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At the Movies: Risk Sharing and the Economics of Exhibition Contracts*

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Abstract

The current literature on sharing contracts emphasizes the importance of asymmetric information and typically assumes that one party is risk neutral while the other is risk averse. This paper describes a real-world contract that is widely used - the movie exhibition contract - and argues that asymmetric information is not the main feature of the environment that leads to sharing. The explanation that fits the facts better is simply that distributors and exhibitors are both risk averse. The analysis suggests that two-sided risk aversion is important in determining contract terms.

JEL Codes: **L14:** Transactional Relationships and Contracts; **L22:** Firm Organization and Market Structure: Markets vs. Hierarchies, Vertical Integration; **L82:** Industry Studies: Entertainment.

Keywords: principal agent, licensing, entertainment, film, rental

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1. Introduction

The literature on the economics of sharing contracts stresses the importance of asymmetric information and the trade-off between providing incentives and sharing risks. Profit sharing occurs either when one party has private information that cannot be credibly revealed or when one party takes some unobserved action that affects the other. It is standard in models of sharing contracts to assume that one player is risk neutral and the other risk averse, so in the absence of asymmetric information no sharing occurs - the risk neutral party bears all of the risk (Mas-Colell et al. 1995). Although sometimes this assumption is reasonable, it often appears to be chosen simply because one player is less risk averse. Further restrictions on preferences would increase the importance of tastes in the explanation of contract terms, and as Stigler and Becker (1977) have noted, economists are uncomfortable basing arguments on tastes.

In this paper we describe a real-world sharing contract that is widely used - the movie exhibition contract - and argue that asymmetric information is not the main feature of the environment that leads to sharing. The explanation that fits the facts better is simply that movie distributors (studios or independent distributors) and exhibitors (theater owners) are both risk averse, and exhibition contracts are designed to share risk. It seems reasonable that other contracting environments may also involve two-sided risk aversion, and this should be taken into account in formal models and empirical work.

In the next subsection we describe exhibition contracts and summarize how they have evolved over time.¹ In Section 2 we show how a simple risk sharing model can generate an optimal sharing contract that is similar to a real-world exhibition contract. Focusing on exhibition contracts allows us to structure our analysis using features of the real-world

¹Modern movie exhibition contracts have been described by De Vany and Eckert (1991), De Vany and Walls (1996), Hanssen (1999), and Borcharding and Filson (2001). We also benefited from several conversations with industry participants, particularly Mike Doban of Trans-Lux Cinema Consulting, and several articles in *The Movie Business Book*, edited by Jason E. Squire. The articles are authored by prominent industry participants involved in distribution and exhibition: Stanley H. Durwood, chairman and chief executive officer of AMC Entertainment Inc.; A. Alan Friedberg, chairman of Loews Theatres, a subsidiary of Sony Pictures Entertainment; Robert G. Friedman, president of Warner Bros. worldwide theatrical advertising and publicity; Robert Laemmle, owner of Laemmle Fine Arts Theatres; A. D. Murphy, financial editor and reporter for *Daily Variety* and *Variety*; D. Barry Reardon, president of Warner Bros. Distributing Corporation, and a former executive of both Paramount Pictures and General Cinema Corporation; and Gregory S. Rutkowski, vice president, West Operations for AMC Theatres.

environment; contract theorists have often been criticized for ignoring real-world contracts. Our explanations for the features of exhibition contracts complement the explanations of De Vany and Eckert (1991) and De Vany and Walls (1996), who emphasize that difficulties with forecasting demand necessitate the use of short-term contingency-rich contracts. Other related work on the movie business is by Ravid (1999), who tests and rejects a model of asymmetric information at the project selection stage.

1.1. Risk Sharing and the Evolution of the Modern Movie Exhibition Contract

Modern movie exhibition contracts vary, but they generally have several common features. The *Paramount* decrees of the late 1940s and early 1950s prohibit contracts that tie movies or theaters together, so there is a separate contract for each movie and each theater. A typical contract is short term but can be extended: the initial run ends after four, six, or eight weeks, but a holdover clause allows the run to continue beyond this point as long as ticket revenue is sufficiently high. De Vany and Eckert (1991) and De Vany and Walls (1996) explain this feature of exhibition contracts: difficulties with forecasting demand necessitate the use of short-term contingency-rich contracts.

We focus on explaining the peculiar form of revenue sharing that is used in the modern contract. Each week, the distributor gets the maximum of three possible payments: 1) 90 percent of the movie's ticket revenue over the "house nut," where the house nut is a fixed amount paid to the exhibitor; 2) a "floor payment," some percentage of the ticket revenue that declines according to a "sliding scale" as the weeks go by - perhaps 70 percent in the first week, 60 percent by the third week, and as low as 40 percent by the end of the run; 3) a refundable advance. For hits early on in their runs, the 90 percent over the house nut is the relevant payment. For most other movies the floor is relevant, and for complete failures the refundable advance applies.² The exhibitor's payoff function associated with such a contract

²The advance works as follows: the exhibitor pays money up front to secure a movie and keeps all of the movie's revenue until the front money is covered. The front money is typically a refundable advance, although in rare cases nonrefundable guarantees are used. If the front money is never covered, then in the case of a refundable advance the distributor has to pay the exhibitor back the difference between the front money and the revenue. In the rare cases where guarantees are used the guarantee is almost always covered. Further, contracts may be renegotiated when complete failure occurs, so guarantees may not be enforced. In our analysis below we ignore the timing of payments and guarantees.

is graphed in Figure 1. Interestingly, concession revenue is *not* shared - the exhibitor gets all of the concession revenue. This is not a trivial oversight - concession profit typically accounts for approximately half of an exhibitor's profit.

In this subsection we argue that revenue sharing is used primarily to share risk. First, we provide a brief summary of the evolution of the sharing rule used in the modern exhibition contract and consider the reasons industry participants give for its use. By doing so we are following the approach of De Vany and Eckert (1991) and Hanssen (2000), who demonstrate that historical analyses provide useful insight into factors that affect contract terms. Our summary is based on the sources cited in fn. 1.

Originally movies were short, silent, relatively non-differentiated products that were cheap to make. Vertical arrangements were simple: movies were sold to exhibitors outright. As feature films were introduced, the public became more selective and production budgets rose. Risk sharing became important. Murphy (1992) notes that percentage rentals were introduced to "justify the investment risk." Originally distributors were paid fairly low percentages of ticket revenue, but the rates rose as production budgets rose. Distributors received roughly 20% early on, 25% in the 1920s, 33% in the 1960s, and around 45% in the 1990s. The actual figures varied considerably from movie to movie.

The modifications to the earliest sharing contracts reflect attempts on the part of exhibitors and distributors to minimize their downside risk. As noted above, in the modern contract the distributor gets 90% over the house nut when a movie is successful. The house nut is a fixed dollar amount that the distributor pays to the exhibitor. It was originally included in contracts with the pretext of covering exhibitors' costs. However, it is determined through negotiations along with every other contract term - none of the exhibitor's accounts are examined. Murphy (1992) describes how floor payments originated in the late 1960s "as a countermove by distributors who questioned the validity of house nuts and who no longer could afford to absorb most of the losses incurred by a failed film." A floor payment limits the distributor's downside - it ensures that the distributor obtains some minimum percentage of the movie's revenue. The floor is relevant when the movie is not a hit or is late in its run.

It is not surprising that risk sharing is the main motivation practitioners mention for the adoption of revenue sharing. Several authors (De Vany and Eckert, 1991; De Vany

and Walls, 1996; Weinstein, 1998; Borchering and Filson, 2001) argue that risk sharing is important in the movie industry. Making a modern movie involves substantial up-front costs which must be incurred before the movie reaches the market, and because each movie is different there is tremendous uncertainty about demand.³ Historically, both distributors and exhibitors relied heavily on internal financing, and neither party could afford to bear the full impact of a big-budget flop. As budgets rose and risks increased the contracts became more sophisticated to allow for greater risk sharing.

To further advance our argument that risk sharing is the primary motivation for revenue sharing, in the following paragraphs we argue that asymmetric information about movie quality (adverse selection) and incentive provision (moral hazard) are not important factors in the determination of contract terms.

Asymmetric information about movie quality does not appear to be an important feature of the environment. As De Vany and Eckert (1991) and De Vany and Walls (1996, 1999) note, the main information problem is that it is difficult to forecast demand because every movie is different. This problem does not give one side an informational advantage. The movie must be released and shown to an audience, and then the audience discovers whether it likes the movie. Screenings in advance of releasing a movie may provide some information, but De Vany and Eckert (1991) suggest that this information is quite limited - exhibitors often do not attend screenings.

Further, evidence suggests that screenings do not affect sharing rules. Regulations vary across U.S. states: in some states *blind bidding*, the practice of contracting before screening, is allowed, and in others it is prohibited. Where blind bidding is practiced, exhibitors submit bids before seeing the movie. Where blind bidding is prohibited, distributors must allow exhibitors to see the movie before contract terms are decided (although exhibitors may choose not to). The sharing rules are similar whether blind bidding is used or not.⁴ When

³Borchering and Filson (2001) report that in 1998 the average movie made by a member of the Motion Picture Association of America had production, distribution, advertising, and overhead and interest costs of \$78 million. De Vany and Walls (1996, 1999) describe the difficulty of forecasting demand. Vogel (1998) and others have noted that the average movie does not earn a positive return on investment - high profits on the few hits make up for the losses on the rest.

⁴Exhibitors often object to blind bidding, but this does not imply that asymmetric information is the cause of the objection. Our conversations with industry practitioners revealed that exhibitors object to blind bidding because it is typically accompanied by nonrefundable guarantees (instead of refundable advances,

comparing contracts in states with blind bidding to those in states without Blumenthal (1988) “focuses on the guarantee because it is the most variable element of the bid vector.”

Is incentive provision an important factor in determining contract terms? Bhattacharyya and Lafontaine (1995) show that simple sharing rules can be optimal when double-sided moral hazard exists, and their model could be applied to movie exhibition. Distributors must advertise and promote the movie, and exhibitors must hire employees and do some local advertising. Neither party’s activities are easy to monitor. Kenney and Klein (1983) point out that sharing contracts provide incentives for exhibitors to keep theaters clean and take other actions which are hard to monitor but that may increase ticket revenue. These incentive effects are clearly present, but are they the reason why revenue sharing is used?

Long-run relationships between exhibitors, customers, and distributors reduce the need for incentive contracts - reputation concerns provide incentives. For example, theater customers typically live nearby, so an unclean theater loses customers. Even if distributors paid flat payments to the exhibitor, a new contract would be negotiated each time a new movie was released. Thus, payments to the exhibitor would quickly fall if the theater lost customers. Therefore, the exhibitor would have the incentive to keep the theater clean even in the absence of a sharing rule. This implies that imposing risk on the exhibitor is unnecessary and sub-optimal (assuming the exhibitor is risk averse) unless the *distributor is also risk averse*. In the absence of the need to share risk the distributor could simply rent the auditorium at a flat rental rate using a “four walls” contract. Such contracts are used, but only rarely - sharing is the norm.

In summary, risk sharing appears to be the main motivation for the use of revenue sharing. In the next section we develop a risk sharing model that explains the basic features of the sharing contract. In modeling the determination of contract terms one issue that arises is how are the terms decided? The actual process is complex. In modern times most exhibition contracts are negotiated (Friedberg, 1992; Laemmler, 1992; Reardon, 1992). Although at the time of the *Paramount* decrees the courts favored allocating movies using competitive bidding they lacked the resources to monitor the bidding process. Distributors and exhibitors tend to prefer negotiating. Even when bidding is used it is not binding; bids serve as points

see fn. 2).

of departure for negotiations. Friedberg (1992) notes that distributors cannot simply choose the “highest” bid because multiple factors matter: studios require exhibitor bids to include 1) a schedule of admissions prices; 2) the number of shows for weekdays and weekends; and 3) the screen number and the number of seats in the auditorium in which the picture will play. Distributors also consider several other factors such as the demographics surrounding the theater, the location, and the decor. We suppress most of these details below, but incorporate one stylized fact that all authors seem to agree on: distributors, particularly the large studios, have more bargaining power than exhibitors. Therefore, in our model, distributors propose contracts and exhibitors accept or reject.

2. A Risk Sharing Model

As noted above, the basic features of the sharing rule, including the house nuts and floor payments, were originally adopted to share risk. The contract evolved during a period when single-auditorium theaters were the norm. In this section we present a simple risk sharing game played between one distributor with one movie and one exhibitor with one auditorium where both players are risk averse. We show how risk sharing explains the basic features of the sharing rule.

In all of our analysis in this paper we ignore costs and assume that profit maximization is equivalent to revenue maximization. This is a reasonable approximation to reality because when the movie is placed in the theater most of the distributor’s costs are sunk and most of the exhibitor’s costs are fixed costs.

We assume that when the exhibition contract is designed both players take the ticket price as given. This is a reasonable assumption. As noted above, distributors typically ask exhibitors to include their proposed ticket price in their initial bid. Further, theaters rarely change their prices over time (with the exception of daily matinee pricing).⁵ Denote the

⁵There are a variety of explanations for why ticket prices do not vary over time or across movies. De Vany and Eckert (1991) and De Vany and Walls (1996) suggest that ticket prices are rarely changed because inflexible ticket prices make it easier for distributors to monitor ticket revenue and help reveal excess demand. Our conversations with practitioners provide other explanations of why ticket prices are not changed: exhibitors want to avoid menu costs and also eliminate consumer uncertainty about what the movie will cost. Exhibitors claim that prices are not revised upwards when a movie is a hit because they are engaged in

ticket price by p . For simplicity assume that there is a single concession good, and that the price of this good is c . The theater's weekly capacity is N . Given p , c , and N , the number of consumers that come to the theater, n , is determined according to a probability density function $\Pr(n|p, c, N)$. Assume that each consumer that arrives at theater buys the concession good with probability $\lambda(c)$. This implies that the number of consumers that buy the concession good, s , is determined according to the binomial probability density function with parameters $\lambda(c)$ and n . Denote this density function by $\Pr(s|\lambda(c), n)$.⁶

The game proceeds as follows: The distributor proposes a contract $w(pn)$. For now, assume that concession revenue is not included in the sharing contract; in the next subsection we discuss reasons for this. If the exhibitor accepts the contract then it shows the movie and gets paid according to the contract. If it does not accept the contract it receives its reservation utility U_e^* . In reality U_e^* would be determined by competing bids (opportunity costs), but for simplicity assume that U_e^* is exogenous.

Suppose that both the distributor and the exhibitor have constant relative risk aversion: their utility functions are $U_d(x) = x^{\alpha_d}$ and $U_e(x) = x^{\alpha_e}$ respectively, where x is money and α_d and α_e are the coefficients that measure relative risk aversion.⁷ Assume that the distributor is less risk averse than the exhibitor, so $0 < \alpha_e < \alpha_d < 1$. This is a reasonable assumption - because of their size and capacity to diversify across movies distributors are likely less risk averse than exhibitors.⁸

The distributor chooses a contract to maximize its expected utility subject to the constraint that the exhibitor accepts the contract. The distributor's problem is

$$\max_{\{w(pn)\}_{n=0}^N} \sum_{n=0}^N U_d(pn - w(pn)) \Pr(n|p, c, N) \quad (2.1)$$

repeat business with local consumers, and the loss of goodwill that would result from higher prices outweighs the small short-run gain.

⁶Assuming that the density is binomial is not necessary to make our argument - the main assumption is that concession sales are a random function of attendance. However, because we simulate the optimal contract, we need to choose a functional form.

⁷These functions are simple and exhibit several intuitively plausible properties: the marginal utility is positive and diminishing; relative risk aversion, $\frac{-xU''(x)}{U'(x)}$, is constant; and absolute risk aversion, $\frac{-U''(x)}{U'(x)}$, is decreasing in the money payoff.

⁸Note that if both players are risk neutral then neither cares about who bears the risk and an infinite variety of contracts are optimal. If one player is risk neutral and the other is risk averse then it is optimal for the risk neutral player to bear all of the risk.

$$s.t. \sum_{n=0}^N \sum_{s=0}^n U_e(w(pn) + cs) \Pr(s|\lambda(c), n) \Pr(n|p, c, N) \geq U_e^* \quad (2.2)$$

The resulting first-order condition implies that at each value of n ,

$$U'_d(pn - w(pn)) = \gamma \sum_{s=0}^n U'_e(w(pn) + cs) \Pr(s|\lambda(c), n), \quad (2.3)$$

where γ is the Lagrange multiplier.⁹

To obtain some intuition about the shape of $w(pn)$, consider a special case: suppose that there is no concession and $\alpha_d = \alpha_e$. In this case

$$w(pn) = \frac{pn}{1 + \gamma^{\frac{1}{\alpha_d - 1}}}. \quad (2.4)$$

The sharing rule in this case is simple: the exhibitor receives a constant share of ticket revenue. If the exhibitor is more risk averse than the distributor, $\alpha_d > \alpha_e$, and the first-order condition implies that

$$pn - w(pn) - \left[\frac{\gamma \alpha_e}{\alpha_d} \right]^{\frac{1}{\alpha_d - 1}} w(pn)^{\frac{\alpha_e - 1}{\alpha_d - 1}} = 0. \quad (2.5)$$

By the implicit function theorem,

$$w'(pn) = \frac{1}{1 + \left[\frac{\gamma \alpha_e}{\alpha_d} \right]^{\frac{1}{\alpha_d - 1}} \frac{\alpha_e - 1}{\alpha_d - 1} w(pn)^{\frac{\alpha_e - 1}{\alpha_d - 1} - 1}}. \quad (2.6)$$

Expression (2.6) shows that $w(pn)$ is increasing in pn and that the slope of $w(pn)$ diminishes as $w(pn)$ rises - thus, the optimal sharing rule has a declining slope when the exhibitor is more risk averse than the distributor.

If the exhibitor is less risk averse than the distributor then $w'(pn)$ in expression (2.6) is increasing in $w(pn)$. This suggests that the assumption that $\alpha_d > \alpha_e$ is critical for generating a realistic contract. However, the presence of a concession contributes to a declining slope,

⁹Expression (2.3) is similar to the first-order condition in several classic papers on risk sharing. Borch (1960, 1962) was the first to characterize the first-order condition for optimal risk sharing between two risk averse parties, and prominent early work that followed his includes Arrow (1963), Wilson (1968), Shavell (1976), and Leland (1978).

even when $\alpha_d \leq \alpha_e$. At low levels of n demand for the concession good has high variance, and this variance imposes risk on the exhibitor. Therefore, the exhibitor has to be compensated with a relatively high share of ticket revenue. As n rises the demand for the concession good becomes easier to predict - when n is large enough the fraction of consumers that buy the concession good is exactly $\lambda(c)$. As the variance in demand for the concession good falls the exhibitor does not need to be compensated for bearing risk associated with the concession. Hence, the exhibitor's share of ticket revenue falls.

In the general case with a concession and $\alpha_e < \alpha_d$, expression (2.3) is analytically intractable, but the optimal contract can be computed using simulation methods. To simulate the model we choose realistic parameters for urban theaters based on information reported by the sources in fn. 1. Assume that the capacity per showing is 250 and there are four showings per day. The ticket price $p = 7$, the concession price $c = 5$, and $\lambda(c) = \frac{3}{5}$. Given p , c , and $\lambda(c)$, consumers spend \$3 on concession products for every \$7 spent on tickets on average. Durwood and Rutkowski (1992) suggest that this ratio is roughly correct. Given the capacity per showing, number of showings, and p , the maximum ticket revenue per week is \$49,000. Friedberg (1992) and Murphy (1992) suggest that successful movies in urban theaters earn close to \$50,000 per week, so these parameters are realistic. We choose the remaining parameters, α_d , α_e , and γ , in a rough attempt to minimize the square of the distance between the optimal contract that the model generates and the real-world contract graphed in Figure 1. The values used are $\alpha_d = .7$, $\alpha_e = .5$, and $\gamma = 20$.

The optimal contract is graphed in Figure 2. The sharing rule has a diminishing slope as in the real-world contract. The model also explains why floor payments have a sliding scale. Typically a movie's ticket revenue on a per-theater basis is highest in the early weeks and falls thereafter.¹⁰ Because n falls, the exhibitor's share of pn must rise in order for the exhibitor to obtain utility U_e^* . Formally, this is accomplished through an increase in γ (the

¹⁰De Vany and Eckert (1991), De Vany and Walls (1996, 1999) and Sawhney and Eliashberg (1996) examine time series of ticket revenue. Although most of the analysis is performed using national revenue, the data on revenue per screen suggests that revenue per screen tends to fall over time.

Distributors and exhibitors may anticipate that revenue per screen will peak in the second or later weeks when the movie opens just before a holiday weekend. In these cases exhibition contracts use a variation of the sliding scale - they include a "best weeks" clause that ensures that the high floor payments are associated with the high demand period.

risk aversion parameters, prices, and other variables do not change over the life of the movie). Increasing γ gives more of the box office revenue to the exhibitor at each level of revenue; thus, the sharing rule becomes steeper.¹¹

In summary, the risk-sharing model explains sharing rules with diminishing slopes and floor payments with sliding scales. Large upfront expenses and tremendous uncertainty about demand cause the distributor and the exhibitor to be risk averse. If exhibitors are more risk averse than distributors then the optimal sharing rule has a diminishing slope. The reduction in the variance of concession demand as attendance rises also contributes to the diminishing slope. The sharing rule must have a higher slope in later weeks of the run because expected revenue is lower but the exhibitor must continue to receive its reservation utility.

One final issue: if the modern revenue sharing contract is optimal why was it not used at the beginning of the industry? Our explanation is that initially movies were relatively non-differentiated and cheap to make. The demand for such movies was fairly predictable, and the cash flow consequences of a flop were not serious. Thus, the transactions costs associated with complex sharing rules were not worth bearing. Over time movies became increasingly differentiated and budgets grew. This trend continued through the 1950s when studios stopped making B movies in response to the emergence of television. As this trend continued it became more worthwhile for distributors and exhibitors to incur the greater transactions costs associated with increasingly complex sharing rules.

2.1. Concession Profits and Monitoring

Why is concession revenue not shared? Optimal risk sharing involves sharing concession revenue - as long as concession revenue is a random function of attendance, as we have assumed above, both parties can gain by agreeing to share the extra risk. Perhaps concession revenue is close to being a deterministic function of attendance - in this case the extra risk associated with fluctuations in concession revenue is slight. It also seems likely that

¹¹It is intuitive that γ , the Lagrange multiplier, must rise as revenue falls. The exhibitor's expected utility remains at U_e^* , so the distributor's expected utility must fall over the life of the movie. Given that the distributor has a concave utility function this implies that the marginal impact of a relaxation in the constraint on the distributor's utility, measured by γ , is higher later on in the life of a movie.

concession revenue is more difficult for distributors to monitor than ticket revenue. This is particularly true in multiplexes, in which distributors would find it difficult to attribute concession revenue to the various movies showing in the multiplex. When the monitoring costs are weighed against the gains from sharing concession risk, the outcome could be that the distributor prefers a sharing rule based entirely on ticket revenue. Suppose that in the model the distributor proposes a sharing rule for ticket sales $w(pn)$ and another rule for concession sales $w_c(cs)$, where if $w_c(cs) < cs$ the distributor has to bear some positive monitoring cost. Then if the monitoring cost is sufficiently high the distributor sets $w_c(cs) = cs$ and chooses $w(pn)$ as above.

2.2. Pricing and Long-term Relationships

Leaving concession revenue out of the sharing arrangement economizes on monitoring costs but contributes to an agency problem: After the contract has been signed the exhibitor may be able to increase its utility by changing the ticket price. A lower ticket price encourages attendance. The exhibitor gets a small percentage of ticket revenue so the small reduction in profit from lowering p is more than offset by the increased concession revenue that results from higher attendance. On the other hand, given the contract terms, the distributor wants to maximize ticket revenue and does not care about concession revenue, so the distributor prefers a higher ticket price.

One simple solution that overcomes the pricing agency problem is to include ticket prices in the contract. Unfortunately, the courts frown on vertical restraints of this type.¹² Another possible solution is to include concession revenue in the sharing contract, but this would require that the distributor bear high monitoring costs. Without monitoring, the best the contract could do is attribute the concession revenue to the various movies based on the number of tickets sold. This suggests that contracting on the number of tickets sold (rather than ticket revenue) could keep ticket prices up. *Per capita* clauses are used but are not common (De Vany and Eckert, 1991; Friedberg, 1992).¹³

¹²Many economists believe that vertical restraints should not be discouraged, in part because they allow contracting parties to economize on transactions costs (for a discussion, see Carleton and Perloff, 1994).

¹³De Vany and Eckert discuss other interesting that have been used in the past to overcome the monitoring problem. Studios have employed individuals to count the number of patrons at a theater to monitor ticket

The most compelling explanation for how ticket prices are kept up has to do with the structure of long-term relationships. Note that in order for the exhibitor to gain from adjusting p the adjustment must occur after the contract is signed. If the exhibitor adjusts p before the contract is signed then the distributor will simply change $w(pn)$ to ensure that the exhibitor still gets expected utility U_e^* . Given that distributors require exhibitors to include their proposed ticket price in their initial bid, an ex post price adjustment would violate an implicit contract. Such uncooperative behavior could cause the distributor to prefer the exhibitor’s competitors in the future. This “threat” encourages exhibitors to keep the ticket price up.

3. Conclusion

Our results suggest that two-sided risk aversion is an important feature of the contracting environment in the movie exhibition market. Movie exhibition contract terms evolved to help distributors and exhibitors share risks and do not appear to be designed to overcome asymmetric information problems. Our simple risk-sharing model shows how revenue sharing is used to share risks. Our model explains concave sharing rules and shows that floor payments with sliding scales are used to ensure that the exhibitor continues to obtain its reservation utility as demand for the movie falls over time. Other features of the environment influence the contract terms as well: concession revenue is not included in the contract because concession revenue is difficult for distributors to monitor, and the long-run nature of the relationship between distributors and exhibitors alleviates the adverse pricing incentives that result from not including concession revenue in the contract.

Although our risk sharing model is designed to explain exhibition contracts in the movie business, many of the insights obtained apply to other entertainment goods with uncertain demand such as new books and compact disks. Future research could investigate the interactions between two-sided risk aversion and contract terms in greater depth. The standard principal agent model with risk neutral principals and risk averse agents should be applied

revenue. Also, exhibition contracts sometimes based the distributor’s payment on the *national* revenue instead of the individual theater’s revenue. This severed the connection between the exhibitor’s revenue and the amount it paid the distributor and thus removed the incentive to misreport revenue.

only when it is reasonable to believe that the contracting party with most of the bargaining power (the principal) is risk neutral. Otherwise both players' risk aversion should be taken into account.¹⁴

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¹⁴Recent empirical work on the role of risk sharing in determining contract terms is mixed. For example, Allen and Lueck (1995, 1999) conclude that risk aversion cannot explain the contract terms in agricultural sharing contracts (the sharing rules originally analyzed by Cheung (1969)), but Aggarwal and Samwick (1999) find that risk sharing is important for explaining executive contracts in firms.

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Fig. 1. The Exhibitor's Money Payoff from a Typical Sharing Contract with an advance of 2000, a nut of 5000, and a floor of 60%

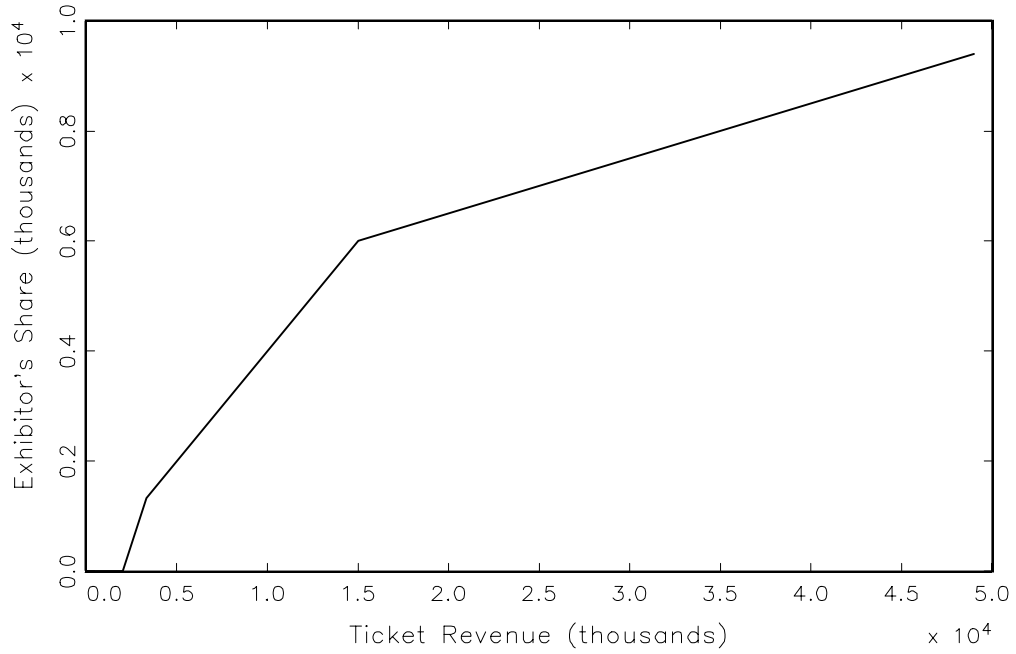


Fig. 2. The Exhibitor's Money Payoff from a Typical Sharing Contract with an advance of 2000, a nut of 5000, and a floor of 60%

