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Consumers as risk takers: Evidence from the film industry during the 1930s

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This paper examines the risk environment of film consumption in the United States during the 1930s when moviegoing dwarfed all other paid-for leisure activities. We argue that the wide variability in the financial performance of films, reflecting the considerable risks that were involved in film production, can be interpreted as being mirrored in the risks incurred by consumers in the film consumption process. We further argue that production risk needs to be understood within the context of consumer risk. Using a dataset derived from the trade journal *Variety*, we examine the weekly fortunes of movies in first-run cinemas as consumers rapidly substitute movies that are currently on release for the promised pleasures of yet unseen movies. That expected utility was not always realised was commonplace, as was the pleasurable surprise that came with being thrilled by certain films. These are important results since, perhaps for the first time in modern society, they led to the emergence of the long right tail of consumer preferences for mass distributed goods.

Keywords: consumer risk; film consumer behaviour; Hollywood; 1930s; long tail; experience goods

Film is an example *par excellence* of a product that is vertically differentiated, in that although each film is unique in some respects in relation to other films, they are not of equal attractiveness to audiences: that is, consumers qualitatively differentiate movies in their minds. Understandably, film history has focused on the role of studios, directors, producers, stars and acting, technical, artistic and musical talent in determining the development of films as artistic products and/or commercial commodities. However, little attention has been afforded to the part played by audiences in shaping the business environment faced by producers.¹ A consequence of the vertical differentiation of a product by its manufacturer is that where prices are invariant between products (of the same type), as in the case of cinema admission prices, it is possible for a small number of the products (sometimes only one) to appear superior in almost all respects to all others, not for just one consumer, but for almost all consumers across a variety of circumstances of time and place. In other words, vertical product differentiation with respect to film, and indeed other

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fashion-influenced products, has a strong consumption dimension, which means that if the film producer's choice of distinctive vertically differentiating attributes is to be vindicated, large numbers of filmgoers must show that they respond positively to these attributes by coming to a common decision to buy tickets in order for 'hits' to occur, thereby creating in the film industry from the 1920s onwards what was perhaps the first modern manifestation of long right tail revenue distributions.

The recent stampede of interest among business scholars in the phenomenon of 'long right tails' has emerged from Chris Anderson's insight into the manner in which Internet retailing is affecting demand patterns for finely differentiated goods, allowing consumers access to products that would not normally have been stocked by conventional bricks and mortar retail outlets.² Yet, interestingly, the pattern identified by Anderson is precisely that which characterised the retailing practice of the film industry and consumption behaviour of audiences in the English-speaking world three-quarters of a century earlier (see Thompson, 1985).

Given invariant prices (prices that did not change with changes in film programmes), sunk costs in production and real estate, and *ex ante* uncertainty concerning consumer preferences, the film industry was built around the principle of revenue maximisation, requiring supply to adjust rapidly to demand, once revealed (see De Vany & Walls, 1996). This happened in two ways: firstly, until the mid-1970s, on release big budget films were showcased in major urban centres (New York, Chicago and Los Angeles in the US, London in the UK) at first-run cinemas that were relatively box-office rich (relatively large numbers of seats and high admission prices), and were screened (normally as a single bill attraction) for as long as a threshold level of demand was realised. Sometimes these runs could be very extensive (see Glancy & Sedgwick, 2007, pp. 183–195; Sedgwick, 2000, pp. 74–83). Second, once on general release, films entered into local distribution networks, in which they transferred through time from high order box-office rich cinemas to low order box-office poor cinemas in an orderly controlled fashion. In urban localities the high demand for certain films resulted in them being screened on numerous occasions at different cinemas, sometimes reflecting local tastes that were not universally shared.³

The outcome of this cascade-type system of film distribution resulted at a territorial level in an aggregate annual frequency distribution of revenues that was highly skewed with a long thick right tail, a tail thick enough to profitably support the continuous flow of new middle-to-low budget films onto the market – those films that made up the bulk of industry supply (see Pokorny & Sedgwick, 2010).

This paper seeks to examine patterns of consumer demand in the United States during the 1930s, when filmgoing was the dominant paid-for leisure activity, constituting annually over 80% of the value of all admissions to spectator amusements during the decade.⁴ Annual cinema attendances during the 1930s fell from a high of approximately 3.6 billion in 1929 and 1930, to a low of 1.9 billion in 1933 before climbing steadily again to 2.9 billion in 1940, with per capita expenditure on admissions ranging between \$3.8 to \$5.8 per annum throughout the decade, and per capita attendances ranging between a low of 15 and a high of 23 visits per annum.⁵ Cinema provision ranked on a par with that of Great Britain with approximately one seat for every 12 persons: elsewhere in Europe ratios were lower, with one seat for 16 persons in Belgium, one for 18 in Sweden, one for 20 in France, one for 22 in Spain (before the Civil War), one for 26 in Italy (somewhat distorted by the fact that 1400 halls were owned by, and served the purposes of, the Fascist party), one for 32 in Portugal, one for 33 in Switzerland, one for 39 in Germany, one

for 39 in Denmark, one for 40 in Norway, one for 53 in the Netherlands, and one for 60 in Finland (*Kine Weekly*, 26 August 1937).

The central argument of this paper is that while film producers manifestly operated within a risk environment, given the wide variation in revenues generated by high budget films in particular (see Figure 1 below), consumers also experienced risk in that there may have been a considerable divergence between the pleasures that a film was expected to deliver *ex ante* and actual pleasures experienced *ex post*. Indeed, it is this risk in the film consumption experience that is central to the risks faced by producers in the calculation of, and the investment in, budgets for new film products. Filmgoers enticed by a big budget movie that had known high quality inputs and associated advertising costs were likely to have held high levels of anticipated utility. Such products are in essence brands – highly differentiated products whose peculiar qualities, including star brand inputs, are accentuated by means of advertising and promotional activities.⁶ A sufficient number of disappointing experiences, corresponding to expectations that were not met, could lead to a predominantly negative word-of-mouth that would jeopardise the revenue prospects of the film. Of course historically we can only observe and analyse the consumer decision-making process indirectly, via the actual financial performance of films in the marketplace, and in particular their weekly box-office performance in named cinemas. Thus film producers had to form expectations concerning the financial performance of the film projects in which they invested and, in turn, these expectations were derived directly from perceptions of how these films might be received by consumers. From the producer's perspective it was the ability to 'second guess' these necessarily ill-defined consumer expectations that was the key to successful film production.

The focus on consumption distinguishes this paper from our previously published work on the 1930s film business, in Sedgwick and Pokorny (1998) and Pokorny and Sedgwick (2001) the focus was on how Hollywood attenuated risk respectively through the production of film portfolios, and the deployment of stars, while in Sedgwick and Pokorny (2005a) we were concerned to show how the industry maximised revenues by demonstrating how the supply of particular films adjusted flexibly to *ex ante* unknown levels of demand.

This study draws upon two datasets. The first sets the context and comprises the revenues, costs and profits emanating from three of the 'major' Hollywood studios during the period 1929 to 1942 – MGM, RKO and Warner Bros. – consisting of the distributor rentals generated by each of the 1861 films distributed by the three studios during this period, together with production and distribution costs for 96% of these films.⁷ A second complementary dataset is utilised in an attempt to gain insights into the decision-making processes of consumers and was constructed from the weekly reports of box-office takings of 104 first-run cinemas, including four in Montreal, Canada, for the 25 months from week ending 4 October 1934 to week ending 29 October 1936, published in the film trade journal *Variety*. The cities reported were Birmingham, Boston, Brooklyn, Buffalo, Chicago, Cincinnati, Denver, Detroit, Indianapolis, Kansas City (Missouri), Los Angeles, Minneapolis, Montreal, New Haven, New York, Philadelphia, Pittsburgh, Portland, Providence, St Louis, San Francisco, Seattle, Tacoma, and Washington DC.⁸

In total, this dataset consists of the weekly box-office revenues of 969 films released in these cities' first-run cinemas, generating 11,004 distinct film bookings

comprising 6384 single bill programmes and 2310 double bill programmes.⁹ Of these 969 films, MGM, RKO and Warner Bros. produced 294, and it is the weekly box-office revenues of these films that will be the focus of analysis here.

To our knowledge these datasets provide unparalleled access to consumers' decision-making behaviour during this era, based upon their willingness to pay. While historians have used business archives to examine the history, development and operation of consumer research, reporting on the outcomes of particular surveys (Bakker, 2008, ch. 8 & 10; Schwartzkopf, 2009), the use of detailed sales figures to quantitatively examine mass consumer preferences for brands like movies with such a rapid life and death process is essentially unexplored territory. The most obvious comparator industries, the music and publishing industries, and public libraries, probably had long tail revenue/usage distributions, but knowledge of these tails and the relative popularity of the products that made up the tails, is still to be published.

The paper is structured as follows. Section 1 discusses the consumption characteristics of film as a commodity; section 2 highlights the audience survey literature that emerged during the 1940s; and section 3 examines the consumption characteristics of filmgoing, drawing on studio production costs and rental incomes, as well as the weekly box-office revenues generated by films screened in first-run theatres, in an attempt to derive insights into the film consumption process. The paper concludes by drawing these theoretical and empirical threads together.

1. The consumption characteristics of film as a commodity

Film has a number of defining properties as a commodity.¹⁰ For current purposes, the characteristics of uniqueness and rapidly diminishing marginal utility will suffice. Each film can be conceived of as a unique bundle of characteristics, although it is difficult to give precise objective form to the range and scope that these might take. The analytical framework becomes even more complex when consumers are introduced as independent agents, since objective characteristics, such as leading stars and/or genre, take on a wealth of different subjective meanings. On the one hand, it is possible to conceive of these bundles as being positioned along a horizontal continuum such that any new release can fit into a space left between two other closely related films. It is also possible to conceive of films occupying positions on the continuum that are distant from one another as being relatively unrelated and not close substitutes – indeed, perhaps not substitutes at all. This Hotelling-type competitive framework is capable of yielding multiple equilibria, with distinctive taste publics formed around particular preferences along the continuum: for instance, Ginger Rogers and Greta Garbo were quite different types of female star, each attracting a distinctive group of fans among American audiences during the 1930s.¹¹

On the other hand, vertically differentiated markets consist of products that can be ranked by audiences in accordance with some widely shared qualitative criteria, such that if products were to be sold at the same price the demand for the top-ranking product would dominate all remaining products. Here the potential for market concentration is considerable, and particularly so in the field of mass reproducible art forms, such as film and recordings, where, because of their

technological and organisational properties, supply is able to respond rapidly to changes in demand, making examples of more popular commodities much less scarce than their unpopular counterparts. Indeed, such was the anticipated pleasure promised by certain films that not only were regular filmgoers drawn to them in preference to rival products on the market, but also occasional filmgoers were roused to visit the cinema. Such films became the ‘hits’ of the year, generating highly skewed distributions of film revenues in which the mean was markedly greater than the median film revenue.¹²

The constraining factor in the tendency towards monopoly is the fact that audiences did not frequently revisit films, once enjoyed. In the years before film was given an extended product life – first, through television during the 1950s, and more recently through video recordings and DVD – the major studios expected films to amortise themselves over a 12 to 15 month period, after which they were considered ‘dead’ (see Sedgwick, 2000, pp. 56–57). Hence, although a film may have been a dominant attraction in a market for a period, this did not last for long, as new attractions emerged on a very regular basis. From this it is possible to conjecture that, on a weekly basis, the market shares of producers among a population of cinemas fluctuated wildly, depending on whether or not their releases of the moment were among the principal attractions of that week (see De Vany, 2004, ch. 9). As far as consumers were concerned it would appear that in a market committed to showing those films that audiences wanted to see, the promise *ex ante* of new unforeseen pleasures was usually more tempting than that of the pleasures offered by the repeated viewing of a previously enjoyed film.

Films, thus, are ‘experience’ goods: audiences can only form a full assessment of the product when the act of consumption is complete. The standard model developed by Nelson (1970, 1974) depicts experience goods as a category of good, the quality of which can be established only after it has been consumed (‘experienced’) by the buyer. In developing his model Nelson adopts a heuristic mechanism in which consumers benchmark the brand that has given them the highest level of utility and uses this as a metric to assess any new experience. Explicit in this model is a range of possible utilities associated with each untried brand, which are randomly distributed, and in experimenting with them consumers will experience either loss, gain or equivalence. Also explicit in Nelson’s model is the idea that consumers can learn which is the best brand through repeatedly consuming it, confirming over time through experimentation that it is superior to the other brands in the marketplace. However, recent research shows that the consumers, engaging in what at first sight might appear to be perverse consumption behaviour, reinforce their preference for the best brand by questing after variety, the logic being that disappointment with rival brands reminds consumers just how good their favourite brand is (Ratner, Kahn, & Kahneman, 1999).¹³ Hence, as a general rule, (a) consumers of experience goods face uncertainty *ex ante*, but (b) this is attenuated *ex post* by repeated experiences of the best brand and by experiences of other brands that confirm the superior quality of the best brand. However, in the case of filmgoing, while (a) holds, (b) does not. This is because film audiences quest novelty, which severely circumscribes their willingness to learn because they are engaged in continuous experimentation for which they require an ever-changing array of films (brands) to choose between, rarely repeat consuming any particular film – according to Arthur De Vany and David Walls (1996, p. 1493), audiences go about discovering ‘what they like’.

Thus, in making the decision to consume a given film, the filmgoer can be characterised as entering a risk environment, in the sense that while *ex ante* the consumer will have formed a view of the pleasures that might be expected from consumption, the *ex post* realisation might fall short of these expectations rather than fulfil, or indeed exceed, them. To think otherwise would be to promote the idea that film audiences chose films on the basis of rational expectations: that faced with an array of film choices, consumers knew – were able to anticipate fully – the range, scope and quality of the cinematic pleasures embodied in each of those films, irrespective of how innovative the film may have been, such that they were able to arrive at perfectly informed expectations, certain that the difference between *ex ante* expectations and the realisation of those pleasures *ex post* in each case was equal to zero. Such excessive formalism in the treatment of cinema audiences needs to be tempered by the empirical evidence presented in the next section.

Indeed, it is the scale of the risks faced by consumers that best explains why the industry adopted the practice of fixing cinema prices, irrespective of the popularity of the film being shown. In an environment in which the demand for films before release cannot be predicted with any degree of statistical reliability, raising cinema prices in anticipation of high levels of demand for a film in effect raises the premium paid by consumers for any given level of pleasure. Having had to pay this higher price to watch it would then exacerbate any consumer disappointment with the film. Additionally, from the experience-goods perspective, there is the question of the kind of signal sent out by the exhibitor if the film being screened is given a low price. Rather than interpreting this as a bargain viewing opportunity, the filmgoer could well take it as a sign of the exhibitor's ambivalent or unfavourable estimation of the quality of the film, and decide to stay away. In general, quality-related pricing at the box-office would increase the volatility of attendance that the exhibitor has to cope with, because, in addition to the existing good uncertainty of consumption outcomes intrinsic to film as an experience good, it would introduce a new, extrinsic uncertainty created by filmgoers factoring value-for-money (consumer surplus) assessments into their decision-making processes. In contrast with these complications, the established practice of invariant pricing actually helps to de-emphasize the risk associated with filmgoing, especially important, one could surmise, for the risk-averse filmgoer.

2. Audience research

It was not until the 1940s that Hollywood, lagging behind the producers/publishers of other mass media, began commissioning market research that employed the kind of formal and rigorous methodologies that we would recognise today (Handel, 1950, p. 3). Bakker (2003) provides a survey of the range of approaches that were used to collect information from film audiences, in both the US and UK, starting in the early years of the twentieth century. However, he also emphasises that prior to the 1940s these approaches were generally informal and unscientific, and were often used as a basis for generating publicity, rather than gaining deeper insights into audience motivations and preferences.

Two organisations led the way in developing more formalised approaches to audience research in the 1940s. George Gallop established Audience Research Inc. in March 1940, with a contract to provide research for the 'major' studio RKO (Ohmer, 1999, pp. 65–67).¹⁴ The second organisation was the Motion Picture

Research Bureau, established by Leo Handel in 1942, conducting studies exclusively for MGM. In his 1950 book, Handel summarised the main findings of research during the previous decade as:

Male and female patrons attend at about equal rates.

Younger people attend more frequently than older people.

Persons in higher socio-economic brackets attend more frequently than those in lower levels.

The more years a person has spent in school, the more frequently he sees motion pictures. (Handel, 1950, p. 99)

A key aspect of the research conducted by organisations during the 1940s was their attempts to establish the frequency of attendance at the cinema and the extent to which filmgoers were selective about what films they saw. For instance, a study of 710 interviewees in metropolitan New York, conducted by Columbia University's Bureau of Applied Social Science (reported in 1947), found that 37% of the sample attended once or more times a week, a further 27% attended once to three times a month, a further 25% a few times a year, with 11% never attending (Handel, 1950, p. 95). An earlier New York study, consisting of 508 interviews conducted by the Motion Picture Research Bureau in December 1941, produced results that were broadly consistent with these findings, with a mean monthly motion picture attendance of 3.70 for men, and 3.75 for women, with 57% of those interviewed indicating that they went three times or more each month (Handel, 1950, p. 100).

The Motion Picture Research Bureau, in a study of 2200 moviegoers from 39 towns conducted in February 1943 found that the normal mode of attendance was with one other person, with 58% of men and 71% of women in this category, while only 30% of men and 14% of women attended by themselves (Handel, 1950, p. 100). With respect to audience preferences, Audience Research Inc. discovered strong preference differences between men and women, age groups and income groups (Handel, 1950, pp. 118–127). However, the extent to which these preferences influenced choice is not so clear-cut. Handel believed that moviegoers could be divided into selective and non-selective categories, where 'A selective moviegoer can generally be described as a person who as a rule uses some degree of discrimination in choosing motion pictures, and selects them prior to the time of attendance' (Handel, 1950, p. 151). Evidence presented in Handel's book includes the aforementioned December 1941 New York study, in which 49% of audiences could be defined as non-selective, 36% selected the show and 12% went on personal recommendations. A 1943 survey of 2700 moviegoers attending 10 different theatres in the New York metropolitan area found very similar responses, with 51% maintaining that they would have seen any film programme showing, while only 21% of the sample indicated that they would not have attended had a substitute film been showing. This survey also found that there was a strong correlation between social class categories of the sample population and (a) the degree of discrimination exercised in choosing a film programme, and (b) the willingness to follow recommendations, with 44% of 'high' class, 34% of 'middle' and 31% of 'low' class interviewees choosing the particular show, while 15%, 11% and 8%, respectively, attended because of recommendation (Handel, 1950, p. 153).

These researches therefore imply a range of motivations for film consumption, from that of the selective consumer to the consumer attracted purely to the film

consumption experience in general, with little emphasis placed on film selection. Indeed, a surprising proportion of film audiences would appear to have been relatively non-discriminatory in their approach to film choice. The matter is made more complicated by the fact that movies were mostly 'jointly' consumed and that where this consisted of couples of the opposite sex, given the research evidence of gendered preferences, it is difficult not to see a conflict of interest involved in the decision-making process. Thus it would seem reasonable to assume that any given film consumption experience was subject to significant uncertainty with regard to outcome – for many consumers this very uncertainty may well have been an integral attraction of the film consumption experience – and that disappointment was a common *ex post* experience, together with the more extensively documented pleasures generated by the high profile 'hits of the season'.

In the case of discriminating audiences, which, if 'personal recommendation' is included as an act of discrimination, will have comprised more than 50% of those interviewed for the 1943 Motion Picture Research Bureau survey reported earlier, the question arises: did consumers know at the point of choice the likely quality of films, and hence did they successfully avoid 'bad' films? The major sources of information that affected movie choice according to the 1943 study were, in order of importance: 'Hearsay' 32%, 'Preview trailer' 15%, 'Reviews, articles in newspapers' 14%, and 'Ads in papers before attendance' 10% (Handel, 1950, p. 69). Clearly, word of mouth and studio publicity materials were of greater importance to audiences than reviews and newspaper articles in making decisions. None of these, however, could wholly eliminate risk for the consumer. That is, while discriminating audiences made choices using various information sources, the value of such information was limited by the very nature of film as a consumption experience, in which consumers were attracted by novelty and, to some extent, the unknown.

The industry seemed to understand this. Systematising the practice of sneak previews that had developed piecemeal since the 1920s, the 'major' studios from the 1940s used a questionnaire survey methodology, known as the Audience Film Index, to establish the likely appeal of a film before its release. They knew that interdependency existed between its appeal and audience expectations, and, if many of the preview audience's responses were uncomprehending, ambivalent, or negative about particular aspects of the film, it was altered to deal with the criticisms and improve its appeal, which also helped the publicity department to finalise its opening campaign. Handel writes:

The interrelation of the expectancy level and audience appeal of a picture is a familiar criterion with every moviegoer. A movie visit may be undertaken with the anticipation of seeing an outstanding picture. If the film in question is one of an average audience appeal, however, the discrepancy between the high expectation and the moderate enjoyment may result in disappointment and, possibly, dislike of the picture. Had the same moviegoer been under the impression that the picture he was about to see was not very good he might enjoy it considerably, due to the fact that the picture appeal was higher than the anticipated enjoyment. (Handel, 1950, p. 70)

Such disparities between *ex ante* expectation and *ex post* realisation clearly had important implications for the industry as to how different films should be promoted and then distributed, with 'high expectation . . . moderate enjoyment' movies receiving a mass of pre-release publicity, but then, as a consequence of disappointing levels of

demand, a distribution schedule that had the film rapidly playing through the subsequent runs (Handel, 1950, p. 71). The industry thus recognised that audience mismatches were commonplace – audiences themselves knew, from a multitude of previous cinema-going experiences that the appeal of a film, not yet seen, could prove to be misleading. Ian Jarvie (1970, p. 181) puts this rather well when he writes that ‘public evaluation is built into the image that sells the film, and . . . this image is not under the control of those selling the film’. In effect, audiences took risks in not knowing fully what they wanted, but insisting that films essentially manifest some captivating aspect of novelty. Producers faced with this market were ultimately Schumpeterian innovators, constantly putting new product onto the market, which, when measured by the rate of diffusion, met with markedly varying success.

3. Consumer reaction to films

Insights into the reactions of consumers to films during the 1930s can be derived from the MGM, RKO and Warner Bros. datasets. From the 1929/30 season to the 1941/42 season, each of the studios produced, on average, 47 films per year (44 in the case of MGM, 46 in the case of RKO and 53 in the case of Warner Bros.), with some year-to-year variation in the number of films produced, but no perceptible trend in numbers. The main distinguishing characteristic between the studios was in the size of mean production budgets, with MGM opting for a strategy of high budget production, relative to both RKO and Warner Bros.

Figure 1 depicts the scatter of distributor rentals derived from North American distribution against production costs for the 1796 films (out of a possible 1861), for which production cost data are available from the three studios for the seasons

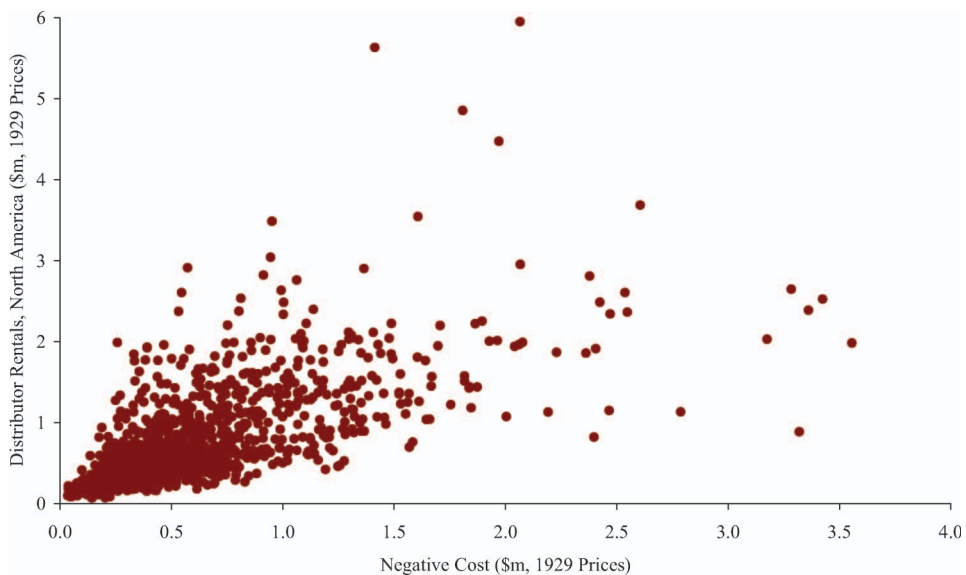


Figure 1. Scatter of North American distributor rentals against film costs, 1929 prices, 1929/30 season to 1941/42 season.

Sources: Sedgwick and Pokorny (2005a). The full ledgers have kindly been given to us by Mark Glancy and Richard Jewell, who copied them from archives held at the University of Southern California.

1929/30 to 1941/42. These rentals data posit a clear positive relationship, albeit one that is affected by increasing levels of variance as production budgets rise (Pokorny & Sedgwick, 2005; Sedgwick & Pokorny, 1998).¹⁵ All monetary data are expressed in constant 1929 prices (which will also be the case in all subsequent analyses using this dataset).

The variance of the revenues generated by films, in various production-cost categories, evident in Figure 1, requires explanation. In earlier publications we interpret the standard deviation of revenues of low, middle and high budget films as a measure of risk facing film producers (see Pokorny & Sedgwick, 2001; Sedgwick & Pokorny, 1998, 2005a). Clearly, the explanation for the tendency for risk to increase positively with production budgets emanates from film audiences and their reception of films released onto the market. Now consider that film production costs serve as a proxy measure for the expected utility of consumers – that is, production costs signify to consumers the quality of filmic inputs, hence allowing them to form expectations of likely levels of pleasure. Further consider that revenues reflect realised utility – the pleasure yields of movies as revealed through the box-office. The disparity between revenues and costs evident among those films found in the bottom right quadrant of Figure 1 suggest many big budget films proved disappointing to audiences.

To take this idea further, the rank correlation coefficient between film revenues and film production costs can be interpreted as reflecting the extent to which consumer reception of films corresponded to producer expectations. Focusing just on high budget films – films that were heavily promoted and would, thus, be known to the regular movie-going public – provides a clearly defined context for evaluating the extent of correspondence between audience reception and producer expectations. Given the marked increase in mean (real) production budgets during the 1930s the appropriate definition of a high budget film is a relative rather than an absolute one. The definition used here derives from expressing the production budget of a given film relative to the mean production budget of all films produced (by MGM, RKO and Warners) in the film's year of release. Specifically, we will here define a (very) high budget film as any film costing more than twice the mean production budget of all films produced in its year of release. Of the 1796 films shown in Figure 1, 179 films fall into this category – just 10% of the films produced over the period. These would clearly have been the high profile films of the period, and the films upon which the studios would have concentrated their promotional activities.

Now, the rank order of (real) film production budgets could be interpreted as reflecting producer expectations concerning audience reception – higher budget films would have incorporated higher production values, and therefore would have been expected to generate wide audience appeal. Similarly the rank order of (real) film revenues reflects consumer reception – higher revenue films generated higher levels of consumer satisfaction. Thus a rank correlation coefficient of close to 1 between film costs and revenues would imply a close correspondence between producer expectations and consumer reception – consumer rankings were consistent with producer rankings, implying that consumer expectations were largely met or exceeded. Conversely a low rank correlation coefficient implies a divergence between consumer experiences and producer expectations – consumer experiences were at variance with producer expectations, implying unmet expectations on the part of consumers, and hence significant levels of consumer dissatisfaction. The Spearman rank correlation coefficient between real US revenues and real production costs for the 179 high budget films was 0.461, implying a relatively low correspondence

between revenues and production budgets, and hence, by implication, significant levels of consumer dissatisfaction deriving from unmet expectations.

As a further illustration of the uncertainties of reception that films were subject to in the North American market, we can consider the high budget¹⁶ musicals on which Busby Berkeley worked for Warner Bros. (as dance director and/or director) during the 1930s, and the Astaire–Rogers musicals produced by RKO in the mid-to-late 1930s. Figure 2 presents indices of the real production costs and real domestic (North American) rentals of the 14 high budget Busby Berkeley films, and Figure 3 presents indices for the eight Astaire–Rogers films, with the films presented in order of release date. In both cases the indices for revenues and costs were each set to 100 for the first data (film) observation. Therefore both figures reflect the relative growth in revenues and production costs during the data periods.

In the case of the Busby Berkeley films (Figure 2) the first two data observations (*42nd Street* and *Gold Diggers of 1933*) represented the high point in terms of financial success during the period. Both films were released in the 1932/33 season, and accounted for just 7.5% of the production costs of all 56 films produced by Warners during the season, and yet they generated 17.5% of domestic revenues and nearly 30% of profits. Unsurprisingly, the next film released – *Footlight Parade* (1933) – attracted a 50% increase in production budget, and while generating respectable revenues (and profits), these revenues were 30% less than those generated by *Gold Diggers of 1933*. The next two films released – *Wonder Bar* (1934) and *Dames* (1934) – resulted in further declines in revenue, although produced with broadly increased production budgets. This decline in performance resulted in production budget cutbacks, and with continued decreases in revenue, *Stars Over Broadway* (1935) became the first of these films to generate losses. There was then a marginal increase in revenues, and a return to (weak) profitability for *Gold Diggers of 1937* and *The Singing Marine* (1937), but

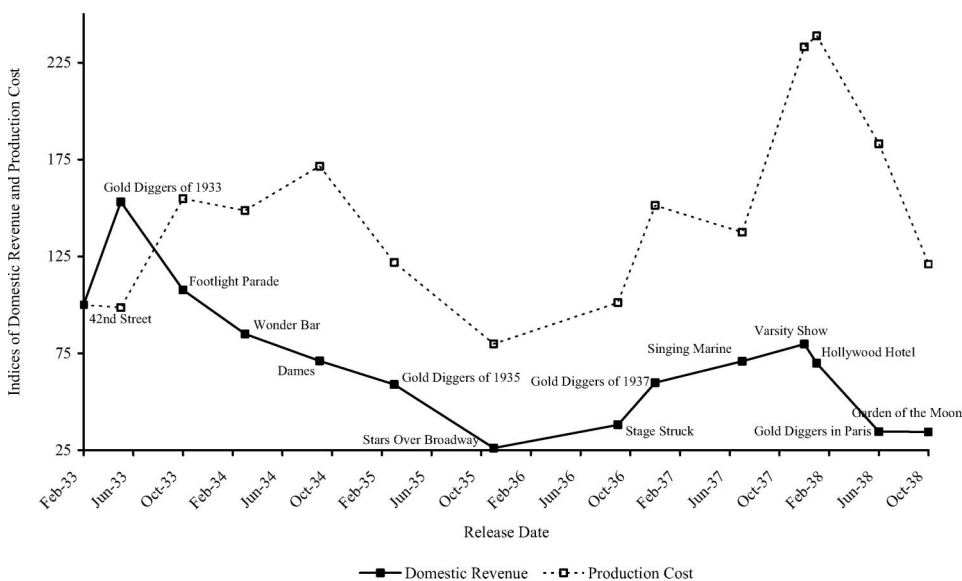


Figure 2. Busby Berkeley musicals, Warner Bros., indices of domestic revenues and production costs, 1929 prices.

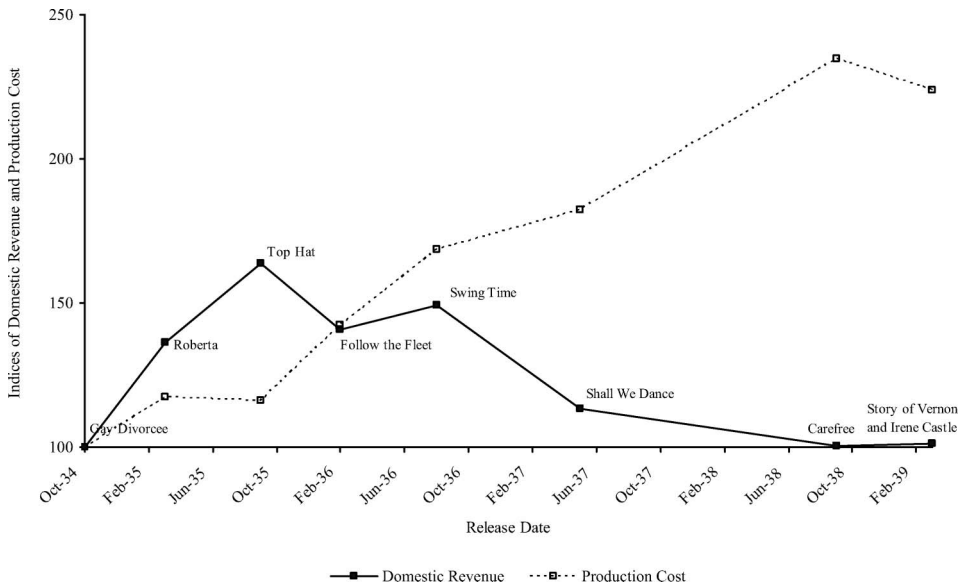


Figure 3. Astaire and Rogers musicals, RKO, indices of domestic revenues and production costs, 1929 prices.

thereafter revenues declined once again, despite substantially increased production budgets, with all the remaining films generating losses.

The Astaire–Rogers films in Figure 3 reflect similar trends. Thus the first film released – *The Gay Divorcee* in the 1934/35 season – was the second highest grossing film of the season, and resulted in increased investment in the next film released in 1934/35 – *Roberta* – and the three following films released in the 1935/36 season – *Top Hat*, *Follow the Fleet* and *Swing Time*. Jointly, these three films accounted for 18.3% of the annual production budget of all the RKO films released in the 1935/36 season, but generated 32% of the revenues and 120% of the profits – the remaining 40 films released, in aggregate, generated losses. Thereafter, despite continued expansion in production budgets, revenues declined, with the final two films – *Carefree* (1938) and *The Story of Vernon and Irene Castle* (1939) – delivering losses.

Clearly *Top Hat* was the outstanding film in the Astaire–Rogers canon, in terms of audience reception, as reflected in domestic revenues, with subsequent films being unable to match or exceed this success. Similarly, in the case of the Busby Berkeley films in Figure 2, *Gold Diggers of 1933* represented the pinnacle in terms of fulfilled and exceeded expectations, with a marked decline in demand for this specific genre thereafter. It therefore seems reasonable to conclude that the films released subsequent to these two films, as detailed in Figures 2 and 3, generated significant levels of disappointed expectations, albeit presumably in a relative sense. It can be surmised that audiences, having viewed *Top Hat* and *Gold Diggers of 1933*, approached the viewing of the subsequent films with heightened levels of anticipation, which, in the event, resulted in disappointment, at least for significant proportions of the audiences. Were this not the case – if these films had fulfilled or even exceeded the expectations generated by *Top Hat* and *Gold Diggers of 1933* – then presumably ‘word of mouth’ would have resulted in equal or even expanded audience numbers, producing correspondingly satisfactory or exceptional revenues.

Our dataset derived from the weekly box-office returns achieved at first-run theatres can also be used to obtain further insights into the manner in which films were received by consumers. To the extent to which consumers can be interpreted as being subjected to risk in film consumption, it is presumably at a film's initial release that this risk is at its highest level, given the limited amount of information concerning the film that would be in the public domain at this stage of the release cycle. The data set contains the weekly box-office revenues achieved by 294 MGM, RKO and Warners films, during their runs, at each of the first-run theatres at which they were released. From these data we have identified the best box-office week, for each film at each theatre, and expressed this as a percentage of the maximum box-office achieved by the best performing film at that theatre. This percentage can then be interpreted, for each theatre, as the capacity utilisation achieved by the film and as such reflects the relative popularity of the film at each theatre.

Of the films shown in Figures 2 and 3, these capacity utilisation distributions are available for eight of them – the five 'successful' RKO films – *The Gay Divorcee*, *Roberta*, *Top Hat*, *Follow the Fleet* and *Swing Time*, and the three 'disappointing' Warners musicals – *Gold Diggers of 1935*, *Stars Over Broadway* and *Stage Struck*.

Figure 4 shows the capacity utilisation distribution for *The Gay Divorcee* over the 21 first-run theatres at which it was released. These theatres are shown in date

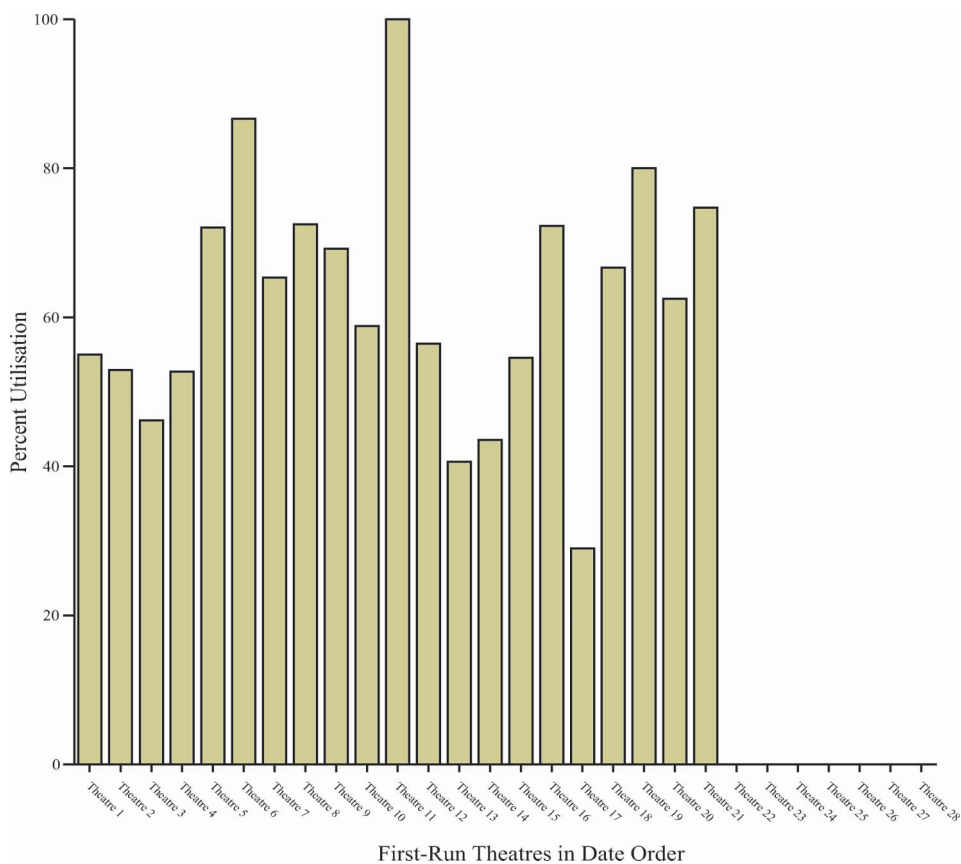


Figure 4. *The Gay Divorcee*: capacity utilisation at first-run theatres.

order,¹⁷ and hence Figure 4 reflects the reception of the film during the course of its initial run. There are two dimensions to this distribution that are reflected in Figure 4 – the mean capacity utilisation achieved, and the variability of these utilisation values, as reflected in the coefficient of variation. In the case of Figure 4 mean capacity utilisation is 62.5%, and the coefficient of variation of the 21 utilisation values is 25.6%. A further relevant aspect of this distribution that is not apparent from Figure 4 is the length of the run – the total number of weeks that the film played at these first-run theatres. In the case of *The Gay Divorcee* this was 41.5 weeks.

Figure 5 presents the capacity utilisation distribution for *Roberta*, which can be seen to generate a distribution superior to that for *The Gay Divorcee*. The mean capacity utilisation achieved was 76.0%, a coefficient of variation of 25.1%, playing for 51 weeks at the 21 theatres at which it was released. Figure 6 presents the capacity utilisation distribution for *Top Hat*. The success achieved by *Top Hat* is clearly reflected in this distribution. The mean capacity utilisation was 83.6%, with a relatively small coefficient of variation of 15.7% – the film achieved consistently high capacity utilisation scores, with the lowest value only slightly below 60%. The film played for 53.5 weeks in the 20 first-run theatres at which it was released. The two subsequently released Astaire–Rogers films, *Follow The Fleet* and *Swing Time*, while

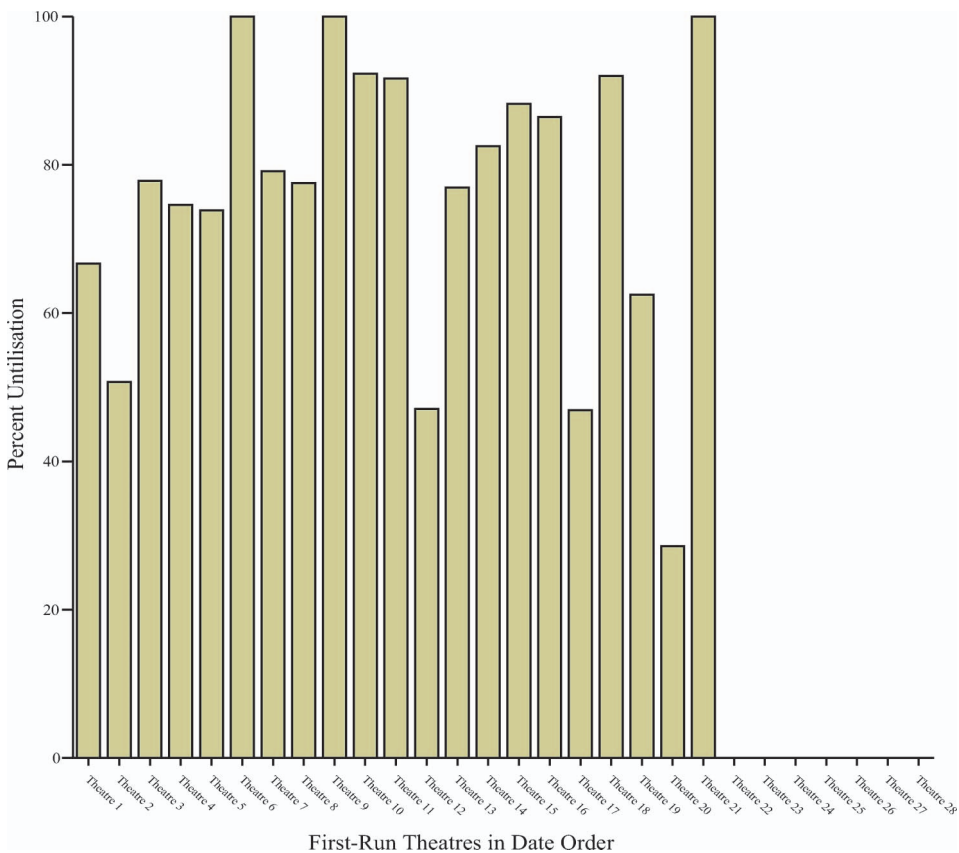


Figure 5. *Roberta*: capacity utilisation at first-run theatres.

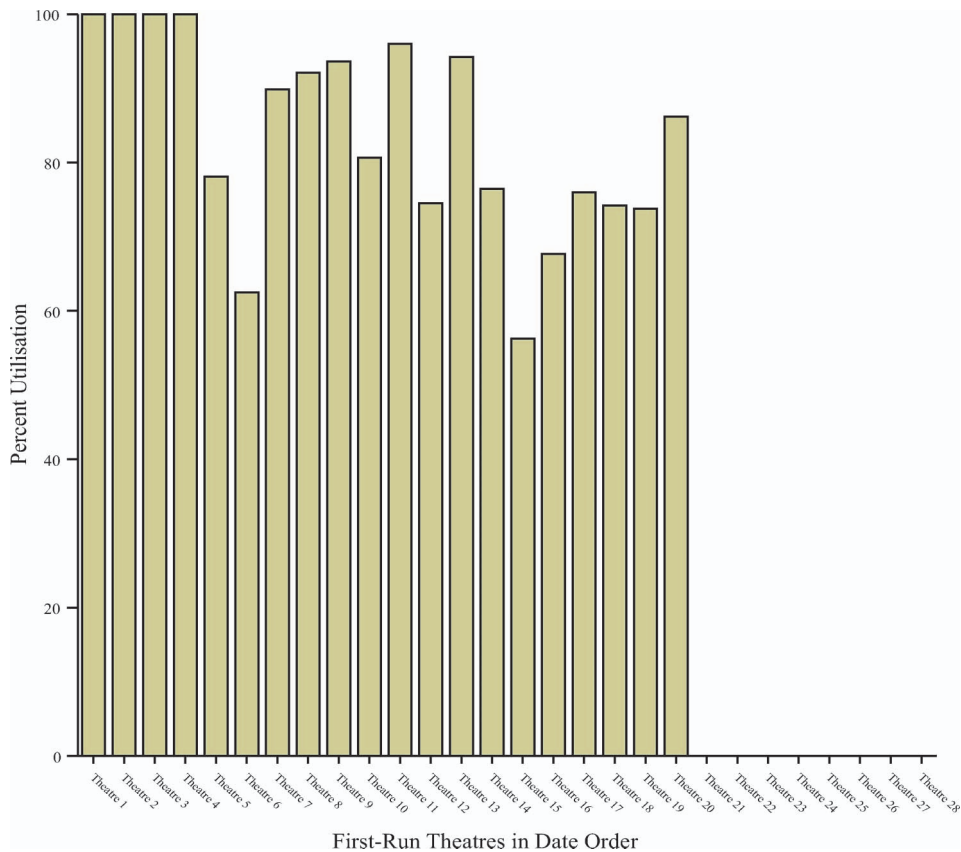


Figure 6. *Top Hat*: capacity utilisation at first-run theatres.

relatively successful, generated distributions (not shown here) that were in all respects inferior to that of *Top Hat* – mean capacity utilisations were 72.8% and 78.1%, coefficients of variation of 21.2% and 20.1%, and runs of 46 and 48.5 weeks, respectively. However, in broad terms Figures 4 to 6 (and the data for *Follow the Fleet* and *Swing Time*) reflect the profiles of successful first-run films, success that unsurprisingly was reflected in the total distributor rentals generated by these films, as shown in Figure 3, and their rates of return.

By contrast, Figures 7 and 8 show the profiles of the relatively unsuccessful Warner Bros. musicals, *Stars over Broadway* and *Stage Struck*. The films achieved relatively low mean capacity utilisations (41.6% and 45.8%, respectively), high coefficients of variation (33.6% and 28.1%) and short runs (21 and 17 weeks). Our interpretation here is that the relatively low capacity utilisations that they achieved, and the high variability in the utilisation values across theatres imply that these films disappointed a significant number of those who went to see them, resulting in an influentially negative word of mouth that led to a large number of stay-aways and hence diminished box-office revenues. Their relatively short runs further reinforce this conclusion. As a final example of the profile of a ‘disappointing’ film we can consider the case of *Hearts Divided*, which was produced by Warner Bros. in the 1935/36 season. This film was the 23rd most expensive of the 294 films produced by

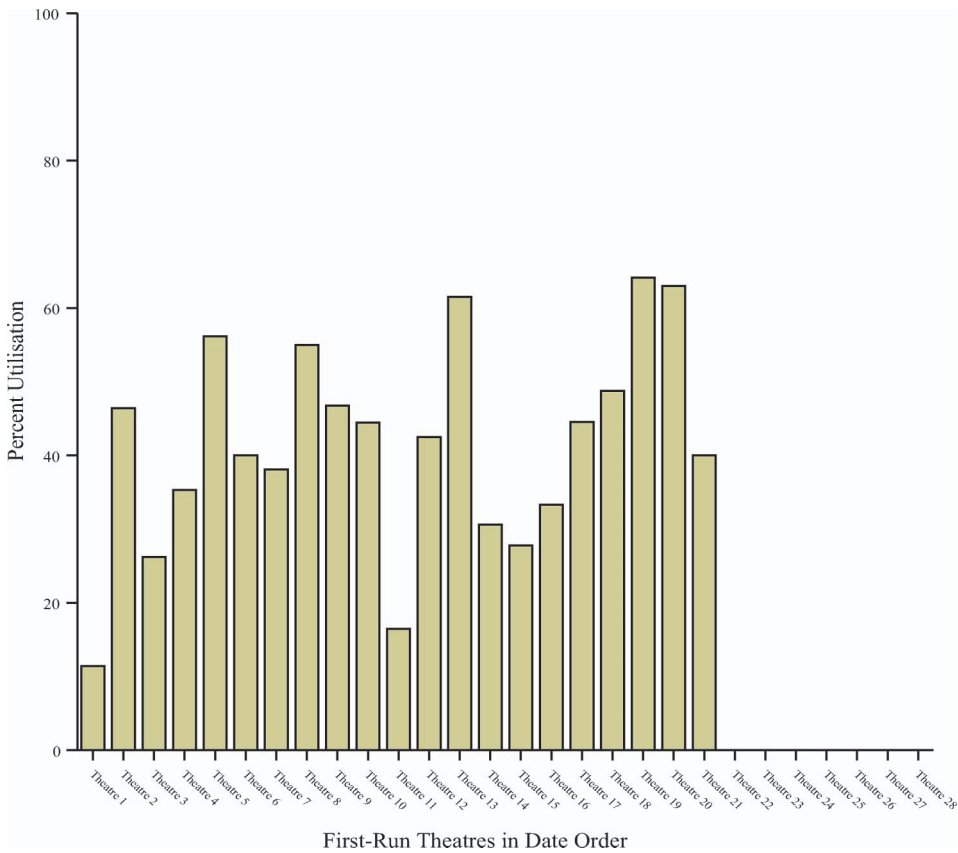


Figure 7. *Stars Over Broadway*: capacity utilisation at first-run theatres.

MGM, RKO and Warners between October 1934 and October 1936. However, its mean capacity utilisation was only 35.7% during its run of 23.5 weeks, and its domestic rentals amounted to barely half of its costs of production. The capacity utilisation distribution of this film is shown in Figure 9, where its poor and variable performance can be seen – the coefficient of variation of the utilisation values was 42.2%.

The issue, then, is the frequency of occurrence of such ‘disappointing’ films, and hence the extent to which consumers can be interpreted as having experienced disappointment. We will here consider only higher budget films, which we will define, for any given year, as those films costing more than the mean cost of all the films produced in that year. Thus using the main dataset as presented in Figure 1 – all films distributed by MGM, RKO and Warner Bros. during the 1930s and early 1940s – we calculated the mean production cost of these films for each of the release years, and then higher budget films were defined, for any given release year, as those films whose production costs exceeded this annual mean. Within the dataset of the 294 MGM–RKO–Warners films for which weekly box-office revenues have been collected, 106 (36%) were higher budget films according to the above definition.

We can first consider the successful films in this group from the dataset. If we define such films as those whose mean capacity utilisation was at least 60% during

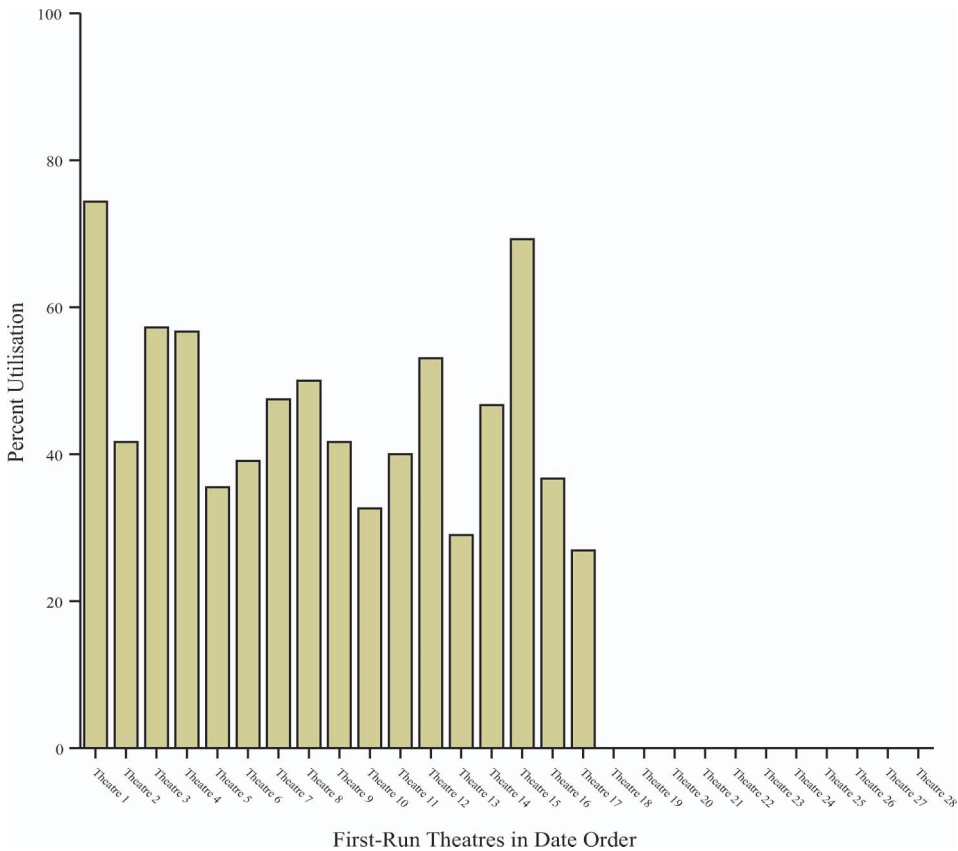


Figure 8. *Stage Struck*: capacity utilisation at first-run theatres.

the course of their runs at first-run cinemas (taking 60% as the floor value indicator of widespread consumer satisfaction), then 26 films (9%) fall into this category. These films all generated domestic rentals in excess of \$1m (in 1929 prices), with a mean of \$1.9m, and ran for an average of 43 weeks. The maximum rentals were generated by *The Great Ziegfeld* (1936) and *San Francisco* (1936) (\$3.7m and \$3.5m, with runs of 66 weeks and 79 weeks, respectively). These films all generated profits, and the domestic rentals that they generated, in aggregate, exceeded their aggregate costs of production by 69%.

By contrast, if we define the disappointing films in the group as those whose mean capacity utilisation was less than 45% – taken as a ceiling value indicator below which there is (some degree of) consumer dissatisfaction – then 35 films (12%) fell into this category. Just one of these films generated rentals in excess of \$1m (*The White Angel* (1936), at \$1.1m), with a group mean rental of \$540,500, and mean run of 19 weeks. Only eight of these films generated significant profits, the remainder making losses or barely breaking even. The total domestic rentals of these 35 films accounted for just 86% of their production costs – the minimum was 37%, in the case of *Enchanted April* (1935). The mean coefficient of variation of the capacity utilisation values of the group was 34.5%, compared to 23.5% for the successful films. It is not being argued here that all of these films were universally

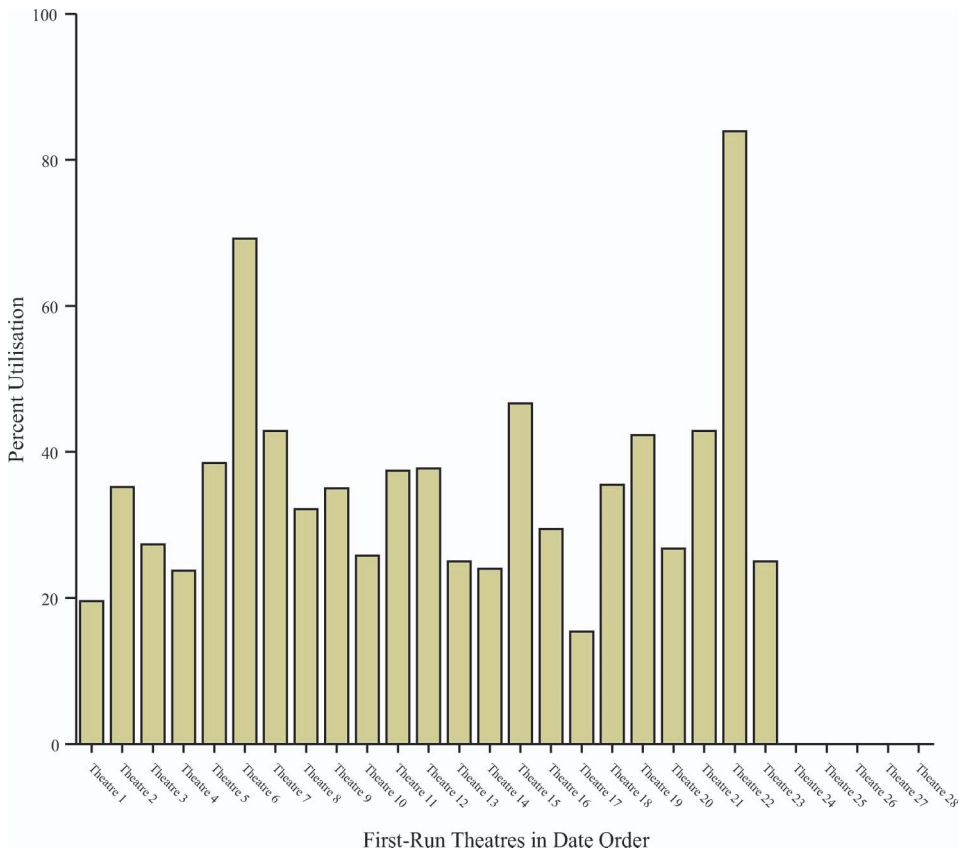


Figure 9. *Hearts Divided*: capacity utilisation at first-run theatres.

disappointing – a handful of these films generated rentals well in excess of their production costs – but they were nowhere near the extraordinary rentals of the successful films, and consequently it seems reasonable to assume that the relatively low mean capacity utilisations recorded by many of these films was a reflection of the disappointment that these films generated in a significant (sometimes dominant) part of their audiences.

Finally, given that the capacity utilisation distributions in Figures 4 to 9 can be interpreted as reflecting film popularity at initial release, it is instructive to determine the extent to which the characteristics of these distributions can explain the overall popularity that a film achieves. That is, we can investigate the extent to which the total domestic revenue generated by a film – its aggregate popularity – can be ‘explained’ by its initial performance at first-run theatres. This can be achieved by regressing the domestic rentals generated by a film (shown in Figure 1) on the various dimensions of the capacity utilisation distributions derived from first-run performance, as reflected in Figures 4 to 9. In order to obtain a measure of the impact of initial audience reception, and to minimise the impact of endogeneity on the regression results, we will focus on the audience reception at the first 10 theatres at which a film was exhibited.¹⁸ The first indicator to consider is the initial reception of the film, which marks the starting process in the subsequent information cascade.

In particular, the (final) domestic rentals of a film would be expected to be positively related to initial audience reactions, measured here as the mean of the capacity utilisation values at the first five theatres at which the film was exhibited (the choice of five, as opposed to any other number of theatres at which the film was initially shown, is arbitrary, but appeared to provide a reasonable basis for measuring initial first-run audience reactions to the film). The second indicator of the impact of audience reception is the extent to which this initial reaction was maintained, or indeed extended, in the next five theatres in which the film was exhibited. This influence is measured by the percentage increase in the average capacity utilisation value of theatres 6–10 over the average capacity utilisation of the first five theatres. The third indicator of the impact of a film's initial reception is the consistency of that reception. This is measured here by the coefficient of variation of the capacity utilisation values that a film achieved at the first 10 theatres at which it was exhibited. These three variables reflect consumer responses, but film revenues will also be influenced by producer investment, and, in particular, the production values that are incorporated into a film. The simplest measure of this influence is a film's production (negative) cost. However, given the extent to which average production budgets increased over the 1930s, the measure used here is a relative one, namely, the ratio of a film's production costs to the mean production costs of all films produced in the film's year of release.

Table 1 presents a range of these regressions. The dependent variable in all cases is derived from the total real North American distributor rentals generated by each film (measured in 1929 prices). The independent variables are the relative average cost of the film – the mean cost of the film divided by the average cost of all films produced in the film's year of release (*RAVCOST*); the mean of the capacity utilisation values of the best box-office weeks at the first five first-run theatres at which the film played (*AVCAPUTIL*); the percentage increase between *AVCAPUTIL* and the mean capacity utilisation values of the next five theatres at which the film subsequently played (*PCCAPUTIL*); and the variability of the capacity utilisation values over the first 10 of the first-run theatres at which the film was shown, as measured by the coefficient of variation of the best week utilisation values (*CVCAPUTIL*). In deriving these regressions there was evidence of non-linearities and heteroskedasticity, which was resolved by using the natural logarithm of distributor rentals as the dependent variable and the natural logarithm of *RAVCOST* (*LRAVCOST*). Thus positive coefficients are expected on *LRAVCOST*, *AVCAPUTIL* and *PCCAPUTIL* and a negative coefficient on *CVCAPUTIL*.

Equation (1) presents the regression results for all films.¹⁹ The remaining regressions relate to various categories of high budget films, which are defined relative to the mean cost of all films produced by MGM, RKO and Warners. Thus Equation (2) presents the results for those films whose production costs exceeded the mean cost of all films in their year of release. That is, the ratio of the cost of these films to the mean cost of all films – or the relative average cost, *RAVCOST* – exceeded 1. Equation (3) derives from films whose production costs exceeded mean production costs by more than 25% – *RAVCOST* > 1.25. Equations (4) and (5) relate to those films for which *RAVCOST* > 1.5 and *RAVCOST* > 1.75, respectively.

In all cases, adjusted R^2 s of 0.77 or more are produced, confirming that the (log of) total (domestic) revenue generated by a film, irrespective of which cost category is adopted, is related strongly to its reception on initial release. The signs of the coefficients are as expected – the (log) of a film's relative average cost, the initial

Table 1. Least squares regressions for natural logarithm of total North American distributor rentals, 1929 prices.

Independent variables	Equation (3)				
	Equation (1) all films coefficient (std error)	Equation (2) $ravcost > 1$ coefficient (std error)	$ravcost > 1.25$ coefficient (std error)	Equation (4) $ravcost > 1.5$ coefficient (std error)	Equation (5) $ravcost > 1.75$ coefficient (std error)
<i>CONSTANT</i>	5.707* (0.133)	5.698* (0.215)	5.885* (0.239)	5.948* (0.270)	5.977* (0.330)
<i>LRAVCOST</i>	0.478* (0.033)	0.266* (0.082)	0.296* (0.101)	0.334* (0.117)	0.443* (0.155)
<i>AVCAPUTIL</i>	0.021* (0.002)	0.025* (0.003)	0.022* (0.003)	0.021* (0.003)	0.019* (0.004)
<i>PCCAPUTIL</i>	0.003* (0.001)	0.006* (0.001)	0.006* (0.001)	0.007* (0.002)	0.006* (0.002)
<i>CVCAPUTIL</i>	-0.013* (0.002)	-0.017* (0.004)	-0.018* (0.004)	-0.019* (0.005)	-0.020* (0.006)
<i>n</i>	269	106	74	57	39
\bar{R}^2	0.801	0.766	0.794	0.818	0.820

*Significant at the 1% level

Independent variable definitions are as follows:

LRAVCOST – the natural logarithm of the ratio of the cost of each film divided by the average cost of all films produced in the film's year of release.

AVCAPUTIL – the mean of the capacity utilisation values of the best box-office weeks at the first five first-run theatres at which each film played.

PCCAPUTIL – the percentage increase between *AVCAPUTIL* and the mean capacity utilisation values of the next five theatres at which the film subsequently played.

CVCAPUTIL – the coefficient of variation of the *AVCAPUTIL* values over the first 10 of the first-run theatres at which the film was shown.

Table 2. Least squares regressions for natural logarithm of the ratio of total North American distributor rentals to production costs.

Independent variables	Equation (1) all films coefficient (std error)	Equation (2) <i>ravcost</i> > 1 coefficient (std error)	Equation (3) <i>ravcost</i> > 1.25 coefficient (std error)	Equation (4) <i>ravcost</i> > 1.5 coefficient (std error)	Equation (5) <i>ravcost</i> > 1.75 coefficient (std error)
<i>CONSTANT</i>	-0.351* (0.134)	-0.342 (0.212)	-0.131 (0.230)	-0.059 (0.259)	-0.059 (0.309)
<i>LRAVCOST</i>	-0.512* (0.033)	-0.737* (0.081)	-0.725* (0.098)	-0.695* (0.112)	-0.599* (0.146)
<i>AVCAPUTIL</i>	0.020* (0.002)	0.025* (0.003)	0.022* (0.003)	0.021* (0.003)	0.019* (0.003)
<i>PCCAPUTIL</i>	0.003* (0.001)	0.006* (0.001)	0.006* (0.001)	0.007* (0.002)	0.007* (0.002)
<i>CVCAPUTIL</i>	-0.012* (0.002)	-0.017* (0.004)	-0.018* (0.004)	-0.020* (0.005)	-0.021* (0.005)
<i>n</i>	269	106	74	57	39
<i>R</i> ²	0.510	0.669	0.718	0.756	0.748

*Significant at the 1% level
See notes to Table 1 for definitions of independent variables.

capacity utilisation and the extent to which this initial utilisation subsequently increased were positively related to the film's final popularity, and the variability in a film's reception over the first 10 first-run theatres at which it played had a negative impact on its subsequent success. The coefficients are in all cases significantly different from zero. Thus, put simply, the reception by first-run audiences early in the release cycle had a major impact on film popularity in the market as a whole, together with the level of investment that the studios committed to a film, and this relationship was stable across a range of film budgetary categories. Of course, it was at this stage of the release cycle that consumer uncertainty was greatest, given the limited (objective) information about the film that was then available. Indeed, it was important for the studios that consumers were induced to take risks, so that the successful films could be identified and subsequent marketing/promotional expenditures focused on these films for the remainder of their runs through the lower run theatres. Thus it was that the industry was geared to screening those films that proved popular with audiences at the expense of those that were less popular, and this competition for popularity was greatest in the first-run market where, relative to the limited number of first-run cinemas, there was an abundance of new films coming onto the market at any one time.

Table 2 presents regressions for film profitability. The measure of profitability used here is the simple ratio of North American film revenues to production costs. Again the log of the dependent variable and the log of *RAVCOST* resolved non-linearity and heteroskedasticity problems. Strong regression results are again produced, although with lower adjusted R^2 values compared to the (log) revenue regressions in Table 1 – film profitability is somewhat less predictable than film popularity. Note also that in the case of Table 2 the magnitude of production budgets (*LRAVCOST*) has a negative impact on rate of return – higher budget films will tend to have lower rates of return than lower budget films, *cet. par.*

However this process is characterised, the essential feature is that consumers operated in an environment of significant risk, and indeed it was this risk, and the potential 'surprises/gains' experienced in film consumption, that provided the stimulus to continued film consumption. Had film producers become predictable in their output, this would have limited the extent of surprise experienced in the consumption process and hence acted as a disincentive to continued consumption.

4. Conclusion

Given the industrial practice that cinema admission prices were invariant, regardless of the calibre of film being exhibited, it would be expected that qualitative differences anticipated by audiences between films screened at the same cinema would generate different levels of attendance, and hence box-office revenue. Furthermore, as the regressions in Table 1 and 2 imply, films that were popular (and profitable) with audiences in first-run cinemas continued to be popular (and profitable) with audiences that frequented lower order cinemas, which in turn implies that the more popular a film was, the greater was the consumer surplus it generated, as supply adjusted to popular demand.

Those films that proved to be the outstanding attractions of the season were likely to offer out of the ordinary levels of pleasure that were somehow communicated from initial-reception first-run filmgoers to subsequent cohorts of filmgoers. These films constituted the long right-hand tail of the revenue distribution,

and audiences recognised them as vertically differentiated from the bulk of films released onto the market. Such films were likely to have contained some element of novelty/innovation which the producer had invested in the film, although this novelty may also have resulted from serendipity, such as the accidental pairing of two stars in a new genre adaptation. Such films were also likely to have been the focus of considerable marketing activity, partly connected to the producer's original conception of, and plan for, the film, and partly as a result of the film's initial success.

While it is not possible to form focus groups to access audience behaviour during the 1930s, it is now nevertheless possible to form a clear idea of the pattern of film preferences from the datasets presented in this paper in conjunction with audience surveys conducted in the 1940s. This paper argues that audiences attending first-run cinemas took risks when going to the cinema because they could form only limited expectations of the cinematic pleasures that they subsequently realised and that differences between expectations and realisation were (and are) both inherent in and integral to the filmgoing experience.

On a more general level, the key to financial success for the film producer was to induce risk-taking activity on the part of the consumer – to induce the consumption of films that *ex ante* promised uncertain pleasures. In turn, keeping the costs of consumption relatively low, and crucially, invariant – that is, calibre-insensitive – stimulated such consumption behaviour. While it might have been tempting for producers to use price discrimination between films – to increase admission prices for popular films – such a strategy would have had at least two negative impacts. First, increasing the price of admission for a popular film would reduce the potential audience for that film, because it would affect negatively the ticket buyer's value-for-money perception of the relationship between the anticipated pleasure to be derived from the film and its cost of consumption – the potential 'gain' for the consumer would be reduced, and 'losses' would be produced for the marginal consumer. And, second, a general price discrimination strategy on the part of producers would induce much more strategic behaviour on the part of consumers, and would discourage risk-taking in consumption. In producing an extensive annual portfolio of films the major studios expected consumers to consume widely across this portfolio, thus allowing the 'hits' of the season to emerge. Any form of price discrimination would inhibit such a process, potentially inhibiting any 'tipping effect' that might otherwise have begun.

Notes

1. A notable exception is a body of work on audiences collected in Stokes and Maltby (1999a, 1999b), and Maltby, Stokes, and Allen (2007).
2. See Anderson (2006); Clemons (2008); and Elberse (2008) for a discussion of this phenomenon.
3. See Sedgwick (2000), for discussions of local film exhibition in Bolton and Brighton.
4. Admission receipts to cinemas are found in Table H884 of *Historical statistics* (US Department of Commerce, 1975). Total consumer expenditure on spectator activities is found in Table H883.
5. Although weekly admission numbers are listed in *Historical statistics*, these appear to be too high. The estimates presented here are based on the admission revenues listed in Table H834 and the mean box-office price of 25 cents that approximates that calculated by the Department of Commerce for the middle years of the decade and found in Conant (1960).

6. An analysis of the returns to stars in the 1930s in both British and US markets can be found in chapter 9 of Sedgwick (2000) and in Pokorny and Sedgwick (2001).
7. These data are derived from the complete Eddie Mannix (MGM), C.J. Trevlin (RKO) and William Schaefer (Warner Bros.) ledgers. The ledgers are partially reported and analysed in Glancy (1992, 1995) and Jewell (1994). We are grateful to Mark Glancy and Richard Jewell for making the complete ledgers available. The ledgers include data, for each film, on year of release, production cost, domestic and foreign distributor rentals, and, in the case of MGM and RKO, the profits generated by each film.
8. Films included in the sample are those whose principal exhibition took place during these 25 months. The records of films released before 1 October 1934 but exhibited predominantly during and after this month have been included. Likewise included are the records of films released during October 1936 and receiving subsequent exhibition in November and December 1936. The dataset remains largely unexploited by scholars and represents an important new source of information about film popularity (see Sedgwick & Pokorny, 2005a).
9. The significant number of double-bill programmes does not affect our approach, since double-bill programmes commonly consisted of a major attraction and a support film, and consumers would have been aware of this when choosing between film programmes. Further, the more popular a film, the less likely it would be twinned with a second feature, allowing the distributor of the attraction to charge a higher price – a greater proportion of the box-office take (see Hanssen, 2005).
10. A full discussion of these characteristics can be found in the introductory chapter in Sedgwick (2000) and chapter 1 of Sedgwick and Pokorny (2005b).
11. See Maltby (1999) for a discussion of ‘taste publics’.
12. See De Vany and Walls (1996), Sedgwick and Pokorny (2005a) and Walls (2007) for discussions of revenue distributions. Excellent discussions of the state of product differentiation theory can be found in Beath and Katsoulacos (1991) and Waterson (1994).
13. Much of the literature associated with experience goods is concerned with estimating the impact of particular forms of information on demand. For instance, Reinstein and Snyder (2005) estimate the impact of film critics on the market performance of movies, while Sood and Drèze (2006) investigate the returns to movie sequels.
14. The organisation emerged from Gallop’s American Institute of Public Opinion (see also Jowett, 1985, p. 30).
15. The correlation coefficient between North American rentals and production (negative) costs is 0.728. Taking the natural logs of rentals and production costs produces an even stronger positive association, in which the log transformations appear to have accounted for the heteroskedasticity in the data. The correlation coefficient between the log of rentals and the log of production costs is 0.819.
16. We define ‘high-budget’ here as films, in any given year, which cost more than the mean cost of all films produced by Warner Bros., RKO and MGM in that year. Busby Berkeley was involved in the production of 21 films for Warners between 1932 and 1938, 14 of which satisfied this definition of high budget.
17. There were a number of theatres at which the film was released simultaneously and the order of these theatres shown in Figure 7 is essentially random.
18. Thus, for example, it would not be appropriate to include a film’s length of run at first-run cinemas as an independent variable as this would be a direct function of a film’s popularity and hence directly related to the final revenues generated by the film.
19. Equation (1) necessarily excluded films that were shown at five or fewer first-run theatres, because such films could not generate an observation for *PCCAPUTIL*. There were 22 such films in the dataset, thereby reducing the sample size to from 294 to 272. Production cost data was unavailable for a further 3 films, reducing the sample size to 269 films.

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