

# Determinants of Ticket Prices in Spanish Cinemas<sup>1</sup>

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*This article presents an analysis of the factors that determine cinema ticket prices in Spain. Previous works were focused on the relationship between the level of concentration in the market and the admission prices. In our paper, we complement that analysis by considering the type of product that the cinema offers. Even though local cinema markets are highly concentrated, that only explains one part of the market power of cinemas whose ticket prices increase with the number of new releases and blockbusters they exhibit. Moreover cinemas charge higher prices when the closest rival is nearer because they differentiate more in the movies they screen.*

**Key words:** Ticket pricing, price determination, spatial competition, cinemas, product differentiation.

**JEL codes:** L11, L82

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## 1. Introduction

Ticket prices in entertainment industries have attracted researchers in the fields of economics and marketing for three main reasons: ticket prices do not change much during the run of a show, discrimination according to the location of seats is usually small and prices do not often match the differences in demand across different shows (which means that the big shows often sell out while there is an excess of seats for less popular shows). Some of the reasons are the existence of menu costs, the complementarity of the attendance and concessions and the two-sidedness of some of these markets. See Courty (2000), Rosen and Rosenfield (1997), Marburger (1997), Orbach and Einav (2007), Chen (2009) and Eichhorn and Marco (2010).

In the particular case of cinemas, certain articles have analysed whether there was a concentration-price effect in the cinema market and found very modest effects of the local market structure on admission prices. See Davis (2005) for the United States, and Böhme and Müller (2011) for Germany. Gil (2006) found, from a database of Spanish cinemas in 1995 and 2000, that price-concentration effect differs across different demand states.

The present paper explains the main determinants of cinema ticket prices paying attention not only to the structure of the market in terms of locations of cinemas run by the same or by a different circuit, but also by considering the characteristics of the cinemas and the features of the films that are exhibited. This work uses a new dataset for the Spanish cinema market.

The results of this paper show that the high level of concentration in the local cinema markets in Spain only explains some of the ability of cinemas to increase their prices. Ticket prices are mainly explained by the type of product that the exhibitor shows, especially the number of new releases and the number of blockbusters screened. Prices are also higher in bigger towns, in regions with higher Gross Domestic Product (GDP) per capita and in those cinemas located in shopping malls. Moreover the shorter the distance between two cinemas the higher their ticket prices. This finding is explained by the evidence of this market, reported in Elizalde (2010), that closer cinemas differentiate more in the set of movies they screen in order to gain market power through product differentiation.

The article is organized as follows. Section 2 shows a revision of the related literature. In Section 3, the Spanish cinema market and the dataset are described. Section 4

presents the model of demand used to predict ticket prices. Section 5 presents the results of the estimation. Finally, Section 6 concludes and outlines directions for future research.

## **2. Literature Review**

Cinema markets have been studied by economists since 1950s. During those years, cinema attendance in the United States and the European Union fell due to competition by television and video. For example, Spraos analyses the characteristics of cinema markets and the decline of cinemas in the United Kingdom (UK) from 4,500 to 3,000 cinemas during the decades of 1950s and 1960s. The reduction of admissions fell by 50% in those years due to the proliferation of television.<sup>2</sup> In a similar fashion Spanish cinema attendees decreased by 77% from 1968 to 1992 (Fernández Blanco and Baños Pino (1997)). This reduction in demand generated interest in the study of cinema market behaviour. Another event that triggered a substantial number of works regarding the cinema market was the 1948 Paramount consent decrees in the United States that led to a considerable change in the structure of the market through the abolition of block booking and the vertical separation of theatres by the five majors. Early studies of the likely impact of the Paramount decrees on the market structure, quality of pictures and ticket prices are those by Cassady (1958) and Whitney (1955) who expected to have higher quality movies and higher prices. A very recent work by Gil (2012) confirmed this prediction by providing evidence that vertical integration in the United States induced lower ticket prices due to the elimination of double-marginalization.

With regards to demand estimation, there is a stream of literature aimed to predict the determinants of gross box office revenues of movies. See Litman (1983), Smith and Smith (1986) and Wallace et al. (1993) among others.

Cameron (1986) pioneered the analysis of the estimation of cinema demand without differentiating by movies and considering price as one of the explanatory variables.<sup>3</sup> He estimates the determinants of national UK cinema attendance using aggregate monthly data for the period 1975-1982, finding that cinema attendance is a normal good and that the proliferation of colour television (TV) has influenced the decline of admissions. As

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<sup>2</sup> A thorough econometric analysis of the UK market in the period 1950-1997 is performed in MacMillan and Smith (2001).

<sup>3</sup> Cameron (1986) modelled the cinema ticket demand based on the “household production” approach defined by Becker (1965), Muth (1966) and Lancaster (1972).

it was expected higher relative ticket prices imply lower demand. Cameron (1990) estimated the average ticket demand by the regions of the UK adding from his previous analysis the population and the number of cinemas of each region. In his regression, regions with higher level of population have a higher level of attendance per cinema and the income per capita affects attendance positively again. Fernández Blanco and Baños Pino (1997) analyse the cinema ticket demand in Spain for the period 1968-1992 by means of a cointegration analysis. They show that the decline of cinema attendance during that period was due to the continuous increase in ticket prices in real terms and by the increase in television programming. Dewenter and Westermann (2005) analyse the German cinema market in the period 1950-2002 and found a negative effect of ticket price on attendance, a positive effect of income and a negative effect of the proliferation of video cassette recorders and private TV stations and the increase in the number of households with TV sets. They also found that attendance increases with the number of German movies released and with the price of other cultural activities such as theatre, opera or exhibitions.

The analysis of ticket demand from a viewpoint of spatial competition using micro data is performed by Davis (2006) and Elizalde (2013). The cinema market is a retail market where geographic and movie characteristics provide the firms with market power. Both papers take a step forward from previous work by estimating the demand for a particular movie in a particular venue considering the characteristics of the cinema, the rivals and the population. Davis (2006) performs the analysis for the United States (US) using weekly data for the summer of 1996 and finds that movie attendance is higher for releases and in those venues with more screens and with superior sound systems. The price is instrumented with the number of rival cinemas with digital sound system and its effect on attendance is not significant at 95%. Elizalde (2013) uses daily data for the cinemas in the North of Spain for ten weeks in the period 2001-2005. The price is instrumented with the number of other-group cinemas within 5 kilometres (km) and is found to have a significant negative effect on attendance. There are positive cross-price elasticities of demand but only from the rival cinemas within 2 km. This work proofs the key competitive role played by the movies screened. It is found that the attendance of a movie is decreased by 22.58% if the movie is also showed in a cinema located within 5 km and by 14.78% if the cinema is located between 5 km and 10 km away.

Regarding the determinants of ticket prices, as it has been mentioned in the introduction previous works have been focused on the analysis of the relationship between local

market concentration and ticket prices and found a modest effect of local market concentration on ticket prices. Davis (2005) uses quarterly panel data for the cinema market in the United States for the period 1993-1997, which was very active in the entry and exit of first-run movie theatres. He uses the counts of cinemas by own and rival circuits in different distance bands up to 30 miles as explanatory variables for the values of ticket prices. Davis finds a statistically significant relationship between local market concentration and prices but the measures of fit suggest that the level of concentration only explains a small fraction of the differences in prices.

Gil (2006) analyses the relationship between concentration and ticket prices in markets with up to five cinemas in Spain in two periods: 1995 (a period of recession) and 2000 (a period of economic boom) and in three different time frameworks: weekdays, weekends and summer. In addition to the number of cinemas in each market, Gil analyses the effects on prices of other variables corresponding to characteristics of cinemas (number of screens and number of seats) and markets (economic level, population and a tourism index). He finds that tacit collusion (which is assumed to happen when the increase in the number of cinemas does not imply a decrease in ticket prices) is more likely to appear during high states of demand.

Böhme and Müller (2011) develop a model to estimate ticket prices in monopolistic markets for Germany in 2005 reaching a hypothetical monopoly price for each market. Using nonlinear least squares (NLS) estimation they found that ticket prices are not significantly different from the hypothetically monopoly ones in markets with more than one exhibitor, interpreting that cinema markets may be local monopolies due to transportation costs.

### **3. Cinema Market**

The cinema market in Spain has been very active in the last two decades in terms of closing cinemas (especially those with one or a few screens located in the town centre) and opening new ones (in particular those with a higher number of screens, in many cases located in new shopping malls in suburban areas). Table 1 shows this evolution. The number of cinemas (including both first-run and second-run cinemas) decreased from 1999 to 2009 while the number of screens per cinema increased considerably. The number of spectators has dramatically decreased since 2004 due to the competition from other ways of watching movies and to the effect of the financial and economic crisis.

The latter can also be observed with the figures of ticket price that has truncated its increasing trend in the last three years. The decrease in attendance has not been so drastic in the whole of the European Union nor in the United States, as Table 1 reports.

Table 1. Evolution of Spanish and foreign cinema market (1998-2012)

	Cinemas	Screens	Screens per Cinema	Attendance Spain (x1000)	Price Spain (€)	Attendance EU (x1000)	Price EU (€)	Attendance USA (x1000)	Price USA (\$)
1999	1,334	3,343	2.51	131,348	3.78	805,786	5.93	1,442,933	5.08
2000	1,298	3,500	2.70	135,391	3.96	838,567	6.17	1,393,712	5.39
2001	1,254	3,770	3.01	146,810	4.20	925,445	6.31	1,436,375	5.65
2002	1,223	4,039	3.30	140,716	4.45	926,240	6.64	1,568,797	5.80
2003	1,194	4,253	3.56	137,472	4.65	877,701	6.57	1,518,755	6.03
2004	1,126	4,390	3.90	143,932	4.81	930,667	6.78	1,496,847	6.21
2005	1,052	4,401	4.18	127,651	4.97	833,545	6.92	1,374,055	6.41
2006	936	4,299	4.59	123,510	5.22	855,351	6.94	1,400,664	6.55
2007	907	4,296	4.74	116,931	5.51	840,936	7.06	1,399,167	6.88
2008	868	4,140	4.77	107,813	5.74	843,805	6.84	1,341,280	7.18
2009	851	4,082	4.80	109,987	6.10	890,835	7.36	1,414,014	7.50
2010	860	4,080	4.74	101,590	6.52	872,634	8.03	1,339,734	7.89
2011	876	4,044	4.62	98,345	6.47	876,934	8.15	1,284,440	7.93
2012	n/a	n/a	n/a	91,443	6.52	853,142	8.33	1,358,196	7.96

Source: Spanish Ministry of Culture, Media Salles and boxoffice.com

Moreover, the evolution of public earnings –taxes– affects the cinema market development. In September of 2012, the Spanish Government increased the Value Added Tax (VAT) from 8% to 21% for some goods and services. In addition, cultural services, including cinemas, lost their privileged VAT status of 8% (a reduced rate) and they were put in the same bracket as other goods and services with a VAT rate of 21%. This 13% increasing VAT initially led cinemas to raise prices but the decline of the demand has led cinemas to decrease prices in the first months of 2013. This can be seen in Table 2, where the figures correspond to the average weekend ticket price in the first-run cinemas in Spain.

Table 2. Average weekend ticket price of Spanish first-run cinemas

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009				6.50	6.39	6.35	6.36	6.31	6.41	6.47	6.45	6.61
2010	6.56	6.59	6.79	6.80	6.77	6.60	6.66	6.80	6.70	7.05	6.87	6.92
2011	6.82	6.83	6.83	6.81	6.72	6.84	6.84	6.76	7.00	6.58	6.63	6.59
2012	6.85	6.74	6.66	6.76	6.56	6.29	6.49	6.64	6.94	6.96	7.03	7.12
2013	7.11	7.04	7.07	7.01	6.95							

Source: Fotogramas (a Spanish cinema magazine)

The VAT on cinema tickets is quite different around European Union countries. This tax is 9% in Ireland, 10% in Italy and 7% in Germany and France. More similar to the case of Spain, Portugal has increased this tax to 23%.

#### 4. Model and data

In this section the estimable model of demand for cinema attendance that helps us define the price equation that we estimate in Section 5 is presented, and the sources of the data that we use and the main statistics of the variables employed are reported.

##### 4.1. Estimable model

First of all, the demand for movies in cinemas is described. The model of estimation used is based on Davis (2006) and Elizalde (2013) and is made within the broad class of Mixed Multi-Nominal logit models (see McFadden (1973)).

The product is defined as a daily session of a movie in a cinema. Let us describe the shape of the demand for a cinema on a particular day (we consider a static model). The conditional indirect utility a consumer  $i$  obtains from watching a film at cinema (house)  $h$  located in a market  $m$  is assumed to be of the form:

$$u_{imh} = x'_{mh} \beta - g(d(L_i, L_{mh}); \lambda) + \xi_{mh} + \varepsilon_{imh}$$

$$i = 1, \dots, I, \quad h = 1, \dots, H, \quad m = 1, \dots, M$$

where  $(\beta, \lambda)$  are parameters,  $x_{mh}$  are  $K_1$  observable product characteristics (including the ticket price  $p_{mh}$ ). The distance from the consumer's location  $L_i$  to the cinema's location  $L_{mh}$  is denoted as  $d(L_i, L_{mh})$  and  $g(\cdot; \cdot)$  is a function of  $d(L_i, L_{mh})$ , known up to the  $(K_2 \times 1)$  vector of parameters  $\lambda$ .  $\xi_{mh}$  represent the unobserved (by the econometrician) product characteristics and  $\varepsilon_{imh}$  is a mean zero individual- and product-specific stochastic term.

Examples of observed product characteristics include the number of screens in the cinema, the circuit that runs it, the location of the cinema in either a shopping mall or an individual building, the number of new releases and the number of blockbusters. Those characteristics are assumed observed by, and common to, all individuals. With the same values of all the observed characteristics, each consumer prefers a product with a higher  $\xi_{mh}$ . We assume that the relevant features of cinemas and movies are public information

and therefore both firms and consumers observe all product characteristics and use all that information when taking their decisions.

The consumer characteristics are their socio-economic conditions and their location  $L_i$ . The location  $L_i$  with which consumer  $i$  is endowed determines their distance to each cinema  $h$ ,  $d(L_i, L_{mh})$ . We assume that, all else equal, an individual attends their closest movie cinema. In accordance with Elizalde (2013) we calculate distance as the driving distance between consumer's location and cinema's location in the shortest available way.

To complete the demand system, we need to define the existence of an *outside option*: some consumers decide not to attend any film in a cinema at all. The conditional indirect utility from the outside option is:

$$u_{im0} = \xi_{m0} + \pi S_i + \varepsilon_{im0}$$

where  $S_i$  is a  $s \times 1$  vector of the consumers' socio-economic characteristics and  $\pi$  is a vector of parameters which measures how the taste for going to the cinemas varies with those socio-economic characteristics, such as GDP per capita. We assume that consumers attend at most one performance of a film at a single cinema each day. The model is formulated as a static choice model.

Given the choice model described, the set of consumers who choose cinema  $h$  is defined as:

$$A_{mh}(x_{mh}, \xi_{mh}; \theta) = \left\{ (L_i, S_i, \varepsilon_{imh}) \mid u_{imh} > u_{img} \quad \forall g, h \text{ s.t. } h \neq g \right\}$$

where  $\theta = (\beta, \lambda, \pi)$  is a vector containing all the parameters of the model.

Following Macmillan and Smith (2001) and Böhme and Müller (2011), we assume that there are no variable costs as most of the costs of a cinema are independent of the number of viewers. The problem of the cinema is to maximise its profit through the choice of the ticket price<sup>4</sup>:

$$\max_{p_{mh}} \Pi_{mh} = p_{mh} A_{mh}(x_{mh}, \xi_{mh}; \theta) - F_{mh}$$

where  $F_{mh}$  is the cinema's fixed cost.

From this problem we obtain the optimal ticket price  $p_{mh}^*$  which is assumed to be a linear function of the observed product characteristics allowing for nonlinearity in the

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<sup>4</sup> We take the restrictive assumption that the set of movies exhibited is exogenous.



function of the distance between the cinema and its closest rival in those markets in which there are more than one cinema.

#### 4.2. Data

In this section, we describe the data used in the estimations and the source of those data which corresponds to the Spanish cinema market. This is a new dataset based on cinema prices in all the Spanish cinemas that exhibited first-run movies in the first week of 2008.

We specify the variables involved in each of the vectors of variables described in the previous subsection, the data sources and some of their main features:

- Ticket prices  $p_{mh}$ : The figures are calculated from the information on average weekly ticket price provided by Nielsen, a private company that collects data on sales and revenues in some retailing markets. The figures collected by Nielsen are figures of attendance and box office revenue for each movie at each cinema each day. We thus do not observe the actual scale of prices, but the average ticket price for each cinema per day (this is the ratio of box office revenue to the number of spectators).
- Observable product characteristics  $x_{mh}$ : The characteristics of the cinema that we observe are the number of screens, the circuit that runs each cinema and whether the cinema is located in a shopping mall. We also observe all the movies exhibited in each cinema during the week that we analyze. We have summarized the set of movies in two quantitative variables: the number of new releases and the number of blockbusters, defining as blockbuster a movie that was released in at least 400 Spanish cinemas.

The source of the information about movies and circuits is Nielsen and about the number of screens and type of building is the Census of Cinemas of March 2008 published by the Asociación para la Investigación de Medios de Comunicación (AIMC), the Media Research Association in Spain.

Information about circuits is relevant for our analysis because, by considering which cinemas are managed by each circuit (chain), we can assess the effects of local market concentration. From this information we have calculated the market shares of circuits in terms of cinemas and screens and we have calculated the concentration ratios  $C_1$  to  $C_4$  and the Herfindahl–Hirschman Index (HHI) of each market. The location of a cinema in an individual building or in a shopping mall is also relevant because shopping malls usually have some features, such as free parking and access to other commercial and

leisure activities, which are complementary to film watching and may drive ticket demand.

- Observable socio-economic characteristics  $S_i$  : In this dataset, we do not observe the behavior of attendance to movie sessions by individual consumers. We observe the locations of the cinemas and the socio-economic characteristics of the areas where all the potential customers live. The sample is divided in markets according to the “subáreas comerciales” defined in the economic survey of the Spanish bank La Caixa for 2008. This survey provides information about the population of the market’s capital and of the rest of the towns that primarily do their shopping in the towns of the area and especially in that capital.

We also use information on regional GDP per capita taken from the Contabilidad Regional de España (the Spanish Regional Accounts) for 2008.

- Location: The location of a cinema  $h$ ,  $L_{h, \mathbb{R}^2}$ , is published in the Census of Cinemas recently mentioned. We have analyzed the distance between every two cinemas in each market and, as it will be seen below, we include in the regressions the distance of each cinema to its closest cinema.

Table 3 presents summary descriptive statistics for the main variables in the data.

Table 3. Descriptive Statistics for the main variables from the data. Markets.

	Observations	Mean	Std. Dev.	Min	10%	25%	Median	75%	90%	Max
Average price	174	5.24	0.55	3.6	4.67	4.83	5.22	5.6	5.98	6.65
Screens	174	22	35.9	1	3	6	10	25	45	293
Cinemas	174	2.87	4.66	1	1	1	2	3	5	42
Cinemas in shopping mall	174	1.42	1.94	0	0	0	1	2	3	13
Circuits	174	2.14	2.11	1	1	1	1	3	4	20
Population	174	279,520	440,457	5,450	43,225	72,130	146,155	305,232	602,516	3,371,011
GDP per capita	52	22,495	4,472	15,980	17,978	19,068	21,104	26,251	27,690	35,906
Average level of minum distance	97	6.88	8.71	0.08	1.3	1.97	3.52	6.57	20.3	45.4
Releases per cinema	174	1.43	1.09	0	0	0.5	1.5	2	2.85	5
Blockbusters per cinema	174	3.53	1.43	0	1	2.5	4	5	5	5.33
HHI	174	0.72	0.30	0.08	0.33	0.48	1	1	1	1
C1	174	0.76	0.26	0.14	0.42	0.5	1	1	1	1
C2	174	0.92	0.14	0.27	0.7	0.91	1	1	1	1
C3	174	0.97	0.08	0.38	0.9	1	1	1	1	1
C4	174	0.99	0.06	0.47	1	1	1	1	1	1

Data from Table 3 reflect the markets (called “subáreas comerciales”) defined in the economic survey of the Spanish bank La Caixa for 2008. We select the markets where there was at least one cinema at that time. From those 174 markets, there are 97 where there is more than one cinema. On the other hand, there are 77 markets with just one cinema.

The values C1, C2, C3 and C4 show the level of concentration of this market. In this article, we will study the influence of this concentration on ticket prices. That concentration is also measured by the HHI of each market. We can observe that the local cinema markets are highly concentrated. The values of C1 and HHI show that more than half of the markets are local monopolies. The main features of local monopolies can be observed in Table 4 and can be compared with the whole sample summarized in Table 3. We see that the price is on average smaller in the monopoly markets. Those markets are smaller in terms of population, cinemas and screens. There is a lower share of cinemas located in shopping malls. The number of releases per market is smaller in local monopolies and the number of blockbusters is also smaller but only slightly.

Table 4. Descriptive Statistics for the main variables from the data. Local monopoly markets.

	Observations	Mean	Std. Dev.	Min	10%	25%	Median	75%	90%	Max
Average price	89	5.11	0.56	3.6	4.41	4.75	5.04	5.52	5.88	6.36
Screens	89	7.13	4.06	1	2	5	7	10	12	23
Cinemas	89	1.11	0.35	1	1	1	1	1	2	3
Cinemas in shopping mall	89	0.48	0.55	0	0	0	0	1	1	2
Population	89	105,630	75,088	5,450	26,631	48,388	87,103	147,451	214,190	363,429
Average level of minum distance	12	10.34	14.70	0.4	0.77	1.85	2.95	16.45	27.5	45.4
Releases per cinema	89	1.22	1.23	0	0	0	1	2	3	4
Blockbusters per cinema	89	3.45	1.65	0	1	2	4	5	5	5

In Table 5 we report the summary statistics of the main variables of the data with cinema as the unit of observation. The value of the ticket price across cinemas is higher than the mean value of the average prices across markets. This means that those cinemas in towns with a high number of venues tend to have higher prices than those in towns with a lower number of cinemas. In relation to the location, we observe that roughly half of the cinemas are located in a shopping mall. The average number of screens per cinema is 7.67. The average value of the distance with the closest cinema is 5.03, which is much higher than the mean value (2.5) meaning that there are some markets with very far competitors which might distort the analysis. This is the reason why we analyze in the following chapter alternative measures of distance. On average the circuit of a given cinema has 44% of the cinemas and screens of the market.

Table 5. Descriptive Statistics for the main variables from the data. Cinemas.

	Observations	Mean	Std. Dev.	Min	10%	25%	Median	75%	90%	Max
Ticket price	497	5.47	0.70	3.55	4.59	4.96	5.53	6.0	6.34	7.16
Screens	499	7.67	4.60	1	2	4	7	10	14	25
Cinema in shopping mall	498	0.50	0.50	0	0	0	0	1	1	1
Distance to closest cinema	420	5.03	8.24	0	0.35	1	2.5	5	11.75	69.6
Releases	499	1.66	1.50	0	0	0	1	3	4	6
Blockbusters	499	3.45	1.89	0	0	2	4	5	5	6
Market share cinemas	499	0.44	0.32	0.02	0.10	0.2	0.33	0.56	1	1
Market share screens	499	0.44	0.33	0.00	0.06	0.16	0.36	0.62	1	1

In Table 6 we report the figures for the main statistics of those cinemas in local monopolies. As many of those markets only have one cinema the values do not differ much from those of Table 4 with the market as the unit of observation.

Table 6. Descriptive Statistics for the main variables from the data. Cinemas in local monopolies.

	Observations	Mean	Std. Dev.	Min	10%	25%	Median	75%	90%	Max
Average price	89	5.11	0.56	3.6	4.41	4.75	5.04	5.52	5.88	6.36
Screens	89	7.13	4.06	1	2	5	7	10	12	23
Cinemas	89	1.11	0.35	1	1	1	1	1	2	3
Cinemas in shopping mall	89	0.48	0.55	0	0	0	0	1	1	2
Population	89	105,630	75,088	5,450	26,631	48,388	87,103	147,451	214,190	363,429
Average level of minum distance	12	10.34	14.70	0.4	0.77	1.85	2.95	16.45	27.5	45.4
Releases per cinema	89	1.22	1.23	0	0	0	1	2	3	4
Blockbusters per cinema	89	3.45	1.65	0	1	2	4	5	5	5

## 5. Results

In this section the results of the estimation of the econometric model described in Subsection 4.1 are presented and discussed.

The significance of the factors that could affect ticket prices ( $p_{mh}^*$ ) is revised. We estimate ticket price  $p_{mh}^*$  as a linear function of observed product characteristics allowing for nonlinearity in the function of the distance between the cinema and its closest rival in those markets in which there are more than one cinema.

We use Ordinary Least Squares (OLS) method to estimate the model. To determine the level of significance, we present significance codes<sup>5</sup>. The main results of the ticket price estimation at cinema level are reported in Table 7.

<sup>5</sup> None \* symbol means the variable is not significant. One \* symbol means the significance is up to 95%. Two \* symbol means the significance is up to 99%

Table 7. Determinants of ticket price. Cinemas.

Dependent variable: ticket price								
Screens	0.0091	0.0072	0.0128	0.0077	0.0128	0.0077	0.0129	0.0079
Cinema in shopping mall	0.1796**	0.1797**	0.2040**	0.1962**	0.1899**	0.1820**	0.2214**	0.2132**
GDP per capita	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**
Market's population	2.39E-07**	2.54E-07**	2.49E-07**	2.54E-07**	2.56E-07**	2.62E-07**	2.36E-07**	2.42E-07**
Distance to closest cinema	--	--	-0.0097**	-0.0099**	--	--	--	--
Distance to closest cinema^2	--	--	--	--	-0.0001*	-0.0001*	--	--
Distance to closest cinema^(1/2)	--	--	--	--	--	--	-0.0861**	-0.0859**
Releases	0.0825**	0.0833**	0.0642*	0.0644**	0.0662**	0.0664**	0.0636*	0.0638**
Blockbusters	0.0537**	0.0501**	0.0457*	0.0387	0.0444*	0.0374	0.0512*	0.0444*
Market share cinemas	0.2458**	--	0.5715**	--	0.5722**	--	0.5536**	--
Market share screens	--	0.2887**	--	0.6318**	--	0.6310**	--	0.6131**
Constant	3.0820**	3.0835**	3.0808**	3.1378**	3.0861**	3.0931**	3.1882**	3.2412**
Observations	495	495	416	416	416	416	416	416
R-squared	0.5378	0.5422	0.5321	0.5438	0.5256	0.5373	0.5415	0.5527
Adjusted R-squared	0.5311	0.5356	0.5229	0.5349	0.5163	0.5282	0.5325	0.5440

Starting with the features of the cinemas and of the movies they screen we observe that cinemas located in shopping malls can increase prices as they attract more consumers due to the complementary commercial and leisure activities that they offer and because most of them have free parking areas. The number of new releases and most popular films increase the ability of the cinema to raise prices.

With regards to market concentration, there is evidence that it affects prices positively. This can be observed by the positive and significant coefficients of the variable for market share in terms both of cinemas and screens.

One of the most relevant findings of this analysis is the fact that having a cinema located nearby could involve an increase in ticket prices. In most markets, the proximity to competitors implies price reductions. In this case, a closer distance leads the cinemas to screen a lower proportion of same movies, as it is demonstrated in Elizalde (2010), thus increasing the market power of firms through product differentiation. Different alternative measures of distance are used (linear, quadratic and square root) and the same conclusions can be extracted from all of them.

Regarding the socio-demographic characteristics of the market, ticket prices are higher in those regions with higher GDP per capita and in more populated markets.

In Table 8 we report the results of the regressions of the market's average ticket price

$$\bar{p}_m^* = \frac{\sum_h I(mh) p_{mh}^*}{\sum_h I(mh)}$$

where  $I(mh)$  is a binary variable that takes value 1 if cinema  $h$  is in market  $m$  and 0 otherwise.

Table 8. Determinants of ticket price. Markets

Dependent variable: average ticket price									
Screens	0.0023*	--	--	0.0022*	--	--	0.0025*	--	--
Cinemas	--	0.0179*	--	--	0.0172*	--	--	0.0189*	--
Cinemas in shopping mall	--	--	0.0528**	--	--	0.0499*	--	--	0.0635**
GDP per capita	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**
Average level of minum distance	-0.0069	-0.0065	-0.0070	-0.0067	-0.0065	-0.0070	-0.0061	-0.0059	-0.0064
Releases per cinema	0.1439*	0.1604**	0.1457**	0.1428*	0.1587**	0.1442**	0.1371*	0.1546**	0.1416*
Blockbusters per cinema	0.0953*	0.1009*	0.0773*	0.0961*	0.1017*	0.0792*	0.0917*	0.0977*	0.0689
HHI	0.3675	0.3648	0.4013*	--	--	--	--	--	--
C1	--	--	--	0.3547	0.3586	0.3835	--	--	--
C2	--	--	--	--	--	--	0.3966	0.3824	0.5463
constant	3.2259**	3.1915**	3.1732**	3.2077**	3.1704**	3.1576**	3.0648**	3.0402**	2.8815**
Observations	97	97	97	97	97	97	97	97	97
R-squared	0.5602	0.5632	0.5695	0.5574	0.5607	0.5659	0.5512	0.5540	0.5634
Adjusted R-squared	0.5309	0.5340	0.5408	0.5278	0.5314	0.5369	0.5212	0.5243	0.5343

The results of the estimations show that the quantity of screens, the number of cinemas, the number of cinemas in a shopping mall, the GDP per capita and the number of new releases and of blockbusters exhibited in each market affect the market's average ticket price positively.

On the other hand the different measures of the degree of market concentration (HHI, C1 and C2) do not play a significant role to explain differences in cinema prices across different markets.

## 6. Conclusions

This article performs an empirical analysis to search for the factors that affect cinema ticket prices. The study uses a new dataset for the Spanish cinema market for the first week of 2008.

Different factors affecting ticket pricing were identified: variables related to economic environment (such us GDP per capita or market's population), cinema's characteristics (in particular, the type of venue, the location of the rivals and the number of screens) and the set of films screened. The location of a cinema in a shopping mall is especially relevant.

In addition, the concentration of the cinema market determines ticket prices but only partially. A cinema with a higher proportion of cinemas or screens in a market can charge a higher price but, at a market level, those markets with higher levels of concentration do not have higher average prices. Moreover, higher proximity between rivals imply higher prices as the firms differentiate more in the set of movies they screen in order to preserve market power.

Films projected also affect cinema prices. Cinemas that project popular films or new releases can charge more for the admissions. We can therefore summarise that this study proves that product differentiation (both geographical and qualitative) provides the firms with market power thus affecting retail prices.

From the time for which we have used data in this study, there have been relevant changes in both demand and supply. In addition to the acute economic crisis that Spain is suffering from 2008, the government increased the VAT rate for movie screenings by 13% on September 2012. As a future research we plan to study the effect of both events on the demand and supply for cinema sessions and on ticket prices.

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