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Examining Success in the Motion Picture Industry

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Abstract
This paper focuses on the effects of several variables on the domestic box-office demand for the 189 widely-released movies of 2007. I will examine if there are factors that ultimately lead to movie success at the box-office or if there are factors that are believed to be important, but in all actuality have very little impact on revenues. Box-office receipts, however, are not the ultimate determinant of success in the industry. Some companies may use theaters as extended advertising medias and capitalize on the relatively cheap cost of producing DVDs and digital copies of films, but success typically has to occur in the theaters in order for other forms of the film to sell. Nevertheless, examining box-office revenue is the best way to determine the success of a film at this time because the information is readily available and movie theaters are still accepted as the major source of revenue for a particular movie.

Examining Success in the Motion Picture Industry

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I. Introduction

We have all heard the old adage "You' ve got to spend money to make money", but will spending a lot of money lead to making a lot of money? Some movie companies have created their own interpretation of the proverb and figure that if one can make money by spending it, then one must be able to make more by spending more. Spending money in the movie industry can be done fairly easily. Companies can hire well-known actors and actresses, employ a popular director, beef up the action sequences with better computer graphics, or advertise the film in mass media outlets.

The eight most expensive films ever produced were made in the last three years, with "Pirates of the Caribbean: At World's End" topping them all with a production budget of $300 million and an advertising budget of nearly $40 million in 2007 (showbizdata.com). While the film did generate $300 million in domestic box-office revenue and continued to generate revenue in DVD sales and rentals, that box-office revenue number is far worse than what the production companies must have estimated for the third installment in the popular pirate series. But the question remains, why would a motion picture production company spend the most ever spent on a single movie and run the risk of losing much of it? Some believe if they spend enough on a film, people will automatically go see it, but then there are movies like "Poseidon" which spent $160 million in production budget and collected only $60 million in domestic box-office receipts in 2006.

One has to believe that there is something more appealing to consumers in the motion picture industry than an expensive film. Do the reviews of professional movie critics impact consumers' thoughts? Or does a certain genre put more people in the seats of theaters? Is box-office success guaranteed by using an established actor or actress in the lead or do people simply not care about any other factors and see movies for seemingly no reason at all?

This paper focuses on the effects of several variables on the domestic box-office demand for the 189 widely-released movies of 2007. I will examine if there are factors that ultimately lead to movie success at the box-office or if there are factors that are believed to be important, but in all actuality have very little impact on revenues. Box-office receipts, however, are not the ultimate determinant of success in the industry. Some companies may use theaters as extended advertising medias and capitalize on the relatively cheap cost of producing DVDs and digital copies of films, but success typically has to occur in the theaters in order for other forms of the film to sell. Nevertheless, examining box-office revenue is the best way to determine the success of a film at this time because the information is readily available and movie theaters are still accepted as the major source of revenue for a particular movie.

II. Literature Review

The blockbuster theory has not been discussed much in the motion picture industry research, but it is the ultimate goal of every company. The theory is that movie production companies should spend vast amounts of money in the creation of a particular film because if it happens to become a blockbuster, a film which generates a large profit, it can cover the costs of several failed projects by the same production company (Garvin, 1981). The Star Wars franchise resurrected a struggling 20th Century Fox company that went out on a limb to spend $11 million on a science fiction movie and other companies have been trying to replicate the success of the surprising smash hit ever since.

While some studies focus on how expenditures increase the chances of producing a blockbuster movie, others have looked at the influence of advertising on box-office revenues. Elberse and Anand (2007) looked at a simulated market of motion pictures and determined the effectiveness of pre-release advertising in the movie industry. They found that when a high quality movie is produced, increases in television advertising will generally

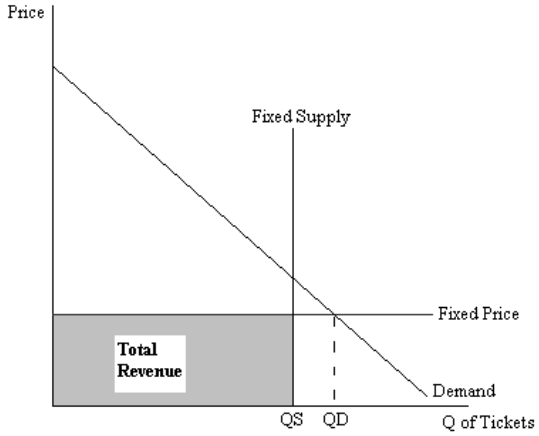
increase box-office revenue because people are being exposed to a well-done movie and will want to go see this "good" movie. When a low quality movie is produced, revenues will fall with an increase in advertising because audiences are being exposed to a poorly done movie and will not want to go see this "bad" movie. If the "bad" movie was never advertised, potential customers will not see the bad previews for the film and they have a greater chance of spending money at the box-office than if they had seen the bad preview and declare the film as a must-miss. Quality and advertising budget, therefore, must be taken into consideration when trying to predict box-office revenues. This study also suggests the possibility of an interaction between advertising costs and professional review scores. When review scores are high, production companies should be spending more on advertising and be spending less when review scores are low. A look at this interaction will determine if those production companies are spending their dollars in the right place.

Holbrook and Addis (2007) look solely into the quality of movies and the impact of expert judgment on box office revenues. They find similar results to Elberse and Anand (2007) in that people go see quality movies, but does it take a vast amount of money to produce these quality movies? A quality picture generally has better acting, better camera shots, and better special effects; all factors that lead to a more expensive production budget, so quality and production costs may be highly correlated, but both are important nonetheless.

III. Theory

When looking at the supply and demand market for motion pictures, one has to realize that it is unlike most markets. Price is fixed for each movie in a theater for those of the same age and for those wanting to see a movie during the same time of day. Changes in price do not have to be considered because there will simply not be any. Supply can be considered fixed as well. There are only so many movie theater seats in the United States and more will not be built with the excitement of a new movie coming out. Since price and supply are generally fixed, the only variation one can witness is in the location of the demand curve. A visual representation of this unique supply and demand model can be seen in Figure 1.

Figure 1: Supply and Demand of Movie Tickets for a Popular Film



Total revenue is calculated by figuring the product of price and quantity of tickets sold, in this case Fixed Price and QS. This model suggests a shortage of movie tickets for a particular film at a particular show-time. At the ticket price, more tickets are demanded than seats are available at the theater, resulting in a shortage. While no movie theaters, or production companies for that matter, want to lose potential customers, it is a good sign when the demand for a particular show is so high.

Several variables can influence the location of the demand curve such as the price of complementary goods, the price of substitute goods, and popular attitudes or trends in society (Mankiw, 2009). Complementary goods to movies are popcorn, soda, and candy, but the relationship is not necessarily reciprocal. The prices of popcorn, soda, and candy will not have a major impact on the demand for movies, so complementary goods will not be included in this study. Substitute goods are other movies at the same theater, but their price will be the same as all of the other movies, so prices of substitute goods will also not be included in this study. Popular trends and attitudes determine whether a film will be successful or not. Famous actors/actresses, advertising, genre, rating, special effects quality, and professional reviews affect popular attitudes towards a particular movie and each can shift the demand curve either favorably or adversely. Seasonality of a film can also impact success at the box-office. During the summer months and the weeks leading up to Christmas, children are home from school and typically go to the movies in order to pass the time. Also, movie theaters seem to be some of a handful of places open during national holidays and many families partake in a film on those days. How much of an effect each variable has on consumer demand remains to be seen.

IV. Empirical Model

The data set contains the 189 widely-released movies of 2007. A movie is considered widely-released if it opens in at least 600 theaters across the United States and Canada. A film can initially open in select cities, but once it is playing in at least 600 theaters, it has reached wide-release status. The statistics of those movies come from The-Numbers.com and boxofficemojo.com which are reliable sources for all motion picture information.

The regression model consists of one dependent variable, total domestic box-office revenue (TR), and eight independent variables; production costs (PC), cumulative professional review scores (PR), star power (SP), age-appropriate rating (R), genre (G), if the film is a sequel (S), if the film is released between June 1 and August 31 or December 14 and December 31 (SW), and if the film is released on a holiday (H). The equation looks as follows:

$$TR = \alpha_1 + \beta_2(PC) + \beta_3(PR) + \beta_4(SP) + \beta_5(R) + \beta_6(G) + \beta_7(S) + \beta_8(SW) + \beta_9(H) + \mu$$

Production costs are collected from the internet, using various websites in order to ensure accuracy. These costs are used as a proxy for advertising budget. Most production companies create their advertising budget based on a percentage of the overall production costs. The production costs used do not include advertising costs. The advertising costs of every movie widely-released in 2007 are difficult numbers to find, so the production costs will serve as such. Professional review scores are gathered from an internet site that aggregates review scores for a particular movie from several respectable critics from around the country. Metacritic.com (2009) serves as the database for compiling the review scores. Star power is combined Oscars won by actors, actresses, and directors of a film. Age-appropriate rating is a set of dummy variables including PG, PG-13, and R with G being the omitted case. Genre is a set of dummy variables including action/adventure, animation, and comedy with drama being the omitted case. Sequel is a dummy variable determined if the film is an additional part of a series with the first/original of its storyline being the omitted category. Seasonality is a dummy variable for films released during the summer months or in the last three weeks of December with normal release as the omitted case. Holiday release is a dummy variable for if the film is released during the same movie week, Friday-Thursday, as Valentine's Day, Memorial Day, Independence Day, Halloween, Thanksgiving, or Christmas with normal release as the omitted case. A summary table of definitions is Table 1. The focus of this research paper is to examine the significance of each variable in order to determine their effectiveness on total domestic box-office revenue.

Table 1: Definitions of Variables

Variable	Definition	Expected Sign
Total Revenue (TR)	Dependent Variable TR=Price*Q Tickets Sold	N/A
Production Costs (PC)	Proxy for advertising costs	(+)
Professional Review Score (PR)	Aggregate reviews from professional movie critics around the nation	(+)
Star Power (SP)	Total Oscars won by main actors, actresses, or director	(+)
Age-Appropriate Rating (R)	Dummy variable; 1 if PG, PG-13, R, or 0 if G	N/A
Genre (G)	Dummy variable; 1 if action, comedy, animation, or 0 if drama	N/A
Sequel (S)	Dummy variable; 1 if sequel, 0 if not	N/A
Summer/Winter Release (SW)	Dummy variable; 1 if released between June 1-Aug 31 or Dec 14-31, 0 if not	N/A
Holiday Release (H)	Dummy variable; 1 if film is released on Valentine's Day, Memorial Day, Independence Day, Halloween, Thanksgiving, or Christmas Weekends, 0 if not	N/A
PC*PR	Interaction variable between advertising costs and professional review scores	(+)

V. Results

After running an OLS regression, only four variables are significant. However, they are four rather important variables; production costs, professional review scores, and the genres of comedy and action. The coefficients for production costs and professional review scores are positive values, which would be expected, as are the coefficients of comedy and action. The coefficients for all genres are positive, but animation is the only one without a confirmed significance.

Production costs and professional review scores result in very interesting information. The coefficient for production costs, our proxy for advertising, is about 0.94, which agrees with the findings of Elberse and Anand (2007) in that spending one more dollar in advertising will result in less than a dollar of extra revenue. This would imply that firms would be better off without advertising their films as much or it could be pointing out an error in the analysis of the data. Either way the results point to an inefficiency in the advertising markets for motion pictures.

Action and comedy movies seem to have an apparent advantage over drama movies as well. Movies of those genres can each expect to generate about $30 million and $24 million more at the box office, respectively. Based on these results and the blockbuster theory of capitalizing on what is successful, we would expect to see more action and comedy movies in theaters in the following years, 2008 and 2009.

A second OLS regression including the interaction variable of PC*PR results in three significant variables. The PC*PR variable is significant to the .05 level, comedy remains significant to the .01 level, and sequel becomes significant to the .1 level. The singular production costs variable turns negative and the professional review score variable remains positive, but both are insignificant when the interaction is included, which may suggest multicollinearity among variables.

Overall, the first regression without the interaction variable is able to explain about 74% of the variation of the dependent variable, Total Revenue, while the second regression with the interaction variable, PC*PR, is able to explain about 76%. This is not much of an increase in the R-squared values, but it is an increase nonetheless. A summarized look at the regression results can be found in Table 2 and Table 3.

Table 2: Significant Regression Results without Interaction Variable

Variable	Beta	Std. Error	t	Significance
Action	30.6	14.08	2.11	.031**
Comedy	24.6	10.02	2.46	.015**
Production Costs	.842	.107	7.83	.000***
Review Score	.813	.228	3.55	.001***
N=137				

** Indicates significance at the α=0.05 level ***Indicates significance at the α=0.01 level

Table 3: Significant Regression Results with Interaction Variable

Variable	Beta	Std. Error	t	Significance
Comedy	27.21	9.69	2.80	.006***
Sequel	20.12	10.74	1.87	.063*
PC*PR	.019	.006	3.23	.002***
N=137				

* Indicates significance at the α=0.1 level *** Indicates significance at the α=0.01 level

VI. Conclusions

This study is meant to investigate what parts of a movie make it successful in the box office. From these results we can determine that people will generally go see an advertised, funny film but it has to be professionally reviewed well also. If the movie is rated PG-13 it will hold an apparent, but not proven, advantage over other age-appropriate labels because it is mature enough for adults to enjoy while still not too violent or sexual to exclude the major demographic in the market of teenagers.

Further research could include a look into the comparisons between box-office revenue, production costs, and DVD sales/rentals in order to determine if movie production companies are even aiming to make their money in movie theaters or if they are using theaters as extended advertising. One could also look at other significant years, such as times of

recession/economic growth or times of war. Comparisons between years would produce interesting results as well.

REFERENCES

Box Office Mojo. 2009. <http://boxofficemojo.com/>

Elberse, Anita and Bharat Anand. "The effectiveness of pre-release advertising for motion pictures: An empirical investigation using a simulator market." *Information Economics and Policy* 19 (2007): 319-43

Garvin, David A. "Blockbusters: The Economics of Mass Entertainment." *Journal of Comparative Economics* 5 (1981): 1-20.

Holbrook, Morris B., and Michela Addis. "Taste versus the Market: An Extension of Research on the Consumption of Popular Culture." *Journal of Consumer Research* 24.3 (2007): 415-24

Mankiw, Gregory. *Essentials of Economics*. 4th ed. South-Western, 2006.

Metacritic - Movie Reviews, TV Reviews, Game Reviews, and Music Reviews. 2009. <http://metacritic.com>.

"ShowBIZ Data – Worldwide Box Office Review." *ShowBIZ Data: The Entertainment Industry online with daily box office including global market shares, development tracking, job listings and film reviews*. 2009. <http://www.showbizdata.com/worldbox.cfm>.

The Internet Movie Database (IMDb). 2009. <http://www.imdb.com>.

The Numbers – Movie Box Office Data, Film Stars, Idle Speculation. 2009. <http://www.the-numbers.com>.

Vogel, Harold L. *Entertainment Industry Economics: A Guide for Financial Analysis*. 7th ed. New York City: Cambridge UP, 2006.

Walls, W. David. "Motion Pictures, Economics of." The New Palgrave Dictionary of Economics. Second Edition. Eds. Steven N. Durlauf and Lawrence E. Blume. Palgrave Macmillan, 2008.