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Retailer entry conditions and wholesaler conduct: The theatrical distribution of motion pictures ☆

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Abstract

I add to the empirical literature on vertical contracting and wholesaler conduct by using retailer entry conditions to infer unobserved choice variables and equilibrium responses to prices and advertising. After estimating the US demand for theatrical motion pictures from 1990–96, I apply these techniques to compare observed outcomes to predictions under various distributor-conduct hypotheses. While several caveats apply, results indicate that the hypothesis of competition among distributors fails to describe advertising levels or aggregate payments of theaters to studios. The hypothesis of some collusion among distributors, however, matches the data fairly well.

JEL classification: D3; L1; L8; Z1

Keywords: Vertical relationships; Collusion; Theatrical movie industry

Empirical research on the vertical issues between wholesaler and retailer is often held back by a lack of data on intermediate prices and other choice variables. Such issues also affect the ability to test horizontal hypotheses of wholesaler conduct and market power when only retail data are available. While wholesaler costs and prices can frequently be recovered under equilibrium and profit-maximizing assumptions for the most common case of sequential price setting, there exists another important margin of many vertical relationships, namely shelf space.[1] Slotting allowances (i.e., payments from wholesalers to retailers to secure placement for new products) have received much attention in marketing, though less in economics.[2] The infrequently observed payments along this margin clearly influence consumer behavior but do not fit readily into

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[1] See Manuszak (2007) and Villas-Boas (2007) for applications of the wholesale cost inference under the sequential pricing framework.
[2] Sudhir and Rao (2006) offers a survey of the slotting allowance literature in marketing in their analysis of whether the practice is pro- or anti-competitive. Shaffer (1991) and Sullivan (1997) are prominent examples of the slotting allowance literature in economics.

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the existing discussion of missing data. Furthermore, even when necessary data are available, the complexity of the retailer's decision will often prevent direct estimation of equilibrium responsiveness.

In this paper, I use entry conditions in retail to draw inferences about the equilibrium responsiveness of retailer resources (e.g., shelf space) to wholesaler choice variables and to infer unobserved wholesaler choice variables. Specifically, I use the fact that in equilibrium retailers must be satisfied with their current shelf space choices and that at the margin the retailer is indifferent between slight changes among products. Such indifference characterizes my equilibrium conditions, the total differentiation of which then yields the impacts of wholesaler choices on retailer allocation of shelf space. As an empirical illustration, I turn to the theatrical exhibition of motion pictures, a sector in which the shelf-space margin of vertical contracting is especially stark. I then apply this method to consider the question of wholesaler conduct, comparing the predictions under various hypotheses of distributor (studio) conduct to observed outcomes of vertical payments and advertising.

While the contentious vertical relationship between movie studios and exhibitors has a long and well-known history, distributor conduct and the extent of horizontal market power among studios has received scant attention. Given the concentration of theatrical movie distribution in the U.S., this omission is on its face somewhat surprising. The top eight distributors throughout the 1990s routinely received over 90% of the payments from exhibitors, with Hirschman–Herfindahl Indices between 1200 and 1550.[3] With the exceptions of Disney's entrance into distribution in 1953 and RKO's exit in 1955, the major distributors through the mid-1990s were the same as they had been in 1930s. Such concentration and stability of players suggest the possibility of at least tacit collusion, perhaps even in the face of difficulties brought on by substantial product differentiation and unstable demand conditions.

The lack of attention to the question of horizontal market power is best explained by an absence of critical price information, namely the wholesale price that theaters pay studios to exhibit a movie for a week.[4] Characteristics of the movie industry allow me to incorporate my retailer entry conditions with now common techniques in industrial organization to infer these wholesale prices under a variety of assumptions. Specifically I use structural demand estimates to back out under the different scenarios what prices would simultaneously maximize profits, clear the exhibitor market, and generate the observed outcomes. I follow a similar approach, conditional upon typical wholesale prices, to infer marginal costs of advertising and the implied expenditures on advertising. While national wholesale price information is rarely (if ever) available by movie and week, cumulative payments from theaters to studios over the theatrical run of a movie are sometimes known. Furthermore, the industry provides strong priors regarding both these prices and advertising-to-sales ratios. Comparing these observations and priors to the cumulative predictions under the various assumptions allows me to compare the validity of those assumptions and hypotheses. Exploiting data that are generally assumed to be unobserved has been used before with respect to marginal cost. Most similar to this work, Nevo (2001) estimates the demand for ready-to-eat cereal, calculates the profit-maximizing mark-ups under different conduct hypotheses, and compares the median to a crude estimate of the mark-up on a typical brand. My approach will parallel Nevo's, as identification works primarily off the level of cumulative payments rather than variation among these payments.

The basic model that I use to describe studio decisions closely follows relevant parts of the standard contract for the time period of my data. Specifically, each week studios select advertising and the percentage of exhibitor box office receipts that will be returned to the studio (i.e., the rental rate). Theater operators observe the rental rates and advertising of all available movies and decide whether or not to show the movie. The total number of exhibiting theaters for each movie is then determined by an entry condition that the marginal theater operator is indifferent between showing his movie and any other available movie at these terms, an obviously quite strong assumption that I explore later. Thus, while studios most directly care about the number of theaters showing their movies, they achieve this outcome by competing against each other in rental rates and advertising. The entry conditions in the exhibition sector imply causal relationships between the rental rate and the number of exhibiting theaters and between the level of advertising and the number of exhibiting theaters. These relationships then enter into a studio's first-order conditions to maximize profits. Differing levels of responsiveness of demand to the number of exhibiting theaters will then imply different levels of rentals rates, allowing the observed level of cumulative rental payments to distinguish between the competition and collusion hypotheses. The same approach with

[3] Figures are taken from Litman (2001), p. 177.

[4] The only economic research of which I am aware that observe these wholesale prices are Blumenthal (1988), Switzer (2004), and Filson, Besocke, and Switzer (2005).