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Dealing with Uncertainty in the Hollywood Movie Industry

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Abstract

Using data collected from 1398 movies during the time period of 2006-2015 this study aims to examine the risk and profitability of movie sequels compared to other types of movies. Economic theory in experience goods and uncertainty is presented to better understand the mechanisms at play. Movie sequels are seen as brand extensions of the first movies and as such the consumers have more information about them than other types of movies. There is a greater familiarity present in movie sequels at the same time as they are new stories. This study theorises that this reduces the consumers perceived uncertainty causing them to choose movie sequels more often than any other type of movie. This is tested through the use of both OLS regressions with robust standard errors. The end result supports the theory that movie sequels are safer to produce and more profitable than any other type of movie.

Keywords:

Experience goods, uncertainty, movie, sequel

1. Introduction

Experience goods are products or services that the consumers have to experience or purchase before they are able to evaluate their quality. This creates a lot of interesting challenges for economists. The most commonly used example of an experience good is wine because in order to know the true quality of bottle of wine it must be bought and tasted, or experienced. Other examples are concerts, theatre performances and movies, which all have to be experienced in order for a consumer to evaluate how much utility they derive from it. Experience goods have to rely on other methods than search goods, goods where the quality and price can easily be verified before purchase, to signal quality to their consumers.

Advertising is widely used to communicate information or image to the consumers. To exemplify how important advertising is for experience goods, the US food industry spend 191 billion dollars on advertising in the year 2016 (Statista). Another important strategy is brand recognition. Successfully building a recognizable brand creates a valuable connection between the brand and the quality of the product in the minds of the consumers. If a brand is successfully established in a market it opens up the possibility of brand extensions. This is where a firm might introduce a new product or service which extends upon what the firm is known for to get consumers to come back or gain new ones (Choi 1998). The more ways a firm can communicate quality to their consumers the less risk an experience good poses.

The movie industry is one of the largest entertainment industries in the world and poses all of the interesting questions related to experience goods. A commonly used phrase in Hollywood is that “nobody knows anything”, referring to what screenwriter William Goldman (1983) said about the success of movies. Combating this uncertainty has become a large focus of the Hollywood film industry. In the early days, the so called golden days of Hollywood, the major film studios at the time formed a cartel to reduce this uncertainty (Pokorny & Sedgwick 2010). In later years the strategy most commonly used by big studios has become building movie franchises (Garrahan 2014).

Every year the biggest studios in Hollywood release several blockbuster movies that are suppose to serve as tent-pole movies. A blockbuster movie is commonly regarded as a movie with a high production budget while a tent-pole movie is a movie that acts much like the sturdy poles that holds up a tent. Studios bet big on tent-pole movies to make enough money to cover

any potential losses the studio might have throughout the year. Today in Hollywood blockbusters and tent-pole movies are often one and the same because if a studio only makes unsuccessful blockbuster movies they collapse. These movies have to carry a heavy burden so it is in every studio's interest to reduce their risk as much as possible. As a result, the modern day Hollywood film landscape is occupied by movie sequels and franchises (Garrahan 2015).

The aim of this study is to examine if movie sequels are safer and more profitable to produce than any other type of movie. Previous studies have explored this question but this study differs in several ways. First, the data collected for this study is the most recent available, spanning from 2006 to 2015. Second, where most previous studies have used box office revenues, revenues from ticket sales, as the dependent variable this study will use profit. By subtracting the production budget from the box office revenues the profit variable is created. The production budgets of different movies vary greatly in scale which means that only using box office revenues to examine the profitability of movie sequels would be misleading. This study also differs from previous studies in that it builds on the idea of movie sequels acting as brand extensions and compares sequels to other types of movies, not just all other movies.

A disposition will now be presented to give a short summary of the papers structure. The next chapter is institutional background which will briefly present the history of film, the history of Hollywood and how it has shaped the modern day film landscape. Chapter three summarizes several previous studies in various areas of the film industry which are relevant to this study. Thereafter comes theoretical framework which presents the economic theories which this study is built upon. Chapter five describes the different aspects of the data that has been collected and used in this study. Then, chapter six presents the empirical model that has been used which is followed by chapter seven where the results are presented. The study ends with chapters eight and nine which are the discussion and conclusion.

2. Institutional Background

To understand the film industry today it is important to look back at its history. The film industry is bigger today than ever before, taking in a record breaking 38 billion dollars in global box office revenue in 2015. Out of this take north America stood for 11 billion dollars, almost a third of the total. China is the second largest country in the world in terms of box office revenue, their film industry has been growing significantly in the last couple of years. However, America is still the largest film market in the world, China's box office revenues in 2015 were 6.78 billion dollars (McClintock 2016). There are several events that have shaped Hollywood into what it is today and risk management has a lot to do with it. Since the golden days of Hollywood it could be argued that reducing risk has been a focal point for movie studios. In this chapter the history of film will be briefly presented followed by the supreme court ruling that is known as the Paramount Decree before presenting the film landscape today.

2.1 History of Film

There is no consensus on who the inventor of film is. Most Americans would probably contribute the title to Thomas Edison but go to France and it will surely be attributed to the Lumière brothers. The truth is probably that it was not a single person who invented film but rather the combined efforts of many. People from all over the world helped develop the technology that today is associated with movies. However, there is no denying that Thomas Edison was an integral part of what made Hollywood what it is today (Wood n.d.).

Thomas Edison developed a film camera called the kinetograph sometime around the year 1890. It was very different from the cameras that shoot film today. The captured images could only be viewed through a large wooden box with a peep hole at the top of it (Wood n.d.). Only one person at a time could watch the films. The Lumière brothers had a different vision for film and created their own much lighter camera. In 1895 that the Lumière brothers held the first public screening of a movie which marks the beginning of the cinematic screenings that exists today (Early Cinema n.d.).

In 1909 Thomas Edison, together with a group of filmmakers, created the Motion Picture Patent Company which would inadvertently become the starting point of Hollywood. The purpose of this company was to protect their various patents and prohibit outsiders from entering the

motion picture industry (History n.d.). Because Edison was prohibiting people from making movies, by suing them for various patent infringements, filmmakers moved from New Jersey where Edison and the Motion Picture Patent Company were based to the freedom of the opposite coast and Hollywood. By the time that the court dissolved the Motion Picture Patent Company in 1917 Hollywood had become the cultural centre of motion pictures in America (US History n.d.).

2.2 The Paramount Decree

During the golden age of Hollywood in the early 1920s to the late 1940s a lot of the big Hollywood studios that produce the most successful films today were established. The big five was the name given to the top five studios in the country which were Paramount, 20th Century Fox, RKO, MGM and Warner Bros. With the exception of RKO these studios are still today some of the most successful film studios in the world. By the 1920s Hollywood had already become the leading producer of films in the world. The big five stood for around ninety percent of all movies produced in Hollywood. In the early days' studios were allowed to own cinemas which attributed to the success of the big five since they owned the biggest cinema theatres' in the country (Dirks n.d.).

In 1948 the supreme court ruled against the studios in a famous case called the Paramount Decree. The uncertainty of the film industry had led to what could be described as a cartel. When independent cinema theatres wanted to show one of the big five's hit movies they would be forced to book a number of that studio's low quality films, or B-films, too (Kenney & Klein 1983). This was called block booking and was used by the big five in order to control both the quantity of supply and its rate. This led to owners of independent cinema theatres taking legal action. The supreme court found that there existed monopoly power among the big five and that this was a violation of antitrust laws. The ruling would prohibit studios from owning their own theatres and using block booking (Pokorny & Sedgwick 2010).

After 1950, as a result of the Paramount Decree, film production decreased. The big five lost a lot of their power after the supreme court ruling and the uncertainty of the movie industry increased. More studios made a place for themselves in the industry and by 1977 the number of studios releasing movies had increased to 16. Market concentration had also changed with 11 studios producing seventy-four percent of the movies in 1977 compared to the five that

produced ninety percent in the 1920s. However, studios were not able to produce as many movies. In 1950 national distributers released 425 new movies, in 1960 that number had gone down to 233 and by 1977 it was 154 (Conant 1981). This meant that other strategies had to be relied on more to reduce the uncertainty of the film industry.

2.3 The Film Landscape Today

Fast-forward to today and the strategy widely used by big studios to reduce risk is building franchises. A franchise is defined as a series of continuing movies, in other words, following up a movie with several sequels. The revenues gained from these franchises are often what enables big studios to survive an occasional loss, even if that loss comes from a 250-million-dollar movie (Garrahan 2014). Franchises are therefore bigger than ever and by looking at the history of Hollywood it is easy to see why.

The major studios in Hollywood today also recycles their bosses. Reducing uncertainty is not only present in the types of movies that are being made but also in who makes them. Five out of eight of the largest studios in Hollywood are run by someone who has had the same position at one of the other eight studios. Much like producing sequels to movies that are successful in order to reduce risk, studios hire executives that are tried and true (Barnes 2017).

Streaming services, such as Netflix and Hulu, and illegal downloading are causing DVD and Blu-ray sales to decrease. Revenues from these streaming services are continuing to increase while the opposite is true of DVD and Blu-ray sales. The sales of these discs fell eleven percent in 2014 and twelve percent in 2015 in the US (Morris 2016). These losses in revenue combined with the continuously increasing budgets of movies also affects which and how movies are made (McClintock 2014). The uncertainty of the industry is more apparent than ever.

3. Theoretical Framework

This study focuses on movie sequels as a form of brand extension that reduces risk for both the firm and consumers. There has been a lot of research done within the field of experience goods since Nelson (1970) first introduced the idea in his benchmark study. Experience goods are defined as a product or service that the consumers cannot evaluate in terms of quality or derived utility before purchase. Because of the very nature of experience goods there exists asymmetrical information between producers and consumers in the motion picture market. This asymmetric information makes it highly important for the producers to find ways to signal quality and in order to reduce consumers' perceived uncertainty of the good. The decisions of movie producers are then to a large extent driven by the demand of the consumers.

Advertising is one of the strongest tools that can be used to signal quality of an experience good to consumers. Because of the nature of experience goods firms spend much more money on advertising them than they do for search goods, where quality can be evaluated before purchase (Leahy 2005). Nelson (1970) explains the effects of advertising and how it is used to signal quality through a two period approach. Two firms producing two competing goods uses advertising before they release their products in period one. If firm one has a high quality product and firm two has a low quality product, given the same amount of advertising, they will sell the same amount in period one. In period two however, the consumers know about firm two's low quality so firm one will get all consumers in period two. Firms producing high quality goods will therefore have a higher incentive to spend money on advertising their products. This means that consumers can use the level of advertising as an indicator of product quality for experience goods.

A two stage approach can be used for movie sequels in much the same way as Nelson (1970) presented it for advertising. In period one two firms release their movies. Firm one releases a high quality movie while firm two releases a low quality one. Even if the firms spend the same amount of money on advertising and end up earning the same amount of money, firm two does not have an incentive to produce a second movie. If both firms one and two would produce a sequel to their movie every consumer would go and see firm one's movie since they now know that the first film produced by firm two was of low quality. Furthermore, if movie sequels are considered a brand extension of their parent movies they pose less risk for consumers. A firm can use their reputation as a bond in order to signal high quality to consumers because if the

first movie is a success it will hurt the firm's reputation if the sequel is of low quality (Choi 1998). If sequels are more profitable than any other type of movie, then it is in the producer's best interest to make sequels to high quality movies and to make the sequels themselves high quality. The reason being that a low quality sequel will not only hurt the reputation of the firm itself it will also increase the risk of producing another sequel to that film.

Social learning also plays an integral part in the success of a movie. Joo (2009) proposes that consumers use social learning as a tool to learn about the quality of a movie. Word-of-mouth, reviews and box office performance can all be used by consumers to inform their decision to see a movie or not.

Much like the effect of advertising, movie sequels can serve as quality signals for consumers. If a movie is successful it warrants a sequel but if it is not successful a sequel will most likely not be produced. The information in the form of experience that the consumers carry with them from the first movie makes sequels safer to produce for firms.

The demand of consumers forms the basis for the decisions made by movie studios. There exist incentives to produce all types of movies because they are all demanded from various groups of consumers but in order to reduce the uncertainty of a movie the perceived uncertainty of the consumers must be reduced. The utility derived by a consumer from experiencing a movie will be affected by the information that is available and what it signals. This can take the functional form presented by Moretti (2011):

$$U_{ij} = a_j^* + v_{ij} \quad (1)$$

Individual *i*:s derived utility from experiencing movie *j* is a function of the quality of the movie, a_j^*, and the taste of individual *i*, v_{ij}.

$$v_{ij} \sim N\left(0, \frac{1}{d}\right) \quad (2)$$

Both taste (2) and movie quality (3) is assumed to be normally distributed. The function for taste is expressed in terms of how the individual's taste differs from the average individual, the precision of which is expressed by *d*.

$$a_j^* \sim N\left(X'_j\beta, \frac{1}{m_j}\right) \tag{3}$$

The perceived quality of a movie is expressed in terms of consumers' priors. Based on the observed characteristics of the movie prior to seeing the movie consumers have an idea of how much they will like it. These priors are represented in the function by $X'_j\beta$ where X'_j includes characteristics such as budget, director, actor, awards, ratings, genre, reviews, advertising etc. This serves as the basis for several of the chosen control variables in this study. The effects of sequels are integrated into m_j which is the precision of the observed characteristics of every single movie. If the movie is a sequel the consumer will have more information and higher precision in the priors, observed characteristics, than if the movie is not a sequel (Moretti 2011).

This study uses a simplified model of the consumers' utility function as a basis for the decisions made by movie studios. However, it would be safe to assume that this is not the entire basis for their decision of what movie to make. Goff, Wilson and Zimmer (2014) concludes that there are other incentives than profit when it comes to the production of R-rated movies, mainly critical acclaim. Since this study is focused on the profitability of sequels and reducing risk the simplified utility function of consumers serves as a basis for the decisions of movie studios.

Following this theory, movie sequels should outperform all other types of movies. Since the first movie usually have to be successful in order for a sequel to be made there might exist a endogeneity problem in the model. However, a successful first movie does not mean that its sequel will be successful. This is further proven by Walls (2009) as he shows that the profit distribution of sequels is similar to that of non-sequels.

The precision of the observed characteristics is smaller for every other movie type than sequels. A movie based on a book adds precision because the consumer who has read the book has more information about the movie then they would for an original movie. However, this does not affect the other observed characteristics. The consumer does not know how the movie will

present the book, how the director has envisioned the book or how the actors will work together. It is still a great deal of uncertainty in how well the book will be adapted to the big screen. A movie sequel brings the highest precision out of all the movie types because consumers have established experience in the world of the movie and with the characters.

4. Previous Studies

Movie economics has received an increasing amount of attention because of its size and the challenges that exists within the industry. Studies that are relevant to this study have focused on various methods that can be used to decrease the uncertainty within the industry. Papers of interest have studied sequels as brand extensions, the effect of star power, the influence of reviews, the effects of movie ratings among other areas. This chapter presents studies that are of relevance because they serve as a base for decisions made regarding data collecting and the test carried out in this study.

Walls (2009) studied the distribution of profit both conditional on stars and sequels. He studied the distribution unconditionally, conditionally on stars and conditionally on sequels. Using a dataset of movies released between 1985 and 1996 he found that non-sequels and sequels both have a similar profit distribution. Walls concluded that this means that movie sequels are not guaranteed to be successful. This could potentially reduce the problem of endogeneity in this study which occurs since making a sequel to a successful film might create a selection bias.

There have been several studies done about various aspects and effects of movie sequels. Sood and Drèze (2006) concluded that sequels that are dissimilar from the first movie receive higher ratings and revenue than those that are similar. The paper uses a marketing strategy called brand extensions as the basis for the study. This is a strategy that is common among search goods, companies who wants to create new successful products make them similar to their old ones in order to keep the consumers' association with the brand. However, they found that for an experience good such as movies this effect of brand extension is reversed, sequels that are similar to the first movie are less successful. They further found evidence that this effect carries over to the title. Sequels that uses a number in the title are perceived as more similar and receive lower ratings, and box office revenues, than those that uses an under title.

Movie remakes has received a bit of attention in previous studied since Hollywood releases remakes every year. Remakes share some of the qualities of sequels in that they can be viewed as brand extensions of their previous movies. Much like sequels this leads to a familiarity and information carry over which most other movies do not have. Bohnenkamp, Knapp, Hennig-Thurau and Schauerte (2014) studied remakes released between the year 1999-2011 and found that on average remakes do not perform better than other types of movies. In their study

remakes are compared to all other types of movies as a whole, meaning that they do not separate between sequels, book adaptations etc. Interestingly enough, that they found that although remakes do not increase revenues they do reduce the financial risk.

Evaluating the effect of film critics and reviews on movies have proven difficult in numerous studies. Eliashberg and Shugan (1997) concluded in their paper that film critics are more of predictors of successful movies than they are influencers. Reinstein and Snyder (2005) studied the effects of expert reviews on movie success. Their study focuses on two film critics, Roger Ebert and Gene Siskel, who are widely considered to be the most influential film critics of all time. They still found that the reviews of these film critics only had a small effect on a movie's box office revenue. Even though the effect was larger on dramas and movies that did not receive a broad release it was still minor. This study has chosen to not account for the effects of critics because of the small effects they have on movie profits. The time it would take to collect reliable data led to this decision.

Movie stars have, until more recently, been thought of as the major drawing power of movies. De Vany and Wallis (2003) found that the majority of individual stars do not show any significant effect on movie revenue. Stars collectively however, do show a significant and positive effect. This is further developed in a paper by Nelson and Glotfelty (2012) where they test the effects of having one, two or three stars in a movie. They find significant results that suggests that the number of stars in a movie increases revenue. They also categorize the stars as either a top star or an average star and finds a significant difference between the two. For the purpose of this study a dummy variable for stars has been included to account for their effect. However, since the effects of stars is not the focus of the study no separation between one, two or three stars has been made.

A common conception in Hollywood is that R-rated movies does not perform as well at the box office as lower rated films. The R-rating means that anyone under the age of 17 is required to have an adult or adult guardian accompanying them (MPAA). Goff, Wilson and Zimmer (2014) researched if support for this conception could be found in the data and what other reasons movie studios might have to produce R-rated films. Through the use of regression analysis, they found that R-rated films do perform worse on average than say PG-13 films but they also get better critical receptions. They suggest that film studios produce R-rated films for other reasons than financial gains such as critical acclaim and reputation. In their concluding

remarks they state that it would be unwise to simply look at the R-rating as a cause for the lower revenues but rather that ratings are indicators of different product traits. The R-rating indicates traits that are adhere to a more selective group of consumers than the other ratings.

Goff, Wilson and Zimmer's (2014) paper raises interesting questions however, it is interesting to note that R-rated films have since become more popular among blockbuster movies. In 2016 the comic book movie *Deadpool* was released with an R-rating and earned a record breaking 745 million dollars in global revenues (Child 2016). A year later another comic book movie, *Logan*, was released with an R-rating and broke the record for highest opening weekend for an R-rated film, taking in 247 million dollars globally (Mendelson 2017). Both movies received critical praise too, supporting the findings of Goff, Wilson and Zimmer (2014). In any case, a movie's rating has an effect on revenue and is usually consciously decided upon before a movie goes into production which is why it is included in this study.

5. Data

Following the method used by Goff, Wilson and Zimmer (2015) data has been collected from the two leading websites when it comes to movie and box office information, IMDB.com and boxofficemojo.com. The dataset contains 1398 observations of Hollywood movies released in the most recently available time period of 2006-2015. Time constraints prohibited data to be collected for years before 2006. To narrow down the data most smaller studios have been omitted and because of the lack of budget data for several movies these too have been omitted from the dataset. The variables of the dataset include profit, weeks in cinema domestically, widest number of screens domestically, Oscar nominations, stars, genre and type of source material. The regression will probably suffer from omitted variables since there are more variables which effects movie profits. One such variable could be advertising costs of movies. Time constraints and the availability of information has reduced the number of variables collected for this study. All numbers have been adjusted for inflation using 2006 as the base year. The profit variable is in US dollars and, with the exception of weeks in cinema and widest number of screens, the rest are dummy variables taking on the value one or zero. A detailed description of all the variables can be found in the appendix.

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
PROFIT	1.14e+08	1.95e+08	-1.11e+08	2.55e+09
LOGPROFIT	17.949	1.413	11.006	21.721
ORIGINAL	.442	.496	0	1
BOOK	.196	.397	0	1
COMIC	.030	.170	0	1
BIO	.077	.268	0	1
REMAKE	.088	.284	0	1
SEQUEL	.160	.366	0	1
WCINEMA	13.708	6.009	2	51
NRSCREENS	2703.946	917.670	141	4458
OSCAR	.183	.387	0	1
STAR	.253	.435	0	1
SCI_FI	.049	.216	0	1
ACTION	.161	.368	0	1
COMEDY	.262	.440	0	1
HORROR	.081	.273	0	1
ROMANCE	.018	.135	0	1
THRILLER	.091	.288	0	1
ANIMATION	.074	.262	0	1
FAMILY	.037	.189	0	1
DRAMA	.183	.386	0	1
MUSICAL	.010	.103	0	1
G	.021	.144	0	1
PG	.169	.375	0	1
PG_13	.443	.496	0	1
R	.365	.481	0	1

1398 observations except profit with 1379 observations.
Source: Data compiled using information from IMDB.com and boxofficemojo.com 2017

The natural logarithm of *PROFIT* will be used as the dependent variable in the regression. Using worldwide box office revenue as the dependent variable would not take the budget of movies into account. Since this study aims to test if movie sequels are more profitable than other types of movies it seems logical to use profit instead. However, information about each movie's marketing expenditure has not been available and generally it is not accounted for in the movie's production budget. In 2007 the average cost for marketing a movie in Hollywood was 36 million dollars (McClintock 2014). Since the marketing cost of movies has not been available it cannot be factored into the *PROFIT* variable. For this study, the *PROFIT* variable is simply a movie's worldwide box office revenues with its production budget subtracted from it.

Types of source material for movies have been divided into six different categories. If the movie is a sequel to another movie or is a prequel (taking place before the events of another

movie) it is categorized as a *SEQUEL*. The interesting feature of sequels is their recognisability that comes with being a continuation of a previously released movie. If this effect is different when it comes from a movie that is set before or after the events of an upcoming movie is for future research to determined. If a movie is based on a book, the *Harry Potter* series for example, the first one is categorized under book but the proceeding movies are sequels to the first movie even though they are also book adaptations. Support for this categorization is that a person could see every film in the series without ever reading or having any knowledge about the books. The rest of the categories are *COMIC* (for comic book adaptations), *REMAKE*, *BIO* (for biographies) and *ORIGINAL*. A movie is considered to be an original if the script is not an adaptation or a continuation of previously released material.

Widest number of screens, *NRSCREENS*, and weeks in cinema, *WCINEMA*, only includes north America. The numbers are domestically which includes the US and Canada. Neither *NRSCREENS* nor *WCINEMA* has been collected from the international market. These variables serve as good control variables although it would have been preferable to have the international data too.

Oscar nominations have been included as a dummy variable, *OSCAR*, since it is the biggest and most well-known award of the movie industry. The study does not make any separation between the movies that won an Oscar, or otherwise known as an Academy Award, and those that only were nominated. An Oscar nomination has proven to increase the financial success of a movie significantly but winning an Oscar yields only a small increase to this number (Deuchert, Adjamah & Pauly 2005). Since there is a large carryover effect between the Oscars and other highly prestigious film awards, it has been deemed enough for the purpose of this study to only include nominations for the Academy Award.

This study uses the Times annual list of the 100 most influential people in the world as a basis for the actors and directors that are included in the *STAR* variable (Time). Previous studies have used various methods for determining who is a star. De Vany and Walls (2003) used the Premier's list which was not used for this study because it does not exist for the time period of 2006-2015. Nelson and Glotfelty's (2012) used the IMDB STARmeter ranking system which was dismissed for this study based on the criticism it received in 2014 for being easily manipulated by outsiders (Block 2014). These are some examples of why it was deemed necessary to find a different approach for the *STAR* variable. The annual list from the Times

results in a smaller number of stars but was chosen based on the criteria and security behind the list.

For the purpose of this study, film genres have been boiled down to ten fundamental genres. Today there exists such a wide number of genres and genre combinations that all of them cannot be accounted for in this study. The movies in the data sample are categorized under the genres: *ACTION*, *COMEDY*, *SCI_FI* (science-fiction), *HORROR*, *ROMANCE*, *THRILLER*, *ANIMATION*, *FAMILY*, *DRAMA* and *MUSICAL*. In the case that a movie was categorized under two or more genres, the primary genre of that film was chosen. At times this was a judgement call since some movies mix and match different categories freely. Some previous studies have included several other categories such as crime and western but since there are few movies released each year in these genres, and they are usually combined with other genre (crime-thriller for example), they have not been included in the sample. If a movie was categorized as a crime-thriller it was categorized under the *THRILLER* genre in this study.

A dummy variable of the different movie ratings has been included to account for the effects of releasing a movie with a PG rating compared to a movie with an R rating. The MPAA is responsible for rating movies in USA and they do so by giving it a G, PG, PG-13, R or NC-17 rating (MPAA). The dataset only contains movies with ratings *G*, *PG*, *PG_13* or *R* so the NC-17 rating has been omitted completely. This is because not a lot of movies receive this rating and most studios re-edit their movies if the NC-17 rating has been received so that it can be dropped down to an R.

5.1 Scatterplots

Scatterplots have been made to show the relationship between worldwide revenue and production budget for each of the movie types. These graphs can be found in the appendix. By examining the scatterplots for adaptations, originals, remakes, biographies and sequels the motivation for using profit as the dependent variable is clear. The scatterplots suggest that there exists outliers or extreme values in the sample data. There are movies with low budgets that earn a lot of money and vice versa. Because of this, profit is used as the dependent variable and to further account for any possible outlier the OLS regression will be carried out with robust standard errors.

6. Empirical Method

To test the effects of different movie types on profit an OLS regression will be executed. The model has four different specifications, introducing more control variables in each one. The full model has the following functional form.

$$LOGPROFIT_i = \beta_0 + \beta_1 \sum_{p=1}^{5} TYPES_i + \beta_2 WCINEMA_i + \beta_3 NRSCREENS_i + \beta_4 OSCAR_i + \beta_5 STAR_i + \beta_6 \sum_{q=1}^{9} GENRES_i + \beta_7 \sum_{g=1}^{3} RATINGS_i + u_i \quad (4)$$

LOGPROFIT is the natural logarithm of the movie's profit which is the worldwide box office revenue with the production budget subtracted from it. Many previous studies have used the production budget as an explanatory variable. This study differs from those studies' in that profit is used as the dependent variable instead of box office revenue. Production budget is therefore not included in the regression to avoid multicollinearity.

TYPES denotes all dummy variables for different movie types with *SEQUELS* as the reference category. *WCINEMA* is the number of weeks that the movie played in cinema in north America and *NRSCREENS* is the widest number of screens that showed the movie in north America. *OSCAR* is a dummy that takes on the value one if the movie was nominated and *STAR* is also a dummy that takes on the value one if an actor or director from the Times 100 most influential people in the world list is in the movie or not. *GENRES* includes all dummy variables for different genres with *ANIMATION* as the reference category. Lastly, *RATINGS* includes all dummy variable for the four different ratings in the US with *PG_13* as the reference category. The i:s denote movie title and u denotes the error term.

Taking the natural logarithm of the dependent variable profit serves two main purposes. First, it makes it so that the results of the regression can be interpreted as percentage change. Second, it could potentially reduce the impact of possible outliers by narrowing the rage of the dependent and independent variables resulting in a distribution closer to normal (Wooldridge

2012). The natural logarithm of the dependent variable and the use of robust standard error in the regression should reduce the effects of extreme values sufficiently.

The coefficients of interest in the model is all the dummy variables of β_1. According to the theory presented all the coefficients are expected to be negative since movie *SEQUELS* are the reference category. Meaning that every other type of movie is less profitable than sequels. The regression can serve as foundation to the theory presented that experiences and the social learning of consumers have a positive effect on movie sequels. However, the regression cannot say anything about causality and as mentioned previously there might exist a endogeneity problem in the model. The control variables are used to make the coefficients of the explanatory variables more reliable but there certainly exists other factors that effects the profitability of movie sequels.

7. Results

Table 2 on the next page presents all four different model specification of the OLS regression. The dependent variable is *LOGPROFIT*. The first specification only takes the different movie *TYPES* into consideration with movie sequels as the reference category. All coefficients from specification one is statistically significant at the one percent level except for the comic book variable which is not significant. The R^2 of the OLS regression is as expected low at thirteen percent. Specification two introduces the variables *WCINEMA*, *NRSCREENS*, *OSCAR* and *STAR*. All coefficients of the second specification are significant at the one percent level except for the *STAR* variable which is significant at the five percent level. The R^2 increases significantly from thirteen in specification one to fifty-four in specification two. The third specification introduces all the different movie genres. The coefficients of the variables *STAR* and *FAMILY* are significant at the ten percent level. *SCI_FI*, *ACTION* and *DRAMA* are significant at the five percent level and the coefficients of the rest of the variables are significant at the one percent level. The last specification introduces all movie *RATINGS* into the regression. All the coefficients of movie *TYPES* are statistically significant at the one percent level in specification four. *WCINEMA*, *NRSCREENS*, *OSCAR*, *ROMANCE*, and *PG* are also significant at the one percent level. The coefficients of *MUSICAL* and the rating *G* are significant at the five percent level, and *HORROR* at the ten percent level. Both regression specifications three and four has an R^2 of fifty-six percent.

The robust standard errors are presented in parenthesis under the coefficients of the variables in Table 2. To account for any possible multi-correlation a correlation matrix of the variables used in regression four has been made and is presented in the appendix. The correlation matrix shows no significant sign of multicolliniarity as no correlation between two variables exceeds seventy percent.

Table 2. OLS regression with four different model specifications and robust standard errors.

Variable	Regression 1	Regression 2	Regression 3	Regression 4
ORIGINAL	-1.381	-.726	-.739	-.744
	(.098)***	(.079)***	(.085)***	(.085)***
BOOK	-1.197	-.728	-.759	-.748
	(.125)***	(.104)***	(.106)***	(.106)***
COMIC	-.320	-.457	-.459	-.478
	(.241)	(.157)***	(.161)***	(.162)***
BIO	-1.245	-.604	-.670	-.665
	(.158)***	(.122)***	(.128)***	(.127)***
REMAKE	-1.074	-.589	-.653	-.651
	(.139)***	(.105)***	(.105)***	(.107)***
WCINEMA		.075	.085	.088
		(.005)***	(.005)***	(.005)***
NRSCREENS		8.04e-04	8.49e-04	8.64e-04
		(3.88e-05)***	(4.61e-05)***	(4.92e-05)***
OSCAR		.527	.523	.479
		(.070)***	(.073)***	(.074)***
STAR		.124	.121	.093
		(.061)**	(.064)*	(.064)
SCI_FI			.326	.081
			(.162)**	(.176)
ACTION			.300	.063
			(.123)**	(.142)
COMEDY			.317	.093
			(.117)***	(.133)
HORROR			.536	.269
			(.139)***	(.156)*
ROMANCE			.817	.586
			(.184)***	(.198)***
THRILLER			.485	.227
			(138)***	(.155)
FAMILY			-.302	-.248
			(.171)*	(.173)
DRAMA			.341	.122
			(.142)**	(.154)
MUSICAL			.752	.631
			(.274)***	(.278)**
G				-.519
				(.236)**
PG				-.306
				(.101)***
R				.025
				(.064)
R^2	.13	.54	.56	.56

The dependent variable is the natural logarithm of profit. 1379 observations. Coefficients of the variables are presented with the robust standard error presented in parenthesis. Reference category for movie *TYPES* are *SEQUELS*, for *GENRES* are *ANIMATION* and for *RATINGS* are *PG_13*. * p<0.1 ** p<0.05 *** p<0.01

The results show that non-sequels are less profitable than movie sequels which supports previous findings (De Vany & Walls 2003). However, the results do not only show that they are less profitable it shows by how much on average. Comic book movies make on average a profit of about forty-eight percent less than movie sequels. Remakes make on average sixty-five percent less, biographies sixty-seven, originals seventy-four and book adaptations seventy-five percent less than sequels. Since original movies are less than half as profitable as sequels these results supports the theory presented in this paper. Movie sequels are profitable because of the information that the consumers carry over from the fist movie. The 2000s has seen a rise in the popularity of comic book movies and this is also evident in the results they are the movie types that are most profitable out of the different types when compared to sequels.

The variable used as the reference category for *GENRES* is animation and the majority of the results in specification four is not statistically significant. *HORROR* movies earn a profit of twenty-seven percent more than animated movies on average. The result is significant at the ten percent level. At the one percent level, *ROMANCE* movies are almost fifty-nine percent more profitable than animated movies on average. *MUSICALS* earn a profit of sixty-three percent more on average. This is surprising considering the rise of animated movies that has occurred since the late 90s (CNN 2007) and that every year in the data sample has at least one animated movie in the top 20.

Both weeks in cinema, *WCINEMA*, and number of screens, *NRSCREENS* are positively correlated with a movie's profit. Holding everything else constant, one more week in cinema accounts for an increase of nine percent in profits on average. The result is significant at the one percent level. The coefficient of *NRSCREENS* is very low which is understandable since it is a measurement of one more screen showing the movie. By multiplying the result with one hundred it becomes easier to interpret. Namely, an increase of one hundred screens showing the movie results in an average increase in profit of almost nine percent. However, the causality could be reversed meaning that profitable movies are shown on more screens. The results of *NRSCREENS* are significant at the one percent level.

The *OSCAR* variable is also positively correlated with profit and significant at the one percent level but it is important to note that all movies that were nominated for an Oscar in any category are included. Since the Oscars have an award for best special effects this means that a lot of blockbuster movies have received a one in this dummy variable. The Oscars are often seen as

a prestigious award that denotes a certain quality however, there are categories that are valued higher than others. Best actor/actress, best director, best screenplay and best movie are all categories that are considered prestigious and are usually given to drama driven films, not blockbusters. This study does not separate between those categories and the best visual effects category which might affect the results. The coefficient of the *OSCAR* variable suggests that if a movie is nominated for the award its profits will increase by forty-eight percent on average.

The *G* variable is statistically significant at the five percent level and the *PG* variable is significant at the one percent level when using *PG_13* as the reference category. They are both negative suggesting that on average movies with a PG-13 rating earn a higher profit. In the data sample only 30 observations were rated G, 237 were rated PG, 620 were rated PG-13 and 511 were rated R. The regression result show that G rated movies on average earn a profit that is fifty-two percent less than that of PG-13 while PG rated movies earn a profit of thirty-one percent less than PG-13 rated movies on average. The variable for R-rated movies is not statistically significant.

8. Discussion

Reducing the uncertainty of the film industry has been a major focus of Hollywood studios all the way back to its golden days. This study suggests that sequels are the most profitable and safest types of movies to produce. The causality of the results can only be speculated around which this discussion briefly does but it is mealy that, speculation. Previous studies have reached the conclusion that sequels on average earn more revenue than non-sequels but this study has differentiated itself by using profit as the dependent variable instead of revenue and by using a data sample collected from a more recent time period of 2006-2015. It has further differentiated itself by categorizing movies into six different types which makes it possible to compare sequels against any other type of movie when previous studies have only compared sequels to all non-sequel movies.

The regression results do not provide prof for the franchise building frenzy that is taking place in Hollywood today but it does support it. Franchise building has become the new focus of most major Hollywood studios. Since sequels are more profitable than any other type of movie it makes sense to create franchises where sequel after sequel can be released. The regression results not only show that no other type of movie is more profitable than sequels but also that comic book movies are the most profitable out of the remaining types of movies. On average, they are seventeen percent more profitable than remakes and twenty-seven percent more profitable than movies adapted from books. This could support the increasing number of comic book movies released by big Hollywood studios in the last decade (Lang & Kelley 2017).

Sood and Drèze (2006) found that movie sequels that are dissimilar to their predecessors are on average more profitable than those that are similar. They suggest that brand extensions in movies have the opposite trait to the traditional definition of brand extensions. In movies, consumers do not want brand extensions that are too similar to the first movie but at the same time the familiarity of movie sequels reduces uncertainty for the consumers. As a result, consumers seek movies that are familiar in order to reduce risk but not predictable in order to enjoy them. The results of regression specification four seem to support this theory. This paper has not carried out any test on the different types of sequels but the theory presented by Stood and Drèze can be applied to the results nonetheless. Original movies, which have no source of familiarity for the consumers to draw from, pose a greater risk for the studios as they earn seventy-four percent less than sequels on average. The only type of movie that earns less than

originals on average are those based on books. Otherwise, movies with higher familiarity are more profitable than originals on average.

This is highly speculative since there is no way to determined causality from the regression results which can be a problem. The results show that sequels are on average more profitable than any other type of movie but if this is because the first movie was successful or if it is some other unobserved effect cannot be proven. This problem exists with all variables in the regression since it only tests for correlation and not for causality. The presented theory can be used as a basis for interpreting the results but the problem still exists.

The results of this study has extended upon previous studies about the connection of movie sequels and the uncertainty of the movie industry. However, there are many factors that makes a movie successful and this study focused on a portion of them. The lack of available information in areas of the film industry has made it difficult to account for a number of different effects that is with high probability present in the industry, for example word of mouth and advertising costs. These missing variables might cause a problem of omitted variable bias in the results of the regression and would therefor be good be focused upon or taken into account in future studies.

Experience goods rely heavily on advertising for promotion and to gain a positive word of mouth before release. Because of this it is of great relevance to study the effects of advertising on movie profits. Movie studios do not usually publicly release their advertising expenditures for individual movies which makes it difficult to collect reliable data. Including a measurement of word of mouth data could further increase the precision of the model. Word of mouth is a difficult phenomenon to measure and was deemed to big of a task for this paper since it was not its focus. However, it has been proven in previous studies to have a significant effect on box office revenue so it might be enlightening including it in future research about movie sequels.

Future studies could also focus on the other types of movies. Several studies have been made about movie sequels and remakes but very little has been explored about the other types. A study similar to the one carried out by Sood and Drèze (2006) but about comic book movies. Focusing on if comic book movies that are close adaptations of a specific issue are more or less profitable than those that take bigger creative freedoms. Similar studies could be done on book

adaptations and biographies to further understand the demand of consumers. Since the movie market is growing fast in China future studies could also be done focusing on its effect on Hollywood.

9. Conclusion

This study set out to answer if movie sequels are more profitable and safer to produce than any other type of movie. The results seem to support the theory that they are however, no conclusion about causality can be drawn from the results. This study has used what previous studies has found as well as economic theories such as brand extensions, experience goods and uncertainty to explain these results. Movies are categorized as experience goods because the consumers have no way of evaluating them before purchasing a ticket as seeing them. To reduce the uncertainty of their choices, consumers seek out as much information about the movies as possible but, as previous studies have suggested, they do not want full information. A movie is an experience that consumers do not want to have spoiled beforehand but they want a reassurance that it will be worth their time and money. This study theorises that this is in large part why movie sequels are more successful than other types of movies. By serving as brand extensions to the first movie they are able to reduce the uncertainty perceived by consumers more than any other movie type can. There is no guarantee for any consumer that they will enjoy a movie before they see it but sequels offer something special. Consumers who have enjoyed the first film has a familiarity with them when the second movie is released. This extra information and added familiarity reduces the consumer's perceived uncertainty. This is why movie sequels will always offer a security that is unmatched by any other type of movie and they will continue to shape the modern film landscape for many years to come.

10. References

10.1 Books

Goldman, W. (1983). *Adventures in the Screen Trade: A Personal View of Hollywood and Screenwriting.* New York: Werner Books.

Wooldridge, M., J. (2012). *Introductory Econometrics: A Modern Approach*. 5th edition., Ohio: South-Western College Pub

10.2 Papers

Bohnenkamp, B., Knapp, A., Hennig-Thurau, T. and Schauerte, R. (2014). When Does It Make Sense to Do It Again? An Empirical Investigation of Contingency Factors of Movie Remakes. *Journal of Cultural Economics*, 39(1), pp. 15-41

Choi, J. P. (1998). Brand Extension as Informational Leverage. *Review of Economic Studies,* 65(4), pp. 655-669

Conant, M. (1981). The Paramount Decrees Reconsidered. *Law and Contemporary Problems*, 44(4), pp. 79-107

Deuchert, E., Adjamah, K. and Pauly, F. (2005). For Oscar Glory or Oscar Money? *Journal of Cultural Economics*, 29(3), pp. 159-176

De Vany, A. and Wallis, W.D. (2003). Movie Stars, Big Budgets, and Wide Releases: Empirical Analysis of the Blockbuster Strategy. *Hollywood Economics: How Extreme Uncertainty Shapes the Film Industry*

Eliashberg, J. and Shugan, S.M. (1997). Film Critics: Influencers or Predictors? *Journal of Marketing,* 61(2), pp. 68-78

Goff, B., Wilson, D. and Zimmer, D. (2015). Why do Movie Studios Produce R-rated Films? *Applied Economics and Finance,* 2(1), pp. 33-43

Leahy, A. S. (2005). Search and Experience Goods: Evidence from the 1960's and 70's. *Journal of Applied Business Research,* 21(1), pp. 45-52

Nelson, P. (1970). Information and Consumer Behaviour. *Journal of Political Economy,* 78(2), pp. 311-329

Nelson, R.A. and Glotfelty, R. (2012). Movie stars and box office revenues: an empirical analysis. *Journal of Cultural Economics,* 36(2), pp. 141-166

Moretti, E. (2011). Social Learning and Peer Effects in Consumption: Evidence from Movie Sales. *Review of Economic Studies,* 78(1), pp. 356-393

Reinstein, D. and Snyder, C.M. (2005). The Influence of Expert Reviews on Consumer Demand for Experience Goods: A Case Study of Movie Critics. *Journal of Industrial Economics,* 53(1), pp. 27-51

Sood, S. and Drèze, X. (2006). Brand Extensions of Experiential Goods: Movie Sequel Evaluations. *Journal of Consumer Research,* 33(3), pp. 352-360

Walls, W. D. (2009). Screen Wars, Star Wars, and Sequels. Nonparametric Reanalysis of Movie Profitability. *Empirical Economics*, 37(2), pp. 447-461

10.3 Electronic Sources

Barnes, B. (2017). *Hollywood Loves Sequels, Even in Executive Suite*. https://www.nytimes.com/2017/04/11/business/media/hollywood-executives.html [2017-05-31]

Block, A.B. (2014). *Reports Claim IMDBPro's Starmeter Rankings Are Rigged*. http://www.hollywoodreporter.com/news/reports-claim-imdbpros-starmeter-rankings-688555 [2017-05-14]

Child, B. (2016). *Deadpool Becomes Highest-Grossing R-rated Film of All Time*. https://www.theguardian.com/film/2016/mar/29/deadpool-becomes-highest-grossing-r-rated-film-of-all-time-ryan-reynolds [2017-05-10]

CNN. (2007). *To Disney and Beyond: The rise of animation*. http://edition.cnn.com/2007/SHOWBIZ/Movies/07/26/animated.films/ [2017-04-26]

Dirks, T. (n.d). *The History of Film: The 1920s*. http://www.filmsite.org/20sintro.html [2017-05-08]

Early Cinema (n.d). *Pioneers: Lumière Brothers.* http://www.earlycinema.com/pioneers/lumiere_bio.html [2017-05-08]

Garrahan, M. (2014). *The Rise and Rise of the Hollywood Film Franchise.* https://www.ft.com/content/192f583e-7fa7-11e4-adff-00144feabdc0 [2017-05-15]

History (n.d). *1897: Edison Patents the Kinetograph*. http://www.history.com/this-day-in-history/edison-patents-the-kinetograph [2017-05-08]

Kaye, B. (2017). *Logan and Comic Book Movies Return to the Source*. https://consequenceofsound.net/2017/03/logan-and-comic-book-movies-return-to-the-source/ [2017-04-17]

Lang, B. (2015). *Tomorrowland Exposes Hollywood's Originality Problem.* http://variety.com/2015/film/news/tomorrowland-box-office-failure-originality-1201504586/ [2017-04-24]

Lang, B. and Kelley, S. (2017). *Summer Movie Preview: Hollywood Banks on Aging Franchises to Break Records.* http://variety.com/2017/film/box-office/summer-movie-preview-box-office-wonder-woman-guardians-of-the-galaxy-1202406839/ [2017-05-15]

McClintock, P. (2014). *$200 Million and Rising: Hollywood Struggles with Soaring Marketing Costs*. http://www.hollywoodreporter.com/news/200-million-rising-hollywood-struggles-721818 [2017-05-08]

McClintock, P. (2016). *Global 2015 Box Office: Revenue Hits Record $38 Billion-Plus.* http://www.hollywoodreporter.com/news/global-2015-box-office-revenue-851749 [2017-04-24]

Mendelson, S. (2017). *Box Office: 'Logan' Is Even Bigger Than We Thought, With an $88M U.S. And $247M Worldwide Debut.* https://www.forbes.com/sites/scottmendelson/2017/03/06/logan-box-office-just-how-huge-was-wolverines-88m-debut-weekend/#5e9aa9cf5e9a [2017-05-10]

Morris, C. (2016). *Blu-Ray Struggles in Streaming Age*. http://fortune.com/2016/01/08/blu-ray-struggles-in-the-streaming-age/ [2017-05-31]

MPAA (n.d). *Film Ratings*. http://www.mpaa.org/film-ratings/ [2017-05-04]

Statista (n.d). *Statistics and Facts about Food Advertising.* https://www.statista.com/topics/2223/food-advertising/ [2017-05-10]

Time. (2007-2016). *The 100 Most Influential People in the World.* http://time100.time.com/2013-2/ [2017-03-17]

US History (n.d). *History of Hollywood, California*. http://www.u-s-history.com/pages/h3871.html [2017-05-08]

Wood, B. (n.d). *The Films of Thomas Edison*. http://www.tcm.com/this-month/article/345136%7C0/The-Films-of-Thomas-Edison.html [2017-05-08]

11. Appendix

11.1 Scatterplots

Figure 1. Scatterplot of book adaptations

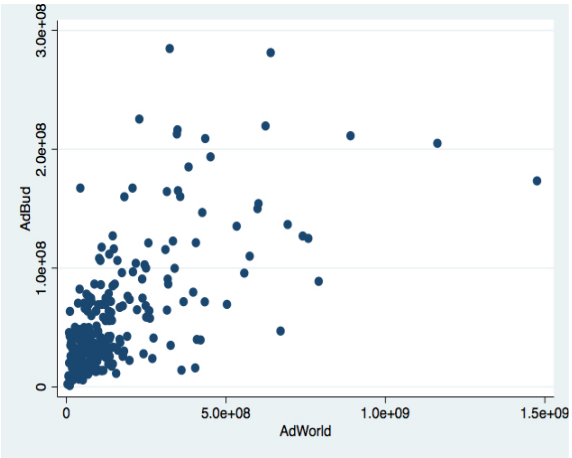


Figure 2. Scatterplot of comic book adaptations

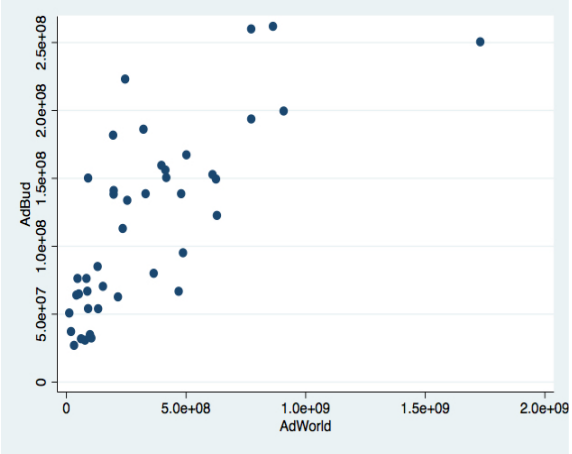


Figure 3. Scatterplot of original movies

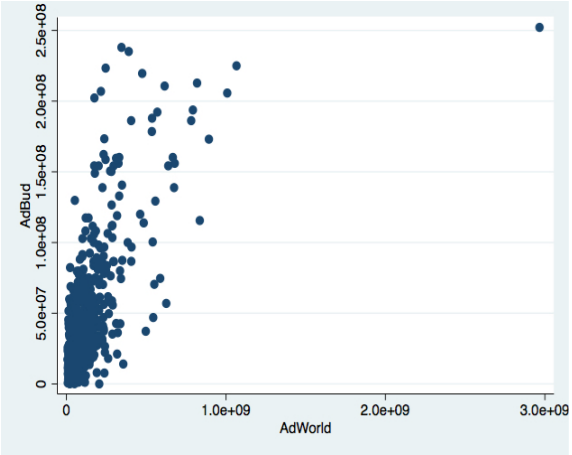


Figure 4. Scatterplot of remakes

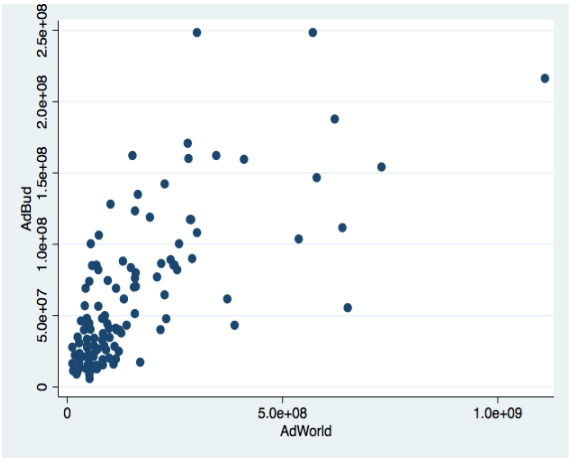


Figure 5. Scatterplot of movie sequels

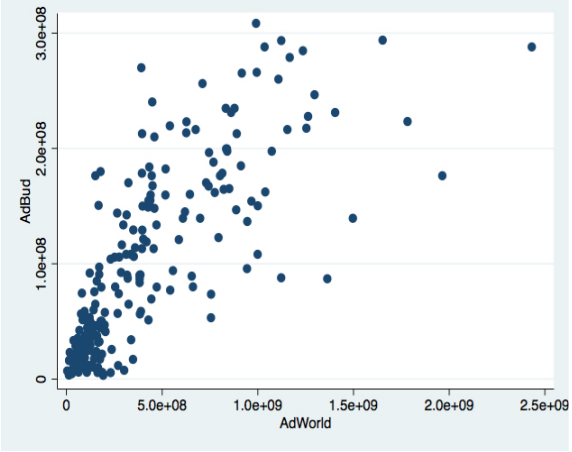
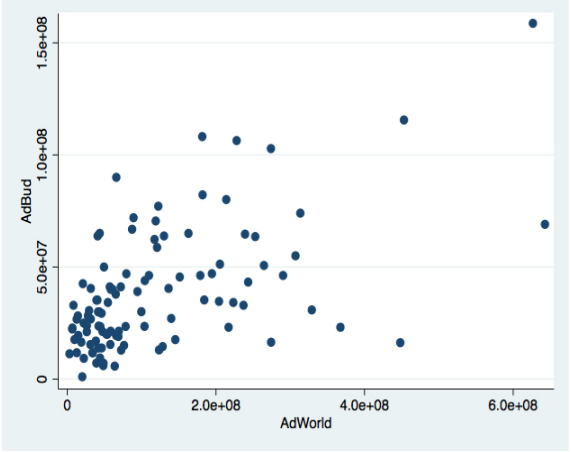


Figure 6. Scatterplot of biographies



11.2 List of Variables

PROFIT	Worldwide box office revenue – Production budget
LOGPROFIT	Natural logarithm of profit.
ORIGINAL	Dummy variable = 1 if screenplay is based on an original idea
BOOK	Dummy variable = 1 if screenplay is based on a book
COMIC	Dummy variable = 1 if screenplay is based on a comic book
BIO	Dummy variable = 1 if screenplay is based on a real person or events
REMAKE	Dummy variable = 1 if screenplay is based on an old movie
SEQUEL	Dummy variable = 1 if screenplay is a continuation of another movie
WCINEMA	Number of weeks the movie was shown in cinema
NRSCREENS	Widest number of screens that showed the movie
OSCAR	Dummy variable = 1 if movie was nominated for an Oscar
STAR	Dummy variable = 1 if an actor or director from Times 100 most influential people in the world list is in the movie
SCI_FI	Dummy variable = 1 if genre is science-fiction
ACTION	Dummy variable = 1 if genre is action
COMEDY	Dummy variable = 1 if genre is comedy
HORROR	Dummy variable = 1 if genre is horror
ROMANCE	Dummy variable = 1 if genre is romance
THRILLER	Dummy variable = 1 if genre is thriller

FAMILY	Dummy variable = 1 if genre is family
DRAMA	Dummy variable = 1 if genre is drama
MUSICAL	Dummy variable = 1 if genre is musical
ANIMATION	Dummy variable = 1 if genre is animation
G	Dummy variable = 1 if rating is G
PG	Dummy variable = 1 if rating is PG
PG_13	Dummy variable = 1 if rating is PG13
R	Dummy variable = 1 if rating is R

11.3 Correlation Matrix

Table 3. Correlation matrix

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1. LOGPROFIT	1.0000													
2. ORIGINAL	-0.2221	1.0000												
3. BOOK	-0.0595	-0.4277	1.0000											
4. COMIC	0.0872	-0.1538	-0.0850	1.0000										
5. BIO	-0.0442	-0.2490	-0.1377	-0.0495	1.0000									
6.REMAKE	-0.0108	-0.2679	-0.1481	-0.0533	-0.0862	1.0000								
7. SEQUEL	0.3448	-0.4116	-0.2276	-0.0819	-0.1325	-0.1426	1.0000							
8. WCINEMA	0.4220	-0.0753	0.0707	0.0128	0.0763	-0.0773	0.0243	1.0000						
9. NRSCREENS	0.5801	-0.1558	-0.0771	0.1418	-0.1859	0.0526	0.3024	0.0477	1.0000					
10. OSCAR	0.2424	-0.1004	0.0731	-0.0140	0.2138	-0.0479	-0.0447	0.4623	-0.1067	1.0000				
11. STAR	0.1404	-0.0500	0.0760	-0.0287	0.0850	-0.0168	-0.0448	0.1171	0.0850	0.1944	1.0000			
12. SCI-FI	0.0976	-0.0068	-0.0023	0.0456	-0.0668	0.0207	0.0240	0.0120	0.1427	0.0396	0.0409	1.0000		
13. ACTION	0.1688	-0.1709	-0.0039	0.2523	-0.0905	-0.0058	0.1723	-0.0302	0.2713	-0.0400	-0.0638	-0.1039	1.0000	
14. COMEDY	-0.1307	0.3022	-0.1367	-0.0916	-0.1518	-0.0502	-0.0634	-0.0765	-0.1097	-0.2025	0.0552	-0.1386	-0.2586	1.0000
15. HORROR	-0.0684	-0.0367	-0.0911	-0.0369	-0.0765	0.1990	0.0604	-0.2387	-0.0331	-0.1541	-0.1538	-0.0730	-0.1363	-0.1817
16. ROMANCE	0.0367	-0.0772	0.1416	-0.0248	-0.0176	-0.0220	-0.0048	-0.0197	0.0123	-0.0559	-0.0590	-0.0335	-0.0626	-0.0834
17. THRILLER	-0.0770	0.0840	0.0187	-0.0544	0.0561	-0.0322	-0.1229	-0.1395	-0.0630	-0.0456	0.0290	-0.0734	-0.1370	-0.1826
18. FAMILY	0.0198	-0.0876	0.0242	0.0161	-0.0562	0.0324	0.0982	0.0969	0.1108	-0.0556	-0.0223	-0.0469	-0.0874	-0.1166
19. DRAMA	-0.1570	-0.1366	0.1544	-0.0809	0.4136	-0.0867	-0.1603	0.1235	-0.4229	0.3170	0.0970	-0.1092	-0.2038	-0.2718
20. MUSICAL	0.0434	-0.0666	-0.0023	-0.0167	0.0061	0.1580	-0.0221	-0.0045	0.0199	0.0395	0.0209	-0.0226	-0.0421	-0.0562
21. ANIMATION	0.1815	0.0439	-0.0261	0.0027	-0.0830	-0.0674	0.0775	0.2606	0.2402	0.1066	-0.0113	-0.0692	-0.1291	-0.1721
22. G	0.0515	-0.0200	-0.0023	-0.0264	-0.0427	-0.0259	0.0895	0.1339	0.0878	0.0089	-0.0279	-0.0356	-0.0513	-0.0758
23. PG	0.1064	-0.0595	0.0436	-0.0011	-0.0605	0.0126	0.0697	0.2296	0.2317	-0.0150	-0.0783	-0.0769	-0.0912	-0.0885
24. PG-13	0.0713	-0.0438	0.0488	0.0566	-0.0096	-0.0200	-0.0005	-0.0574	0.0878	-0.0560	0.0755	0.1423	0.1542	0.0304
25. R	-0.1729	0.0981	-0.0839	-0.0497	0.0703	0.0189	-0.0814	-0.1611	-0.2991	0.0671	-0.0085	-0.0765	-0.0729	0.0609

Table 3. Cont. Correlation matrix

	15	16	17	18	19	20	21	22	23	24	25
15 HORROR	1.0000										
16. ROMANTIC	-0.0440	1.0000									
17. THRILLER	-0.0962	-0.0442	1.0000								
18. FAMILY	-0.0614	-0.0282	-0.0618	1.0000							
19. DRAMA	-0.1432	-0.0658	-0.1440	-0.0919	1.0000						
20. MUSICAL	-0.0296	-0.0136	-0.0298	-0.0190	-0.0443	1.0000					
21. ANIMATION	-0.0907	-0.0417	-0.0912	-0.0582	-0.1357	-0.0280	1.0000				
22. G	-0.0467	-0.0214	-0.0469	0.1163	-0.0698	0.0445	0.3491	1.0000			
23. PG	-0.1395	-0.0167	-0.1403	0.3827	-0.1106	0.0265	0.4708	-0.0680	1.0000		
24. PG-13	-0.0805	0.1094	-0.0419	-0.1796	0.0507	0.0009	-0.2468	-0.1365	-0.4080	1.0000	
25. R	0.2069	-0.0939	0.1675	-0.1485	0.0553	-0.0353	-0.2192	-0.1128	-0.3372	-0.6765	1.0000