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Information, Blockbusters and Stars? A Study of the Film Industry

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INFORMATION, BLOCKBUSTERS AND STARS - A STUDY OF THE FILM INDUSTRY

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INFORMATION, BLOCKBUSTERS AND STARS - A THEORETICAL AND EMPIRICAL STUDY OF THE FILM INDUSTRY - abstract

The purpose of this paper is to explore the role of stars and other potential informational signals in the movie business. In the first part of the paper, we explore two alternative economic explanations for the role of stars in motion pictures. The first approach is a signaling view; namely that informed insiders signal project quality by selecting an expensive star. The second approach is the "rent capture" hypothesis, i.e. that stars receive their marginal value. These two approaches have different implications regarding stars' pay, movie revenues and return on investment. The second part of the paper contains an extensive empirical investigation of a sample of movies produced in the 90's. Univariate analysis seems to show that star-studded films bring in more revenues than other films. However, regression analysis only supports the notion that any big budget investment increases revenues. Sequels, highly visible films and "family oriented" ratings also contribute to revenues. However, when we measure return on investment, we find that stars or big budgets are not associated with profits - if anything, low budget films seem to do better. This supports again, the "rent capture" hypothesis. We identify some additional variables that are associated with profitable films.

I. Introduction.

The purpose of this paper is to explore the role of stars and other potential informational signals in the movie business. In the first part of the paper, we explore two alternative economic explanations for the role of stars in motion pictures. These two approaches have different implications regarding stars' pay, movie revenues and return on investment.

The second part of the paper contains an extensive empirical investigation of a sample of movies produced in the 90's.

In some sense, this analysis applies techniques that are generally used to assess overall firm performance to a discussion of individual projects. There are very few industries where such a wealth of data concerning individual undertakings is available, and thus the implications of our discussion may transcend the motion picture industry[1].

II. Project Finance and the Film Industry.

Films are essentially projects, similar to a new product line or a new restaurant. However, they possess some unique, important characteristics.

Movies are expensive commodities. The most expensive film in our sample cost close to 70 million dollars to produce, excluding advertising and distribution expenses. The record to date is held by the Titanic (to be released late in 1997) with a projected price tag exceeding 200

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[1] There are few empirical investigations of profitability at a project level and they often pertain to developing countries. Most theoretical investigations are concerned with optimal investment or capital structure issues - see for example Shah and Thakor (1987) Webb (1991) or Chemmanur and John (1996).

million dollars. The average cost of films has reached 50.4 million in 1995 (see Weinraub (1995))[2]. Yet, each project is unique.

The exception that proves the rule is the desperate scramble for sequels - if you find a successful formula you must try it again[3]. Also, whereas some attributes of most commodities can be easily described and measured (for instance, good shoes must be durable and comfortable, good warplanes must be fast and agile), attributes of successful movies are much harder to quantify. Yet, at each point in time, studios and production companies must pick and choose among an enormous number of competing projects, and sink a significant sum of money into the select few that reach the production stage.

The hype involved in any release of a new film is often heightened by the participation of a major star or by expensive and unusual special effects (examples of movies of the latter type include Jurassic Park, Volcano, Twister and many others).

This paper investigates two competing hypotheses regarding the role of stars in the movie business. The first hypothesis maintains that stars essentially capture most of their value added. This view can find some support in the institutional background. Until the 1950's, the studio system ruled supreme in Hollywood. A star would sign a long-term contract with a studio. If s/he had a successful film and their market value went up, the studio would capture most of this rent. In spite of some possible re-negotiation, the star was bound by the contract s/he had signed. The demise of the studio system made stars

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[2] Press reports and trade publications propose numerous "average budgets". It is not always clear how each figure is calculated, but our sample seems reasonably representative of the universe of films produced in the period in question. A MPAA (Motion Pictures Association of America, the major trade group) figure reported by S&P for 1996, for instance, is $39.8 million for negative costs and $19.8 million for print and advertising (see S&P Credit week 1997).

[3] Later we shall test the role of sequels directly. We thank the referee for suggesting this route.

essentially free agents, whose salary reflects their market value. Since each star is unique in some sense, one could conjecture that they should be able to capture most of their expected value added[4].

This "rent capture" hypothesis is supported by significant casual evidence indicating that stars may very quickly adjust their fees to reflect their marginal value. Weinraub (1995) reports that John Travolta who had earned only $150,000 for "Pulp Fiction" (a much lower fee than he had commanded earlier in his "Saturday Night Fever" days) increased his fee to $10 million after the success of that film. Alicia Silverstone, who had received $250,000 for "Clueless", increased her fee for the next film to $5 million and other examples abound (see Weinraub (1995)). If the "rent capture" hypothesis is correct, there should be no correlation between star participation and film profitability[5].

The other hypothesis is somewhat more complex and relies on the process by which films are being produced. Studios purchase options on many scripts. Some of these scripts are chosen for development, where additional participants are attached to the project as it progresses. In the process, studio executives learn more about the project. Furthermore, before a film is approved for financing, there is almost invariably some "talent" attached - i.e. either a director has agreed to direct the film, or a star has agreed to participate, or a star producer has taken it under his wing. This is where a signaling interpretation may come in. Executives' careers may depend on the success of a film (the average tenure in office for executives in charge of production at large studios had been around 20 years during the 40's and but declined to 4 years by the 70's and 80's (Weinstein (1997), fn. 40)). With a

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[4] Of course, since the success of the next film is always at least somewhat random, and the star's value is also not always clear ex-ante, this can only be true in expectation, i.e. empirically on average.

[5] I thank a referee for suggesting this interpretation.

significant probability of being fired, a commitment to a star, or to expensive special effects, can be a high-risk proposition for a risk averse executive. Since it is costly, one can view such commitment in an early stage of the project as a signaling device, by which the executive signals the quality of the project to the studio or to outside financiers. The executive cares about the current impact of the signal because his current compensation is dependent on the project he is involved in. He cares about ex-post results because his future in the business depends on the success of the project. The signaling process here is thus akin to a simple Ross (1977) type model (but it can be developed into a more complicated set-up such as John and Williams (1986), Miller and Rock (1985) or Ravid and Sarig (1991)). A similar interpretation can apply if a star actor or star director is the initiator of a project (which happens sometimes, for example, for the film Forrest Gump). In this latter case, star participation may signal superior information -in other words, they would not commit to a movie they did not know was good.

Casual evidence seems to support the idea of an in depth evaluation and gradual attachment of "talent" to a project which should breed informed insiders who can signal quality. Breese (1992) describes the long screening process a script must endure from submission to acceptance. Lippman illustrates this notion in the Wall Street Journal (1995) with a story about a screenplay that had been sold by two newcomers for $1.2 million, but five years, four rewrites, and another 1 million in costs after the original sale, it had still not been produced.

The signaling notion is also supported by the fact that stars and directors typically receive a portion of their compensation as percentages of the gross revenue of the film. This set-up is consistent with either an incentive contract or a signaling framework. In other words, either the star needs an incentive to perform well, or she has inside information about the

future success of the project or both. The institutional background leads one to believe that the latter interpretation may be more likely - reputational effects should keep stars on track even without a specific incentive component in their contract[6].

Chisholm (1997) finds that actors are likely to receive share contracts for projects that have a longer production time. This finding can be interpreted various ways, but it can support the notion that share contracts are more likely if a less transparent project were at stake and if actors were trying to signal quality.[7]

The few studies that have documented the determinants of success in the film industry seem to indicate that stars and other manifestations of recognition are associated with successful movies[8]. Dekom (1992 p. 130) verbalizes this popular notion about stars that can "open" a film in describing Disney's strategy: "The first (strategy) is Disney's technique, which

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[6] Weinstein (1997), in a historical analysis of contracts in the movie industry, believes so too - in an environment where each project is re-contracted, stars cannot afford to fail. This contractual form, i.e. a fixed component and share participation, agrees with some of the literature on optimal contract design in very uncertain environments (see Ravid and Spiegel (1997)).

[7] The study by Chisholm (1997) examines the incidence of share contracts vs. fixed payment contracts. A relatively small number of contracts were collected in a painstaking effort for 118 films over 30 years (this represents a very small percentage of the total number of films produced). For some films the information obtained was incomplete. Probit analysis points out that male actors and experienced actors (marginally significant) tend to receive share contracts. There is also a significant correlation between the probability of receiving a share contract and the length of production. Revenue from the previous movie and previous work- as- a- team variable are also marginally significant. However, a word of caution is due in interpreting her results - even a casual glance at the actors included in the sample reveals that most of them are stars by most definitions. On average, each actor in the sample had 2 Oscar nominations (max - 11) as opposed to about 1.5 per film (i.e. for all cast members) in our more random sample. This selection bias is because contracts of "lesser" luminaries are usually not reported in the press or in trade publications.

[8] There are several studies of the stardom phenomenon, in other words, whether stars are indeed the most talented people in the profession or whether they have become stars for other reasons. The classical analysis in this area is by Rosen (1981) followed by a paper by Adler (1985). The empirical evidence is hard to obtain and is somewhat mixed - see for example Hamlen (1991). However, in our case the question is whether stars, who are stars for whatever reason, are hired so as to signal some independent measure of quality.

recognizes that once a person is a star, even if his or her fortunes seem to have changed, he or she will be recognized and valued by the public. By uniting an attractive concept, well marketed, with a recognizable name (although perhaps from the recent past) Disney has been able to generate considerable grosses". Litman (1983) finds that Academy award nominations or winnings are significantly related to revenues.[9] Litman and Kohl (1989) find that the participation of stars and top directors (classified in a manner similar but not identical to our empirical measures), critical reviews, ratings, and several other variables are significantly related to revenues. However, academy award nominations are significant only for the best film category and winning did not seem to affect revenues.

These studies, as well as some sophisticated analyses of success in the business (see Eliashberg and Shugan (1994) and Eliashberg and Sawney (1996)) have focused on receipts. The economic measure of success, on the other hand, should be profits or returns to investment, which we try to incorporate in this study. Furthermore, in recent years the importance of video and international revenues has increased significantly. This is the first study (to my knowledge) which includes such data, reflecting the new reality of the movie business. We also include a comprehensive set of control variables[10].

We thus test the hypothesis that stars signal quality (which implies that stars should

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for whatever reason, are hired so as to signal some independent measure of quality.

[9] Smith and Smith (1986) analyze a sample, which includes only the most successful films in the 50's 60's and 70's. The results (which differ by decade) of running revenues against award are curious. For instance, winning an award seems to have a negative and significant effect in the 60's and a positive and significant effect in the 70's. The Best Actor award variable is insignificant, whereas the Best Actress award variable changes sign from positive in the 50's to negative in the 70's. The total number of awards received per film has a positive and significant effect on revenues.

[10] S&P Credit week (1997) reports that in 1996 video revenues were the largest component of the average film's revenues. While it was not so in our sample period (video revenues have grown about 7 fold between 1986 and 1996), still, the inclusion of video revenues and international theatrical revenues improves the accuracy of our revenue estimate compared to other recent studies.

be associated with higher returns) against the "rent capture" hypothesis, which implies that star participation will not change profits.

In most industries, a discussion of return on investment should be sufficient. However, as noted earlier, the movie industry is very concerned with revenues. This is reflected in reports in the popular press and in some previous empirical studies -in fact, all empirical studies quoted in this paper have used revenues as the dependent variable and did not try to estimate returns. We will thus also consider revenues as a possible objective in the empirical investigation by looking at the correlation between stars and revenues. This type of test can examine the signaling idea for revenues as well, although the signaling model cannot be empirically disentangled from a simple model proposing that more expensive stars lead to higher revenues. A discussion of revenues will also enable us to better compare our sample and results with other papers.

Finally, we should note that an alternative empirical specification could have included an event study of the announcement effect of hiring a star or of committing to a package of special effects. However, there are significant impediments to such studies in the current context. First, the projects in question, while large, are often not sufficiently significant to warrant discernable changes in stock prices unless the studio is very small. The problem is exacerbated by the fact that studios have been purchased by even larger diversified companies (Sony for instance). Furthermore, since there is no reporting requirement for decisions concerning individual films, timing may sometimes be hard to gauge. Unfortunately, any study of individual projects can invariably run into such difficulties.

The rest of the paper is organized as follows: the next section describes the data. Section 4 provides the results. Section 5 concludes the paper.

III. Data and variables

The data was collected from several sources. We identified a sample of over 200 films released between late 1991 and early 1993. This sample was pared down because of various missing data to 180 final observations. (For instance, two observations were dropped because of a late release date - as discussed later, the revenues are up until the end of 1993 and late releases may bias the revenue figure downward). Most testing was performed on 175 films, eliminating all very low budget films. However, we do report results for the entire sample as well. [11].

Baseline services in California provided the budget of each film (the so-called "negative cost" or production costs, not including gross participation, which is the ex-post share of participants in gross revenues) as well as domestic, international and video revenues. Specifically, we have domestic box office receipts, whereas international revenues are the shares of domestic distributors in box office receipts overseas. As noted, all revenue numbers are current as of the end of 1993. Since revenues tend to taper off rather quickly, and the last movie on the list of 180 was released in February 1993, we are fairly confident that we have a good measure of the economic returns for each film. Baseline also provided a list of the director, and up to 8 main cast members. We then consulted several sources so as to characterize the cast members as "stars", "just" actors or unknowns. For the first definition of a "star", we identified all cast members who had won an academy award (Oscar). A dummy variable AWARD denotes films in which at least one actor or the director had won an

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[11] This sample covers a significant percentage of films released between late 1991 and early 1993. In 1992 only 150 MPAA (Motion Pictures Association of American, the major trade group) affiliated films were released. The numbers for 1991 and 1993 were 164 and 161 respectively (see Vogel (1994) table 3.2).

academy award. An alternative measure is NEXT. This dummy variable receives a value of one if any member of the cast participated in a top ten grossing movie in the previous year. These two variables define two alternative sets of "star studded" films. The measures we have suggested so far are reasonably common in studies of the industry; however, we tried other specifications as well. [12] From the above-mentioned sources we collected the number of academy award nominations for the actors and the director for each film in the sample. Two variables were defined - ANYAWARD, which receives a value of one if one of the actors or the director was nominated for an award. This increased the number of films in the "star studded" classification (at least one nomination) to 76 out of 180. A second way of looking at the data was by measuring recognition value. For each of the 76 films in the AWARD category, we summed up the total number of awards and the total number of nominations. This method effectively creates a weight of 1 for each nomination and doubles the weight of an actual award to 2 (in other words, if one actress in the cast was nominated for an award VALAWARD was 1. If she also won, the value went up to 2. If another cast member was nominated for an award but did not win, VALAWARD was 3). Each of the 76 films was thus assigned a numerical value, ranging from 15 (for Cape Fear, directed by Martin Scorsese and starring Gregory Peck, Robert Mitchum, Jessica Lange and Martin Balsam) to of course 0 for the films in the sample which had no nominations. These new variables did not perform differently (in terms of sign and statistical significance) than the AWARD and NEXT variables, and hence the results are generally not reported with the exception of one table[13].

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[12] Film journals and other reference sources often carry rankings of stars. However, the rankings, while correlated, tend to be idiosyncratic, where film critics promote their individual choices.

[13] We also tried to define a dummy variable which receives a value of 1 if either AWARD = 1 or NEXT = 1. The coefficients were not significant in either the revenues or the return on investment regressions. Similarly, a union of (ANYAWARD = 1 and NEXT = 1) did not

We also defined a dummy variable UNKNOWN- which designates films in which all cast members did not appear in either of three major references on movies : Katz (1994) Maltin (1995) or Halliwell (1993). Presumably, if leading cast members are not listed anywhere, the film must be in opposite end of the star kingdom. If stars provide significant benefits, these films should be the least profitable or bring in least revenues.

Our second dependent variable is the return on investment. Direct profit measures in the film industry are difficult to obtain. The accounting profit of a movie is not necessarily publicly reported and may be of dubious economic value even if it were to be announced. One of the most glaring recent instances is the film Forrest Gump. In spite of revenues in excess of half a billion dollars, the film theoretically failed to make a profit. As noted, actors and directors often receive, in addition to their salaries, a percentage participation (gross participation) in profits. In recent years, most contracts have reverted from percentages of the net profit to percentages of the gross revenue, since the net is manipulable. Even so, there are quite a few variations - some actors receive points from the first dollar of revenues, others after some revenue figure has been reached (say 30 million dollars) and still others start collecting their share after distribution costs have been recouped. This has two implications: first, it is hard to believe net numbers not trusted even by people who are closely associated with the project. Secondly, "true" profits are made harder to gauge because of these complex deals.

There are additional issues. Typically, distribution and advertising (including fees, exhibitors' share and various other expenses) add significant amounts to negative costs

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perform any better.

(Vogel, (1994), S&P Credit week (1997)). The difficulty with including such additional costs even if the data were available is that whereas negative costs end when the film is ready for distribution, advertising can be an ongoing activity.

On the revenue side, in today's multi-media world, some sales components may be hard to account for (see Vogel (1994) for some aggregate data). Thus, it was difficult to select an appropriate proxy for economic profits. We chose the measure that required fewest assumptions and used (of course) available data - namely, Revenues/Negative Costs, i.e. (1 + the return on initial investment). In reality, as mentioned, revenues accruing to the studio or the production company are a fraction of total revenues (except for international revenue numbers in our data set which exclude distributors' shares). Similarly, costs are augmented by advertising and gross participation. However, our measure can be a good approximation under the following assumptions, which we believe to be reasonable. First, we assume that revenues available to the studio or the production company (after exhibitors' cut) are a constant proportion of gross revenues. Since agreements with theaters tend to be standardized, this is not a bad assumption.

On the other side of the equation, we must assume that the actual costs, including advertising and distribution, are a constant proportion (greater than one) of the negative cost. Again, distribution agreements tend to be of similar format across films, which supports this notion. If one accepts these assumptions, then the "true" revenue should be a proportion α of box office receipts, whereas the correct costs would be $(1 + ß)$ x (negative costs). α, ß are constants, $\alpha < 1$. Therefore, "True revenue"/"True cost" $= \alpha/(1 + ß)$ x (BO Receipts/negative costs). In other words, the measure we selected is then (1 + true return on investment) multiplied by a constant. Clearly, this is the best we can do with available data. We should note that if the ratio we find is greater than one, it does not imply that the film is "profitable"

because of the way the index was constructed. However, if the ratio for film (a) is greater than the ratio for film (b), then film (a) should be more profitable than film (b). This ratio of revenues to costs, is our RATE variable.

Another variable that may be of interest is whether or not a film is a sequel. Suppose that there is no quantifiable variable which predicts success, however, there is some elusive component which captures audiences' hearts and pocketbooks. If a film succeeds one should then try to reproduce this elusive formula as closely as possible. This implies that sequels should be successful on average. The opposite argument may be that, if indeed, success is completely unpredictable, sequels will not do any better than any other films - in fact, they may do worse because they tend to be expensive as actors capitalize on their earlier achievements. Our SEQUEL variable (suggested by a referee) receives a value of 1 if the movie is a sequel to a previous movie and zero otherwise. We identified 11 such films in our sample.[14]

We use several control variables. The publication "Variety" lists reviews for the first weekend in which a film opens in New York. However, they include national listings as well. INDEX 4 is the total number of reviews. It proxies for the attention the film has received (and possibly the number of screens on which it opened). Reviews are classified by "Variety" as good, bad and mixed, and we use these classifications to come up with several measures of critical review assessment. INDEX1 is the number of good reviews divided by the total number of reviews; INDEX2 is the number of good and mixed reviews divided by the total.

Additionally, since ratings are considered by the industry to be an important issue, we use ratings as dummy variables. For instance, a dummy variable G receives a value of 1 if the

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[14] Sometimes identification was trivial -e.g. Alien 3. Sometimes we had to work harder - one film in our sample was a sequel to a movie produced in 1985 and had a different title.

film is rated G and zero otherwise. Note that some films are not rated at all for various reasons and those received our default value of zero.

Finally, we looked up each film's release date. In some other studies (see Litman (1983)), release dates were used as dummy variables, on the theory that a Christmas release should attract greater audiences, and on the other hand, a release in a low attendance period should be bad for revenues. However, since there are several peaks and troughs in attendance throughout the year, we use information from Vogel (1994 figure 2.3) to produce a somewhat more sophisticated measure of seasonality. Vogel constructs a graph, which depicts the normalized weekly attendance over the year (based upon 1969-84 data). This figure assigns a number between 0 and 1.0 for each date in the year (where Christmas attendance is 1.0 and early December is 0.35 for the high and low points of the year respectively). We match each release date with this graph and assign a variable which we call "release" to account for the seasonal fluctuations.

IV. Results

Table 1 below describes the data for 175 films with budgets exceeding 1 million dollars[15]. The budgets in this sample range up to 70 million dollars. Domestic, video and international revenues are listed as well. Total revenues range from a low of $347,000 to a high of over $426 million. This variability is perhaps the most significant feature of the sample, and of the industry as a whole.

Our Index variables denote the reviews. On average, positive reviews account for almost half of the total (43%) whereas non-negative (including neutral) reviews comprise over 2/3 (68%).

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[15] Later we discuss the full sample, including the low budget films.

The average number of reviews per film is 20. The range is from 3 to 43.

Seventeen films in the sample feature actors who had a top grossing movie the previous year (NEXT = 1). For 30 films we could not find references to lead actors in any guide (UNKNOWN = 1). Twenty-six films include actors or directors who won academy awards (AWARD = 1). In 76 of the films some participant had an academy award nomination or won an actual award (ANYAWARD = 1). We had 5 G rated films, 24 that were rated PG, 41 that were rated PG 13, 86 that were rated R whereas the rest were unrated.

The first panel of table 2 contains univariate tests comparing AWARD vs. non-AWARD films. The results are very clear - while the budget, domestic revenues, and international revenues are significantly higher for films which employ a star, the rate of return measures are not significantly different, although the difference we find is in the "right" direction, i.e. "star studded" films are more profitable. Interestingly, video revenues are not significantly different between the two sub-samples, indicating that films in the two categories may not differ that much in video revenues even though their budgets are, on average, more than twice as high.

Panel B of table 2 provides an alternative specification for the two sub-samples, i.e. it compares films with top grossing stars (NEXT = 1) vs. the rest of the sample. Again, films with top stars are more expensive, provide more revenues but are not more profitable according to our measure. Video revenues are higher for films with known actors, but again, not significantly so.

The critical reviews (INDEX) variables are telling us an interesting story - films with award winning participants receive only marginally better reviews (the difference in the INDEX1 and INDEX2 variables is at best marginally significant). There is virtually no difference between reviews of films, which employ stars who had a top ten hit, and the rest of the sample. On the other hand, no matter how star power is measured, star-studded films are

much more heavily reviewed - possibly also opening on more screens.

Panel C of table 2 examines the other end of the spectrum - films where the actors were not mentioned in any of several leading reference books. Again, while the budget and the revenues are significantly lower for such films, the very high standard deviation does not enable us to establish that profits are statistically different. Interestingly, reviews are better for films that have unknown participants, although not significantly so. Reviewers' attention, however, is significantly lower, as expected. Panel d provides a univariate comparison for our other specification, namely, separating out films with participants who were either nominated or received awards. Now we have 76 films where for which the new dummy variable, ANYAWARD, has a value of 1. The picture, however, is virtually unchanged, except that now video revenues as well are significantly higher for the "star studded" sub-sample.

The rates of return are still not significantly different between the two sub-samples and reviews are no better, but again, reviewers' attention is significantly greater.

Panel e compares sequels to non-sequels. Sequels have higher budgets and higher revenues than the average film in the sample, but they use fewer stars. Interestingly, they are reviewed less and get worse reviews than average, weakly supporting the notion that sequels sell a formula rather than a unique, quality product. Return on investment is higher, but not significantly so, providing some support to the view that it is hard to quantify what makes a movie tick, however, even with low quality and less stars, a sequel still works better than the average film.

The results so far seem not to support any role for stars in either signaling or helping profitability, rejecting a signaling hypothesis. However, there seems to be a strong indication that stars do signal (or cause) higher revenues and exposure. This is weakly related to the

industry concept of a "bankable star" or a star that can "open" a movie. In other words, star-studded films seem to have significantly higher revenues whereas films with unknown cast members seem to have significantly lower revenues. Also, sequels seem to be a good idea. These concepts are further tested below.

Table 3 provides correlation matrices for the data. They reinforce the previous results. It is interesting to note that budgets do not seem to be highly correlated with returns - in other words, big budget films do not necessarily make money. Similarly, there is little correlation between either AWARD, NEXT or UNKNOWN and returns (RATE). However, there is a reasonably significant correlation between award and INDEX4, which measures the number of reviews. In other words, films with award winning actors get noticed, but they do not necessarily get good reviews.

Subsequent tables provide results of regressions where revenues and profits serve as dependent variables. Panels a) -c) of table 4 provide revenue regressions, with a breakdown according to the source of revenue. For international, domestic and video revenues the most significant variable is the budget - in other words, more expensive films bring in more money. The other significant variables are the number of reviews, i.e. the attention the film has received (as noted, this variable may indirectly measure the number of screens as well). Ratings matter as well - for domestic, video and total revenues, PG ratings are important and for video and total revenues, a G rating will improve sales. The results for international revenues are the most difficult to interpret with only budget and INDEX4 (the number of reviews) turning out to be significant. These results are somewhat in line with expectations - the video market is more concerned with the question of whether the kids are eternally

harmed if they accidentally stick the wrong cassette in the VCR. The international theatrical market, on the other hand, buys well received or sometimes "action" films, with less regard to their rating.

The interesting feature here is that once we take into account a reasonable variety of independent variables, stars are not correlated with revenues any more (the coefficients are even negative, but insignificant). However, big budget films seem indeed to increase revenues, regardless of the disposition of the big budget - whether it is for star participation or for instance, to create expensive special effects. These results do not support the view that stars signal revenues but supports the "rent capture" hypothesis - you invest more to receive more revenues. Stars seem to receive their marginal value. [16][17]In all regressions sequels bring in more revenues which seems to support the idea that although one cannot specify a formula ex-ante, once it is found it may work again.

The total revenue regression is of course consistent with the parts - revenues increase if the budget is higher, if the rating is more "family friendly" (G, PG and to some extent PG13) if the film is a sequel and if it is heavily reviewed. We should note that we have tried several other specifications, for example, including only NEXT or only AWARD as independent

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[16] In order to test further whether stars have an impact on the revenues, we performed also a matched pairs test. We matched 20 of our award winning films with other films in terms of budget, rating and INDEX4 (the number of reviews) and attempted to see whether there is a significant difference in the revenues. We performed a similar test for 13 films with Next = 1 and also for unknown vs. the rest of the films in the sample. In all cases the differences between the two sub-samples were not statistically significant.

[17] The two top grossing films of 1996 "Twister" and "Independence Day" provide two good examples - both are low on star power and plot and high on special effects. Jurassic Park is an additional example.

variables, however, there was no qualitative difference in the results. We also ran all regressions with different specifications of stars (ANYAWARD, VALAWARD) but that did not affect the outcome.

Earlier studies, typically using fewer independent variables and lacking data on international or video revenues (some are from the pre-video era) obtained mixed results. Litman (1983) (using a smaller data set) finds that production budget is an important determinant of revenues, but stars and content seem to matter as well, and so does critical appreciation. Similar results are obtained in Litman and Kohl (1989). However, as noted, in their study the academy award process is only weakly related to revenues, in some agreement with our results. Smith and Smith (1986) who consider a sample of the highest grossing films until 1980, come up with the curious finding that in the 50's and 60's academy awards for best actors and best films had a negative impact on rentals. We should also note that if indeed the correct interpretation is that stars receive their marginal value, it is more likely to hold for our data set containing films from the 90's, due to the demise of the studio system. In 1944, for instance, there were 804 actors under contracts to major studios. This number fell to 164 in 1961 and kept falling. Thus, the earlier the data, the less likely it is that the rent capture hypothesis should hold.

In an extensive (but differently focused) study of the impact of critical reviews on box office receipts, Eliashberg and Shugan (1994) find that reviewers do not influence the success of a film but are a good predictor of it. While our study cannot distinguish the two, the thrust of our results is that the number of reviews matters, but the content does not seem to be important. Eliashberg and Sawhney (1996), on the other hand, attempts to measure the impact of early box office receipts on revenues whereas our study aims at providing an ex-ante forecast. Most studies, as noted, have less independent variables which may also

account for the different results. No study, however, has considered the return on investment, which we turn to next.

Table 5 contains the rate of return regressions. The only significant independent variables are ratings - in other words, G and PG rated films seem to do better. This finding may be explained in several ways: first, the potential audiences are nested - in other words, everybody can see a G rated movie, however, most teen-agers may be excluded from an R rated movie. Also, the video market for non-family oriented films may be limited.

Stars, or even budgets, are not significantly related to returns. The sequel variable is significant only at the 10% level. Reviewers' attention seems to be positively but not significantly related to rates. Big budgets may increase revenues, but they do not seem to signal or predict rates of return[18]. Table 5 thus supports again the "rent capture" hypothesis rather than the signaling view. In other words, stars, who are constantly in the market, are able to capture the best estimate of their ever-changing marginal value[19]. Thus there is no advantage to hiring a star, and return on investment may be weakly lower for star studded

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[18] We tried several other specifications, including other reviews variables, mainly INDEX2 instead of INDEX1. There was no change. We also altered the specification of the unknown variable, this time including the director. This of course decreased the number of films for which the variable UNKNOWN had a value of one. However, there was virtually no qualitative change in the profit or revenue regressions or in the univariate tests.

[19] This is not an uncommon industry view. Weinraub (1997), in an article describing the effect of failure in movies on the careers of actors directors and producers, agrees with the idea that the marginal value of a player in this industry may change rapidly and depends on current performance and on the perceived contribution to a failure. However, the market does takes into account the random element involved - in other words, it may often take more than one failure to ruin a career. As to the notions of predictability he says: "No one knows precisely why films, or actors fail or succeed".

movies[20]. However, the relative success of sequels may hint at a non-quantifiable element that does capture audiences' hearts and pocketbooks. The best the industry can do, is to try and recreate this element. A related interpretation of table 5 reinforces the notion that revenues (empire building, sales maximization) may be included in the objective function of decision makers, and that it may be signaled by big budgets, whereas profits are either less important or unpredictable or both[21].

Finally, we added our 5 low budget films. The revenue regression does not change dramatically, except that another rating category becomes marginally significant (see table 6 panel a). Sequels are also important to revenues, even more so than for the sample of 175. The return equation, however, has changed dramatically. The most (negatively) significant variable is budget. As perhaps expected, once we add successful low budget films, big budget seems to spell financial failure, on average.[22]

In this regression all ratings (as opposed to unrated films) contribute to return on investment, but the unexpected transformation is in the reviews variables. Good reviews seem

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[20] Both the Wall Street Journal (Shapiro and Lippman (1997) and the New York Times (Weinraub and Fabrikant (1997) cite Warner Brothers' policy of "using expensive talent for high profile, big budget projects" (Shapiro and Lippman) or "overreliance on expensive stars and a reluctance to seek out more adventurous material and riskier film makers" (Weinraub and Fabrikant) as major factors in the series of expensive failures that has left the studio in turmoil in late 1997. This broadly agrees with our results.

[21] This unpredictability, however, is common in principle to all creative industries and to some extent to other industries as well. It is very hard to predict whether a new toy creation will be the next Barney (if the reader does not have toddlers at home, I should explain that Barney is a purple dinosaur who has spawned an industry complete with TV programs, books and ads) or just another stuffed animal. Therefore, the methodology proposed here may be used to analyze other industries as well.

[22] Weinstein calculates that the average negative cost in 1995 for Motion Pictures of America members (who are responsible for all large releases) was 36.2 million dollars, whereas the average domestic box office receipts were only 23.5 million. Even without advertising, and not counting the exhibitor profit, large movies may then be a losing proposition.

to be negatively related to return on investment. As before, INDEX4, which measures critical attention, seems to be positively, and here also very significantly, related to profits. The sequel variable is still positively, but not significantly, related to returns. We included here the ANYAWARD (nominations) variable because it performs somewhat better than the AWARD variable, but it is still insignificant statistically.

Thus, when we add to the sample small successful films, we find more variables that can explain return on investment, mainly budgets (with a negative coefficient), ratings and critical attention. However, stars are still not there, reinforcing again the notion of "rent capture". A caveat is that the low budget films in our sample are not necessarily representative of the universe of small films and may have been included in databases because of their success. However, these results are consistent with the rest of the story, perhaps in a more dramatic fashion. Also, this final regression reinforces the sad notion that what film critics say does not really matter to film revenues or to return on investment.

In conclusion, it is clear that we can not find support to the hypothesis that stars, and perhaps even big budgets, signal quality. The "rent capture" hypothesis, however, is consistent with our empirical results.

V. Conclusions:

This study considers the film industry practices of hiring stars and engaging in big budget extravaganzas. We propose two hypotheses - one that stars (and perhaps big budgets) signal high returns or at least high revenues. Alternatively we propose the "rent capture" hypothesis - i.e. that stars receive their marginal value. Tests on a sample of close

to 200 films seem to show that stars play no role in the financial success of a film. Univariate tests support the industry view that stars increase revenues. However, when we run multiple regressions, including budget figures, budgets seem to take all the significance. In other words, big budget films may signal high revenues, regardless of the source of spending. Also, attention by reviewers seems to be important to success - the more reviews a film receives, the higher the revenues. However, what the reviewers actually say is less important. Film ratings are important as well and sequels seem to do better – which is consistent with the view that insiders are not better informed than outsiders, but that when, for whatever elusive reason, a film succeeds, studios attempt to replicate the formula.

Return regressions also support the "rent capture" rather than the signaling hypothesis, however, the role of budgets sees a dramatic reversal - big budgets do not contribute to profitability - if anything (as our final table demonstrates) they may contribute to losses. Only ratings and perhaps sequels or reviewers' attention seem to matter. Naturally, as in all empirical studies, some caveats are in order. The definition of stars we used is consistent with industry parameters and other studies and we have tried several possible specifications. However, it is still somewhat subjective, as all such definitions must be. Also, return on investment calculations are hard to come by in the film industry, and admittedly, we have a rough proxy. Nevertheless, this study leaves us wondering as to why the institution of stars is such a cornerstone of Hollywood and why studios keep turning out big budget films loaded with special effects.

We can offer some tentative ideas. One often hears of films that are produced because a specific star agreed to participate, essentially independent of quality control.

Thus a star may be hired simply because this is the easiest way to justify a failed project in

the presence of extreme uncertainty. This is close to the rationale for inefficiency of prices used by Froot et al. (1992) or by Keynes who is quoted in the same article. Keynes had suggested that judges in a beauty contest voted on the basis of their expectation of other judges' vote rather than as a result of any independent judgement on their part. In our context, if everybody is after a given star, signing him or her to a project may be a safe bet for an executive who is concerned with his job security. Or perhaps the motive for signing stars on to a project or constructing expensive sets of cities just to destroy them in simulated earthquakes, floods or alien attacks is even simpler. As noted earlier, executives may care about revenues in addition to or instead of profits, and big budgets seem to predict revenues. This idea is supported by some casual empiricism. Weinraub (1995) quotes Ron Meyer, president of MCA justifying a recent three picture, $60 million deal with Sylvester Stallone " The major reason for the deal? Mr. Meyer wanted to send a message to Hollywood that Universal was now in the big star action business". However, in the final analysis, perhaps the truth lies with Bill Mechanic, president of 20th century Fox, who said in the same article: "The entire business is out of control. There is no rationality for the prices paid".

References:

Adler, M. "Stardom and Talent" American Economic Review, 75, March 1985, pp. 208-212.

Breese, E. "The Story Editor", in the Movie Business Book, J.E. Squire, Editor, Fireside, NY 1992.

Chemmanur, T.J. and K. John "Optimal Incorporation, Structure of Debt Contracts, and Limited-Recourse Project Financing" Journal of Financial Intermediation; 5(4), October 1996, pp. 372-408.

Chisholm, D.C. "Profit Sharing Vs. Fixed Payment Contracts - Evidence from the Motion Pictures Industry" Journal of Law, Economics and Organization, 1997, Vol. 13 #1, pp. 169 - 201.

Dekom, P.J. "Movies, Money and Madness" in the Movie Business Book, J.E. Squire, Editor, Fireside, NY 1992.

Diamond, D. (1991) "Debt Maturity and Liquidity Risk" Quarterly Journal of Economics, 106, pp. 709 - 737.

Diamond, D. (1993) "Seniority and Maturity of Debt Contracts" Journal of Financial Economics, 33, pp. 341-368.

Eliashberg, J. and S.M. Shugan "Motion Pictures, Critics and Commercial Box office Performance" University of Pennsylvania working paper, 1994.

Eliashberg, J. and M.S. Sawhney: "A Parsimonious Model for Forecasting Gross Box-Office Revenues of Motion Pictures" Marketing Science; 15(2), 1996, pp. 113-31.

Froot, K.J., D.S. Scharfstein and J.C. Stein "Herd on the Street: Information Inefficiencies in the Market with Short Term Speculation" Journal of Finance, September 1992

Fershtman, C. and K.L. Judd (1987). "Equilibrium Incentives in Oligopoly," American Economic Review (December) pp. 927-940.

John, K. and J. Williams, "Dividends, Dilution, and Taxes: A Signaling Equilibrium," Journal of Finance, September 1985, 40,1053-1070.

Hamlen, W.A. "Superstardom in Popular Music: Empirical Evidence"
The Review of Economics and Statistics, 1991, pp.729-733.

Katz, Ephraim, The Film Encyclopedia 2nd edition New York: Harper Perennial, 1994.

King, T. "Joe Roth Reshapes Disney with Stars in Live Action" Wall Street Journal, June

30th, 1995.

Lippman, J. "Dying Hard - how a Red-Hot Script that Made A Fortune Never Became a Movie" The Wall Street Journal, June 13th, 1995.

Litman, B.R. "Predicting the Success of Theatrical Movies: An Empirical Study" Journal of Popular Culture Spring 1983, pp. 159-175.

Litman, B. R. and L. Kohl "Predicting Financial Success of Motion Pictures: the 80's Experience" Journal of Media Economics, Fall 1989, pp. 35-49.

Maltin, Leonard, ed., Leonard Maltin's Movie and Vide Guide 1995, New York: Signet, 1994.

Miller, M. and K. Rock, "Dividend Policy Under Asymmetric Information," Journal of Finance, September 1985, 40, 1031-1051.

Ravid, S. A., and O. Sarig "Financial Signaling by Committing to Cash Flows" Journal of Financial and Quantitative Analysis, June 1991, 165.

Ravid, S.A. and M. Spiegel "Optimal Financial Contracts for a Start-up with Unlimited Operating Discretion" Journal of Financial and Quantitative Analysis, September 1997, pp. 269-286.

Rosen, S. "The Economics of Superstars" American Economic Review, 71, December 1981, pp. 845-858.

Ross, S., "The Determination of Financial Structure: The Incentive Signaling Approach," Bell Journal of Economics, Spring 1977, 23-40.

Shah S. and A.V. Thakor "Optimal Capital Structure and Project Financing Journal of Economic Theory; 42(2), August 1987, pp. 209-43.

Shapiro, E. and J. Lippman: "Film Flops, Dated Tunes Bedevil Warner Co-Chairmen" The Wall Street Journal, December 4th, 1997 p. B1.

Smith, S.P and V.K. Smith "Successful Movies - a Preliminary Empirical Analysis" Applied Economics, 1986, 18, pp.501-507.

S&P Credit week "Are the Cameras Ready to Roll on Securitizing the Movies?" September 3rd, 1997

Vogel, H. "Entertainment Industry Economics" Cambridge University Press, Third edition, 1994.

Walker, John, ed., Halliwell's Filmgoer's and Video Viewer's Companion, Harper Perennial, 1993.

Webb, D. C. "Long-term Financial Contracts Can Mitigate the Adverse Selection Problem in Project Financing" International Economic Review; 32(2), May 1991, pp. 305-20.

Weinraub, B. "Skyrocketing Star Salaries" The New York Times, September 18th, 1995

Weinraub, B. "Feeling the Pain when a Film Fails", The New York Times, November 23rd, 1997, p. E1.

Weinraub B. and G. Fabrikant : "Warner Bros., in Film Slump Under Scrutiny" The New York Times, December 4th, 1997, p. E1.

Weinstein, M. "Profit Sharing Contracts in Hollywood: Evolution and Analysis" forthcoming, Journal of Legal Studies

Williamson, O.E. (1964), The Economics of Discretionary Behavior: Managerial Objectives and the Theory of the Firm, Prentice Hall, 1964.

Definition of variables - used in all tables.
BUDGET is the "negative cost", or production costs of films, not including gross participation.
DOMESTIC are box office receipts for domestic revenues, whereas INTER is the share of domestic distributors in box office receipts overseas.
VIDEO is video sales revenues.
G,PG13, R are dummy variables for ratings. These variables take the value of 1 if the film is rated G, PG13 or R respectively and 0 otherwise.
INDEX1 = positive reviews / total reviews.
INDEX2 = (positive reviews + neutral reviews) / total reviews.
INDEX4 = total number of reviews.
UNKNOWN is a dummy variable receiving a value of 1 if the lead actors in the film are not found in any of three major guides and encyclopedias of the industry.
AWARD is a dummy variable, receiving a value of 1 if any participant in the film has received an academy award.
ANYAWARD is a dummy variable receiving a value of 1 if any participant in the film has been nominated for an academy award.
NEXT is a dummy variable receiving a value of one if any actor participating in the film had participated in the previous year top 10 grossing films.
SEQUEL is a dummy variable receiving a value of one if the film is a sequel to an earlier movie (not necessarily in our sample).
RELEASE is a variable adjusting for release date. See discussion in the text for an exact definition.
VALAWARD adds the number of nominations and actual awards for all cast members in each film.
LN denotes the natural logarithm of a variable.

TABLE 1 Descriptive statistics for the non-dummy variables.

Number of observations: 175

Variable	Mean	S.D.	Maximum	Minimum
INDEX1	0.43426	0.25391	1.00000	0.00000
INDEX2	0.67661	0.24100	1.00000	0.00000
INDEX4	20.9028	9.94390	43.0000	3.00000
BUDGET	15.6791	13.8961	70.0000	1.00000
DOMESTIC	22.0870	32.7949	162.800	0.00600
INTER	7.82412	13.0614	69.3000	0.00000
VIDEO	10.69708	20.28299	233.7000	0.027000
TOTREV	40.60824	60.32909	426.3010	0.347000
RATE	2.273892	2.611170	17.05204	0.086750
VALAWARD	1.594285	2.69118	15.00000	0.000000

TABLE 2 Panel a: univariate tests for AWARD (films where at least one cast member won an academy award) vs. non-AWARD films.

	AWARD =	1	AWARD =	0		
	n =	26	n =	149		
	Mean	Std	Mean	Std		t value
RATE	2.903	2.913	2.164	2.550		1.334
BUDGET	27.538	14.155	13.610	12.813	*	5.035
DOMESTIC	42.801	41.194	18.473	29.821	*	3.609
INTER	15.324	16.540	6.515	11.948	*	3.260
VIDEO	17.505	16.730	9.509	20.660		1.868
TOTREV	75.630	70.041	34.497	56.544	*	3.298
INDEX1	0.497	0.190	0.424	0.262		1.353
INDEX2	0.734	0.149	0.667	0.256		1.295
INDEX4	31.327	8.153	19.302	8.937	*	6.409

* Denotes significance at the 5% level.

TABLE 2 panel b: univariate tests for films which included actors in top grossing film the previous year (NEXT = 1) vs. all others.

	NEXT =	1	NEXT =	0		
	n =	17	n =	158		
	Mean	Std	Mean	Std		t value
RATE	2.695	2.934	2.229	2.580		0.698
BUDGET	29.971	14.392	14.142	12.977	*	4.729
DOMESTIC	41.804	41.043	19.966	31.204	*	2.654
INTER	16.941	18.880	6.843	11.948	*	3.103
VIDEO	19.228	17.969	9.779	20.355		1.837
TOTREV	77.973	75.014	36.588	57.383	*	2.737
AWARD	0.588	0.507	0.101	0.303	*	5.835
INDEX1	0.435	0.206	0.435	0.259		0.000
INDEX2	0.682	0.181	0.677	0.250		0.080
INDEX4	28.471	10.777	20.284	9.365	*	3.375

* Denotes significance at the 5% level.

TABLE 2 panel c: Univariate tests of films with unknown casts vs. all other films.

	UNKNOWN	=1	UNKNOWN	=0		
	n =	30	n =	145		
	Mean	Std	Mean	Std		t value
RATE	1.797	2.541	2.373	2.623		-1.100
BUDGET	5.178	4.901	17.852	14.169	*	-4.830
DOMESTIC	4.615	7.228	25.702	34.818	*	-3.295
INTER	1.520	2.114	9.128	13.973	*	-2.969
VIDEO	2.672	3.560	12.357	21.872	*	-2.413
TOTREV	8.808	11.299	47.188	64.171	*	-3.258
AWARD	0.000	0.000	0.179	0.385	*	-2.541
NEXT	0.000	0.000	0.117	0.323	*	-1.979
INDEX1	0.517	2.908	0.418	0.243		0.407
INDEX2	0.738	0.251	0.665	0.241		1.490
INDEX4	14.967	7.308	22.345	9.773	*	-3.911

* Denotes significance at the 5% level.

TABLE 2 panel d: univariate tests for ANYAWARD (films where cast members were nominated for academy awards) vs. all other films.

	ANYAWARD = 1		ANYAWARD = 0			
	n =	76	n =	99		
	Mean	Std	Mean	Std		t value
RATE	2.489	2.855	2.108	2.409		0.956
BUDGET	22.237	13.936	10.645	11.630	*	6.339
DOMESTIC	32.298	41.185	14.248	21.646	*	4.657
INTER	12.146	16.500	4.506	8.303	*	5.052
VIDEO	16.459	18.807	6.274	7.061	*	6.897
TOTREV	60.904	77.956	25.028	35.308	*	5.334
INDEX1	0.436	0.241	0.434	0.264		0.033
INDEX2	0.676	0.236	0.678	0.251		-0.058
INDEX4	24.658	9.934	18.333	8.768	*	4.636

* Indicates significance at the 5% level.

TABLE 2 panel e: Univariate tests of sequels vs. all other films.

	SEQUEL =	1	SEQUEL =	0		
	n =	11	n =	164		
	Mean	Std	Mean	Std		t value
RATE	3.689	2.236	2.179	2.613		1.870
BUDGET	26.455	20.587	14.956	13.106	*	2.705
DOMESTIC	52.227	55.482	20.065	29.897	*	3.233
INTER	19.703	22.259	7.027	11.898	*	3.197
VIDEO	21.113	18.177	9.998	20.275		1.770
TOTREV	93.044	90.248	37.091	56.458	*	3.048
AWARD	0.000	0.000	0.159	0.366		-1.431
NEXT	0.000	0.000	0.104	0.306		-1.121
RELEASE	0.556	0.118	0.635	0.158		-1.636
UNKNOWN	0.091	0.302	0.177	0.383		-0.728
INDEX1	0.334	0.231	0.441	0.254	*	-1.349
INDEX2	0.622	0.282	0.681	0.242	*	-0.775
INDEX4	17.454	10.511	21.323	9.918	*	-1.248

* Denotes significance at the 5% level.

TABLE 3: Correlation Matrices.

	RATE	LNBUDGET	LNDOMES	LNINTER	LNVID	LNTOTREV
RATE	1.000000	0.182877	0.612913	0.521737	0.566690	0.641882
LNBUDGET	0.182877	1.000000	0.729022	0.616926	0.733819	0.794720
LNDOMES	0.612913	0.729022	1.000000	0.771642	0.823803	0.959312
LNINTER	0.521737	0.616926	0.771642	1.000000	0.591286	0.797589
LNVID	0.566690	0.733819	0.823803	0.591286	1.000000	0.895404
LNTOTREV	0.641882	0.794720	0.959312	0.797589	0.895404	1.000000

	AWARD	LNBUDGET	LNTOTREV	INDEX1	INDEX2	INDEX4
AWARD	1.000000	0.344185	0.285372	0.102054	0.097722	0.436298
LNBUDGET	0.344185	1.000000	0.794720	-0.208644	-0.170529	0.491070
LNTOTREV	0.285372	0.794720	1.000000	-0.048257	-0.056106	0.507682
INDEX1	0.102054	-0.208644	-0.048257	1.000000	0.872275	0.325822
INDEX2	0.097722	-0.170529	-0.056106	0.872275	1.000000	0.377061
INDEX4	0.436298	0.491070	0.507682	0.325822	0.377061	1.000000

	RATE	AWARD	RELEASE	UNKNOWN	NEXT	SEQUEL
RATE	1.000000	0.100880	0.018612	-0.083307	0.053035	0.140783
AWARD	0.100880	1.000000	0.077382	-0.190007	0.405485	-0.108185
RELEASE	0.018612	0.077382	1.000000	-0.106005	-0.084858	-0.122861
UNKNOWN	-0.083307	-0.190007	-0.106005	1.000000	-0.149201	-0.055331
NEXT	0.053035	0.405485	-0.084858	-0.149201	1.000000	-0.084951
SEQUEL	0.140783	-0.108185	-0.122861	-0.055331	-0.084951	1.000000

	RATE	ANYWARD	RELEASE	UNKNOWN	NEXT	LNBUDGET
RATE	1.000000	0.072539	0.018612	-0.083307	0.053035	0.182877
ANYWARD	0.072539	1.000000	0.103051	-0.306767	0.140808	0.484749
RELEASE	0.018612	0.103051	1.000000	-0.106005	-0.084858	0.071698
UNKNOWN	-0.083307	-0.306767	-0.106005	1.000000	-0.149201	-0.438810
NEXT	0.053035	0.140808	-0.084858	-0.149201	1.000000	0.302140
LNBUDGET	0.182877	0.484749	0.071698	-0.438810	0.302140	1.000000

	RATE	LNBUDGET	G	PG	PG13	R
RATE	1.000000	0.182877	0.261368	0.327952	-0.077100	-0.152299
LNBUDGET	0.182877	1.000000	0.113620	0.101132	0.161663	-0.010036
G	0.261368	0.113620	1.000000	-0.068372	-0.094864	-0.168583
PG	0.327952	0.101132	-0.068372	1.000000	-0.220524	-0.391897
PG13	-0.077100	0.161663	-0.094864	-0.220524	1.000000	-0.543743
R	-0.152299	-0.010036	-0.168583	-0.391897	-0.543743	1.000000

TABLE 4 panel a: The domestic revenue regression. The dependent variable is LNDOMES. Independent variables include dummy variables for ratings (G, PG, PG13, R- the default is non-rated films) dummies as to whether participants had received academy awards (AWARD), whether cast members could not be found in standard film references (UNKNOWN), and whether a cast member had participated in a top grossing film (NEXT). Additional variables include the log of the budget of the film (LNBUDGET), the number of reviews (INDEX4), the percentage of non-negative reviews (INDEX2), a seasonality variable (RELEASE) and a dummy variable denoting sequels.

Number of observations: 175

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-3.8073774	0.8045552	-4.7322764	0.0000
LNBUDGET	1.3492735	0.1691444	7.9770514	0.0000
AWARD	-0.2694808	0.3912471	-0.6887740	0.4920
UNKNOWN	0.5363139	0.3620966	1.4811351	0.1405
NEXT	-0.0431328	0.4493107	-0.0959976	0.9236
G	1.3360061	0.8430603	1.5847101	0.1150
PG	1.3535991	0.5202013	2.6020681	0.0101
PG13	0.4688866	0.4770818	0.9828223	0.3272
R	0.3549449	0.4370094	0.8122133	0.4179
INDEX2	0.0709012	0.6039775	0.1173905	0.9067
INDEX4	0.0679752	0.0180777	3.7601600	0.0002
RELEASE	0.0586542	0.7830232	0.0749073	0.9404
SEQUEL	1.1438608	0.5115261	2.2361728	0.0267

R-squared	0.613320	Mean of dependent var.	1.446031
Adjusted R-squared	0.584678	S.D. of dependent var.	2.389427
S.E. of regression	1.539879	Sum of squared resid.	384.1386
Log likelihood	-317.1083	F-statistic	21.41263
Durbin-Watson stat.	1.883750	Prob(F-statistic)	0.000000

TABLE 4 panel b: The Video regression. The dependent variable is LNVID. Independent variables include dummy variables for ratings (G, PG, PG13, R- the default is non-rated films) dummies as to whether participants had received academy awards (AWARD), whether cast members could not be found in standard film references (UNKNOWN), and whether a cast member had participated in a top grossing film (NEXT). Additional variables include the log of the budget of the film (LNBUDGET), the number of reviews (INDEX4), the percentage of positive reviews (INDEX1), a seasonality variable (RELEASE) and a dummy variable denoting sequels

Number of observations: 175

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-1.3874586	0.4574982	-3.0327081	0.0028
LNBUDGET	0.9457284	0.1036397	9.1251540	0.0000
AWARD	-0.0591275	0.2393842	-0.2469982	0.8052
UNKNOWN	-0.2910299	0.2219518	-1.3112301	0.1916
NEXT	0.2790855	0.2745635	1.0164696	0.3109
G	1.5638631	0.5171451	3.0240316	0.0029
PG	0.7103283	0.3153707	2.2523595	0.0256
PG13	0.2390445	0.2902463	0.8235918	0.4114
R	0.0711945	0.2648773	0.2687831	0.7884
INDEX1	-0.0426490	0.3457541	-0.1233506	0.9020
INDEX4	0.0103442	0.0107535	0.9619321	0.3375
RELEASE	0.3366782	0.4805477	0.7006135	0.4845
SEQUEL	0.6325177	0.3113996	2.0312089	0.0439

R-squared	0.654020	Mean of dependent var.	1.444043
Adjusted R-squared	0.628392	S.D. of dependent var.	1.544062
S.E. of regression	0.941254	Sum of squared resid.	143.5255
Log likelihood	-230.9653	F-statistic	25.51965
Durbin-Watson stat.	1.879419	Prob(F-statistic)	0.000000

TABLE 4 panel c: The International revenue regression. The dependent variable is LNINTER. Independent variables include dummy variables for ratings (G, PG, PG13, R- the default is non-rated films) dummies as to whether participants had received academy awards (AWARD), whether cast members could not be found in standard film references (UNKNOWN), and whether a cast member had participated in a top grossing film (NEXT). Additional variables include the log of the budget of the film (LNBUDGET), the number of reviews (INDEX4), the percentage of non-negative reviews (INDEX1), a seasonality variable (RELEASE) and a dummy variable denoting sequels

Number of observations: 175

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-2.6643092	1.0172154	-2.6192182	0.0097
LNBUDGET	1.2297957	0.2138527	5.7506677	0.0000
AWARD	0.4814898	0.4946617	0.9733718	0.3318
UNKNOWN	0.7038553	0.4578060	1.5374530	0.1261
NEXT	-0.0636730	0.5680726	-0.1120861	0.9109
G	0.7514494	1.0658982	0.7049917	0.4818
PG	0.4783983	0.6577010	0.7273796	0.4680
PG13	-0.1095200	0.6031842	-0.1815697	0.8561
R	-0.2674686	0.5525199	-0.4840887	0.6290
INDEX2	-0.5888299	0.7636210	-0.7711024	0.4418
INDEX4	0.0528724	0.0228560	2.3132787	0.0220
RELEASE	-1.2113537	0.9899921	-1.2235993	0.2229
SEQUEL	1.1141714	0.6467328	1.7227692	0.0868

R-squared	0.437691	Mean of dependent var	0.305644
Adjusted R-squared	0.396039	S.D. of dependent var	2.505181
S.E. of regression	1.946900	Sum of squared resid	614.0478
Log likelihood	-358.1518	F-statistic	10.50816
Durbin-Watson stat	1.801613	Prob(F-statistic)	0.000000

TABLE 4 panel d: The total revenue regression. The dependent variable is LNTOTREV. Independent variables include dummy variables for ratings (G, PG, PG13, R- the default is non-rated films) dummies as to whether participants had received academy awards (AWARD), whether cast members could not be found in standard film references (UNKNOWN), and whether a cast member had participated in a top grossing film (NEXT). Additional variables include the log of the budget of the film (LNBUDGET), the number of reviews (INDEX4), the percentage of non-negative reviews (INDEX1), a seasonality variable (RELEASE) and a dummy variable denoting sequels.

Number of observations: 175

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-1.3678737	0.4760825	-2.8731863	0.0046
LNBUDGET	1.1144907	0.1078497	10.333738	0.0000
AWARD	-0.1130825	0.2491083	-0.4539493	0.6505
UNKNOWN	0.1491674	0.2309678	0.6458363	0.5193
NEXT	0.0556393	0.2857167	0.1947358	0.8458
G	1.3330188	0.5381523	2.4770291	0.0143
PG	1.0410616	0.3281816	3.1722124	0.0018
PG13	0.3358272	0.3020365	1.1118761	0.2678
R	0.2626644	0.2756370	0.9529361	0.3420
INDEX1	0.3445801	0.3597991	0.9577014	0.3396
INDEX4	0.0326718	0.0111903	2.9196396	0.0040
RELEASE	0.1126997	0.5000683	0.2253687	0.8220
SEQUEL	0.8542032	0.3240492	2.6360297	0.0092

R-squared	0.702051	Mean of dependent var	2.565284
Adjusted R-squared	0.679980	S.D. of dependent var	1.731456
S.E. of regression	0.979489	Sum of squared resid	155.4227
Log likelihood	-237.9335	F-statistic	31.80970
Durbin-Watson stat	1.962897	Prob(F-statistic)	0.000000

TABLE 5: The rate of return regression. The dependent variable is RATE. Independent variables include dummy variables for ratings (G, PG, PG13, R- the default is non-rated films) dummies as to whether participants had received academy awards (AWARD), whether cast members could not be found in standard film references (UNKNOWN), and whether a cast member had participated in a top grossing film (NEXT). Additional variables include the log of the budget of the film (LNBUDGET), the number of reviews (INDEX4), the percentage of non-negative reviews (INDEX1), a seasonality variable (RELEASE) and a dummy variable denoting sequels.

Number of observations: 175

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.5462505	1.1388483	-0.4796517	0.6321
LNBUDGET	0.0377177	0.2579899	0.1461982	0.8839
AWARD	0.1956128	0.5958980	-0.3282656	0.7431
UNKNOWN	0.2548779	0.5525036	0.4613144	0.6452
NEXT	0.1365797	0.6834698	0.1998329	0.8419
G	5.0920873	1.2873269	3.9555511	0.0001
PG	3.1499843	0.7850509	4.0124585	0.0001
PG13	0.7475581	0.7225087	1.0346700	0.3024
R	0.6685193	0.6593578	1.0138945	0.3121
INDEX1	0.9283509	0.8606840	1.0786199	0.2824
INDEX4	0.0383392	0.0267687	1.4322397	0.1540
RELEASE	0.4261174	1.1962252	0.3562183	0.7221
SEQUEL	1.3570073	0.7751657	1.7506028	0.0819

R-squared	0.250344	Mean of dependent var	2.273892
Adjusted R-squared	0.194814	S.D. of dependent var	2.611171
S.E. of regression	2.343060	Sum of squared resid	889.3688
Log likelihood	-390.5653	F-statistic	4.508256
Durbin-Watson stat	2.024886	Prob(F-statistic)	0.000003

TABLE 6 Panel a: The total revenue regression including small budget films. The dependent variable is LNTOREV. Independent variables include dummy variables for ratings (G, PG, PG13, R- the default is non-rated films) dummies as to whether participants had received academy awards (AWARD), whether cast members could not be found in standard film references (UNKNOWN), and whether a cast member had participated in a top grossing film (NEXT). Additional variables include the log of the budget of the film (LNBUDGET), the number of reviews (INDEX4), the percentage of non-negative reviews (INDEX1), a seasonality variable (RELEASE) and a dummy variable denoting sequels.

Number of observations: 180

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
LNBUDGET	0.5607678	0.0828585	6.7677794	0.0000
AWARD	0.0160498	0.2834129	0.0566303	0.9549
UNKNOWN	0.1081541	0.2578389	0.4194637	0.6754
NEXT	0.3146565	0.3217440	0.9779715	0.3295
G	1.9639264	0.5838629	3.3636774	0.0010
PG	1.2106936	0.3518104	3.4413241	0.0007
PG13	0.5574194	0.3170017	1.7584115	0.0805
R	0.3652622	0.2837428	1.2873004	0.1998
INDEX1	-0.2272955	0.3936881	-0.5773491	0.5645
INDEX4	0.0563940	0.0115113	4.8990023	0.0000
RELEASE	-0.0033635	0.5616837	-0.0059883	0.9952
SEQUEL	1.1729983	0.3637259	3.2249512	0.0015

R-squared	0.620478	Mean of dependent var	2.505415
Adjusted R-squared	0.593207	S.D. of dependent var	1.747470
S.E. of regression	1.114542	Sum of squared resid	207.4480
Log likelihood	-268.1821	F-statistic	22.75228
Durbin-Watson stat	2.125864	Prob(F-statistic)	0.000000

TABLE 6 Panel b: ***The rate of return regression including small films and ANYAWARD.*** The dependent variable is RATE. . Independent variables include dummy variables for ratings (G, PG, PG13, R- the default is non-rated films) dummies as to whether participants had been nominated for an academy award (ANYAWARD), whether cast members could not be found in standard film references (UNKNOWN), and whether a cast member had participated in a top grossing film (NEXT). Additional variables include the log of the budget of the film (LNBUDGET), the number of reviews (INDEX4), the percentage of non-negative reviews (INDEX1), a seasonality variable (RELEASE) and a dummy variable denoting sequels.

Number of observations: 180

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	24.466100	20.066829	1.2192310	0.2245
LNBUDGET	-28.619559	3.4877912	-8.2056401	0.0000
ANYAWARD	11.626220	8.0619062	1.4421180	0.1511
UNKNOWN	3.5732958	10.622882	0.3363772	0.7370
NEXT	11.536452	12.480697	0.9243435	0.3566
G	54.570068	24.055732	2.2684851	0.0246
PG	30.749839	14.445367	2.1286990	0.0347
PG13	28.462901	13.000801	2.1893190	0.0300
R	25.878054	11.616467	2.2277044	0.0272
INDEX1	-36.319857	16.126617	-2.2521684	0.0256
INDEX4	1.7507277	0.4606050	3.8009307	0.0002
RELEASE	-13.630345	23.020937	-0.5920847	0.5546
SEQUEL	17.519313	14.897772	1.1759687	0.2413

R-squared	0.325257	Mean of dependent var	7.259610
Adjusted R-squared	0.276772	S.D. of dependent var	53.68721
S.E. of regression	45.65710	Sum of squared resid	348123.4
Log likelihood	-936.4709	F-statistic	6.708466
Durbin-Watson stat	2.213927	Prob(F-statistic)	0.000000