The Effect of Organizational Form on Entry Response:

Evidence from the Movie Theater Industry

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Abstract. We investigate how incumbent movie theaters respond to a competitor's entry by adjusting their admission prices, movie portfolios and seat allocations across movies of different popularity. We find that the organizational form of the incumbent firm affects how it responds to competitive entry. More specifically, incumbent chain theaters tend to be more accommodating towards the entrants by avoiding reductions in admission prices, becoming less likely to include the most popular movies in their movie portfolios and reducing the seat share allocated to the most popular movies. By contrast, incumbent independent theaters respond to entry by reducing their admission prices, becoming more likely to include the most popular movie in their portfolios, and avoiding any reallocation of seat capacity away from the most popular movies. The entering theaters also adjust their strategy depending on the organizational form of the incumbent theaters: entering theaters charge lower admission prices against independent incumbents compared to chain incumbents. Hence, our results suggest that the incumbent theater's organizational form may lead to qualitatively different competitive paradigms between the incumbent and the entrant.

Keywords: competitive strategy; entry; capacity allocation; organizational form

1. Introduction

This paper examines how the organizational form of firms affects the way they respond to competitive entry. We examine the South Korean movie theater industry, where movie theaters may either belong to a chain or be independent. Note that unlike some other markets, independent theaters in Korea were mainstream in terms of the movies they screen during the time of our data, and they targeted similar customers as the chained theaters. We analyze several key decisions for the theaters – prices, product portfolio and capacity allocation across products of different popularity – and find that both independent and chain-affiliated incumbents respond to competitive entry differently for these 3 decisions.

The Korean movie theater industry is the fifth largest movie market in the world (MPAA 2018). Approximately 55% of the theaters in our dataset belong to a chain, while the remaining 45% are independent. Our analysis focuses on the predominant situation where the entering theater belongs to a chain and the incumbent theater is either independent or belongs to a rival chain – this happens in about 80% of entry cases.

We first investigate how a competitor's entry affects the incumbent theater's pricing strategy. Our results show that after a competitor's entry, incumbent independent theaters decrease their admission prices, whereas incumbent chain-affiliated theaters tend not to reduce their admission prices. One explanation is that chain-affiliated theaters avoid price cuts in order to avoid poaching the sales of other theaters in the same chain. By contrast, independent theaters do not have to worry about stealing sales from affiliated theaters, and hence, can more flexibly cut prices. We test this explanation using our dataset, and we find that the number of co-chained neighboring theaters did not have any significant effect on a focal chain-theater's price response to entry. Thus, the mutual forbearance theory (Edwards 1955; Bernheim and Whinston 1990) and managerial inattention are more plausible explanations for this result.

Next, we analyze the incumbent theaters' changes in their movie portfolios and seat allocation across movies in response to entry. We find that following entry, an incumbent chain theater becomes less likely to screen the most-popular movies in a given week and allocates a smaller share of its seat capacity to these most-popular movies. By contrast, an incumbent independent theater responds to entry by becoming more likely to screen the most-popular movie. Further, unlike chain-affiliated incumbents, independent incumbents avoid reducing seat capacity allocated to the most popular movies. Hence, incumbent independent theaters' entry response tends to be relatively more aggressive, involving price cuts and an increase in the quality of their product offering.

Given the differences between incumbent independent and chain-affiliated theaters' responses to entry, a natural question arises: how does the entering theater adjust its pricing and portfolio based on the organizational form of the incumbent theater? Our analysis reveals that while an entrant does not make any significant adjustments to its movie portfolio or seat allocation based on the incumbent's organizational type, the entrant charges a significantly lower admission price when the incumbent theater is independent than when it is chain-affiliated.

Our paper is related to the literature on market entry and competitive strategy. A stream of this literature analyzes the effect of competition on firms' pricing decisions. For example, Davis (2005) shows that in the U.S. movie theater market, incumbent chain theaters' price response to entry is economically very modest. Arcidiacono et al. (2019) similarly show that the entry of a Walmart Supercenter did not have any causal effect on incumbents' prices. However, Zhu, Singh and Dukes (2011) look at the same industry and find that incumbent firms raised prices in some categories and reduced prices in others. Thomadsen (2005) shows that the presence of competitors has a large effect on pricing in the fast food industry and that

common ownership of nearby outlets can significantly increase prices – even to levels above the monopoly levels.

Another stream of this literature studies how competition affects a firm's product positioning decisions. This topic has been examined in many analytical studies (e.g., Moorthy 1988; Desai 2001; Iyer and Seetharaman 2008). Empirically, Orhun, Venkataraman, and Chintagunta (2015) show that in the U.S. movie theater industry, when a new theater from a rival chain enters the market, the incumbent chain theater screens more popular movies and adopts new movies faster than when the entering theater is from the same chain as the incumbent.[1] Similarly, Matsa (2011) shows that competition reduces the likelihood of inventory shortfalls (stockouts) in the supermarket industry. However, competition does not always lead to higher quality. Prince and Simon (2014) provide evidence that incumbent airlines worsened their on-time performances in response to entry of Southwest Airlines, while Bauner and Wang (2017) find that after wholesale club entry, incumbent retailers tend to increase assortments for less storable products, but reduce assortments for more storable products.

Finally, several studies have examined the implications of firms' organizational structures. For example, Hwang, Bronnenberg and Thomadsen (2010) find that the effect of ownership structure on the similarity between supermarkets' product assortments is substantially stronger than the effects of competition or composition of clientele. Hollenbeck (2018) argues that online reputational mechanisms, such as online reviews, may have decreased the reputational value of chain affiliation and shows that the profit gap between chain-affiliated and independent hotels has decreased by more than half from 2000 to 2015. Our paper is also closely related to the literature examining the link between franchising and profitability.

[1] One reason why the competitive responses might be different in the U.S. than we find in Korea is the presence of clearance restrictions in U.S. movie contracts that give movie theaters exclusive rights to show the movie within a geographic zone (Gardner 2015, Gray 2018).

Lafontaine (1999) examines the amount of price dispersion between franchised vs corporate outlets, finding that franchised chains tend to have more price dispersion than corporate chains, with chains that have both franchised and chain-owned outlets exhibiting the most price dispersion. Kosová et al. (2013) examines whether franchised vs corporate-owned outlets tend to perform better. They show that the firms select the organizational form based on the local market fundamentals, but that the two forms seem to perform equally well conditional on the outlet's environment.

Our paper builds on this literature to show that the organizational structure of the incumbent firm changes the way competition plays out, both on the price and quality dimensions. The paper proceeds as follows: Section 2 provides industry details along with the data. Section 3 provides our main results. Finally, Section 4 concludes the paper by discussing theories that may explain our findings.

2. Industry Overview and Data

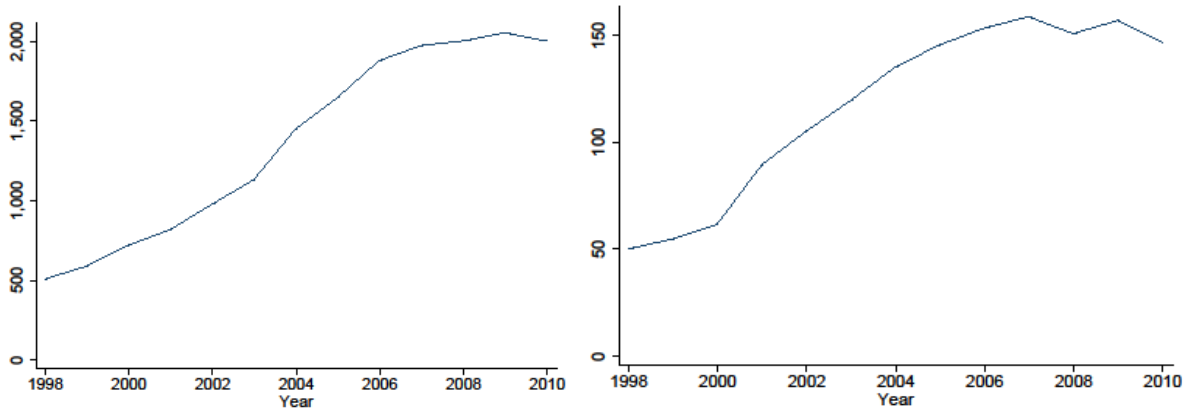
2.1. The industry

Our analysis focuses on the South Korean movie theater industry, which is currently the fifth largest in the world in terms of box office revenue (MPAA 2018). Figure 1 shows that this market has been growing very fast in the 2000s. The dataset covers the period from 2005 to 2009.

The biggest players in the market were five movie theater chains (CGV, Lotte, Megabox, Cinus, and Primus).[2] In 2007, they ran about 55% of the theaters (174 out of 314 theaters), and because the average chain theater has more screens than the average independent theater, the chain theaters operated 68% of the screens (1,336 out of 1,975).

[2] CGV and Primus belonged to the same company. Hence, we treat them as the same chain.

Figure 1 Screen Capacity and Audience Size in the Korean Movie Theater Industry



a. *Number of screens* b. *Audience size (in millions)*

Source: Korean Film Council Annual Reports

Movie distributors use a uniform revenue-sharing contract across movies and theaters: half of the after-tax box office revenue goes to the theater, while the remaining half is shared among the distributor, the producer, and investors.[3] The revenue-sharing amounts do not change with the time after a movie's release, removing a theater's incentive to delay the screening in order to obtain more favorable terms, as is common in many other markets (e.g., Spain and U.S.).[4] Furthermore, in the Korean market, movie distributors provide all commercial theaters with an equal access to movies, and hence, a theater can buy screening rights for a movie even if a nearby competitor screens the same specific movie.

2.2. The data

Our dataset includes commercial movie theaters operating in South Korea, which are predominantly located in large metropolitan areas. We exclude art theaters from the analysis, as they are smaller in size, typically with one or two screens, and specialize in showing small art-house films, and hence, are not directly competing with mainstream commercial theaters.

[3] The only exception from the equal sharing rule is when a foreign distributor distributes a movie to the theaters located in Seoul. In these cases, the foreign distributor takes 60% of the box office revenue. Outside Seoul, the foreign distributor receives half of the revenue.

[4] Admission sales tend to be a bigger source of revenue for theaters in Korea than in some other major markets. For example, CGV's 2012 annual report pointed out that admission sales generated close to 70% of the chain's revenue.

We construct the dataset using two sources – the Korean Film Council and the Korea Box Office Information System (KOBIS).[5]

First, we use data provided by the Korean Film Council, which lists all operating movie theaters. The list is updated at the end of each year, and contains detailed information about each theater's address, number of screens, number of seats assigned to each screen, and which chain the theater belongs to, if any. In addition, the dataset contains opening and closing dates of the theaters, allowing us to see which theaters have exited or entered the market during the sample period. By combining these annual lists from the Korean Film Council, we obtain a panel dataset of movie theaters from 2005 to 2009.

Second, to find which movie was played at each screen of a given movie theater, we use a web crawler to download each theater's weekend screening schedules from KOBIS, alongside the posted admission prices. Our data on nationwide movie audience size also come from KOBIS. Using weekday audience size, we construct the weekly movie rankings, which allows us to investigate how a movie's ranking affected a theater's weekend decisions on whether to screen the movie and what seat capacity to allocate to it.[6] Based on conversations with several industry professionals in Korea, we found that a theater's weekend portfolio decisions are often based on the observed movie demand during the preceding weekdays. Hence, using weekday movie audience information to investigate weekend screening decisions is reasonable.

Consistent with several papers that study competition in densely populated regions (e.g., Hastings 2004; Watson 2009; Ren et al. 2011), we examine an incumbent's response to the opening of a "direct" competitor within a one-mile radius of the incumbent's location. Further, our main analysis focuses on incumbents that did not have any other existing competitors within a one-mile radius prior to the entry. Our focus on such incumbent theaters allows us to

[5] Korean Film Council: https://www.kofic.or.kr/, KOBIS: http://www.kobis.or.kr/kobis/business/main/main.do.
[6] During a movie's release week, its weekday audience size depends on what day the movie is released. To address this issue, we also consider the weekly movie rankings based on the *average* weekday audience size, and we find that our results still hold.

obtain clean measures of entry response.[7] In the Web Appendix, we show the robustness of our qualitative results in situations where the incumbent facing a new entry already had an existing competitor within a mile from its location.

We focus on analyzing only cases where the entrant is a chain theater because most (87%) of the new entries are by chain theaters, and we want to keep the entry conditions as similar as possible. We also restrict our analysis to exclude any cases where the entrant and the incumbent belong to the same chain (only 10% of the chain-entering-against-a-chain scenarios[8]), which would have different strategic implications (e.g., Thomadsen 2005). In addition to firms that face new entry from a (rival) chain, we also include theaters that do not face new entry and do not have any competitors within a one-mile radius, which helps identify regional and chain time trends. Our final dataset consists of 23 incumbent theaters that experienced competitive entry (among which 40% were independently owned) and 67 theaters that did not experience entry.

2.3. Key variables

Our analysis examines how theaters respond to a competitor's entry in terms of three important decision variables: admission prices, the portfolio of screened movies and seat capacity allocation across screened movies. Below we elaborate on each of these variables.

Admission price. Consistent with the practice in other major markets, each movie theater in Korea charged a uniform admission price across all movies screened in a particular time slot during the time of our data sample, although the prices varied across time slots.[9] In our pricing

[7] Note that when there are two or more incumbents, each incumbent's response to entry could be confounded with the decision of the other incumbent(s). For instance, an incumbent theater may react to the entry in a different manner depending on the organizational form of the other incumbents. Our focus on markets where the number of theaters changed from one to two allows us to avoid making additional assumptions about the interactive relationship between different incumbents when they respond to entry.

[8] This is consistent with the finding in Davis (2006) that chains tend to avoid opening new theaters near their existing ones.

[9] More recently some movie theaters in Korea have started to price discriminate between movies shown at the same time, but that was not the practice at the time of our data.

analysis, we examine each theater's average weekly admission prices, which is the average (not adjusted for audience size) posted price for each movie showing during the week. The standard deviations of prices between and within all theaters in the dataset are 0.45 and 0.36, respectively. That is, the level of price variation within a theater across time is 80% of the level of price variation across theaters within a given time period.

Screened movie popularity. To analyze the popularity of theaters' screened movies, we construct a weekly popularity ranking of movies. The ranking is based on the movies' weekday nationwide audience size. The movies are ranked in a descending order, with the movie that attracts the biggest audience receiving a rank $r = 1$. All movies with a ranking 15 or below are assigned a rank $r = 15$. Using the movies' popularity ranking, we examine how an incumbent theater responds to entry in terms of the popularity of movies that it shows on weekends.[10]

Seat allocation. Since theaters have limited capacity in terms of the number of screens, seats and time slots during the day, we explore a movie theater's decision about how to allocate its limited capacity across movies of different popularity on weekends. More specifically, by merging the screening schedule data with the information on the number of seats for each screen, we are able to obtain the number of seats that a theater allocated to each movie in a given week. We focus on weekend seat allocation because the vast majority of a theater's ticket sales occur on weekends, making the seat allocation decision more crucial for the theater. Using data for the entire week does not affect our main insights.

Table 1 provides summary information about the theaters' admission prices and screen capacities, as well as movie-level screening and seat allocation information. Overall, we have 14,383 theater-week level observations for the analysis of theaters' pricing decisions, and 648,373 movie-theater-week observations for the analysis of theaters' movie selection and seat

[10] The use of weekday demand to determine the popularity of the movie was supported by an anonymous industry insider. The idea is that movies sometimes sell out on weekends, so the audience size for different movies is not necessarily equal to demand. However, movies rarely sell out on weekdays, so we get an accurate picture of how popular the movie is.

allocation decisions. The average admission price at a chain theater was only slightly higher than at an independent theater, and chain theaters also had a higher average number of screens. In a given weekend, an average theater played 17% of movies currently on screen in the nationwide market, and a movie that was chosen for screening occupied, on average, 13 percent of a theater's seat capacity.

Table 1 Theater-Level and Movie-Level Summary Statistics

Variable	Avg.	Std. Dev.	Min.	Max.
Panel A. Theater-time level (14,383 observations)				
Admission price (in US dollar)				
Incumbent independent theater	6.03	0.41	5.14	7.37
Incumbent chain theater	6.26	0.53	4.45	9.07
Entering theater	6.19	0.51	4.63	8.06
Number of screens				
Incumbent independent theater	6.21	2.40	2.00	14.00
Incumbent chain theater	7.68	2.27	2.00	16.00
Entering theater	7.99	1.37	5.00	10.00
Panel B. Theater-time-movie level (648,373 observations)				
Movie screening‡	0.17	0.38	0.00	1.00
Movie seat share (%)	12.83	10.60	0.04	100.00
Average movie ranking	5.95	4.13	1.00	15.00

‡ Movie screening variable is 1 if the movie was played in the theater and 0 if otherwise.

3. Main Analysis

In the following subsections, we investigate how an incumbent theater's organizational form affects the incumbent's entry response in terms of admission prices, portfolio of screened movies and seat allocation across movies. Then, we examine how the entrant's strategy also differs based on the incumbent's organizational form.

3.1. Effect of entry on incumbent's price

We first examine how entry affects an incumbent theater's admission price. Specifically, we estimate a model where the log price of incumbent theater j in time w (year-week) is as follows:

$$\ln Price_{jw} = (\alpha^C Chain_j + \alpha^I Indept_j) Entry_{jw} + \beta \ln(S_{jw}^{inc}) + \psi_j + \psi_{cm} + \psi_{pm} + u_{jw}, \quad (1)$$

where the indicator variable $Entry_{jw}$ is equal to one in periods after entry and zero otherwise. The variables $Chain_j$ and $Indept_j$ take the value one if the incumbent theater is chain-affiliated and independent, respectively, and zero if otherwise. S_{jw}^{inc} is the number of screens in the incumbent theater.[11]

The model also includes ψ_j, ψ_{cm} and ψ_{pm}, which represent theater, chain-year-month and province-year-month fixed effects, respectively. The ψ_j terms control for permanent theater-specific characteristics such as the attractiveness of the location, while ψ_{cm} and ψ_{pm} control for factors such as time-varying nationwide shifts in pricing strategies of each chain and time-varying province-specific demand shocks. u_{jw} is the theater-year-week specific error. Under this specification, the price effect of entry is mainly identified by the within-theater variations in the admission price and the presence of a competitor. We assume that the entry timing is such that entry is not correlated with the weekly error term, u_{jw}. This is a reasonable assumption because entry decisions are typically made at least several months ahead of the theater's opening. Therefore, decisions to enter are unlikely to be correlated with any unobserved theater-specific demand shocks in a given week, and the specific timing of entry itself is likely to depend on random factors (delays in construction, permits, etc.) that make timing the opening for a specific week very difficult (Orhun, Venkataraman, and Chintagunta 2015).[12]

[11] Seven theaters experienced changes in the number of screens during the time of our data.
[12] For example, Kang (2003) mentions that the opening of a new theater is often planned more than a year in advance.

The error term u_{jw} may be contemporaneously correlated across j and also be autocorrelated across w. Given that the dataset contains information for a large number of weeks and a smaller number of theaters, we estimate the model with panel-corrected standard errors (Beck and Katz, 1995) that are robust to contemporaneous cross-sectional correlation as well as autocorrelation of type AR(1):[13]

$$u_{jw} = \rho u_{j,w-1} + \varepsilon_{jw}, \tag{2}$$

where $\rho < 1$ and ε_{jw} are not serially correlated but can be correlated across theaters.

The estimation results are provided in Table 2. Column (1) shows that independent incumbents reduce their admission prices by 1.9 percent after the entry of a chain theater, and this effect is significant at the 1 percent level. By contrast, incumbent chain theaters tend not to reduce their admission prices in response to a rival's entry, as the coefficient is both small and relatively precisely estimated.[14]

One reason why chain theaters might be reluctant to decrease their admission prices in response to entry is that doing so could decrease sales at other locations in the chain. That is, a chain theater's price response to entry may potentially be influenced by the presence of other theaters from the same chain that are not too far from its location. To test this hypothesis, we add the number of theaters owned by the same chain within a three-mile radius from the focal theater, N_{jw}^{own}, and its interaction with $Chain_j * Entry_{jw}$.[15,16] The results in column (2) of

[13] Cameron and Trivedi (2010) provide a useful discussion about the need to account for serial correlation in the error when the number of time periods is significantly larger relative to the number of variables (page 273).

[14] Consistent with these results, Table A1 in Appendix A shows that prices during the last month in our sample (December 2009) are higher for chain-affiliated incumbents that had a rival within one mile of it than for independent incumbents that had a rival within one mile of it. One key difference between the results in Table A1 and Table 2 is that we include both theaters that had entry during the time of our dataset and those that always had competition. That means that we cannot control for theater-level fixed effects. Nevertheless, this evidence suggests that the results are present even in a cross-section of data.

[15] Thomadsen (2005) shows that co-owned outlets tend to influence a focal outlet's prices within a greater distance than the maximum distance where a rival outlet affected prices. Our qualitative results still hold when we consider the number of theaters owned by the same chain within a five-mile radius from the focal theater.

[16] Hence, the model is $\ln Price_{jw} = (\alpha_1^C + \alpha_2^C N_{jw}^{own}) Chain_j * Entry_{jw} + \alpha^I Indept_j * Entry_{jw} + \beta_1 N_{jw}^{own} + \beta_2 \ln(S_{jw}^{inc}) + \psi_j + \psi_{cm} + \psi_{pm} + u_{jw}$.

Table 2 show that a chain theater that has fewer neighboring theaters from the same chain generally charges lower admission prices. However, the existence of these same-chain theaters does not affect the focal chain theater's price response to entry.

Table 2 Effect of Entry on Incumbent's Admission Prices

	Dependent variable: ln(Price)		
Variable	(1)	(2)	(3)
$Entry * Chain$	-0.002	-0.003	0.001
	(0.003)	(0.003)	(0.018)
$Entry * Indept$	-0.019***	-0.018***	-0.038
	(0.003)	(0.003)	(0.035)
$Entry * Chain * \ln(S^{ent})$			-0.002
			(0.009)
$Entry * Indept * \ln(S^{ent})$			0.009
			(0.017)
$Entry * Chain * N^{own}$		-0.001	
		(0.002)	
N^{own}		0.019***	
		(0.002)	
$\ln(S^{inc})$	0.031***	0.047***	0.031***
	(0.011)	(0.011)	(0.011)
Fixed effects			
Theater	Yes	Yes	Yes
Chain - Month	Yes	Yes	Yes
Province - Month	Yes	Yes	Yes
ρ	0.743	0.747	0.742
Observations	14,383	14,383	14,383

Note: Panel robust standard errors are in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01

Finally, in Column (3), we allow the number of screens of the entrant to affect the price by adding two interaction terms, $Chain_j * Entry_{jw} * \ln(S_{jw}^{ent})$ and $Indept_j * Entry_{jw} * \ln(S_{jw}^{ent})$, where S_{jw}^{ent} is the entering chain theater's screen count. When we put in the number of screens the standard errors of the point estimates blow up. However, as Table 1 shows, new entrants have between 5-10 screens. Thus, we observe that the implied size of the differences

in the price responses for chained vs independent theaters remains at approximately the same level as we observed in the previous two columns. More specifically, because of the covariance matrix between the first four variables in Column (3), we find that the total effect of entry on the prices of independent outlets is between -1.7 to -2.4% depending on the number of screens (different than 0 with p<0.01). On the other hand, the total effect of entry on prices of the chained entry is -0.2 to -0.4% depending on the number of screens, with the effects not statistically significantly different than 0. The difference between the price change of the independent outlets and the price change of the chained outlets is significant at the 5% level.[17]

3.2. Effect of entry on incumbent's movie offerings and seat allocation

A theater's movie portfolio is one of the most important factors when customers decide which theater to patronize. Theaters face a tradeoff when deciding which movie to screen: showing movies that are more popular makes the theater attractive to a large number of customers, but popular movies are also likely to be screened by the theater's competitor, which can offset the benefit of having a popular movie. Thus, it is not obvious how the incumbent should adjust its movie portfolio in response to a competitor's entry into the local market.

To study this question, we set the indicator variable $Screening_{ijw}$ equal to one if theater j plays movie i during the weekend of week w and zero otherwise. The incumbent theater's decision to screen a movie is then determined by the following Probit model:

$$Screening_{ijw} = \begin{cases} 1 & \text{if } y_{ijw} > 0 \\ 0 & \text{if } y_{ijw} \leq 0 \end{cases}, \tag{3}$$

where the underlying latent variable y_{ijw} is defined as follows:

[17] These levels of significance are determined by drawing 10,000 draws of the parameters from a multivariate normal distribution with the estimated means and covariance matrix. 98.7% (98.8%) of the draws for the effect of entry for chains were greater than the corresponding draws for independent theaters when the screen size was 5 (10).

$$y_{ijw} = \sum_{r=1}^{15}(\alpha_{r1}^{C} + \alpha_{r2}^{C}Entry_{jw})I_{iw}^{r}\ Chain_j + \sum_{r=1}^{15}(\alpha_{r1}^{I} + \alpha_{r2}^{I}Entry_{jw})I_{iw}^{r}Indept_j \qquad (4)$$
$$+\lambda_1 \ln(S_{jw}^{inc}) + \lambda_2 V_{ij} + \psi_j + \psi_w + u_{ijw}.$$

The index r shows the weekly ranking of a movie based on its weekday audience size. The indicator I_{iw}^{r} equals to one if the movie i had a ranking r during week w. Movies with a ranking of 15 or below are classified together into the group with $r = 15$. The vertical integration variable, V_{ij}, is 1 if the movie is released by the same company that owns the theater and 0 otherwise.

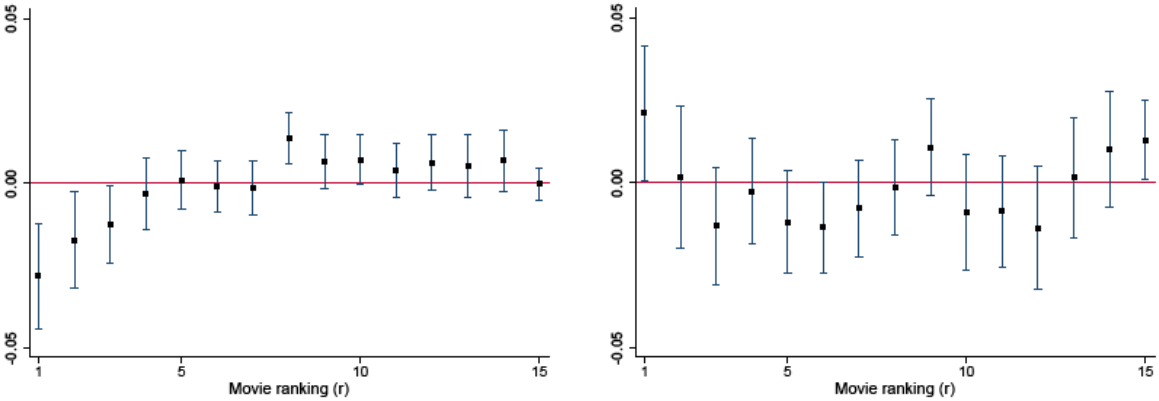
Theater fixed effects ψ_j are included in the model to exploit the within theater changes in the popularity profiles of the movies shown at a particular theater. That is, the model compares the screening decision (whether to play or not) for movies of a certain ranking before and after entry of a rival theater. Since movies available in the market are different each week, we also add week fixed effects ψ_w in the model to reflect that the probability of playing any particular movie will be lower during periods where there is a wider selection of movies available from studios.[18] We assume that the error term u_{ijw} follows a standard normal distribution.[19]

The estimation results of the Probit model are reported in Table A2 in Appendix A, and Figure 2 graphically illustrates the marginal effects (at sample means) of a competitor's entry on the incumbent's likelihood of screening a movie with ranking r, along with 95 percent confidence bands. The left panel demonstrates that after a competitor's entry, an incumbent chain theater becomes less likely to play the most popular movies in a given week, while the likelihood of playing mid-range movies increases. For example, the probability of playing the first and second most popular movies decrease by 2.8 and 1.7 percentage points, respectively, while the probability of playing the eighth most popular movie increases by 1.4 percentage

[18] Results are qualitatively the same when we consider region-specific and/or chain-specific time trends.
[19] We cluster standard errors on the movie title level.

points. By contrast, the right panel shows that an incumbent independent theater becomes more likely to screen the most popular movie following a competitor's entry.

Figure 2 Effect of Entry on Incumbent's Portfolio of Screened Movies



a. Incumbent chain theater b. Incumbent independent theater

Movie theaters do not only need to figure out which movies to screen. Because a movie theater operates with limited capacity, it must also carefully choose how to allocate its screens and seating capacities for each movie. We examine this through equation (5):

$$Seat\ Share_{ijw} = \sum_{r=1}^{15}\left(\beta_{r1}^{C} + \beta_{r2}^{C} Entry_{jw}\right) I_{iw}^{r}\ Chain_{J} + \sum_{r=1}^{15}\left(\beta_{r1}^{I} + \beta_{r2}^{I} Entry_{jw}\right) I_{iw}^{r} Indept_{j} + \delta_1 \ln\left(S_{jw}^{inc}\right) + \delta_2 V_{ij} + \psi_j + \psi_w + \epsilon_{ijw}. \quad (5)$$

The dependent variable $Seat\ Share_{ijw}$ is the weekend seat share (%) of movie i in theater j at time w (year-week). All explanatory variables are the same as in specification (4).[20] For a given movie with ranking r, the coefficients β_{r2}^{C} and β_{r2}^{I} measure the effect of entry on the movie's seat share in an incumbent chain and independent theater, respectively. The error term ϵ_{ijw} is movie, theater, and time specific.

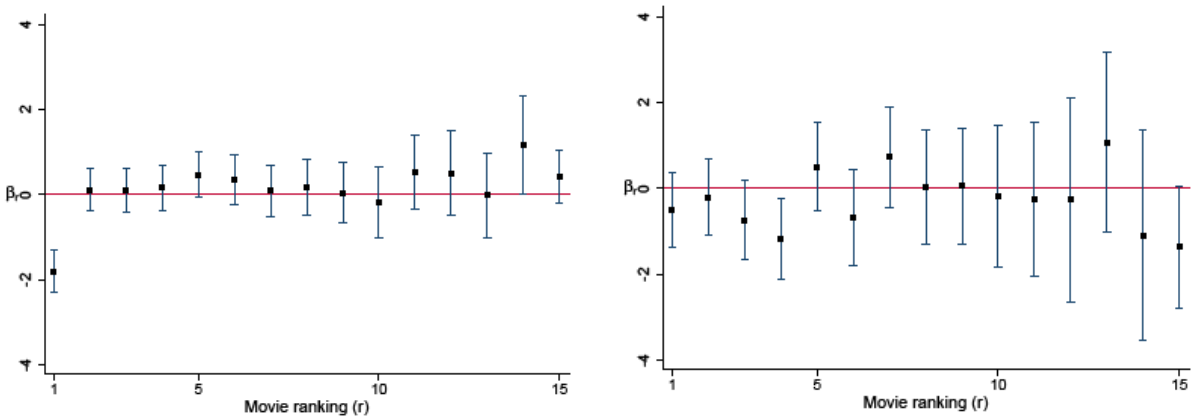
Since we observe seat shares only for those movies that are screened in a theater, a sample selection problem may arise. More specifically, a theater first decides whether to play a movie,

[20] The results are qualitatively similar when we consider region-specific and/or chain-specific time trends.

and then the theater decides how many seats to allocate to this movie if the movie is screened. However, seat shares that would have arisen for movies that are not chosen are missing from the data. We handle the issue of missing seat share data by using the two-step procedure from Heckman (1979); we use the Probit model (equations 3 and 4) as the participation equation and obtain the inverse Mills ratio from its estimation. Then, we add the inverse Mills ratio as the selection correction term in the outcome equation, model (5).[21] The second stage estimates, reported in Table A2 in Appendix A, show that the selection correction term is indeed statistically significant.[22]

Figure 3 shows the estimates of β_{r2}^{c} and β_{r2}^{I} for $r = 1, 2, \ldots 15$ along with 95% confidence bands, illustrating how a competitor's entry affected the incumbent's seat allocation decision for a movie with ranking r.

Figure 3 Effect of Entry on Incumbent's Seat Allocation across Screened Movies



a. Incumbent chain theater b. Incumbent independent theater

We find that, after entry, incumbent chain theaters reduce the seat share of the most popular movie by about 2 percentage points, while the seat shares of lower ranked movies are not

[21] Since specifications (4) and (5) share the same set of regressors, the coefficients in model (5) are identified through the nonlinearity of the selection correction term.
[22] While a statistically significant inverse Mills ratio coefficient can indicate the presence of sample selection, it can also be the result of functional form misspecification.

adjusted in any significant way (left panel of Figure 3). Further, we find no evidence that an incumbent independent theater adjusts its seat allocation across movies, except for a slight decrease in the fourth-most popular movie's seat share (right panel of Figure 3).

Intuitively, given its lack of price response after a competitor's entry, an incumbent chain theater may anticipate that its ticket sales of the most popular movies will decline because its competitor is also likely to screen these movies, capturing some share of the market. Hence, the incumbent has an incentive to reduce the seat share allocated to the most popular movies after entry, and to reallocate it to other movies. By contrast, incumbent independent theaters respond to entry by decreasing their admission prices, which can mitigate the reduction in sales following the competitor's entry, allowing the incumbent not to reduce seat allocation for the most popular movies.

3.3. Entering chain theater's strategy

Our analysis in the above three subsections suggests that incumbent chain theaters respond to entry in a manner that is qualitatively different from the way that incumbent independent theaters respond. Hence, one might naturally wonder whether the entering theater adjusts its strategy based on the organizational form of the incumbent theater.

First, using observations of the 23 entering chain theaters, we examine whether the entrant prices differently depending on the organizational form of the incumbent theater in the local market. The results are reported in Table 3. We find evidence that the entrant sets lower prices when the incumbent theater's type is independent. For example, after including chain, province, and year-month fixed effects, along with the log of the screen counts of the entrant, we find that the entrant's admission price is 7 percent lower when the incumbent is an independent theater than when the incumbent is chain-affiliated (column 2). We get a similar effect when we also account for the number of screens of the incumbent (column 3).

Table 3 Entering Chain Theater's Admission Prices

	Dependent variable: $\ln(Price)$		
Variable	(1)	(2)	(3)
$Indept$	-0.019***	-0.069***	-0.075***
	(0.005)	(0.007)	(0.007)
$\ln(S^{ent})$		-0.275***	-0.330***
		(0.035)	(0.037)
$\ln(S^{Inc})$			-0.026***
			(0.005)
Fixed effects			
Chain	Yes	Yes	Yes
Province	Yes	Yes	Yes
Month	Yes	Yes	Yes
ρ	0.805	0.787	0.789
Observations	2,205	2,205	2,205

Panel robust standard errors are in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01

Regarding the entrant's movie portfolio and seat capacity allocation decisions, our analysis in Appendix B shows that there is no statistically significant evidence that the entrant adjusts its movie portfolio or seat allocation depending on the organizational form of the incumbent theater. Despite this, we observe that entrants choose to build theaters with more screens when they enter against independent theaters: Entrants have an average screen count of 7.4 when they enter against a chained incumbent, and they have an average of 8.2 screens when entering against an independent theater.

4. Conclusion

This paper examines how an incumbent movie theater's organizational form affects its response to a competitor's entry and how the entrant adjusts its strategy based on the incumbent's organizational form. We find that an incumbent chain theater tends to be more accommodating towards the entering rival than incumbent independent theater. Namely, a chain incumbent avoids price reductions, becomes less likely to screen the most popular movies

and decreases the seat share allocated to these movies. By contrast, an independent incumbent theater's entry response is more aggressive: the incumbent reduces its admission prices, becomes more likely to screen the most popular movie and does not reduce its seat capacity allocated to the most popular movies. Price competition is affected on both sides: The entering chain theaters respond to the incumbent's firm type, too, by charging a lower price if they face an independent theater.

When the incumbent theater is chain-affiliated, the incumbent and the entrant avoid intense price competition. One can think of several possible explanations. First, a chain theater may be reluctant to take aggressive actions – especially with regard to price – because doing so can negatively affect other theaters in the same chain through cannibalization. However, our regression results suggest that this is not the main story here. A second potential explanation is based on the mutual forbearance theory (Edwards 1955; Bernheim and Whinston 1990), which suggests that theaters from rival chains with multimarket contact may avoid aggressive actions against each other to prevent competitive tension from spreading to other theaters in the chain, hurting the overall chain performance. Finally, it is possible that some form of managerial inattention could drive the reduced responsiveness of chained incumbents. For example, there is some anecdotal evidence suggesting that pricing decisions in chain theaters in Korea are centralized, which can help explain why admission prices in a focal chain theater are not responsive to changes in the local competitive environment.[23] These last two theories may be more likely to be the driving force of our results, although we leave the testing of these theories as future research.

Our findings have several managerial implications. When entering a new market, a firm's manager may want to anticipate incumbent firms' likely response to entry, allowing the

[23] Jung (2018) points out centralized pricing at the CGV chain. We received a similar feedback during a conversation with a local manager of a chain theater.

manager to plan in advance and be better prepared to compete. Our results suggest that an incumbent's organizational form may help the entrant predict the incumbent's future response to entry and adjust its entry strategy accordingly. For example, analyzing the incumbent firms' organizational forms and their likely entry responses can help the entrant decide what location may be best for entry. Further, understanding the portfolio of movies that incumbent theaters will show can help a manager determine whether a specific entry is likely to be profitable, once such knowledge is combined with local demand information.

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Appendix A

Additional tables and figures

Table A1 Price comparison before and after entry

Organizational form	Mean	Std. Err.	Obs.
Independent (facing chain)	8.821	0.013	32
Chain (facing independent)	8.917	0.010	52
Chain (facing chain)	8.932	0.006	112

Note: The table reports the average prices at the last month of the sample (December 2009) of (i) independent incumbents having a chain theater within one mile distance, (ii) chain incumbents having an independent theater within one mile distance, and (iii) chain incumbents having a rival chain's theater within one mile distance.

Table A2 Estimation of Movie Portfolio and Seat Allocation Models

	Movie portfolio		Screen allocation	
Variable	Coeff.	Std. Err.	Coeff.	Std. Err.
$Chain * I^r * Entry$ when r is:				
1	-0.248	(0.072)***	-1.808	(0.255)***
2	-0.152	(0.066)**	0.115	(0.256)
3	-0.109	(0.053)**	0.112	(0.259)
4	-0.028	(0.048)	0.160	(0.265)
5	0.010	(0.041)	0.472	(0.276)*
6	-0.007	(0.035)	0.352	(0.293)
7	-0.011	(0.037)	0.090	(0.308)
8	0.122	(0.034)***	0.162	(0.335)
9	0.058	(0.037)	0.044	(0.363)
10	0.063	(0.034)*	-0.187	(0.425)
11	0.034	(0.037)	0.523	(0.440)
12	0.055	(0.038)	0.504	(0.504)
13	0.046	(0.043)	-0.014	(0.506)
14	0.060	(0.042)	1.175	(0.594)**
15	-0.002	(0.022)	0.428	(0.320)
$Indept * I^r * Entry$ when r is:				
1	0.185	(0.091)**	-0.494	(0.442)
2	0.016	(0.096)	-0.214	(0.453)
3	-0.115	(0.080)	-0.734	(0.473)
4	-0.022	(0.071)	-1.180	(0.484)**
5	-0.105	(0.070)	0.509	(0.528)
6	-0.118	(0.062)*	-0.679	(0.576)
7	-0.068	(0.065)	0.740	(0.597)
8	-0.013	(0.064)	0.029	(0.673)
9	0.095	(0.065)	0.060	(0.686)
10	-0.079	(0.078)	-0.192	(0.841)
11	-0.076	(0.076)	-0.238	(0.917)
12	-0.120	(0.084)	-0.263	(1.220)
13	0.014	(0.082)	1.076	(1.074)
14	0.090	(0.079)	-1.089	(1.252)
15	0.114	(0.054)**	-1.363	(0.721)*
$\ln(S^{inc})$	1.027	(0.094)***	1.027	(0.060)***
Vertically integrated (V)	0.390	(0.039)***	0.390	(0.010)***
Inverse Mills ratio			-2.334	(0.230)***
Fixed effects				
Move ranking$*$ $Chain$	Yes		Yes	
Move ranking$*$ $Indept$	Yes		Yes	
Theater	Yes		Yes	
Week	Yes		Yes	
Observations	648,373		648,373	

Note: The first two columns report estimation results of the Probit model of movie portfolio decision, while the last two columns present estimates of the seat allocation model. Standard errors are corrected for movie-level clusters in the movie portfolio model. *p < 0.1; **p < 0.05; ***p < 0.01.

Appendix B

Entering theater's movie portfolio and seat allocation decisions

Here, we first analyze how the entering theater's movie portfolio differs depending on whether the incumbent theater belongs to a chain or is independently run. The model specification is similar to the one that we analyzed earlier for the incumbent theaters. Namely, let $Screening_{ijw}^{E}$ be equal to one if the entrant theater j played the movie i during the time period w (year-month) and zero if otherwise:

$$Screening_{ijw}^{E} = \begin{cases} 1 & \text{if } y_{ijw}^{E} > 0 \\ 0 & \text{if } y_{ijw}^{E} \leq 0 \end{cases}. \tag{6}$$

The underlying latent variable y_{ijw}^{E} is defined as follows:

$$y_{ijw}^{E} = \sum_{r=1}^{15} (\alpha_{r1}^{E} + \alpha_{r2}^{E} Independent_j) I_{iw}^{r} + \lambda_1^E \ln\left(S_{jw}^{ent}\right) + \lambda_2^E \ln\left(S_{jw}^{inc}\right) + \lambda_3^E V_{ij} + \psi_c + \psi_m + \psi_p + u_{ijw}, \tag{7}$$

where the number of screens in the entrant, S_{jw}^{ent}, and the number of screens in the incumbent, S_{jw}^{inc}, control for the capacity effects on screening decisions. ψ_c, ψ_m and ψ_p are chain, year-month, and province fixed effects, respectively. We estimate model (7) with robust standard errors clustered by movie using observations of the six-month period after the entry.

Figure B1 Comparison of Entrant's Movie Portfolio Based on Incumbent's Type

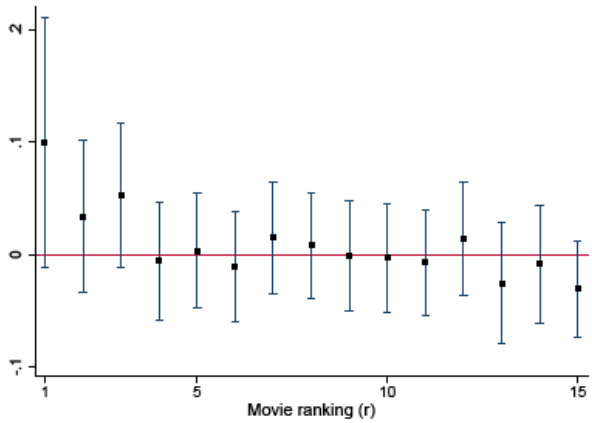


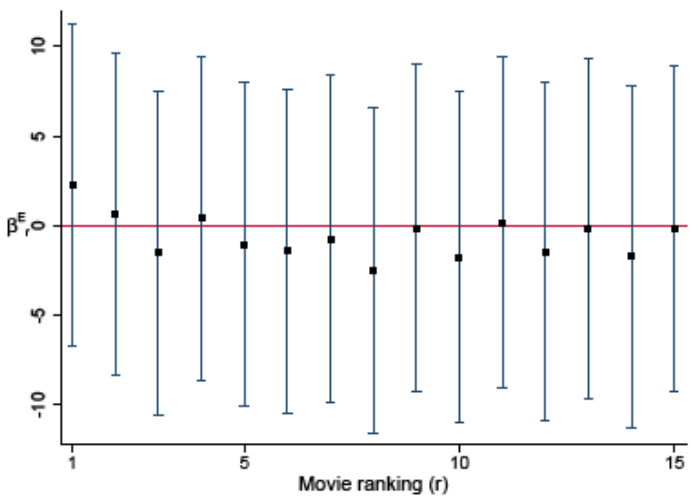
Figure B1 graphically illustrates the difference in the entrant's likelihood of screening a movie of ranking r between the two cases of independent incumbent and chain incumbent, measured by α_{r2}^{E} multiplied by the standard normal density. According to the figure, the entering theater does not seem to adjust its movie quality depending on the organizational form of the incumbents.

Next, we investigate how an entering chain theater's seat allocation across movies is different between the case of independent incumbent and the case of chain incumbent using the following specification:

$$Seat\ Share_{ijw}^{E} = \sum_{r=1}^{15}(\beta_{r1}^{E} + \beta_{r2}^{E} Independent_j) I_{iw}^{r} + \delta_1^E \ln\left(S_{jw}^{ent}\right) + \delta_2^E \ln\left(S_{jw}^{inc}\right) + \delta_3^E V_{ij} + \psi_c + \psi_p + \psi_m + \epsilon_{ijw}, \tag{8}$$

where β_{r2}^{E} measures the seat share difference for a movie of given weekly ranking r between a chain theater entering a market with an independent incumbent and a chain theater entering a market with a chain incumbent. Again, we estimate model (8) using Heckman (1979)'s two-step procedure, and present estimates of β_{r2}^{E} for r from 1 to 15 along with 95 percent confidence bands in Figure B2. We find no evidence that the entering theater differentiates its seat allocation depending on the organizational form of the incumbents.

Figure B2 Comparison of Entrant's Seat Allocations Based on Incumbent's Type



Web Appendix

Effect of entry in more competitive markets

In this section, we briefly extend our analysis by studying the effect of competitive entry in markets where the focal incumbent theater facing a new entrant already has one direct rival located within a mile from the incumbent's location before this new entry. We can think of this scenario as representing situations where a firm obtains a second direct competitor. Consistent with our previous analysis, we focus on the predominant situation where the entering theater belongs to a chain, while the incumbent theater can either be independent or belong to a rival chain. In our dataset, there are 15 such incumbent theaters (8 chain-affiliated and 7 independent theaters). Note that the number of theaters facing such competitive entry need not be even because the entering theater can be located within one mile of the focal incumbent theater, while it may be more than a mile away from the focal theater's direct incumbent competitor. To help identify time trends and regional differences, we also include 88 theaters from markets where two incumbent theaters were located within a mile from each other and neither of them faces entry of a new direct rival. The model specifications are similar to the ones in section 3.

We first analyze the effect of entry on the incumbent theaters' admission prices. The results are reported in Table W1, revealing a similar pattern as in Section 3. Namely, in columns 1 and 2 we observe that incumbent independent theaters respond to entry by reducing their admission prices, while incumbent chain theaters do not make any significant changes in prices. In column 3 the coefficients are not aligned quite in the same way as in column 1, but we get a qualitatively similar result. The effect of entry on prices in chained theaters is negligible. We see that the prices of independent incumbents decreases, however: Adding together the effect of the entering theater's screen size based on the range of values this takes plus the direct entry effect, we observe that prices for independent incumbents go down by 1.0% to 1.3%.

Table W1 Effect of Entry on Incumbent's Admission Prices

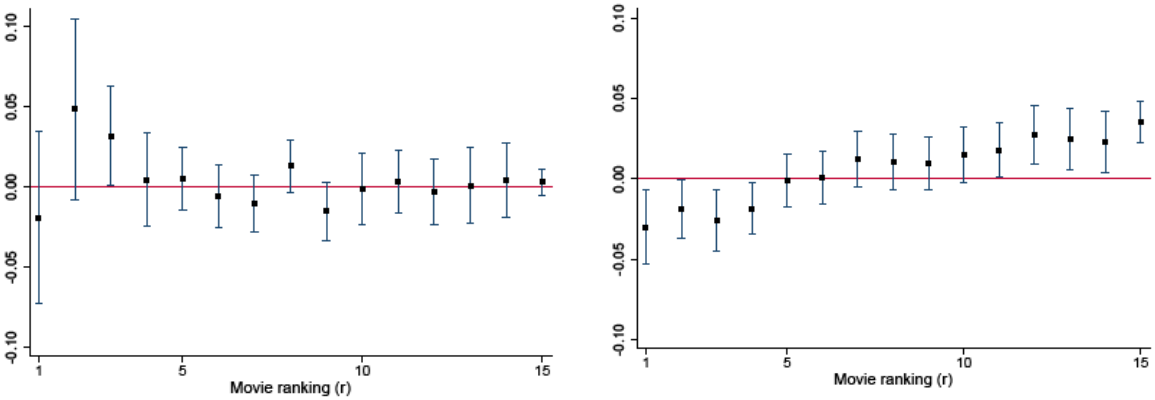
	Dependent variable: ln(Price)		
Variable	(1)	(2)	(3)
$Entry * Chain$	0.002	-0.006	0.002
	(0.004)	(0.005)	(0.008)
$Entry * Indept$	-0.015***	-0.016***	-0.006
	(0.005)	(0.005)	(0.008)
$Entry * Chain * \ln(S^{ent})$			-0.000
			(0.002)
$Entry * Indepet * \ln(S^{ent})$			-0.003
			(0.002)
$Entry * Chain * N^{own}$		0.005**	
		(0.002)	
N^{own}		0.013***	
		(0.004)	
$\ln(S^{inc})$	-0.021**	-0.023**	-0.021**
	(0.010)	(0.010)	(0.010)
Fixed effects			
Theater	Yes	Yes	Yes
Chain - Month	Yes	Yes	Yes
Province - Month	Yes	Yes	Yes
ρ	0.747	0.736	0.745
Observations	6,727	6,727	6,727

Note: Panel robust standard errors are in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01.

We next examine the impact of entry on an incumbent theater's movie portfolio and seat allocation based on the incumbent's organizational form. The analysis is comparable to that of Section 3.2, and the results are presented in Figures W1 and W2. We again find that independent and chain theaters respond differently to entry of a new competitor, although the pattern is different than what we saw in Section 3. Namely, incumbent independent theaters become less likely to screen the most popular movies without significantly adjusting seat allocation for these movies. These theaters also show more lower-ranked movies, but put a lower seat share on these movies, suggesting that the independent incumbents diversify their

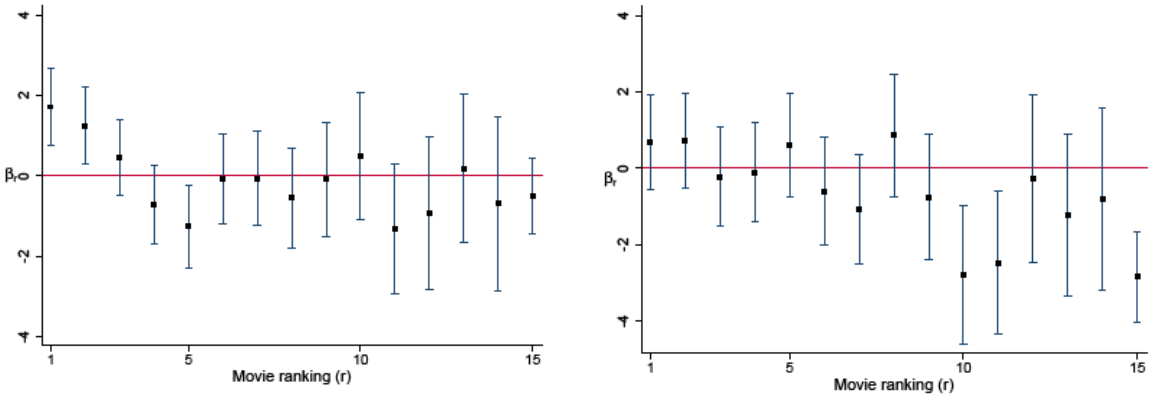
movie offerings. By contrast, after a competitor's entry, an incumbent chain theater does not adjust its portfolio, but increases the seat allocation for the most popular movies.

Figure W1 Effect of Entry on Incumbent's Movie Portfolio



a. Incumbent chain theater b. Incumbent independent theater

Figure W2 Effect of Entry on Incumbent's Seat Allocation



a. Incumbent chain theater b. Incumbent independent theater