Decision Rights and Vertical Integration in the Movie Industry

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Abstract

In this paper I analyze how variation in firm boundaries affect economic outcomes in the movie industry. In this industry, a movie distributor contracts with different exhibitors to show its movie on their screens. Due to incompleteness in these contracts, specifying ownership of decision rights over screen use is important. Since I observe the same movie showing in the same period at different organizational forms in the Spanish movie industry, I exploit this variation to study differences in outcomes across organizational forms. The evidence presented here indicates that integrated theaters show their own movies two weeks longer than other movies. These differences in outcomes decrease as the certainty of movie performance and theater size increase. The control that integrated firms have on their own theaters as distribution channels leads movies of uncertain audience appeal to be shown at distributor-own theaters. As a consequence of this, integrated firms specialize in the distribution of this type of movies more than do non-integrated firms.

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1 Introduction

Since Coase (1937) raised the question of what determines the boundaries of the firm, economists have developed different theories to explain why firms vertically integrate (Williamson (1975, 1985); Klein, Crawford and Alchian (1978); Grossman and Hart (1986), and Holmstrom and Milgrom(1991,1994)). Unfortunately, empirical evidence on the effect of integration on economic outcomes is scarce. Much of the empirical literature examines how organizational form varies as a function of transaction characteristics, and thus examines this issue indirectly (exceptions are Mulhainathan and Scharfstein (2001), Hastings (2004), and Gilbert and Hastings (2001)). Hence the questions of how integration affects economic outcomes and by how much remains largely unexplored.

This paper investigates how vertical integration affects outcomes in the movie industry, using new data from the Spanish movie industry. In contrast to the US, movie distributors are allowed to directly own theaters in Spain. As a consequence, I observe the same movie showing in the same period at different organizational forms and I exploit this variation to study differences in outcomes across organizational forms. Evidence from other countries where antitrust regulation is more relaxed, such as Spain, can be of great value to understanding the mechanics of integration and its effect on economic outcomes not only in the movie industry, but also in other industries.

This new data set combines weekly theater-level data on revenues at 107 theaters from July 2001 to June 2002 with data collected by hand on movie screenings at those theaters and that period of time from the leisure section of two major Spanish newspapers. For a sample of 511 movies I also collected information about their distribution firm, nationality, total box office revenue in Spain, total box office revenue in the U.S. and release week in Spain. I then use variation in integration status across theaters and variation in product sourcing across time within theaters to estimate how the movie stopping rule of theaters varies with organizational form. In particular, I not only compare how the stopping rule of integrated theaters differs from that of non-integrated theaters, but also how it differs within integrated theaters between movies they distribute and movies from other distributors. The fact that each movie is released at the same time in more than one theater under different organizational forms allows me to compare outcomes across organizational forms for the same movie and the same period.

In this industry, a movie distributor contracts with an exhibitor to show its movie on a screen. Due to uncertainty in movie outcomes and externalities between movies, these contracts are incomplete about the movie's run length. If only one distributor were the source of all movies, the exhibitor maximizes profits from that distributor's movies only. However, because of concession

sales revenues and gains in ancillary markets, their incentives may not align perfectly. When more than one distributor exist, exhibitors may decide unexpectedly to stop the movie's run in order to start a new movie release from a different distributor. In this case, the incompleteness of these contracts exacerbates the incentive alignment problem described in the case of upstream and downstream monopolies. Therefore, defining ownership of decision rights over screen use is important.

I analyze incentives in this industry and set up a model that presents three testable implications that are consistent with the previous institutional description. The first implication states that a movie should last longer in a screen owned by its distributor than in a screen owned by another firm. The second implication states that the effect of integration on the movie's run length is stronger for movies of more uncertain audience appeal. Finally, the third implication states that movies of more uncertain performance are more likely to be distributed by integrated firms, while movies of less uncertain performance are more likely to be distributed by non-integrated firms.

The evidence suggests that holding revenue constant a movie runs for 2 weeks longer on a screen owned by its distributor than on a screen owned by another firm. These differences decrease as movie audience appeal certainty increases. Consistent with the last implication above, I find that movies of more uncertain audience appeal are more likely to be distributed by an integrated distributor than by a non-integrated distributor. The control that integrated firms have on the decisions in their own theaters gives these firms a comparative advantage over non-integrated firms in distributing movies of uncertain audience appeal.

Apart from the work mentioned above, there are a few other papers documenting the effect of organizational form on market outcomes in this and other industries.[1] Some examples of papers studying vertical relations in this industry are Kenney and Klein (1983, 2000) and Hanssen (2000, 2002), who debate over the contractual practices in the first half of the 20th century in the US movie industry; and Dana and Spier (2001) and Mortimer (2002), who examine the change in contractual form in the home video industry. Directly related to the main focus of the paper, Corts (2001) studies the consequences of integration of production and distribution in the US movie industry, and Fu (2004) examines the effect of integration of distribution and exhibition firms on market foreclosure in the Singapore cinema market. This paper contributes to the literature in that it documents vertical integration in the movie industry and focuses on the potential gains in efficiency

[1] Some of these are Shelton (1967) and Lafontaine (1999) for the restaurant industry; Barron and Umbeck (1984), Shepard (1993), and Blass and Carlton (2001) for gas retailing; Monteverde and Teece (1982), Smith II (1982) and Ham (1998) for the automobile industry; Masten (1984) for the aeronautical industry; Joskow (1987) for the coal industry; Gertner and Stillman (2001) for the apparel industry; or, Hubbard and Baker (2003) for the trucking industry.

of economic outcomes.

The paper is organized as follows. In the following section, I describe the institutional setting, the parties involved and their roles in the provision of movies to theaters, and characterize the contracting environment in which they operate. Section 3 develops a model of vertical integration that presents the three main testable implications that I test later in the paper. In section 4, I describe my data and show patterns in the raw data that shed light on the problem at hand and motivate the estimation strategy described in section 5. Section 6 shows empirical results regarding the effect of variation in organizational form on movie run length and product choice decisions in the movie industry. Section 7 discusses the robustness of the results, and lays out the main conclusions.

2 Decision Rights, Incentives and Contracts in Movies

This section describes the institutional and market framework, drawing heavily from books[2], visits and interviews. I describe the main trade-offs involved in the allocation of decision rights and asset ownership. The movie industry is divided mainly into three sectors: production, distribution and exhibition. The production sector includes all those agents who produce movies. Producers use distributors to introduce the movie into the theater market. Finally, exhibitors run theaters and place movies on their screens to attract the audience and generate box office revenue. Since this paper studies the vertical interaction between distributors and exhibitors, I concentrate my analysis on these two sectors.

Distributors maximize revenues of their own movies across the theater market and other ancillary markets (home video, DVD and TV). *Distributors* are in charge of distributing films and promoting these films through advertising and other activities. They provide promotional activities in each of the markets until it is no longer profitable.

On the other hand, *exhibitors* maximize total box office revenue of the movies they show in their screens, in addition to revenue from other sources such as concession sales. *Exhibitors* are in charge of screen space management and some promotional activities.

When an exhibitor agrees to show a distributor's movie, there is a clear separation of promotional activities. The distributor advertises the movie nationally and regionally (TV), and locally (newspaper). The exhibitor monitors the distributor's promotional activities in its local market, and may also undertake some promotional activities such as advertisement inside the theater,

[2] Squire (1992) and Caves (2000).

previews, special concession sales and site specific advertising.

An important decision they face is what movie to show on which screen. The distributor may have an interest in showing the movie longer because that affects performance of the movie in ancillary markets. The distributor can choose its optimal run length in the theaters that it owns. On the other hand, the independent exhibitor may have other sources of revenue, such as concession sales, on-screen advertisement and in-theater advertisement. These can be correlated with movie performance and affect the decision of when terminating the movie's run. Therefore, deciding what movies to play requires an evaluation of how to optimally allocate screen space across movies and across time.

Distributors' and exhibitors' incentives differ in that distributors maximize revenues from their own movies across the different markets, whereas exhibitors maximize box office revenues and concession sales from the movies playing in their theaters regardless of whom distributes these movies. Notice then that distributors and exhibitors maximize different profit functions when deciding the optimal length of a movie's run, and that the incentive alignment problems grow for movies of more uncertain audience appeal. This difference in objective functions drives the problem examined in this paper.

2.1 Contractual Environment

Distributors and exhibitors use revenue-sharing contracts. Each contract specifies the names of the distributor and exhibitor involved in the transaction, the movie that the distributor will provide, and the theater where the movie will be playing.[3] Each contract specifies the weekly share of box office revenue that the distributor keeps. By default, the exhibitor keeps the remaining amount of revenue. The revenue-sharing terms for the distributor usually decline from 60% to 40% and this decline varies across movies and theaters. Figure 1 presents a typical contract.

The contract that distributors and exhibitors use does not specify how long the movie must remain on screen. The exhibitor decides when to stop showing the movie. Since optimal time to discontinue a movie's run is affected by the arrival of new information such as other movies' releases periods, it is not good ex-ante to commit to a fixed termination date.[4] The arrival of new information is not contractible and constitutes part of the contractual incompleteness.[5]

[3] Each contract is screen specific. This means that if a movie is showing in more than one screen in a theater, the distributor and exhibitor must write down a different contract for each screen used.

[4] If the movie performs below expectations, exhibitors are worse off. If, on the contrary, the movie performs above expectations, negotiating a new contract could lead to opportunistic behavior from the distributor.

[5] Some of this new information could come with weather changes, sport events on TV or externalities between movies.

Although it may be possible to contract on output, it is not possible to contract on the exhibitor's opportunity cost of showing the movie in any given week since that value is not observable nor verifiable. Having a fully contingent contract in this case is expensive, and probably infeasible. This constitutes another source of contractual incompleteness and a main reason why movie run length is not contractible.

Imagine now the case when only one distributor and one exhibitor exist, using revenue-sharing as contractual form insures that the exhibitor would maximize the revenue generated from movies of that distributor only. Nevertheless, if posterior markets for the movies exist and the movie success in these depends on run length, incentives will still not align perfectly. In addition to this, concession sales will only exacerbate the problem.

In the case of multiple distributors, the exhibitor's optimal screening decisions may not coincide with the individually optimal run lengths of each distributor, despite the use of revenue-sharing contracts mainly because of the continuous release of movies and the concession sales. Since exhibitors decide which movies to play and how long to keep them, distributors will use different contract terms to align exhibitor's decisions with their own.

Distributors use different sharing terms in their contracts to account for the existing heterogeneity in movies. These sharing terms vary across weeks with box office revenues so that the exhibitors' value of showing the movie remains constant across weeks, and equals the value of its outside opportunity cost (see Figure 2 for a graphical example). This downward sliding scheme is designed to provide incentives for the exhibitor to continue showing the movie an extra week, and prevent the exhibitor from switching to a new movie release.

Despite the use of different sharing terms, the exhibitors' optimal decision rules may differ across movies as concession sales may decrease more sharply than net box office revenues do, and increase the gains from switching to a new release (Figure 2). Therefore, using contract terms may not be enough to solve the incentive alignment problems between the distributor and the exhibitor.

Revenue trajectories of some movies depend on the effect of word of mouth. Word-of-mouth cannot be contracted and therefore constitutes an industry-specific source of contractual incompleteness. The demand for some movies are not sensitive to TV advertising and rely mostly in the word of mouth to determine its evolution in the weeks after release. Consequently, it is important to identify this type of movies earlier on and apply different movie run stopping rules.

Therefore, the benefits of allowing the exhibitor to decide on the duration of the contract vary across movies. These benefits are high for those movies with demand sensitive to advertising and that accumulate most of revenues during the first weeks of their run. These benefits are lower for

those movies with demand that mostly depends on the word of mouth and revenues equally spread over the weeks or concentrated in later weeks of their run.

The contractual incompleteness surrounding the optimal movie run length leads the distributor to use other tools besides contract terms, such as screen ownership, to appropriate the movie revenues of later weeks. In the next section I discuss how these tools affect incentives in the distributor-exhibitor relationship and I argue why screen ownership is important.

2.2 Decision Rights Allocation and Incentives

We observe three broad organizations in this market: non-integrated distributors, non-integrated exhibitors and distributors integrated with an exhibitor. These three organizations vary fundamentally on who controls screen use. Non-integrated distributors retain residual control rights over the movie on screen. Non-integrated exhibitors keep the decision rights of what movies to play on their screens. Integrated distributors allocate these decision rights within the supply chain to maximize profits.[6]

In interviews, I learned that distributors with an internal exhibitor retain the decision rights on whether to screen their own movies on their own screens, and decentralize the decision of what external movies to screen and how long to keep all movies on screen. Industry managers agree that while distributors delegate decision rights to exhibitors, distributors keep real authority and therefore they make the ultimate decision.

As a result, we should observe a consequence of this difference in the allocation of decision rights: *A movie should last longer on a screen owned by its own distributor than a movie distributed by another distributor on that same screen, and longer than it shows on a screen owned by a non-integrated exhibitor.*

Theaters of distributors that keep the decision rights will substitute screen space from external movies toward their own movies. The owner of the screen gets only a share of the former movies, whereas she gets the totality of the revenues from the latter movies. This makes the distributor cut movies distributed by others at higher levels of revenue than she does with its own movies.

Similarly, a movie should run longer on a distributor-owned screen than on screens owned by other firms because the distributor owns the decision rights of when to terminate the movie run on its own screen, but it is the non-integrated exhibitors who own the decision rights on their screens.

[6] Regardless of the final allocation of decision rights, they still use contracts between divisions in the same organization. This can be understood as a way to distribute formal authority and decision rights. Real authority may or may not follow the distribution of formal authority. They may use them as well to link pay with performance inside the firm.

Contracts may not do a good job on aligning incentives between the two parties and therefore non-integrated exhibitors will cut the movie's run on their screens before distributors would on their own screens.

This fact changed with the recent introduction of multi-screen theaters. Owners of multi-screen theaters do not need to cut the movie's run to start a new release and maximize the use of screen capacity, but change the movie to a smaller screen and let it continue its run. These multi-screen theaters have given exhibitors more flexibility around the management of the seating capacity, and therefore allowed them to attenuate the replacing incentives described in Figure 2. Therefore, we should observe that *the difference between integrated and non-integrated theaters decrease as we increase the size (number of screens) of the theater.*

Because movie duration is not contractible, distributors may find it optimal to use their own integrated exhibitors to screen certain movies. Distributors that own the rights of movies that are more sensitive to word-of-mouth may use internal exhibitors in order to keep the movie running until optimal. Contracts for these movies will use flatter schemes than those for other movies. This gives external exhibitors better incentives to open and keep the movie on screen.

On the other hand, distributors owning the rights of block-busters will use contracts and act through the market. In this case, the contracts have a downward sloping scheme of sharing terms that provide the exhibitor with the correct incentives in its termination decision.

A second effect of integration follows as a consequence: *Integrated firms should specialize in the distribution of movies for which there is less information available, and non-integrated firms should specialize in the distribution of movies for which there is information available.*

This is another consequence from the allocation of ownership and decision rights. Integrated distributors have a comparative advantage in movies where contingencies are more difficult to forecast, such as local movies and art movies. These two markets are different from others (American blockbusters) because distributors and exhibitors do not have market references for these products,[7] and therefore are more sensitive to the word of mouth, or other unexpected contingencies. Thus, integrated distributors will concentrate their activity in these types of markets more than independent distributors will.

[7] U.S. and U.K. movies have been marketed and achieved success in international markets. Distributors and exhibitors use this previous performance as an indicator of potential success.

3 The Model

Let us model a world where there exist two agents, a distributor and an exhibitor. The distributor owns the rights of exploitation of a movie i, but needs of an exhibitor (or the screen that the exhibitor runs) to undertake such exploitation. Assume that movie i brings revenue across time t such that

$$BOR_i = A_i e^{-\gamma_i t}$$

and that there is a marginal cost c of exhibition and a marginal cost r of distribution per period. On top of this, the exhibitor faces an opportunity cost $w = 1, 2, ...n$ of showing the movie. Each one of these realizations is equally likely to occur. The realization of w is unknown to distributor and exhibitor previous to showing the movie, but known to the exhibitor when showing the movie. Therefore, there is uncertainty about what the opportunity cost of the exhibitor will be. Assume as well that distributors and exhibitors use revenue sharing as contractual form. Distributors keep a share s of the revenue generated, and exhibitors $1 - s$, where $0 < s < 1$.

Therefore if we imagine a world where it is costless to identify contingencies and include clauses in contracts, contracts will include n clauses (one for each contingency) that cover all possible scenarios. In that world, the exhibitor decides when to stop the movie run maximizing her objective function

$$\max_T \int_0^T [(1-s)A_i e^{-\gamma_i q} - c - w]dq$$

where T is the optimal movie's run length, and s, $A_i e^{-\gamma_i q}$, c and w have been defined before. The first order condition yields a stopping rule such that the exhibitor will stop showing movie i in period T that

$$(1-s)A_i e^{-\gamma_i T} = c + w. \tag{1}$$

The distributor internalizes the optimal rule of the exhibitor and maximizes its profit by designing a contract that aligns the exhibitor's incentives with their own. In particular, distributor maximizes

$$\max_{s,T} \int_0^T [sA_i e^{-\gamma_i q} - r]dq$$

subject to expression (1) for each w. This means that contracts will include n contingencies that specify s^* and T^* for every possible w.[8]

[8] Following standard maximization, solutions to the optimal s and T are $s^* = 1 - \frac{2(c+w)}{r+\sqrt{r^2+4A_i(c+w)}}$ and $T^* =$

Unfortunately, including contingencies in a contract is costly and furthermore identifying the realizations of the opportunity cost could be prohibitive. In that case, assume now that there is a cost of including contingencies identified with a function $G(z)$ where $G'(z) > 0$ and $G''(z) > 0$. In this case, there will be a value z^* ($z^* \leq n$) such that it is not optimal to include a clause for every contingency. In this case, $z^* \leq n$, the contracts will not include a clause for each possible contingency. Therefore, in the spirit of Segal (1999), it will be optimal to leave the contract incomplete.

3.1 Incomplete Contracts & Organizational Form

Given that these contracts are not complete and that the cost of including clauses increases with the number of clauses, we proceed under the assumption that the distributor chooses only one term s[9]. The problem of the distributor then becomes

$$\max_{s,T_w} \sum_{w=1}^{n} \frac{1}{n} \int_0^{T_w} [sA_i e^{-\gamma_i q}] dq - rT_w$$

subject to

$$(1-s)A_i e^{-\gamma_i T_w} = c + w \quad \text{for each } w = 1 \ldots n.$$

We obtain $2n+1$ first order conditions (FOCs) such that

$$\sum_{w=1}^{n} \frac{1}{n} \int_0^{T_w} [sA_i e^{-\gamma_i q}] dq = \sum_{w=1}^{n} \lambda_w A_i e^{-\gamma_i T_w} \tag{2}$$

$$sA_i e^{-\gamma_i T_w} - r = (1-s)\lambda_w \gamma_i A_i e^{-\gamma_i T_w} \quad \text{for each } w, \text{ and} \tag{3}$$

$$(1-s)A_i e^{-\gamma_i T_w} = c + w \quad \text{for each } w. \tag{4}$$

Using (2), (3) and (4), we find that

$$2A_i s^2 + [2c(1-n) + 2n(1-r) + (1-n^2) - 4A_i]s + 2A_i - 2c - n - 1 = 0. \tag{5}$$

Therefore, distributors will set $\overline{s}$ that solves expression (5), but that we simplify as

$$\overline{s} = f(A_i, r, c, n),$$

$-\frac{1}{\gamma_i} \ln(\frac{r+\sqrt{r^2+4A_i(c+w)}}{2A_i})$.

[9] Assume that $G(1) < \infty$ and that $G(z) \simeq \infty$ for $z \geq 2$.

and exhibitors will respond to $\overline{s}$ and w such that

$$(1-\overline{s})A_i e^{-\gamma_i T_w} = c + w. \tag{6}$$

Given (6), we can solve for T_w as

$$T_w^{NInt} = -\frac{1}{\gamma_i}\ln[\frac{c+w}{(1-\overline{s})A_i}] \tag{7}$$

for each realization of w.

On the other hand, if the distributor uses one of its own screens, she observes the realization of w when making the decision T_w. Therefore, she maximizes the following objective function

$$\max_{wrt\ t} \int_0^t [A_i e^{-\gamma_i q} - r - c - w]dq - F,$$

where she incurs the marginal cost of distribution r and exhibition c, a fixed cost F of integration, as well as the opportunity cost w of running the movie. In this case, T_w^{Int} will be such that

$$T_w^{Int} = -\frac{1}{\gamma_i}\ln(\frac{r+c+w}{A_i}) \tag{8}$$

When making differences of T_w^{Int} and T_w^{NInt} from (7) and (8), we find

$$T_w^{Int} - T_w^{NInt} = -\frac{1}{\gamma_i}\{\ln[\frac{r+c+w}{A_i}] - \ln[\frac{c+w}{(1-\overline{s})A_i}]\},$$

which transforms into

$$T_w^{Int} - T_w^{NInt} = -\frac{1}{\gamma_i}\{\ln(\frac{r+c+w}{c+w}) + \ln(1-\overline{s})\}.$$

Under the assumption that r is very small, we can simplify further to

$$T_w^{Int} - T_w^{NInt} \simeq -\frac{1}{\gamma_i}\{\ln(1-\overline{s})\}$$

and since $\ln(1-\overline{s}) \approx -\overline{s}$,

$$T_w^{Int} - T_w^{NInt} = \frac{1}{\gamma_i}\overline{s}, \tag{9}$$

which is always positive since γ_i and $\overline{s}$ are positive. Notice that this result would be true even if

there was no contractual incompleteness.

When looking at the effect of n on the difference between integrated and non-integrated theaters, it is easy to see that

$$\frac{\delta(T_w^{Int} - T_w^{NInt})}{\delta n} = \frac{1}{\gamma_i}\frac{\delta \overline{s}}{\delta n} > 0, \tag{10}$$

holding movie characteristics constant, since at low levels of n there will not be much difference between the response to the actual realization w and its average realization, but this difference will be large for high levels of n. These two results are the first two testable implications from this model: *integrated theaters will keep their own movies longer than non-integrated theaters would* (due to the sharing rule), and *this difference should grow with the number of possible contingencies* n (due to contractual incompleteness).

Even though in this model contracting environment always improves with integration, integration has also costs over non-integration: the distributor now must pay a fixed cost F to operate its own screen (managerial overload as in Acemoglu, Aghion and Zilibotti (2002)), and the marginal cost of exhibition c (paid before by the exhibitor). The alternative option is to pay $\overline{s}$, and let the independent exhibitor decide on movie run length. This is the trade-off that determines whether a distributor will decide to integrate or remain non-integrated.

3.2 Product Choice & Organizational Form

The second implication above has a direct consequence on the effect of organizational form on firm profits depending on movie type (n): integrated firms have a comparative advantage at dealing with high-n movies since they observe the ex-post realization of w. Therefore, in a world with a monopolist studio auctioning off its movies to integrated and non-integrated firms, the willingness to pay of integrated distributors will be higher than that of non-integrated distributors for high-n movies. However, the willingness to pay for low-n movies will be roughly the same for both types of distributors.

If there is no such firm that can handle the whole market (there exists decreasing managerial returns to the number of movies distributed), competitive bidding will drive integrated distributors to acquire high-n movies and non-integrated distributors to acquire low-n movies. This is the last of the implications of this model: *integrated distributors will be more likely to distribute movies of higher uncertainty (high n), and non-integrated distributors will be more likely to distribute movies of lower uncertainty (low n).* Next, I take these implications to the data and I test them.

4 The Data and Preliminary Evidence

4.1 Data Description

During the summer of 2002, I interviewed managers from over 10 firms and several institutions of the Spanish movie industry. As a result of this, I collected a new data set of weekly revenue data from the Spanish movie industry. The data set can be divided into two different groups: data at the *theater* level and data at the *movie* level.

I obtained data on weekly revenue and attendance for 226 theaters for 12 and 18 months respectively (from June 2001 to June 2002, and January 2001 to June 2002 respectively). I complemented these data copying by hand movie-theater screenings from January 2001 to June 2002 from the leisure section of two major Spanish newspapers covering the regions of Madrid and Catalonia.[10] Although these comprised of weekly screening data for 229 theaters in 59 different cities, I had revenue data available for only 107 of these theaters, spread in 40 different cities. I use this subsample of theaters in my empirical estimation below. Besides these data, I collected information on characteristics of the theaters such as number of screens and total seat capacity.

I also collected, for a sample of 511 movies, information about their distribution firm, nationality, total box office revenue in Spain, total box office revenue in the U.S. and release week in Spain. I obtained this information mainly from Spanish government agencies and movie industry web pages.

As of 2002, Spain counts roughly with one thousand theaters, which translates into three thousand screens total. Therefore my 107-theater sample represents 10% of the total number of theaters in Spain. Nevertheless, these 10% of theaters contain 30% of the screens in the country and collect almost 40% of all the annual revenue. These theaters belong to 19 different firms from which only 3 are integrated firms. These 3 firms account for 19 theaters (15, 3 and 1 respectively) out of the 107 total in the sample. These firms not only run these 19 theaters, but also others outside the geographical area represented in the data.

Table 1 shows summary statistics for the sample of 107 theaters mentioned above. The average theater has 7 screens and a total capacity of over 1,700 seats. The average theater showed 158 movies during the year that revenue data were available. This means 25 movies per screen, 9 movies every week in each theater and 1.16 movies per week and screen. On average, every theater collected 35,283 euros a week and hosted 7,750 people per week. Adjusting these numbers by size of theaters in screens and total number of seats, screens average 4,000 euros per week and each seat

[10] These two newspapers are El Pais and La Vanguardia. Madrid and Catalonia account for 25% of the Spanish population.

receives 4 spectators per week.[11]

Similarly, when dividing theaters into integrated and non-integrated, we observe that non-integrated and integrated theaters have the same sizes in screens and seats, and show the same number of movies during the sample period here. All the other measures differ across integration status. Non-integrated theaters have higher average box office revenue per week and attendance per week than integrated theaters do. Nevertheless, integrated theaters have higher averages of weekly revenue and audience per screen and seat respectively than non-integrated theaters do.

It is also important to note that non-integrated theaters open more movies per screen, show more movies per week and project more movies per week and screen than do integrated theaters, but they show these movies not as long as integrated theaters do (3.93 to 4.39). Also, notice that 44% of the movies shown in an integrated theater are distributed by their own distribution firm. Calculating from this table, a non-integrated four-screen theater shows 28 more movies a year than does an integrated theater of the same size.

Table 2 shows how integrated theaters are located in markets of the same size than non-integrated theaters are. Similarly, Figure 3 depicts the distribution of theaters within the city of Barcelona in 2004. Barcelona is politically divided in 10 districts. Notice that most of the theaters locate in districts 1, 2, 5 and 6, and that those districts have both integrated and non-integrated theaters. It is reasonable then to say that integrated theaters do not seem to locate strategically away from non-integrated theaters.

Finally, Table 3 looks at movie characteristics by organizational form of each movie's distributor. On average, movies distributed by integrated firms are as likely to be produced in the European Union and the U.S., and as likely to have been released previously in the US as movies distributed by non-integrated firms. If anything, movies distributed by non-integrated firms are less likely to be produced in Spain and less likely to have collected high levels of revenue in the US. These indicate that integrated firms are more likely to distribute movies with no market information prior to their Spanish release and movies that collected lower revenues in their US market experience.

Next, I show some patterns in the data using a subsample of observations that shed light on the decision of stopping the run of movies.

[11] Theaters in the 229-theater sample have an average size of 5 screens and 1,325 seats. The advantage of this sample is that it includes one more integrated firm (10 integrated theaters out of the new 122), and therefore lets me infer the effect of integration in the movie industry from 4 out of the 5 integrated firms in the Spanish industry.

4.2 Preliminary Evidence from Raw Data

One drawback in the data is that it does not contain information on weekly box office revenue in each theater by movie. This fact makes it difficult, without using statistical tools, to determine how organizational form changes the decision rule over screening space and movie run length.

In this section, I use one-screen theaters to observe the ideal data that I describe above. Since these only have one screen, the revenue collected corresponds to the only movie showing. I show data from two one-screen theaters located in Madrid. One is integrated and the other is independent.

Figures 4 and 5 show weekly attendance per seat for the two theaters. This is a helpful measure to look at because it determines how empty a theater is before the exhibitor decides to switch the movie. Also, this measure is useful when comparing decision rules across theaters that have different seat capacities. Each one of the continuous lines in the figures represents the run of a movie in that particular theater, and follows the evolution of the number of audience per seat from the opening week to the closing week. White spells represent integrated movies and black spells represent non-integrated movies.

Notice that movies generally start their spell at high values of attendance and decrease exponentially until their run is cut and replaced by a new movie. Notice as well that movies usually start at higher attendance levels than the last attendance level of the previous movie. These two general patterns justify some assumptions in the empirical section later on.

Figure 4 shows that this integrated theater feeds its screen using only own movies. This is unusual. The first observation from comparing these figures is that the length of the runs are significantly shorter in Figure 5 than they are in Figure 4. A second difference appears in that the non-integrated theater seems to cut movies spells at higher attendance/seat levels than does the integrated theater. Despite this, we do not observe any movies distributed by other firms showing in integrated theaters, and therefore we can say nothing about a differential treatment in integrated theaters of movies distributed by other firms.

To summarize, notice then that the integrated theater keeps movies at lower levels of attendance/seat than does the non-integrated theater. Overall, the integrated theater keeps movies longer on screen than does the non-integrated theater. This fact is a combination of movie selection and organizational form and cannot be disentangled using the data in this section. Using more sophisticated statistical tools will help answering the question that we are interested in: how organizational form changes firm behavior in the movie industry. This is the goal of the next section.

5 Econometric Methodology

The goal is to estimate the effect of organizational form on theaters' movie run stopping rule. This section discusses the different approaches that I use to estimate this effect. I first use a linear probability that allows me to answer this question without observing revenues. Then I describe a two-step econometric procedure that I follow to estimate this effect controlling for box office revenue. In the first step, I use a parametric approach to back out weekly movie revenues from weekly theater revenues. The identifying assumption here is that revenues for the same movie in different theaters follow the same path. In the second step, I use these revenue estimates to examine the theaters' decision to continue the movie's run into the following week.

5.1 Linear Probability Model

Consider first specification in equation (11) where the decision of stopping the run ($CUT_{ijt} = 1$) of movie i in theater j and period t is a linear function of whether movie i is distributed by the owner of theater j ($D_{ij}[Integ\ Theater, Own\ Movie]$), of whether theater j is owned by a movie distributor ($D_j[Integ\ Theater]$) and of fixed effects by movie, period and city (δ_{itc}),

$$CUT_{ijt} = \alpha + \beta D_{ij}[Integ\ Theater, Own\ Movie] + \gamma D_j[Integ\ Theater] + \delta_{itc} + \epsilon_{ijt} \qquad (11)$$

The movie-period-city fixed effects control for the absence of revenue in the specification under the assumption that each movie yields same amount of revenue across theaters in the same town within the same period. Therefore, β is interpreted as the effect of playing a movie in a theater owned by its distributor on the probability of stopping the movie's run compared to playing that same movie in a non-integrated theater. γ is the effect of distributor-ownership of the theater on the probability of stopping all movie's runs (those distributed by the theater owner and those distributed by others). Note that variation in revenues across theaters could drive these results. The next section develops a two-step procedure to include the variation in revenues across theaters in the analysis.

5.2 Two-Step Parametric Estimation

I assign a starting box office revenue (A_i) and decrease (or increase) rate parameters (γ_i and β_i) per movie i, such that $BOR_{il} = A_i e^{\gamma_i l_i + \beta_i l_i^2}$. My dependent variable will be $\ln(BOR_{jt})$ which

stands for box office revenue for theater j in period t. In the first step, we fit equation (12),

$$\ln(BOR_{jt}) = \sum_{i \in j,t} [\ln(A_i) + \gamma_i l_{it} + \beta_i {l_{it}}^2] + \alpha_j + \delta_t + \epsilon_{jt} \tag{12}$$

where l_{it} stands for run length of movie i in period t since the movie was released, α_j are theater fixed effects that capture both the effect of physical characteristics and relative success of each theater in particular, and δ_t are period fixed effects.[12] These fixed effects are intended to pick up the effect of demand seasonality[13] and changes in opportunity cost in this industry. Therefore, $\ln(BOR_{jt})$ equals the sum of logarithms of revenue of all movies playing in theater j in period t, being each one of them at different run lengths since each movie has its own release week. The parameters A_i, γ_i and β_i are the parameters of interest in this equation. From the estimation of these parameters, I can attribute a box office revenue amount ($\widehat{BOR}_{it}$) to any movie i in any period t during its lth week. I take the estimated movie box office revenue common to all theaters showing the movie during its lth week as a measure of how popular that movie is. I then use this measure of popularity to attribute proportional shares of the revenue that I observe at the theater level. In particular, I attribute a share (s_{ijt}) of the observed revenue to each movie i in each theater j and period t equal to the share of "popularity" of that movie i in that theater j and that period t to the total sum of "popularity" of all movies playing in that theater j in that period t ($s_{ijt} = \frac{\widehat{BOR}_{it}}{\sum_{i \in j,t} \widehat{BOR}_{it}}$).

The second step estimates the effect of organizational form on the firm's decision to cut a movie's run. In this case, the dependent variable will be CUT_{ijt} which is an indicator variable that takes value 1 if theater j cuts movie i in period $t+1$, and 0 otherwise. Following the specification in equation (13), CUT_{ijt} depends on box office revenue of movie i in period t ($\widehat{BOR}_{ijt}$[14]), organizational form dummy variables ($D_{ij}[Int\ Theat, Own\ Film]$, $D_j[Int\ Theater]$ and $D_i[Int\ Film]$), and their interaction with box office revenue.

$$CUT_{ijt} = 1\{\beta D_{ij}[Int\ Theat, Own\ Film] + \gamma D_j[Int\ Theat] + \delta D_i[Int\ Film] + \epsilon_{ijt}\} \tag{13}$$

$D_{ij}[Int\ Theat, Own\ Film]$ is a dummy variable that takes a value of 1 if movie i is distributed by

[12] Following Greene (1999), I construct a variable $BOR^*_{jt} = \ln(BOR_{jt}) - \overline{\ln(BOR_j)} - \overline{\ln(BOR_t)} + \overline{\overline{\ln(BOR_{jt})}}$, and then I estimate the specification $BOR^*_{jt} = \sum_{i \in j,t} [\ln(A_i) + \gamma_i l_{i,t} + \beta_i {l_{i,t}}^2] + \epsilon_{jt}$ for all movies i showing in theater j during week t.

[13] Einav (2003) documents the importance of seasonality in the movie industry.

[14] $\widehat{BOR}_{ijt} = s_{ijt} * BOR_{jt}$, where BOR_{jt} is the actual revenue data that I observe.

the owner of theater j, and 0 otherwise; $D_j[Int\ Theat]$ is a dummy variable that takes a value of 1 if theater j is an integrated theater, and 0 otherwise; and similarly, $D_i[Int\ Film]$ is a dummy variable that takes a value of 1 if movie i is distributed by an integrated firm, and 0 otherwise. Notice that the omitted case will be that where a non-integrated movie is showing in a non-integrated theater.

The ultimate goal is to estimate the specification in equation (13) and determine the effect of integration on the probability of stopping the run of movies distributed by the theater owner and of movies distributed by independent firms. I report results in section 6.

6 Results

This section presents results from the methodology described above. The results here show that organizational form has an effect on the stopping rule of a movie's run. Furthermore, I examine whether US movie performance and theater size affect in any way the effect of organizational form on the length of a movie's run. I show that the effect of organizational form decreases as US box office revenue and theater size increase. The last subsection provides supporting evidence that integrated firms deal with different types of movies than non-integrated firms.

6.1 Results from Linear Probability Regression

Table 4 provides evidence on the stopping rule of theaters using the specification in equation (11). Table 4 uses all the data available (229 theaters for 78 weeks). I run OLS on the decision of stopping the movie (CUT_{ijt}) using movie-period-city fixed effects. This allows me to control for possible differences in revenue collection across movies, periods and cities. The results for the whole sample suggest that integrated theaters are 14% less likely to stop their own movies than non-integrated theaters provided that both integrated and non-integrated are showing the same movie in the same period and city. On the other hand, integrated theaters are as likely to stop the run of any movie as a non-integrated theater showing that same movie.

When I control for US movie revenues, results do not change qualitatively. If anything, the effect of organizational form increases (16% to 25%) when I control for whether the movie had a US release, US box office revenues and theater size. I also observe how the effect of organizational form decreases for those movies that had a US release (7% smaller), those with high US box office revenues (1% smaller for every $2 million) and those showing in larger theaters (3% smaller for every 2 extra screens). This indicates that the run length of movies preceded by market information (released and successful in the US) and showing in bigger theaters (more screens) is less sensitive to the use of different organizational forms than the run length of movies with no previous information

(not released in the US) or showing in smaller theaters. In addition to this, columns (4) and (5) show that integrated theaters are less likely to stop the run of any movie by 2%. This result is consistent with predictions of the job design and organizational form literature (Holmstrom and Milgrom (1991,1994)). Still, main results suggest that integrated theaters substitute screen use from external movies to their own movies.

6.2 First Step Estimation

I use equation (12) above to back out the parameters A_i, γ_i and β_i for each movie i. I use box office revenue data from the sample of 107 theaters described above to estimate these parameters. I estimate these parameters by isolating theater box office revenue numbers from period and theater fixed effects.[15] I show results of this estimation in Table 5.

The table shows results for the 397 movies that I identify in my 511-movie sample. I divide these 397 movies into movies distributed by non-integrated firms and movies distributed by integrated firms. Although the differences in averages are not statistically significant (last column), movies distributed by non-integrated firms have higher average levels of $\ln(\widehat{A}_i)$ (0.36 to 0.16) and sharper average decrease rates $\widehat{\gamma}_i$ (-0.44 to -0.11). These differences in averages are consistent with the differences in movie types across organizational forms observed in Table 3.

6.3 Stopping Rule and Organizational Form

In this section, I estimate the stopping rule for movies and how that rule varies with organizational form. The summary statistics presented in Table 1 show that integrated theaters show fewer movies than non-integrated theaters and that movies last longer in integrated theaters. There are two main competing explanations for these facts. First, the higher share of profit per dollar of revenue collected from own movies would result in a softer stopping rule in integrated theaters with their own movies than with movies of other distributors. Second, integrated theaters are more successful than non-integrated theaters, and therefore collect higher amounts of revenue.

In Figure 6, I divide my estimates of box office revenue per movie i in theater j at period t into ten equally weighted (10% of the data) bins. I then plot the percentage of movies cut in each one of those bins against the median value of each bin. I do this for integrated theaters showing their own movies, integrated theaters showing other companies' movies and non-integrated movie theaters. Notice that the percentage of movies cut in integrated theaters is always higher for movies distributed by other companies, than it is for their own movies in any given bin. These

[15] Having done so, it is not strange to observe how certain movies have negative values of $\ln(\widehat{A}_i)$.

two shares are only equal at high levels of estimated revenues. Also, the second graph shows that there is no difference between the stopping rule of non-integrated theaters and that of integrated theaters showing movies distributed by other firms.

Figure 7 depicts how the movie stopping rule differs by organizational form and US revenue of movies. The horizontal axis plots median run lengths of movies per organizational form, while the vertical axis plots estimated weekly movie revenue per category. This figure first shows how estimated Spanish box office revenues from the first step estimation are correlated with those in US (weekly revenue scheme shifts out as we move from left to right figure) and how movies that were not released in the US are comparable in revenues to those movies that had lower amounts of US revenues. It also shows that integrated theaters keep their own movies for at least 2 weeks longer than do non-integrated theaters. Although not in the picture, integrated theaters cut movies of other distributors 2 weeks before than they cut their own. Finally, the picture illustrates how the difference in cut-off decisions between integrated and non-integrated theaters changes across US box office revenues of movies. The run length of movies with no US release or that collected less than 10 million dollars doubles in distributor-owned theaters compared to non-integrated theaters. In the case of movies that collected higher amounts of US revenues, the length of movie run less than doubles in distributor-owned theaters. Although this indicates that relative differences shorten for movies with high US revenues, the numbers plotted are rough summary statistics and need to be adjusted for seasonality and other unobservables.

Table 6 shows the results when using the estimates of revenue generated from the first step estimation. The results show that a movie is more likely to be cut the lower the revenue level collected. A decrease of 1,000 euros in revenue increases the chances to cut the movie by roughly 2% (column 4) independently of organizational form. In addition to this, integrated theaters are 10% less likely to cut own movies than movies distributed by others. However, estimates in this table seem to indicate that integrated theaters stop the run of all movies at the same time than do non-integrated theaters.[16]

Given that movie performance in the US is correlated with movie performance in Spain and that this correlation is stronger the higher the success achieved in the US market, I identify movies that were never released in the US as more uncertain movies than movies released in the US. Similarly, I identify movies that collected higher US revenues as less uncertain than movies with lower US revenues. If this argument is valid, the testable implication above predicts that the effect

[16] Gil (2004) bootstraps the estimation of the effect of organizational form on the probability of stopping a movie's run. That takes into account the fact that revenues in the estimation of Table 6 are estimates. Results do not change.

of organizational form decreases in importance as the availability and certainty of information on potential performance increases.

Results from Table 7 suggest that theaters are less likely to cut runs of movies with an US release or high US revenues, but also shows that the effect of organizational form decreases with movies released in the US (3.4% smaller), and with movies of high US revenues (12% smaller). In fact, organizational form does not matter for the run length of movies that collected over $100 millions in the US, but it does matter for movies that were not as successful in their US experience and movies that were not released in the US.[17] In addition to this, results from columns (6) and (7) show that bigger theaters are less likely to cut the run of movies. It also shows that the effect of organizational form decreases as we increases theater size from 1 to 4-screen theaters (control group) to 5 to 9-screen theaters (12% smaller), and to 10 or more screen theaters (21% smaller). Finally, integrated theaters behave like non-integrated theaters when the movies are distributed by some other firm independently of the movie US revenues.[18]

The evidence up to now has implicitly assumed that ϵ_{ijt} in equation (13) is independently drawn for every movie i in each theater j at every period t. While this assumption appears to oversimplify the decision process, it stems from information collected during my interviews with managers. They claim to evaluate the level of revenue generated each week, assess the success of new releases and decide which movies to cut from their current screens. Despite this, ϵ_{ijt} could be correlated across periods within movie and theater. To address this problem, I use a duration model.

Table 8 examines the effect of organizational form on movie stopping rules using a Cox proportional hazard model.[19] Duration models take into account the information of how long the movie has been showing, whereas the discrete choice model specification estimated above takes each decision independent of that information and assumes that revenue and organizational form are sufficient statistics for decision making. Again, the results are qualitatively consistent with previous results in Tables 6 and 7: integrated theaters are less likely to cut their own movies than other movies holding revenue constant. This effect of integration decreases in magnitude for movies with US release (not statistically significant here), with higher US revenues (columns (6) and (7)) and for movies playing in larger theaters (column (9)). This implies that introducing the run length

[17] Coefficients of the dummy variables "Over $100m US Box Office" and "$100m-$10m US Box Office" are statistically different from 0 and statistically different from each other.

[18] In an earlier version, I divide movies by country of production. Similar to the results here, the effect of organizational form decreases as the country's movie industry reputation improves.

[19] Table 8 uses a random subsample of 50% of the movies. Using different random subsamples did not change the results.

of the movie up to the decision period does not change the results and, if anything, strengthens the view that the existence of prior information about the movie lessens the effect of organizational form on movie run length as discussed above.

In the next section, I provide supporting evidence of the fact that integrated firms specialize in distributing different movies than do non-integrated firms.

6.4 Product Choice and Product Placement Decisions

In this section, I examine differences in the characteristics of the movies distributed by integrated firms and non-integrated firms. These characteristics are known previously to the distribution of the product. Equation (14) provides a non-linear specification for the indicator variable VI_i which takes value 1 if movie i is distributed by an integrated distributor, and 0 otherwise.

$$VI_i = 1\{X_i\beta + \epsilon_i\} \tag{14}$$

The non-linear specification defines the decision of distributing a movie as a function of product characteristics (X_j) such as country of origin dummies (US, Spain or European), US release dummy, and total US box office revenue when available. In the same way, integrated firms may allocate their movies in distributor-owned and/or non-integrated theaters depending on the product characteristics. Equation (15) provides a non-linear specification for the indicator variable IN_j which takes value 1 if movie i opens in a distributor-owned theater j, and 0 otherwise, given that all movies in the sample are distributed by an integrated distributor.

$$IN_{ij} = 1\{X_i\beta + \epsilon_{ij}\} \tag{15}$$

The regressors in equation (15) are the same as those in equation (14), that is, movie characteristics known previously to the movie release such as country of origin and US box office revenue.

Table 9 indicates that integrated firms distribute more often movies that were not released in the US, and within those movies with US release, integrated firms distribute those with lower U.S. box office revenues. Since the results are not significant, I run the same regressions excluding one integrated firm in particular from the sample. This firm is the subsidiary of a major distribution company in the U.S. and therefore does not choose all the movies that it distributes. The coefficients now support the story: integrated firms are more likely to distribute Spanish and European movies, less likely to distribute U.S. movies, less likely to distribute movies with US release and less likely to distribute successful movies in other markets.

On the other hand, Table 10 shows that integrated firms are more likely to play their own movies in their own theaters if they are European, not from the U.S., not released in the US and if their US box office revenues are low. Results are mixed with movies produced in Spain. Special regulation protecting the local industry fosters the exhibition of these movies, and therefore increases the demand for copies of local movies.

Consistent with the results in Tables 9 and 10, integrated firms are more likely to distribute movies for which control rights are important due to contractual incompleteness. Nevertheless, these conclusions are extrapolated from cross-section regressions during a period in which no firm changed integration status. In the next section, I discuss the robustness of my results.

7 Discussion of Results and Conclusions

7.1 Does Organizational Form Affect Box Office Revenues?

If integrated theaters promote their own movies more than non-integrated theaters do, then we may expect a difference in revenues of integrated movies playing in their own integrated theaters with respect to the revenues of those same movies showing in non-integrated theaters. This represents a potential source of bias for the first-step estimates.

This is unlikely to happen for several reasons. Since integrated theaters do not change status in my data set, some of this effect would be picked up by the theater fixed effect. Second, this gain in revenue is most likely concentrated over the last periods of the movie run, where most of the theaters showing the movie are integrated, because word of mouth takes time to build up demand. And finally, if there was a bias, that would simply mean that there still exist gains from vertical integration that come from other sources. I use equation (16) to isolate these gains from alternative sources.

We are also interested in determining the effect of vertical integration on box office revenue for a particular movie. Since integrated theaters show both movies from their own distribution and from other distribution companies, we can compare revenue of integrated theaters showing the same movies as non-integrated theaters. Consider then equation (16), which states that box office revenue of theater j in period t is a function of box office revenue of movie i showing in theater j in period t, theater and period fixed effects and the percentage of movies showing in theater j during period t distributed by the owner of theater j ($ShVI_{jt}$).

$$\ln(BOR_{jt}) = \sum_{i \in j,t} [\ln(A_i) + \gamma_i l_{it} + \beta_i {l_{it}}^2] + \theta ShVI_{jt} + \alpha_j + \delta_t + \epsilon_{jt} \tag{16}$$

Notice that equation (16) holds movie constant across theaters and periods. Therefore the parameter θ captures differences of revenues across theaters, holding the movie mix constant, associated with differences in organizational form. A statistically significant value of θ would imply differences in revenues across theaters for the same movie and violate the identifying assumption in my first step estimation.

I estimate equation (16) above, and find that $\widehat{\theta}$ equals +0.041, but this coefficient is not statistically significant from zero (t-statistic=0.63). Therefore, the parameters obtained from my first-step estimation are not biased from this and the second-step estimation results are correct.

Figure 8 addresses the question of what are the effects of vertical integration on revenues in the movie theater industry. I divide the area below the revenue-time line in three parts: A, B and C. Area A represents the effect of providing more theater-specific promotional activities. The above estimation shows that these effects $(\widehat{\theta})$ are small if not zero. Area B represents the amount of revenues the movie would collect if the firm were not integrated. Area C represents the gains from owning the rights to decide when to cut the movie's run. These effects are important when a movie needs longer time to build up a demand.

There are other effects of integration that are missing from Figure 8. Over the years, revenue from the theatrical industry as a percentage of total revenue collected by a movie has decreased. This indicates that theaters have become less important for movie revenues and that theater movie runs now serve as promotional activity for other media markets. Since the movie rights for these ancillary markets are often owned by the same firm, integrated firms would keep their own movies longer on their own screens even if they collect lower amount of revenues than otherwise. Benefits from these decisions may come later in the form of higher revenues from home video and DVD sales, and TV contracts.

Figure 9 shows median movie revenues in the opening and last week of integrated and non-integrated movies in an integrated screen, and the median length of the movies' run. This figure suggests that by keeping their own movies running two weeks longer, integrated screens lose an average of €1,800 per year. This represents roughly a 1% of their yearly box office revenue. The overall loss is bigger than this amount if we take into account the loss in concession sales (proportional to attendance), and add it up across all screens.[20] In any case, this indicates that gains in ancillary markets from continuing the movie's run in an integrated screen must at least be this amount.

[20] Do not forget the fact that this number comes from a back of the envelope calculation from median revenue values, using the fact that on average integrated screens show non-integrated movies roughly $\frac{2}{3}$ of the time.

7.2 Using Distribution Firm Level Data

Unfortunately, none of the firms or theaters in the data used before switch status from non-integrated to integrated. Nevertheless, I do observe firms becoming vertically integrated in my distribution firm level data. In this data[21], I observe 5 integrated firms before and after they became integrated and, therefore, use this to further study the effect of vertical integration on economic outcomes in the movie industry.

Consider then equations (17) and (18), which take advantage of the variation in integration status over the years at the distribution firm level. Equation (17) provides a linear specification for the number of movies shown by firm j in year t. The number of movies is a function of integration status (VI_{jt}), the number of screens owned if integrated ($VI_{jt} * Screens_{jt}$), and firm and year fixed effects.

$$Movies_{jt} = \alpha_0 + \alpha_1 VI_{jt} + \alpha_2 VI_{jt} * Screens_{jt} + \gamma_j + \eta_t + \epsilon_{jt} \tag{17}$$

Similarly, equation (18) depicts the average attendance per movie by distributor j in year t as a function of integration status (VI_{jt}), the number of screens owned if integrated ($VI_{jt} * Screens_{jt}$), the number of movies distributed by firm j in period t ($Movies_{jt}$), and firm and year fixed effects.

$$[\frac{Attendance}{Movie}]_{jt} = \alpha_0 + \alpha_1 VI_{jt} + \alpha_2 VI_{jt} * Screens_{jt} + \alpha_3 Movies_{jt} + \gamma_j + \eta_t + \epsilon_{jt} \tag{18}$$

Table 11 shows results from equation (17). From this table, we can see that integration increases the number of movies distributed into the market and this number increases with the number of screens owned by the integrated firm. Additionally, Table 12 uses the linear specification in equation (18) to show that integrated firms distribute movies that have lower average attendance than those distributed by same size non-integrated firms. In this case, the number of screens owned by the integrated firm increases the average attendance per movie distributed by that firm.

These results are then consistent with those using cross-sectional data in previous sections. As distributors become integrated, they start distributing more movies and movies that have lower average total attendance, therefore movies of more uncertain audience appeal.

[21] I collected data at the distribution firm level from an annual report published by the Spanish Ministry of Culture called "*Boleto Informativo. Anexo Cultura en Cifras*". I collected data from 1980 to 2001 in total attendance and number of movies per distributor for a sample of distribution firms. This sample consists of all distributors whose movies surpassed the 1% of total attendance for any year during this period.

7.3 Concluding Remarks

In this paper, I examine the behavior of integrated firms in the movie industry using data from the Spanish movie industry. I find that integrated theaters show their own movies longer than those distributed by other firms, and longer than non-integrated theaters would show the same movie.

I find as well that integrated firms distribute more frequently movies of more uncertain audience appeal than do non-integrated firms, and that integrated firms use their own screens more often to show those of their own movies of most uncertain audience appeal. Integrated distributors specialize in this type of movies because they control the distribution channels and can avoid the incompleteness that characterizes these contracts. On the other hand, non-integrated firms specialize in less uncertain movies because contracts for those movies are easier to write and rarely incomplete.

The mechanism described in the paper is consistent with the history of the US motion picture industry. In 1948 after the Supreme Court ruled against the *Paramount* and the other *majors*, the U.S. movie industry experienced a decrease in production of movies but an increase in the budget invested per movie. This is consistent with the fact that firms could not control distribution channels any longer, and therefore former integrated firms decided to distribute movies that were more attractive a priori. Needless to say, at the same time television was spreading throughout the US and the movie studios faced a new type of competition that forced them to change their movie production. Future research should investigate the importance of television versus disintegration in the change of movie production in the US in that period.

The paper contributes to the scarce existing empirical literature on the effect of vertical integration on economic outcomes not only by providing clean and consistent evidence that clarifies how differences in organizational form affect firm behavior, but also sheds light on the study of the antitrust practice in the US movie industry that started more than 50 years ago. Further research should be directed towards a better understanding of the contractual arrangements between parties in vertical markets. This would improve the assessment of future antitrust cases, and the benefits and costs of vertical integration.

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Figure 1. Sample Contract

Date

Contract/Confirmation

Distribution Firm Exhibition Firm

Contract #. The two people signing this contract, one as a representative of the distribution firm and the other as a representative of the exhibition firm, agree on the current date to formalize the contract of rights disposal and the handing over of the movie material indicated below. This contract is driven by the conditions specified in the front and the back of it. The two parties signing the contract understand and recognize that all of those conditions are clauses of this contract.

Theater: ---------- City: ----------

Opening Date | Type | Number of Days| Movie Title | Version | Format | Dolby | Duration | Length | Rating | Exhibition License #

Contract Specific Conditions

1st Week Share | 2nd Week Share | 3rd Week Share | 4th Week Share | 5th Week Share | 6th Week Share
Overtime Share Specified if Applicable.

Some Contracts Specify Management, Previews and Advertising Expenses. Others include the number of seats and screen that they want the movie to be showed on, and some extreme cases include the retailing Price

Distributor's Signature Exhibitor's Signature

General Conditions

- Goal of the Contract.
- Exhibition Period.
- Movie copy, previews and advertising material.
- Publicity.
- Privacy and Confidentiality.
- Auditing and Monitoring Rights.
- Taxes.
- Movie Title Change.
- Contract Length.
- Means of Payment.
- Special Discount Day.
- Unilateral Contract Termination.
- Court Enforceability.

Figure 2. Contractual Friction Between Exhibitor and Distributor

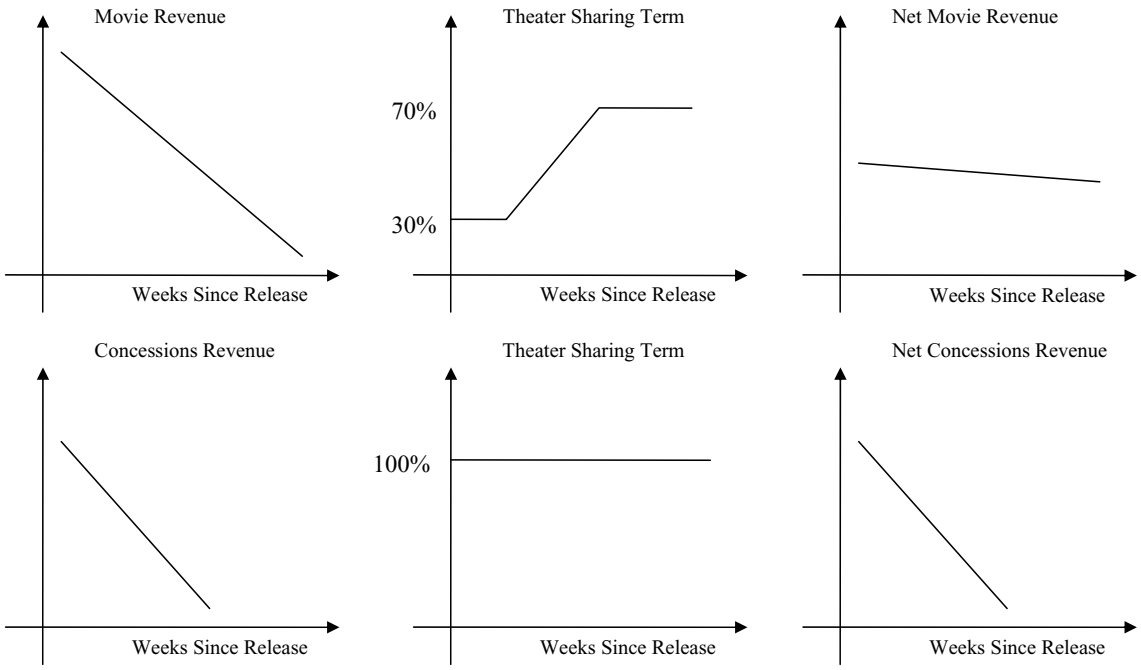
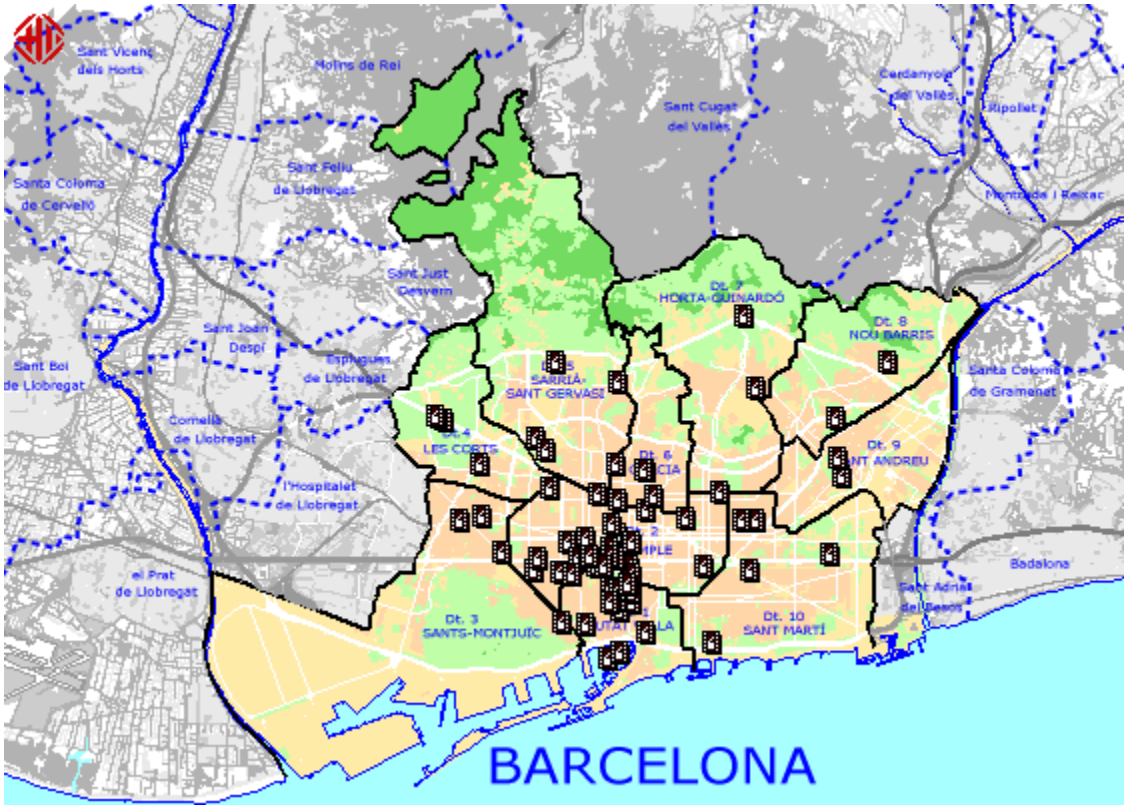
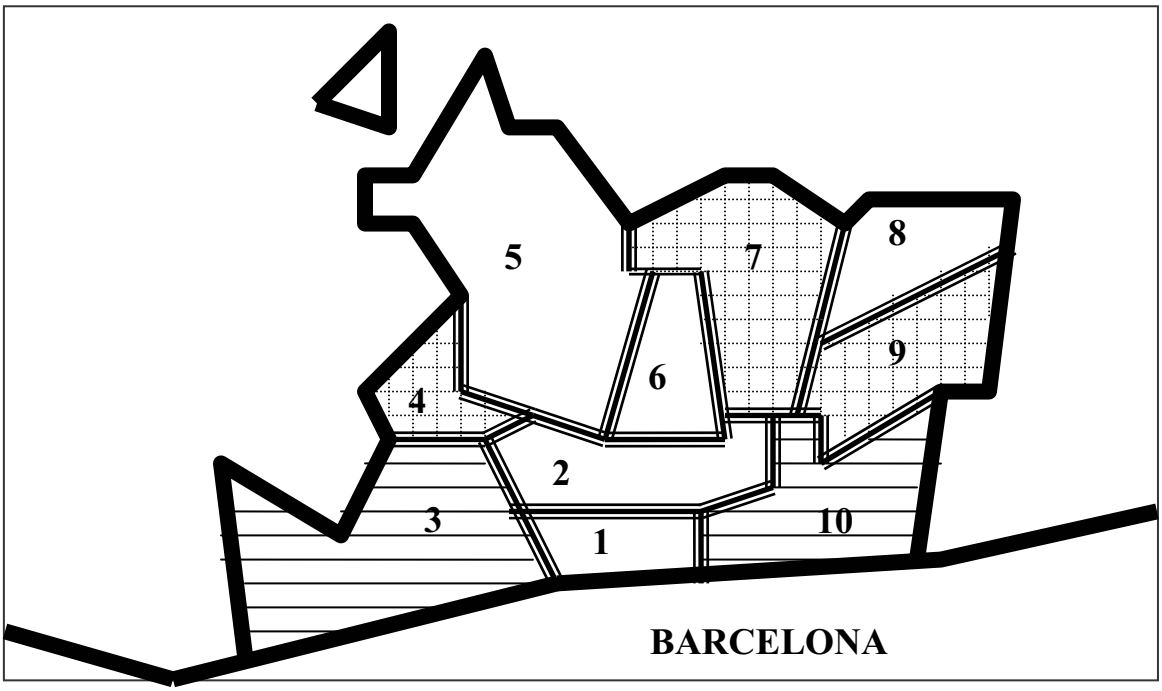
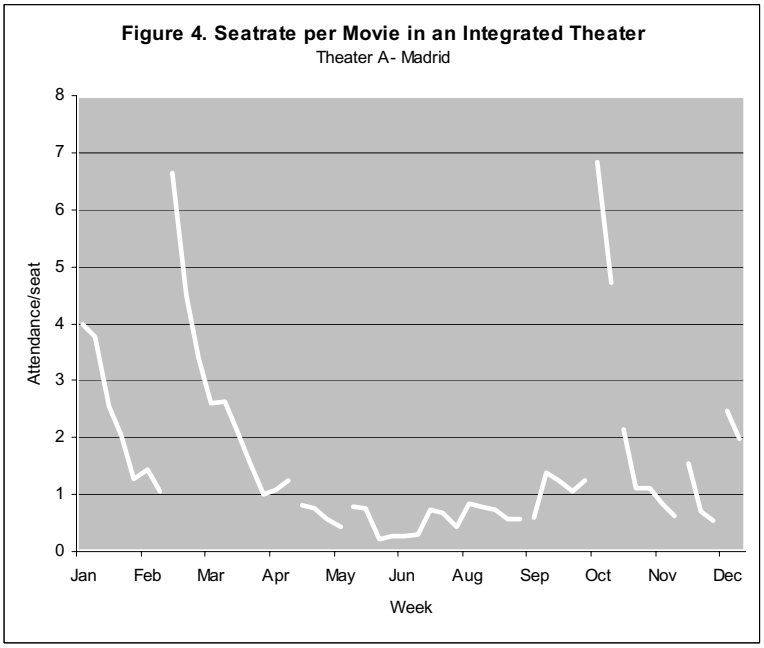


Figure 3. Theater Map of Barcelona





The map above shows the distribution of theaters in Barcelona. As you can see most of these are located in District 1, 2, 5 and 6.
The map below shows what districts have both integrated and non-integrated theaters (white background), only integrated (squares) and only non-integrated (flat lines).



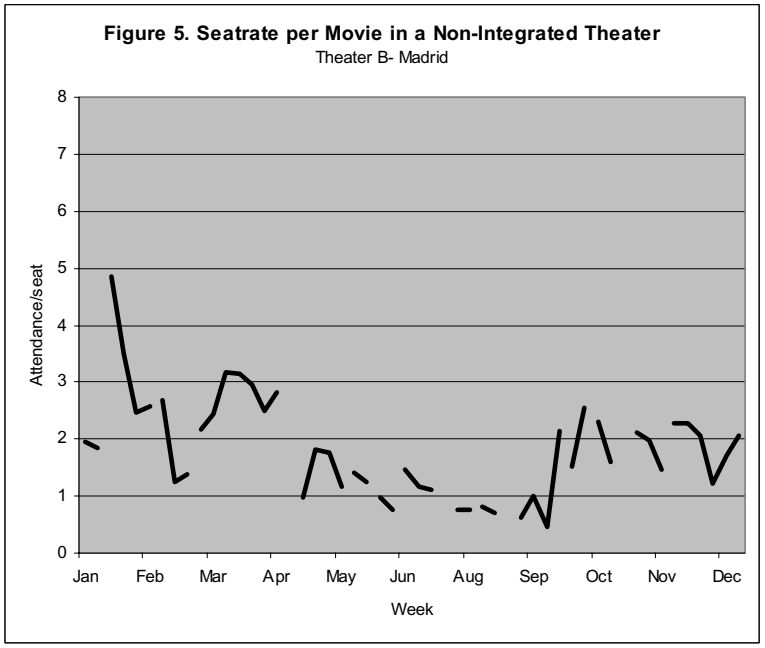
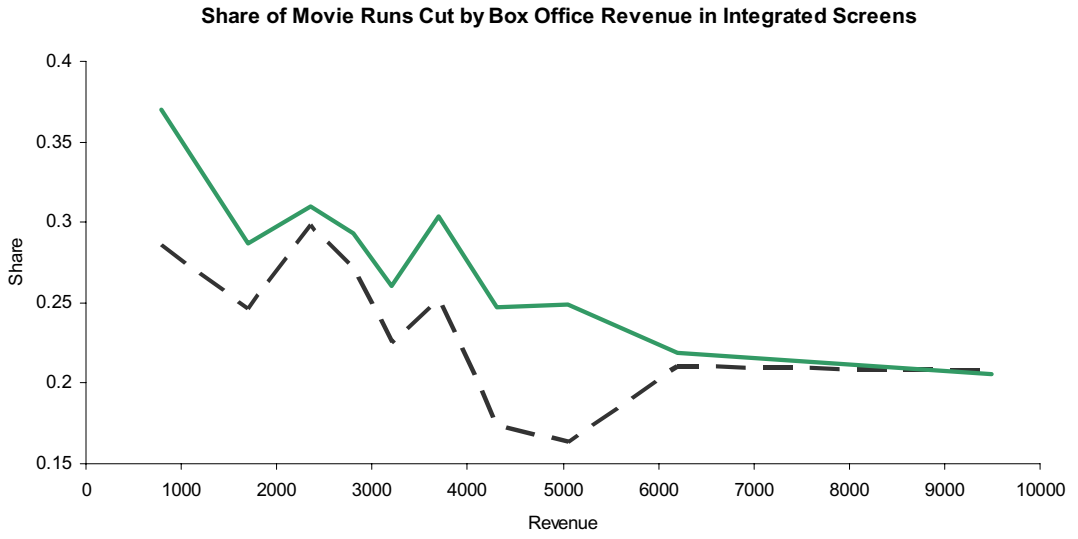
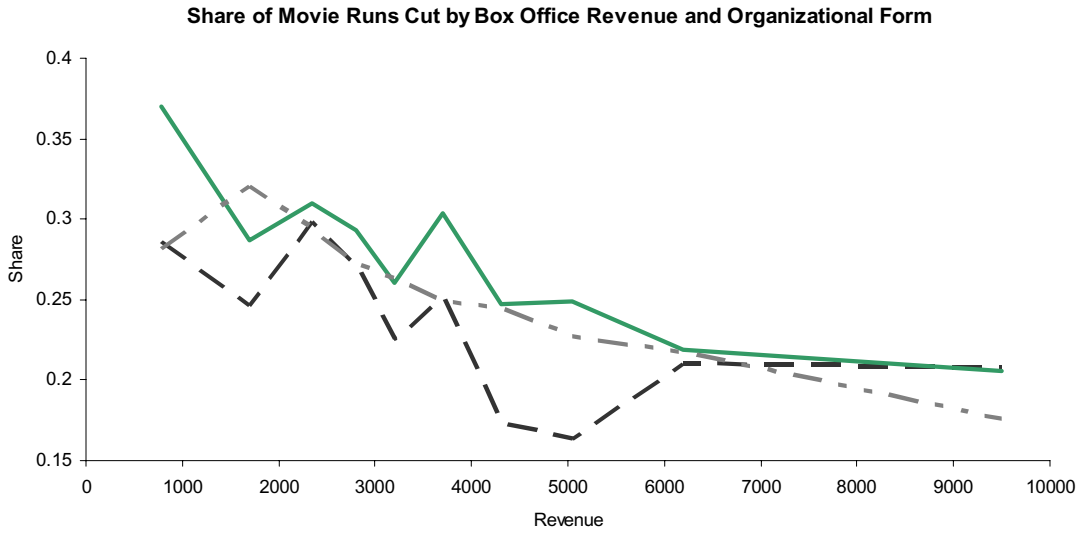


Figure 4 & 5.
Note: These figures show the evolution of Seatrate (attendance/seats) per movie in two different one-screen theaters. Theater A is an integrated theater, and B is non-integrated. White spells represent movies distributed by screen owner, and black spells movies distributed by others. See that theater A is only showing its own movies.

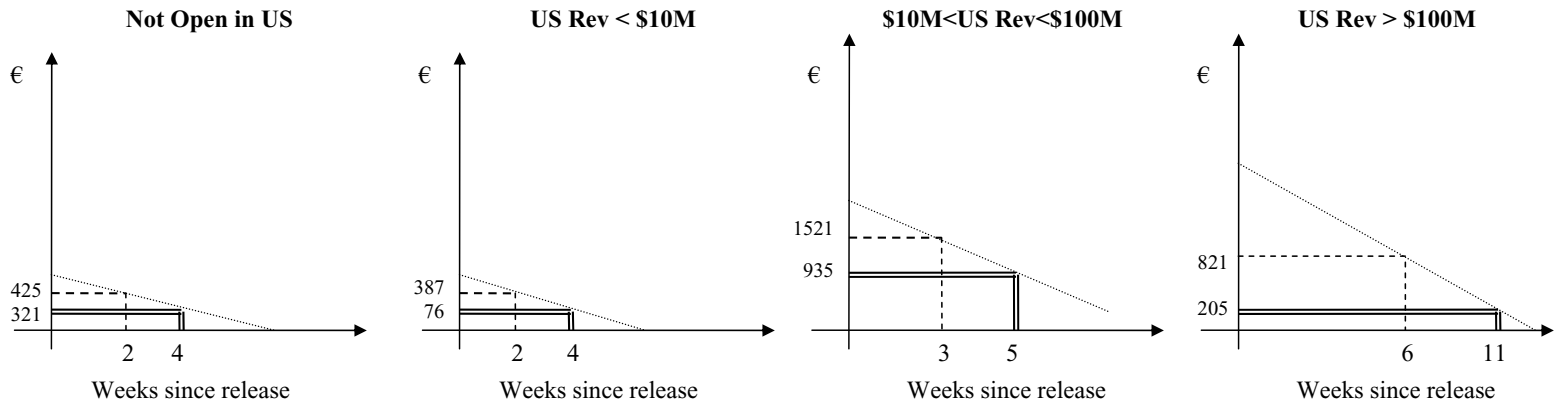
Figure 6. Plotting box office estimates and share of movie runs cut.





In this figure, I divide my box office revenue estimates in ten "equally-massed" intervals, and I calculate the percentage of movie runs terminated per interval and organizational form. Then I plot those points and unite them with a line.
In the graph above, I show the line for integrated theaters showing other companies' movies (solid line) and integrated theaters showing their own movies (dotted line).
In the graph below, I add the line for non-integrated theaters (dotted line of lighter color).
They show how integrated theaters are always more likely to cut movies from other companies than their own. Also, notice that organizational form does not matter for high amounts of revenue (6,000 Euros or higher).

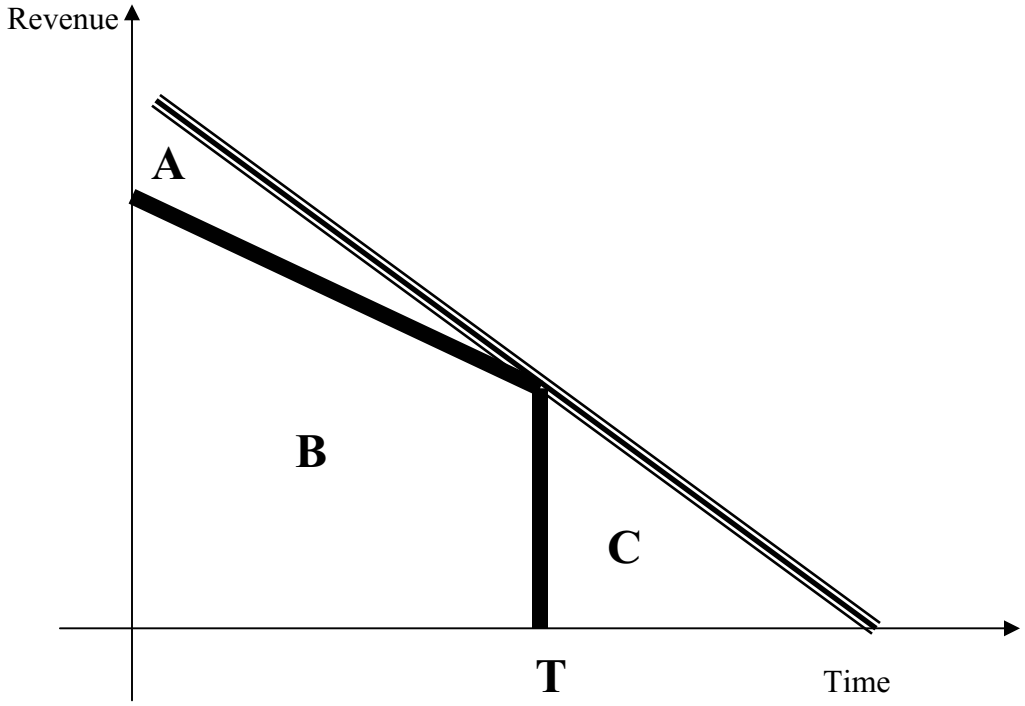
Figure 7. HOW DO STOPPING RULES VARY ACROSS U.S. BOX OFFICE REVENUES & ORGANIZATIONAL FORM.



Notes: These four pictures show how median run length and estimated revenue cut-off thresholds vary with organizational form and US box office revenue in Spanish movie theaters. The horizontal axis plots the median movie run length by organizational form. The vertical axis plots the corresponding revenue levels from the estimation of equation (2) in the text. The dotted line comes from estimating revenues within movie category above using the estimated values of revenue from first step estimation. In the graphs, the stopping rule of non-integrated theater appears as a dashed line, and the stopping rule of the integrated theater as a double line. I do not include the median movie run length of integrated theaters with other distributors' movies because they are statistically equal to those of non-integrated theaters.

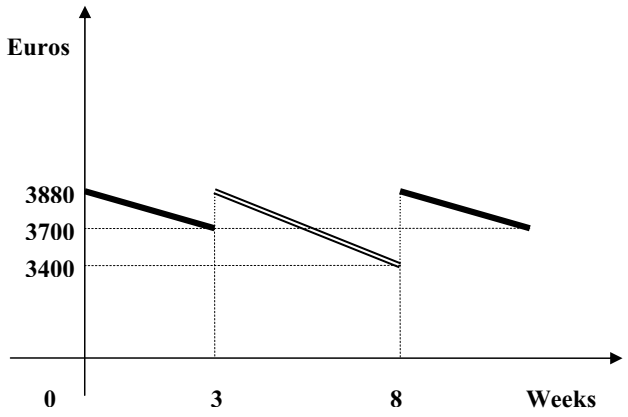
This figure depicts how non-integrated theaters stop movies earlier than integrated theaters for every movie category. When comparing the difference in thresholds across pictures, it is not possible to establish a pattern across levels of US box office revenues. Notice that these are raw numbers and are not adjusted by seasonality. Correcting for the effect of seasonality in section 6 will allow me to compare difference in cut-off thresholds across US box office revenues.

Figure 8. The Effect of Vertical Integration on Movie Revenues



Note: The three-mark line represents the evolution of revenue over time of a movie distributed by an integrated firm in one of its theaters, whereas the thick black line represents the evolution of revenue over time of that same movie in a non-integrated theater up to the moment where the movie run is cut. . I divide the former into three areas: A, B and C. A represents the extra revenue generated in integrated theaters with respect to non-integrated theaters due to the higher marginal benefit curve at every level of promotional activities. B represents the revenue collected in both integrated and non-integrated theaters during the first T periods of the movie run. Finally, C represents the gain from owning the rights of deciding whether to continue showing the movie longer in its own theaters beyond T. The estimates suggest that area A is rather small (+0.041 ln(euros); t-stat=0.63), and therefore gains from vertical integration come from area C, as well as other ancillary markets.

Figure 9. The Effect of Vertical Integration on Theater Revenues



Movie Distributed by Other than Screen Owner.

Movie Distributed by Screen Owner.

Notes: In this figure, I plot the median box office revenue values of movies owned by the theater owner and independent movies at the opening and final week of their runs, and their respective median run lengths. Independent movies in independent theaters have the same length than they do in integrated theaters. The "back of the envelope" calculation provided that if integrated theaters showed their own movies as long as they show independent movies, their yearly revenues would go up around 4%. This indicates that benefits from ancillary markets must amount at least to this amount.

Table 1. Summary Statistics for 107-Theater Full Sample and by Integration Status

	All	Non-Integrated	Integrated	Difference
Screens	7.38	7.52	6.74	0.78
	(4.92)	(5.13)	(3.81)	(1.24)
Seats	1712.10	1755.96	1509.10	246.85
	(1202.40)	(1260.31)	(885.37)	(304.67)
Attendance/ Week	7752.90	7982.40	7434.87	**547.55**
	(9255.00)	(9635.63)	(7113.94)	**(238.30)****
Revenue/ Week	35282.99	37408.29	33932.30	**3475.93**
	(43449.00)	(46178.67)	(34410.36)	**(1289.80)****
Attendance/ Week&Seat	3.88	3.79	4.39	**-0.59**
	(2.29)	(2.22)	(2.44)	**(0.08)****
Revenue/ Week&Screen	4228.00	4246.09	4864.94	**-618.85**
	(2893.00)	(2713.61)	(3736.76)	**(85.67)****
Movies	157.90	164.74	125.16	39.59
	(93.20)	(93.13)	(89.07)	(23.32)
Movies/ Screen	24.56	25.73	18.97	**6.76**
	(12.49)	(13.13)	(6.54)	**(3.09)****
Movies/ Week	8.52	8.81	7.24	**1.56**
	(5.82)	(6.03)	(4.59)	**(0.17)****
Movies/ Week&Screen	1.16	1.17	1.11	**0.06**
	(0.25)	(0.26)	(0.19)	**(0.01)****
% Own Movies	0.05	0.00	0.44	**-0.44**
	(0.16)	-	(0.31)	**(0.01)****
Movie Run Length	3.99	3.93	4.39	**-0.47**
	(4.06)	(0.04)	(0.08)	**(0.11)*****

Note: This table reports the averages of the variables used in the paper for the sample of 107 theaters in the first column. Second and third columns split the sample into non-integrated and integrated theaters. Finally, the fourth column shows differences between these two and test it statistically. ** significant at 5 %.

Table 2. Theater Location by Organizational Form

City Size	Non-Integrated Theater	Integrated Theater
1 M - 3 M	Madrid (19) Barcelona (13)	Madrid (4) Barcelona (7)
200 K - 1 M	Hospitalet (3) Badalona (2)	
100 K - 200 K	Mataro (4) Tarragona (1) Getafe (3) Fuenlabrada (1) Leganes (1) Sabadell (2)	Lleida (1) Tarragona (1)
50 K - 100 K	San Cugat (2) Las Rozas (1) Granollers (4) Manresa (2) Pozuelo (3) Girona (1) Reus (1) Parla (1) Cornella (2) Torrejon de Ardoz (1)	Viladecans (1) Girona (1) Alcobendas (1) Reus (1)
0 K - 50 K	Mollet del Valles (1) Collado Villalba (2) Gava (1) Sant Feliu (1) Figueres (2) Tres Cantos (1) Vic (3) Tortosa (1) Olot (1) Rivas Vacia (1) Barbera del Valles (1) Amposta (1) Mejorada del Campo (1) Arenys de Mar (1) Calafell (1)	Majadahonda (1) Blanes (1)

This table shows and compares the distribution of non-integrated and integrated theaters across towns of different population sizes in my sample. Each name is the name of a town and the number in brackets is the number of theaters of that organizational form in that town in my sample.

Table 3. Movie Characteristics: Summary Statistics by Integration Status of Distributor

	All	Non-Integrated	Integrated	Difference
US Movie	0.53	0.55	0.51	0.04
	(0.49)	(0.03)	(0.04)	(0.05)
UK Movie	0.09	0.10	0.08	0.02
	(0.29)	(0.02)	(0.02)	(0.03)
Spanish Movie	0.18	0.16	0.23	**-0.07**
	(0.39)	(0.02)	(0.03)	**(0.04)****
Rest EU Movie	0.14	0.14	0.13	0.02
	(0.34)	(0.02)	(0.03)	(0.03)
Movie Open in US	0.61	0.64	0.57	0.06
	(0.48)	(0.03)	(0.04)	(0.05)
US Revenue (Millions US$)				
All Movies that Open in US	45.9	50	37.4	**12.6**
	(60.80)	(4.51)	(4.75)	**(7.30)***
US Movies	50.4	55.5	39.7	**15.8**
	(61.90)	(4.99)	(5.42)	**(8.18)****
UK Movies	21.7	19.7	26.1	-6.4
	(30.50)	(7.15)	(9.35)	(12.40)
Spanish Movies	96.5	.	96.5	.
	.	.	.	.
Rest of EU Movies	12.9	22.1	0.7	21.4
	(2.17)	(13.10)	(0.57)	(15.50)
Spain Revenue (Millions Euros)				
All Movies	2.2	2.3	2.0	0.3
	(3.86)	(0.21)	(0.29)	(0.36)
US Movies	2.8	3.1	2.3	0.8
	(3.90)	(0.29)	(0.39)	(0.51)
UK Movies	1.7	1.5	2.2	-0.6
	(2.94)	(0.54)	(0.74)	(0.95)
Spanish Movies	1.8	1.5	2.2	-0.7
	(4.32)	(0.48)	(0.84)	(0.92)
Rest of EU Movies	0.7	0.8	0.5	0.3
	(1.27)	(0.21)	(0.14)	(0.33)
Movies that Open in US	2.9	3.0	2.6	0.4
	(4.38)	(0.29)	(0.44)	(0.53)
Observations	511	335	176	

Note: This table reports the average values of characteristics of the movies for which I have information in my data set. These movies were showing in Spanish screens from January 2001 to June 2002.
First column provides average values among the 511 movies in the data set, whereas second and third columns provide averages of non-integrated (335 obs) and integrated (176 obs) separately. The number in brackets report the standard errors of each average. Finally, the fourth column tests whether the differences between second and third column are statistically different from 0.
Revenue amounts are total amount of revenue collected by each movie during the whole run in US and Spain, respectively. I break each one of these averages by producing country and previously available information categories.
* significant at 10%, and ** significant at 5%.

Table 4. The Effect of Organizational Form Using Linear Probability Estimation Model

	(1)	(2)	(3)	(4)	(5)
Integ Theater	-0.0065	-0.0067	-0.0065	-0.0183	-0.0185
	(0.0071)	(0.0071)	(0.0071)	(0.0070)***	(0.0070)***
Integ Theater, Own Movie (IT,OM)	-0.1369	-0.1843	-0.1572	-0.1585	-0.2579
	(0.0150)***	(0.0267)***	(0.0180)***	(0.0151)***	(0.0268)***
IT,OM*[US Release]		0.0695			
		(0.0303)**			
IT,OM*[US Box Office] **($1 million)**			0.0055		
			(0.0020)**		
# Screens				-0.0147	-0.0151
				(0.0005)***	(0.0005)***
IT,OM*[# Screens]					0.0161
					(0.0036)***
Constant	0.2905	0.2907	0.29062	0.4208	0.4232
	(0.0016)***	(0.0016)***	(0.0016)***	(0.0050)***	(0.0050)***
R-squared	0.74	0.74	0.74	0.75	0.75

Note: The table reports the effect of organizational form on the probability of stopping the run of a movie once we co
movie-period-city fixed effects. I use linear probability model in this case because there are over 55,000 fixed effects
and logit have a hard time estimating the effect of organizational form with these many fixed effects. Each column he
presents a regression. All regressions used 93,792 observations. The dependent variable is CUT, a dummy variable
takes value 1 if movie does not continue showing in the theater the following period, and 0 otherwise.
I regress CUT as the dependent variable using the whole sample of 229 theaters and 18 months of data.
IT,OM stands for "Integrated Theater, Own Movie".
The numbers in brackets are robust standard errors and clustered by theater. *** significant at 1%, ** at 5%.

Table 5. Selective Results from First Step Estimation

	Non-integrated	Integrated	Difference
$LogA_i$	0.36	0.16	0.21
	(3.26)	(0.12)	(4.21)
γ_i	-0.44	-0.12	-0.32
	(0.54)	(0.07)	(0.69)
β_i	-0.19	0.01	-0.2
	(0.23)	(0.01)	(0.29)
No. Obs	248	149	

Note: This table reports the coefficients found in the first step estimation of the econometric procedure. In this first step, I estimate the equation below and back out coefficients lnA, γ and β for each movie i.

$$\ln(\text{Revenue}jt)=\Sigma[\ln Ai +\gamma i*t +\beta i*t2] + \alpha j + \delta t + \varepsilon jt$$

First and second columns show statistics of those parameters for movies distributed by non-integrated and integrated firms respectively. Finally the third column shows differences between these two groups.

Table 6. The Effect of Organizational Form in the Probability of Cutting the Run of a Movie

Dep Var: {Cut Movie=1}	(1)	(2)	(3)	(4)
Integrated Movie	**0.045**	**0.044**	**0.044**	**0.044**
	(0.006)* **	**(0.007)*** **	**(0.007)*** **	**(0.007)*** **
Integrated Theater	**-0.010**	**-0.001**	**0.017**	**0.007**
	(0.014)	**(0.087)**	**(0.028)**	**(0.028)**
Integrated Theater, Own Movie	**-0.055**	**-0.058**	**-0.101**	**-0.099**
	(0.015)* **	**(0.015)*** **	**(0.025)*** **	**(0.024)*** **
Revenue (in thousands)		-0.011	-0.011	-0.016
		(0.004)**	(0.004)**	(0.006)***
[Integrated Theater]*Revenue (in thousands)			-0.004	-0.001
			(0.005)	(0.005)
[IntTheat,OwnMov]*Revenue (in thousands)			0.012	0.011
			(0.006)**	(0.005)**
Revenue^2 (in thousands)				0.0008
				(0.0001)***

Note: The table reports the marginal effects of organizational form and revenue on the probability of stopping the run of a movie. The dependent variable CUT takes value 1 if the movie in question is cut in that theater in that period, and 0 if it continues. Each one of the estimations counts with 43180 observations.

Revenue numbers come from my first step estimation, where I back out a measure of popularity per movie and period, and apply the share of popularity of each movie in each theater and period to the revenue collected by that theater in that same period.

The numbers in brackets are robust standard errors and clustered by theater. * significant at 10%, ** at 5% and *** at 1%.

Table 7. The Effect of Organizational Form on Movie Run Length by Movie Type and Theater Size

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Integ Movie	0.0338	0.0337	0.0193	0.0190	0.0259	0.0453	0.0456
	(0.0059)***	(0.0058)***	(0.0054)***	(0.0054)***	(0.0045)***	(0.0057)***	(0.0056)***
Integ Theater	0.0099	0.0100	0.0119	0.0120	0.0111	-0.0061	-0.0076
	(0.0278)	(0.0278)	(0.0282)	(0.0282)	(0.0220)	(0.0284)	(0.0292)
Integ Theater, Own Movie	-0.0926	-0.1103	-0.1046	-0.1174	-0.1389	-0.1139	-0.1617
	(0.0246)***	(0.0265)***	(0.0206)***	(0.0209)***	(0.0171)***	(0.0242)***	(0.0287)***
US Release	-0.0821	-0.0838					
	(0.0121)***	(0.0128)***					
IT,OM*[US Release]		0.0341					
		(0.0204)*					
Over $100m US Box Office			-0.1664	-0.1687	-0.1838		
			(0.0129)***	(0.0133)***	(0.0135)***		
$100-$10m US Box Office			-0.0749	-0.0767	-0.1032		
			(0.0121)***	(0.0129)***	(0.0149)***		
IT,OM*[Over $100m]				0.1207	0.1622		
				(0.0459)***	(0.0555)***		
IT,OM* [$100m-$10m]				0.0325	0.0716		
				(0.0215)	(0.0293)**		
5-9 Screens						-0.0842	-0.0943
						(0.0256)***	(0.0260)***
10 + Screens						-0.1296	-0.1419
						(0.0290)***	(0.0294)***
IT,OM*[5-9 Screens]							0.1208
							(0.0632)*
IT,OM*[10 + Screens]							0.2084
							(0.0680)***

Notes: Dependent variable is the same as in Table 6 and Table 4, CUT=1 if period t is the last period of the movie run, and 0 otherwise.
Each specification above include revenue, revenue squared and revenue interacted with dummy variables of integrated theater and own movie in integrated theater. The marginal effect of revenue and its interaction with the dummy variables of interest are consistent with those in Table 6.
IT,OM stands for "Integ Theater, Own Movie". "5-9 Screens", "10+ Screens", "Over $100m US Box Office" and "$100m-$10m" are all dummy variables that take value 1 if their name takes place, and 0 otherwise.
All estimations count with 43,180 observations, except column (5) that counts with 32,399 observations. Column (5) is a repetition of column (4) with only those movies that were released in the US previous to their release in Spain. All regressions contain month fixed effects.
The numbers in brackets are the robust standard errors and estimations are clustered by theaters. *** means significant at 1% level, ** significant at 5% and * significant at 10%.

Table 8. The Effect of Organizational Form Using Cox Proportional Hazard Model, plus by Movie Type and Theater Size

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Integ Movie	0.0681	0.1107	0.0078	0.0409	-2.7761	-2.7318	-1.1543	-0.1874	-0.3948
	(0.0212)***	(0.0231)***	(0.0887)	(0.2917)	(0.5299)***	(0.4753)***	(0.2868)***	(0.2895)	(0.4114)
Integ Theater	-0.0428	-0.0387	0.0078	0.0072	0.0072	0.0074	0.015	-0.0625	-0.0615
	(0.0537)	(0.0544)	(0.0887)	(0.0873)	(0.0873)	(0.0874)	(0.1008)	(0.0586)	(0.0586)
Integ Theater, Own Movie	-0.3714	-0.3655	-0.7307	-0.749	-0.7815	-0.8293	-0.9209	-0.9571	-2.1451
	(0.0525)***	(0.0625)***	(0.1622)***	(0.1658)***	(0.2938)***	(0.1809)***	(0.1770)***	(0.1813)***	(0.2439)***
IT, OM*[US Release]					0.0408				
					(0.2075)				
IT, OM*[US Box Office] **($millions)**						0.0027	0.0031		
						(0.0009)***	(0.0009)***		
Screens								-0.0606	-0.0639
								(0.0056)***	(0.0063)***
IT,OM* [Screens]									0.1550
									(0.0226)***
Fixed Effects	No	Month	Movie	Month,Movie	Month,Movie	Month,Movie	Month,Movie	Month,Movie	Month,Movie

Notes: The coefficients reported are the result of estimating a Cox Proportional Hazard Model. Each one of the estimations counts with 19,771 observations, except for column (7) that counts with 14,932 observations. This difference is due to the fact that column (7) only has movie runs of movies previously released in the US.

The sample used in this table is much shorter than that in Tables 6 and 7 because of estimation problems with the amount of movie fixed effects. For this purpose, I randomly selected 50% of the 511 movies for which information is available, and proceeded with the estimation. I allow weekly box office revenue to vary across time in the baseline hazard.

Robust standard errors are in parentheses, and observations are clustered by theater. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 9. Are There any particular Type of Movies more Likely to Be Distributed by Integrated Firms?

All Observations

	(1)	(2)	(3)	(4)	(5)	(6)
Spanish Movie	0.1000			0.1010		
	(0.0700)			(0.0701)		
European Movie		-0.0175			-0.0297	
		(0.0650)			(0.0649)	
US Movie			0.0110			0.0271
			(0.0631)			(0.0638)
US Release	-0.0132	-0.0723	-0.0674	0.0249	-0.0426	-0.0404
	(0.0537)	(0.0665)	(0.0652)	(0.0571)	(0.0677)	(0.0662)
US Box Office				**-0.0009**	**-0.0009**	**-0.0009**
(in $1000K)				**(0.0004)***	**(0.0004)***	**(0.0005)***

Drop Observations of Subsidiary Firm

	(1)	(2)	(3)	(4)	(5)	(6)
Spanish Movie	0.0340			0.0333		
	(0.0647)			(0.0636)		
European Movie		0.0370			0.0149	
		(0.0641)			(0.0622)	
US Movie			-0.0705			-0.0419
			(0.0615)			(0.0623)
US Release	**-0.1105**	-0.0987	-0.0740	-0.0383	-0.0430	-0.0257
	(0.0515)**	(0.0655)	(0.0632)	(0.0543)	(0.0644)	(0.0617)
US Box Office				**-0.0019**	**-0.0019**	**-0.0018**
(in $1000K)				**(0.0006)*****	**(0.0006)*****	**(0.0006)*****

Note: The first half of this table reports the marginal effect of movie characteristics on its probability to be distributed by an integrated distributor. The sample contains 511 observations, and counts with movies distributed by the biggest five integrated distributors in the Spanish movie industry. The dependent variable is an indicator variable that takes value 1 if movie is distributed by an integrated distributor, and 0 otherwise.
The bottom half of this table also shows the marginal effect of movie characteristics on the probability of being distributed by an integrated firm. This part is different from the top half in that I take into account the fact that one of the integrated distributors is the subsidiary of a major US distributor, and therefore it cannot choose freely which product to distribute and which not to distribute.
The dependent variable is still an indicator variable which takes value of 1 if distributed by an integrated firm, and 0 otherwise. Due to dropping this integrated firm, the sample size is reduced to 454 observations. The numbers in brackets are robust standard errors.
* significant at 10%; ** significant at 5%; and, *** significant at 1%.

Table 10. "Make-or-Buy" Decision in Movie Exhibition Services

	(1)	(2)	(3)	(4)	(5)	(6)
Spanish Movie	-0.02113 (0.0094)**			-0.0048174 (0.0080)		
European Movie		0.04109 (0.0105)***			0.0278871 (0.0074)***	
US Movie			-0.04765 (0.0094)***			-0.0322749 (0.0073)***
US Release	-0.03751 (0.0096)***	0.00703 (0.0099)	0.011502 (0.0090)			
US Box Office **(by $1000K)**				-0.00031 (0.00010)***	-0.00019 (0.00009)**	-0.00018 (0.00009)**

Note: This table reports the marginal effects of movie qualitative information available before the opening of the movie in the Spanish exhibition market on the probability of showing the movie in one theater inside the firm or outside the firm. Colums (4) to (6) combine three of the previously described variables with an interaction between the existence of prior information from the US exhibition market and the exact quantitative information available. The sample in this case is restricted to only movies distributed by integrated firms and showing in both integrated and non-integrated theaters. The dependent variable MAKE takes a value 1 if the movie shows in a screen owned by its distributor and 0 otherwise. All regressions contain 9128 observations.
The numbers into brackets are robust standard errors; * significant at 10%, ** at 5% and *** at 1%.

Table 11. The effect of Vertical Integration in Number of Movies Marketed by Distributors

	(1)	(2)	(3)	(4)	(5)
VI	**32.1193**	**16.2089**	**-1.2241**	**18.1852**	**18.1081**
	(6.70)* **	**(9.48)***	**(9.28)**	**(9.10)** **	**(8.91)** **
VI*Screens		**0.507**	**0.0393**	**0.6731**	**0.1543**
		(0.21) **	**(0.14)**	**(0.21)*** **	**(0.14)**
Constant	40.6884	40.6884	43.6752	40.0194	83.0837
	(2.04)***	(2.04)***	(1.47)***	(1.92)***	(5.64)***
Fixed Effects	No	No	Firm	Year	Firm & Year
R-squared	0.04	0.05	0.65	0.18	0.72

Note: This table reports the effect of vertical integration in the number of movies distributed by each firm. Columns vary by fixed effects used and the inclusion of the size of exhibition division in integrated firms. The sample size is constant across regressions and accounts for 559 observations.
The numbers in brackets are the robust standard errors: * significant at 10%, ** at 5% and *** at 1%.

Table 12. The effect of Vertical Integration in the Average Movie Audience per Distributor

	(1)	(2)	(3)	(4)	(5)
Movies	323.7232	306.5271	432.6457	111.7267	49.1897
	(72.65)***	(72.71)***	(76.69)***	(94.10)	(104.68)
VI	**45.0584**	**-26,964.73**	**-29,633.70**	**-12,650.10**	**-13,844.01**
	(11,722.99)	**(16,301.88)***	**(16,264.48)***	**(19,358.59)**	**(20,401.64)**
VI*Screens		**878.2046**	**579.7152**	**799.5551**	**858.1167**
		(369.95) **	**(373.91)**	**(301.84)*** **	**(319.58)*** **
Constant	36,006.83	36,706.51	32,317.84	44,112.68	58,439.62
	(4,584.17)***	(4,574.68)***	(4,594.44)***	(5,125.07)***	(15,512.34)***
Fixed Effects	No	No	Year	Firm	Firm & Year
R-squared	0.04	0.05	0.11	0.48	0.5

Note: This table reports the effect of vertical integration in the average audience per movie distributed by each firm. Columns vary by fixed effects used and the inclusion of the size of exhibition division in integrated firms. The sample size is constant across regressions and accounts for 559 observations.
The numbers in brackets are the robust standard errors: * significant at 10%, ** at 5% and *** at 1%.