CPRC Discussion Paper Series

Competition Policy Research Center
Japan Fair Trade Commission

Vertical Integration in the Japanese Movie Industry

Mitsuru SUNADA
Competition Policy Research Center,
Japan Fair Trade Commission

CPDP-29-E October 2007

1-1-1, Kasumigaseki, Chiyoda-ku, TOKYO 100-8987 JAPAN
Phone:+81-3-3581-1848 Fax:+81-3-3581-1945
URL:www.jftc.go.jp/cprc.html
E-mail:cprcsec@jftc.go.jp

Vertical Integration in the Japanese Movie Industry[*]

Mitsuru Sunada[†]

Competition Policy Research Center, Japan Fair Trade Commission

Abstract

This study examines the vertical integration in the Japanese movie industry, estimating the model of demand for movie attendance, and conducts a simulation analysis of the welfare effect of the hypothetical court decision in which major distributors were ordered to divest their theaters. According to the results, while vertical integration leads to higher prices, theaters owned by producers/distributors are highly assessed by consumers. It is concluded that the order of theater divestment in Japan will possibly reduce the welfare.

Keywords: Vertical Integration; Movie Theater; Discrete Choice Model
JEL Classification: L42; L22; L82

---

[*] This study is an outgrowth of the joint research project on *Media Kontentsu Sangyo deno Kyoso no Jittai Chosa (Research on Competition in the Media Contents Industry)* at the Competition Policy Research Center (CPRC). I would like to thank the Ministry of Economy, Trade and Industry (METI) and the Ministry of Internal Affairs and Communications (MIC) for allowing me to use the dataset of the movie theater file of *Tokutei Sabis Sangyo Jittai Chosa (Survey of Selected Service Industries).* I am also thankful to Akira Goto, Toshiaki Iizuka, Hiroyuki Odagiri, Yosuke Okada, Hideo Owan, Ayako Suzuki, Kotaro Suzumura, Tatsuo Ushijima, and other attendees of a seminar at the CPRC, the Business & Economics International Workshop, the Japanese Economic Association Autumn Meeting, for their valuable comments and suggestions. The views expressed in this paper are mine, and do not reflect the views of the CPRC, the Japan Fair Trade Commission, or any individual commissioner. Needless to say, all remaining errors are mine.
[†] Researcher: mitsuru_sunada at jftc.go.jp.

1. Introduction

There is an old but important antitrust case referred to as the *Paramount*. In the *Paramount*, following the long litigation, five major U.S. studios were required to divest their theater chains, in addition to the prohibition of block booking. The *Paramount* is still a controvertible case that provides rich debates on the effects of vertical integration and vertical restraints on competition and welfare, while the Supreme Court decision was made about sixty years ago. On the other hand, major Japanese distributors operate their own theaters as well as production divisions, because vertical integration is not prohibited by law in Japan. Hence, we can observe both of vertically integrated theaters and non-integrated ones

This study examines the vertical integration in the Japanese movie industry. For that purpose, I estimate the discrete choice model of demand for movie attendance, utilizing the unique data of Japanese theaters, in which one can identify whether or not a theater is owned by producers/distributors. Moreover, in the demand model, vertical integration will affect the individual utility level, and if vertical integration improves the quality of movie exhibition services, integrated theaters will have more attendance than they otherwise do. While previous empirical works on vertical integration tend to use the reduced-form regression model, I utilize a variant of the discrete choice model used in Einav (2006) and Davis (2006c). Finally, I conduct a simulation analysis of the welfare effect of the hypothetical court decision like the *Paramount*, where major distributors are ordered to divest their theaters.

It is well known that vertical integration and vertical restraints resolve inefficiencies such as double marginalization, downstream moral hazard, transaction cost, and free-riding. Especially, according to Gil (2006c), vertical integration can solve distortion on the movie run length, which is similar to the inefficiency created by double marginalization, and vertical integration will improve consumers' welfare. However, such practices may also have anticompetitive effects in certain circumstances. Hence, competition authorities should be cautious with regard to intervention, and should carefully investigate the net effect of certain integration or restraints on competition and welfare.[1]

Motta (2004) argues that vertical integration will be anticompetitive only if all of the three

[1] Even among economists, vertical integration is one of the hottest issues among antitrust experts. As one may be able to recall, in 2001, although the U.S. Department of Justice (DOJ) had approved the proposed merger between General Electric and Honeywell after the detailed investigation, the European Commission (EC) blocked the integration because of the threat of market foreclosure of aircraft engine and avionics through the bundling practice of the merging firms. Nalebuff (2004) conducted a detailed analysis of this case. Cooper et al. (2005a) conducted a comparative study of the U.S. and European Union approaches to vertical controls. In February 2007, the EC released the draft version of the guideline for the assessment of the merger between companies in a vertical or conglomerate relationship in order to make the EC's commitment more clear and predictable for businesses (See the EC (2007)).

conditions are satisfied. First, vertical integration results in price increases. Second, the effect of price increase dominates the positive effect of the effort made by integrated firms to provide services. Third, the social welfare becomes exactly smaller than the case without vertical integration. There are many empirical studies that investigate the competition effect of vertical integration.[2] While some of them obtain results consistent with the anticompetitive effect of vertical integration, others suggest that the vertical integration appears to be procompetitive. Hence, the effect of vertical integration must be empirically examined on a case-by-case basis.

The results of this paper suggest that, although vertical integration leads to higher prices, theaters owned by producers/distributors are highly assessed by consumers. This implies vertical integration can possibly solve the distortion created by contractual complexity as well as promotion service effort by integrated theaters, such as pre- and post-release information of movies, and improving the direct service provided to customers, and so on. In addition, according to the simulation results, it is concluded that the order for major distributors to divest their theaters will possibly reduce the social welfare in Japan. This study will be an important case study of vertical integration in the Japan, because the empirical works analyzing vertical integration in Japanese industries are scarce.

While empirical studies of the Japanese movie industry are relatively rare, there are many empirical works on the movie industry in the US and Europe. For example, Corts (2001) examined the effects of the vertical market structure between movie production and distribution on release data competition, and found that complex vertical structures do not lead to efficient movie scheduling. Gil (2006a) studies the relationship between integration and the frequency of costly renegotiation in the Spanish movie industry; the results suggest that movies renegotiated ex-post tend to be distributed by integrated distributors ex-ante, and are more likely to show in vertically integrated theaters. Gil (2006c) analyzes the effect of vertical integration in the Spanish movie industry on movie run length, which will be affected by the revenue-sharing contracts, and finds that integrated theaters run their own movies longer than others. Gil (2006b) studies the effects of the *Paramount* case on the U.S. movie industry.[3] The present study will also contribute to the development of the

---

[2] For example, Shepard (1993), Hastings (2004), Hastings and Gilbert (2005), Vita (2000) for the U.S. retail gasoline market, Slade (1998) for beer, Chipty (2001), Suzuki (2006), and Waterman and Weiss (1996) for cable television. Cooper et al. (2005b) conducted a comprehensive survey on the empirical studies regarding vertical integration and vertical controls.

[3] Other examples are as follows: De Vany (2004) is a comprehensive study of the U.S. movie industry, and studies the effect of the *Paramount* decision in the stock market. Einav (2006) studies the relationship between the release timing and seasonality in the exhibition market, applying the discrete choice model. Davis (2005) investigates the effect of the local market structure of the U.S. movie theater market on the admission price, and Davis (2006a) reveals the nature of business stealing, cannibalization, and market expansion effects in the exhibition market. While the above two studies use reduced-form models, Davis (2006b) accurately analyzes the local competition in the U.S. movie theater industry by utilizing a sophisticated model in the line of Berry (1994) and Berry, Levinsohn, and Pakes (1995).

economic analysis of Japanese media industries.

The remaining parts of this study are organized as follows: The next section briefly reviews the movie industry. In the third section, I explain the data used in this study. The fourth section describes the model of demand for movie attendance, variables and estimation issues, as well as estimation results. In the fifth section, I simulate the *Paramount* case in Japan by using the estimated demand model. The sixth section provides further discussion of results. The seventh section is the concluding remarks.

2. Movie Industry

2.1 Industry Characteristics and Paramount

The movie industry comprises three different sectors: production, distribution, and exhibition.[4] Movies are generally created by production companies, and supplied by distributors to the exhibition market. Exhibitors operate single or multiple theaters and show films on their screens and generate box office revenue. The box office revenue is distributed by the three agents depending on the contract between each of them. For example, according to De Vany (2004), theaters rent a film from distributors for exhibition and pay depending on the contracted rental rate, which varies with the movie run. In addition, the revenue-sharing contract usually contains various arrangements and collateral conditions. Corts (2001) introduces some types of financing and distribution arrangements between production companies and distributors, which determine the ownership structure of copyright and the distribution right to the film.

The successful movie run involves many key strategic factors such as screenplay, casting, film footage, scheduling release and end timing, and the number and location of theaters. Moreover, at each step of the process, agents must contract with counterparts; because there is uncertainty, appropriate arrangements are required ex-post. According to Gil (2006c), vertical integration can solve distortion on the movie run length due to revenue-sharing contracts; that is similar to the distortion created by double marginalization.[5] In addition, theaters are expected to provide appropriate promotion service effort, such as pre- and post-release information of movies, morning and midnight shows, ensuring that facilities are clean and convenient, and improving the direct service provided to customers. As seen in the case of other retailers, theaters are differentiated to

[4] This subsection greatly depends on various literatures listed in the References.

[5] Gil (2006c) points out that, contracts between exhibitors and distributors generally are silent about movie run length and revenue-sharing contract is a source of incentive misalignment between independent theaters and distributors. Details in movie contracts in Japan are not well known, however, Kinema Junpo Film Institute (2005) reports that, generally, box office revenues are also shared by distributors and exhibitors, and movie run length is determined between distributors and exhibitors ex post, with given initial box office condition as well as various other factors.

some extent in terms of geographic location and have regional market power. Since movies themselves are highly differentiated products, there exists the possibility of double marginalization. The downstream moral hazard problem may be another source of inefficiency. Hence, to avoid inefficiencies that are inherent in the complicated business nature, there are incentive to various types of vertical integration, in addition to facilitating vertical controls, such as block booking and blind license.

In the U.S., however, vertical integration between distribution/production and exhibition has been illegal after the Supreme Court ruling on the *Paramount* case in 1948. Before that time, major studios, such as RKO, MGM, Twentieth Century Fox, Warner Brothers, and Paramount, operated their own theater chains and engaged in the production, distribution, and exhibition of their own films. The DOJ regarded such an industry structure as anticompetitive. In 1938, the DOJ brought suit against major studios and started a long litigation that lasted about ten years. Although the first decision was reached in 1946, both sides appealed to the Supreme Court and in 1948 the Supreme Court reversed the 1946 decision of the District Court; in particular, the Supreme Court recommended that the District court ensure divestment of theaters owned by the five major studios.[6] First, following the decision, RKO divested its theater branch in 1948; finally, MGM separated from its theaters.

2.2 The Japanese Movie Exhibition Market

This subsection briefly reviews the Japanese movie market using data from the website of the Motion Picture Producer Association of Japan, Inc. (MPPAJ).[7] Figure 1 depicts the aggregate pattern of the box office revenue in Japan from 1955 to 2006. According to this, the box office revenue increased drastically during the 1970s and the early 1980s; it took a downward turn toward the mid 1990s. Thereafter, from 1996 onward, the box office revenue started to grow: in 2006, the total box office revenue was 202,934 million JPY. Further, Figure 1 shows the long-run change in the number of screens. The number of screens increased rapidly during the latter half of the 1950s; however, from 1960 onward, it started to decline sharply, with there being only 1.734 screens in 1993. However, the first multiplex theater was opened in Ebina, Japan, the same year; this city is located in the center of Kanagawa Prefecture, about 50 km from Tokyo. Thereafter, the number of screens has been increasing annually. According to Figure 2, the aggregate movie attendance indicates a similar pattern for the number of screens. However, in the late 1990s and early 2000s, the

[6] In addition, the Supreme Court confirmed the 1946 decision of the District Court, in which major studios were found guilty of trade restriction using block booking, and such vertical controls were prohibited.

[7] This subsection also refers to Kaneyama (1994), Kinema Junpo Film Institute (2005), and Murakami and Ogawa (1999).

attendance did not refloat the same way as the number of screens. Thus, the attendance per screen is observed to have a downward trend.

= Figure 1 =

= Figure 2 =

In Japan, the vertical integration in the movie industry is not prohibited by the law, and there are some large distributors who own theaters as well as production divisions, such as Toho, Shochiku, and Toei, which are large Japanese distributors, have had affiliated movie theaters for a long time. The recent growth in the number of screens was driven by the increase in multiplex theaters. The Kadokawa Group and Tokyu Group, as well as three large distributors, are operating their own multiplex theater chains. Even foreign movie companies, such as Warner Brothers and United Pictures, have their own multiplex theater chains. There are also many independent exhibitors. Figure 3 depicts the number of screened films, and its decomposition into Japanese and foreign films. During the 1950s and 1960s, the Japanese film ratio was around 60% or more and then the ratio began to decline. After 1986, the Japanese film ratio drifted below 50%. However, the number of Japanese films released in a year increased dramatically in 2006, and the Japanese film ratio reached 50.8%. Accordingly, Japanese films seemed to have faced the competitive pressure from foreign films.

3. Data

In this study, I use the micro-data of the movie theater file of *Tokutei Sabis Sangyo Jittai Chosa (Survey of Selected Service Industries)* (hereinafter, SSSI).[8] The SSSI is an annual survey conducted by the Ministry of Economy, Trade and Industry (METI) for several selected industries However, given the rotation of industries selected for the survey, different industries are surveyed each year. The SSSI of the movie theater industry was conducted in 1975, 1976, 1980, 1991, 1994, 1997, 2001, and 2004; however, the micro-data of the first three surveys are not available. Hence, the data of the 1990s and 2000s are used in this study.

According to the report on the SSSI, establishments engaged in services included in Japan Standard Industrial Classification, category 841, (motion picture theaters) are treated as the sample unit of the SSSI of the movie theater industry. In principal, a theater is assumed to have one screen;

[8] The micro-data of the movie theater file of the SSSI is used,under the licence to the joint research project on *Media Kontentsu Sangyo deno Kyoso no Jittai Chosa (Research on Competition in Media Contents Industry)* at the CPRC by the Minister of Internal Affairs and Communications. For more details of the research project, please see Tanaka et al. (2007).

thus, if an owner operates a number of screens in the same building, each screen is treated as different establishments. However, if multiple screens have a common entrance and ticket office, then it becomes a typical case of multiplex theaters. Such an overall system is regarded as a single establishment.[9] Eventually, after observing the dataset, the definition of establishment by the METI may not be consistent on a yearly basis. For example, a certain multiplex theater is reported as a single establishment, while screens of the same theater are regarded as different establishments in one of the previous surveys. Therefore, based on the name and address of the original sample, I produce a new ID number. In the end, I construct a unique dataset of the Japanese movie theater, in which one can consistently identify each establishment on a yearly basis. Thus, the observation unit of this study is theater (establishment).

Since the SSSI on the movie industry does not always report the admission price, I calculate the annual average admission price of each theater by dividing the total box office revenue by the total number of attendance. Since there are some abnormal values, theaters outside the range of the mean of the estimated average admission price plus/minus the standard deviation multiplied by three, are defined as outliers and excluded from the sample. In the end, the total sample size is 4,254. Table 1 presents the details of my dataset, as well as the information from the website of the MPPAJ (bottom panel). According to this, on average, the sample accounts for about 87% of the total number of screens, about 76% of the total attendance, and about 81% of the total box office revenue, respectively. Table 1 also reports the number and share of vertically integrated theaters and screens in the Japanese movie industry, and the integrated theaters and screens account for about one fourth to one third of the total. In addition, one can see that the number and share of integrated theaters declined gradually during this time period: while the share of integrated theaters is about 31% in 1991, it decreased to about 23% in 2004. On the other hand, those of integrated screens have recently taken an upward turn: although the share of integrated screens declined from about 33% (1991) to about 24% (2001), it recovered to about 28% in 2004,

4. Estimation of Demand for Movie Attendance

4.1 Model

In this study, I employ the nested logit model.[10] As explained above, this study uses annual data, with a theater (establishment) being regarded as the sample unit. The utility that consumer i attains from going to theater j within market m in year t is assumed to be

[9] See Ministry of Economy, Trade and Industry (each edition).
[10] Ohashi (2003) studied the U.S. VCR market using the nested logit model.

(1)
$$\begin{aligned} v_{ijmt} &= \alpha p_{jmt} + Z_{jmt}\beta + d(L_i, L_{jmt}) + \xi_{jmt} + \varsigma_{imt} + (1-\sigma)\varepsilon_{ijmt} \\ &= \delta_{jmt} + \varsigma_{imt} + (1-\sigma)\varepsilon_{ijmt} \end{aligned}$$

where p is the admission price; Z, the vector of observed theater characteristics such as number of screens, number of seats as well as type of ownership; and ξ, an unobserved theater characteristic. Following Davis (2006b), I introduce the geographic differentiation, or, more concretely, the location of consumers and theaters, L_i and L_j, respectively. $d(,)$ denotes the distance of consumer location from each theater. The details of the measurement of distance and variable definition will be explained below. On the other hand, the mean utility from the outside alternative, i.e., from not going to any theater, is assumed to vary on a yearly basis.

(2) $$v_{i0mt} = \delta_{0mt} + \varsigma'_{imt} + (1-\sigma)\varepsilon_{imt}$$

where δ_{0mt} is the mean utility level in year t within market m; I treat this as the year fixed effect. ξ_0 is normalized to zero.

ε is assumed to be distributed as the i.i.d. type I extreme value distribution. ζ is a random variable that has a distribution with the parameter σ ($0 \leq \sigma < 1$); subsequently, even $\zeta + (1-\sigma)\varepsilon$ has the extreme value distribution.[11] If σ approaches zero, the within group correlation reaches zero, and the model becomes a simple logit model; however, if σ approaches one, the within group correlation reaches one. Further, the outside alternatives do not substitute for the inside goods.

In this setting, the market share of theater j's condition on going to any of the theaters is

(3) $$s_{jmt|1} = \frac{s_{jmt}}{s_{1mt}} = \frac{s_{jmt}}{1 - s_{0mt}} = \frac{\exp(\delta_{jmt}/(1-\sigma))}{D_{1mt}}$$

where

(4) $$D_{1mt} = \sum_{j \in J_m} \exp(\delta_{jmt}/(1-\sigma))$$

J_m is the set of theaters within market m in year t. Moreover, the probability of going to any of the theaters is defined as follows:

(5) $$s_{1mt} = \frac{D_{1mt}^{1-\sigma}}{D_{0mt}^{1-\sigma} + D_{1mt}^{1-\sigma}} = \frac{D_{1mt}^{1-\sigma}}{\exp(\delta_{0mt}) + D_{1mt}^{1-\sigma}}$$

and the possibility of not going to any theater is

(6) $$s_{0mt} = \frac{\exp(\delta_{0mt})}{\exp(\delta_{0mt}) + D_{1mt}^{1-\sigma}}$$

Hence, the market share of each theater is expressed as follows:

(7) $$s_{jmt} = s_{jmt|1} s_{1mt} = \frac{\exp(\delta_{jmt}/(1-\sigma))}{D_{1mt}^{\sigma}(\exp(\delta_{0mt}) + D_{1mt}^{1-\sigma})}$$

In the end, one can get the following well-known linear regression equation (hereinafter, share

[11] For example, Berry (1994).

equation):

$$(8) \qquad \ln(s_{jmt}) - \ln(s_{0mt}) = \alpha p_{jmt} + Z_{jmt}\beta + d(\overline{L}_{mt}, L_{jmt}) + \sigma \ln(s_{jmt|1}) - \delta_{0mt} + \xi_{jmt}$$

where α, β, δ_0, and σ are parameters that must be estimated. The L_{mt} with a bar denotes the representative consumer's location within market m at t; $d(.)$ is the average travel distance from consumers' location to theater j.

4.2 Variables

In this subsection, I explain the variables used in the demand estimation. First, as mentioned above, I define the annual average admission price of each theater as price, and the mean and standard error of the estimated admission price for the sample are reported in Table 2. The number of screens, number of seats, number of screened films, and Japanese film ratio to the total screened films are defined as other theater characteristics.

= Table 1 =

= Table 2 =

In addition, I include the dummy variable for vertical integration, which takes one if the theater is owned by production or distribution companies; otherwise, zero. If the vertical integration of the theater improves the quality of its services, the coefficient of the dummy variable is expected to be positive. Moreover, the following dummy variable is included: dummy variable for a separate theater, which takes one if the theater is located in a building that does not have any other theaters; otherwise, zero. For example, in Tokyo, several theaters owned by different exhibitors are located in the same building. In addition, the dummy variable for the first-run theater is also included as a theater characteristic.

With respect to the dependent variable, one must define the geographical market and potential market size of movie attendance. In this study, forty-seven prefectures are defined as geographic markets.[12] In almost all the markets, the sum of attendance of theaters within a market

[12] The geographic market delineation is another important issue that must be examined. However, this is beyond the scope of this study, and therefore, I simply define each prefecture as a market. It must be noted that the Japanese geographic features are very complicated: these consist of four large islands and many small ones, with the large islands comprising many mountains and rivers. The simple distance between two points tends not to represent the travel cost, because mountains and rivers may be located between the points. On the other hand, the borders of prefectures are typically defined by mountains and rivers; hence, the market definition of this study does not seem to cause serious problems.

exceeds the population. Therefore, I assume that the potential market size minus the sum of attendance, which is the number of consumers not going to any of the theaters, is proportional to the market population. Based on this assumption, the dependent variables are arranged as follows:

$$(9) \qquad \ln(s_{jmt}) - \ln(s_{0mt}) = \ln(x_{jmt} / (POP_{mt} \exp(\theta))) = y_{jmt} - \theta$$

where θ is a constant that will be estimated. On the other hand, the market share of theater j, conditional on going to any of the theaters, is calculated as the number of attendees of j divided by the total number of attendees in the market.

The utility function incorporates the geographic differentiation or the distance from each consumer to the respective theaters. Davis (2006b) captures the features of the density of travel distance by simply counting the number of consumers within some distance rings. In this study, I define the ratio of population within a 20-km circle of theater j to the total market population as the inverse of the average consumer travel distance to theater j.

$$(10) \qquad d(\overline{L}_{mt}, L_{jmt}) \cong \gamma(POP^{20km}_{jmt} / POP_{mt}) = \gamma C^{20km}_{jmt}$$

The idea behind this variable is that if the ratio is large, a relatively large portion of potential attendees within the market will live near the theater and the average travel distance will be small. The population within the 20-km circle of each theater is estimated based on the address of theaters and municipal head offices. The population within the 20-km circle is defined as the sum of the population of municipalities whose government offices located within the 20-km distance from each theater.[13]

In the end, the share equation is rearranged to

$$(11) \qquad y_{jmt} = \alpha p_{jmt} + Z_{jmt}\beta + \gamma C^{20km}_{jmt} + \sigma \ln(s_{jt|1}) - \delta_{0mt} + \theta + \xi_{jmt}$$

α, β, γ, δ_0, θ, and σ are parameters that will be estimated; however, δ_0 and θ cannot be separately identified. In the estimation, I include the year and selected market dummies for the following relatively large markets: Tokyo, Aichi, and Osaka. This is done to capture the variation in $-\delta_0+\theta$. Table 3 reports the descriptive statistics of regression variables for vertically integrated theaters and others as well as for the entire sample. According to this table, there are no significant differences in these variables between vertically integrated theaters and others.

---

[13] In this study, all distances between two points, a and b, are calculated as the Great Circle Distance following the Haversine formula as Seim (2006).

$$GCD_{a,b} = 2R \arcsin(\min((\Delta_{a,b})^{1/2}, 1))$$

$$\Delta_{a,b} = \sin^2((x_b - x_b)/2) + \cos(x_a)\cos(x_b)\sin^2((y_b - y_b)/2)$$

where (x, y) is the latitude-longitude coordinate of each point and R is the great circle radius of the sphere.

= Table 3 =

4.3 Econometrics

In this subsection, I address the identification problem of demand parameters.. According to the literature, some of the explanatory variables in the regression model will be correlated to the unobserved theater characteristic, ξ. In this study, the average admission price, p, and the market share conditional on going to any of the theaters, $s_{.|1}$, are potentially endogenous and correlated to ξ; however, the observable theater characteristics, Z, are assumed to be exogenous and orthogonal to ξ. As Berry (1994) and Berry, Levinsohn, and Pakes (1995) proposed, the rivals' exogenous theater characteristics are candidates of valid instruments for endogenous variables. In this study, the mean of the number of screens, number of seats, number of screened films, and Japanese film ratio, for the rival theaters within the same market are used as instruments. There is another endogenous variable, the density of travel distance, C. I follow a strategy similar to that proposed by Davis (2006b), and the mean of C for the rivals within the same market is used as an instrument. GMM is used as the estimation method, and the heteroskedastic-efficient GMM estimator of standard error is used for the statistical inference. Finally, the admission price is deflated by the Consumer Price Index (general, year 2000 = 100).

4.4 Estimation Results

Table 4 reports the estimation results of the share equation. The first column is the result of the basic specification without location. The estimated coefficient of the admission price is negative and that of the within market share conditional on going to any of the theaters is positive, and smaller than unity; hence, both of these satisfy the theoretical requirement. Moreover, these estimates are statistically significant at the 1% level. For other theater characteristics, such as the number of screens, number of seats, number of screened films, and Japanese film ratio, all of the estimated coefficients are statistically significant; moreover, while the estimates of the first two characteristics are positive, those of the number of screened films and the Japanese film ratio are negative. Thus, consumers preferred to watch foreign movies as compared with Japanese ones; the large number of screened films implies that the theater, on average, screened relatively inferior movies, which ran for a very short time. According to the uncentered R-squared, the model explains a large part of variations observed in the dependent variables. The Hansen J statistics show that the endogeneity problems are not so serious.

= Table 4 =

The second column presents the results of the model that adds the squared number of screens to the first model; the estimated coefficient of the new variable is statistically significant. Moreover, the effect of the number of screens on individual utility is nonlinear. The third model adds the dummy for vertically integrated theaters owned by producers/distributors, as well as other dummies, such as the independent establishment dummy. The estimated coefficient of the vertical integration is positive and statistically significant at the 1% level, while the other new dummies are not significant except for the first-run theater dummy, which is significant at the 1% level. Hence, compared to others, the services offered by vertically integrated theaters are highly evaluated by consumers. In addition, other estimated coefficients are not so different from those of the first model. The uncentered R-squared and the Hansen J statistics suggest that the models are almost successfully estimated.

The fourth and fifth columns report the result of the models that add the location, or the density of consumers' travel distance, to the second and third models. The estimated coefficients of the density of travel distance are positive and statistically significant at the 1% level. This implies that the shorter the average travel distance between consumers and the theater, the higher is the evaluation by the consumers. Furthermore, the addition of the location variable affects the magnitude of the coefficients of other variables. For example, the estimates of the admission price become smaller than the models without the location variable in the absolute measure, while the estimates of the within market share are larger than those of the previous models. However, they are still statistically significant and show the expected signs. Again, the uncentered R-squared implies that the model can explain almost all the variations in the dependent variables, and that the Hansen J statistics suggest that the model is successfully identified.

4.5 Additional Regression Results

The above results suggest that consumers have highly evaluated the vertically integrated theaters. I perform the additional descriptive regression and investigate the relationship between vertical integration and price and the rental rate for films, which is defined as the total film cost divided by the box office revenue. Table 5 shows the results of reduced-form regression of these variables on the various theater characteristics. The estimation method is the OLS. The first column is the results of the regression of the log admission price, and the coefficient of the vertical integration dummy is positive and significantly estimated at the 1% level. This suggests that the vertical integration resulted in a higher price than the nonintegrated theaters by 0.02%. The second column reports the regression result of the film rental rate on the vertical integration dummy as well as other theater characteristics, and the vertical integration dummy has a positive and statistically significant coefficient at the 1% level Thus, the average film rental rate of integrated theaters was 2.2% point higher than that for others.[14] With respect to some theaters, the estimated average film rental rates exceed one. This does not imply that such theaters are problematic samples, because, in a certain contract between theaters and distributors, the film rental cost would be over the box office revenue. I perform the same regression for theaters with a film rental rate that is greater than zero and smaller than one. The result is reported in the third column and is almost the same as the results for the full sample: The rental rate of integrated theaters was 2.4% point higher than that for others.[15]

= Table 5 =

5. Simulating the *Paramount* in Japan

According to the empirical results in the previous section, while vertical integration results in higher prices, vertically integrated theaters are preferred by consumers. This section simulates the *Paramount* ruling in the Japanese movie industry, and assesses its effects on welfare by using the estimated demand model for movie attendance. Operationally, the simulation strategy is very simple. First, I consider the hypothetical case in which the Japanese court required major distributors to separate from their exhibition branches; following this decision, they divested their theater chains. This is represented by changing the vertical integration dummy to zero for all ex-integrated theaters. As explained in the previous section, this change will reduce the individual utility attained from the theaters previously owned by the major distributors; in the present study, this effect is called the structural change effect.

The vertical separation will decrease the admission price of previously vertically integrated theaters by about 0.02%, according to the previous regression analysis. This is referred to as the price change effect. The change in the consumers' surplus (*CS*) or the compensated variation (*CV*) caused by the divestment is estimated by using the following formula.

$$(12) \qquad CV_{mt} = -\frac{\ln(\exp(\delta_{0t}) + (D^1_{1mt}(p^1_{mt}, w^1_{mt}))^{1-\sigma}) - \ln(\exp(\delta_{0t}) + (D^0_{mt}(p^0_{mt}, w^0_{mt}))^{1-\sigma})}{\alpha}$$

where 0 and 1 denote the stages before and after the divestment, respectively. $p_j^1 = (1 - 0.0002)\, p_j^0$, if the theater was owned by the distributors; otherwise, $p_j^1 = p_j^0$. w is the indicator variable for vertical integration, and $w_j^1 = 0$ after the divestment, if the theater was previously vertically integrated.

---

[14] This is calculated as exp(Coefficient of Vertical Integration Dummy)-1.

[15] In the simulations shown in the following subsection, I focus on the sample in which the film rental rate is greater than zero and smaller than one ($0 < \eta < 1$). In addition, I perform the same demand estimation with the same subsample; Tables 9 and 10 of the Appendix report the results. These results suggest that the omission of such theaters from the sample does not qualitatively or dramatically change the estimated parameters.

On the other hand, the theaters' profit function provides the following model

$$\pi_{jmt} = ((1-\eta_{jmt})p_{jmt} + e_{jmt} - mc_{jmt})s_{jmt}(p_{jmt})X_{mt} - F_{jmt} \tag{13}$$

where X is the potential market size, and e denotes the expenditure per attendee on confectionery or other goods, which is not shared with distributors. mc and F represent marginal and fixed costs. η is the average rental rate for films. Following the results in the previous section, the film rental rates of integrated theaters are about 2.4% point larger than others. Hence, the theater divestment tends to reduce the rental rate for films of vertically integrated theaters as well as price, and change the share distribution among theaters.[16] The change in the producers' surplus (*PS*) per consumer due to the divestment is computed as follows:

$$\begin{aligned} \Delta PS_{mt} = & \sum_{j\in J_{mt}}((1-\eta^1_{jmt})p^1_{jmt}s_{jmt}(p^1_{jmt}, w^1_{jmt}) - (1-\eta^0_{jmt})p^0_{jmt}s_{jmt}(p^0_{jmt}, w^0_{jmt})) \\ & + \sum_{j\in J_{mt}}(e_{jmt} - mc_{jmt})(s_{jmt}(p^1_{jmt}, w^1_{jmt}) - s_{jmt}(p^0_{jmt}, w^0_{jmt})) \end{aligned} \tag{14}$$

where $\eta_j^1 = \eta_j^0 - 0.024$, if the theater is vertically integrated; otherwise, $\eta_j^1 = \eta_j^0$. As mentioned above, the changes in η and w are the structural changes. The second term depends upon $e - mc$, as well as the change in the share distribution. Table 1 reports the mean and the standard deviation of the expenditure on confectionery per attendee, and it ranges from about 125 to 184 JPY. This study considers three cases in which $e - mc = 0$, 100, and 150, respectively.

Finally, the change in the total welfare (*TW*) is defined as the sum of the change in the *CS* and the *PS*. In the simulation, I focus on the sample in which the film rental rate is greater than zero and smaller than one ($0 < \eta < 1$)— 4,198 theaters. In addition, as described above, the parameters δ_0 and θ cannot be separately identified. Hence, there are various ways to distribute the combined variations in δ_0 and θ, captured by the year and selected market dummies. In the base case, I set θ such that it is equal to the estimated constant term and assign the remaining variations to δ_0.

= Table 6 =

Table 6 presents the simulation results. Every welfare effect per consumer is reported in the constant year 2000. Panel (a) of the table presents the results of $e - mc = 0$. First, the effect of all the structural changes is negative, and the change in the *PS* is larger than the *CV*. The structural change, on average, reduces the *TW* about 116.181 JPY. Second, although the price effects are all

[16] Davis (2005) pointed out the puzzle of price formation in the U.S. movie exhibition market, and Orbach and Eivav (2006) provided some discussions and answers. Such complexity about the pricing behavior of theaters remains the same in Japan; in this paper, although I do not specify the mode of competition among theaters, I simply reduce the price by the uniform rate based on the results of previous regressions.

positive, they are very small. Even the change in the *PS* is larger than that in the *CS*. In the end, the total effect is dominated by the structural change effects, and the divestment of theaters decreases the *TW* by almost the same amount as the structural change (115.939 JPY). Panels (b) and (c) show the results of the cases in which $e - mc$ = 100 and 150, respectively; one can see that the estimated welfare effect becomes large as $e - mc$ increases. The reductions in *TW* are 139.571 JPY and 151.387 JPY, respectively.

6. Discussion

In this study, the vertical integration dummy is assumed to be orthogonal to the unobserved theater characteristic, ξ. However, someone may say that vertically integrated theaters tend to be able to show 'big' movies relative to other theaters. Moreover, they can probably make investments and upgrade their facilities, such as seats and screens, or they can potentially be in good locations, because of sufficient financial ability of upstream distributors/producers.[17] This implies that ξ of vertically integrated theaters may be larger than those of others, and the estimated coefficient of the dummy for vertical integration partly captures such differences in terms of theater quality.

One possible interpretation is that the choice and arrangement of movies as well as large screens, luxury seats, and good access, may be important services of vertically integrated theaters, and these services will be beneficial to consumers. Although I agree with this interpretation, I further assess the effect of vertical integration, applying the following two different strategies.[18] First, relaxing the assumption that the vertical integration dummy is exogenous, the ratio of vertically integrated theaters to the total number of theaters in each market is defined as an instrument for the vertical integration dummy. Then, the full model is estimated by adding the interaction terms of the vertical integration dummy and the mean deviation of other theater characteristics with the ratio of vertical integrated theaters, and the interaction terms of the ratio and other theater characteristics as instruments. In another method, the probit model of the determinant of vertical integration with the vertically integrated theater ratio in addition to exogenous characteristics, and instruments as exploratory variables. Thereafter, the full model is estimated as adding the interaction terms of the vertical integration dummy and the mean deviation of other theater characteristics, $w(\varphi/\Phi)$ and $(1\text{-}w)(\varphi/(1\text{-}\Phi))$. w is the vertical integration dummy, and Φ and φ are estimated from the probit

[17] There is another possibility that the composition of the Japanese and foreign movies, which were screened by each theater, depends on the vertical relation of theaters with producers/distributors. However, as shown in Table 3, the average Japanese film ratio of vertically integrated theaters is not so drastically different from that of others. In addition, the correlation between the vertical integration dummy and the Japanese film ratio is 0.072, and it is not so large. The correlation matrix of regression variables are reported in Table 7 of the Appendix.

[18] These are variants of Procedures 18.2 and 18.4 in Wooldridge (2002).

estimation result.[19] The sixth and seventh columns of Table 4 present the results. The estimates are not so drastically different from those provided in the fifth column; however, the estimated coefficient of the dummy for vertical integration becomes larger, for example, in the sixth model, from 0.212 to 0.917. These results suggest that our inference that vertically integrated theaters were highly evaluated by consumers is not so problematic.[20]

7. Concluding Remarks

Empirical results show that the price of vertically integrated theaters tends to be higher than others. According to Motta's checklist, it satisfies the first condition of anticompetitive vertical integration. However, theaters owned by producers/distributors are highly evaluated by consumers. This implies vertical integration can possibly solve the distortion created by complex revenue-sharing contracts, which is pointed out by Gil (2006c), as well as various service provisions by integrated theaters. In addition, the simulation analysis reveals that the positive effect of resolving the distortion due to complex revenue-sharing contracts as well as service provision encouraged by vertical integration will outweigh the negative effect of price increase in the sense of Motta's checklist, and the order for major distributors to divest their theaters will possibly reduce the social surplus. In other words, the vertical integration in the Japanese movie industry may enhance welfare. These results illuminate the importance of careful investigation of competition effects of respective integrations.

Finally, I address the remaining concerns pertaining to competition in the Japanese movie industry. In the movie industry, there are many industry-specific business practices. For example, in Japan, in addition to vertical integration, block booking, which packs the licensing of several movies into a single agreement, is also legal. Block booking acts like bundling or exclusive dealing because a screen can show only one film at a time.[21] Eventually, Toho and Toei, two of the major Japanese distributors, distribute their movies using block booking. According to Gil (2006b), only block booking banning was the source of the positive effects of the *Paramount* ruling on competition, while vertical divestment did not have any effect; thus, the effect of such vertical controls must also be empirically tested. In addition, uniform pricing is another typical business practice in the movie exhibition market.[22] While the average admission price in Figure 2 shows some variation, the general admission price for adult has been fixed at 1,800 JPY for many years; this price does not

[19] The probit results are reported in Table 8 of the Appendix. In this method, the bias-corrected standard errors are estimated by nonparametric bootstrapping in order to resolve problems that are attributable to generated regressors.

[20] In addition, I estimate the same demand models focusing on the sample with $0 < \eta < 1$ (Table 9 and Table 10 in Appendix), and perform same simulations. Table 11 in the Appendix reports the simulation results, and the results are not dramatically different from those of Table 6.

[21] Hanssen (2000) and Kenney and Klein (2000) study the economics of block booking.

[22] Orbach and Einav (2006) study the uniform pricing in the U.S. movie exhibition market.

vary with films. Hence, the variation in the average admission price among theaters in Table 2 may be attributed to the discount for morning or midnight shows, coupons, and the point system, in which, for example, a theater issues a point per attendance and attendees can exchange a certain amount of points for a ticket.[23] The pricing strategy of theaters is somewhat puzzling. Future studies should include the analysis that explicitly incorporates these business practices.

[23] In addition to the discounts for students and elder people, there is the service day, on which the admission price is set at 1,000 JPY, and the ladies' day, on which the price for females is discounted to 1,000 JPY. These are uniformly applied by almost all theaters.

References

Berry, S. T. (1994) "Estimating Discrete-Choice Model of Product Differentiation," *RAND Journal of Economics*, 25(2), 242–262.

Berry, S. T., J. Levinsohn, and A. Pakes (1995) "Automobile Prices in Market Equilibrium," *Econometrica*, 63(4), 841–890.

Cooper, J. C., L M. Froeb, D. O'Brien, and M. G. Vita (2005a) "A Comparative Study of United States and European Union Approaches to Vertical Policy," *George Mason Law Review*, 13(2), 289–308.

Cooper, J. C., L M. Froeb, D. O'Brien, and M. G. Vita (2005b) "Vertical Antitrust Policy as a Problem of Inference," *International Journal of Industrial Organization*, 23(7–8), 639–664.

Corts, K. S. (2001) "The Strategic Effects of Vertical Market Structure: Common Agency and Divisionalization in the US Motion Picture Industry," *Journal of Economics & Management Strategy*, 10(4), 509–528.

Chipty, T. (2001) "Vertical Integration, Market Foreclosure, and Consumer Welfare in the Cable Television Industry," *American Economic Review*, 91(3), 428–451.

Davis, P. (2005) "The Effect of Local Competition on Admission Prices in the U.S. Motion Picture Exhibition Market," *Journal of Law & Economics*, 48(2), 677–708.

Davis, P. (2006a) "Measuring the Business Stealing, Cannibalization and Market Expansion Effects of Entry in the U.S. Motion Picture Exhibition Market," *Journal of Industrial Economics*, 54(3), 293–321.

Davis, P. (2006b) "Spatial Competition in Retail Market: Movie Theaters," forthcoming in *RAND Journal of Economics*.

De Vany, A. (2004) *Hollywood Economics: How Extreme Uncertainty Shapes the Film Industry*, Abingdon, U.K.: Routledge.

Einav, L. (2006) "Seasonality in the US Motion Picture Industry," forthcoming in *RAND Journal of Economics*.

European Commission (2007) "Draft Commission Guidelines on the Assessment of Non-horizontal Mergers," (http://ec.europa.eu/comm/competition/mergers/legislation/draft_nonhorizontal_mergers.pdf)

Gil, R. (2006a) "Make-or-Buy in Movie: Integration and Ex-post Renegotiation," *International Journal of Industrial Organization*, 25(4), 643–656 .

Gil, R. (2006b) "An Empirical Investigation of Paramount Antitrust Case," mimeo.

Gil, R. (2006c) "Revenue Sharing Distortions and Vertical Integration in the Movie Industry," mimeo.

Hanssen, F. A. (2000) "The Block Booking of Films Reexamined," *Journal of Law & Economics*, 43(2), 395–428.

Hastings, J. S., and R. J. Gilbert (2005) "Market Power, Vertical Integration and the Wholesale Price of Gasoline," *Journal of Industrial Economics*, 53(4), 469–492.

Hayashi, S. (2007) "Meiji no Koyo to Genkai: Oshu no Hi–suihei–gata Kigyo Ketsugo Gaidorain An (Benefit and Limitation of Clarification: Draft Commission Guidelines on the Assessment of Non-horizontal Mergers)" *Kosei Torihiki*, No. 679, 19–26. (in Japanese).

Kaneyama, K. (1994) *Eiga Kai ni Shinro wo Tore (Take the course toward Movie Business)*, Tokyo, JAPAN: Synergy Kikagaku (in Japanese).

Kenney, R. W., and B. Klein (2000) "How Booking Facilitated Self-Enforcing Film Contracts," *Journal of Law & Economics*, 43(2), 427–435.

Kinema Junpo Film Institute (2005) *Eiga Produsa no Kiso Chishiki (A Basic Guide for the Producer)*, Tokyo, JAPAN: Kinema Junpo (in Japanese).

Ministry of Economy, Trade and Industry (each edition) *Tokutei Sabisu Sangyo Jittai Chosa Hokokusho: Eigakan Hen (Report on Survey of Selected Service Industry: Movie Theaters)*, Tokyo: Keizai Sangyo Tokei Kyokai (in Japanese).

Motion Picture Producers Association of Japan (2007) *Statistics of Film Industry in Japan: Year 1955–1999 & Year 2000–2006*, (http://www.eiren.org/toukei/index.html) (in Japanese).

Motta, M. (2004) *Competition Policy: Theory and Practice*, New York, NY: Cambridge University Press.

Murakami, Y., and N. Ogawa (1999) *Nihon Eiga Sangyo Saizensen (Japan Movie Now)*, Tokyo, JAPAN: Kadokawa Shoten (in Japanese).

Nalebuff, B. (2004) "Bundling: GE–Honeywell (2001)," in J. E. Kwoka, Jr., and L J. White eds., *The Antitrust Revolution*, the fourth edition, Case 16, 388–412, Oxford, UK: Oxford University Press.

Ohashi, H. (2003) "The Role of Indirect Network Effects in the U.S. VCR Market, 1978–86," *Journal of Economics & Management Strategy*, 12(4), 447–497.

Orbach, B. Y., and L. Einav (2006) "Uniform Prices for Differentiated Goods: the Case of the Movie–Theater Industry," forthcoming in *International Review of Law and Economics*.

Seim, K. (2006) "An Empirical Model of Firm Entry with Endogenous Product-Type Choice," *RAND Journal of Economics*, 37(3), 619–640.

Shepard, A. (1993) "Contractual Form, Retail Price, and Asset Characteristics in Gasoline Retailing," *RAND Journal of Economics*, 24(1), 58–77.

Slade, M. (1998), "Beer and the Tie: Did Divestiture of Brewer-owned Public Houses Lead to Higher Beer Prices?" *Economic Journal*, 108(448), 565–602.

Suzuki, A. (2006) "Vertical Integration in the U.S. Cable Television Industry," ISER Discussion Paper Series, No. 675.

Tanaka, T., Y. Yasaki, R. Murakami, M. Funakoshi, and M. Sunada (2007) “Media Kontentsu Sangyo deno Kyoso no Jittai Chosa (Research on Competition in Media Contents Industry),” forthcoming as CPRC Report, Competition Policy Research Center, Japan Fair Trade Commission (in Japanese).

Vita, M. (2000) “Regulatory Restrictions on Vertical Integration and Control: The Competitive Impact of Gasoline Divorcement Policies,” *Journal of Regulatory Economics*, 18(3), 217–233.

Waterman, D., and A. A. Weiss (1996) “The Effects of Vertical Integration between Cable Television Systems and pay Cable Networks,” *Journal of Econometrics*, 72(1–2), 357–395.

Wooldridge, J. M. (2002) *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press.

Appendix

= Table 7 =

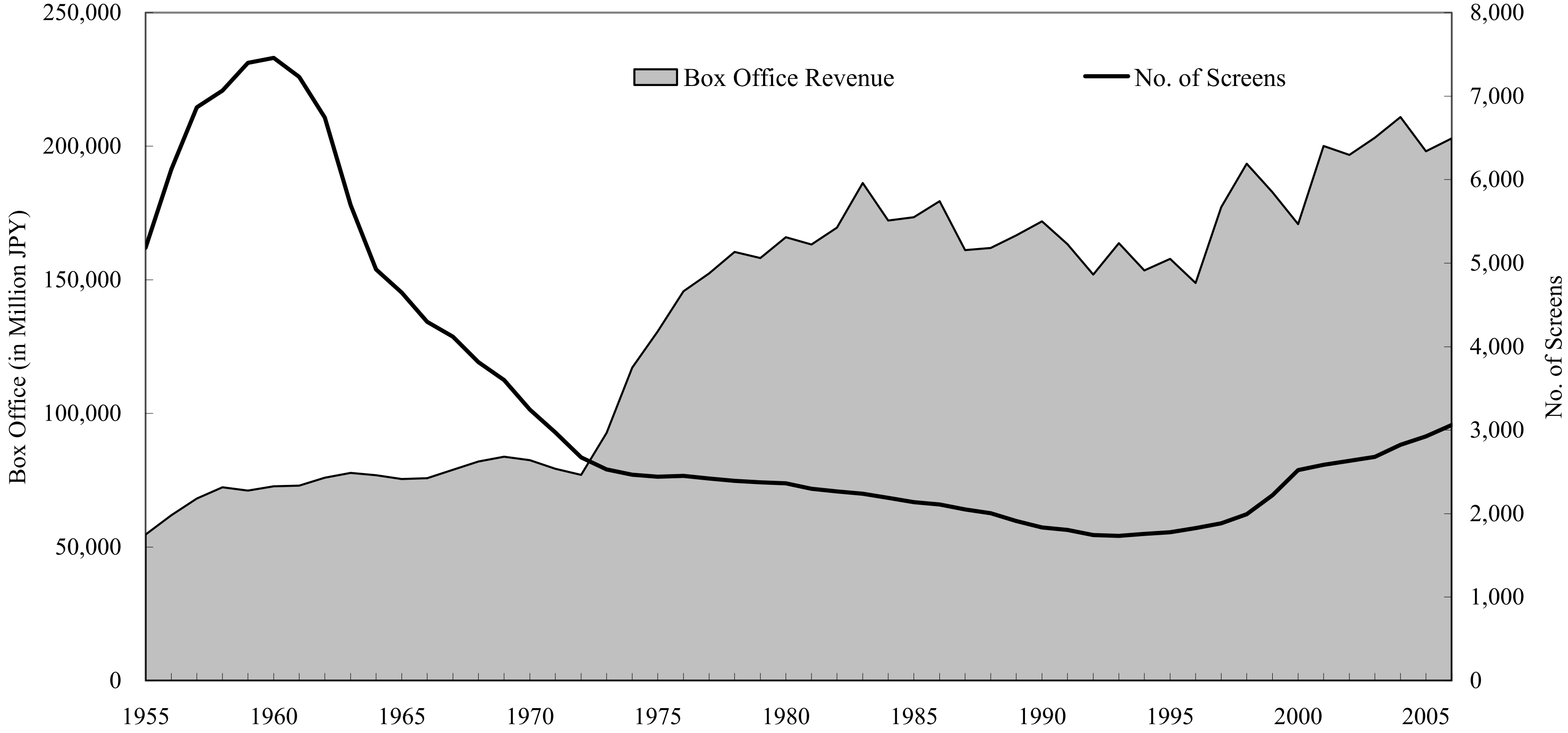
= Table 8 =

= Table 9 =

= Table 10 =

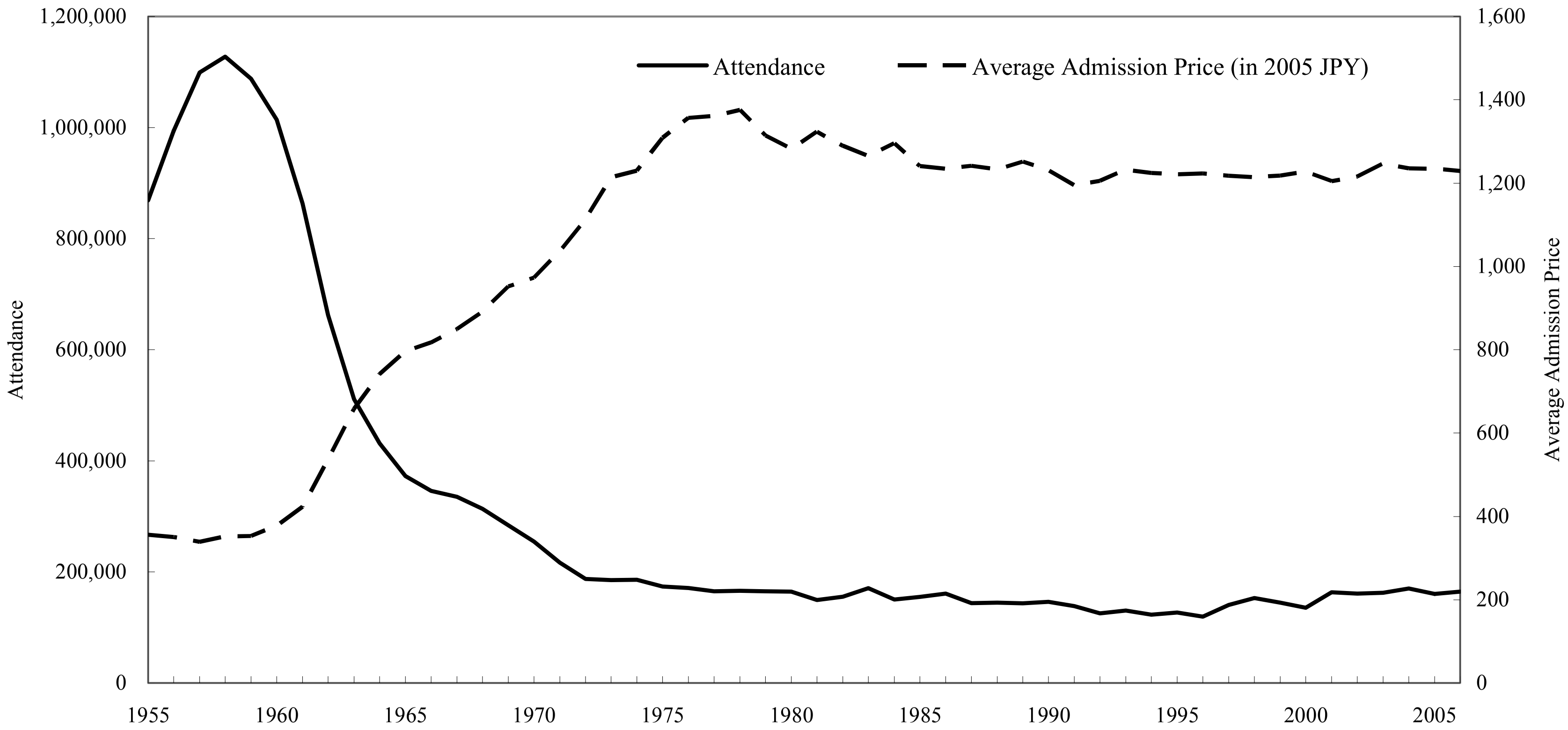
= Table 11 =

Figure 1: Box Office and No. of Screens



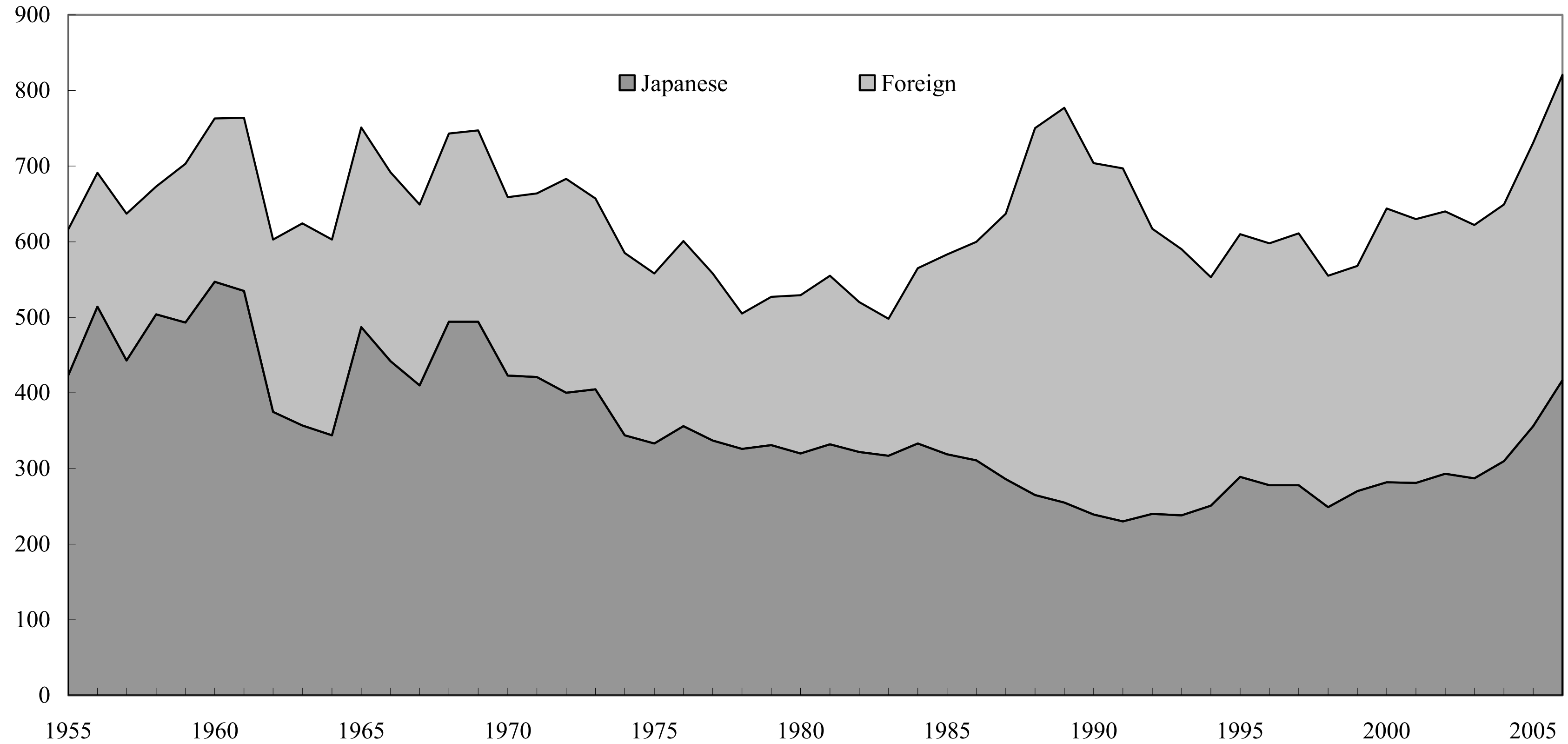
NOTE: The author prepared this figure by using the data from the website of the MPPAJ.

Figure 2: Attendance and Average Admission Price



NOTE: The author prepared this figure by using the data from the website of the MPPAJ.

Figure 3: No. of Screened Films



NOTE: The author prepared this figure by using the data from the website of the MPPAJ.

Table 1: Time-series and Cross-sectional Data of Japanese Movie Theaters

		1991	1994	1997	2001	2004
No. of Theaters	Total	1,053	974	831	793	678
	Outlier	10	17	22	13	13
	Sample	1,043	957	809	780	665
No. of Screens	Total	1,568	1,571	1,635	2,354	2,464
	Outlier	12	28	35	33	30
	Sample	1,556	1,543	1,600	2,321	2,434
Attendance (Thousand Persons)	Total	96,864	91,896	95,844	134,232	143,843
	Outlier	237	362	1,130	1,028	327
	Sample	96,627	91,534	94,714	133,203	143,516
Box Office Revenue (Million JPY)	Total	127,430	127,424	131,474	169,889	183,860
	Outlier	485	760	3,072	584	2,093
	Sample	126,946	126,663	128,403	169,305	181,767
No. of Multiplex Theaters (Screens)	Total	134	176	360	1,213	1,600
	Outlier	0	5	0	17	10
	Sample	134	171	360	1,196	1,590
Screen per Theater	Mean	1.49	1.61	1.98	2.95	3.66
	S.D.	0.96	1.08	1.54	2.64	3.21
Average Addmission Price (JPY)	Mean	1,286.02	1,346.90	1,318.20	1,292.69	1,269.54
	S.D.	271.73	313.76	269.15	287.11	249.79
Expenditure on Confectionery Per Attendee (JPY)	Mean	125.18	132.98	139.14	160.33	184.56
	S.D.	228.40	181.19	131.34	133.84	158.91
No. of Vertically Integrated Theaters	No.	326	294	214	194	158
	Ratio	30.96%	30.18%	25.75%	24.46%	23.30%
No. of Vertically Integrated Screens	No.	511	452	404	547	671
	Ratio	32.84%	29.29%	25.25%	23.57%	27.57%
MPPAJ (Reference):						
No. of Screens		1,804	1,758	1,884	2,585	2,825
Attendance (Thousand Persons)		138,330	122,990	140,719	163,280	170,092
Box Office Revenue (Million JPY)		163,378	153,590	177,197	200,154	210,914
No. of Multiplex Theaters (Screens)					1,259	1,766
Average Addmission Price (JPY)		1,181	1,249	1,259	1,226	1,240

NOTE: The time-sereis and cross-sectional data is constructed from the micro data of the SSSI. The number of multiplex theaters (with more than 5 screens) in 2001 and 2004 and the average addmission price are compared to those provided for the figure on the website of the MPPAJ. The definition of a multiplex theater is that it has more than 5 screens, following that of the MPPAJ. For more details, please see the text.

Table 2: Average Admission Price

	1991		1994		1997		2001		2004	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Hokkaido	1,227.50	307.12	1,361.86	408.79	1,341.51	265.98	1,286.79	324.79	1,230.65	157.65
Aomori	1,380.45	157.99	1,446.83	191.89	1,282.39	176.71	1,284.16	170.20	1,229.15	279.72
Iwate	1,350.80	315.63	1,332.18	334.37	1,343.89	142.01	1,139.29	294.02	1,296.20	219.33
Miyagi	1,330.56	208.41	1,356.51	269.24	1,473.87	203.70	1,373.79	303.34	1,292.21	222.70
Akita	1,276.99	151.14	1,345.59	428.75	1,409.82	400.28	1,399.97	473.44	1,236.10	153.18
Yamagata	1,266.89	194.06	1,334.18	269.70	1,112.77	305.11	1,314.15	373.25	1,089.15	82.95
Fukushima	1,312.91	251.51	1,511.26	396.25	1,248.45	174.58	1,309.42	202.83	1,223.90	189.73
Ibaraki	1,354.06	326.75	1,315.87	271.37	1,266.67	371.56	1,313.99	240.44	1,217.51	205.05
Tochigi	1,246.34	161.88	1,292.96	269.63	1,297.36	174.84	1,343.85	104.83	1,335.14	300.95
Gumma	1,353.55	264.34	1,269.99	174.99	1,254.20	208.25	1,298.47	206.74	1,164.36	314.93
Saitama	1,319.38	327.73	1,260.98	220.32	1,281.45	181.40	1,168.98	151.78	1,215.16	144.49
Chiba	1,276.29	268.45	1,274.08	334.00	1,272.91	209.28	1,180.63	206.28	1,242.20	283.58
Tokyo	1,262.54	265.99	1,387.40	312.84	1,346.65	292.34	1,349.17	303.08	1,311.81	190.68
Kanagawa	1,257.24	197.14	1,229.41	229.16	1,272.41	226.69	1,255.65	225.05	1,263.86	133.78
Niigata	1,273.41	151.95	1,351.16	337.25	1,337.01	157.13	1,194.71	193.72	1,194.53	200.05
Toyama	1,294.84	267.61	1,398.85	209.74	1,337.68	174.78	1,312.73	383.01	1,305.39	248.04
Ishikawa	1,254.30	149.48	1,309.81	120.34	1,274.27	156.31	1,166.93	119.99	1,204.53	71.10
Fukui	1,227.38	178.52	1,262.65	196.55	1,358.23	228.63	1,237.10	391.74	1,303.03	136.63
Yamanashi	1,263.05	330.46	1,211.39	277.57	1,213.46	388.27	1,240.39	267.60	1,199.31	260.91
Nagano	1,317.81	280.24	1,418.58	326.03	1,362.06	217.49	1,343.61	189.35	1,407.36	323.52
Gifu	1,338.26	204.88	1,477.56	255.16	1,442.01	138.98	1,468.29	671.16	1,320.54	292.88
Shizuoka	1,222.38	191.69	1,348.38	313.91	1,273.65	184.82	1,132.96	183.10	1,238.17	182.35
Aichi	1,345.23	282.65	1,387.56	372.22	1,431.85	292.91	1,321.29	231.39	1,241.09	270.51
Mie	1,343.25	283.55	1,436.90	328.20	1,403.08	270.70	1,383.47	221.50	1,279.63	310.48
Shiga	1,176.44	158.10	1,232.05	201.53	1,372.51	327.64	1,320.35	201.91	1,325.11	196.60
Kyoto	1,331.29	205.90	1,380.86	269.65	1,265.95	298.89	1,312.08	197.75	1,326.56	237.50
Osaka	1,220.53	259.27	1,269.53	286.76	1,272.15	371.87	1,256.85	386.69	1,235.22	364.38
Hogo	1,314.78	367.98	1,305.06	266.99	1,304.16	225.05	1,269.16	229.99	1,365.86	415.58
Nara	1,131.18	178.59	1,262.51	142.54	1,356.72	191.57	1,372.63	257.96	1,239.15	90.02
Wakayama	1,384.20	223.48	1,725.36	486.02	1,359.31	259.61	1,273.65	239.83	1,455.96	329.11
Tottori	1,305.45	114.63	1,373.43	175.41	1,346.80	124.35	1,258.75	160.97	1,375.15	69.67
Shimane	1,325.24	283.96	1,332.49	86.35	1,450.95	207.63	1,356.22	312.06	1,396.07	219.21
Okayama	1,225.98	105.88	1,310.41	229.93	1,348.79	185.99	1,412.74	306.97	1,210.89	154.94
Hiroshima	1,466.33	434.69	1,395.65	197.30	1,366.48	200.24	1,332.26	167.07	1,303.43	169.91
Yamaguchi	1,249.85	143.61	1,407.79	230.21	1,116.58	347.26	1,177.69	119.09	1,185.06	153.35
Tokushima	1,282.78	238.07	1,530.39	543.48	1,352.78	315.51	1,546.85	438.37	1,374.59	312.56
Kagawa	1,421.68	281.56	1,555.67	299.95	1,334.68	128.10	1,234.97	142.60	1,278.84	102.85
Ehime	1,235.81	240.46	1,491.25	317.11	1,201.01	174.75	1,304.24	263.69	1,199.79	83.28
Kochi	1,307.05	314.04	1,364.36	106.85	1,288.97	173.10	1,260.34	151.78	1,228.47	451.53
Fukuoka	1,258.36	196.35	1,331.54	342.69	1,299.20	404.79	1,257.40	311.92	1,198.09	153.95
Saga	1,309.41	205.29	1,393.94	107.92	1,225.63	104.85	1,326.46	62.18	1,151.34	80.84
Nagasaki	1,312.83	156.24	1,283.36	292.29	1,353.72	209.09	1,329.52	255.04	1,403.35	461.85
Kumamoto	1,456.72	511.79	1,340.96	301.85	1,330.31	189.71	1,220.27	202.32	1,208.81	71.63
Oita	1,328.24	123.37	1,310.30	305.34	1,221.16	337.62	1,638.43	586.63	1,405.18	398.70
Miyazaki	1,342.36	461.89	1,523.42	497.83	1,426.20	69.42	1,355.97	200.13	1,395.58	109.10
Kagoshima	1,300.30	124.27	1,376.78	103.93	1,402.16	147.17	1,226.57	198.79	1,338.25	275.26
Okinawa	841.32	169.53	1,002.47	204.41	1,177.14	314.21	1,096.00	151.22	1,100.30	104.07
Total	1,286.02	271.73	1,346.90	313.76	1,318.20	269.15	1,292.69	287.11	1,269.54	249.79

NOTE: The statistics are calculated based on the time-series and cross-sectional data of the SSSI without outliers. All figures are in current JPY. For more details, please see the text.

Table 3: Descriptive Statistics

	Full Sample No. = 4,254				VI No. = 1,186		Non-VI No. = 3,068	
	Mean	S.D.	Min.	Max.	Mean	S.D.	Mean	S.D.
Admission Price/CPI (year 2000 = 100)	13.287	2.873	5.435	31.510	13.472	2.303	13.216	3.063
No. of Attendees/Market Population (log)	2.738	1.388	-7.081	7.363	3.196	1.279	2.560	1.388
Witin Market Share (log)	-3.902	1.510	-14.874	-0.109	-3.495	1.410	-4.059	1.518
Density within Travel Distance 20 km	0.435	0.247	0.003	1.000	0.492	0.236	0.412	0.247
No. of Screens	2.222	2.142	1.000	18.000	2.180	2.072	2.239	2.169
No. of Seats/100	4.738	5.188	0.080	49.810	5.874	5.878	4.299	4.825
No. of Screened Films/100	0.617	0.711	0.010	16.420	0.489	0.597	0.666	0.745
Japanese Film Ratio (%)	49.219	35.756	0.000	100.000	53.341	36.543	47.625	35.325
Vertical Integration	0.279	0.448	0.000	1.000	1.000	0.000	0.000	0.000
Separate Location	0.382	0.486	0.000	1.000	0.341	0.474	0.398	0.490
First-run Theater	0.794	0.404	0.000	1.000	0.895	0.307	0.755	0.430
Average Rental Rate for Films	0.439	0.180	0.000	2.222	0.471	0.156	0.427	0.187
Tokyo	0.114	0.317	0.000	1.000	0.153	0.360	0.098	0.298
Aichi	0.062	0.241	0.000	1.000	0.059	0.236	0.063	0.243
Osaka	0.075	0.264	0.000	1.000	0.077	0.266	0.075	0.263

NOTE: The statistics are calculated based on the time-series and cross-sectional data of the SSSI without outliers. "VI" is an abbreviation of vertical integration. For more details, please see the text.

Table 4: Estimation Results of Demand for Movie Attendance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
α : Admissoin Price/CPI	-0.241 *a*	-0.265 *a*	-0.272 *a*	-0.165 *a*	-0.166 *a*	-0.179 *a*	-0.178 *a*
	(0.041)	(0.043)	(0.042)	(0.030)	(0.028)	(0.061)	(0.033)
σ : $\ln(s_{j\|g})$, Within Share	0.416 *a*	0.398 *a*	0.375 *a*	0.496 *a*	0.480 *a*	0.509 *a*	0.468 *a*
	(0.044)	(0.047)	(0.049)	(0.029)	(0.029)	(0.043)	(0.031)
γ : Density within 20 km				1.137 *a*	1.166 *a*	1.140 *a*	1.091 *a*
				(0.086)	(0.084)	(0.230)	(0.093)
β :							
No. of Screens	0.040 *b*	0.265 *a*	0.227 *a*	0.267 *a*	0.232 *a*	0.244 *b*	0.273 *a*
	(0.017)	(0.034)	(0.032)	(0.025)	(0.023)	(0.104)	(0.025)
No. of Screens, Squared/100		-2.081 *a*	-1.680 *a*	-1.756 *a*	-1.414 *a*	-0.970	-1.596 *a*
		(0.235)	(0.217)	(0.182)	(0.168)	(0.950)	(0.204)
No. of Seats/100	0.089 *a*	0.086 *a*	0.070 *a*	0.056 *a*	0.045 *a*	0.020	0.039 *a*
	(0.007)	(0.007)	(0.006)	(0.005)	(0.004)	(0.033)	(0.006)
No. of Screened Films/100	-0.058 *b*	-0.064 *b*	0.078 *a*	-0.098 *a*	0.005	0.164	0.046 *c*
	(0.025)	(0.027)	(0.030)	(0.023)	(0.020)	(0.453)	(0.025)
Japanese Film Ratio	-0.006 *a*	-0.006 *a*	-0.006 *a*	-0.004 *a*	-0.004 *a*	-0.005 *a*	-0.004 *a*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Vertical Integration (w)			0.341 *a*		0.212 *a*	0.917 *a*	0.769 *a*
			(0.037)		(0.023)	(0.307)	(0.086)
Separate Location			-0.027		-0.041	-0.070	0.002
			(0.042)		(0.027)	(0.084)	(0.036)
First-run Theater			0.579 *a*		0.434 *a*	0.462 *a*	0.439 *a*
			(0.067)		(0.043)	(0.163)	(0.053)
$-\delta_0+\theta$:							
Tokyo	0.144	0.117	0.092	-0.043	-0.064	-0.717	-0.067
	(0.090)	(0.095)	(0.098)	(0.071)	(0.071)	(0.531)	(0.076)
Aichi	-0.381 *a*	-0.348 *a*	-0.382 *a*	-0.348 *a*	-0.374 *a*	-0.673	-0.382 *a*
	(0.089)	(0.091)	(0.092)	(0.060)	(0.059)	(0.559)	(0.068)
Osaka	-0.270 *a*	-0.284 *a*	-0.283 *a*	-0.478 *a*	-0.488 *a*	-0.735	-0.538 *a*
	(0.084)	(0.088)	(0.088)	(0.066)	(0.066)	(0.831)	(0.073)
1994	0.047	0.037	0.038	0.014	0.013	0.079	0.012
	(0.039)	(0.041)	(0.040)	(0.028)	(0.027)	(0.081)	(0.037)
1997	-0.026	-0.074 *c*	-0.061	-0.045	-0.038	-0.039	-0.036
	(0.042)	(0.045)	(0.043)	(0.030)	(0.028)	(0.180)	(0.037)
2001	0.010	-0.049	-0.044	0.052	0.054	0.201 *b*	0.044
	(0.050)	(0.054)	(0.053)	(0.035)	(0.033)	(0.101)	(0.044)
2004	0.017	-0.043	-0.079	0.074 *b*	0.047	0.164	0.010
	(0.054)	(0.058)	(0.059)	(0.038)	(0.037)	(0.136)	(0.049)
ρ_1: $w(\varphi/\Phi)$							-0.434 *a*
							(0.059)
ρ_2: $(1-w)(\varphi/(1-\Phi))$							0.114
							(0.071)
Constant	7.431 *a*	7.411 *a*	6.918 *a*	5.969 *a*	5.566 *a*	5.704 *a*	5.600 *a*
	(0.629)	(0.661)	(0.606)	(0.469)	(0.415)	(1.013)	(0.474)
Instruments:							
Rivals' Mean of Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rivals' Mean of Density (20 km)	No	No	No	Yes	Yes	Yes	Yes
Ratio of VI Theaters in the Market	No	No	No	No	No	Yes	Yes
No. of observations	4,254	4,254	4,254	4,254	4,254	4,254	4,254
Uncentered R-squared	0.926	0.918	0.920	0.963	0.966	0.939	0.963
Hansen J statistic	2.010	1.262	1.388	0.537	0.821	0.554	2.064
p-value	0.366	0.532	0.500	0.764	0.664	0.758	0.356

NOTE: All models are estimated by the GMM. In the sixth model, the full model is estimated by adding the interaction terms of the vertical integration dummy and the mean deviation of other theater characteristics with the ratio of vertical integrated theaters, which are instrumented with the interaction terms of the ratio and the mean deviation of other theater characteristics. In the seventh model, the full model is estimated by adding the interaction terms of the vertical integration dummy and the mean deviation of other theater characteristics, $w(\varphi/\Phi)$ and $(1-w)(\varphi/(1-\Phi))$. Φ and φ are computed from the probit estimation result. The estimated robust standard errors for the first to sixth models, and the bias-corrected bootstrap standard errors for the seventh model, are provided in parentheses. *a*, *b*, and *c* indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Table 5: Some Descriptive Regression Results

	ln(Price)	Rental (Full)	Rental (0, 1)
No. of Screens	-0.011 *a*	0.008 *b*	0.009 *a*
	(0.003)	(0.003)	(0.003)
No. of Seats/100	0.003 *a*	0.004 *a*	0.003 *a*
	(0.001)	(0.001)	(0.001)
No. of Screened Films/100	0.016 *b*	-0.065 *a*	-0.063 *a*
	(0.007)	(0.015)	(0.015)
Japanese Film Ratio	-0.001 *a*	-0.001 *a*	0.000 *a*
	(0.000)	(0.000)	(0.000)
Vertical Integration	0.019 *a*	0.022 *a*	0.024 *a*
	(0.007)	(0.005)	(0.005)
Separate Location	0.033 *a*	-0.028 *a*	-0.028 *a*
	(0.008)	(0.006)	(0.005)
First-run Theater	0.095 *a*	0.078 *a*	0.088 *a*
	(0.011)	(0.011)	(0.010)
Tokyo	0.012	-0.022 *a*	-0.009
	(0.010)	(0.008)	(0.007)
Aichi	0.041 *a*	-0.017 *c*	-0.014
	(0.014)	(0.009)	(0.009)
Osaka	-0.044 *a*	-0.030 *a*	-0.022 *a*
	(0.014)	(0.009)	(0.008)
1991	2.531 *a*	0.402 *a*	0.385 *a*
	(0.016)	(0.013)	(0.012)
1994	2.538 *a*	0.404 *a*	0.388 *a*
	(0.016)	(0.013)	(0.012)
1997	2.507 *a*	0.412 *a*	0.391 *a*
	(0.016)	(0.013)	(0.012)
2001	2.493 *a*	0.438 *a*	0.420 *a*
	(0.016)	(0.014)	(0.012)
2004	2.489 *a*	0.454 *a*	0.435 *a*
	(0.018)	(0.016)	(0.013)
No. of Observations	4,254	4,254	4,198
R-squared	0.994	0.893	0.917

NOTE: Ordinary least square regression results. The estimated robust standard errors are given in parentheses. *a* , *b* , and *c* indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Table 6: Welfare Effects of Theater Divestment

	1991	1994	1997	2001	2004	Mean
			(a) $e - mc = 0$			
Structural Change:						
CV (= ΔCS)	-38.753	-31.894	-38.050	-31.113	-35.564	-35.061
ΔPS	-101.170	-71.067	-78.851	-75.780	-79.062	-81.120
ΔTW	-139.922	-102.960	-116.901	-106.893	-114.626	-116.181
Price Change:						
CV (= ΔCS)	0.073	0.060	0.065	0.055	0.065	0.064
ΔPS	0.192	0.159	0.163	0.190	0.191	0.179
ΔTW	0.265	0.218	0.229	0.245	0.256	0.242
Total Effect:						
CV (= ΔCS)	-38.680	-31.834	-37.985	-31.058	-35.499	-34.998
ΔPS	-100.978	-70.908	-78.688	-75.590	-78.871	-80.941
ΔTW	-139.657	-102.742	-116.672	-106.648	-114.370	-115.939
			(b) $e - mc = 100$			
Structural Change:						
CV (= ΔCS)	-38.753	-31.894	-38.050	-31.113	-35.564	-35.061
ΔPS	-126.154	-90.706	-103.134	-99.757	-104.519	-104.794
ΔTW	-164.906	-122.600	-141.184	-130.870	-140.083	-139.856
Price Change:						
CV (= ΔCS)	0.073	0.060	0.065	0.055	0.065	0.064
ΔPS	0.238	0.196	0.205	0.231	0.236	0.221
ΔTW	0.311	0.255	0.270	0.287	0.301	0.285
Total Effect:						
CV (= ΔCS)	-38.680	-31.834	-37.985	-31.058	-35.499	-34.998
ΔPS	-125.916	-90.511	-102.929	-99.525	-104.283	-104.573
ΔTW	-164.596	-122.345	-140.914	-130.583	-139.782	-139.571
			(c) $e - mc = 150$			
Structural Change:						
CV (= ΔCS)	-38.753	-31.894	-38.050	-31.113	-35.564	-35.061
ΔPS	-138.646	-100.526	-115.275	-111.745	-117.248	-116.632
ΔTW	-177.399	-132.420	-153.325	-142.859	-152.812	-151.693
Price Change:						
CV (= ΔCS)	0.073	0.060	0.065	0.055	0.065	0.064
ΔPS	0.261	0.214	0.225	0.252	0.258	0.242
ΔTW	0.334	0.273	0.291	0.308	0.323	0.306
Total Effect:						
CV (= ΔCS)	-38.680	-31.834	-37.985	-31.058	-35.499	-34.998
ΔPS	-138.385	-100.312	-115.050	-111.493	-116.989	-116.390
ΔTW	-177.065	-132.146	-153.034	-142.551	-152.488	-151.387

NOTE: The population-weighted mean of the welfare changes per consumer across markets are reported in year 2000. For more details, please see the text.

Table 7: Correlation Matrix

	1	2	3	4	5	6	7	8
1 Admission Price/CPI	1.000							
2 Market Share	-0.048	1.000						
3 Witin Market Share	-0.022	0.927	1.000					
4 Density within 20 km	0.034	0.165	-0.020	1.000				
5 No. of Screens	-0.042	0.596	0.479	-0.009	1.000			
6 No. of Seats/100	0.010	0.635	0.494	0.135	0.814	1.000		
7 No. of Screened Films/100	-0.062	0.034	-0.029	0.116	0.310	0.183	1.000	
8 Japanese Film Ratio	-0.155	-0.304	-0.245	-0.073	-0.235	-0.243	0.175	1.000
9 Vertical Integration	0.040	0.206	0.168	0.145	-0.012	0.136	-0.111	0.072
10 Separate Location	0.043	-0.408	-0.341	-0.045	-0.403	-0.342	-0.034	0.217
11 First-run Theater	0.144	0.398	0.377	-0.054	0.210	0.256	-0.302	-0.273
12 Average Rental Rate for Films	-0.036	0.300	0.265	-0.072	0.232	0.258	-0.273	-0.267
13 Tokyo	0.031	-0.080	-0.316	0.373	-0.025	0.085	0.059	-0.059
14 Aichi	0.046	-0.151	-0.151	-0.005	0.066	0.023	0.063	0.025
15 Osaka	-0.055	-0.121	-0.212	0.352	-0.045	0.021	0.050	0.034

	9	10	11	12	13	14	15
9 Vertical Integration	1.000						
10 Separate Location	-0.052	1.000					
11 First-run Theater	0.155	-0.266	1.000				
12 Average Rental Rate for Films	0.110	-0.227	0.372	1.000			
13 Tokyo	0.077	0.004	-0.054	-0.038	1.000		
14 Aichi	-0.008	0.018	-0.011	-0.033	-0.092	1.000	
15 Osaka	0.003	-0.082	-0.068	-0.064	-0.102	-0.074	1.000

NOTE: The statistics are calculated based on the time-series and cross-sectional data of the SSSI without outliers. For more details, please see the text.

Table 8: Probit Regression Results of Vertical Integration

	Coef.	S.E.	p-value	Conf. Interval (95%)	
Ratio of Vertical Integration	3.473	0.194	0.000	3.092	3.853
No. of Screens	0.126	0.080	0.113	-0.030	0.283
No. of Seats	-0.105	0.039	0.007	-0.180	-0.029
No. of Screened Films	0.242	0.170	0.155	-0.091	0.576
Japanese Film Ratio	-0.008	0.003	0.028	-0.014	-0.001
Density within 20 km	-0.080	0.183	0.664	-0.439	0.280
No. of Screens	-0.260	0.044	0.000	-0.346	-0.174
No. of Screens, Squared/100	0.618	0.309	0.046	0.012	1.225
No. of Seats	0.108	0.010	0.000	0.089	0.128
No. of Screened Films	-0.157	0.070	0.025	-0.294	-0.020
Japanese Film Ratio	0.007	0.001	0.000	0.006	0.008
Separate Location	-0.179	0.054	0.001	-0.284	-0.074
First-run Theater	0.535	0.074	0.000	0.390	0.681
Tokyo	0.052	0.106	0.620	-0.155	0.260
Aichi	0.059	0.098	0.543	-0.132	0.250
Osaka	0.031	0.113	0.786	-0.190	0.251
1991	-1.788	0.230	0.000	-2.238	-1.337
1994	-1.807	0.230	0.000	-2.258	-1.357
1997	-1.803	0.230	0.000	-2.254	-1.352
2001	-1.767	0.229	0.000	-2.215	-1.319
2004	-1.755	0.250	0.000	-2.245	-1.266
No. of observation	4,254				
Log pseudolikelihood	-2,102.661				

NOTE: The dependent variable is the dummy for vertical integration, which is 1 if the theater is vertically integrated; otherwise, 0.

Table 9: Estimation Results of Demand for Movie Attendance: Robustness Check

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
α: Admissoin Price/CPI	-0.240 *a*	-0.263 *a*	-0.269 *a*	-0.164 *a*	-0.166 *a*	-0.169 *a*	-0.175 *a*
	(0.041)	(0.042)	(0.041)	(0.030)	(0.028)	(0.057)	(0.033)
σ: $\ln(s_{j\|g})$, Within Share	0.417 *a*	0.398 *a*	0.377 *a*	0.497 *a*	0.482 *a*	0.506 *a*	0.469 *a*
	(0.044)	(0.047)	(0.049)	(0.029)	(0.029)	(0.040)	(0.031)
γ: Density within 20 km				1.149 *a*	1.174 *a*	1.165 *a*	1.101 *a*
				(0.086)	(0.083)	(0.218)	(0.092)
β:							
No. of Screens	0.041 *b*	0.265 *a*	0.229 *a*	0.267 *a*	0.234 *a*	0.269 *a*	0.278 *a*
	(0.016)	(0.034)	(0.031)	(0.024)	(0.022)	(0.088)	(0.026)
No. of Screens, Squared/100		-2.068 *a*	-1.676 *a*	-1.742 *a*	-1.414 *a*	-0.975	-1.602 *a*
		(0.234)	(0.216)	(0.180)	(0.168)	(0.884)	(0.211)
No. of Seats/100	0.088 *a*	0.085 *a*	0.068 *a*	0.055 *a*	0.043 *a*	0.012	0.037 *a*
	(0.007)	(0.007)	(0.006)	(0.005)	(0.004)	(0.034)	(0.006)
No. of Screened Films/100	-0.063 *b*	-0.070 *a*	0.072 *b*	-0.102 *a*	-0.001	0.150	0.040
	(0.025)	(0.027)	(0.029)	(0.023)	(0.019)	(0.410)	(0.025)
Japanese Film Ratio	-0.006 *a*	-0.006 *a*	-0.006 *a*	-0.004 *a*	-0.004 *a*	-0.005 *a*	-0.004 *a*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Vertical Integration (w)			0.338 *a*		0.208 *a*	0.877 *a*	0.761 *a*
			(0.037)		(0.023)	(0.282)	(0.088)
Separate Location			-0.021		-0.032	-0.050	0.013
			(0.042)		(0.027)	(0.080)	(0.038)
First-run Theater			0.577 *a*		0.435 *a*	0.449 *a*	0.440 *a*
			(0.067)		(0.043)	(0.147)	(0.054)
$-\delta_0+\theta$:							
Tokyo	0.142	0.114	0.095	-0.044	-0.059	-0.638	-0.063
	(0.090)	(0.095)	(0.097)	(0.071)	(0.071)	(0.429)	(0.079)
Aichi	-0.383 *a*	-0.352 *a*	-0.384 *a*	-0.350 *a*	-0.374 *a*	-0.771	-0.387 *a*
	(0.090)	(0.092)	(0.093)	(0.061)	(0.059)	(0.561)	(0.073)
Osaka	-0.272 *a*	-0.286 *a*	-0.278 *a*	-0.483 *a*	-0.486 *a*	-0.770	-0.536 *a*
	(0.084)	(0.089)	(0.088)	(0.067)	(0.066)	(0.779)	(0.076)
1994	0.041	0.032	0.030	0.009	0.006	0.058	0.003
	(0.038)	(0.041)	(0.040)	(0.027)	(0.026)	(0.072)	(0.036)
1997	-0.030	-0.078 *c*	-0.068	-0.051 *c*	-0.045	-0.055	-0.044
	(0.042)	(0.044)	(0.043)	(0.030)	(0.028)	(0.158)	(0.037)
2001	0.003	-0.058	-0.054	0.042	0.043	0.166 *c*	0.029
	(0.050)	(0.054)	(0.053)	(0.035)	(0.033)	(0.092)	(0.043)
2004	0.017	-0.045	-0.084	0.072 *c*	0.043	0.152	0.004
	(0.054)	(0.058)	(0.059)	(0.038)	(0.037)	(0.116)	(0.049)
ρ_1: $w(\varphi/\Phi)$							-0.431 *a*
							(0.060)
ρ_2: $(1-w)(\varphi/(1-\Phi))$							0.117 *c*
							(0.070)
Constant	7.429 *a*	7.408 *a*	6.900 *a*	5.984 *a*	5.571 *a*	5.569 *a*	5.568 *a*
	(0.627)	(0.659)	(0.602)	(0.468)	(0.412)	(0.946)	(0.484)
Instruments:							
Rivals' Mean of Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rivals' Mean of Density（20 km）	No	No	No	Yes	Yes	Yes	Yes
Ratio of VI Theaters in the Market	No	No	No	No	No	Yes	Yes
No. of Observations	4,198	4,198	4,198	4,198	4,198	4,198	4,198
Uncentered R-squared	0.928	0.920	0.923	0.964	0.967	0.944	0.965
Hansen J Statistic	1.653	0.872	1.260	1.204	1.718	1.390	3.458
p-value	0.438	0.647	0.533	0.548	0.424	0.499	0.178

NOTE: All models are estimated by the GMM. In the sixth model, the full model is estimated by adding the interaction terms of the vertical integration dummy and the mean deviation of other theater characteristics with the ratio of vertical integrated theaters, which are instrumented with the interaction terms of the ratio and the mean deviation of other theater characteristics. In the seventh model, the full model is estimated by adding the interaction terms of the vertical integration dummy and the mean deviation of other theater characteristics, $w(\varphi/\Phi)$ and $(1\text{-}w)(\varphi/(1\text{-}\Phi))$. Φ and φ are computed from the probit estimation result. The estimated robust standard errors for the first to sixth models, and the bias-corrected bootstrap standard errors for the seventh model, are provided in parentheses. a, b, and c indicate statistical significance at 1%, 5%, and 10% levels, respectively. The sample is theaters with the film rental rate, which is greater than 0 and smaller than 1.

Table 10: Probit Regression Results of Vertical Integration: Robustness Check

	Coef.	S.E.	p-value	Conf. Interval (95%)	
Ratio of Vertical Integration	3.485	0.196	0.000	3.101	3.868
No. of Screens	0.128	0.080	0.110	-0.029	0.285
No. of Seats	-0.106	0.039	0.006	-0.182	-0.030
No. of Screened Films	0.257	0.170	0.130	-0.076	0.590
Japanese Film Ratio	-0.007	0.003	0.031	-0.014	-0.001
Density within 20 km	-0.062	0.185	0.738	-0.423	0.300
No. of Screens	-0.258	0.044	0.000	-0.345	-0.172
No. of Screens, Squared/100	0.593	0.310	0.056	-0.016	1.201
No. of Seats	0.108	0.010	0.000	0.089	0.128
No. of Screened Films	-0.162	0.071	0.023	-0.301	-0.023
Japanese Film Ratio	0.007	0.001	0.000	0.006	0.008
Separate Location	-0.180	0.054	0.001	-0.286	-0.074
First-run Theater	0.530	0.075	0.000	0.382	0.677
Tokyo	0.047	0.106	0.661	-0.162	0.255
Aichi	0.046	0.098	0.638	-0.146	0.238
Osaka	0.019	0.113	0.866	-0.202	0.240
1991	-1.798	0.232	0.000	-2.252	-1.344
1994	-1.813	0.231	0.000	-2.267	-1.359
1997	-1.812	0.232	0.000	-2.267	-1.357
2001	-1.770	0.231	0.000	-2.222	-1.318
2004	-1.758	0.252	0.000	-2.252	-1.264
No. of observation	4,198				
Log pseudolikelihood	-2,079.991				

NOTE: The dependent variable is the dummy for vertical integration, which is 1 if the theater is vertically integrated; otherwise, 0. The sample is theaters with the film rental rate, which is greater than 0 and smaller than 1.

Table 11: Welfare Effects of Theater Divestment: Robustness Check

	1991	1994	1997	2001	2004	Mean
			(a) $e - mc = 0$			
Structural Change:						
CV (= ΔCS)	-37.941	-31.290	-37.326	-30.558	-34.882	-34.386
ΔPS	-98.036	-68.679	-76.113	-72.851	-76.227	-78.316
ΔTW	-135.977	-99.968	-113.439	-103.408	-111.109	-112.702
Price Change:						
CV (= ΔCS)	0.072	0.059	0.065	0.055	0.065	0.063
ΔPS	0.192	0.160	0.163	0.191	0.192	0.180
ΔTW	0.265	0.219	0.229	0.246	0.257	0.243
Total Effect:						
CV (= ΔCS)	-37.868	-31.230	-37.260	-30.502	-34.817	-34.323
ΔPS	-97.844	-68.519	-75.950	-72.660	-76.035	-78.136
ΔTW	-135.712	-99.749	-113.210	-103.163	-110.852	-112.459
			(b) $e - mc = 100$			
Structural Change:						
CV (= ΔCS)	-37.941	-31.290	-37.326	-30.558	-34.882	-34.386
ΔPS	-122.651	-88.038	-100.132	-96.627	-101.442	-101.719
ΔTW	-160.592	-119.328	-137.457	-127.185	-136.324	-136.106
Price Change:						
CV (= ΔCS)	0.072	0.059	0.065	0.055	0.065	0.063
ΔPS	0.238	0.196	0.205	0.233	0.238	0.222
ΔTW	0.311	0.256	0.270	0.288	0.302	0.285
Total Effect:						
CV (= ΔCS)	-37.868	-31.230	-37.260	-30.502	-34.817	-34.323
ΔPS	-122.413	-87.842	-99.927	-96.394	-101.204	-101.497
ΔTW	-160.282	-119.072	-137.187	-126.897	-136.021	-135.820
			(c) $e - mc = 150$			
Structural Change:						
CV (= ΔCS)	-37.941	-31.290	-37.326	-30.558	-34.882	-34.386
ΔPS	-134.959	-97.718	-112.141	-108.516	-114.049	-113.421
ΔTW	-172.900	-129.007	-149.466	-139.073	-148.931	-147.807
Price Change:						
CV (= ΔCS)	0.072	0.059	0.065	0.055	0.065	0.063
ΔPS	0.261	0.215	0.226	0.254	0.260	0.243
ΔTW	0.334	0.274	0.291	0.309	0.325	0.307
Total Effect:						
CV (= ΔCS)	-37.868	-31.230	-37.260	-30.502	-34.817	-34.323
ΔPS	-134.698	-97.503	-111.915	-108.262	-113.789	-113.178
ΔTW	-172.566	-128.733	-149.175	-138.764	-148.606	-147.501

NOTE: The population-weighted mean of the welfare changes per consumer across markets are reported in year 2000. For more details, please see the text. The simulation is based on the estimation results of the twelfth model in Table 9.