VERTICAL INTEGRATION DURING THE HOLLYWOOD STUDIO ERA

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ABSTRACT: The Hollywood "studio system" – with production, distribution, and exhibition vertically integrated – flourished from the late teens until 1948, when the U.S. Supreme Court issued its famous *Paramount* decision. The *Paramount* consent decrees required the divestiture of affiliated theater chains and the abandonment of a number of vertical practices. Although many of the banned practices have since been posited to have increased efficiency, an efficiency-enhancing rationale for ownership of theater chains has not been developed. This paper explores the hypothesis that theater chain ownership promoted efficient ex post adjustment in the length of film runs. Post-contractual run length adjustments are desirable because demand for a given film is not revealed until the film is actually exhibited. To test the hypothesis, the paper employs a unique data set of cinema booking sheets. It finds that run lengths for releases by vertically integrated (into exhibition) film producers were significantly – economically and statistically – more likely to be altered ex post. The paper also discusses additional contractual practices intended to promote flexibility in run lengths, some of which were instituted following the *Paramount* divestitures.

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I. INTRODUCTION

Arguably, no U.S. antitrust action of the post-War period has had a more profound effect on an industry than the *Paramount* case, which brought the famous Hollywood studio era to an end.[1] The *Paramount* consent decrees, following more than twenty-five years of near-continuous litigation, altered fundamentally the structure of the relationship between producer/distributors and exhibitors. Under the terms of the decrees, contractual practices such as block-booking were banned; the system of runs, clearance periods, and zoning under which films were distributed was outlawed; and the divestiture of producer-owned cinemas was mandated. The scope of the decision was remarkable – in recent years, only the AT&T break-up comes close.

The passage of time has not been kind to the economic arguments underlying the *Paramount* decision.[2] Kenney and Klein (1983) and Hanssen (2000) provide efficiency rationales for block-booking. De Vany and Eckert (1991) and Orbach and Einav (2007) discuss how minimum ticket prices reduced monitoring costs. De Vany and Eckert (1991, 76) argue that

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[1] *U.S. v. Paramount Pictures, Inc.*, 66 F. Supp. 323 (S.D.N.Y. 1946); modified on recharging, 70 F. Supp 53 (S.D.N.Y. 1947); *U.S. v. Paramount Pictures, Inc.*, 334 U.S. 131 (1948); remanded, 85 F. Supp. 881 (S.D.N.Y. 1949).

[2] The Court asserted that (first-run) exhibition was "foreclosed" in order to maintain a monopoly on movie production, and that the monopoly on movie production enabled the defendants to foreclose exhibition. (The circularity of the argument was not noted.) "Naive foreclosure" theory of this type was effectively demolished by Chicago school scholars of the late 1950s onwards. Although more recent models provide a stronger theoretical foundation for the claim of foreclosure through vertical integration (see, e.g., Salinger 1988, Ordover, Saloner, and Salop 1990, Riordan 1998), many non-affiliated producers and exhibitors were clearly *not* foreclosed during the Hollywood studio era – see the discussion that follows.

the system of runs, clearances, and zoning served to provide low-cost access to large numbers of film goers.[3]

The one banned practice that has yet to be explained satisfactorily is Hollywood's vertical integration of exhibition with production/distribution. Although the Justice Department's assertion that integration was intended to foreclose the market (thus preventing independent producers and exhibitors from entering) appears naive today, no better alternative has arisen.[4] Indeed, it is not immediately apparent what (if anything) film companies gained by owning both production and exhibition facilities. Cinema ownership was certainly not a prerequisite for success in production – there were a large number of cinema-less film producers (albeit somewhat smaller in size), including three of the *Paramount* defendants. Similarly, many independent cinemas flourished, and in fact accounted for the majority of attendance revenues. Furthermore, because most affiliated cinemas were more likely to show films by rival film-makers than by the affiliated studio, avoiding double marginalization does not appear to have been a key issue. And although direct ownership of certain large urban cinemas – the "movie palaces" – might conceivably be understood as a response to concerns about risk-sharing (they showed some of the highest variance films), information-gathering (they helped producers understand local demand conditions), or free-riding problems (their screenings influenced

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[3]In addition, De Vany and Eckert argue that various other practices described by the Supreme Court as "devices for stifling competition and diverting the cream of the business to the large operators" (e.g., "formula deals," whereby film rents were set as a percentage of national gross; and "master agreements," which licensed whole circuits simultaneously) actually served to reduce transaction costs.

[4]See Raskovich (2003) for a general model with proposed applications, one of which is the *Paramount* decrees.

attendance in subsequent runs), large urban cinemas comprised only a tiny minority of the exhibition outlets owned by the *Paramount* defendants.

In this paper, I explore the hypothesis that cinema-ownership promoted revenue-enhancing but difficult-to-contract-for ex post adjustments in the length of film runs.[5] Because the precise nature – or even existence – of any arrangement cannot be observed, I proceed by indirection.[6] Was vertical integration associated with a greater probability of ex post renegotiation in run length, ceteris paribus? Was there less ex post renegotiation where information problems were less severe? Did the distribution of motion pictures change following the *Paramount* -mandated divestitures?

To answer these questions, I make use of a unique data set of cinema booking sheets from the 1937-8 film season.[7] Consistent with the hypothesis, I find that abbreviated run lengths were roughly 10 percentage points more likely for films released by companies that owned cinema chains. The results are robust to alternative specifications, and hold for films of different types. I find that previously-screened films – i.e., films for which more accurate information about public demand was available – were significantly (economically and statistically) less likely to be abbreviated. I find that films released by companies that owned theater chains were booked for

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[5]Ex post adjustments could generate potentially large gains, because demand is highly unpredictable until a film actually begins its run (see, e.g., De Vany and Walls 1996).

[6]Although I use the word "arrangement," no explicit collusion was necessary – cinema ownership could simply have aligned incentives so as to support coordination. The existence of efficiency-enhancing cooperation during the studio era is discussed by Gomery (1986, 193), who writes, "Historians' interest in competition for maximum box office revenues (i.e., the differences between films) has only served to ignore the total and necessary corporate cooperation which existed on the levels of distribution and exhibition."

[7]The film booking season typically ran from September 1 of one year to August 31 of the following year. See *United States v. Paramount et al*, Petition, Equity No. 87-823 (1938), p 55.

narrower ranges, consistent with the idea that ex post adjustments were easier to make. Finally, I find that both film contracts and the process of film distribution changed fundamentally after the *Paramount* decrees, in ways a concern with ex post adjustment would suggest. All this is consistent with the proposition that cinema ownership was part of a system that supported efficient ex post adjustments in the length of film runs.

This paper thus contributes to a large literature on "relational" or "implicit" contracts – arrangements undergirded not by the threat of third-party enforcement (by a court, for example), but by reputation, the prospect of repeat dealings, or self-enforcing penalties.[8] As many researchers have noted, important aspects of business relationships (both inside and outside the firm) are conducted without formal contracts. Baker, Gibbons, and Murphy (2002, 40) write, "A relational contract . . . allows the parties to utilize their detailed knowledge of their specific situation and to adapt to new information as it becomes available." My hypothesis is that – whether because it underlay a well-defined agreement or simply served to align incentives – cinema ownership allowed film companies to adjust contracted-for run lengths as new information about the demand for individual films was revealed.

The paper also contributes to a burgeoning literature on vertical arrangements in the motion picture industry. Most similar to this study in its findings is Gil's (2007) analysis of the Spanish film industry – Gil concludes (as I do here) that vertical integration into exhibition is associated with more frequent ex post adjustments in run lengths. In another paper, Gil (2008) argues that vertical integration resolves run length distortions induced by revenue sharing

[8]See, e.g., Klein (1996), Klein and Leffler (1981), Telser (1981), and Williamson (1975, 1985). There is also a large related literature in sociology/organizational behavior; see, e.g., Simon (1951) on employment relationships.

contracts, and Gil and Lafontaine (2008) propose that revenue sharing deters opportunistic (i.e., inefficient) ex post renegotiation while giving exhibitors the incentive to keep films of ex ante uncertain quality on the screen longer. Filson (2005) develops a model that predicts that vertical integration allows better coordination of film runs, while Filson, Switzer, and Besocke (2005) examine ex post adjustments in sharing percentages, which grant a larger proportion of residual claims to exhibitors when films do more poorly then expected, and to distributors when films do better than expected. Corts (2001) provides evidence that producers and distributors with linked-ownership are better able to coordinate film opening dates. In studies of the Hollywood studio era, Hanssen (2002) explains the emergence of revenue-sharing contracts in movie exhibition as a response to measurement problems and the need to provide appropriate incentives, while Hanssen (2000) documents a number of features of contractual features intended to promote ex post flexibility. De Vany and Eckert (1995) examine and discuss the basic problem created by ex ante uncertainty in the motion picture industry, and the contractual mechanisms that have evolved to deal with it.[9]

The findings presented in this paper have implications not only for understanding the *Paramount* case (as important as this may be, given that the *Paramount* consent decrees are still in effect), but for theories of foreclosure more generally. The parallels between Hollywood's motion picture companies and today's cable television companies are clear, with vertically-integrated firms both providing "content" (movies and cable programs/networks) and owning exhibition facilities. A number of commentators have suggested that if allowed to produce

[9]For profit sharing contracts among "the talent", see, e.g., Chisholm (1997), Goldberg (1997), and Weinstein (1998). See Mortimer (2008) for a discussion of revenue sharing in the video rental business.

programming, cable television companies will favor their own productions over those of independent rivals.[10] In this paper, I provide evidence that cinema-owning motion picture companies did *not* favor their own productions – days of exhibition were divided nearly equally across the films of *all* producers. Moreover, I propose that any favoritism would have defeated the very purpose of the vertical integration.[11]

II. THE MOTION PICTURE INDUSTRY AT THE TIME OF *PARAMOUNT*

The motion picture industry encompasses three vertically-linked activities: production (using actors, sets, and film), distribution (passing motion picture prints from producer to exhibitor, and from exhibitor to exhibitor), and exhibition (showing motion picture prints to the final consumer). In any given year, hundreds of movies of various genres, costs, and ex ante unobservable levels of popularity are produced, distributed to local theaters, and exhibited.[12]

At the time of the *Paramount* decrees, there were five fully integrated (production-distribution-exhibition) and three partly integrated (production-distribution) *Paramount* defendants. The fully integrated defendants – known as the "Big Five" – were Twentieth Century-Fox, Loew's-MGM, Paramount, RKO, and Warner Bros. The partly integrated

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[10]See, e.g., Waterman and Weiss (1996), Chipty (2001). Similar arguments were applied to network television in past decades; see the discussion in Crandall (1975).

[11]These conclusions are consistent with studies of other industries – e.g., gasoline by Blass and Carlton (2001) and Barron and Umbeck (1984); breweries by Slade (1998) – that find forced divestment of retail outlets (generally justified on foreclosure grounds) *reduced* consumer welfare.

[12]Cassady (1958, 152) writes, "The major problem of motion picture distribution is to so deploy the several hundred prints of a film that maximum revenue will result from the process." De Vany and Eckert (1991, 77) note that in 1945, a black-and-white film print cost $150-300, and a colored print $600-800, to manufacture. The average number of prints per film was 300, and each print had about 100 bookings.

defendants – known as the “Little Three” – were Columbia, Universal and United Artists.[13] In the 1940s, Big Five-owned cinemas accounted for about 15 percent of all cinemas in the U.S., and for about 70 percent of first-run cinemas (cinemas that received films for exhibition first).[14] Big Five cinemas were the source of nearly half of all film rental revenues.[15]

Broadly speaking, the Big Five owned two different types of cinemas: “movie palaces” and “ordinary cinemas.” The movie palaces (sometimes referred to as “metro-deluxe” theaters) were the most famous, their distinguishing characteristics being size (typically seating thousands of viewers), opulence, and – importantly – the fact they exhibited *only* the films of the affiliated

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[13]All eight defendants engaged in distribution, and all but United Artists engaged in production (UA distributed the films of a small number of affiliated producers). The eight defendants accounted for 71 percent of total feature films released between 1937 and 1946, and almost all of the ‘A’ pictures (see Conant 1960, 45). There were also a large number of smaller production companies who were not defendants in the case – the *1946 Film Daily Yearbook* lists film releases by 29 separate firms. Most of these companies (Monogram and Republic were two of the largest), tended to devote themselves to serials (such as the *Lone Ranger* films) and B-pictures. There were 64 film distributors in existence as of 1944 (and 77 in 1946), but only eleven engaged in nationwide distribution (the eight *Paramount* defendants plus low-budget film makers Monogram, Republic, and PRC).

[14]The Big Five also owned subsequent-run theaters; see Conant (1960) for details and discussion. First-run theaters exhibited films first upon release, and were located in prime downtown areas. Second and third-run theaters tended to be somewhat smaller, and were located in less central, areas. Fourth and fifth (and subsequent) run theaters were smaller still, and found mostly in residential neighborhoods. A large city (like Chicago) might have a dozen runs. Theaters within each run designation enjoyed a contractually-set period of time that had to pass before a film could be sent to a lower-run theater – the “clearance.” Second-run theaters, for instance, usually had to wait for three weeks beyond the end of the first-run to exhibit a film. Finally, runs and clearances operated within a specified geographic “zone,” over which the exhibitor was given exclusive privilege. This was the system of “runs, clearances, and zoning” that was banned under the *Paramount* decrees. See, e.g., Huettig (1944, 125-7) for more detail.

[15]See Appendix to the Brief for the United States of America, Section B, *The United States v. Paramount Pictures, Inc., et al.*, October 1947. Cinemas owned by the Big Five were especially important in major urban areas, accounting for 70 percent of rental revenues in New York, 75 percent in Philadelphia, and 75 percent in Atlanta. Generally speaking, the larger the city, the smaller the proportion of revenue earned during the first-run (because the greater the number of subsequent runs). See Huettig (1944, 78-9).

studio (typically in a "pre-release" mode that preceded the official first-run).[16] Palace screenings could last for weeks, were tracked nationwide by industry publications (the weekly trade paper *Variety* devoted several pages to them in each issue), and served to influence success in the runs that followed (both by inspiring audiences to see the film, and by inspiring exhibitors to show the film in the first place).

Yet, as can be seen in Table 1, movie palaces made up but a small minority of the cinemas owned by the *Paramount* defendants – about 5 percent in terms of numbers (two-to-three times that in terms of revenue generated).[17] Most Big Five cinemas were "ordinary," in the sense of not differing from the independent cinemas with which they competed (in terms of size, appearance, or booking practices). "Ordinary" Big Five cinemas were set in unglamorous locales, such as Hickory, North Carolina (the Paramount-owned Center Theater), or Florence, Colorado (Fox's Liberty Theater), or Appleton, Wisconsin (Warner Brother's Appleton Theater). The were also relatively small, seating hundreds rather than thousands, as did the palaces.[18]

Most germane to this analysis, these ordinary cinemas, unlike the palaces, exhibited films produced by rival film companies, typically renting from all of the major producers. This can be

[16]Balio (1985, 47) writes, "after the movie palaces were built, it meant playing a picture before general release in a first-class theater on an extended basis." The original complaint by the Department of Justice did not focus on first-run cinemas per se, but rather on ownership of "metropolitan deluxe theaters" – i.e., movie palaces. An example of an erstwhile movie palace is the Paramount Theater, which was located at the base of the Paramount Building in Times Square and seated 3600. (For a description, see http://en.wikipedia.org/wiki/Paramount_Theater_(New_York_City).)

[17]The exceptionally large number of Paramount cinemas is partly explained by the fact that Paramount commonly took partial stakes (see below for discussion).

[18]As of the late 1930s, the average cinema in the U.S. seated 579, and only 0.7 percent of all cinemas seated more than 3000 (and 7 percent seated more than 1500) – see the *1938-39 International Motion Picture Handbook*, pp 930-1. Huettig (1944) calculates that the average cinema of the mid-1940s seated 627, while cinemas that belonged to chains seated 897 (that latter average would include palaces).

seen in Table 2, which shows total days of first-run exhibition by producer for twenty-three Warner Bros.-owned cinemas over the 1937-38 season (see Section IV for more detail on these cinemas). Despite the Warner Bros' ownership, Warner Bros.' releases accounted for only 16 percent of film showing days, the same as for Paramount and Fox, and less than for MGM, which accounted for 18 percent of total film showing days.

The hypothesis I test in this paper – that cinema ownership supported post-contractual adjustments in film run lengths – applies solely to these "ordinary" cinemas. Because a movie palace exhibited only the films of its affiliated studio, the costs and benefits of adjusting film runs ex post were fully internalized. This was not the case with the ordinary cinemas – when an ordinary cinema terminated the run of one producer's film, it (generally) replaced it with a film from a rival producer (as will be documented in Section IV). This created a problem which – I propose – cinema ownership helped resolve.

III. THE PROBLEM

The salient contracting problem in motion picture distribution is the need to promote two desirable yet conflicting objectives, commitment and flexibility. The schedule (including number of prints to be made, number of screens to be booked, length of bookings, and so forth) must be established before a film can be exhibited, but until the film is exhibited, demand for the film (and thus how many prints are needed, screens should be booked, etc.) is highly uncertain.[19]

[19]For a discussion of the problem, see De Vany and Walls (1996).

As a result, it may be desirable to renegotiate the contracted-for length of a film's run ex post; i.e., after demand for the film has been revealed.[20]

Yet establishing a formal – third-party enforceable – system under which ex ante contracts can be adjusted ex post is not a simple task. Movie exhibition contracts during the Hollywood studio era specified early termination penalties; indeed, this was the only formal contractual feature that dealt explicitly with ex post adjustments in run length (more on the penalty clause below). However, in order to promote efficient ex post adjustments, the penalties would have had to compensate the injured producer without affecting the producer's incentives regarding the ex ante quality of its films, and simultaneously render it profitable for exhibitors to engage only in surplus-increasing replacements. My hypothesis is that cinema ownership helped to "complete" the contract, and thus promoted efficient ex post adjustments in film run lengths.[21]

Cinema ownership would have played three principal roles. First, it would have reduced the need for film-by-film haggling by functioning as a de facto side payment, allowing vertically integrated producers to share in the surplus generated by the early replacement of their unpopular films.[22] Second, it would have reduced (or eliminated) information asymmetries between

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[20] An alternative to ex post adjustments would have been for movie companies to "start small" – i.e., release films in a small number of cinemas first – and then expand outwards as popularity is revealed. This is how manufacturers of many consumer goods release new products (adjusting shelf space, for example). And indeed, this is how films were released after theater chains were divested – see Section IV.

[21] As Klein and Leffler (1981) point out, when demand is uncertain ex ante (certainly the case with films), the bargaining threat points of the parties may move outside the easily "self-enforcing" range. See, Baker, Gibbons and Murphy (2002) for a formal analysis in which vertical integration may support a relational contract.

[22] Once producer A integrates into exhibition, when B's more popular film replaces A's, the rental revenue of "A the producer" diminishes, but the attendance revenue of "A the exhibitor" rises.

producers and exhibitors that could have led to inefficiently too many or too few replacements if a penalty clause alone were employed.[23] Third, it would have rendered the arrangement self-enforcing (which, because it was implicit, it needed to be) – the showing of Firm B's film in Firm A's cinema (to replace Firm A's unpopular film) could be made contingent on allowing Firm A's unpopular film to be replaced in Firm B's cinemas, as well (and vice versa). I will return to and expand upon this last point in Section V below.

In short, my hypothesis is that cinema ownership supported ex post renegotiations of film runs. The question is ultimately empirical – is there a relationship between run renegotiation and vertical integration? I turn now to the empirical analysis.

IV. THE EVIDENCE

To investigate the relationship between integration and renegotiation, I employ a unique sample of booking sheets from twenty-three Warner Bros.-owned cinemas in the state of Wisconsin.[24] What makes this data set unique – and allows my test – is that the sheets provide information on the *length of runs contracted for*, as well as on the number of days actually played (for several hundred films exhibited in nearly 2000 first-run screenings). Obtaining information

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[23]For example, exhibitors have better knowledge of local demand conditions, while on the producer's side, certain inputs to film performance may be difficult for exhibitors to observe, ex ante or ex post (because so many unidentifiable factors contribute to a film's performance). As a result, if the penalty is set too low (i.e., a cinema pays too little to switch films ex post), the cinema may switch too often (in the sense that expected revenue increases to the exhibitor is not by enough cover the full switching costs). Yet if the cinema pays the full cost of ex post switching (or more), the producer's ex ante incentive to invest in complementary inputs may be reduced.

[24]The source is the Warner Bros. Archives at the University of Southern California Film School.

on how long a film was *originally booked to play* is extremely difficult (I have found no other sources).[25] As a result, I am able to conduct a test that would not be possible otherwise.

At the same time, it is important to note the data set's limitations. First, it encompasses only cinemas owned by Warner Bros.. That said, as far as can be determined, Warner Bros. was no different than any other film company (vertically integrated or independent) when it came to the management of its cinemas, and the types of exhibition contracts its cinemas signed with distributors.[26] For example, the appendix to the brief in the *Paramount* case lists the "Master Agreement" (i.e., the terms in and above those of the Standard Form Exhibition Contract) for each and every *Paramount* defendant producer with each and every *Paramount* defendant exhibition chain. The terms employed with Warner Bros. cinemas are essentially identical to the terms employed with Fox, Paramount, Loew's and RKO cinemas.[27] A second, more minor limitation of the data set is the relatively small number of cinemas in the sample – more cinemas would presumably provide more information. However, the most relevant variation (given the paper's objective) resides in the cross-section of film companies – specifically, whether a given producer/distributor owns cinemas or not – and the composition of that cross-section is invariant

[25]By contrast, determining the number of days a film *actually played* at any given cinema is relatively unproblematic (although potentially time-consuming) – cinemas have advertised film showings in newspapers for many years.

[26]For example, Warner Bros.' executives (like executives from all the *Paramount* defendants) testified that they negotiated with their own cinema circuits as if the circuits were "strangers," and that many circuit officials, including theater managers, received salaries based upon a percentage of the given theater's profits (Conant 1960, 72). Consistently, RKO's theater managers had the right to refuse to accept any RKO film that they considered "unsuitable" for local audiences (Lewis 1933, 110).

[27]See *U.S. v. Paramount Pictures, Inc.*, 334 U.S. 131 (October 1947), "Appendix to Brief for the United States of America," pp. 61-88.

to the number of cinemas or films in the sample (and over the time period, as well).[28] I will discuss below what this implies for the estimation.

The sample consists of all films booked and screened by this group of cinemas during the 1937-8 film season. The 23 theaters collectively held 1950 screenings of 347 different films, with screenings lasting from one to ten days.[29] The fact that the average sample screening lasted 3.4 days provides further evidence that the sample is not atypical – the average screening in *all* U.S. cinemas at about that time lasted 2.25 days.[30] Each screening is an observation, so I have 1950 observations.

There are several features of the booking process worth noting. The first can be observed in Table 3. The vast majority of screenings – 1556 out of 1950 – involved films that were booked for a range of days (two-to-three days, three-to-four days), rather than for a fixed number of days. Booking films for a range of days was a logical response to ex ante uncertainty about quality – cinemas were thus contractually permitted to adjust run lengths (to a degree) after observing film performance. Table 3 also illustrates a second notable feature of the booking process: Each cinema booked films for many different periods of time (anywhere from one to

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[28]All of the Big Five integrated production/distribution with exhibition between the late teens and the late 1920s. Two of the Little Three – United Artists and Universal – owned theater chains in the 1920s, but sold them off (UA in a dispute among shareholders; Universal after declaring bankruptcy in the early 1930s).

[29]The film total includes second features when double features were shown, which was most of the time (in these cinemas and everywhere, the double feature was the norm). Thus, most of the screenings in the sample involved two films, although the same two films did not always run concurrently (e.g., the run of one-half of the double feature might expire or be replaced before the other).

[30]Because my sample consists only of first-run screenings, it is to be expected that its average run would be longer than the average for all cinemas. The figure for all cinemas is taken from *The 1940 Film Daily Year Book of Motion Pictures* (cited in De Vany and Eckert 1991, 77).

seven days). The average cinema in the sample booked films for 4.4 different time periods (6.8 when weighted by number of screenings). It appears that (not surprisingly) cinemas booked films they expected to perform better for longer runs – the more stars a film featured and the longer its running time (a proxy for budget), the longer the booked run.[31] In other words, cinemas and producers did not simply follow a mechanistic change policy, but attempted to set run length in accord with ex ante expectations about film quality.

Yet foresight being imperfect, there would have been times when replacing a film before (or after) the contractually-permitted range would have increased attendance revenues. And indeed, as Table 4 shows, early terminations were relatively common – 13 percent of screenings were ended before the minimum period specified in the contract (and 18 percent of screenings were extended).

What happened when a film's run was terminated before the minimum time specified in contract? There are several possibilities. First, prematurely terminated films may have been replaced by other (presumptively more successful) films released by the same producer, so that the costs and benefits of replacement were fully internalized (as was the case with the movie palaces). The data shown in Table 5 rule this out. The highlighted diagonal indicates the proportion of early terminations of a given producer's films followed by replacement by a film from the same producer. As can be seen, replacement by a film from a *different* studio was much

[31]In order to verify the relationship between running time and booked run, I examined three frequently-employed contract lengths – 2-4 days, 3-4 days, and 4 days – in the subset of cinemas that booked at least ten runs of each of these lengths. Films booked for 4 days were 91 minutes long on average, versus 79 minutes for films booked for 3-4 days, versus 71 minutes for films booked for 2-4 days. Only 20 percent of the shorter films starred a contract player (i.e., an actor under long-term contract with the studio – a status give mostly to A-stars), while nearly all the 4-day films starred at least one contract player.

more common. Given there are eight producers (and ignoring the fact that somewhat different numbers of films were booked from different producers), pure chance would indicate that 12.5 percent of the time, a terminated film would be followed by a film from the same producer. The average in the sample is 15 percent, falling to 13 percent when weighted by number of terminations. Terminated films were *not* more likely to be replaced by films from the same producer than from other producers.

Alternatively, perhaps the cinema replacing the film before its contractually-specified period merely paid the penalty indicated in the Standard Form Exhibition Contract – 65 percent of the rentals earned on the last day of showing before termination.[32] Simple calculations suggest that, for this sample of cinemas at least, this would not have been good strategy – early termination increased gross attendance revenues by 17 percent on average, but with the penalty subtracted, had a *negative* expected value for the cinema.[33] The fact that attendance revenue increased on average post-termination is reassuring (suggesting the replacements may have been efficient) but the relatively large number of early terminations – 258 out of 1950 screenings – is

[32]See any issue of the *Film Daily Yearbook* during the 1930s for a copy of the Standard Form Exhibition Contract. I cannot observe the contracts producers used with these particular cinemas (I have only the booking sheets), but the Standard Form Exhibition Contract formed the basis for exhibition contracts used by these producers elsewhere (see *U.S. v. Paramount Pictures, Inc.*, 334 U.S. 131, "Appendix to Brief for the United States of America," pp. 61-88.) I have obtained copies of exhibition contracts employed by Warner Bros. and RKO when booking films in other cinemas – they correspond closely to the Standard Form Contract.

[33]I analyzed the sub-set of films that were booked for the two-to-three day range (i.e., the exhibitor can send it back after two days or to keep it for a third) and canceled after the first day (so that I can observe how the film performed in its last screening; i.e., the first day) with the films that replaced them. I found that about two-thirds of replacements were *efficient* in the sense of generating more revenue than the old film on the day of replacement, but that only about forty percent of replacements were *profitable* to the exhibitor once the penalty is taken into account. In dollar terms, replacement increased gross attendance receipts on the day of replacement by 17 percent of average daily revenues, but led to an average *net loss to the cinema* equal to 6 percent of average daily revenues.

difficult to reconcile with a negative expected value for the cinema. This suggests that the early termination penalty may not have been widely enforced.[34]

Finally, there is the hypothesis I explore here – cinema ownership improved the incentive of fully-integrated firms to allow screenings of their films to be adjusted ex post, rendering application of the early termination penalty unnecessary (or redundant) in most cases. If this hypothesis is correct, early terminations – call them "abbreviations" – should be more common for the films of the cinema-owning Big Five than for the films of the cinema-less Little Three.

Test 1: The Relationship between Abbreviations and Integration

I start with a simple examination of mean values. As can be seen in the third column of data in Table 5, 16 percent of the screenings of Big Five films were taken off the screen earlier than specified in the contract, versus only 6 percent of the screenings of films of the Little Three. Furthermore, Warner Bros. films do not appear to have been treated differently than those of other producers, despite the Warner Bros.' ownership of the cinemas.

To test more systematically, I will start with probit analysis.[35] My model is:

1) $$Abbreviate_{ig} = \alpha + Integrate_{g}\beta + \mathbf{Z}_{ig}\gamma + \epsilon_{ig}$$

[34]No data exists to allow me to calculate by how much concession revenue – which presumably rises with attendance – might have increased because a less popular film was replaced. If I employ the present-day estimate that 40 percent of a cinema's total revenues are generated by concessions (National Organization of Theater Owners, quoted in Pellettieri 2007), and adjust for the fact that cinemas keep 15-20 percent of box office receipts today, as compared to 70 percent during my sample period, simple calculations suggest the expected loss to the cinema from abbreviation would have been somewhat smaller (closer to 5 percent than 6 percent), but a loss nonetheless. (And this does not account for the marginal cost of concession items.)

[35]93 percent of the abbreviations equal 1 day (recall that the average booking was only for 3.4 days), so using a dichotomous measure as my dependent variable rather than a continuous measure (more precisely, a count) has little effect on the results.

where $Abbreviate_{ig}$ is whether the showing has been abbreviated (ended before permitted under the contract), $Integrate_g$ is whether the producer owns cinemas, and **Z** is a matrix of controls. The subscript "i" signifies variation at the level of the individual observation (in this case, the screening), and subscript "g" signifies variation at the level of the group (in this case, the film company). My dependent variable takes on the values

$$Abbreviate_{ig} = \begin{cases} 1 \text{ if the screening period was abbreviated} \\ 0 \text{ otherwise} \end{cases}$$

I employ several specifications. First, I include the *Integrate* dummy variable by itself. Second, I control for the expected popularity of the film, using an ex ante measure and an ex post measure: number of days contracted for, and actual attendance revenue earned per day.[36] Third, I include dummy variables for each of the 23 cinemas and four seasonal quarter dummy variables (some cinemas shut down temporarily during the summer).

Table 6 presents descriptive statistics. Films released by the cinema-owning Big Five – represented by the *Integrate* variable – account for about three-quarters of all screenings (the other quarter being films released by the Little Three). The average contract was for 3.36 days, and the average film ran for 3.39 days, and generated about $1400, or $360 per day. The numbers vary across theaters – different theaters booked films for different periods, and some of the theaters only rarely exhibited films on first-run. (Appendix A shows the data by cinema.)

The left-hand side of Table 7 presents the results of the probit regressions (marginal effects shown). Consistent with the hypothesis, the point estimates on the *Integrate* variable are

[36]The correlation between the two variables (days contracted and revenue per day) is 0.62. Including higher order terms (e.g., days contracted squared) has little effect.

positive, statistically significant at less than one percent, and of such magnitude as to suggest screenings of films by the cinema-owning Big Five were seven-to-ten percentage points more likely to be abbreviated.[37]

In the data set, there are no changes over time in the cinema-owning status of any of the *Paramount* defendants – the measure of interest, *Integrate*, varies only across the eight producer/distributors. Moulton (1990) shows that models combining individual-level data (such as *Abbreviate*, which varies across screenings) with grouped data (such as *Integrate*, which varies only across film companies) will bias downwards the estimated standard errors of the coefficients if the group-specific effect is not taken into account. Thus, although the point estimates presented on the left-hand side of Table 7 are unbiased and consistent, the confidence interval implied by the reported standard errors is too narrow.

To illustrate the bias, I will re-write equation 1, decomposing the residual into two parts, a group-specific residual, and an idiosyncratic residual:

1') $$\mathit{Abbreviate}_{ig} = \alpha + \mathit{Integrate}_{g}\beta + \mathbf{Z}_{ig}\gamma + \mu_{g} + \upsilon_{ig}$$

A common way to account for the group-specific residual is to cluster standard errors at the group level (e.g., Wooldridge 2003). However, Donald and Lang (2007) point out that such clustering is justified only when the number of groups is "large" relative to the number of observations per group.[38] I have eight groups with roughly 250 observations each, rendering

[37]Including a Warner Bros. dummy in the probit analysis reduces the size of the coefficient on *Integrate* slightly (0.09 rather than 0.10 or 0.06 rather than 0.07), not surprisingly given that it removes from the *Integrate* coefficients the effect of one of the five fully-integrated firms. (The *Integrate* coefficients nonetheless remain statistically significant at less than one percent.)

[38]When this condition does not hold, the effect of clustering on the standard errors of the coefficients is simply not well-understood – the asymptotic properties are generally unknown. Donald

clustering inappropriate. Instead, I employ a "between-group" estimator.[39] I use a linear probability model, because a between-group estimator cannot be calculated using probit analysis.[40] One may think of this latter approach as complementing the probit results shown to the left – an "upper bound" to the probit's "lower bound" on the value of the standard errors.

The results are shown in the middle columns of Table 7. The marginal effects implied by the point estimates are roughly the same (not surprisingly) – the coefficients continue to indicate that cinema ownership is associated with a nine-to-ten percentage point increase in the likelihood of a film run being abbreviated. The estimated standard errors on the *Integrate* coefficients are now substantially larger, reflecting the fact that the approach accounts for the presence of common group effects. Nonetheless, the coefficients remain statistically significant at the five percent level.

An alternative means of accounting for group effects is the two-step approach proposed by Donald and Lang (2007). The first step is to estimate by OLS:

$$\textit{Abbreviate}_{ig} = d_g + \mathbf{Z}_{ig}\gamma + \epsilon_{ig}$$

where d_g are dummy variables for each producer. The second step estimates the effect of integration as follows:

$$\hat{d}_g = a + \textit{Integrate}_g\beta + \mu_g$$

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and Lang (2007, 299) state that, "the Cluster approach may be quite unreliable except in the case when there are many groups." Clustering by film company has very little effect on the standard errors in my analysis (results available from the author).

[39]The "between estimator" uses only the between group – i.e., cross-sectional – information contained in a panel data set (in contrast to the within-group, or time series, variation).

[40]I employ Stata. If I instead estimate a probit model on company-specific averages (i.e., one observation per company), I obtain qualitatively equivalent results.

where $\hat{d}_g$ are the estimates from the first stage equation.[41] Donald and Lang demonstrate that under the assumption that the error terms μ_g and υ_{ig} in equation 1' are normally distributed with 0 mean, constant variance, and 0 covariance for all *i* and *g*, the test statistics for this second stage estimator will be t-distributed, with g-2 degrees of freedom.[42]

The results of this third approach are shown in the far right-hand column in Table 7. The point estimate implies that integration is associated with an 8 percentage point greater likelihood of abbreviation. Based on a t-distribution with 6 degrees of freedom, the coefficient is significant at better than the five percent level.

In short, in all three estimations, the results are consistent with the hypothesis that cinema ownership promotes post-contractual changes in run lengths.[43]

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[41]By definition, the fitted values of d equal

$$\hat{d}_g = \overline{Abbreviate}_g - \overline{\mathbf{Z}}_g\gamma$$

where

$$\overline{Abbreviate}_g \, , \overline{\mathbf{Z}}_g$$

are the average values of the variables for each producer.

[42]An alternative method that does not require these assumptions is the minimum distance estimator, which here produces qualitatively equivalent results (not shown). In the first step, I estimated for each different producer a probit (using *Abbreviate*) on the film quality variables and the cinema and time dummy variables. Then with the eight intercepts, I estimated a weighted least squares (minimum distance) specification, with the weights equal to the inverse of the sampling variances. The resulting t-statistics are distributed approximately standard normal. I thank Jeff Wooldridge for this suggestion.

[43]As can be seen in Table 4, extensions of film runs beyond the contractual period were also common. Extensions may have been less contentious than abbreviations – if the alternative use of the film print was a second-run in a smaller theater in the same geographic zone, the film's producer was unlikely to object. However, at least on occasion, the alternative might have been more profitable than the extension – a first-run showing at a slightly smaller theater whose audience had yet to be exposed to the film, or a second-run showing in a wealthy area. Yet if total surplus would have been increased by the extension, vertical integration should be associated with extensions as well as abbreviations. When I replicate the estimations shown in Table 7 with extensions rather than abbreviations on the left-hand

Test 2: **Abbreviations of Films for which There was more Ex Ante Information**

This paper proposes that vertical integration into exhibition was driven by a lack of information – not enough was known about films being booked to set the run length accurately. An indirect test of this hypothesis is to examine whether abbreviations were fewer where the information problem was less severe. This is only a partial test: If I find this was so, it does not speak to the rationale for vertical integration, per se. However, if I find no relationship between the severity of the information problems and abbreviations, it would suggest the argument underlying this paper's hypothesis may not be correct (or is incomplete).

To define a set of films for which the information problem was less severe, I make use of the fact that the "movie palaces" discussed above exhibited films prior to the first-run during what was called a "pre-release" (pre-release attendance results were tracked weekly by *Variety* for the benefit of cinemas). Only a subset of films were exhibited in pre-release – the most expensive, star-filled productions. Pre-releases lasted weeks, and at least some of the information about box office receipts would have been revealed prior to the booking of first-run dates.[44]

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side, the coefficients on the *Integrate* variable are positive, indicating that the probability of extension is indeed higher for the fully-integrated Big Five. The point estimates are somewhat smaller (implying a five percentage point difference rather than a ten percentage point difference), and are on the border of statistical insignificance when the between estimator is used. Thus, although integration appears to have supported extensions as well as abbreviations, it also appears to have been less important to extensions, suggesting, perhaps, that ex post extensions were simply easier to negotiate.

[44]Cinemas would contract for a slate of films at the start of the film season, but would not agree the actual dates until several weeks before a film's first-run release, when pre-release results were already published (in trade papers like *Variety*). Most films were not finished when the original exhibition contract was signed (many had not even begun filming, and were identified simply as a "Clark Gable picture," or a "Lana Turner picture") – see Hanssen (2000). Similar practices exist today – agreements to show films are made well in advance of the film's release, and the specific date is set closer to the release time (see Fellman 2004).

For the 1937-38 season (i.e., my data set), I am able to determine which films were shown in pre-release by Warner Bros. and MGM.[45] Table 8 presents a list of these pre-release films (nine for WB; ten for MGM), along with each film's running time and negative cost. I also present average running time and negative cost for the other WB and MGM films in my sample (i.e., the films *not* shown in pre-release). As can be seen, pre-releases were substantially longer and more expensive than non-pre-releases (nearly one standard deviation more expensive). Most pertinently, as shown in the last column of Table 8, abbreviation rates were significantly (economically and statistically) smaller for pre-releases: 12 percent for WB pre-releases versus 26 percent for other WB films, and 3 percent for MGM pre-releases versus 9 percent for other MGM films.[46] In short, where the information problem was less severe (i.e., where the sample of films consists of films screened in pre-release before the first-run showings were booked), there were substantially fewer abbreviations.

<u>Test 3</u>: Integration and Booking Lengths

A third test of this paper's hypothesis can be conducted by examining the length of bookings. This paper proposes that cinema ownership rendered ex post adjustments in run lengths less costly. If this is true, then the length of ex ante bookings should have been less important for the films released by cinema-owning firms. More specifically, the ex ante range of

[45]The source for the Warner Bros. data is the William Schaeffer ledger, which contains information on film negative costs for and revenues earned by all WB films released during the 1937-8 season, and for the MGM data is the Eddie Mannix ledger, which contains the same information for MGM. For a discussion of ledger data and sources, see Glancy (1992, 1995). I thank Mark Weinstein for providing me with the Schaeffer data.

[46]Note that because of differences in local tastes and conditions, even a film shown in pre-release would not be expected to have an abbreviation rate of zero.

days for which a film was booked (defined as minimum days booked less maximum days booked) could be narrower, since ex post adjustments could be made more easily.

Were booked ranges narrower for the cinema-owning Big Five? The answer is yes, as can be seen in Table 9. The table presents regressions run on three dependent variables: *Range* (the number of days booked), *Max* (the maximum number of days booked), and *Min* (the minimum number of days booked). Each regression includes cinema and quarter dummy variables. Results from OLS and Poisson regressions are presented (the dependent variable is a count). As can be seen in the first two columns, the coefficient estimates are positive and statistically significant, implying that the average Big Five film was booked for a range that was roughly half a day less than that of the average Little Three film.

The table also shows the results of regressions using *Max* and *Min* as the dependent variables. The small and statistically insignificant coefficient on *Integrate* in the *Max* regression indicates that Big Five and Little Three films were booked for the same maximum number of days on average, ceteris paribus, while the positive and statistically significant coefficient on *Integrate* in the *Min* regression indicates that Big Five releases were booked for minimums that were roughly half a day longer. In other words, the difference between the Big Five and the Little Three shown in the *Range* regressions in the first two columns of Table 9 results from a larger value at the lower end, so that abbreviations (rather than extensions) were more likely to be required should the original calculations prove incorrect. This is again consistent with the hypothesis that Big Five film runs were less costly to abbreviate ex post.[47]

[47]Using a between estimator, as in the previous section, produces similar coefficient values, but with larger standard errors, so that the corresponding t-statistics are about 1.20.

<u>Test 4</u>: *Paramount's* Aftermath

Examining the period following the *Paramount* decrees would appear the ideal test of this paper's hypothesis. It is, in fact, somewhat problematic. First, a variety of vertical practices were banned, making it difficult to determine what changes (if any) followed from vertical dis-integration specifically. Second, the *Paramount* decision was handed down at a time of tremendous social and economic change – service men and women were returning home from war, the baby boom had commenced, the suburbs were growing rapidly, and (very importantly) television was on the rise. The motion picture industry changed dramatically, too. As Balio (1990, 3) writes,

> Beginning in 1947, Hollywood entered a recession that lasted for ten years; movie attendance dropped by half, four thousand theaters closed their doors, and profits plummeted. In foreign markets, governments erected trade barriers to limit the importation of motion pictures. Thus, instead of enjoying sustained prosperity after the war, which many had predicted, Hollywood retrenched. Production was severely cut back; 'B' pictures, shorts, cartoons, and newsreels were dropped, and the studios concentrated their efforts on fewer and fewer 'A' pictures. The studio system went by the board as companies disposed of their back lots, film libraries, and other assets and pared producers, stars, and directors from their payrolls.[48]

For the most part, despite these changes, the *Paramount* defendants maintained their dominant position in the industry, now as "distributors" rather than "producer/distributors,"

[48]One of the few studies purporting to show an actual effect from the *Paramount* decision is De Vany and McMillan (2004), which finds that the share prices of the integrated *Paramount* defendants fell by 4 to 12 percent when the Supreme Court handed down its 1948 decision, and that the share prices of both the non-integrated defendants and independent producers who were not defendants fell by just as much. The authors conclude that this supports the hypothesis that the disputed vertical practices did not foreclose competition. More typical are Crandall (1975) and Conant (1981), who harbor no doubts that the *Paramount* defendants were behaving anticompetitively (on page 54, Crandall writes, "A more successful cartel could hardly be imagined"), yet acknowledge nonetheless (in a somewhat puzzled fashion) that the *Paramount* consent decree appears to have had little effect on the industry.

albeit distributors who financed film production.[49] But in the absence of cinema ownership, how were ex post adjustments of run lengths dealt with? The answer is that exhibition contracts changed in fundamental ways that made run length adjustments less costly.[50]

The pre-*Paramount* exhibition contracts had specified how long a run would last and included a penalty clause for early termination, but little else – ex post adjustments (of which, as we have seen, there were many) were handled outside the formal framework of the contract. The post-*Paramount* exhibition contracts also specified a basic run length and a penalty for early termination, but for the first time included several clauses that formally linked the duration of the run to the performance of the film. Foremost was the "holdover" clause, which automatically extended the length of a screening if weekly attendance revenues exceeded a specified target (which differed by cinema).[51] Given widespread use of the holdover clause, it became less important to agree a specific duration for a run (recall that in the pre-*Paramount* days, cinemas booked films for varying periods, depending upon how the film was expected to perform), and an initial run of one week became the norm (regardless of the size, location, or priority of the

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[49]Crandall (1975, 52) reviews the evidence for the post-*Paramount* period and concludes "Distributors [principally, the former *Paramount* defendants] still control the number of productions and often exert an influence over the artistic details since it is they who underwrite the pictures." Similarly, Balio (1990, 10) states, "By 1970, the majors functioned essentially as bankers supplying financing and landlords renting studio space. Distribution now became the name of the game . . . but as financiers, the studios were able to retain ultimate discretionary power."

[50]See, e.g., De Vany and Eckert (1991) and De Vany and Walls (1996) for more detail on these practices. For a copy of a 1980 exhibition contract, see May (1983).

[51]The holdover clause was used on occasion during the Hollywood studio era, primarily for pre-releases in independent (i.e., non-Big Five-owned) movie palaces. However, it was not part of the Standard Form Exhibition Contract, and generally, therefore, would not have been employed in contracting with "ordinary" first-run theaters, such as those in my sample.

cinema).[52] In addition, the number of screens on which a film was shown could be more quickly adjusted, because by the mid-1950s, the elaborate system of runs had shrunk to a first-run and a subsequent-run (smaller cinemas either upgraded or disappeared).[53] Thus, film roll-outs could be gradual – commencing in large cities and expanding (or not) as the popularity of the film was revealed. It also became common for a distributor to allow a cinema to split scheduled screening times between motion pictures (the alternate feature being supplied by the same distributor) if an originally-booked film performed poorly. The appearance of the multiplex (multiple screen cinema) in the early-1960s furthered the process, by allowing cinemas to open films on several screens (or in larger screening rooms) and downgrade to fewer screens (or smaller screening rooms) as dictated by consumer demand.[54]

In an earlier paper (Hanssen 2000), I concluded that the booking practices that developed after the *Paramount* decrees managed largely to replicate the outcome of block-booking, although presumably at higher cost. The same appears to have occurred with respect to managing the ex post revelation of film quality. Whether these later practices were as effective as cinema ownership cannot be determined – certainly, film companies fought the forced divestiture of their theater chains vigorously. That said, the film industry has changed

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[52]Today, the period is three weeks for cinemas that open as part of the national run, which is most of them.

[53]By 1955, the number of four-wall cinemas had fallen by nearly 3000 units, 17 percent of the 1948 total, and by 1960, by more than 5000 units, 30 percent of the 1948 total. (Four-wall cinema numbers actually peaked in 1945, and declined subsequently.) Some of the fall was offset by the substantial rise in drive-in theaters that occurred over the same period. Even counting drive-ins, the total number of cinemas fell by nearly 10 percent between 1948 and 1960. See Steinberg (1980, 40-1).

[54]According to Steinberg (1980, 39), the first multiplex was built in 1963 in Kansas City, and by the late 1970s, multiplexes accounted for about 25 percent of all screens.

profoundly since 1948. Several firms reintegrated exhibition with production/distribution (a legal stricture binds only a sub-set of the *Paramount* defendants), but have since dis-integrated voluntarily.[55] No fully integrated company exists today.

V. A SELF-ENFORCING SYSTEM?

Baker, Gibbons, and Murphy (2002, 40) write, "relational contracts cannot be enforced by a third party and so must be self-enforcing."[56] Consider the relational contract I propose for the motion picture industry. If ex ante contracted run lengths reflected unbiased expectations about film performance, the hazard rate for terminations should have been roughly the same across the Big Five producers (ignoring differences in number and nature of films produced). If, in addition, each of the Big Five generated the same amount of revenue from its theater chain, roughly equal abbreviation rates would have implied roughly equal abbreviation counts. And with roughly equal abbreviation counts, it would not have benefitted any individual firm to cheat. If a firm insisted that, to the contrary, it be paid the contractually-required termination penalty, other firms could have retaliated by following suit, netting out to a transfer of zero. If instead a firm attempted to cheat by abbreviating film runs opportunistically (in response to a bribe, for example), the cheating would have been revealed over time by a higher abbreviation count, and other firms could then have imposed the contractually-specified termination fee. An implication

[55]For example, from the mid-1980s until 2002, the cinema chain Loews and film producer/distributor TriStar Pictures shared common ownership (and, after purchase by Sony, were linked with Columbia Pictures, too). However, in 2002 the Loews chain was spun off to private investors.

[56]See also, e.g., Klein (1996), MacLeod and Malcomson (1989), and Telser (1981).

is that a prohibitively high early termination penalty may have been optimal, serving as an effective deterrent to support the implicit contract.

My analysis reveals a number of consistent details. First the majority of early terminations by the Warner Bros. cinemas in the sample consisted of films released by *other* members of the Big Five, rather than Warner Bros.' own films – see Table 5. This suggests some sort of arrangement, in which only (or largely) members of the Big Five participated (not members of the Little Three). Second, Big Five firms generated roughly equal revenues in their theater chains (despite differences in cinema numbers, because of corresponding differences in the size and location of owned-cinemas). Table 10 presents the percentage of 1943-4 rental revenues generated by each chain – the percentages do not differ substantially across firms, with the exception of RKO, which was slowly going bankrupt.[57] (The Paramount number is overstated because Paramount's partial ownership of the majority of its cinemas is not taken into account).[58] Third, the 65 percent early termination penalty contained in the Standard Form Exhibition Contract may indeed have been prohibitively high (as discussed above, the majority of

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[57]Gomery (1986, 124) describes RKO as "the least profitable of the Big Five . . . the marginal studio – closer in many ways to Columbia and Universal than Loew's or Paramount." The revenues listed in the table are those from films released by the eight *Paramount* defendants only (which would have comprised the vast majority of box office receipts, in any case; circa 95 percent), and include receipts by palaces as well as by "ordinary" cinemas.

[58]According to a 1947 article in *Fortune* magazine (June 1947, p. 92), Paramount owned stakes of greater than 95 percent in 155 cinemas, stakes of 50-95 percent in 755 cinemas, stakes of 25-50 percent in 275 cinemas, and stakes of less than 25 percent in 25 cinemas. (Note that this adds up to a different number of cinemas than listed in Table 1 – getting precise totals was difficult, especially given that sales and purchases of individual cinemas were common). Partial ownership was employed much less frequently by the other Big Five firms. Possibly, the difference resulted from Paramount's early history – it the first company to vertically integrate, and did so in large part by bidding independent exhibitors away from a competing exhibitors' cooperative (known as the First National Exhibitors Association). See Hampton (1931, chpt. 12) for details.

early terminations would have generated negative returns for the terminating cinemas if the penalty was enforced).[59] Finally, although the number and proportions of abbreviations differed across members of the Big Five – see Table 5 – so did the mix of films. MGM released by far the longest – i.e., highest budget – films (see Table 11) and also had the smallest percentage of films abbreviated (see Table 5).[60] Fox and Paramount fell in the middle in both respects, while RKO and Warner Bros. released the largest proportion (among the Big Five) of shorter films, and had the largest proportions of abbreviations.

VI. THE CHANNEL

There are two, non-mutually exclusive, ways in which cinema ownership could affect ex post run length adjustments: 1) directly, by promoting more renegotiations, or 2) indirectly, by leading to specialization in types of films more likely to require renegotiation. Which effect dominated in the Hollywood Studio Era?

Broadly speaking, there were two distinct types of films produced during the Hollywood studio era: A-films and B-films.[61] A-films had relatively high budgets, starred well-known actors, and were long in duration; B-films had relatively low budgets, lesser/unknown actors, and

[59]In fact, in this setting penalties would have netted out to zero, and therefore could equally well have been imposed as not (ignoring the cost of imposition).

[60]Gomery (1986,63) writes that during the studio era, MGM "accumulated the greatest number of stars, and with these stars produced more top grossing films than any other studio." Davis (1993, 43) states, "Although not all of MGM's pictures were big productions, even its B-movies had a glossier look than many of the A's turned out by other studios."

[61]This oversimplifies – A-films included both the big budget extravaganza and the middle-of-the-road potboiler – what Schatz (1988, 75) calls "prestige" and "standard" A features – while B-movies included well-loved series (e.g., Sherlock Holmes, Andy Hardy, Charlie Chan) as well as stock westerns and gangster films.

short running times. B-films served primarily as the second feature in double bills, and as the occasional lead film in a subsequent run.[62] Although all of the eight *Paramount* defendants – whether vertically integrated into exhibition or not – produced both A-films and B-films, a greater proportion of the Big Five's production was devoted to A-films, while a larger proportion of the Little Three's – more specifically, of Columbia's and Universal's – production was devoted to B-films. This is evident in the data set, as summarized in Table 11. Films of less than 70 minutes in length were primarily B's. Compared to the fully integrated Big Five, Columbia and Universal released substantially larger proportions of B-films.[63]

Yet as shown in Table 12, films that ran for less than 70 minutes (presumptive B's) were only slightly less likely to be abbreviated than films that ran for 80 or 90 minutes. When I estimate the association between *Abbreviation* and *Integration* leaving the longest films out of the sample, it *strengthens* – films released by integrated producers are 10 to 13 percentage points more likely to be abbreviated. (Results available upon request.)

In short, it appears that the relationship between abbreviation and integration did not result merely (or even primarily) from the fact that the Big Five and the Little Three (specifically,

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[62] Low budget films have always existed, but the heyday of the B-film began with the emergence of the double feature as a standard mode of exhibition in the early 1930s (Davis 1993, 50, writes that Warner Brother's B-pictures, "were concocted to fill the bottom half of a double bill"). The double feature was a product of the Great Depression, the 1931 creation of a New England exhibitor with the goal of attracting audiences. Exhibitors tried many such fan-attractors, including raffles and crockery give-aways, but double features proved the most durable, remaining the norm in most cinemas through the 1940s. See Izod (1988, 98).

[63] The numbers presented in the table are not atypical – for example, Davis (1993, 50) states that about half of Warner Brother's pictures were B's during the 1930s and early 1940s. And Balio (1990, 4) writes that, "Universal and Columbia . . . were useful to the majors in supplying low-cost pictures for frequent program changes and double features." (Yet note that although UA released A-films exclusively during this period, abbreviations were no more common among UA films then among Columbia films.)

Columbia and Universal) made different types of films, but rather from the fact that otherwise similar films released by the Big Five were more frequently abbreviated.

VII. CONCLUSION

During the Hollywood studio era, the largest motion picture producers owned cinemas. In this paper, I have sought to explain why. Investigating a unique sample of cinema booking sheets from the 1930s, I find evidence in favor of the hypothesis that integration supported ex post changes in film run lengths, a desirable but potentially difficult-to-implement feature of film exhibition contracts.

An implication of this analysis is that antitrust authorities may not have been as far off in their *Paramount* accusations as one might think. If this analysis is correct, the Big Five *did* cooperate in a manner that raised their collective profits. The cooperation *did* involve differential treatment of films released by fellow members of the Big Five. And the ownership of cinema chains *did* serve to underpin the cooperation. Antitrust enforcers erred on just one small point – rather than reducing the number or quality of available films by foreclosing competition, the cooperation allowed film companies to match films and audiences better, so that consumers could see more of the movies they valued most.

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TABLE 1: CINEMAS OWNED BY THE BIG FIVE

Company	**Total cinemas**	**Palaces***	**Palaces****
20th Century Fox	575	19	35
MGM	143	20	29
Paramount	1165	40	29
RKO	105	19	23
Warner Bros.	443	20	19
Total	2431	118	135

Palaces* = "Metropolitan deluxe theaters, as listed in the DOJ complaint of 1938, pp 63-67
Palaces** = cinemas tracked by "*Variety*" in January 1940.

TABLE 2: WARNER BROS.-OWNED THEATERS
(1937-8 film season)

Producer	No. of screenings	No. of films	Days played	Percent of total days
Columbia	224	40	1531	10%
20th Century Fox	294	55	2367	16%
MGM	319	45	2659	18%
Paramount	337	52	2382	16%
RKO	245	46	1872	12%
United Artists	87	15	769	5%
Universal	180	38	1119	7%
Warner Bros.	264	56	2346	16%
Total	1950	347	15045	100%

Based on 23 Wisconsin-based cinemas that showed first-run films. Source: Warner Bros. Archives, University of Southern California Film School.

TABLE 3: FIXED VERSUS VARIABLE CONTRACTUAL RUN LENGTHS

Fixed Number of Days		Range of Days	
Contract (# Days)	# Films	Contract (# Days)	# Films
1	4	*1-3*	3
2	28	*2-3*	433
3	32	*2-4*	511
4	209	*2-5*	1
5	22	*3-4*	596
6	3	*3-5*	12
7	96	*4-5*	1
total fixed	394	***total range***	1556

TABLE 4: DAYS BOOKED VERSUS DAYS PLAYED

	Actual Days Played			
Contracted Days	*< Contract*	*Contract*	*> Contract*	*% Within Contract*
1	NA	3	1	75%
1-3	NA	0	3	0%
2	4	23	1	82%
2-3	66	358	8	83%
2-4	12	404	94	79%
3	12	20	0	63%
3-4	124	349	123	59%
4	19	76	115	36%
3-5	2	8	2	67%
5	7	15	1	65%
6	1	2	0	67%
7	11	82	3	85%
total	258	1340	352	69%

TABLE 5: REPLACEMENT MATRIX

	total screenings	total abbreviate	% abbreviate	Replaced by: Fox	MGM	Para.	RKO	WB	Columbia	UA	Universal
Fox	294	46	16%	**11%**	13%	22%	9%	17%	13%	4%	11%
MGM	319	26	8%	31%	**12%**	8%	8%	12%	19%	4%	8%
Paramount	337	38	11%	8%	32%	**18%**	5%	11%	13%	13%	0%
RKO	245	59	24%	12%	20%	15%	**15%**	19%	10%	0%	8%
WB	264	60	23%	18%	13%	12%	15%	**10%**	15%	2%	15%
Big Five	1459	229	16%								
Columbia	224	16	7%	13%	13%	6%	13%	13%	**25%**	13%	6%
UA	87	7	8%	29%	0%	29%	0%	0%	29%	**14%**	0%
Universal	180	5	3%	0%	40%	0%	20%	20%	0%	0%	**20%**
Little Three	493	28	6%								
Total	1950	257	13%	38	45	38	29	35	37	12	23
%				15%	18%	15%	11%	14%	14%	5%	9%

TABLE 6: DESCRIPTIVE STATISTICS

Number of observations (screenings):	1950
Number of cinemas:	23
Number of films:	347

Variables	mean	stdev	min	max
Abbreviate	0.13	0.34	0	1
Integrate	0.75	0.43	0	1
days contracted	3.36	1.00	1	7
days played	3.39	1.53	1	10
admissions ($000)	1.39	1.75	.002	17.37
admissions per day ($000)	0.36	0.28	.002	2.48

TABLE 7: REGRESSION ANALYSIS
(Full sample of First-run Cinemas)

Dep. Var. = *Abbreviate*	Probit regression (marginal effects only)			Between-groups regression (linear probability model)		Two-step method (2nd stage)
constant				0.059 (.034)	-0.406 (.146)	-0.275 (.003)
Integrate	0.100 (.014)	0.101 (.014)	0.072 (.015)	0.104 (.043)	0.086 (.028)	0.080 (.032)
days contracted		-0.062 (.009)	0.105 (.017)		0.124 (.083)	
revenue per day		0.006 (.004)	0.009 (.004)		0.016 (.051)	
cinema dummies			yes			
quarter dummies			yes			
no. observations	1950	1950	1950	eight groups no. obs per group: min=89, max = 337, avg = 244		8
R2 (pseudo / adj)	0.03	0.03	0.10	0.49	0.88	0.39

Dependent variable = 1 if a screening is terminated before the contracted period; 0 otherwise.

TABLE 8: ABBREVIATIONS OF FILMS SHOWN IN PRE-RELEASE
(Compared to other films)

Films shown in pre-release:	running time (minutes)	negative cost (000$)	abbreviation rate
Warner Bros.			
Tovarich	98	1259	
Varsity Show	120	1114	
Emile Zola	116	829	
Jezebel	103	1073	
Gold Diggers In Paris	97	875	
The Adventure of Robin Hood	102	2033	
Fools For Scandal	80	1027	
Hollywood Hotel	109	1141	
Gold Where You Find It	94	1199	
Average for WB pre-releases	102.1	1172.2	12.3%
Average for WB non-pre-releases	70.0	274.3	26.1%
MGM			
The Bride Wore Red	103	960	
Conquest	115	2732	
Firefly	131	1495	
Girl of the Golden West	120	1680	
Marie Antoinette	160	2926	
Of Human Hearts	105	940	
Rosalie	122	2096	
Test Pilot	120	1701	
Yank At Oxford	105	1374	
Three Comrades	100	839	
Average for MGM pre-releases	118.1	1674.1	2.9%
Average for MGM non-pre-releases	80.4	430.6	9.7%

Source: William Schaeffer ledger (Warner Bros.); Eddie Mannix ledger (MGM)

TABLE 9: LENGTH OF SCREENING

Dep. variable:	*Range*		*Max*		*Min*	
	OLS	Poisson (marginal effects)	OLS	Poisson (marginal effects)	OLS	Poisson (marginal effects)
constant	1.968 (.375)		3.570 (.269)		2.060 (.484)	
Integrate	-0.465 (.022)	-0.451 (.095)	0.015 (.020)	0.015 (.012)	0.428 (.036)	.406 (.083)
cinema dummies	yes	yes	yes	yes	yes	yes
quarter dummies	yes	yes	yes	yes	yes	yes
no. obs.*	1556	1556	1556	1556	1556	1556
R^2 (adj/ pseudo)	.373	.027	.811	.043	.680	.083

*Only films booked for a range (rather than a fixed period) included.

TABLE 10: PERCENTAGE OF FILM RENTALS RECEIVED FROM EACH EXHIBITOR (1943-4 Season)

	Exhibitor								
Producer/ Distributor	RKO	Fox	Warner	Paramount	Loew's-MGM	Total affiliated	Five largest indeps	Other indeps.	Total
TOTAL	4.8	8.5	8.2	16.8*	7.1	45.3	3.7	51.0	100%

Source: Appendix to the Brief for the United States of America, Section B, *The United States v. Paramount Pictures, Inc., et al.*, October 1947,
*Paramount's total is not corrected for partial ownership of cinemas, which would reduce the number to about 10 percent.

TABLE 11: A-FILMS VERSUS B-FILMS

		# screenings	# films	avg running length (mins.)	# films less than 70'	% films less than 70'	# screenings of films less than 70'	% screenings of films less than 70'
Big Five	Fox	294	55	75.98	17	31%	88	30%
	MGM	320	45	88.35	3	7%	21	7%
	Paramount	337	52	78.96	22	42%	119	35%
	RKO	245	46	73.45	22	48%	96	39%
	WB	263	56	78.31	28	50%	114	43%
Little Three	Columbia	224	40	69.91	29	73%	142	63%
	Universal	180	38	73.75	26	68%	106	59%
	UA	87	15	94.43	0	0%	0	0%

TABLE 12: ABBREVIATIONS AND FILM LENGTH

Film Length	No. of screenings	Percent abbreviations
< 70 mins.	686	0.141
70 ≤ mins. < 80	418	0.163
80 ≤ mins. < 90	347	0.153
90 ≤ mins. < 100	288	0.097
mins. ≥ 100	211	0.048

APPENDIX A: WARNER BROS. CINEMAS IN WISCONSIN (1937-8 film season)

cinema name	*# first-run screenings*	*total first-run days*	*average screening length (days)*	*average total revenue per screening ($)*	*average daily revenue per screening ($)*	*number of contract lengths*
Appleton	53	207	3.9	864	221	8
Delavan	175	334	1.9	245	128	4
Egyptian	2	8	4.0	1074	269	2
Garfield	3	10	3.3	1649	495	1
Gateway	138	516	3.7	986	264	9
Geneva	217	406	1.9	330	176	4
Juneau	11	27	2.5	416	170	1
Kenosha	198	656	3.3	1754	529	6
Majestic	4	11	2.8	356	129	2
Milwaukee	1	3	3.0	626	209	1
National	7	18	2.6	607	236	1
Oshkosh	169	576	3.4	1418	416	6
Princess	3	5	1.7	324	195	1
Rex	146	559	3.8	773	202	6
Rialto	137	555	4.1	925	228	8
Rio	81	255	3.1	1512	480	7
Sheboygan	193	664	3.4	1206	351	9
Strand	105	453	4.3	1298	301	8
Uptown	3	9	3.0	1739	580	2
Venetian	190	653	3.4	1780	518	9
Vogue	15	37	2.5	244	90	2
Warner1	96	641	6.7	7119	1066	3
Warner2	5	12	2.4	1118	466	2