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A note on the relationship of mainstream and art house movie theaters

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Abstract

We use a set of German micro data to study the relationship between mainstream and art house movie theaters. We find that both types of cinema have a significant price effect within their own group, but there is no significant price effect between the two types. Furthermore, we provide an example for the biased results that occur, if both types of movie theaters are pooled into one regression. Doing so, we demonstrate that it is important, to carefully distinguish mainstream and art house facilities in empirical studies of the movie theater industry.

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1. Introduction

When studying a goods market, it is often not clear what constitutes a substitute or complement to a specific product. In case of the movie theater industry, most empirical literature controls for substitutes by including variables for the diffusion of television and VCR sets (see e.g. Cameron 1986, Dewenter and Westermann 2005, Fernández Blanco and Baños Pino 1997, and Macmillan and Smith 2001). Very little attention, however, has so far been given to the fact that "the movie theater experience" is not a homogeneous good itself. Some movie theaters play mainstream (or "major") movies, while others play art house (or "independent") movies, i.e. movie theaters are either specialized in the one or the other. From a theoretical point of view, these two kinds of movie theaters might produce either substitutes or complements.

If consumers choose a movie from the "menu" after deciding for a theater, then art houses will be a substitute for mainstream facilities and both types of movie theaters will compete for audience. In the case that moviegoers first choose the movie they want to see and then browse for locations that play this movie, art house programming enriches the portfolio of available movies. Given consumers have Dixit-Stiglitz-type preferences (Dixit and Stiglitz 1977), that is, if consumers intrinsically value variety, both types of movie theaters benefit from each other, i.e. they are complements. Eliashberg (2005) gives anecdotal evidence that "movie first, then theater" as well as "theater first, then movie" might describe consumer behavior in practice.

Although not explicitly discussed in the literature, a third and often implicitly assumed possibility is that "the mainstream movie theater experience" and "the art house movie theater experience" are independent goods. The market for the one does not affect the market for the other. This might also be the case, if mainstream and art house moviegoers are two distinct groups of individuals with negligible intersection. For instance, mainstream moviegoers might just be "average people", while art houses might appeal to a bohemian walk of life. In this case, the presence of the one type of movie theater will have no implication for the other. Empirically this case is supported by Gemser *et al.* (2007), who study the impact of reviews on the success of movies. They find that art house moviegoers are led by reviews when making their movie choice, while mainstream moviegoers are not. The determinants of decision making being different might be seen as a hint on different groups of individuals or homogeneous individuals making two separate decisions on independent goods, because otherwise the individual's decision making would be inconsistent.

To our knowledge, no empirical study explicitly addresses the relationship of mainstream and art house movie theaters. Coming most closely, Davis (2005) distinguishes "first run" and "second run" locations in his study in the US movie theater industry to take account of the different pricing schemes.[1] However, Davis (2005) pools art house and mainstream facilities within his set of second run locations, so the relationship of art house and mainstream movie theaters cannot be read from his paper.

[1] In Germany the revenue share usually ranges from approximately 38% to 53%, and is fix over time. This is a major difference to the US movie theater industry, where shares are declining over time starting with some 90% of box office revenues being passed to the distributor for newly released movies (Filson *et al.* 2005). In addition, movie distributors in Germany might charge a limit price that can be considered to be non-binding, since limit prices of about 2 to 3 Euro are common. Unlike in the US, movie distributors do not influence the exhibitor's price setting behavior (see Kinowelt 2007), which would be an illegal form of vertical integration.

In this paper we use a set of German micro data to study the relationship of these two variants of "the movie theater experience". Our aim is to find out whether mainstream and art house facilities offer substitutes, complements, or independent goods. The following section will briefly describe the data set. Thereafter we will provide our regression specifications and results.

2. The Data[2]

The data set consists of 183 mainstream and art house movie theater locations in 64 German cities, compiled in January 2010. Each observation contains cross-sectional information about the location's programming, number of seats, admission price for a regular seat on a Saturday 8 p.m. show, control variables for the local market, and the number of seats available at other movie theaters in up to 20 km linear distance. The latter are categorized by ownership (same or rival operator) and programming.[3]

As there seems to be no generally accepted definition of "mainstream" and "art house" (see e.g. Gemser *et al.* 2007 for a brief overview of definitions applied in the literature), we draw the following distinction: If a movie theater runs at least two out of the following four up-to-date blockbusters that are on the program of all major German chains, it is labeled as mainstream (date of first run in Germany in parentheses): Avatar (Dec. 2009), Haben Sie das von den Morgans gehört? (Did You Hear About the Morgans?; Jan. 2010), Zweiohrküken (Dec. 2009), and New Moon (Nov. 2009). As mentioned in the introduction, movie theaters have a clear profile, being either art house or mainstream facilities. This definition has therefore enabled us to classify each observed location without a doubt.

The data set also provides information about the movie theater operator's profit-orientation. While all mainstream facilities are profit-oriented, roughly 30% of the art house facilities are not-for-profit organizations. This can easily be seen by the legal form of the operator, since German law clearly defines which legal forms are for profit and which ones are not. Due to different treatment in taxation, tax authorities do not tolerate an inappropriate legal form, so that we can assume the legal form to give us reliable information about profit-orientation.

Table I shows some descriptive statistics.

Table I: Descriptive statistics of the data set (standard deviation in parentheses)

	Mean Admission Price (€)	**Mean Capacity (Seats)**	**Share of Not-for-Profit**	**Number of Observations**
Mainstream	7.20 (0.85)	1391 (802)	-	113
Art House, for-Profit	6.57 (0.94)	350 (248)	-	50
Art House, Not-for-Profit	5.65 (0.99)	145 (98)	-	20
Art House, Pooled	6.31 (1.03)	292 (235)	28.57%	70
Total	**6.86 (1.02)**	**970 (839)**	**10.93%**	**183**

[2] For a general description of the German movie theater industry see the statistical yearbooks by Berauer (2008) or the overview in Dewenter and Westermann (2005).

[3] Literature proposes some other categories that we are not able to distinguish, because we would obtain many categories with only a small number (< 5) of non-zero observations. For instance, Davis (2005) uses 15 distance categories.

3. Empirical Analysis

In this section, we present the regression model and the results. Our model follows the standard OLS scheme and can be denoted as

$$p_i = \beta_0 + \beta X_i + \gamma CAP_i + \varepsilon_i,$$

where p_i is the admission price of cinema i and β_0 is a constant.[4] X_i is a vector of control variables, consisting of the number of inhabitants (*INHAB*) and per-capita income (*INC*) in the local area, a dummy taking the value "1" for art house programming of location i (*ART*) and a dummy taking the value "1" for not-for-profit operators (*NONPROFIT*), with a vector β of coefficients. CAP_i is a vector of capacities available at other locations within the same local area of location i with a vector γ of coefficients. Capacities are categorized by ownership and programming, where the shortcut *own* represents the same operator, *rival* represents other operators, *ms* represents mainstream, and *ah* represents art house programming. For instance, the variable $CAP\_ms\_own_i$ represents the number of seats in other mainstream theater locations owned by the same operator as cinema i.

Table II: Regression results with pooled distance categories (standard deviation in parentheses)

Variable	Total	Mainstream Only[x]	Art House Only
Constant	*6.329***	*7.2071***	*3.797**
	(0.5810)	*(0.4795)*	*(1.193)*
ART	*-0.5496**	-	-
	(0.1944)		
NONPROFIT	*-0.7543**	-	*-0.8091**
	(0.2305)		*(0.2660)*
INHAB	*3.368e-06****	*3.7240e-06****	*2.273e-06*
	(9.701e-07)	*(9.464e-07)*	*(2.094e-06)*
INC	*4.336e-05*	*-1.0420e-05*	*1.344e-04**
	(3.332e-05)	*(2.821e-05)*	*(6.250e-05)*
CAP_ms_own	*-1.324e-04*	*-2.1311e-04***	*2.346e-04*
	(1.237e-04)	*(6.605e-05)*	*(3.048e-04)*
CAP_ms_rival	*-2.945e-04****	*-3.7753e-04****	*3.331e-05*
	(6.716e-05)	*(8.630e-05)*	*(1.827e-04)*
CAP_ah_own	*1.932e-04*	*2.0016e-04*	*2.384e-04*
	(1.806e-04)	*(6.220e-04)*	*(2.132e-04)*
CAP_ah_rival	*-2.219e-04****	*1.3097e-05*	*-8.595e-05*
	(6.376e-05)	*(2.078e-04)*	*(1.217e-04)*
Adjusted R^2	*0.3175*	*0.1784*	*0.2051*
Breusch-Pagan Test (p-Value)	*0.3871*	*0.09676*	*0.4671*
RESET (p-Value)	*0.9852*	*0.6589*	*0.4347*

*** $p \leq 0001$; ** $0.001 < p \leq 0.01$; * $0.01 < p \leq 0.05$.

[x] Due to the Breusch-Pagan test result, we present White's heteroskedasticity-consistent errors.

[4] As a robustness check we also specified the regression model using $\ln(p_i)$, CAP_i, and $\ln(CAP_i)$ as dependent variables, where CAP_i is the capacity of cinema i. All specifications qualitatively yield the same results.

Since many communities and states offer a per-ticket subsidy for art house programming[5], we expect a significantly negative impact of *ART*. For self-explanatory reasons, we expect *NONPROFIT* to be negative.
The signs of the *CAP* variables will allow us draw conclusions about the relationship of the goods offered by the two types of movie theaters. If they are substitutes, the effect of the other type on admission prices will be negative. If they are complements, the effect will be positive, and if they are independent of each other, we will expect to find no significant effect. More precisely, from the mainstream perspective, we need to study the sign and significance of the *CAP_ah* variables, and from the art house perspective the sign and significance of the *CAP_ms* variables. Therefore, we will only be able to draw conclusions from regression results of subsets containing observations of one type only, since in the total set the two perspectives overlap. Table II shows the regression results.
Using the total data set, we find a significantly negative impact of *ART* and *NONPROFIT* as expected. Furthermore, there are significantly negative coefficient estimates for rival capacities on admission prices. This holds for rival art house as well as for rival mainstream capacity. Using the mainstream subset, we find a significantly negative effect of own and rival mainstream capacities. However, there is no significant price effect of art house capacities on mainstream prices. Using the art house subset, we find no significant price effect of mainstream capacities on art house prices, either. We also do not get any significant effect of other art houses. The reason for that might be in the programming choice. Mainstream locations, even in close proximity, have very similar programming, but art houses feature a rather heterogeneous portfolio of movies. Therefore, art houses are presumably less of a substitute and might compete less within their category, while mainstream cinemas are very substitutable among each other.

4. Conclusions

The small econometric exercise presented here, yields valuable insights for future studies of the movie theater industry. There is no evidence at all that art house and mainstream movie theaters affect each other positively or negatively in terms of prices. There is no evidence that "the mainstream movie theater experience" and "the art house movie theater experience" are related goods. This implies on the one hand that empirical studies that focus on one type and ignore the other one do not suffer from a sample selection bias, and demand models that do not include effects from the other theater type do not omit variables. On the other hand it implies that studies that do not differentiate between the types and pool observations, get biased results due to pooling apples and oranges. Our regression results illustrate this (Table II): Using the total data set, we obtain a significantly negative effect of rival art house locations on admission prices. Inference from these results would require us to conclude a negative impact of rival art houses on all movie theaters in the local area. However, this effect vanishes completely, if the subset of mainstream locations is used. Prices of mainstream facilities are not significantly affected by the presence of art house facilities. Vice versa, the results of the total data set suggest a significantly negative impact of mainstream capacity on all admission prices in the local movie theater market that vanishes, if only art houses are used in the regression.

[5] According to Koch (2005), this subsidy was on average € 0.23 per ticket in 2004.

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