174.2	21	926	188
Family Mart	162.6	192.9	3	1,025	193
sunkus	90.7	93.7	4	503	106
Circle K	119.3	161.7	1	847	93
ministop	78.0	74.6	1	301	93
Overall	162.9	191.4	1	1,328	823
Per-outlet sales (daily, US$)					
7-Eleven	6,163	652	4,126	7,384	150
LAWSON	4,440	473	3,568	6,026	188
Family Mart	4,274	499	2,621	5,570	191
sunkus	4,625	618	2,876	5,749	104
Circle K	4,478	430	3,179	5,693	90
ministop	4,200	545	1,492	5,737	83
First entrant	5,293	1,078	3,201	7,490	224
Second entrant	4,622	819	2,760	7,140	187
Third entrant	4,620	602	2,900	6,370	176
Fourth entrant	4,509	674	2,916	6,440	113
Fifth entrant	4,625	799	1,547	5,871	66
Sixth entrant	4,378	478	3,521	5,809	26
Overall	4,724	886	1,492	7,384	806
Time in market (years)					
7-Eleven	15.7	7.657	1	30	150
LAWSON	18.1	7.295	2	32	188
Family Mart	13.2	7.073	1	30	193
sunkus	11.1	6.174	1	27	106
Circle K	13.1	5.617	1	25	93
ministop	9.8	7.322	1	26	93
Overall	14.1	7.517	1	32	823
Density of own outlets	0.0525	0.0342	0.0008	0.1652	806
Density of rival outlets	0.2518	0.0673	0.0750	0.4549	806
Population (thousand people)	3,418	2,915	600	12,758	806

Notes. The data years are 1991, 1994, 1997, 1999, 2002, 2004, and 2007. The per-outlet sales are daily and in U.S. dollars. Summary statistics for years since entry are limited to the year-chain-prefecture combinations with no missing market-share information. I exclude observations with no outlet in a given prefecture.

the order of entry. First, several studies in the franchising literature confirm that the distance from the monitoring headquarters is related to the measure of the control/behavioral monitoring costs. The idea behind the correlation is that the cost of sending a company employee to monitor the outlet in a given market may increase as the distance to the market from the headquarters increases (see, e.g., Brickley and Dark 1987, Minkler 1990). Second, given the industry's institutional background, the distance from the headquarters of the shareholding company is likely to affect the behavior of its subsidiary company in the convenience-store industry in Japan. Six different major retail chains initially developed and owned all six of these convenience-store chains in Japan in the late 1970s and early 1980s. For instance, Table 4 shows that the largest shareholder of 7-Eleven in 1974 was Ito-Yokado Co., Ltd., which was a general-merchandise-store chain. Similarly, the largest shareholder of LAWSON in 1975 was The Daiei Inc., which was one of the largest supermarket chains in Japan. Finally, this paper indeed observes a correlation between the instrument and order of entry. Figure 2 illustrates that the distance to the shareholding company's headquarters negatively correlates with the entry order (and thus the geographical roll-out decisions) for the largest and the second-largest chains, respectively. I find similar patterns for the rest of the chains.

The second condition is that an instrument needs to be uncorrelated with unobservables in the market-share

Table 4. The Largest Shareholding Company for Each of the Six Convenience-Store Chains in Japan, 1973–2007

Year	Convenience-store chain					
	7-Eleven	LAWSON	Family Mart	sunkus	Circle K	ministop
1973			Seiyu GK.			
1974	Ito-Yokado Co., Ltd.		Seiyu GK.			
1975–1979	Ito-Yokado Co., Ltd.	The Daiei, Inc.	Seiyu GK.			
1980–1993	Ito-Yokado Co., Ltd.	The Daiei, Inc.	Seiyu GK.	Nagasakiya Co., Ltd.	UNY Co., Ltd.	JUSCO Co., Ltd. (renamed AEON Co., Ltd. from 1989)
1994–1997	Ito-Yokado Co., Ltd.	The Daiei, Inc.	Seiyu GK.	Ono Group	UNY Co., Ltd.	JUSCO Co., Ltd. (renamed AEON Co., Ltd. from 1989)
1998–2000	Ito-Yokado Co., Ltd.	The Daiei, Inc.	ITOCHU Corporation	UNY Co., Ltd.	UNY Co., Ltd.	JUSCO Co., Ltd. (renamed AEON Co., Ltd. from 1989)
2001–2004	Ito-Yokado Co., Ltd.	Mitsubishi Corporation	ITOCHU Corporation	UNY Co., Ltd.	UNY Co., Ltd.	JUSCO Co., Ltd. (renamed AEON Co., Ltd. from 1989)
2005–2007	Seven & i Holdings Co., Ltd.	Mitsubishi Corporation	ITOCHU Corporation	UNY Co., Ltd.	UNY Co., Ltd.	JUSCO Co., Ltd. (renamed AEON Co., Ltd. from 1989)

and sales-per-outlet regression equations. The industry is likely to satisfy this exclusion restriction for two reasons. First, as discussed in the previous paragraph, the instrument, the distance to the headquarters of the largest shareholding company for each convenience-store chain, is a cost shifter, and thus unlikely to be correlated with the unobserved demand shocks in Equation (1) because market-share variables are based on sales. Second, because sales are driven mostly by demand-side factors, we are particularly concerned with whether any unobserved demand shifters, such as consumers' market-brand-specific taste or goodwill over the chain's brand, are related to the largest shareholder company's brand name (hence location). The instrument and a demand shock are likely to be uncorrelated when consumers shopping at a convenience-store chain do not recognize the store's shareholder chain brand or company name. The non-correlation is plausible in our study, in which, for two reasons, not many consumers notice the affiliations between convenience-store chain brands and the largest shareholder's retail chain brand or company name. The first reason is that these shareholding retail companies and convenience-store chains are operated separately, and their brands were never jointly advertised. The second reason is that the business category is different (i.e., convenience-store industry versus supermarket, general merchandise or trading industry), so consumers are unlikely to have the opportunity to associate these chain brands of the shareholding company with the convenience-store chain. Note that if I were regressing profits, which are revenue minus costs, instead of market shares, the use of this instrument would have been more problematic, because it is likely to be correlated with the cost shocks in the regression equations.

Finally, because entry timing differs across chain brands, our third condition is that the instrument needs to provide independent variations across firms in the same market-year observations. The proposed instrument creates a variation across convenience-store chains' entry orders in a given market because the locations of the headquarters of the largest shareholder companies differ across these six convenience-store chains. The instrument provides some variations across time because ownership turnovers exist for all chains (Table 4).

Estimation results. Columns 1 through 6 in Table 5 report the results from the IV regressions of market shares, outlet shares, and per-store-outlet shares on the first-entrant indicator and other controls. All specifications include the market fixed effects and chain-brand fixed effects, in which I use ministop, a chain brand, as the reference group for chain-brand fixed effects. By including the chain-brand fixed effects, I control for any systematic differences in the dependent variables across chains that are constant over time, such as the chain-level heterogeneity in the store size, pricing, product quality, brand equity, depth of product assortments, and strength of parent companies. Given the panel-data structure, I cluster the standard errors on the panel identifier (a market-chain combination), which imposes no restrictions on the variance matrix over time for a given panel identifier, including serial correlation.

Column 1 presents IV estimates of the first-entrant effects on market shares, β^s_{first}. These results show that the first entrant obtains a higher market share than later entrants by a wide margin. Similarly, column 4 shows a negative relationship between entry order and market shares. The sign on the first-entrant indicator variable and entry-order variable is statistically

Table 5. Decomposition of the Entry-Order Effects, 1991–2007

Dependent share variable (log)	(1) Market share	(2) Number of outlets	(3) Sales per outlet	(4) Market share	(5) Number of outlets	(6) Sales per outlet
First entrant (β_{first})	1.153**	1.017**	0.136***			
	(0.482)	(0.454)	(0.043)			
Entry order (β_{order})				−0.783***	−0.690***	−0.092**
				(0.222)	(0.202)	(0.036)
Time in market (γ)	0.643***	0.628***	0.016	0.066	0.118	−0.052
	(0.158)	(0.138)	(0.033)	(0.280)	(0.248)	(0.054)
7-Eleven	1.129***	0.751***	0.378***	0.079	−0.175	0.254***
	(0.245)	(0.231)	(0.027)	(0.479)	(0.440)	(0.071)
LAWSON	0.210	0.210	0.000	−0.927**	−0.793*	−0.134**
	(0.213)	(0.198)	(0.027)	(0.453)	(0.415)	(0.067)
Family Mart	0.747***	0.717***	0.030	−0.379	−0.276	−0.102**
	(0.136)	(0.121)	(0.028)	(0.336)	(0.309)	(0.049)
sunkus	0.173	0.073	0.100***	−0.425*	−0.454*	0.029
	(0.158)	(0.144)	(0.025)	(0.255)	(0.233)	(0.036)
Circle K	0.175	0.143	0.032	−0.744*	−0.667*	−0.076
	(0.246)	(0.231)	(0.024)	(0.387)	(0.356)	(0.059)
ministop	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)
R-squared	0.594	0.597	0.545	0.468	0.455	0.537

Notes. The instrumental variable for the first-entrant indicator variable is the log geographical distance to the headquarters of the chain's largest shareholding company. The data years are 1991, 1994, 1997, 1999, 2002, 2004, and 2007. A prefecture constitutes a market. Standard errors are reported in parentheses and are based on two-tail t-tests for parameter estimates. I cluster the standard errors on the panel identifier (i.e., a market-chain combination). All specifications include market fixed effects. For purposes of exposition, the table suppresses the intercept and market fixed effects. The number of observations is 806.

***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

significant at the 5% level and 1% level, respectively. Although the magnitudes of the first entrant may seem somewhat large ($\hat{\beta}^s_{\text{first}} = 115.3\%$ increase), these parameter coefficients are relative to the market share of the base category (non-first entrants). For instance, consider a market with six entrants in which five non-first entrants have a market share of 13.98% each. Applying the frequently used linear approximation, the first-entrant parameter estimates in column 1 imply that, all else being equal (i.e., chain brands and number of years), the market share of the first entrant would be approximately 30.1% ($13.98\% \cdot (1 + 1.153)$). Meanwhile, the coefficient on the 7-Eleven-brand fixed effect is 1.129, implying that the leading chain brand in Japan, 7-Eleven, from the ministop chain brand (base category) would have the market share of 29.76% ($13.98\% \cdot (1 + 1.129)$) if ministop has a market share of 13.98%, all else being equal. Although not shown in the table, the results are robust to the exclusion of time in the market.

Several tests are available to examine the performance of the instrument. The statistic proposed for testing for underidentification is 27.658, implying the rejection of the null hypothesis that the estimation equation is underidentified. As to the strength of the instrument, I examine the incremental F statistic following Rossi (2014). Because I cluster standard errors on the panel identifier (a market-chain combination), I obtain the Kleibergen–Paap (2006) Wald rk F statistic, which is valid under non i.i.d. errors. Because the statistic 40.95 exceeds the critical value for the weak instrument test by Stock and Yogo (2005) at the 5% significance level, 16.38, I reject the null hypothesis that the instrument is weak. The endogeneity test statistics yield the p-values of 0.003, rejecting the null hypothesis that the indicator variable for the first entrant can be treated as exogenous in the estimation equation. Given these results, this paper does not find major issues with this instrument.

Overall, I confirm a market-share advantage in line with the extant literature on entry-order effects (e.g., Robinson and Fornell 1985, Urban et al. 1986). A natural question would be which mechanisms drive this market-share advantage for first entrants. I explore this in Section 4.2.

4.2. Decomposing Market-Share Advantage into Outlet-Share and Per-Outlet-Sales-Share Advantages

This section focuses on the role of distribution and sales performance by decomposing market shares into outlet shares and per-outlet-sales shares.

Columns 1 through 3 in Table 5 present the decomposition results. Columns 2 and 3 use the log outlet share and log per-outlet share as the dependent variable, respectively. As Equation (3) shows, the regression coefficients of a given regressor in columns 2 and 3 add up to the coefficient of the corresponding variable in column 1.

The second and third columns in Table 5 show that the first-entrant effect on outlet share and per-store-sales share, β^{n}_{first} and β^{v}_{first}, is positive and statistically significant at the 1% and 5% levels. These two columns reveal how these two advantages are quantitatively important. Specifically, although most of the market-share advantage (1.153) for the first entrant comes from the outlet-share advantage ($\hat{\beta}^{n}_{\text{first}} = 1.107$), the sales-per-outlet advantage ($\hat{\beta}^{v}_{\text{first}} = 0.136$) is positive and significant statistically and economically. In other words, the first entrant's market share will be larger than that of the non-first entrants by 115.3%, of which 13.6 percentage points come from higher sales per outlet and the remaining 101.7 percentage points come from a higher number of outlets. The decomposition of chain-brand fixed effects in column 1 into columns 2 and 3 is informative of how each chain achieves its market shares, either by quantity, i.e., the number of outlets, or by outlet quality, i.e., the sales per outlet, or both. The results are robust to the exclusion of time in the market and the use of the historical entry-order variable instead of the first-entrant indicator (columns 4 through 6). The observed outlet-share advantage is related to Gielens and Dekimpe (2007), who find in the context of expansion of grocery retailing into foreign countries that early entrants tend to have a larger size of entry than late entrants, where a size of entry is measured by the number of outlets opened in the first year of entry.

As to the first entrant's advantage in developing the number of outlets, the coefficients on the first-entrant indicator variable and entry-order variable in columns 2 (β^{n}_{first}) and 5 (β^{n}_{order}) suggest that the data favor the preemption of market demand via sequential quantity competition with credible commitment. This result is qualitatively consistent with the characteristics of the industry: The entry-timing decisions are made over a long period of time, e.g., decades, which allows each chain, before making a decision, to observe and react to other chains' decisions on entry timing and number of outlets. Moreover, the costs of relocating or closing an outlet in a market are sizeable. Annual financial statements show that a chain incurs costs of approximately US$100,000 on average for closing one of its stores. Given these industry features, we should probably not be surprised to see that sequential-move games with high exit costs provide a more realistic description of order of entry and number of outlets than sequential-move games with low or no exit costs, or Cournot's simultaneous-move game with complete information.

4.3. Investigating Per-Outlet-Sales Advantage

Entry-order effects on individual store's performance. I now turn to the finding that the first entrant achieves by a nontrivial margin ($\hat{\beta}^{v}_{\text{first}} = 13.6\%$) a higher sales-per-outlet share. Several theoretical models and anecdotal evidence suggest that the density of own and rival outlets affect per-outlet sales through competition and advertising. To investigate how the density of outlets affects the per-outlet performance in detail, I estimate Equation (4).

Column 1 in Table 6 presents the results from the full specification. These results indicate that the entry-order effect on per-store sales is nonexistent with a control for the outlet density, whereas the density of outlets (own and rival), which accounts for competition and advertising, seems to drive the permanent sales-per-outlet increase. Specifically, the effect of the first-entrant indicator does not seem to directly affect the sales per outlet. Meanwhile, the density of own outlets enters positively when the density is low. This result is qualitatively consistent with the repetition effect. Given that the first entrant attains a higher number of own outlets, it may achieve the higher individual store sales through the density of own stores. The empirical finding is robust across specifications that use the historical entry order or exclude market fixed effects and/or years since entry.

Another pattern that emerges from the estimation is the inverted-U relationship between the number of own outlets and the sales per store ($\hat{\lambda}^{\text{own}}_{1} > 0$ and $\hat{\lambda}^{\text{own}}_{2} < 0$). To understand how this nonlinearity appears, Figure 3 plots the prediction of the own density effect on the sales per outlet implied by the estimated parameters in column 1 in Table 6. This figure shows that the individual store performance in sales improves in the number of own outlets when the density is low, but that eventually the sales per outlet start to decrease after the density of own outlets exceeds a certain threshold. The maximum is attained at a density of 0.108 outlets per 1,000 people, and the effect will be negative at a density of 0.215. Given that the maximum density of own outlets in the data is around 0.165, chains seem not to develop outlets in the region of the negative effect. This nonlinearity is qualitatively consistent with the dynamics of the trade-off between the repetition effect and the cannibalization effect, both of which are driven by own density. That is, we would expect that the sales per outlet may increase in the number of own outlets when the number is low because the repetition effect, which is high in the wear-in phase, dominates the negative competition effect. The increase in the density of own outlets helps the firm increase the individual store performance because the chain brand is more advertised through increased repeated purchases because of a denser network of outlets. However, as the number increases, the competition effect increases as the own density increases, and eventually it dominates the repetition effect. This outcome may arise when the marginal effect of the repetition effect levels off as I

Table 6. Entry-Order Effects on Outlet-level Sales, 1991–2007

Dependent variable (log)	(1) Sales per outlet	(2) Sales per outlet	(3) Sales per outlet	(4) Sales per outlet
First entrant (β^{sales}_{first})	0.016	0.014		
	(0.027)	(0.027)		
Entry order (β^{sales}_{order})			−0.021	−0.016
			(0.040)	(0.031)
Time in market (γ^{sales})	0.015	0.007	−0.007	−0.007
	(0.018)	(0.017)	(0.055)	(0.039)
Density of own outlets (λ^{own}_1)	2.440***	2.705***	2.175***	2.574***
	(0.496)	(0.493)	(0.714)	(0.556)
Density of own outlets squared (λ^{own}_2)	−11.327***	−11.148***	−10.118***	−9.960***
	(2.995)	(3.038)	(3.312)	(3.468)
Density of competitors' outlets (λ^{rival})	−0.547***	−0.379***	−0.521**	−0.249
	(0.208)	(0.136)	(0.222)	(0.357)
Chain-brand fixed effects	Yes	Yes	Yes	Yes
Market fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes		Yes	
R-squared	0.817	0.811	0.806	0.805

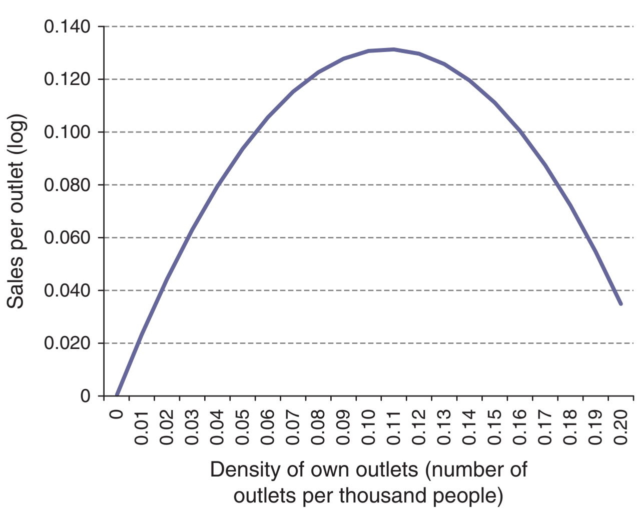
Notes. The instrumental variable for the first-entrant indicator variable is the log geographical distance to the headquarters of the chain's largest shareholding company. The data years are 1991, 1994, 1997, 1999, 2002, 2004, and 2007. A prefecture constitutes a market. Density of own outlets is the number of outlets of the same chain in market m in year t divided by the population in market m in year t. Density of competitors' outlets is similarly defined. For purposes of exposition, the table suppresses the intercept, year fixed effects, and chain-brand fixed effects. The number of observations is 784. Standard errors reported in parentheses are based on two-tail t-tests for parameter estimates. I cluster the standard errors on the panel identifier (i.e., a market-chain combination).

***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

discuss in Section 2.2.2, whereas the marginal effect of cannibalization does not. Meanwhile, the density of competitors' outlets significantly decreases the per-outlet sales because only the business-stealing effect exists. In summary, the order of entry only affects the sales per outlet through distribution. Entering the market earlier than rivals helps the chain because the first entrant is likely to face a smaller business-stealing effect from competitors, which monotonically increases in the density of rival outlets. Because all chains provide similar services and products, not observing positive spillover effects across chains because of clustering is natural in this industry, unlike shopping malls. The above results do not change, qualitatively or quantitatively, after I include the log number of supermarkets in the market as a regressor.

Overall, the empirical results support the preemption of geographical space with outlet proliferation and the repetition effect through outlet developments. The sole results may not be convincing, however, because the results above do not eliminate other explanations, such as prime location for the first entrant. To address these issues, Section 5 uses two additional cross-sectional data, i.e., the supplemental surveys and outlet-level location.

Figure 3. (Color online) The Relationship Between Density of Outlets and Sales per Outlet Implied by the Estimates



5. Discussions

This section discusses the empirical findings. The first two sections supplement Section 4's findings with evidence from the brand-preference surveys and outlet-level location data.

Verifying the repetition effect with survey data. To examine whether the development of brand loyalty through density of outlets indeed drives the findings in the previous section, I supplement the market-level aggregate data with two cross-sectional surveys. These surveys contain information on geographical variations in the degree of consumers' brand loyalty to a particular chain brand.[10]

Table 7. The Entry Order and Brand Preference, 2005 and 2010

	2005 survey				2010 survey			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
First entrant ($\beta^{brand}_{\text{first}}$)	14.407**		4.325		8.825**		−0.829	
	(5.477)		(4.596)		(3.792)		(3.422)	
Entry order ($\beta^{brand}_{\text{order}}$)		−5.042***		−0.532		−2.469**		1.172
		(1.501)		(1.574)		(0.949)		(0.984)
Time in market (γ)	1.925	−0.296	−2.402	−2.690	5.753***	4.206*	−0.298	−0.196
	(2.830)	(2.800)	(2.308)	(2.323)	(1.970)	(2.130)	(1.880)	(1.830)
Density of own outlets			323.465***	332.138***			219.859***	250.641***
			(62.079)	(73.886)			(39.705)	(45.051)
Chain-brand fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43	43	43	43	53	53	53	53
R-squared	0.804	0.822	0.890	0.887	0.827	0.832	0.898	0.901

Notes. A unit of observation is a chain-region combination. The data contains 10 regions. The dependent variable is the percentage of people who voted for chain i in region r in 2005 and 2010. The survey in 2005 asked, "What is your favorite convenience-store chain (Pick one)?" The 2005 survey did not include Circle K in the choice set of convenience-store chains. The survey in 2010 asked, "Which convenience-store chain do you like the most?" Standard errors reported in parentheses are based on two-tail t-tests for parameter estimates. For purposes of exposition, the table suppresses the intercept and chain-brand fixed ffects.

***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

To implement the estimation, I regress the log fraction of consumers who vote for one of the convenience-store chains on the first-entrant indicator and other controls. I denote the parameter on the first-entrant indicator and entry-order variable as $\beta^{brand}_{\text{first}}$ and $\beta^{brand}_{\text{order}}$, respectively. I use two distinct cross-sectional surveys, one from 2005 and the other from 2010. Because these surveys publish the consumers' responses aggregated at the regional level, I changed the right-hand side variable accordingly. For instance, the first-entrant indicator is the average of the first-entrant indices across prefectures in a given region. The first two columns show the results from the 2005 survey, and the next two columns show the results from the 2010 survey. Note that 10 regions exist in Japan, where a region is a unit of an administrative district, and each has one to eight prefectures.

Columns 1 through 8 in Table 7 show that the density of own outlets drives a statistically and economically significant return from being the first entrant on the brand preference. For instance, column 4 implies that after taking into account the number of years and outlet density, the first entrant obtains four points more on average than non-first entrants on a scale of 0–100 points, which is, however, not precisely estimated even at the 10% level, all else being equal. In other words, the density of own outlets is strongly associated with brand preference, qualitatively consistent with the results from Table 6. The above results are robust to the use of a historical entry variable or the exclusion of region and chain-brand fixed effects.

Overall, the results suggest that the entry order might affect the preference for a chain's brand through the density of the chain's outlets. The next section considers whether the location preemption may explain the per-outlet-sales advantage for the first entrant.

Alternative explanation: preemption of prime physical location. This section examines whether the first entrant is successful in achieving a higher market share by obtaining physical resources, such as good locations. When taking costs into account, such as the cost of space, predictions on the profitability per store for the first entrant may not be as obvious as the sales per store because better locations with larger sales may suffer from increased costs. To investigate whether the first entrant tends to achieve a "better" or attractive location as measured by a higher land price in the neighborhood, I complement the market-level information on entry order with the geographical location for all convenience stores in Japan in 2001. To assess whether the data support this explanation, I use several measures of the attractiveness of retail location with publicly available location data. These variables include nighttime population, number of workers, number of households, and the land price in 2001. The unit of analysis is an outlet. For a given convenience store, I construct population, number of workers, and number of households from demographics of the 1 square kilometer (km^2) mesh grid in which the outlet falls. I also use population at the census block in which the outlet is located. For land price, I use the closest price point from the outlet's location. The population from the census block is normalized by the geographical size of the census block because each census block has a different geographical area. To associate these outlet-level demographics with the market-level entry-order information, I average these demographic variables across

Table 8. The Entry Order and Measures of Attractiveness of Location, 2001

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Measure	Number of residents		Number of residents		Number of households		Number of workers		Land price	
Data source	Census, 1 km mesh grid level		Census, block level		Census, 1 km mesh grid level		Census, 1 km mesh grid level		National survey	
First entrant ($\beta^{\text{location}}_{\text{first}}$)	0.098*		0.137*		0.123*		0.170*		0.062	
	(0.058)		(0.078)		(0.065)		(0.099)		(0.044)	
Entry order ($\beta^{\text{location}}_{\text{order}}$)		−0.109***		−0.171***		−0.129***		−0.145**		−0.029
		(0.034)		(0.048)		(0.038)		(0.059)		(0.026)
Chain-brand fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Market fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.865	0.861	0.808	0.803	0.861	0.856	0.744	0.745	0.933	0.926

Notes. A prefecture constitutes a market. The dependent variable in columns (1) and (2) is the log of the average number of residents at the 1 km-mesh-grid level across outlets of chain i in market m in 2001. The dependent variable in columns (3) and (4) is the log of the average number of residents at the census block level across outlets of chain i in market m in 2001. The dependent variable in columns (5) and (6) is the log of the average number of households at the 1 km-mesh-grid level across outlets of chain i in market m in 2001. The dependent variable in columns (7) and (8) is the log of the average number of workers at the 1 km-mesh-grid level across outlets of chain i in market m in 2001. The dependent variable in columns (9) and (10) is the log of the average land price across outlets of chain i in market m in 2001. The number of observations is 186. For purposes of exposition, the table suppresses the intercept. Standard errors reported in parentheses are based on two-tail t-tests for parameter estimates.

***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level.

outlets of the same chain in a given prefecture. I denote the parameter on the first-entrant indicator as $\beta^{\text{location}}_{\text{first}}$.

Table 8 presents the results of regressing the above demographic variables at the chain-market level on the first-entrant indicator or entry-order variable and other controls, including chain-brand and market fixed effects, to account for differences across markets and chains. Columns 1 and 3 use the log nighttime population as the dependent variable as a proxy for attractiveness of outlet location. The estimated magnitude of coefficients on the first entrant is positive, but most of these coefficients are not precisely estimated at the 5% level. The same pattern applies to the specifications in columns 5, 7, and 9, in which I use the log number of households, log number of workers, and log land price, respectively, as the measures of location attractiveness. The above results are robust to the use of a historical entry variable, although the evidence is a bit stronger than that of the indicator-variable specifications.

Overall, no evident pattern emerges from these regressions as to how entry order is associated with attractiveness of outlets' location.

Robustness checks. To see how the results are sensitive to the specifications, I conduct eight robustness checks. First, Online Appendix D examines whether the results are robust to an unbalanced versus balanced panel structure. The results in Table A4 yield the magnitude of market-share and other advantages quantitatively similar to the baseline results in Table 5. Second, Table A7 uses an alternative density measure, which is the number of outlets in level, to verify the robustness of the measures for the presence of outlets in the same market. The results yield a non-linear relationship between the number of own outlets and sales per outlet, similar to Table 6. Third, Online Appendix E examines the strategic choice of spatial outlet location, another potential mechanism for the per-outlet-sales advantage for early entrants. I focus on whether the first entrant locates its outlets close to or distant from other outlets of own chain or rival chains. Using cross-sectional location data, I find no evidence of entry orders affecting strategic location choice. Fourth, Online Appendix F examines whether the presence of own and competitors' chains in adjacent markets poses a concern about dependency among 47 markets. The results confirm that the presence of outlets in neighboring markets has little effect on sales. Fifth, the current operationalization with a single variable for entry order may yield the very large estimated effect. The limitation is that the baseline specifications must be restricted to one variable on entry order because I only have one available instrument, such that the entry-order effects will be under-identified when I have more entry-order indices. To examine this concern, I jointly investigate the effects on the first, second, third, fourth, and fifth entrants, using standard fixed-effect regressions without using instruments. The results in Online Appendix G show that the entry-order effects are diminishing in entry order. Yet these entry-order effects go away once I control for the outlet density, thus confirming the baseline results in Tables 5 and 6. Sixth, Online Appendix H confirms the robustness of the results to more aggregated data, such as regional and national-level observations. Seventh, to investigate how contingency factors affect the magnitudes of entry-order effects, I enrich the specifications in Tables 5 and 6 by including a market growth rate as a marketplace variable (Online Appendix I). Finally, to see how the results in Table 6 are sensitive to the choice of instrument, Table A8 uses OLS and the IV approach with the distance to the first store of the convenience-store chain as an alternative instrument. Both results confirm the findings from Table 6: The sales per outlet do not correlate with the first-entrant index, whereas the sales per outlet are nonmonotonically related to density of own outlets.

Limitations and extensions. The empirical findings are based on the specific application of the decomposition to the case of the Japanese convenience-store industry. Although several institutional background features, e.g., uniform pricing, homogeneity of retailers, and virtually no exits, may make the analysis clean, these features may not apply to other industries in general. Furthermore, the public data from financial statements lack information on other endogenous variables at the market level, such as advertising, product assortment decisions, investments, and store size, all of which may affect revenues over time. Because the corresponding empirical model does not explicitly consider these endogenous variables other than various fixed effects, the implications may not directly extend to other retailing and service sectors in general. Other limitations include (1) the time-invariant fixed effects for chain brands in the empirical specification, which may neglect the possibility of heterogeneous changes in the chain brands' strength in increasing sales over time for various reasons, e.g., innovation, (2) no consideration of profits and rental rate, due to lack of data, and (3) lack of market-share information before 1991.

Theoretically, the decomposition approach could incorporate additional variables at the market level, if available. For instance, when floor-size information at the market and chain-brand level is available, a researcher may decompose observed sales as

$$\begin{aligned}
&\text{Sales}_{i,m,t} \\
&= \frac{\text{Sales}_{i,m,t}}{\text{Floor space}_{i,m,t}} \cdot \frac{\text{Floor space}_{i,m,t}}{\text{Number of outlets}_{i,m,t}} \\
&\quad \cdot \text{Number of outlets}_{i,m,t} \\
&= \text{Sales per floor space}_{i,m,t} \cdot \text{Floor space per outlet}_{i,m,t} \\
&\quad \cdot \text{Number of outlets}_{i,m,t},
\end{aligned}$$

and one could examine how entry orders affect each of these three components and the importance of each in affecting sales.

Managerial implications. Because two actionable levers for chains in this study are entry-order decisions and outlet-density decisions, the results in this paper offer rich implications to managers in at least two ways. First, this paper shows and quantifies a trade-off between new markets and existing markets. One of the major managerial implications from marketers' viewpoint is that, according to the results from Tables 5 and 6, when expanding a certain number of outlets, a chain can decide whether to prioritize rushing into a new market over increasing its outlet density in existing markets. By entering new markets earlier than its competitors, a firm may obtain a substantial first-mover advantage in outlet share, which increases the total sales from the market via a higher number of outlets. Alternatively, a firm may want to develop its existing markets to have a higher density of outlets, which leads to a higher sales performance at the store level and thus higher total sales. The optimal decision hinges on how many outlets a chain has developed in existing markets: Results from Table 6 suggest that due to a nonmonotonic (inverted-U) relationship between density of own outlets and sales per outlet, the marginal benefit from increasing the store density is decreasing in its density. That is, when the store density is at a low range, a chain may want to exploit the advertising effect through repetition to increase the individual store performance in sales. To do so, a chain would increase the store density in existing markets rather than rush to enter a new market earlier than competitors. When the store density goes beyond 0.11 per thousand people, however, the chain may want to switch to developing its outlets in a new market because of the business-stealing effect in a chain ("cannibalization"). With a better understanding of this trade-off, managers should be in a better position to make decisions that will yield higher revenues. Note that the density of outlets is directly related to the two following marketing variables, i.e., product line and distribution in the retail setting. First, because the number of outlets in a geographical space corresponds to the number of product lines in a product space, one may use the outlet density as a measure of how the product line is proliferated in retail and service sectors. Second, as Section 2.1 describes, one may use the density of outlets as a measure that researchers use to approximate the degree of distribution.

Second, the positive effect of the density of outlets on individual store sales suggests another use of corporate outlets for retailers. The results imply that the higher density of outlets, not the entry order per se, increases the store-level sales performance, especially when the outlet density is at a low level. Corporate-owned outlets may be helpful in achieving higher sales per outlet via exposure effects when the chain has just entered the market.

6. Conclusions

An investigation of entry order on performance is important to marketing, economics, and strategic management. Consequently, a sizable literature has grown around entry-order effects on market shares and profits, both theoretically and empirically. However, little is known about whether distribution, which affects market shares, helps us better understand the entry-order effects.

This paper examines the entry-order effects on firms' performance with an emphasis on the geographical expansion of distribution. Recognizing that retail and service industries are characterized by their physical outlets, this paper documents and decomposes the market-share advantage into outlet-share and per-outlet-sales advantages. Using the manually collected panel information on store counts, sales, and entry timing of the convenience-store industry in Japan for 47 distinct geographic markets between 1991 through 2007, this article documents that for a given market, the first entrant would obtain a higher market share than non-first entrants. This paper finds a strong role of distribution in market-share advantage, which is qualitatively consistent with the sequential-move preemption games. This paper also finds a non-linear relationship between sales performance at the store level and distribution, suggesting a trade-off between the business-stealing effect in a chain ("cannibalization") and the repetition effect through repeated exposures. This paper blends cross-sectional survey data on chain-brand preference with the historical entry-timing information to confirm the interpretation of the baseline results. The empirical evidence is robust to several alternative specifications.

Although this paper's empirical findings are based on the data on geographical entry in the convenience-store industry in Japan, extending the decomposition analysis beyond (1) entry in geographical space and (2) a single industry in a single country would be interesting. First, a researcher may be interested in applying the market-share decompositions beyond entry in a geographical space. For instance, a researcher could focus on the spatial preemption in the product space, such as product proliferation in a ready-to-eat breakfast cereal industry discussed in Schmalensee (1978), such that a researcher could measure and decompose the entry-order effects on market shares into the entry-order effects on the number of products and sales per product. Second, spatial preemption in the geographical space is ubiquitous, and one may apply this market-share decomposition where spatial preemption is a key component behind changes in market structure and rapid expansion. Some evidence of such spatial preemption matters includes a study on the supermarket industry (West 1981). Because store counts and location data, current and historic, are mostly publicly observable for many retail and service sectors, extending the decomposition approach to rapid expansion and geographical preemption in other industries, such as the U.S. premium-ice-cream industry (Murphy 2006), may prove useful.

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Endnotes

[1] This outlet share represents the fraction (or percentage) of outlets carrying a chain's brand in a market. That is, I construct an outlet share for chain i in the geographical market m as the number of chain i's outlets in market m divided by the total number of outlets from all chains in market m.

[2] For practitioners, outlet counts and sales per outlet are two meaningful measures for gauging performance across chains (Kosová et al. 2011). Indeed, marketers treat the magnitude of the per-outlet sales as one of the key yardsticks for measuring the relative performance of a chain compared with other chains in the same market. For scholars, the economic literature on retailing and service has treated the average sales per outlet/unit/establishment as one of the key performance measures for a chain (see, e.g., Caves and Murphy 1976, Martin 1988, Lafontaine 1992). Also, having two performance metrics would be helpful because the potential mechanisms through which early entrants achieve the market-share advantage are likely to act differently on these two measures, thereby allowing us to further identify the source(s) of the market-share advantage. See Sections 4.2 and 4.3 for details.

[3] See http://www.meti.go.jp/english/statistics/tyo/syougyo/pdf/gyoutai-riyou-all-e.pdf.

[4] In the early 1970's, the Ministry of International Trade and Industry of Japan recognized that, challenged by growing supermarkets, small traditional stores are operationally inefficient and thus need further modernization in management and distribution for survival. In fact, the Small and Medium Enterprise Agency in the Ministry published a book in 1972 titled *Convenience-store Manual* to induce traditional small and independent store owners to a newer format of retail outlets with several distinctive characteristics that differ from traditional small-size retailers, such as adoption of a self-service system, opening throughout the year, longer business hours, introduction of franchising, and operation as a chain's store. The Ministry of International Trade and Industry published a white paper on small and medium enterprise the following year (1973), reporting that large-scale retailers had started to experimentally open convenience-store outlets in Japan.

[5] See the 2010 corporate outline report from the Seven & i Holdings Co., Ltd. at http://www.7andi.com/dbps_data/_template_/_user_/_SITE_/localhost/_res/ir/library/co/pdf/2010_06.pdf.

[6] See the fact sheets from the National Association of Convenience Stores at http://www.nacsonline.com/Research/FactSheets/ScopeofIndustry/Pages/IndustryStoreCount.aspx.

[7] The number of SKUs a typical convenience store in the United States carries is slightly more than 3,000 (Bishop 2010). For a comparison of a particular chain, a typical 7-Eleven store in the United States carries 2,500 SKUs in a store (Korolishin 2004), whereas a typical 7-Eleven store in Japan carries 2,800 (see Online Appendix C).

[8] See the report from the Japan Marketing Research Institute at http://www.jmr-g.co.jp/reports/report10.html.

[9] A policy report in 2013 from the Ministry of Land, Infrastructure, Transport and Tourism describes the estimates of the size of

the trade area for a convenience store. The report is available at http://www.mlit.go.jp/common/000998270.pdf.

[10] The strength of consumers' brand loyalty in the convenience-store industry is an empirical question. On one hand, each chain is differentiated in particular goods or services that are specific to that chain, such as ticketing and own brand's lunchbox and other private-label items. If there is an advantage for the first entrant in shaping the consumers' perceptions, we should observe a higher degree of brand loyalty for earlier entrants, which may eventually increase the willingness to pay for the chain brand's outlets. On the other hand, convenience-store chains carry national brand items, too. For instance, any outlet would carry Coke and other popular soft-drink brands, and consumers would choose the geographically closest outlet from their location. The effect of brand loyalty or switching costs on purchasing decisions may not be as clear in the retailing industry as in other industries, such as the consumer packaged-goods industry.

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