

The Role of Film Audiences as Innovators and Risk Takers

Michael Pokorny,
University of Westminster,
London, United Kingdom

John Sedgwick
University of Portsmouth
Portsmouth, United Kingdom

Abstract:

Central to understanding the economics of the film industry is the recognition that hit films are determined via the choices that audiences make. The role of film producers is to provide a diversified range of films over which these choices can be exercised. Film producers deal with the risk of film making via the production of extensive and diversified annual film ‘portfolios’. Consumers are then induced to consume widely across these portfolios, thereby generating a word-of-mouth process that allows the hits of the season to emerge. From the hard-headed producer’s perspective it is the profitability of the film portfolio that is of overriding importance not the success or failure of individual films. However in viewing films, consumers are also taking risks – the risk of disappointment, with the consequent loss of resources which have been committed to the viewing process, which are balanced against the returns that are derived from the pleasures of the hit films. For while it is tempting for producers to assume that consumers crave familiarity, a satisfying viewing experience is also one that contains elements of novelty and ‘surprise’. This paper will explore the extent to which audiences are being presented with narrower film choices, as film producers become increasingly risk averse, conditioned by a financial environment which discourages excessive risk taking. The implications for audiences and the industry of more predictable and formulaic film outputs will be explored, and contrasted with an industry that has historically been highly innovative. The analysis is based on an extensive data set, consisting of financial information relating to nearly 12,000 films which were released onto the North American market between 1988 and 2009, thereby allowing for a detailed analysis of the film production strategies adopted by the major studios, and the manner in which these have evolved over time.

Table of Contents

Introduction 5

The Dataset 6

Some Broad Trends in the Film Market 9

Distributor Profitability Performance12

Some Conclusions17

References.....20

Introduction

Film is a complex product, formed from a wide range of disparate inputs, with the precise nature of the final product being uncertain until the production process is complete. However, even if the completed film exactly matches the producer's conception and expectations – indeed even exceeds these – there is still the final hurdle to overcome of satisfying film consumers. For in the final analysis it is film audiences which determine a film's success or failure, irrespective of the producer's judgement concerning the quality of the film. And the evolving tastes of film audiences are very difficult to predict, satisfied as they are by an ill-defined combination of the familiar and the novel.

Thus the process of film production is fraught with risks, from conception through to production and exhibition. While the major Hollywood studios/distributors are notoriously secretive about the profits that their films generate, it is widely accepted that most films lose money. The profitability of Hollywood, therefore, derives from the relatively small number of films that generate substantial profits, profits that are sufficient to, in effect, cross-subsidise the loss-generating output.

Nonetheless film production is clearly not a purely random process, and all film producers attempt to develop strategies that are aimed at maximising the profitability of their film outputs. These strategies, however, need to develop continually over time, as film audiences seek out novelty and originality, and stale film formulae need to be refreshed by innovation, incremental or otherwise. One way of characterising this process is to interpret film producers – at least in terms of the major studios/distributors – as constructing annual portfolios of films, the objective of which is not so much to maximise the returns on each film in the portfolio, but maximise the returns on the portfolio as a whole, with the clear expectation that many films, if not the majority, will generate losses. Such film portfolios will typically exhibit high levels of diversification, in terms of film budgets, genres, stars, directors, screenwriters, and so on. It is via this diversification process that some control can be exercised over the risk of film production, in much the same way that a traditional investment portfolio is constructed with a view to minimising risk. A more detailed discussion of these ideas can be found in Sedgwick and Pokorny (1998) and Pokorny and Sedgwick (2010).

This paper will analyse the financial performance of Hollywood film production over the last 20 or so years, with a view to identifying and evaluating some of the strategies that have been employed in constructing annual film portfolios. A particular emphasis will be placed on the role and impact of the production of sequels, a strategy that would appear to have dominated the recent output of the Hollywood majors. In the marketing literature sequels have been

The Role of Film Audiences as Innovators and Risk Takers

interpreted as brand extensions, thus extending the success of the parent film and reducing the risks of film production (Hennig-Thurau *et al*, 2009). The literature is consistent on the box office and profit enhancing impact of sequels (Basuroy and Chatterjee, 2008, Hennig-Thurau *et al*, 2007, Walls, 2009, Terry *et al*, 2009, Terry *et al*, 2010). However, given the general trend of sequels generating lower returns than parent films and previous sequels, the implication is that sequels tend to generate lower satisfaction levels amongst consumers. Hence there are implications for the manner in which sequels need to be marketed and promoted (Moon *et al*, 2010, Sood and Drèze, 2006).

This study will employ a more extensive dataset than most previous studies, in terms of both number of films and the time period over which the study extends. In particular, the following analyses will derive from the financial performance of some 12,000 films that were released in North America from 1988 to 2009.

The Dataset

The dataset was supplied by Nielsen EDI¹, the major source of international box-office data. The dataset consists of a total of 11,967 films which were released in North America and the UK between 1988 and 2009, of which 9,685 were released in North America and 7,598 were released in the UK. Data are provided on the domestic box-office that each of the films generated, together with distributor, stars, directors, screenwriters, rating, and whether the films were sequels, remakes or reissues. The reissued films were dropped from further analysis. In addition, estimates were provided of the production budgets of 3,960 of these films.

The focus of this paper will be the financial performance of films in the North American market. For those films for which production budget estimates are available, estimates of film profits can be derived, and in particular, estimates of profits generated from theatrical release in North America. The detailed methodology used to derive these profitability estimates is outlined in the appendix. In summary, these estimates are obtained by first deriving estimates of overseas box-office income, thereby allowing film costs to be allocated as between domestic and overseas release. Domestic rental incomes were then estimated from the domestic box-office data, also assuming that rental incomes deriving from theatrical release were a declining proportion of total rental incomes, given the growth in ancillary markets over the 22 year data period. This assumption allowed costs to be allocated as between theatrical and non-theatrical exhibition. Estimates were also made of film distribution costs. All data were deflated to 2005 prices using the US Consumer Price Index.

¹ Nielsen EDI was sold to Rentrak in 2010.

The Role of Film Audiences as Innovators and Risk Takers

Given these US profit estimates, film rates of return could then be derived, as the ratio of the profits derived from US theatrical release to total film costs attributable to US theatrical release.

Excluding films with budgets that were less than \$1m (98 films), reissues, for which budget estimates were also available (26 films) and films that were only released in the UK and for which budget estimates were available (83 films) produced a total of 3,759 films for which profitability estimates could be derived. Figure 1 presents a scatter diagram of the profits generated by these films from North American theatrical exhibition against the production budgets of these films, all in 2005 prices. The titles of a number of these films are also shown.

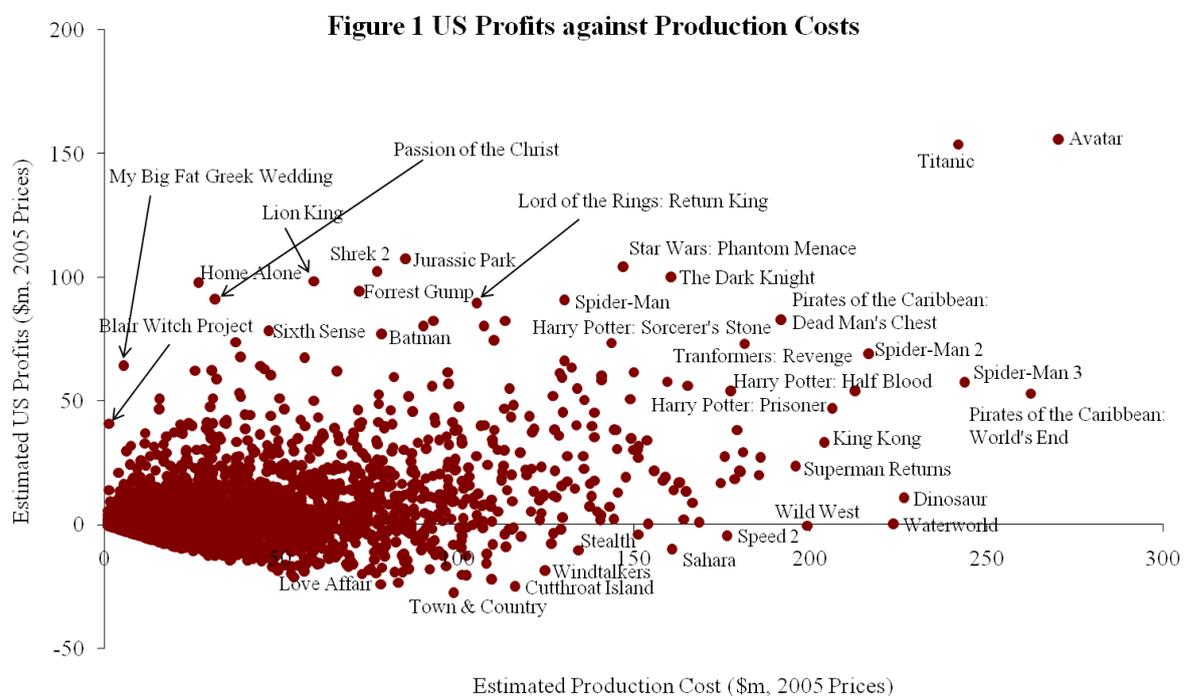


Figure 1 captures the essentials of the risk environment of film production. High budgets cannot guarantee high profits, but rather generate an environment in which profitability is highly variable. A further aspect of Figure 1 is that the high budget/high profit films would appear to be dominated by films produced in the latter half of the data period, with a high proportion of these being sequels.

In order to examine the time trends in profitability, annual aggregate rates of return can be derived. That is, for any year the annual rate of return to theatrical exhibition in North America can be derived as the sum of the North American profits across all films released in that year, expressed as a percentage of total costs (the sum of production and distribution

The Role of Film Audiences as Innovators and Risk Takers

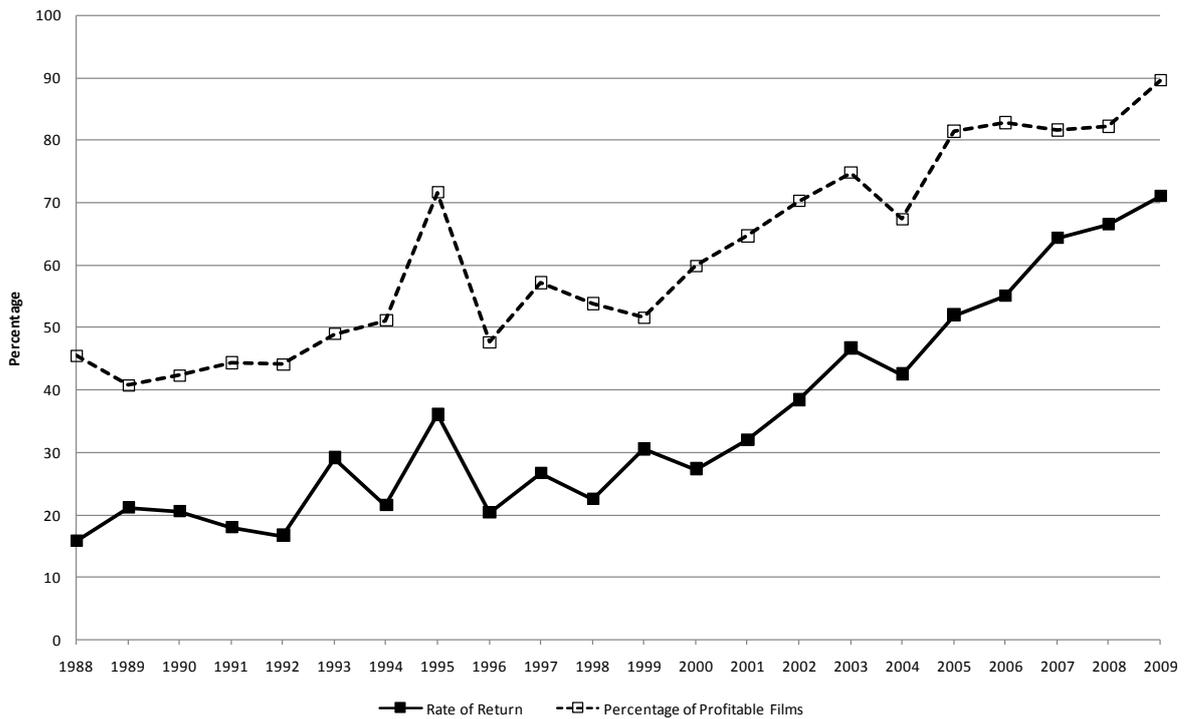
costs attributable to North American theatrical exhibition). However, given the relatively limited coverage of production cost estimates in the dataset, we will focus just on the annual profitability of the major studios/distributors. In particular, we will define the major studios/distributors as those studios/distributors for which budget estimates are available for at least 70% of their films over the data period (1988 to 2009). These studios are Columbia, Dreamworks, New Line, Orion, Paramount, Sony, Tristar, Twentieth Century Fox, Universal, Walt Disney Studios and Warner Bros. The two major studios that are not categorised as ‘majors’ according to this definition are MGM and Miramax. In both cases budget estimates were available for less than 70% of their films over the data period, 56% in the case of Miramax, and 69% in the case of MGM. However, while MGM nearly meets the threshold, it is in the second half of the data period – 1999 to 2009 – where coverage is least, with only 60% of MGM’s films having budget estimates.

In terms of box office coverage, these distributors accounted for 85.1% of all US box-office over the data period, ranging from 93.6% in 1992 to 80.5% in 2004 and 2008. If MGM and Miramax are included overall box office coverage increases to 91.9%. Thus, we will assume hereinafter that the performance of the majors, narrowly defined, provides an accurate barometer of the performance of the whole (North American) market, given the extent to which these majors dominate the market.

Figure 2 shows these annual rates of return, together with the percentage of profitable films each year.

The Role of Film Audiences as Innovators and Risk Takers

Figure 2 Annual US Theatrical Rates of Return, Percentage of Profitable Films, Majors, 1988 to 2009



The clear feature of Figure 2 is the strong profitability performance in the second half of the data period, where annual rates of return increased consistently (apart from relatively poor performance in 2004), commensurate with an increasing proportion of film outputs that were profitable. Indeed, by 2009 a remarkable 90 percent of the films released by the majors were profitable. This performance stands in stark contrast to the performance in the first half of the data period, where annual rates of return were relative low, volatile, and typically less than half of film outputs achieved profitability. It is the nature of the performance prior to 2000 that would generally be interpreted as characterising the financial and risk environment of the film industry, and why the performance post-2000 can be seen, historically, to represent such a clear break with the past.

Some Broad Trends in the Film Market

In terms of the total number of films released onto the North American market, these increased from 319 in 1988 to 567 in 2009, an increase of 78 percent. By contrast the number of films released by the majors declined by 20 percent, from 138 films in 1988 to 110 films in 2009. That is, by 2009 the majors accounted for just 19 percent of film releases, from 43 percent in 1988.

However, in terms of the proportion of box-office accounted for by the majors this was virtually unchanged over the period, from 81.1 percent of total box-office in 1988 to 83.1 percent in 2009. The explanation, quite simply, is that the majors have nearly tripled the

The Role of Film Audiences as Innovators and Risk Takers

average real budgets of their films, from \$20.8m in 1988 to \$61.7m (2005 prices) and the average real North American box-office of these films has more than doubled from \$33.9m to \$74.4m. This has occurred within an environment in which a declining proportion of film income is derived from theatrical exhibition, from about 43 percent in 1988 to just 20 percent in 2009², and in which the contribution of foreign markets has increased from 37 percent of worldwide theatrical revenues generated by the majors in 1988 to 56 percent in 2009. It is this consistent domination of the domestic market and the increasing presence in overseas markets that forms the starting point for explaining the profitability performance of the majors as reflected in Figure 2. A further influence on domestic box-office revenues is that theatre admissions have declined by nearly 10 percent from 2002 to 2009, a decline that has been more or less offset by an 8.4 percent increase real theatre ticket prices, resulting in just a 1.7 percent decline in box-office revenues.³

However, a strategy of simply increasing real production budgets, of itself, is no guarantee of improved profitability performance. Indeed average production budgets increased consistently during the 1990s and yet, as is clear from Figure 2, profitability performance during this period was volatile. It would appear that, at least in the second half of the data period, the more focused approach to film production, resulting from the production of fewer but more highly budgeted films, generated impressive profitability performance. The issue, then, is what specific strategies were employed that appear to have so markedly reduced the risk of film production?

In discussing Figure 1 above one such strategy that was alluded to was the apparent growing reliance on sequels. Figure 3 shows the proportion of annual production budgets that was allocated to the production of sequels together with the proportion of annual profits that was accounted for by sequels. Thus, in the first half of the data period there was an overall decline in the investment in sequels, from a high of 20.2 percent of budgets in 1990 to just 5.9 percent in 1999. Investment grew strongly thereafter, to a high of 33.3 percent of budgets in 2007, and 24.7 percent in 2009. However, it is the profitability performance of sequels throughout the entire period that is the most noteworthy, with sequels contributing a higher proportion to profits than the proportion of budgets that they absorbed in all but three years (1993, 1996 and 1998). Equivalently, sequels generated higher rates of return each year than the rates of return of all other films, apart from these three years. Over the whole data period sequels absorbed 16.0 percent of budgets and accounted for 26.9 percent of profits, these

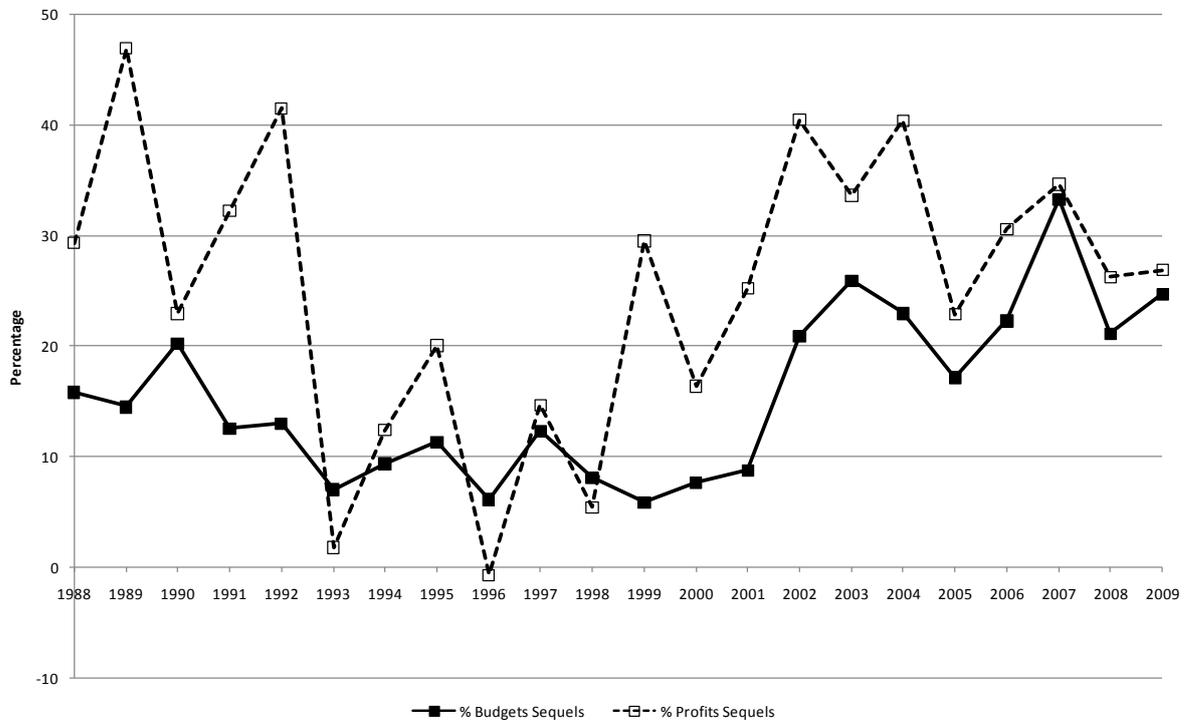
² See Appendix and Vogel (2007).

³ See <http://www.natoonline.org/statisticstickets.htm>,
<http://www.natoonline.org/statisticsadmissions.htm>

The Role of Film Audiences as Innovators and Risk Takers

percentages being 11.6 and 19.8 in the first half of the data period and 19.0 and 30.1 in the second half. Indeed, when comparing the average (real) production budgets of sequels with the average budgets of all other films, the average budgets of sequels have increased five-fold whereas the average budgets of all other films have increased at about half of this rate.

Figure 3 Percentage of Production Budgets and Profits Accounted for by Sequels



The production of remakes is a further strategy that Hollywood has used in an attempt to exploit past successes. However, the aggregate performance of remakes has been far less important to overall profitability than that of sequels. Remakes have consistently accounted for only about 10 percent of production budgets over the entire period, also generating profits of about 10 percent of aggregate profits. At best, remakes can be interpreted as a fairly reliable, but relatively unimportant, source of profits.

A final strategy that can be considered as reflecting a relatively conservative approach to film production relates to the production of films rated as G, PG or PG13. Such films accounted for over 80 percent of film budgets in 2009, whereas they accounted for just 50 percent of budgets in 1988. The profit contribution of these films equalled or exceeded that of their budgetary allocation in all years except 1992 and 2009. In aggregate these films absorbed 66.7 percent of production budgets over the whole period and accounted for 81.0 percent of profits, these percentages being 56.5 percent and 76.1 percent for 1988 to 1998, and 73.8 percent and 83.2 percent for 1999 to 2009. G, PG, PG13 rated films have always tended to be the major source of Hollywood profits, which is confirmed by the current dataset, and we can

The Role of Film Audiences as Innovators and Risk Takers

simply conclude here that the studios have continued to expand their investment in such films, although resulting in only a relatively marginal increase in their profit contribution. Of course many of these films will also have been sequels.

However there is an extent to which these aggregate analyses suffer from an ‘illusion of aggregation’, in the sense that they are derived from aggregating across the distributors, whereas the specific investment decisions are taken at the distributor level. Consequently it may be misleading to evaluate the outcomes of these investment decisions without examining their impact on the individual distributors. The following section will therefore explore these film investment decisions at the distributor level.

Distributor Profitability Performance

As a starting point, we can compare the annual rate of return performance of each of the distributors with the overall ‘market’ performance as shown in Figure 2. For illustrative purposes, we will consider just three distributors – New Line, Twentieth Century Fox and Warner Bros. Figures 4, 5 and 6 reproduce the market annual rates of return from Figure 2, together with annual rates of return for each of these majors. The obvious characteristic of these graphs is the much more volatile rate of return performance exhibited by the individual distributors, a feature which is replicated by the other distributors. In other words, the smooth growth in market rates of return in the second half of the data period conceals a much more competitive underlying market, the implication of which is that the market shares of the each of the distributors fluctuate markedly from year to year. Nonetheless, each of the distributors in Figures 4, 5 and 6 broadly replicate market movements in the sense of exhibiting limited growth in rates of return in the first half of the period, with strong growth thereafter.

The Role of Film Audiences as Innovators and Risk Takers

Figure 4 Rate of Return all Majors, New Line

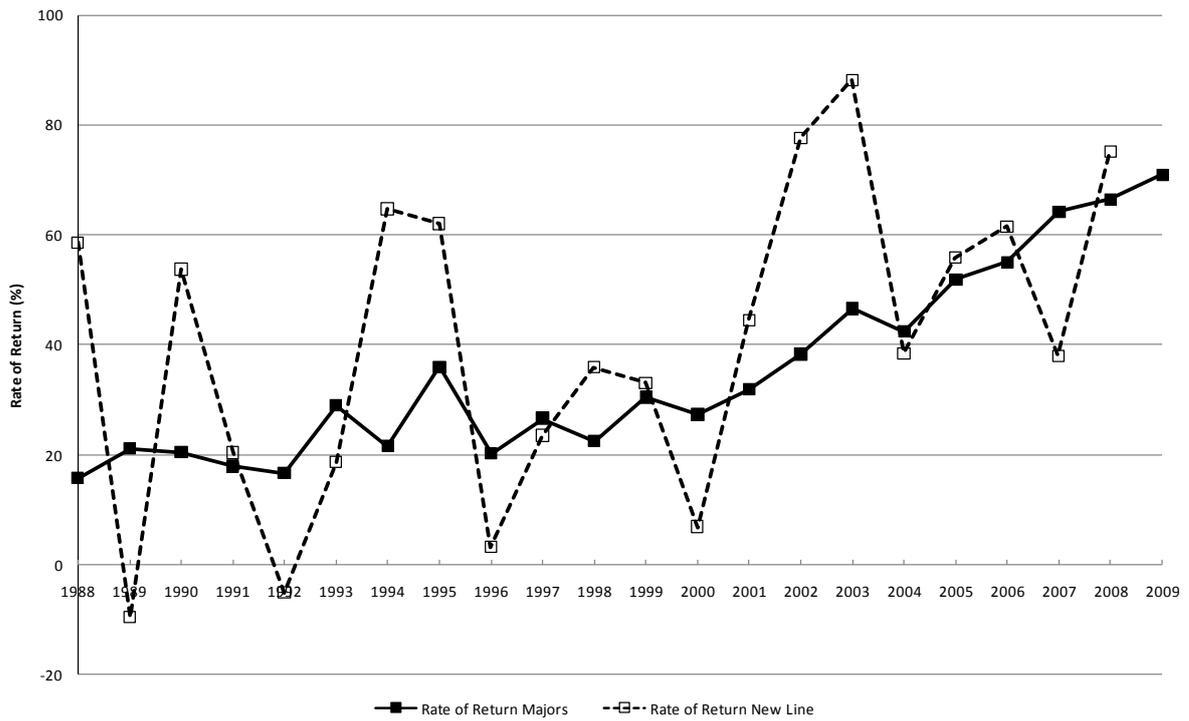
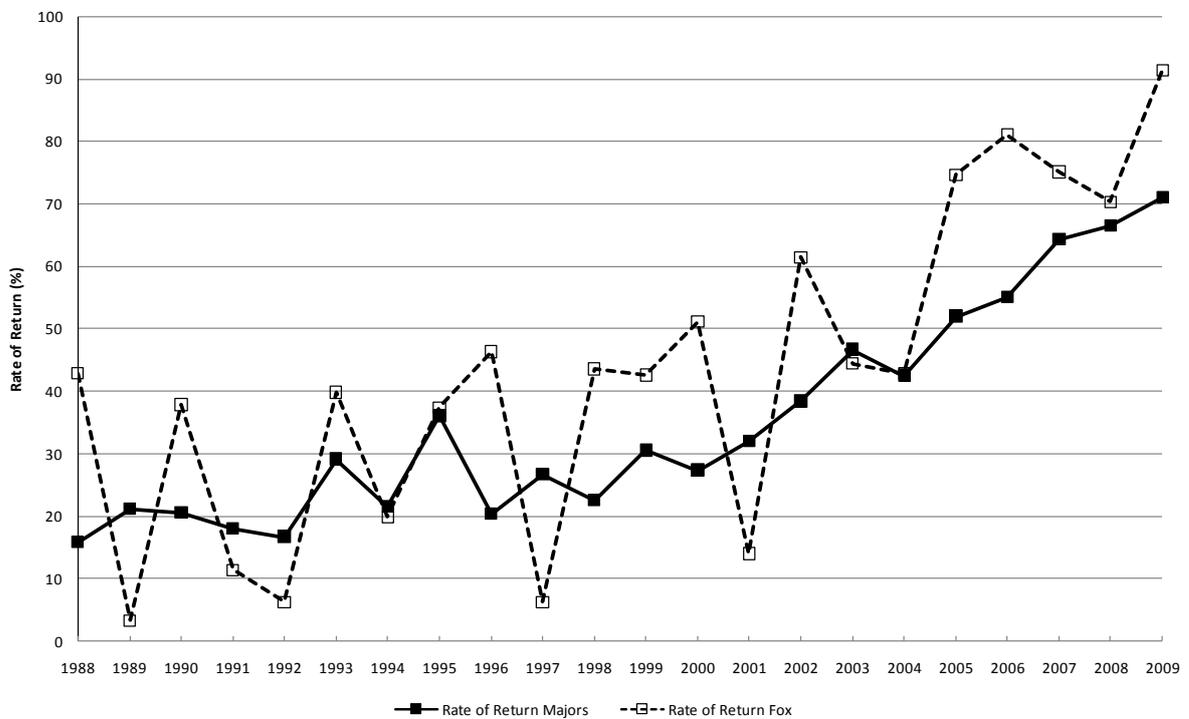
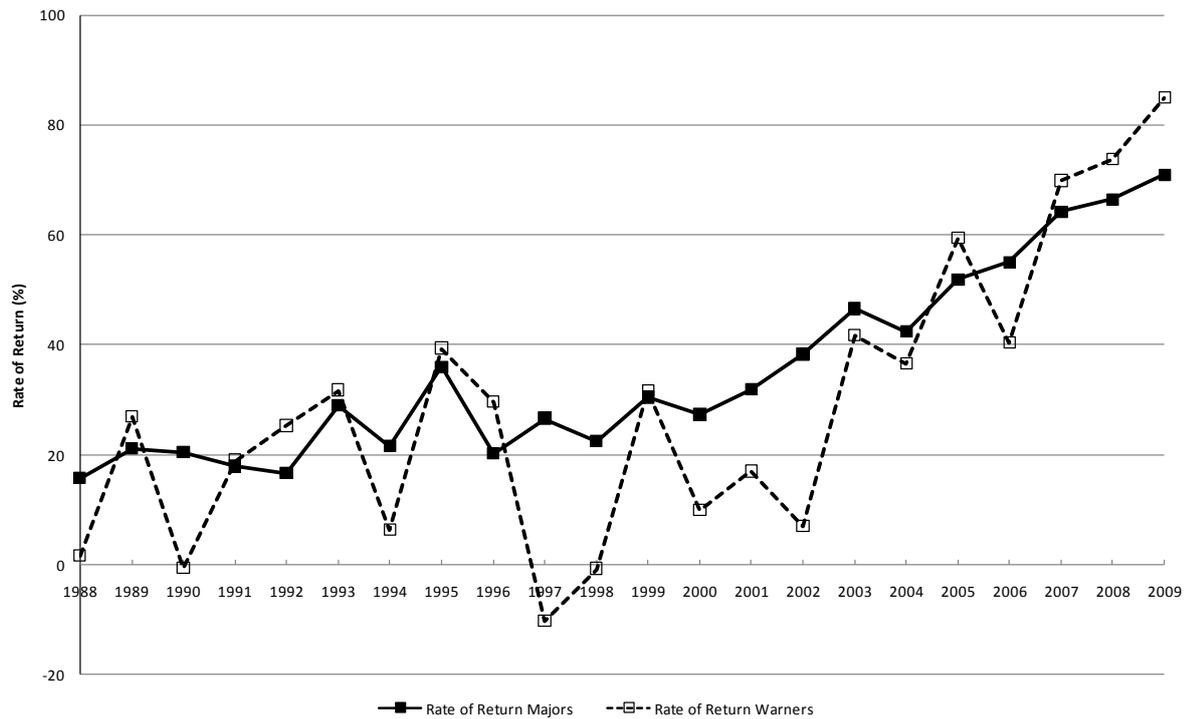


Figure 5 Rate of Return all Majors, Twentieth Century Fox



The Role of Film Audiences as Innovators and Risk Takers

Figure 6 Rate of Return all Majors, Warner Bros.



Given the volatility of distributor annual rates of return it would seem inappropriate to judge success or failure on the basis purely of a single year's performance. Rather, it is outcomes aggregated over a number of years that provides a more reliable and realistic barometer of distributor performance. The approach taken here is to consider aggregate rates of return over a five or six year period as a basis for comparing and contrasting distributor performance. Thus we will consider four data periods – 1988 to 1992, 1993 to 1998, 1999 to 2003 and 2004 to 2009. Table 1 shows, for each of the major distributors that distributed films for most or all of the data period, the rates of return achieved during each of these time periods, together with average production budgets of the films distributed over these periods (in constant 2005 prices) in order to reflect the relative scale of production. The final row of the table presents the corresponding figures across all the majors, and the final column presents average budgets and rates of return over the whole data period for each distributor.

As would be expected, the average budgets of films increased markedly over time, both at the market and distributor level, with the exception of Universal which reduced its average film budgets in the 2004 to 2009 period. New Line was the smallest scale producer, with the remaining distributors all producing at a similar scale throughout. By the final data period, the largest scale distributors were Disney, Paramount and Warner Bros. In terms of rate of return performance, this increased in aggregate over the four data periods, consistent with Figure 2. This was also the case for all of the distributors, with the exception of New Line which experienced a fall in rate of return in the last period. In terms of the entire data period,

The Role of Film Audiences as Innovators and Risk Takers

New Line exhibited the highest rate of return and Warner Bros. the lowest, with the remaining distributors exhibiting comparable performance. In the case of Warner Bros. this poor performance resulted from poor performance over the first three data periods, with the final data period exhibiting very strong performance.

Table 1 Average Real Film Budgets (\$m, 2005 prices) and Film Rates of Return (%), by Distributor and Time Period

Distributor	1988 to 1992	1993 to 1998	1999 to 2003	2004 to 2009	1998 to 2009
New Line					
<i>Av Film Budget (\$m)</i>	9.9	27.0	37.4	39.5	27.8
<i>Rate of Return (%)</i>	25.5	33.0	53.4	46.2	42.8
Paramount					
<i>Av Film Budget (\$m)</i>	29.8	44.2	43.8	67.0	45.8
<i>Rate of Return (%)</i>	24.8	31.9	31.2	51.0	35.1
Sony					
<i>Av Film Budget (\$m)</i>	-	36.9	46.3	50.6	44.9
<i>Rate of Return (%)</i>	-	21.2	25.2	52.4	34.4
Fox					
<i>Av Film Budget (\$m)</i>	27.5	43.1	48.6	54.2	43.2
<i>Rate of Return (%)</i>	20.4	34.1	41.9	73.6	44.5
Universal					
<i>Av Film Budget (\$m)</i>	27.1	46.1	56.7	50.7	44.6
<i>Rate of Return (%)</i>	21.8	28.6	39.9	48.1	35.1
Disney					
<i>Av Film Budget (\$m)</i>	27.9	41.7	53.3	68.1	46.2
<i>Rate of Return (%)</i>	35.5	25.8	43.7	55.5	38.9
Warner Bros.					
<i>Av Film Budget (\$m)</i>	29.0	51.7	55.1	63.5	49.3
<i>Rate of Return (%)</i>	16.2	14.7	20.8	60.6	28.7
All Majors					
<i>Av Film Budget (\$m)</i>	26.8	42.0	49.8	56.6	43.3
<i>Rate of Return (%)</i>	18.5	25.7	34.9	57.3	34.4

Clearly the data in Table 1 is the product of a wide range of film production strategies and explaining this performance both in aggregate and across the distributors would be a complex exercise. As already suggested, one explanation for the improving performance over time is the growth in film revenues that are derived from non-theatrical sources together with increasing overseas revenues. This would, at least in part, explain the increasing rate of return performance and the increasing scale in film production. Our focus here is to attempt an evaluation of the impact of the increasing investment in film sequels that was illustrated in Figure 3. Table 2 presents data on the proportion of budgets and profits accounted for by sequels, and the rates of return of sequels, in aggregate and by distributor, disaggregated by the same data periods as in Table 1.

The Role of Film Audiences as Innovators and Risk Takers

Table 2 Percentage of Budgets, Profits Accounted for by Sequels, and Rates of Return of Sequels, by Distributor and Time Period

Distributor	1988 to 1992	1993 to 1998	1999 to 2003	2004 to 2009	1988 to 2009
New Line					
<i>% Budgets</i>	24.8	9.0	33.5	25.9	24.2
<i>% Profits</i>	59.1	2.1	74.0	24.2	48.0
<i>Rate of Return(%)</i>	44.4	7.6	90.5	49.9	70.9
Paramount					
<i>% Budgets</i>	23.9	15.7	15.5	17.5	17.7
<i>% Profits</i>	50.7	12.9	23.4	34.2	29.4
<i>Rate of Return(%)</i>	47.2	27.6	48.6	84.9	53.9
Sony					
<i>% Budgets</i>	-	2.4	13.6	26.5	16.0
<i>% Profits</i>	-	3.7	16.0	25.0	19.1
<i>Rate of Return(%)</i>		24.1	36.2	60.1	50.5
Fox					
<i>% Budgets</i>	17.6	16.9	15.1	24.1	19.0
<i>% Profits</i>	33.4	6.6	40.3	27.4	27.6
<i>Rate of Return(%)</i>	40.3	22.2	82.1	77.5	64.5
Universal					
<i>% Budgets</i>	11.7	10.0	16.4	21.6	16.0
<i>% Profits</i>	24.2	14.1	27.2	28.5	24.9
<i>Rate of Return(%)</i>	42.4	45.7	59.7	63.1	55.8
Disney					
<i>% Budgets</i>	8.5	2.8	8.1	18.2	9.3
<i>% Profits</i>	10.3	3.6	14.4	25.0	14.6
<i>Rate of Return(%)</i>	45.9	27.4	65.8	80.8	63.6
Warner Bros.					
<i>% Budgets</i>	17.6	12.6	13.7	31.0	19.4
<i>% Profits</i>	44.1	35.5	39.0	37.5	38.4
<i>Rate of Return(%)</i>	39.0	36.9	63.7	71.7	57.0
All Majors					
<i>% Budgets</i>	15.2	9.2	14.0	23.5	16.0
<i>% Profits</i>	34.8	9.8	30.1	30.1	26.9
<i>Rate of Return(%)</i>	40.9	28.9	67.4	72.9	58.1

Consider first the final column of Table 2. In terms of the rates of return over the whole period, it is clear that in all cases sequels generated higher rates of return than the aggregate rates of return to all film production shown in the final column of Table 1, and in most cases markedly so. Overall the market allocated 16 percent of film budgets to sequels, with Disney being the lowest investor in sequels (9.3 percent of budgets) and New Line the highest (24.2 percent). However, these proportions varied considerably over time, with the first data period exhibiting relatively high investment, and marked drop in the second data period, a sharp increase in the third period which was maintained in the last period. Rate of return performance was also weakest in this second period, although still superior to overall performance from Table 1 (except for New Line, Paramount and Fox). The last two data periods exhibited very strong rate of return performance throughout.

The Role of Film Audiences as Innovators and Risk Takers

However, it also clear that some of the distributors relied heavily on sequels as a source of profits.⁴ New Line stands out in this regard, with nearly half of its profits derived from sequels overall, and three quarters of its profits in the third data period. Warner Bros. also relied heavily on sequels, which consistently accounted for nearly 40 percent of its profits. Conversely, Disney invested less than 10 percent of its budgets in sequels, which generated just 15 percent of its profits. Nonetheless, the Disney sequels were very successful, matching or exceeding market performance throughout.

So the picture that emerges from Table 2 is a market that by the end of the data period relied heavily on sequels as a source of profits. However, as the case of Disney illustrates, extensive investment in sequels was not a prerequisite for strong profitability performance. Indeed, in the market as a whole investment in sequels increased from the third to the fourth data period, but the share of profits accounted for by sequels remained unchanged. In the case of some of the distributors increased investment in sequels was associated with a fall in profit shares, or only a very marginal increase (Fox, Warner Bros., and Universal). New Line, while reducing its investment in sequels modestly in the fourth data period, experienced a sharp drop in profit contribution, from 74 percent to just 24 percent. In other words there is a suggestion in Table 2 that the effectiveness of sequels as a profit generator had begun to diminish by the end of the period.

Some Conclusions

The conclusion that Hollywood has become increasingly reliant on sequels as a source of profits is neither unexpected nor original – this is manifestly self-evident to anyone who has even a cursory interest into Hollywood film releases and, for some time, has been a source of debate both within and outside the industry. What we have attempted here is to quantify the extent of Hollywood's reliance on sequels and how this has evolved over time and varied as between the major distributors.

One conclusion that can be drawn from the above analyses is that it would appear that film production, at least in the case of the Hollywood majors, has become significantly less risky over time. In large part this is a result of the increasing importance of ancillary markets as a

⁴ In terms of the successful sequels distributed by the majors examples of these franchises were: for New Line, Austin Powers, Rush Hour, Lord of the Rings; for Paramount, Indiana Jones, Star Trek, Mission Impossible, Shrek; for Sony, Men in Black, Spiderman, James Bond; for Fox, Die Hard, Home Alone, Star Wars, X-Men; for Universal, Back to the Future, Jurassic Park, Bourne; for Disney, Toy Story, Pirates of the Caribbean; and for Warner Bros., Batman, Lethal Weapon, Harry Potter, Terminator, Matrix.

The Role of Film Audiences as Innovators and Risk Takers

source of film profits, significantly extending the life of a film and its income generating potential. In addition, the major film distributors have also become much more conservative in their film production strategies, increasingly relying on sequels and generally rated films as a source of profits.

The majors can therefore be interpreted as having adopted increasingly risk-averse production strategies, particularly since 1999, and have benefited from markedly improved profitability performance. Thus the majors can no longer be characterised as producing widely diversified annual film portfolios, from which the hit films emerge in an unpredictable manner. Rather it would appear more realistic to interpret the majors as treating each film project as a one-off project, confident that it will be profitable. The risk aversion derives from film projects designed to appeal to broader market segments, fully exploiting previously successful films, via sequels, with major film producers presumably becoming adept at anticipating consumer tastes.

The dynamics of film production and consumption have therefore changed radically. Whereas once it was film audiences that determined hit films, their roles are now much more passive. Film producers, in targeting less challenging market segments, and carefully building on past successes, now have much greater control over the film consumption environment. Increasingly sophisticated film marketing strategies also mean that audiences can form clear expectations of what they will derive from any given film consumption experience.

For audiences this has meant an environment in which choice is restricted, and the unanticipated, 'surprising' film experience less likely to occur. We can also speculate with regard to the implications that this might have for pricing strategies. Traditionally, in an era when film success was much less predictable, and film portfolios much more diversified, admission prices had to be kept low to encourage wide consumption across the portfolio, allowing the hit films to emerge via a process akin to experimentation. In the current environment in which film releases are treated as 'events', and film producers are confident of the success of each of their releases, there are clear opportunities for engaging in price discrimination – to charge higher admission prices for more popular films. In the past such a pricing strategy would have been considered counter-productive, for two reasons. First, because it would discourage wide consumption across film portfolios, and encourage much more targeted and strategic film consumption decisions, and second, because discriminatory pricing would send out unintended quality signals, implying that lower priced films are of lower quality. A further consequence of such a strategy is that high price films would raise consumer expectations concerning the film consumption experience, consequently reducing the difference between expected and actual experience, thereby increasing the incidence of

The Role of Film Audiences as Innovators and Risk Takers

disappointment. None of these justifications for uniform pricing has the force that it once had, and we could speculate that we might increasingly observe price discrimination at the point of theatrical release, where distributors and exhibitors can behave as profit rather than revenue maximisers. Indeed, the fact that theatre admissions have been declining since 2002, and real admission prices increasing would be consistent with such a strategy. Declining theatre admissions are no doubt in part a function of film consumption occurring increasingly in ancillary markets but may also be a reflection of more strategic and targeted film consumption decisions. This would then allow exhibitors to increase admission prices, and particularly so for the high demand films.

The Role of Film Audiences as Innovators and Risk Takers

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Appendix

Estimating Theatrical Film Profits Generated in North America

In order to estimate profits generated in North America, from theatrical release, it is first necessary to estimate the worldwide BO generated by a given film. This then allows for the estimation of the proportion of BO generated in North America, and hence the estimation of the proportion of film production costs attributable to North American release.

From the dataset we have the BO revenue generated in the UK by all the films released in North America. Of all the films released in North America (9,685) 45% of these were not released in the UK. In the case of just the majors these figures are 3,653 and 22% respectively. The vast majority of these films generated very low BO domestically, and presumably did not receive an international release as a result. Those films that did generate relatively large BO (although modest in absolute terms), and indeed were profitable even on the assumption of no overseas revenues, appeared to be films with very specific US themes (many were described as 'African-American' in terms of keywords), and hence it was presumably decided that such films would have very limited international appeal, and thus were made for domestic audiences only, and were budgeted for accordingly. There were about 80 films that were reissues that fell into this category, and such films will be omitted from further detailed analysis in any event. That is, the assumption of zero overseas revenues for those films released in North America but not in the UK would appear to be a reasonable one.

We are then left with estimating the overseas revenues generated by the films released in both the US and UK. That is, we start by assuming that those films not released in the UK were also not released elsewhere and hence generated zero overseas revenues. Again, a trawl of worldwideboxoffice.com was undertaken, and all films with overseas box office data were identified and these data were added to the dataset. Thus of the 5,316 films released in both the US and UK, 102 were reissues. The reissues will be dropped from further analysis. In fact, this process did identify 66 films that were not released in the UK and yet generated overseas BO. However, these were very specialised films (a large number were documentaries), generating very low overseas revenues. Nonetheless, these overseas BO totals were left on the datafile, with all remaining films not released in the UK allocated zero overseas revenues. That is, 4,304 films that were released in the US but not the UK were assumed to have generated zero overseas revenues. Thus there were $5,316 - 102 - 66 = 5,148$ for which estimates of overseas revenues were required. Worldwideboxoffice.com had overseas box office for 1,224 of these films. Thus estimates of overseas box office are required for

The Role of Film Audiences as Innovators and Risk Takers

5,148–1,224=3,924 films. The approach taken here is to predict overseas box office on the basis of a given film’s performance in the UK market. That is, it will be assumed that a film that was relatively successful in the UK market would be relatively successful elsewhere. Thus, for those films for which overseas revenue was available from worldwideboxoffice.com, a regression was run of overseas box office (in \$m) on UK Box office (converted into \$m dollars at the prevailing exchange rate). This regression produced the following results (*Avatar* excluded as box office data is still incomplete):

Regression

(Processing...)

[DataSet1] C:\Documents and Settings\pokorny\My Documents\WORK Home\spss\Nielsen 2010\Nielsen Data 2010 Version 3.sav

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	(BOCumeUK/1000000) *ExchRate ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: Overseas BO in millions from worldwideboxoffice.com

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.879 ^a	.772	.772	54.98791

a. Predictors: (Constant), (BOCumeUK/1000000)*ExchRate

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.254E7	1	1.254E7	4146.097	.000 ^a
	Residual	3694925.471	1222	3023.671		
	Total	1.623E7	1223			

a. Predictors: (Constant), (BOCumeUK/1000000)*ExchRate

b. Dependent Variable: Overseas BO in millions from worldwideboxoffice.com

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.620	1.981		6.371	.000
	(BOCumeUK/1000000) *ExchRate	6.079	.094	.879	64.390	.000

a. Dependent Variable: Overseas BO in millions from worldwideboxoffice.com

The problem with this approach is the significant constant term of 12.62 (\$m), implying that films with very low UK revenues (a few hundred thousand or less) will still generate at least 12.62 (\$m) internationally. Thus the approach taken was to rerun the regression, but through the origin, with the following results:

The Role of Film Audiences as Innovators and Risk Takers

Regression

(Processing...)

[DataSet1] C:\Documents and Settings\pokornm\My Documents\WORK Home\spss\Nielsen 2010\Nielsen Data 2010 Version 3.sav

Variables Entered/Removed^{a,c}

Model	Variables Entered	Variables Removed	Method
1	(BOCumeUK1000000) *ExchRate*	.	Enter

- a. All requested variables entered.
 b. Dependent Variable: Overseas BO in millions from worldwideboxoffice.com
 c. Linear Regression through the Origin

Model Summary

Model	R	R Square ^b	Adjusted R Square	Std. Error of the Estimate
1	.924 ^a	.854	.854	55.87085

- a. Predictors: (BOCumeUK1000000)*ExchRate
 b. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

ANOVA^{c,d}

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.238E7	1	2.238E7	7169.901	.000 ^a
	Residual	3817657.608	1223	3121.552		
	Total	2.620E7	1224			

- a. Predictors: (BOCumeUK1000000)*ExchRate
 b. This total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.
 c. Dependent Variable: Overseas BO in millions from worldwideboxoffice.com
 d. Linear Regression through the Origin

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta	t		
1	(BOCumeUK1000000) *ExchRate	6.445	.076	.924	84.675		.000

- a. Dependent Variable: Overseas BO in millions from worldwideboxoffice.com
 b. Linear Regression through the Origin

Thus the fitted values from this regression were then used to estimate the overseas revenues for those films without direct values from worldwideboxoffice.com. Excluding reissues, the total number of films in the dataset is then 9,414 (9,415 if *Avatar* is included) with both domestic and overseas revenues, of which 4,137 had zero overseas revenues, and 1,290 with overseas revenues available directly from worldwideboxoffice.com. For the majors, there are 3,573 films for which these data are available, of which 1,105 films had overseas box office available directly from worldwideboxoffice.com. 714 of these films were assumed to have zero overseas box office (20% of the films) and hence overseas box office was estimated for $3,573 - 1105 - 714 = 1,754$ of these films.

Thus given overseas revenues for all films, total worldwide revenue can be derived (US plus overseas) and hence for each film the proportion of revenues attributable to US release can be derived (real US\$ (2005 prices) are used by deflating all monetary values by the USCPI, lagged by month, on the assumption that there will be about a month's delay before revenues are received from the film's release). This proportion can then be applied to the real production budget of the film to derive the level of (real) production costs that is attributable to US release. We then need to estimate the film rentals that are produced by a film.

Following Vogel (2007), Table 3.4, p. 82, the average percentage of box office reverting to rentals was 41.6 over the period 1988 to 2005, without any discernible trend, although ranging from 34.5 to 45.6. But we will here use the average figure for the whole of the period.

Finally, we require the proportion of film revenues that are attributable to theatrical release. From Vogel this was estimated to have been 52.4% in 1980 and 29.4% in 2000. Assuming

The Role of Film Audiences as Innovators and Risk Takers

that in 2009 it was 20% then these 3 points lie nearly exactly on a straight line (y -axis, theatrical proportion, x -axis, year). Fitting a straight line to these points produces the following equation (see Excel file 'Proportion theatrical revenues'):

$$\textit{Theatrical proportion} = 22.75203 - 0.01123 \times \textit{Year} \quad (1)$$

We then require the distribution costs associated with a film. As was the case for Pokorny and Sedgwick (2010), these are assumed to be generated by:

$$D = \alpha C + \beta R \quad (2)$$

where C are production costs and R are film rentals. Again following Pokorny and Sedgwick (2010) we assume that $\alpha = 0.07$ and $\beta = 0.40$.

To illustrate the methodology we can use an example. Take *Shrek 2*, released in 2004. This generated US revenues of \$436.72m and, from worldwideboxoffice.com, overseas revenues of \$466.00m (in real terms \$449.76 and \$479.92). Thus total real worldwide box office is \$929.68, and hence the proportion attributable to US release is 0.484. In terms of rentals, the film is assumed to have generated $0.416 \times 449.76 = 187.10$ in real US rentals.

From Equation (1) the proportion of revenues attributable to theatrical release for *Shrek 2* is:

$$\textit{Theatrical proportion} = 22.75203 - 0.01123 \times 2004 = 0.247$$

The estimated production budget of the film was \$75m, or \$77.24m in 2005 prices. Thus the real distribution cost of the film from Equation (2) can be estimated as:

$$D = 0.07 \times 0.484 \times 0.247 \times 77.24 + 0.40 \times 187.10 = 75.486$$

Hence the total (real) cost of the film is production cost (attributable to theatrical and US release) plus distribution cost. That is:

$$TC = 0.484 \times 0.247 \times 77.24 + 75.486 = 84.720$$

Thus real profit derived from US theatrical release is:

$$187.10 - 84.72 = 102.38$$

And the rate of return of the film, derived from US theatrical release is:

$$\frac{102.38}{84.72} = 1.21 = 121\%$$

(note that this rate of return will be the same as the rate of return derived from worldwide distribution, on the assumption that rental proportions and proportions derived from theatrical release are the same worldwide)

As another example, take a loss-making film, *Cutthroat Island*. This was released in 1995, and generated US revenues of just \$10.02m (\$12.66m 2005 prices), with a production budget

The Role of Film Audiences as Innovators and Risk Takers

of \$92m (\$116.31m in 2005 prices). No overseas revenues for this film were available from worldwideboxoffice.com, but it generated \$0.8514m in the UK (£0.562170m×1.5145=\$0.8514m). Thus from the above regression equation predicted overseas box office for the film is $0.8514 \times 6.445 = \$5.487\text{m}$. This results in US revenues accounting for 64.6% of worldwide revenues.

Thus we have:

$$\textit{Theatrical proportion} = 22.75203 - 0.01123 \times 1995 = 0.348$$

and therefore:

$$D = 0.07 \times 0.646 \times 0.348 \times 116.31 + 0.40 \times 0.416 \times 12.66 = 3.937$$

Hence the total real cost of the film attributable to US release is:

$$TC = 0.646 \times 0.348 \times 116.31 + 3.937 = 30.084$$

And so US profits generated by the film are:

$$\textit{Profit} = 0.416 \times 12.66 - 30.084 = -24.817$$

generating a rate of return of:

$$\frac{-24.817}{30.084} = -0.82 = -82\%$$