

# Profit-Sharing Versus Fixed-Payment Contracts: Evidence From the Motion Pictures Industry

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The choice between sharing and fixed-payment compensation schemes is examined using data on contracts from the motion pictures industry. Several competing explanations are explored, including moral hazard mitigation, risk sharing, liquidity constraints, and the superstar phenomenon. Detailed descriptive statistics are presented, and qualitative variation in contracting clauses is analyzed within this industry's institutional setting.

## 1. Introduction

Why does one film actor receive a fixed payment for his performance while another receives a share of the output? The answer to this question holds inherent interest to contract theorists as well as those intrigued by these high-profile contract terms. Does a share payment align the actor's incentives with those of the studio? Does the producer spread risk across the film's creative contributors? Or does the studio face liquidity constraints that lead to the promise of a future payment in order to secure the actor's services today? Perhaps it is the superstar who receives a share payment as a reward for his ability and star status.

This article explores these questions and hypotheses with original data on contract design in the U.S. motion pictures industry. Each hypothesis is pre-

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sented and tested using quantitative analysis of contract and contracting parties' characteristics. This study contributes to the share compensation literature by providing evidence on contracting patterns, particularly on the choice of contract type, from new data on actor compensation schemes, rather than from the traditional chief executive officer compensation data sources. Further, it provides a deeper understanding of the contracting institutions unique to this industry.

The discussion begins by describing the institutional framework within which an actor's contract is devised. Section 2 reconstructs a contracting time line and establishes contractual links between key contributors to the film's final attributes. This qualitative analysis of contracting terms suggests the principal-agent benchmark analysis of contract design presented in Section 3.

A detailed account of the data set is presented in Section 4. The empirical results of Section 5 reveal that contract length, experience, and revenue-generating ability are among the significant predictors of contract design, supporting the moral hazard propositions. The results of Section 6 suggest that liquidity constraints may influence contract design, but risk-sharing concerns do not appear to dominate contract selection. The superstar analysis provides a qualified refutation. Section 7 provides concluding remarks.

## 2. Institutional and Qualitative Contract Analysis

The analysis begins by providing some institutional background on contracting in the motion pictures industry and by identifying general patterns in the qualitative contracting terms unique to this industry. This framework provides an institutional foundation for the empirical exploration of contract choice determinants presented in Sections 3 through 6.

We begin by describing the nature of the producer-studio relationship and the contracting terms offered to other artistic contributors to the film's success, including the director, screenwriter, and other leading actors. This section attempts to reconstruct the film-contracting hierarchy by examining the structure and clauses of generic contract forms for each of the key artistic contributors. The primary source of contracting forms is *Negotiating Contracts in the Entertainment Industry*, published by the Law Journal Seminars-Press.<sup>1</sup> While the standardized forms discussed here do not necessarily reflect the particulars of the compensation schemes in the current data set, they complement the quantitative analysis by providing details of the institutional setting in which film contracting choices are realized.

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1. The Chairman for this 1993 volume was Michael I. Rudell. The Law Journal Seminars-Press operates within the New York Law Publishing Company in New York City. The volume documents the Tenth Annual "Negotiating Contracts in the Entertainment Industry" program meeting. It includes standardized contracting forms from across the entertainment industry. This analysis examines contract information from the following film subsection in the book: "Motion Picture Production Agreements," pages 541–652, compiled by John Logigian.

## 2.1 Producer's Contracting Terms

The "Producer Employment Agreement-Direct" delineates the main issues over which the studio and producer contract.<sup>2</sup> This standard contract reveals a contracting time line relevant to all film-contracting parties. The studio contracts with the producer

for the development and, if [the studio] elects to proceed to production, the producing services of [the producer] in connection with the proposed theatrical production.<sup>3</sup>

A significant component of the development stage includes the writing of the screenplay. Based on the terms described in the "Writer Employment Agreement-Direct," and in the "Director Employment Agreement-Direct," it appears that one of the first primary responsibilities of the producer is to negotiate contracts with the screenwriter and the director. The screenwriter prepares a first draft of the film's screenplay, plus one set of revisions, as part of his or her initial commitment, while the director supervises this writing process.<sup>4</sup>

According to both the screenwriter's and director's agreements, the studio is under no contractual obligation to proceed with the production of the film after the screenplay is completed. Section 18 of both contracts states the following:

Nothing contained herein shall in any way obligate [the studio] to use [employee's] services hereunder or to include any of the results and proceeds thereof in the Picture or to produce, exhibit, advertise or distribute the Picture or continue to do so.

The screenwriter's contract establishes a series of fixed payments for installments of the screenplay, resulting in the final screenplay. This contract allows for the possibility of a share payment; if a share payment is offered, of course, it will only apply if the film is produced. The director faces similar contracting terms for the development of the screenplay.

If the studio decides not to undertake production, both the screenwriter and director relinquish their rights to the results of their pre production work, including the "moral rights" of authors, based on the premise that their efforts constitute "work-made-for-hire."<sup>5</sup> The producer, however, retains rights to the

2. Given the nature of the contracting details, and given its title, this agreement appears to represent the contract between a studio and a producer. It is assumed that in the contract, "Producer" refers to the studio, and "Employee" refers to the producer. See *Negotiating Contracts* (1993:635–50).

3. See the *Producer's Agreement*, page 635.

4. See *Negotiating Contracts* (1993: 561–75, 577–88) for the *Screenwriter's Agreement* and the *Director's Agreement*, respectively. Another potential source for the screenplay is a literary work; contracting terms for such an arrangement appear in *Negotiating Contracts* (1993: 589–622).

5. See Section 10 of the *Writer's Agreement*, page 567, and Section 9 of the *Director's Agreement*, page 582, both titled "Results and Proceeds."

pre production activities according to the following:<sup>6</sup>

If [the studio] elects to so abandon during the development period, [the producer] shall have the right to acquire all of [the studio's] right, title and interest in and to the Picture, and all materials created by [the studio] therefor for a period of one (1) year from the date of [the studio's] written notice of abandonment. . .

The producer is paid a series of fixed-payment installments at various milestones of the pre production process, including the completion of the screenplay. In addition, if the film is produced, the producer may receive a fixed payment, a share payment, or a combination of the two. Furthermore, the standard producer contract states that if the studio elects to make a sequel within seven years of the first U.S. general release of the film, the producer will have the right to first negotiation, provided

negative cost of the Picture does not exceed one hundred percent (100%) of the final approved budget for the Picture plus a cushion equal to ten percent (10%) of the direct below-the-line costs contained therein.<sup>7</sup>

Some of the remaining contracting terms in the Producer Agreement complete the profile of the studio-producer relationship. The producer has the right to consult with the studio "with respect to key creative elements" of the film.<sup>8</sup> One of the primary contractual obligations of the producer is that the film be "produced in accordance with the production budget, shooting schedule and screenplay therefor approved" by the studio.<sup>9</sup> Furthermore, the producer is expected to "render services in connection with the promotion and/or publicity" of the film, subject to her post production availability.<sup>10</sup>

## 2.2 Actor's Contracting Terms

The "Actor Employment Agreement-Direct" represents the functional relationship between the producer and the actor.<sup>11</sup> It is instructive to compare and

6. See the Producer's Agreement, Section 2 (Development), Subsection b (Abandonment), page 636.

7. See the Producer's Agreement, Section 6 (Remakes and Sequels), page 639. The director will also have the right to first negotiation for the position of director, provided the same cost conditions hold as described for the producer.

8. See the Producer's Agreement, Section 10 (Consultation Rights; Approvals and Controls), page 640.

9. See the Producer's Agreement, Section 11 (Production Obligations), page 641.

10. See the Producer's Agreement, Section 16 (Publicity), Subsection b, page 643.

11. The official language of the document suggests that the terms reflect the legal agreement between the studio and the actor. However, since the producer is charged with oversight of all stages of production, according to the contracting terms previously discussed, the producer is assumed to negotiate as the representative of the studio. Therefore, the contract is assumed to reflect the functional agreement between the producer and the actor. See *Negotiating Contracts* (1993:623–33).

contrast key features of the producer's and actor's contracts. The actor is hired after the studio decides to proceed to production. As in the producer's contract, the actor's compensation terms specify the payment the actor will receive, which may include fixed compensation, a share payment, or both.<sup>12</sup> Both parties are expected to participate in publicity.<sup>13</sup> In addition to the obvious differences in the services the producers and actors provide, one striking contractual difference remains. The standard acting agreement does not provide the actor with the right of first negotiation of acting services on sequels.<sup>14</sup>

While the goal of aligning the producer's and actor's incentives with those of the studio is not explicitly stated in the standard agreements, both types of contracts include a clause describing the unique nature of services provided by both actors and producers. For example, the Actor's Agreement stipulates the following:

It is acknowledged and agreed that Employee's services are special, unique, unusual, extraordinary, and of an intellectual character giving them a peculiar value, the loss of which cannot be reasonably or adequately compensated in damages in action at law.<sup>15</sup>

This clause suggests that the contributions that these players make to the film may be costly to observe, and this contractual incompleteness may give rise to ex post transaction costs of enforcement.

### 2.3 Producer-Actor Relationship

The analysis of the general contracting terms for actors and producers suggests a theoretical framework in which to analyze the details of contract negotiations, and in particular, whether a producer should offer an actor a fixed or share payment. Since the producer is contractually charged with the responsibility of overseeing the financial matters associated with the film, and since her future employment depends directly on the financial success of the film, subject to cost control measures, it appears reasonable to assume that the producer faces stronger self-enforcing reputational mechanisms than the actor for enhancing the profitability of the film.

While the producer is not a residual claimant in the strictest sense, among the contracting parties, her incentives seem to be the most contractually aligned with those of the studio's, based on a comparison of standard contracting terms. It is also easier to monitor the producer's efforts (e.g., distribution and market-

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12. This general formulation of compensation allows for the possibility of more than one actor receiving a share payment. See the Actor's Agreement, Section 4, pages 624–25. Note that the actor's standardized contract differs from the producer's in that it allows for overage compensation.

13. See the Actor's Agreement, Section 18 (Publicity), pages 629–30.

14. Note, however, that there is nothing to prevent rider attachments. It seems reasonable to infer that a sequel clause may be a "standard" rider for superstars.

15. See the Actor's Agreement, Section 17 (Services Unique), page 629. A similar clause appears in the Producer's Agreement, Section 8 (Services Unique), page 640.

ing strategies). Hence, the behavior of the producer in the producer-actor contracting relationship may approximate that of the principal in a principal-agent setting. Therefore, we begin by framing the contract-type decision with a benchmark principal-agent analysis.

### 3. The Principal-Agent Framework

The principal-agent analysis starts with the most simple representation of the determination of the actor's contracting terms: A producer offers either a fixed-payment or a revenue-sharing contract to the actor, and only the producer and the actor may receive share payments.<sup>16</sup> The analysis is then extended to include both profit- and revenue-sharing contracts and to address the role of multiple artistic contributors and multiple share contracts.

#### 3.1 Benchmark Analysis

The commercial success of a film depends on the levels of effort chosen by its artistic and financial contributors. Higher levels of effort by actors and producers enhance the revenue potential of the film. Therefore, if a contributor's payment is tied to the total revenue generated by the film, he or she will receive a positive marginal benefit from exerting a higher level of effort.

Consider the contractual agreement between a producer of a film and an actor who will play a leading role in that film.<sup>17</sup> The producer, behaving as a residual claimant, wishes to maximize profits. Both the producer and actor are risk neutral.<sup>18</sup> The decision variables for the producer are her level of effort and the form of the actor's contract. The producer offers the actor either a fixed payment or a share of the revenues. The size of the share the actor receives equals  $s$ , implying that the producer receives  $(1 - s)$ . When  $s$  equals zero, the actor receives a fixed payment.<sup>19</sup> Therefore, the producer must evaluate the

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16. The benchmark analysis combines results from the principal-agent and transaction-cost literature, including Coase (1960); Cheung (1969, 1983); Alchian and Demsetz (1972); Klein et al. (1978); Holmström (1979, 1982); Williamson (1979); Eswaran and Kotwal (1985); Hart and Holmström (1985); Holmström and Tirole (1987); Barzel (1989); Wiggins (1991); Hermalin (1992); and Khalil and Lawarrée (1995). In response to this literature, a body of empirical contract analysis has developed, including Masten (1984); Joskow (1985 and 1987); Crocker and Masten (1988); Leffler and Rucker (1991); Allen and Lueck (1992, 1993); Lafontaine (1992); Gibbons and Murphy (1992); and Crocker and Reynolds (1993).

17. The impact of other artistic contributors on the revenue of the film will be explored in the benchmark analysis extensions.

18. The assumption of risk neutrality will be relaxed and the implications of the risk-sharing hypothesis will be explored in Section 6.

19. The logical extreme of this proposition is that the actor is offered a share size of 100 percent. In this case, the actor's incentives would be fully aligned with those of a full residual claimant. Logically, this would imply that the actor "becomes" the studio. While in practice we observe some actors producing their own films, a significant portion of leading actors are not producers. If the optimal share that an actor should receive is significantly large, then that actor should oversee production *and* perform as an actor in the film. In the more general case in which the actor is not the producer, the upper limit of the share size will lie below the full residual claimant level of 100 percent. Share payments to multiple artistic contributors also constrain the size of the share to the actor below 100 percent.

costs and benefits of providing the actor with a share of the revenues versus a fixed payment for his performance.

The actor will choose a positive level of effort, whether or not his compensation is tied to revenues, due to the reputational effect of today's performance on his expected future income stream. However, beyond this reservation level of effort, the actor requires an inducement to exert higher levels of effort to offset his disutility of effort. Therefore, if the share size is zero, the actor will choose his reservation level of effort. If the share size is positive, the actor's optimizing level of effort will increase with the size of the share payment. The producer faces analogous incentives.<sup>20</sup>

**3.1.1 The Benefits of Share Contracts.** The optimal value of the actor's share  $s$  reflects an implicit trade-off created by potential shirking. The larger the share payment to the actor, the more directly his incentives are aligned with the revenue outcome of the film, and the more the potential for shirking by the actor is mitigated. The smaller the share payment to the actor, the more the potential for shirking by the producer is mitigated. What is the nature of shirking by the actor and producer? From whom can the success of the film benefit most when that person's payment is most directly linked to the output?

The answer to the first question revolves around the issue of monitoring. For a given level of talent, an actor can enhance the quality of his performance in a variety of ways. If an actor will play an autistic character in a film, he can read neurobiology books, analyze psychological case studies, and spend time with individuals diagnosed with autism. This type of effort is relatively easy to monitor, and may be stipulated directly in the contract. The actor will also choose a level of effort during the shooting of the film itself. Since the attributes of an artistic performance are themselves difficult to measure, it is costly, if even possible, to measure the level of effort the actor exerts during his performance. Since the actor will always have superior information as compared to the producer regarding his choice of effort, there will always exist the possibility of undetected shirking if the actor's payment is not directly tied to the output.

While the producer's contribution to a film's success can involve artistic contributions, most of her efforts involve activities that are easier to monitor than the actor's effort. For example, the producer's marketing and distribution strategies are relatively costless to observe, and the studio can determine whether or not a producer keeps a film within the allocated budget. These considerations suggest that shirking is easier to detect, and therefore less costly to monitor, for the producer than for the actor.<sup>21</sup>

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20. Weinstein (1996) argues that reputational mechanisms alone are essentially sufficient to prevent potential shirking. The present analysis acknowledges the importance of the self-enforcing role reputation plays in effort choice but postulates that as long as there is disutility of effort, and as long as it is costly to observe effort, the potential for moral hazard in the form of hidden action exists.

21. The details of the producer's responsibilities were documented in Section 2.1.

How valuable is it to elicit a higher level of effort from each player? I would argue that while the producer's effort is essential to bringing the film to the public, it is the actor's performance to which audiences are most sensitive. And a higher level of effort on the part of the actor will contribute more to generating attendance and revenues than a higher level of effort on the part of the producer, particularly since the producer's reservation level of effort will most likely include at least getting the film out to audiences for viewing. Since the cost of monitoring the actor's effort is higher, and since the benefits of tying the actor's payment to the output may be larger (and the opportunity costs of not doing so may be larger), an actor should be offered a larger share than the producer, to contractually align his incentives optimally.<sup>22</sup>

3.1.2 The Costs of Share and Fixed-Payment Contracts. If it were costless to implement a share contract, and if the marginal benefit of a share arrangement were always positive, as described above, then we should observe share agreements dominating fixed-payment contracts for actors. This subsection delineates the differences in legal costs between share- and fixed-payment contracts and proposes that these cost differentials may explain the existence of both contract forms in equilibrium.

The marginal cost of lawyer's fees associated with a fixed payment contract is relatively small. The Screen Actor's Guild, for example, has a "Minimum Free Lance Contract." This two-page standardized form requires only the following information: the date; the names of the producer and the actor; the actor's role; the working title of the film; the actor's payment; the duration of the employment relationship; the address of the actor; the starting date of the actor's next job; and both parties' signatures.<sup>23</sup> In some cases, a rider will be attached for special, nonpecuniary stipulations. But, in general, the marginal legal cost of drafting and enforcing the boilerplate fixed-payment contract is small.

On the margin, the legal costs of a share contract can be quite significant. Consider the case in which the actor's payment is tied to the revenue of the film. Many resources will be devoted to simply answering the questions raised, as revenue is defined *ex ante*. For example, do the total revenues include theatrical revenues, ancillary revenues, and foreign theatrical revenues?<sup>24</sup> We shall explore profit sharing in the extension of the benchmark analysis; in that case, the contracting parties must additionally resolve cost definitions. Do the

22. See Eswaran and Kotwal (1985) for a detailed analysis of optimal contract choice when the level of effort is costly to observe.

23. For a sample contract, see Beil et al. (1980:107–8).

24. While the revenue debate may also center on receipts from video rentals, it is important to note that this market was virtually nonexistent during most of the time frame of analysis, 1959 to 1989. According to *The National Association of Theatre Owners Encyclopedia of Exhibition: 1991–92*, in 1980 only 2.4 percent of TV households had VCR machines (Kozak, 1962). By 1983, this percentage was still below 10 percent. From 1984 to 1989, the percentage rose from 17.6 percent to 67.6 percent. This suggests that the share contracting cost issues may have been more pertinent to contracts appearing later in the sample, implying a possible positive coefficient on the trend variable introduced in Section 4.

total costs include negative cost,<sup>25</sup> interest on negative cost, and distribution expenses? Regarding interest payments on negative cost, at what point in the accounting period does interest start to accumulate? There is also room to exploit the incompleteness of the definition of revenues and profits *ex post*, giving rise to enforcement costs (i.e., costs of litigation). The larger the share, the more resources each party will devote to defining profits in their favor.

### 3.2 Empirical Implications

In the partial equilibrium analysis of contract choice, a share contract is more likely to be chosen under two conditions. First, if the marginal benefit of inducing a higher level of effort is significant, a share contract is more likely, since the benefits may offset the legal costs of drafting and enforcing the share contract. Second, if the marginal cost of monitoring effort during film production is significant, the actor is more likely to receive a share contract to optimally align his incentives. Empirical proxies for these benefits and costs and refutable implications follow.

**3.2.1 Sequels and Oscars.** Consider first the significance of an actor's role in the case of a sequel. The main character in a film with many sequels becomes the dominant contributor to the film's characteristics. For example, in the *Rambo* film series, the character played by Sylvester Stallone has become legendary to many viewers. Since the character plays such a critical role in the success of the film, even the smallest change in performance can have a potentially large impact on film attendance. The refutable implication is that the likelihood of a share contract emerging will increase if the film is a sequel, since a small decrease in effort level by the actor could lead to a significant loss of revenues. A similar result will hold for actors who have received Oscars or Oscar nominations in the past.

**3.2.2 Actor's Experience.** The actor's experience will impact contract design in a manner analogous to that of Oscar recognition. Furthermore, for new actors, the reservation minimum level of effort is unlikely to differ greatly from the higher level of effort that would be induced if the actor received a share payment. If a new performer does not choose a high level of effort, he may never be chosen to perform in a leading role again; an established actor who shirks is more likely to secure future employment based on his reputation to date. For experienced actors, future employers are more likely to attribute the poor performance to the fluctuations in performance one might expect over a career. Therefore, actors with less experience will choose higher reservation levels of effort, reinforcing the implication that an actor with more experience is more likely to receive a share contract.<sup>26</sup>

25. The movie industry jargon "negative cost" is a bit misleading. It includes overhead cost, studio charges, fringes charged to the picture, and overbudget penalty. See Megal (1982).

26. See Klein and Leffler (1981) and Gibbons and Murphy (1992) for detailed discussions of the reputational effects of career concerns.

**3.2.3 Contract Length.** Films requiring lengthy production times involve large degrees of production complexity. Many individuals contribute to the ultimate financial success of such a film, including the cinematographer, sound editor, director, and others who are literally behind the scenes. Since the actor knows that the producer's monitoring costs increase with the number of contributors to the final output, the actor is more likely to shirk. Tying the actor's payment to the output will provide the actor with the incentive to exert a higher level of effort in a circumstance in which the probability of shirking would otherwise be high. Such an agreement will mitigate the incentive of the actor to "hide" his shirking behind the many sources of effort. A share agreement will be more likely to be offered the longer the contract length.

**3.2.4 Prior Collaborations.** The shirking problem is driven in part by the difficulty the producer faces in measuring the effort level of the actor. If the producer and actor have worked together in the past, this asymmetric information gap may be narrowed, as the producer becomes familiar with the finer points of the actor's performance techniques. This knowledge may assist the producer in separating the talent and effort contributions to the quality of the actor's performance.<sup>27</sup> The producer may be able to evaluate and monitor the actor's choice of effort more effectively and, therefore, at a lower cost. Thus, an actor is less likely to receive a share contract, since the benefits normally derived from an expensive share contract can be achieved via a less-costly monitoring mechanism.<sup>28</sup>

**3.2.5 Past Revenues.** The producer can examine the revenue of the most recent film in which the actor has had a principal role. The producer will take this (imperfect) measure of past performance as a signal of the actor's talent. Since the opportunity cost of a talented actor shirking is higher than that of a less talented performer, a higher past (real) revenue will increase the likelihood that a share arrangement is offered.

**3.2.6 Gender.** Approximately 70 percent of lead and principal roles are held by actors versus actresses.<sup>29</sup> The apparent low availability of female roles implies a greater degree of competition among actresses than actors. The corresponding self-enforcing reputational mechanisms will lead to higher levels

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27. Weinstein (1996:34–5) argues that producers and directors are particularly skilled at identifying the characteristics of a performance "that make a movie a success." I maintain that while a producer can assess the quality of a performance, the effort component may remain costly to observe.

28. It is also possible that the actor has superior information about his success potential when the new producer does not; that actor would then prefer a share contract. In this case, a negative relationship between the likelihood of a share contract being offered and the degree of prior collaborations would also be predicted.

29. The percentage of lead and principal roles was computed by examining a subsample of cast lists for films in this data set. Cast lists document a given film's lead and principal performers.

of effort by actresses. Therefore, a producer is more likely to tie payment to the output when the performer is male.

### 3.3 Extensions of Benchmark Analysis

The main focus of the benchmark analysis has been on revenue-sharing contracts. How would the incentives and observed contract choice differ if the actor were offered a share of the profits rather than of the revenues? The main difference in this case is that the actor would consider his contributions to the production costs of the film more carefully than he otherwise would. While the actor may be more likely to arrive at the film's set on time and perhaps be more helpful in expediting the shooting procedure, since most of the production costs are outside of the control of the actor, the actor's incentives will remain similar to those described in the previous subsection. While the marginal benefit the actor perceives from an extra unit of effort will, in general, be smaller, the direction of the predicted changes will remain the same as in the previous subsection.<sup>30</sup>

What role do multiple actors play in the choice of optimal contract form? If there are clearly one or two leading performers, with the rest of the cast playing secondary roles, it is only the quality of the lead performances that is likely to influence the commercial success of the film. Those actors will receive share payments according to the predictions presented above. If, however, the cast is "star-studded," with several leading roles, it is possible that each actor may receive a share contract. However, for a fixed size of the share payment to the producer, as the number of share participants increases, the *size* of the share each actor receives will, in general, decrease.<sup>31</sup> Therefore, the positive incentive effects from sharing will be somewhat diminished by the possibility of the size of the share becoming systematically smaller.

## 4. The Data Set

### 4.1 Data Collection Procedure

The contract data were collected at the Academy of Motion Pictures Arts and Sciences in Beverly Hills, California. The Margaret Herrick Library of the Academy houses extensive documentation of activity in the motion pictures industry. Library staff members follow industry journals and general periodicals and place clippings in file folders arranged by topic. Contract information came from the following folders: *Actors & Actresses: Contracts and Clauses*; *Actors & Actresses: Salaries; Contracts*; and *Profit Participation*. Among the journals and periodicals referenced in these folders were *Daily Variety*; *Weekly Variety*; *Hollywood Reporter*; *Screen International*; *The Wall Street Journal*;

30. Weinstein (1996:42) suggests that, depending on costs, profit-sharing contracts may lead to positive payments only 10 percent to 20 percent of the time. The fact that not all films earn "profits" may dampen the incentive effects, but the observable implications will parallel those outlined in the previous subsection.

31. The role of other potential share participants, including the screenwriter and the director, would be analogous.

and *The New York Times*.<sup>32</sup> The search resulted in the collection of 118 payment schemes.

The clippings stated whether an actor received a fixed fee for his performance, or a share payment, or a combination of the two. In some cases, a clipping documented the exact nature of the share payment, by fully specifying the size of the percentage payment, and whether the payment was a share of the gross revenues or of the profits. However, many of the articles simply stated that the actor received “points,” which means that the actor received a share payment, either of the gross or of the net revenues. Therefore, an actor was placed in the share group if the clipping stated that he received any form of a share contract, and in the fixed-payment group otherwise.

The sources described above actually contained compensation information on 140 agreements. However, the exclusion of 22 of these observations was justified for several reasons. Twelve observations were dropped since the contracts were written before 1959. Since long-term contracts dominated the industry during the Age of the Studio, 1929–1948, and the transition to a Free Agency system occurred during the ten years following the Paramount decision of 1948, contracts during the period before 1959 may reflect the incentives from the previous regime.<sup>33</sup>

Five data points were excluded due to the fact that the actor was also the producer, thereby removing the potential for moral hazard. While the compensation an actor/producer receives holds academic interest in itself, the focus of the present analysis is on the asymmetry of incentives when the producer and actor differ. Two observations were dropped since they involved television films, which are subject to different incentive effects than feature releases. Two more observations were omitted since there was no cast credit information. In one case, the film was not a major release (it did not appear in the *Annual Index to Motion Picture Credits*), and the universe of contracts for the present analysis is major U.S. releases. In the other case, the film was too recent for its cast and credit information to be listed in the *Index*. A final observation was dropped since the actor’s history involved foreign films to a significant extent. The remainder of observations comprised the data set used in the empirical analysis of Section 5.

How representative are these contracts of those signed between 1959 and 1989? According to *The National Association of Theatre Owners (NATO) Encyclopedia of Exhibition: 1991–92* (Kozak, 1991), the average number of new films released per year by major studios between 1959 and 1981 was 220.<sup>34</sup> Since this data set includes 118 observations, this represents an average of just

32. A complete list of sources is documented in Appendix B. Additionally, the source of eight of the 118 contracts was Universal Studios.

33. See De Vany and Eckert (1991), Chisholm (1993), and Weinstein (1996) for analyses of the institutional details and contracting incentives during the Age of the Studio. The source of 12 of the 22 dropped observations was Universal Studios.

34. For years following 1981, the *NATO Encyclopedia* documents the number of all new films released theatrically in the United States; from 1982 to 1989, the average per-year number of releases was 423. See the *NATO Encyclopedia* (Kozak:108).

under four contracts per year. Clearly, the current sample does not represent the universe of all film acting contracts of the period. However, since the focus of the present analysis is limited to actors who hold leading roles and possess significant potential to affect the commercial success of a film based on the quality of their performances, the sample appears to be representative. For an actor's contract terms to appear in the press and in public sources, that actor will have a degree of visibility unique to the pool of actors to whom incentive arguments may apply. A review of the descriptive statistics in the next subsection and of the list of performers in Appendix A, suggests that the sample is representative of this group.

#### 4.2 Descriptive Statistics

Table 1 presents the descriptive statistics for the entire data set. Of a total of 118 contracts, 49 involved share payments and 69 involved only fixed payments. Table 2 documents descriptive statistics by contract type. Appendix A presents a comprehensive list of the actors in the data set.<sup>35</sup> Detailed descriptions of the variables appearing in Tables 1 and 2 follow.

The experience variable measures the number of films in which the actor appeared prior to the current film. This variable was constructed using various annual editions of *The International Motion Picture Almanac* and *Halliwel's Film Guide*.<sup>36</sup> The team variable is equal to one if the actor and producer have worked together in the current capacity in the past, and zero if they have not. The filmographies of actors and producers were compiled from the same sources involved in deriving the experience variable.

The length variable measures the shoot time for a film, from the starting shoot date to the closing shoot date. This information was available in clippings and on microfiche in the *Production Notes* for a given film at the Academy of Motion Pictures. In some cases, the starting date of production was available but only the film completion date was known. Therefore, the central probit analyses of Section 5 use only the observations for which contract length is known.

The Oscar variable represents the degree of Academy Award recognition an actor has received. Recognition is measured by the number of Oscars and Oscar nominations the actor received prior to the current film. *60 Years of the Oscar: The Official History of the Academy Awards* (Osborne, 1989) was employed to construct an Oscar history for each actor.<sup>37</sup>

35. Most actors played leading roles in the films in question. *John Willis' Screen World* and *Halliwel's Film Guide* publish cast list rankings. The average rank across all actors is 1.7119, with a standard deviation of 1.8309. The average rank for share-contract actors is 1.6939, with a standard deviation of 1.6356. The average rank for the fixed-payment actors is 1.7246, with a standard deviation of 1.9695. The lowest ranks are 11 for share actors, and 12 for fixed-payment actors. One contract reflects the offer the actor received by the producer, but a different actor ultimately starred in the film. The ex ante contracting conditions are assumed to have been similar to those of the other contracts in the data set.

36. For nine of the actors and actresses, *Motion Picture Players' Credits* (Oliviero, 1991) was also consulted.

37. *The Academy Awards Index: The Complete Categorical and Chronological Record* (Shale, 1993) was also consulted.

Table 1. Descriptive Statistics: Entire Data Set

Variable	Definition	Mean	Std. Dev.	Min.	Max.	<i>N</i>
<i>EXPERIENCE</i>	Number of films in which actor appeared prior to current film	17.31	15.17	0.00	79.00	118
<i>TEAM</i>	1 if producer and actor collaborated in the past; 0 otherwise	0.28	0.45	0.00	1.00	101
<i>LENGTH</i>	Contract length measured by number of weeks to shoot film	15.88	13.04	1.00	72.00	68
<i>OSCAR</i>	Total number of Oscars and Oscar nominations the actor received prior to the current film	1.97	2.73	0.00	11.00	118
<i>GENDER</i>	1 if actor is female; 0 if actor is male	0.24	0.43	0.00	1.00	118
<i>SEQUEL</i>	1 if current film is a sequel; 0 otherwise	0.12	0.32	0.00	1.00	118
<i>REVENUE</i>	Real revenue of actor's most recent film, in millions; of dollars; regression analyses employ real revenue measured in dollars	36.80	51.33	0.00	253.3	75
<i>ACTION</i>	1 if film is an action film; 0 otherwise	0.23	0.42	0.00	1.00	118
<i>COMEDY</i>	1 if film is a comedy; 0 otherwise	0.32	0.47	0.00	1.00	118
<i>DRAMA</i>	1 if film is a drama; 0 otherwise	0.45	0.50	0.00	1.00	118
<i>HOLIDAY</i>	1 if film was released on or near a holiday; 0 otherwise	0.11	0.31	0.00	1.00	118
<i>TREND</i>	Year in which current film was produced	1975.1	9.01	1959	1989	118
<i>SHARE</i>	1 if actor received share payment; 0 otherwise	0.42	0.49	0.00	1.00	118

Table 2. Descriptive Statistics by Contract Type

Variable	Share Contracts					Fixed-Payment Contracts				
	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N
<i>EXPERIENCE</i>	20.63	14.79	2.00	79.00	49	14.96	15.10	0.00	77.00	69
<i>TEAM</i>	0.44	0.50	0.00	1.00	45	0.14	0.35	0.00	1.00	56
<i>LENGTH</i>	15.25	14.01	3.00	72.00	32	16.44	12.29	1.00	60.00	36
<i>OSCAR</i>	2.53	3.03	0.00	11.00	49	1.57	2.43	0.00	10.00	69
<i>GENDER</i>	0.12	0.33	0.00	1.00	49	0.32	0.47	0.00	1.00	69
<i>SEQUEL</i>	0.22	0.42	0.00	1.00	49	0.04	0.21	0.00	1.00	69
<i>REVENUE</i>	39.41	51.14	2.96	206.4	31	34.96	51.97	0.00	253.3	44
<i>ACTION</i>	0.20	0.41	0.00	1.00	49	0.25	0.43	0.00	1.00	69
<i>COMEDY</i>	0.35	0.48	0.00	1.00	49	0.30	0.46	0.00	1.00	69
<i>DRAMA</i>	0.45	0.50	0.00	1.00	49	0.45	0.50	0.00	1.00	69
<i>HOLIDAY</i>	0.18	0.39	0.00	1.00	49	0.06	0.24	0.00	1.00	69
<i>TREND</i>	1976.6	9.42	1959	1989	49	1974.0	8.60	1959	1989	69

The gender variable equals one for an actress and zero for an actor. The sequel variable equals one if the film is a sequel, and zero otherwise. Both of these variables were determined by inspection.

The revenue variable measures the real revenue generated by the actor's most recent film. In order to research the revenues of past films, the dates of release had to be determined. Max Joseph Alvarez's *Index to Motion Pictures Reviewed by Variety, 1907–1980* (Alvarez, 1992) provided review dates for films prior to 1981; and various annual editions of John Willis' *Screen World* revealed the month and year of release of films after 1980. Once the approximate date of release was established, data on revenues were collected. *Variety* magazine tracks revenue data for films, generally on a weekly basis. The primary source of revenue information was *Variety's* May 4, 1992, listing entitled, "All-Time Film Rental Champs," which gave revenue information on all films distributed in the U.S. and Canada that generated a nominal \$3 million or more in rentals.<sup>38</sup> These revenue data were then adjusted for inflation to construct the revenue variable.

The genres of most of the films in the data set were determined by consulting *The Video Source Book*, 13th Edition, and *Halliwel's Film Guide*, Eighth Edition.<sup>39</sup> For some films, *The Video Source Book* contained two or three genre descriptions (for example, "Comedy/Comedy-Drama/Crime & Criminals" appeared for one film). In such a case, the genre listed first was taken to be the genre of the film. This decision rule appears to be consistent with the intent of the publisher of *The Video Source Book*.<sup>40</sup> In order to prevent potential multicollinearity, genres were further compressed into three categories: action, comedy, and drama.<sup>41</sup> The genre dummy variables equal one when a given film falls in that category, and zero otherwise.

The holiday dummy variable is included to control for the timing of the film's release. For films released between 1982 and 1989, *Art Murphy's Boxoffice Register* provided release dates; for films released between 1959 and 1981,

38. The film exhibitors pay the studios a "rental" payment, which is a percentage of the box-office take.

39. The genre for eight of the films required examination of the following sources: *Film 68/69: An Anthology by the National Society of Film Critics* (Albert and Sarris, 1969); *John Willis' Screen World, Volume 27* (1976); and *Variety* (May 18, 1960, and May 22, 1968).

40. At this point, most of the films' primary genres fell into one of the following classifications: action, drama, comedy, musical, mystery, and western. A discussion of the eight exceptions follows. One film listed as "Civil War/Drama/Action-Adventure" was classified as a drama. One film listed as "Science Fiction/Comedy" was classified as a comedy. Four films were listed with "Romance" as the primary category. Two of these had secondary listings of "Drama," one had a secondary listing of "Musical," and the fourth was listed with only the primary category. In an attempt to consistently represent this genre, all four of these films were classified as dramas. One film listed as "Horror/Drama" was classified as a drama; one other "Horror" film was classified as a drama.

41. This final compression of film genres into three categories affected 21 films. Mysteries were assigned to the drama category, westerns to the action category, and musicals to the drama or comedy category, depending on the particular film. There were five mysteries, eight westerns, and eight musicals.

release dates were determined by consulting Alvarez's *Review Index* (Alvarez, 1982).<sup>42</sup> Alvarez documents the date the review for the film appeared in *Variety*, which generally appears the Wednesday after a Friday opening. If the film was released within six days prior to and including a holiday, *HOLIDAY* equals one, otherwise it equals zero.<sup>43</sup>

The trend variable simply reflects the year in which the film was produced. It is included to account for the possibility of a trend over time in the optimality of one contract form over the other. Careful industry observers would probably argue that there has been a gradual trend towards more sharing arrangements.<sup>44</sup> A positive sign on *TREND* would confirm this proposition.<sup>45</sup>

#### 4.3 The Life Cycle of Contract Design

Of the 70 actors appearing in the data set, 50.0 percent received at least one share contract during their careers. Of the 24 actors appearing more than once in the data set, 62.5 percent received a share contract at some point in their careers.<sup>46</sup> The first documented contract for 18 of the 24 repeat-appearance actors was a fixed payment. The average percentage of the contracts following these fixed-payment contracts that were share contracts was 33.4 percent. From the subsample of 24, the first occurrence of a share contract (if any) was noted. Contract information for 11 of these actors extended beyond the first occurrence of a share contract. Based on this group, the average percentage of remaining contracts that involved share payments was 72.2 percent.

These data suggest that an actor is more likely to receive a fixed-payment contract earlier in his career, although he will not necessarily ever receive a share contract. Given that an actor has received a share contract, it is quite likely that he will receive one again in the future.

### 5. Empirical Methodology and Results

The optimization driving the contract design choice is based on an underlying continuum of share sizes. Within the Academy's file folders on compensation, sometimes a clipping simply stated that an actor received "points." Such a statement implies that an actor received a share arrangement, but it does not reveal the size of the share or the nature of the share (i.e., a share of the profits versus revenues). These limitations require that the share variable be represented as dichotomous rather than continuous, equal to one if the actor received

42. One release date was determined by consulting *Variety* (June 24, 1981).

43. The following are considered important holidays for the motion pictures industry: Memorial Day, Independence Day, Thanksgiving, and Christmas. The purpose of including this variable is to control for the effects of the release-date choice. One should be cautious about making predictions with respect to this variable, since the release date may change.

44. Weinstein (1996) presents evidence from Warner Brothers contracts suggesting an increase in the general usage of participation contracts during the post-World War II period through 1960.

45. Also see footnote 24 for documentation of the countervailing influence the video rental market may have on the trend variable.

46. For actors appearing more than once in the data set, complete contract histories were unavailable. Percentages are computed from these samples of contracts from the actors' careers.

a share contract, and zero otherwise. This dichotomous choice is driven by the underlying share-determination equation.

### 5.1 Econometric Specification

The nature of the contract data suggests the following econometric specification for the benchmark analysis of Section 3:

$$s^* = X\beta + \varepsilon,$$

$$C = 1 \text{ if } s^* > 0, \tag{1}$$

and

$$C = 0 \text{ if } s^* \leq 0,$$

where  $s^*$  represents the unobserved optimal share size, and  $C$  represents the observed choice of contract form.  $C$  equals one when a share contract is chosen, and zero otherwise. If a share contract is chosen, then  $\varepsilon > -X\beta$ . Assuming that  $\varepsilon$  is normally distributed, the probability of observing the choice of a share versus a fixed-payment contract is  $[1 - F(X\beta)]$ . The formulation in Equation (1) can be estimated with the probit analysis, using the empirical predictors of contract choice from Section 3.2 as the explanatory  $X$  variables.

### 5.2 Estimation and Interpretation of Results

Equation (1) was estimated with the probit analysis, using all observations with no missing explanatory variables, leaving a sample of 43 observations.<sup>47</sup> The results are presented in Regression I of Table 3. Analysis of these results follows.

Regression I demonstrates that *LENGTH* is positive and significant at the 0.05 level. A positive coefficient on *LENGTH* implies that a share contract is more likely the longer the production time of the film. This result is consistent with the proposition that the costs of monitoring an actor increase with a larger number of contributors to the production process, increasing the likelihood of a share contract being offered.

The gender of a performer is also a significant predictor of contract type at the 0.05 level.<sup>48</sup> The negative coefficient on *GENDER* implies that an actress is less likely to receive a share contract than her male counterpart. This result is consistent with the hypothesis that the higher degree of competition for

47. The number of observations missing explanatory variables are as follows: *LENGTH* (50); *REVENUE* (43); *TEAM* (17). Note that since some observations are missing more than one variable, there is some overlap, leading to fewer observations being excluded than the sum of observations described here.

48. The holiday variable was included simply to control for any timing effects the films' release dates might have on contract design. In spite of this variable's significance, the result should be interpreted in a qualified manner. Before a film is produced, there is an expectation of when the release date will be; however, there may be uncertainty surrounding this variable *ex ante*.

female leading roles leads to stronger self-enforcing reputational effects among actresses than among actors.

Variables significant at the 0.10 level include *EXPERIENCE*, *REVENUE*, and *TEAM*. The positive coefficient on *EXPERIENCE* implies that actors with more experience are more likely to receive share payments. This positive relationship provides support for the argument that the self-enforcing reputational concerns of an actor may be stronger earlier in his career. According to this argument, losses arising from shirking are more likely to occur the more experienced the actor, making a share contract more likely later in an actor's career.<sup>49</sup>

The revenue variable is significant beyond the 0.10 level. The positive coefficient on *REVENUE* demonstrates that a share contract is more likely to emerge the larger the real revenue of the actor's most recent film. This result supports the proposition that the opportunity cost, in terms of expected lost revenues arising from shirking, will be larger the more profitable the actor's most recent performance.

Note that in Regression I, 43 observations were excluded due to lack of data on revenue. Does this exclusion introduce a selection bias in the results? As noted in the data set description in Section 4, the "Rental Champs" list excluded films that grossed less than three million nominal dollars. A majority of the observations missing past revenues correspond to films produced prior to 1970.<sup>50</sup> Therefore, since nominal film revenues were significantly lower in the 1950s and 1960s, it is not clear that the missing *real* revenues are necessarily biased downwards. If a film did not appear on the "Rental Champs" list, this does not imply that the film bombed in real terms. The fact that an observation

49. Since a subset of actors appears in the data set more than once, the error terms may be correlated across these actors' contracts. In most cases, however, the contract information is on movies at distinctly different points in each actor's career. These observations can be treated as cross-sectional, with the experience variable controlling for the point in the actor's career at which each contract was designed. The problem of nonspherical errors may enter in the case of back-to-back films. If, for a given actor, the contract of the current period as well as the contract from the previous period is known, then there is a chance that the error terms are correlated. There are only seven instances in which current contracts and the most-recent contracts are known.

In order to examine the impact of these seven cases of contiguous contracts, the observations corresponding to the previous contracts were dropped, and Regression I of Table 3 was run on the remaining sample. The selection bias presented in doing so would most strongly affect the experience variable; by dropping observations appearing earlier in these actors' careers, the experience variable may be biased slightly upward. The results of the original Regression I in Table 3 are compared to the results of that same regression using this new sample. All coefficients retained their original signs. Most of the variables that were significant in Regression I, Table 3, remained significant in this subsample, with minor exceptions noted below.

*TEAM* and the constant term became insignificant, but their *t*-ratios remained close to the 0.10 level (1.662 and -1.620, respectively). A possible explanation for this slightly different outcome is that the degrees of freedom became more restrictive with this smaller sample. *HOLIDAY* became insignificant. If there were some serial correlation in these error terms, it had only a slight impact on the core analysis in Table 3.

50. Among the 43 observations missing data on revenue, four correspond to films produced in the 1980s, eleven to films produced in the 1970s, 25 to films produced in the 1960s, and three to films produced in the 1950s.

Table 3. Probit Analysis with Share as Dependent Variable

Variable	Regression				
	(I)	(II)	(III)	(IV)	(V)
CONSTANT	-219.06 (-1.701)*	-290.48 (-2.455)**	-906.64 (-1.481)	-12.872 (-0.213)	-2.0480 (-0.021)
TREND	0.10808 (1.671)	0.14483 (2.445)**	0.45373 (1.484)	0.0059173 (0.193)	0.0024506 (0.055)
GENDER	-2.8851 (-2.118)**	-1.7886 (-1.935)*	-4.8612 (-1.578)	-0.76441 (-0.813)	-1.7244 (-1.303)
SEQUEL	-0.68522 (-0.532)	-0.79384 (-0.672)	-1.9904 (-0.676)	-0.59196 (-0.487)	0.59454 (0.423)
OSCAR	0.21148 (1.404)	0.10999 (0.818)	0.32715 (0.841)	0.18779 (1.324)	0.43580 (1.363)*
EXPERIENCE	0.10202 (1.789)*	0.084847 (1.847)*	0.19221 (1.128)	0.027960 (1.454)	0.022638 (0.892)
HOLIDAY	4.7634 (2.014)**	3.5330 (1.875)*	13.727 (0.289)	1.6241 (1.976)*	1.0455 (0.997)
TEAM	2.6212 (1.748)*	2.5664 (2.065)**	6.9549 (1.614)		
LENGTH	0.087946 (2.519)**	0.075095 (2.501)**	0.084996 (0.602)		
REVENUE	0.18424E-07 (1.763)*	0.14862E-07 (1.894)*	0.97156E-07 (1.496)		

Continued

Table 3. *Continued*

Variable	(I)	(II)	Regression (III)	(IV)	(V)
COMEDY	1.8620 (1.331)				
DRAMA	0.10261 (0.124)				
MARKETSHARE			-0.14768 (-1.008)		
MAJOR					5.6864 0.135)
COST				0.16701E-07 (1.113)	0.59152E-07 (1.794)*
Sample size	43	43	35	30	25
Likelihood ratio	33.06457	30.17120	35.72504	13.81159	17.28576
Percent correctly predicted	0.813953	0.906977	0.914286	0.800000	0.880000

I: Core principal-agent benchmark analysis

II: Benchmark analysis without genre effects

III: Risk-sharing test based on studio market share in previous year

IV: Liquidity-constraint test based on real cost of production

V: Joint risk and liquidity test with risk based on studio type

Dependent variable equals one for share contracts, zero otherwise

Significance levels \*.10, \*\*.05, \*\*\*.01

t-ratios in parentheses

is missing, therefore, does not produce a clear bias on *REVENUE* in either direction. The minority of observations missing revenue data from the more recent time period may bias *REVENUE* upward slightly.<sup>51</sup>

The team variable, like the revenue variable, is significant beyond the 0.10 level. The positive coefficient on *TEAM* suggests that repeat collaborations are more likely to lead to share arrangements than first-time collaborations. This result is opposite the predicted outcome of the benchmark model.<sup>52</sup> Perhaps it is the case that the producer offers an actor a share payment as a reward for the known box-office appeal of the actor. This alternative hypothesis will be explored in Section 6.<sup>53</sup>

Note that in Regression I, 17 observations were omitted due to lack of information on the actor's and producer's prior collaborations. Does this exclusion

51. Since films may be rereleased, the revenue variable may be biased downward, strengthening the results in Regression I, Table 3. However, empirically, the annual percentage of rereleases in the U.S. first-run market is insignificant. For example, according to *Art Murphy's Boxoffice Register*, the percentages of major releases in U.S. movie houses that were rereleases are as follows: 2 percent (1986); 4 percent (1987); 2 percent (1988); 4 percent (1989); 3 percent (1990).

52. According to the benchmark analysis, if several stars are offered share contracts, the incentive effects will be lessened to some extent. The current data set involved two films with three or more known share payments to actors. Regression I, Table 3 was repeated, excluding contracts associated with these two films. All of the coefficients retained their original signs, and most of the significant variables remained significant. The changes in significance levels follow. *EXPERIENCE* and *REVENUE* became insignificant (with *t*-ratios of 1.657 and 1.593, respectively). The significance level of *HOLIDAY* changed to the 0.10 level. *CONSTANT* became insignificant. These results suggest that perhaps most of the contracts in the entire data set are subject to shares given to multiple artistic contributors.

53. In order to test the robustness of the estimation technique represented in Regression I, Table 3, a series of probit analyses were performed on various subsamples of the data, the results of which are described here. The purpose of this extension was to include observations that were dropped from the original analysis due to missing right-hand-side variables. Since *LENGTH*, *REVENUE*, and *TEAM* were each missing some values, two of the three variables were dropped from Regression I. For example, in Regression I, *REVENUE* and *TEAM* were omitted from the right-hand side of Equation 1 in order to add 25 more observations to the core group of contracts analyzed in Regression I. This procedure was repeated with the other pairings of missing variables, as well as by dropping all three variables to examine the entire data set. While one should be cautious about the theoretical motivation for this exercise, particularly since it involves excluding independent variables that have been shown to be significant predictors of the choice of contract form, this drawback is offset by the ability to reinstate many observations that themselves contain valuable contracting information.

This alternative sample expansion analysis yielded the following results. *OSCAR*, *GENDER*, and *HOLIDAY* are significant across three of the four regressions, retaining their signs from Regression I. *COMEDY* is significant in two cases, *EXPERIENCE* in one, and *LENGTH* in the only regression in which it appears; they all retain their original signs. *REVENUE* and *TEAM* are now insignificant but retain their original signs. The constant term is insignificant, while *DRAMA* and *TREND* remain insignificant. *SEQUEL* is significant and positive in two of the four regressions, in contrast to its insignificance shown in Regression I. This change most likely reflects the influence the dropped significant variables have on the remaining coefficients. These outcomes combined suggest that the benchmark results are essentially representative of the entire data set, with the possibility that the influences of past revenues and prior collaborations may be overstated, and that the influence of Oscar recognition may be somewhat understated.

introduce a selection bias in the results? In all instances, the lack of prior collaboration information was driven by the fact that the filmographies for the producers were not listed in several film biographical sources, including *International Motion Picture Almanac* (various editions); *The Film Encyclopedia* (Katz, 1979); *The International Encyclopedia of Film* (Manvell, 1975); *Dictionary of Film Makers* (Sadoul, 1972); *The Illustrated Who's Who of the Cinema* (Lloyd and Fuller, 1983); *World Film Directors* (Wakeman, 1988). For observations for which the team variable is missing, therefore, it is likely that the actor and producer have not worked together before, since the producer was relatively unknown or perhaps just starting her career. Therefore, the TEAM coefficient may be biased slightly upward, somewhat diminishing the strength of the finding.<sup>54</sup>

## 6. Alternative Hypotheses for Share Contract Choice

While the empirical evidence provides some support for the benchmark principal-agent explanation of the share versus fixed-payment contract choice, several other hypotheses can be explored and tested using the current data set. In particular, this section describes and empirically examines risk sharing, liquidity constraints, and the superstar phenomenon as alternative motivations underlying the contract optimization problem.

### 6.1 Risk Sharing

The moral hazard argument presented in Section 3 assumed that both the actor and producer were risk neutral; the validity of this assertion can be tested against industry observations. Weinstein (1996) presents an argument suggesting that not only are actors and producers risk averse, but producers appear

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54. The comedy and drama genre classifications were not significant predictors of contract type. To examine the potential importance of action films in determining contract form, *ACTION* was explicitly incorporated into Regression I, first subsuming *DRAMA*, then *COMEDY* in the constant term as the omitted genre variable. In both cases, the coefficient on *ACTION* was negative and insignificant.

Regression I in Table 3 was analyzed again, expanding the genre classifications to include dummy variables for *MUSICAL*, *MYSTERY*, and *WESTERN*. (See footnote 40.) The original results in Regression I did not change dramatically. In fact, *MUSICAL*, *MYSTERY*, and *WESTERN* were insignificant. All significant coefficients retained their original signs with only slight changes in significance and significance levels, if at all. A notable exception is *HOLIDAY*, which became insignificant with the *t*-ratio dropping to 0.278, suggesting a possible link between release dates and movie genre classification. The remaining minor differences follow. *TEAM* and *EXPERIENCE* became insignificant, but their *t*-ratios (1.658 and 1.635, respectively) remained quite close to the critical value of a 0.10 significance level. A similar outcome was observed for *REVENUE* and the constant term, with new *t*-ratios of 1.573 and -1.540, respectively.

Since most of these changes involve minor changes in *t*-ratios and borderline changes in significance levels, the main results demonstrated by Regression I in Table 3 appear to be essentially unaffected by this alternative genre classification scheme. Therefore, when one considers the trade-off of including insignificant variables and demonstrating a result previously captured, our understanding of contract choice is not enhanced and is somewhat offset by the loss of degrees of freedom in this genre extension analysis. The original compression of genres into *ACTION*, *COMEDY*, and *DRAMA* appears to be justified for the present purposes.

to be relatively more risk averse than actors. In support of this argument, he cites the historically low average tenure of studio production executives. The turnover implied by this decline suggests that producers face more uncertain career prospects than they did in the past. And since well-known actors are more wealthy and face more stable future employment prospects than producers do, a producer will behave as a more risk-averse party than an actor (Weinstein:38).

According to this hypothesis, a producer will offer an actor a share contract in order to spread the risk associated with the commercial success of the film. If the producer is more risk averse than the actor, then a more risky film prospect will increase the likelihood that the actor is offered a share contract. This hypothesis can be tested using the current data set.

One measure of the risk associated with a film production is the financial status of the studio backing the film. The relative standing of each studio in the market may capture the perceived relative risk of projects associated with those studios. One proposition for testing the risk-sharing explanation is to examine the market share of the studio in the previous year. Market share is measured as the percentage of the total distributor receipts (rentals) accruing to a studio in a given year.<sup>55</sup> The source used to determine the market share was the *NATO Encyclopedia* (Kozak, 1991), in particular the table titled "North American Theatrical Film Rental Market Shares: 1970–1990."<sup>56</sup>

Using the estimation of the benchmark Equation (1) as a base, this market share measure was added to the analysis. Due to the restrictions arising from the combination of a small sample and a relatively large number of explanatory variables, the insignificant *COMEDY* and *DRAMA* variables were omitted from Equation (1). For comparison purposes, Equation (1) was first reestimated without genre effects, and those results are presented in Regression II, Table 3.<sup>57</sup>

55. The studio associated with each movie in the data set was determined by consulting *The Video Source Book* (18th Edition), and the "Rental Champs" list used in measuring the revenue variable. *The Video Source Book* indicates the original producer, which may be the studio, the production company, and/or the person who produced the film. This source was used to determine the studios and production companies associated with the films in the current data set. The "Rental Champs" list documents the film's final distributor. This second reference was used as a complement to the first source. All except nine of the films appeared in at least one of the two sources.

One drawback of using the film's final distributor as that film's "studio" is that not all films are produced by the same studio that distributes the film (Weinstein, 1996:7). Examination of a standard "Film-Distributor Security Agreement" demonstrates that even if a distributor does not participate fully in the production of a film, that studio may advance the production company "certain pre-production costs" while the producer awaits financing. (See *Negotiating Contracts in the Entertainment Industry*, the primary source described in the qualitative analysis of Section 2.) I will assume that the final distributors in the current data set participated to some extent in preproduction financial assistance.

56. For one film, the studio was listed as Orion/Warner Brothers. The studio with the larger market share in the previous year, Warner Brothers, was assumed to be the primary focus in the players' risk analysis. In late 1973, United Artists gained control of the distribution of MGM productions. After 1973, the studio so combined was referred to as MGM/UA. Market shares for United Artists were determined by using MGM/UA's market share following 1973. See the *NATO Encyclopedia* (Kozak:116).

57. Regression II of Table 3 demonstrates that the qualitative core results do not change significantly when genre effects are excluded.

Equation (1) was then estimated with the probit analysis, including the market share variable and excluding genre effects. *MARKETSHARE* is the size of the percentage of market rentals the studio generated in the previous year. The results are presented in Regression III, Table 3.<sup>58</sup> If risk sharing motivated contract choice, we would expect to see a negative relationship between the studio's last-period market share and the likelihood of observing a share contract. The empirical results do not support this hypothesis.

## 6.2 Liquidity Constraints

Perhaps the liquidity constraints imposed by the film's production costs lead to share payments.<sup>59</sup> According to this argument, successful financing negotiations will only follow if the leading actors take their payments on the back end. While there is anecdotal evidence suggesting that this may be true, we can turn to the data and devise a formal test, to determine whether or not the likelihood of observing a share payment moves with costs.

For a subsample of the films in the data set, the *Production Notes* at the Academy of Motion Pictures contained information on the costs of production. The amount reported was assumed to capture the production or "negative" costs of the films. Given the data limitations, this measure serves as a proxy for costs rather than the measure of the actual costs incurred, especially since a cost figure appearing in the public press may also include the costs of advertising, interest, and distribution expenses (Megal:21–3). Another drawback of this variable is that while film revenues are reported on a regular basis in the industry press, cost information is generally more difficult to obtain. Still, it is instructive to examine the movement of a proxy for costs with the likelihood of observing a share payment.

Using the estimation of the benchmark Equation (1) as a base, the real cost of production measure was added to the analysis. The intersection of the set of observations in Regression I with the set of observations with cost data included only 14 observations. Due to the severe small-sample restrictions imposed by this subsample, Equation (1) was estimated with the probit analysis, excluding genre effects and the variables with missing right-hand-side values.<sup>60</sup> *COST*

58. The mean of this variable is 11.157, and the standard deviation is 6.0831. The minimum market share is zero and the maximum is 24. Only films produced after 1970 are included due to the nature of the data source. For one observation, the studio is a new studio. The market share of the previous year is assumed to be zero.

59. Paul and Kleingartner (1994) propose a similar argument. Weinstein (1996) also suggests that budget constraints may drive the decision to offer a share contract to the actor, particularly with the well-established stars. A producer might do this to shift a large fixed cost to a variable cost (Weinstein, 1996:43).

60. In particular, since unknown values of *TEAM*, *LENGTH*, and *REVENUE* led to omitted observations in Regression I, these variables were dropped from Equation (1) in order to reinstate more observations. This allowed all observations with known production costs to be included in the sample. While one should be cautious about the theoretical justification for excluding these variables, especially since they were significant in Regression I, this drawback is somewhat offset by the empirical value of reinstating observations that themselves contain valuable contracting information. Genre effects were omitted for analogous reasons to those discussed in the risk-sharing subsection.

represents the real production cost of the film.<sup>61</sup> The results of this estimation are presented in Regression IV, Table 3.

Given the relatively small sample and the noise surrounding the cost variable, the results presented here should be interpreted with care. They do suggest that the probability of observing a share contract may not be as strongly tied to production costs and liquidity constraints as the anecdotal evidence suggests. And since films with smaller budgets are less likely to have their costs appear in the public press, the cost variable may be biased slightly upwards, enhancing the result that liquidity constraints may not be the underlying motivation for contract choice.

To complete the analysis of the risk-sharing and liquidity-constraint hypotheses, measures of both risk and production costs were simultaneously added to the benchmark analysis. Due to the small sample constraints discussed earlier, Regression IV served as the base to which a measure of risk was added. Since half of the observations with known production costs were produced prior to 1971, and since market share data were available starting in 1971, an alternative measure of risk was employed. In particular, the status of the studio as a major, well-established studio versus an independent studio was used to capture the riskiness associated with the film.

The status of the studio as a major or independent was determined based on several sources from the industry.<sup>62</sup> Industry experts appear to agree that Columbia, MGM and United Artists, Paramount, Twentieth-Century Fox, and Warner Brothers are major studios. Buena Vista and Disney, Orion, and Tri-Star often fall in the major category, but these studios have also been listed in the mini-major group. Cannon has been classified as both a mini-major and an independent studio. For the present analysis, all of the studios mentioned above were classified as majors, except Cannon, which was treated as an independent studio. All other studios were classified as independents.<sup>63</sup>

Regression V estimated Equation (1) by using the same explanatory variables as in Regression IV and adding the major variable. *MAJOR* is equal to one for major studios, and zero otherwise. The results are presented in Regression V, Table 3.<sup>64</sup>

If risk sharing motivated contract choice, we would expect to see a negative coefficient on *MAJOR*. Established studios face less risk than do independent studios; therefore, we are less likely to observe share contracts when the studio is one of the majors. The empirical results do not support this hypothesis.

The positive *COST* coefficient, significant at the 0.10 level, suggests that

61. The mean of *COST* is 21.284 million dollars, with a standard deviation of 21.399 million dollars. The minimum is 0.2637 million dollars; the maximum is 88.24 million dollars.

62. Sources include the *NATO Encyclopedia* (Kozak, 116), *Daily Variety* (July 3, 1986), and *Weekly Variety* (February 21, 1990).

63. The remaining independent studios in the data set include the following, with the year noted in parentheses: Avco Embassy (1967); M.C.E.G. International (1988); New Line Cinema (1988); and the Samuel Goldwyn Company (1989).

64. The regression includes all observations for which the studio is known; the studios for five observations were unknown.

binding liquidity constraints may lead to an increased probability of a share contract being offered. This result must be qualified by the limitations of the production-cost proxy variable discussed above.<sup>65</sup> These results suggest qualified support of the hypothesis that share contracts are offered to assuage liquidity concerns.

### 6.3 The Superstar Phenomenon

Perhaps it is the superstar who receives a share contract as a reward for his talent and star status.<sup>66</sup> This hypothesis frames the following empirical question: Does the *value* of the payment actually received by an actor vary with his star attributes? The problem with evaluating the final dollar amount paid to the actor is that payment on share contracts involve *ex post* realizations of revenues and costs, but our objective is to determine the *ex ante* influences on the choice of contract form.

The current data set, however, can be used to inform the superstar debate. Since the value of a fixed-payment contract will be known *ex ante*, we can examine the movement of the size of the real fixed payment with proposed measures of star status. If the variables that measure star power move with the size of real fixed payment in contracts with no known share components, then the superstar hypothesis may be supported.

In order to implement this analysis, the selection bias introduced by only examining contracts with fixed payments must be corrected. This can be achieved by employing Heckman's (1979) two-stage estimation procedure. The original econometric specification for contract choice postulated the following share determination equations:

$$s^* = X\beta + \varepsilon,$$

$$C = 1 \text{ if } s^* > 0,$$

and

$$C = 0 \text{ if } s^* \leq 0.$$

If the superstar status determines the actual payment  $y$  received by an actor, then that payment will vary with star attributes as follows:

$$y = Z\alpha + v,$$

where  $Z$  represents star attributes,  $\alpha$  represents the coefficients, and  $v$  represents the error term. This is the structural equation that determines the total value of compensation to an actor. Since star characteristics include Oscar recognition, experience, and revenue-generating ability, and since these variables move with

65. Furthermore, *MAJOR* is only equal to zero in one instance, and therefore its variation is severely restricted. The positive and significant *OSCAR* coefficient is consistent with the results in the test for robustness discussed in footnote 53.

66. Rosen (1981) presents a general analysis of the superstar phenomenon; Weinstein (1996:36) proposes that this argument applies to the motion pictures industry.

the probability of receiving a share contract,  $\epsilon$  and  $\nu$  are likely to be correlated.<sup>67</sup> This correlation can be corrected by first estimating Equation (1), the selection equation, and then computing the selection variable  $\lambda$ .<sup>68</sup> The following bias-corrected equation can then be estimated with least squares, including  $\lambda$  as a right-hand-side variable. This standard Heckit procedure was implemented. The first-stage probit equation was identical to Equation (1).<sup>69</sup> The second-stage least squares equation was as follows:

$$\begin{aligned} \text{LOGFIXEDPAY}_i = & \alpha_1 + \alpha_2 \text{TREND}_i + \alpha_3 \text{GENDER}_i + \alpha_4 \text{OSCAR}_i \\ & + \alpha_5 \text{EXPERIENCE}_i + \alpha_6 \text{LOGREVENUE}_i + \gamma \lambda_i + \xi_i, \end{aligned}$$

where *LOGFIXEDPAY* measures the log of the real fixed payment for contracts not involving share arrangements.<sup>70</sup> The results of the first-stage estimation of the selection equation and the second-stage estimation of the structural equation are reported as Regressions I and II, respectively, in Table 4.

The most striking result in Regression II, Table 4, is the lack of significance of the star attribute variables. The measures that one would associate most with star power, such as revenue-generating ability and Oscar recognition, are not predictors of the size of the fixed payment, but they are predictors of the likelihood of a share contract being chosen. This suggests that the incentive argument, and perhaps the other alternative hypotheses explored above, predict the choice of contract form better than the superstar hypothesis.<sup>71</sup>

## 7. Conclusion

An original data set on contracts between actors and producers is used to uncover empirical determinants of the choice of contract form. Contract length, actor's experience, and revenue-generating ability are positively related to the likelihood of a share payment being offered to an actor. Prior collaborations are more likely to lead to share arrangements for actors, as are larger degrees of Oscar recognition under certain testing conditions.

These patterns demonstrate that contract choice may be influenced, in part, by disincentive effects arising from moral hazard. Qualitative contract and

67. While *OSCAR* was insignificant in Regression I, Table 3, it was positive and significant in three of the four tests for robustness in footnote 53.

68. This  $\lambda$  is a variation of the standard Inverse Mill's Ratio, since we are selecting observations for which *C* equals zero rather than one.

69. Three observations were dropped from the original sample of 43. In these cases, the actors were performing in their first films, and past revenues equaled zero. Since a log revenue variable was constructed for the second-stage analysis, these observations were dropped. Otherwise, the second-stage analysis would drop observations that had been included in the estimation of  $\lambda$ .

70. The size of the fixed payment is known for 55 of the 69 fixed-payment contracts appearing in the data set. The mean of the real fixed payment is \$1.8807 million, with a standard deviation of \$1.9597 million. The minimum real payment is \$2,601; the maximum is \$10.56 million.

71. These results should be interpreted with caution, however, since the subsample size in the second-stage analysis is limited to 17 observations, and the  $R^2$  value is only 0.1774040. This estimation is a method of moments estimation and yields consistent but not fully efficient coefficient estimates (Heckman, 1979; Greene, 1981).

Table 4. Two-Stage Estimation with Log of Real Fixed Payment as Dependent Variable: Sample Selection Bias Correction from Selection Equation

Variable	Regression	
	(I)	(II)
CONSTANT	-218.80 (-1.689)	-12.324 (-0.088)
TREND	0.10795 (1.660)	0.0087581 (0.125)
GENDER	-2.8844 (-2.117)**	0.040480 (0.038)
OSCAR	0.21152 (1.404)	-0.25387 (-1.281)
EXPERIENCE	0.10193 (1.782)*	0.013996 (0.331)
COMEDY	1.8629 (1.331)	
DRAMA	0.10309 (0.125)	
SEQUEL	-0.68384 (-0.530)	
HOLIDAY	4.7609 (2.011)*	
LENGTH	0.087891 (2.509)**	
REVENUE	0.18409E-07 (1.757)*	
TEAM	2.6189 (1.742)*	
LOG REVENUE		0.52045 (1.116)
$\lambda$		-1.1134 (-1.127)
Sample size	40	17
Likelihood ratio	28.21239	
Percent correctly predicted	0.800000	
$R^2$		0.1774040
Rho		-0.67541

I: First-stage probit estimation of selection equation with dependent variable equal to one for share contracts and zero otherwise

II: Second-stage least squares estimation of structural size-of-payment equation with dependent variable equal to log of real fixed payment. Subsample includes fixed-payment contracts with no share components.

$\lambda$  represents selection variable

Rho represents correlation of disturbance between selection and structural equations

Significance levels \* 10, \*\* 05, \*\*\*.01

t-ratios in parentheses

institutional analyses suggest that contractual and reputational self-enforcing mechanisms may be stronger for producers than for actors. Since acting effort is costly to monitor, actor share contracts may be offered when the marginal

impact of additional effort on the commercial success of the film is expected to be significant.

Empirical tests reveal some support for the liquidity-constraint hypothesis and qualified refutation of the risk-sharing hypothesis. Furthermore, a test devised to measure the influence of star power on contract design suggests that share payments may not simply serve as rewards to star status. Together, these analyses contribute to the empirical evaluation of the contract choice literature, while revealing new information about contracting patterns and institutions unique to the U.S. motion pictures industry.

## Appendix A: Comprehensive List of Actors and Actresses Appearing in Data Set

Woody Allen	Gene Hackman	Al Pacino
Julie Andrews	Tom Hanks	Harold Ramis
Dan Aykroyd	Audrey Hepburn	Robert Redford
Jacqueline Bisset	Katharine Hepburn	Christopher Reeve
Sonny Bono	Dustin Hoffman	Burt Reynolds
Marlon Brando	William Holden	Arnold Schwarzenegger
Richard Burton	Rock Hudson	George C. Scott
Michael Caine	Diane Keaton	George Segal
Sean Connery	Alan King	Simone Signoret
Tom Cruise	Jack Lemmon	Frank Sinatra
Bette Davis	Traci Lords	Sylvester Stallone
Sandra Dee	Shirley MacLaine	Meryl Streep
Bo Derek	Jock Mahoney	Barbara Streisand
Danny DeVito	James Mason	Elizabeth Taylor
Kirk Douglas	Steve McQueen	Spencer Tracy
Faye Dunaway	Liza Minelli	John Travolta
Clint Eastwood	Rick Moranis	Jon Voight
Harrison Ford	Ben Murphy	David Warner
Tony Franciosa	Eddie Murphy	John Wayne
Clark Gable	Bill Murray	Sigourney Weaver
James Garner	Paul Newman	Mae West
John Glover	Olivia Newton-John	Richard Widmark
Colleen Gray	Jack Nicholson	Bruce Willis
	Ryan O'Neal	

## Appendix B: Data Sources for Dependent and Explanatory Variables

*SHARE*

*Daily Variety, Weekly Variety, Hollywood Reporter, Screen International, The Wall Street Journal, The New York Times, The Los Angeles Times, The Los Angeles Herald-Examiner, Los Angeles Magazine, People, Cosmopolitan, and Us.*

- EXPERIENCE, TEAM** *The International Motion Picture Almanac* and *Halliwel's Film Guide*, various editions. For nine of the actors and actresses, the following additional source was consulted: *Motion Picture Players' Credits: Worldwide Performers of 1967 through 1980 with Filmographies of their Entire Careers, 1905–1983* (Oliviero, 1991).
- LENGTH** *Production Notes* for each film at the Academy of Motion Pictures, appearing in clippings and on microfiche.
- OSCAR** *60 Years of the Oscar: The Official History of the Academy Awards* (Osborne, 1989) and *The Academy Awards Index: The Complete Categorical and Chronological Record* (Shale, 1993).
- GENDER, SEQUEL** Determined by inspection.
- REVENUE** *Max Alvarez's Index to Motion Pictures Reviewed by Variety, 1907–1980* (Alvarez, 1992), and *John Willis' Screen World*, various editions, for review and release dates. *Variety*, various editions, especially May 4, 1992, "All-Time Rental Champs." "Rentals" indicate the portion of the box-office receipts that the film distributors receive from the theatres.
- ACTION, COMEDY, DRAMA** *The Video Source Book*, 13th Edition and *Halliwel's Film Guide*, Eighth Edition. For eight of the films, the following additional sources were consulted: *Film 68/69: An Anthology by the National Society of Film Critics* (Alpert and Sarris, 1969); *John Willis' Screen World, Volume 27* (1976); *Variety* (May 18, 1960, and May 22, 1968).
- HOLIDAY** Alvarez's *Review Index* (Alvarez, 1982) for films released between 1959 and 1981. *Art Murphy's Box-office Register*, various editions, for films released between 1982 and 1989. One release date was determined by consulting *Variety*, June 24, 1981.

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