THE DETERMINANTS OF BOX OFFICE REVENUE FOR MOVIE SEQUELS

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ABSTRACT

This paper examines the domestic box office revenue determinants of movies that include a series of sequel films that create a franchise. The sample consists of 225 movies released during 1976-2014 as a parent or sequel film as part of a franchise. Regression results indicate the primary determinants of box office revenue for films that are part of a movie franchise are genre, numeric order in a series of movies, receiving a restricted rating, critical acclaim, Oscar award nominations, and production budget. One of the more interesting results includes the observation that science fiction, action, comedy, and family movie genres have a positive and statistically significant impact on box office revenue but the horror movie genre is not statistically significant. The empirical results imply a 10% increase in positive critical ratings augments box office revenue by $11.89 million, while an Oscar nomination is worth approximately $35 million in box office revenue. Holding other factors constant, production budget returns 26 cents per dollar of expenditure but the marginal return of continuing a franchise decreases box office revenue by $9.2 million per successive film in a franchise. One of the more interesting observations is that the horror, action, and comedy genres have negative and statistically significant relationship between numeric order in a series of movies and domestic box office revenue, indicating studios tend to push the storyline in those genres to the point of satiation. In contrast, studios like Disney and Universal appear to be strategic with a franchise brand as movies for children have a positive and statistical significant relationship between numeric order and box office performance.
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INTRODUCTION

The sequel and movie franchise has evolved into an integral strategic endeavor in the movie industry. The financial success of the original Star Wars trilogy provided evidence that audience interest in a continuing storyline could result in the creation of a franchise with multi-faceted sources of income. Today, any hit movie is immediately subject to sequel speculation and some movies are filmed from the start with a franchise

of multiple releases in mind. In the extreme, Disney paid over \$4 billion to Lucas Films to take over the rights to Star Wars, Raiders of the Lost Ark, and other franchise assets (Leonard, 2013). The movie franchise has not only arrived, in many ways it has become the dominant force in the motion picture industry.

A successful movie franchise can be the difference between millions of dollars of profits or losses for a studio and filmmaker (Simonoff & Sparrow, 2000; Obst, 2013; Valentini, 2014). Financial success creates an impetus for additional films but a financial failure usually results in an abrupt end to the franchise. The purpose of this research is to analyze the motion picture industry with a focus on the determinants of domestic box office revenues of movie franchises that include one or more sequels. This manuscript is divided into five sections. First, a survey of the related literature on the movie industry is discussed. The second section offers background information specific to movie franchises and sequels. The third section provides the model specification. The next section puts forth an empirical evaluation of the determinants of domestic box office revenues for the movie franchise with sequels released during the years 1976-2014. The final section offers concluding remarks.

SURVEY OF THE LITERATURE

Although there is only limited research focusing exclusively on movie sequels, many researchers have developed models that explore the potential determinants of motion picture box office performance and related issues. Litman (1983) was the first to develop a multiple regression model in an attempt to predict the financial success of films. The independent variables in the landmark work include movie genre (science fiction, drama, action-adventure, comedy, and musical), Motion Picture Association of America rating (G, PG, R and X), presence of a superstar in the cast, production costs, release company (major or independent), Academy Awards (nominations and winning in a major category), and release date (Christmas, Memorial Day, summer). Litman's model provides evidence that the independent variables of production costs, reviews from critics, genre, holiday release, Academy Award nomination, and winning an Academy Award are all significant determinants of the success of a theatrical movie. Litman and Kohl (1989), Litman and Ahn (1998), Terry, Butler, and De'Armond (2004), Moon, Bergey, and Iacobucci (2010), and others have replicated and expanded the initial work of Litman.

One strong area of interest in the movies literature has been the role of the critic (Weiman, 1991). The majority of studies find that critics play a significant role on the success or failure of a film. Eliashberg and Shugan (1997) divide the critic into two roles, the influencer and the predictor. The influencer is a role where the critic will influence the box office results of a movie based on his or her review of the movie. Eliashberg and Shugan's results suggest that critics have the ability to manipulate box office revenues based on their review of a movie. The predictor is a role where the critic, based on the review, predicts the success of a movie but the review will not necessarily have an impact on how well the movie performs at the box office. Eliashberg and Shugan show that the predictor role is possible but does not have the same level of statistical evidence as the influencer role.

King (2007) explores the theoretical power and weakness of critics on the box office performance of movies. The substantial market power of critics is derived

from the following: (1) Film reviews are widely available in newspapers, magazines, and websites. The ubiquitous availability of critical reviews in advance of a movie release creates positive or negative energy in the critical opening weeks; (2) Film critics regard themselves as advisors to their readers. They are often as explicit in their recommendations as Consumer Reports is about other consumer purchases; and (3) Film critics are likely to be considered objective. There are too many critics and too many films for serious critical bias to develop. Those who are skeptical about the influence of film critics point to the following counter arguments: (1) It is possible that the effects of aggressive marketing at the time of a film's release might dominate critical evaluations in determining opening attendance; (2) Critics may raise issues that do not concern most audiences. They are more likely to notice and comment on technical issues, like cinematographic technique, than the average member of the audience; and (3) Critics may write for a readership that has different tastes from the average cinemagoer. The most obvious potential reason for this is demographic. Cinema audiences are younger than the general population and less likely to pay attention to print reviews. Critics might therefore, be expected to aim their reviews at the older demographic audience and give relatively negative reviews to certain film genres. The empirical results put forth by King (2007) are mixed with respect to the impact of critics on box office earnings for the U.S. box office in 2003. He finds zero correlation between critical ratings for films and gross box office earnings when all releases are considered because of the affinity critics have for foreign movies and documentaries relative to the general public. For movies released on more than 1,000 screens, critical ratings have a positive impact on gross earnings.

Wallace, Seigerman, and Holbrook (1993) employ a sample of 1,687 movies released from 1956 through 1988 to investigate the relationships between the box office success of movies and critic ratings. They find a poorly rated movie will actually lose money for every positive review it receives while a highly rated movie will continue to gain money for every positive review it receives. They conclude that a bad movie has something to gain by being as trashy as possible, while it pays for a good movie to strive for excellence. Ravid (1999) has also looked at movie reviews as a source of projecting higher revenues. He concludes that the more reviews a film receives, positive or negative, the higher revenues it will obtain.

Although much research has supported the critic as a positive indicator of box office success, others have shown that the critic plays a much less important role. Levene (1992) surveyed students at the University of Pennsylvania and concludes from her 208 useable surveys that positive critic reviews ranked tenth, behind plot, subject, and word-of-mouth on a list of factors that influence the decision to watch a film. Levene's study reveals that theatre trailers and television advertising were the two most important determinants. Faber and O'Guinn (1984) conclude that film advertising, word-of-mouth and critics' reviews are not important compared to the effect that movie previews and movie excerpts have on the movie going public. Wyatt and Badger (1984) find that negative or positive reviews have little effect on the interest of an individual to see a movie over a mixed review or seeing no review. Further research by Wyatt and Badger (1987) conclude that positive reviews and reviews that contain no evaluative adjectives, which they called non-reviews, are deemed more interesting than a review that was negative or mixed. More recently, Wyatt and Badger (1990) report that reviews containing high information content about a movie raise more interest in a film than a positive review.

Film ratings passed down from the Motion Picture Association of America (MPAA) may also influence box office performance. Many studios fight for a better rating, often re-shooting or editing scenes multiple times in order to get their preferred ratings, most often being PG or PG-13 because these ratings exclude virtually no one from seeing the movie. Sawhney and Eliashberg (1996) develop a model where the customer's decision-making process on whether to see a movie can be broken into a two-step approach, time-to-decide and time-to-act. The results of their study show that movies with an MPAA rating of restricted (rated R) perform worse at the box office than movies without a restricted rating. The analysis shows that restricted rated movies have a higher time-to-act but have longer time-to-decide periods than family movies. Terry, Butler, and De'Armond (2004) verify the negative impact of the restricted rating on box office performance, providing evidence of a penalty in excess of $10 million. Ravid (1999) provides evidence from a linear regression model that G and PG rated films have a positive impact on the financial success of a film. Litman (1983) on the other hand, finds that film ratings are not a significant predictor of financial success. Austin (1984) looks at film ratings in an attempt to find a correlation between ratings and movie attendance but find no significant relationship. Cicirett, Hasan, and Waisman (2015) explore the relationship between distribution strategies combined with various categorical traits to the success of motion pictures. Their results support the notion that critics can have a positive impact on box office performance but a restricted rating is a financial liability.

Anast (1967) was the first to look at how film genre relates to movie attendance. His results show that action-adventure films produce a negative correlation with film attendance. Litman (1983) shows that the only significant movie genre is science fiction. Sawhney and Eliashberg (1996) use their two-step approach and find that the drama genre has a slower time-to-act parameter while action movies result in a faster time-to-decide than other movie genres. Neelamegham and Chinatagunta (1999) employ a Bayesian model to predict movie attendance domestically and internationally. They find that across countries the thriller and action themes are the most popular, while romance genre was the least popular.

Terry, King, and Patterson (2011) examine the determinants of horror movie box office revenue for the years 2006-2008. The most interesting result of the study is the observation that slasher movies are the most profitable theme and zombie movies are the least profitable theme in the horror movie genre. One of the most influential determinants of domestic box office performance of horror movies is critical acclaim. Horror movies are one of the most harshly reviewed movie genres. The fact that the majority of horror movies receive poor critical reviews creates a box office opportunity for the relatively rare horror movies that receives critical acclaim. Movie sequels are shown to have a positive and statistically significant impact on domestic box office performance of horror movies. The built in audience associated with a sequel is worth approximately $7 million in domestic box office revenue. Horror movies earning a restricted rating pay a significant financial box office penalty of $15 million to $29 million. The results also identify production budget as a positive and significant determinant of domestic box office performance of horror movies. The positive impact an increase in the production budget has on box office performance is consistent with the findings put forth by other researchers, including Ravid, Wald, and Basuroy (2006) and Palia, Ravid, and Reisel (2008).

Awards are important to every industry but few industries experience financial

compensation from an award more than the motion picture industry (Lee, 2009). Litman (1983) shows that an Academy Award nomination in the categories of best actor, best actress, and best picture is worth $7.34 million, while winning a major category Academy Award is worth over $16 million to a motion picture. Smith and Smith (1986) point out that the power of the Academy Award explanatory variable in models explaining patterns in movie rentals will change over time as the effects of different Academy Awards could cause both positive and negative financial results to a movie in different time periods. Nelson, Donihue, Waldman, and Wheaton (2001) estimate that an Academy Award nomination in a major category could add as much as $4.8 million to domestic box office revenue, while a victory can add up to $12 million. The authors find strong evidence toward the industry practice of delaying film releases until late in the year as it improves the chances of receiving nominations and monetary rewards. Dodds and Holbrook (1988) look at the impact of Academy Awards after announced nominations and after the award ceremony. The authors find that a nomination for best actor is worth about $6.5 million, best actress is worth $7 million and best picture is worth $7.9 million. After the award ceremony the best actor award is worth $8.3 million, best picture is worth $27 million, and best actress award is not statistically significant. Simonoff and Sparrow (2000) find that for a movie opening on less than ten screens, an Academy Award nomination will increase the movies expected gross close to 250 percent more than it would have grossed if it had not received the nomination. For movies opening on more than ten screens, an Academy Award nomination will increase the movies gross by nearly 30 percent.

Literature investigating movie revenue streams beyond the box office are limited. Chiou (2008) explores the timing of a theatrical release as it relates to the home video industry and finds the highest demand season for the video market is between Thanksgiving and Christmas. Terry and De'Armond (2008) employ regression analysis to investigate the determinants of movie video rental revenue. They find domestic box office, Academy Award nominations, and domestic release exposure to be positive and significant determinants of movie video rental revenue. Time to video, sequels, and children's movies are shown to have a negative and statistically significant impact on video rental revenue.

The academic literature focusing on sequels has been relatively limited to a few studies. Sood and Dreze (2006) examine movie sequels as brand extensions of experiential goods. They find the title strategy for sequels affects the degree of assimilation of the sequel and consequently influences the likelihood of satiation with the sequel's story line. Numbered sequels rely heavily on the original movies as a basis for evaluations, and a simple change to a named sequel seems to diminish the degree of assimilation. Yeh (2011) employs several quasi-experimental designs with 280 participants to explore how and when original movies can dominate sequels, based on analogy learning theory. When a consumer's purchase decision reflects greater product knowledge, the preference for original movies dominates the preference for sequels such that other original movies are preferred over the sequel to a known film. The study also reveals that numbered sequels achieve greater familiarity effects than name-based sequels on judgment and a sense of connection, but not preferences. Craig, Greene, and Versaci (2015) control for budget and sequels in an empirical model adding awareness, purchase intention, and electronic word of mouth variables. Although a film's budget and being a sequel are strong predictors of success in isolation, when pre-release e-buzz variables of awareness and intention to see the film are part of

the equation, the effect of budget and sequels disappears. The authors temper their results based on a limited sample size of 62 films and an inability to explore possible differences across movie different genres.

THE ROLE OF THE SEQUEL

The release of the first sequel was in 1916 with the film Fall of a Nation, which followed the 1915 release of The Birth of a Nation (Williams, 2011). The sequel franchise started with a silent film but the reasoning behind producing a sequel is the same; to capitalize on the success of the parent film. Several generations watched Snow White and the Seven Dwarfs in the movie theater. First released in 1937 as the first animated feature film, Snow White and the Seven Dwarfs was re-released at least once every decade for the rest of the century. Other movies classics, including Gone with the Wind (1940), The Wizard of Oz (1939), and Dumbo (1941) followed a similar path of multiple releases of the same film. Studios were slow to capitalize on the possible success of a franchise when the original parent film often produced income at the theater for many years. Before cable movie channels and the rise of movies on home video, re-releasing a movie dominated over sequels. Although home video might have challenged multiple releases of an original film, it did create an avenue beyond the box office for individuals to access a film and facilitate an audience for a franchise.

James Bond films and a few other movies established preliminary formal franchises but the pioneer of the modern franchise came from the box office success of the original Star Wars franchise. The Star Wars phenomenon hit historical box office highs that included a boom in merchandise revenue from action figures, fast food restaurant collector's cups, lunch boxes, and a variety of related products. In its quest for certainty, movie studios have increasingly embraced sequels as a mechanism to reduce risk and to help ensure financial success. The perception is that sequels are a vehicle to reduce the risk of failure: If the initial film demonstrated audience appeal, its loyal fan base likely will want to see more of what they enjoyed initially (Craig, Greene & Versaci, 2015). The importance role sequels play in the modern film industry is highlighted by the observation that in 2010 four of the top-five movies were sequels (Toy Story 3, Iron Man 2, Twilight: Eclipse, and Harry Potter and the Deathly Hallows Part 1), 2011 all five of the top five movies were sequels (Transformers: The Dark Moon, Twilight: Breaking Dawn Part 1, Harry Potter and the Deathly Hallows Part 2, The Hangover Part II, and Pirates of the Caribbean: On Stranger Tides), 2012 four of the top five were sequels (The Dark Knight Rises, Skyfall, The Avengers, and The Hobbit: An Unexpected Journey), 2013 four of the top five were sequels (The Hunger Games: Catching Fire, Despicable Me 2, Man of Steel, and Iron Man 3), and 2014 three of the top five were sequels (The Hunger Games: Mockingjay Part I, Captain America: The Winter Soldier, and Transformers: Age of Extinction). Note that the movies in the top five that were not a sequel in the 2010-2014 window have already been converted to franchise status (Hunger Games is already a franchise and sequels are in development for Frozen and Guardians of the Galaxy) or are candidates to be a franchise (Alice in Wonderland and The LEGO Movie).

Familiarity with a product improves consumers' abilities to learn about the new product (Johnson & Russo, 1984) and consumers' knowledge in turn influences their

decision paths (Maheswaran & Sternthal, 1990). The appeal of a new product often relies on analogy information that allows consumers to map the attributes of the new product onto existing domains (Yeh, 2013). A movie containing multiple success factors that becomes embedded in memories tends to facilitate the evaluation of its sequels. As Moon, Bergey, and Iacobucci (2010) show, consumers also store rating histories and movie communities' collective opinions in their memories, which then influence their evaluations of those movies. Other studies suggest sequel satiation, which occurs because of overconsumption of an experiential attribute (Sood and Dreze, 2006).

Much as manufacturers try to create brand affinity for their product, a hit film can create a valuable brand via the franchise. New movies that are successful at the box office automatically receive sequel consideration. The success or failure of a sequel is directly linked to the success of the original parent movie, star power, genre, director, critical reviews, or more intricate details within the movie. In recent years, the movie franchise has matured to the point where a series of films are part of the same shooting schedule. Many of these may matriculate from a novel, which includes Twilight (2008), The Hunger Games (2012), and The Hobbit (2012). All three franchises were part of an ex ante effort of creating multiple sequel releases. The popularity of the book and the box office success of the first movie in the series are critical in the success of pre-planned sequels in a franchise.

The notion of a built-in audience is an important characteristic of a sequel. Sequels with relatively low critical acclaim can still find box office success, which is accentuated by the increasing importance of the global market as a revenue source. The Hangover (2009) movies are a noteworthy comedy franchise where the two sequels struggled to find critical acclaim but the following created from the parent film carried the inferior sequels to box office success. A new movie might require an aggressive marketing effort to find an audience. In contrast, Star Wars: Episode VII: The Force Awakens and subsequent films in the franchise will not have any trouble finding an audience. Although a good movie will augment box office success, the reality is hardcore Star Wars fans are certain to pack the theatres regardless. How sure is the studio that Star Wars VII will be a hit? There are two additional sequels for Star Wars VIII and IX already in development as part of the third trilogy of the franchise plus two additional films outside of the trilogy being developed that are part of the Star Wars movie story universe. Sequels from Star Wars and other key franchises appear to be in position to dominate the box office for years to come.

This manuscript is consistent with finance, economics, and marketing multidisciplinary studies that explore factors that influence the financial performance of motion pictures. These studies usually employ financial performance, behavioral, and categorical data collected from industry trade sources. A unique contribution of this study is a focus on the profitability of a franchise as a studio releases multiple sequels of a successful parent film. While some studies have considered sequels in the empirical model, no study has concentrated on a series of sequels as part of a franchise. Specifically, this study differs from previous work in that the derivation of the sample isolates movies that are part of a franchise across a robust window of time that is in excess of 35 years. On the one hand, a studio may push the number of films pass the point of satiation in an effort to extract all economic rent. For example, horror movies have the reputation of continuing a storyline pass the point of satiation by offering seven or more films in a franchise. On the other hand, it is possible that a studio will

manage a brand and seek expanding profit margins per release by limiting the number of films in a franchise to three or four. Action movies such as the Hunger Games or The Hobbit franchises or children's movies such as Disney's Toy Story or Cars franchises are recent examples. This study also offers a data set with 225 observations, which is large enough to break the data into genre groups for comparison purposes.

DATA AND MODEL

Predicting the financial performance of feature films and movie sequels is widely regarded as a difficult endeavor. Each film has a dual nature, in that it is both an artistic statement and a commercial product (Sochay, 1994). Many studies have attempted to estimate the determinants of box office performance by employing empirical models to high profile features (Litman, 1983; Sochay, 1994; Radas & Shugan, 1998; Reinstein & Snyder, 2000; Craig, Greene & Versaci, 2015). The approach of this study provides a unique focus on the determinants of box office revenue for movies that are part of a franchise. The final sample of usable and complete data consists of 225 movies released during 1976-2014 that are part of a franchise with sequels. The movies selected for the research cohort include several of the most successful films in movie history.

The primary sources of data for this study are the Rotten Tomatoes and boxofficemojo.com websites. The Rotten Tomatoes website utilizes a unique rating system that summarizes positive or negative reviews of accredited film critics into an easy to use total percentage that is aggregated for each motion picture. The boxofficemojo.com contains information pertaining to revenue, release date, movie rating, and genre. Movies.com, imdb.com, Oscars.org, WorldwideBoxoffice.com, and the-numbers.com are additional sources of data and information.

The specification of the empirical model employed to investigate the determinants of the box office performance of sequels via regression analysis is below:

$$BOXOFFICE_i = B_0 + B_1 NUMBER_i + B_2 HORROR_i + B_3 ACTION_i + B_4 SCIFI_i + B_5 COMEDY_i + B_6 CHILDREN_i + B_7 RESTRICTED_i + B_8 OSCAR_i + B_9 CRITIC_i + B_{10} BUDGET_i + u_i,$$

$$(1)$$

where BOXOFFICE is domestic box office earnings adjusted for inflation and presented in real 2014 dollars, NUMBER is the numerical placement of a particular film as part of a franchise, HORROR is a categorical variable representing the horror film genre, ACTION is a categorical variable representing the action movie genre, SCIFI is a categorical variable representing the science fiction genre, COMEDY is a categorical variable representing the comedy genre, CHILDREN is a categorical variable representing the family movie genre, RESTRICTED is a categorical variable for movies with a restricted rating (Rated R), OSCAR is a variable measuring the number of Academy Award nominations for a film, CRITIC is the percent of composite approval rating for a movie by a group of leading film critics organize by rottentomatoes.com, and BUDGET controls for the estimated production for each movie after being adjusted for inflation by converting all nominal values to 2014 real values.

Table 1 presents descriptive statistics for the model variables. The average

inflation adjusted box office revenue in the sample is approximately $226 million, with a maximum of $1.17 billion (Star Wars, 1977). The three films in the research cohort with the highest inflation adjusted box office revenue are Star Wars (1977, $1.17 billion), Jurassic Park (1993, $704 million), and Star Wars: Phantom Menace (1999, $693 million). Major League 3: Back to the Minors offers the lowest revenue at $6.2 million.

The variable NUMBER reaches a maximum of 11 with the Freddy Versus Jason film (2003, $112 million) as part of the Friday the 13th franchise. Other notable franchises reaching seven or more films include Star Trek, Child's Play, Harry Potter, and Saw. The expectation is that number will have a negative impact on box officer revenue based on the assumption that negative diminishing marginal quality and consumer saturation effects will begin to dominate positive familiarity traits as the number of releases increase.

Film genre is captured in the model by leaving out the drama genre for specification and including the categorical variables HORROR (18% of the sample), ACTION (19% of the sample), SCIFI (19% of the sample), COMEDY (18% of the sample), and CHILDREN (19% of the sample). Some movies are classified in more than one category as it is not uncommon for science fiction movies to include elements of horror or action and for some family movies to double as a comedy. The genre categorical variables specified are expected to be more successful at the box office than drama franchises.

Movies with a rating of R or restricted (RESTRICTED) are expected to have a negative impact on box office revenue because the rating limits attendance to individuals 17 years of age and older. Thirty-two percent of the movies in the research sample apply the restricted rating. Horror movies are the dominant genre in the category but several comedies and action movies also earn a restricted rating from the Motion Picture Association of America.

The expectation is for critical acclaim to create positive momentum for the box office success of a film. Average critical rating of the movies in the research cohort is approximately 60 percent positive with a standard deviation of 26.1. Movies with positive critical rating above 95% include Alien (1979, $257 million in domestic box office revenue), Aliens (1986, $188 million), Back to the Future (1985, $482 million), The Empire Strikes Back (1980, $644 million), Ghostbusters (1984, $556 million), The Gods Must Be Crazy (1980, $69 million), Harry Potter & the Deathly Hollows – Part 2 (2011, $392 million), How to Train Your Dragon (2010, $253 million), The Lord of the Rings: The Two Towers (2002, $468 million), The Lord of the Rings: Return of the King (2003, $503 million), Monsters Inc. (2001, $368 million), Raiders of the Lost Ark (1981, $631 million), Terminator (1984, $93 million), Toy Story (1995, $358 million), Toy Story 2 (1999, $391 million), Toy Story 3 (2010, $426 million), and Vacation (1983, $159 million). An alternative form of critical acclaim is award nominations. The Academy Award (OSCAR) has long been considered the most prestigious and highest profile award for a motion picture. Sixty-four movies in the sample received one or more Oscar nominations. Lord of the Rings: Fellowship of the Ring (2001, $445 million in domestic box office revenue), Lord of the Rings: The Return of the King (2003, $503 million), Rocky (1976, $450 million), and Star Wars (1977, $1.17 billion) are the four movies in the sample earning 10 or more Oscar nominations.

Production budget (BUDGET) for the research sample averages $94.5 million.

The pre-existing audience associated with sequels combined with rent seeking stakeholders capitalizing on previous success and special effects that help attract a global audience are keys to explaining why sequels often move toward big budget productions. The research sample includes 23 movies that exceed an inflation adjusted production budget of $200 million or more. Pirates of the Caribbean: At World's End (2007, $356 million production budget), Spider-Man 3 (2007, $306 million production budget), and Dark Knight Rises (2012, $288 million production budget) are the three movies that lead the way with the biggest budget. The expectation for the BUDGET variable is to have a positive impact on box office revenue.

DETERMINANTS OF BOX OFFICE REVENUE

This section presents estimates of the empirical relationship between the explanatory variables and box office revenue for movies that are part of a franchise. The correlation of estimates put forth in Table 2 reveals none of the independent variables have a correlation higher than 0.75 and only one set of independent variables have a correlation above 0.50 (HORROR and RESTRICTED have the highest correlation at 0.73), suggesting that excessive multicollinearity is not a problem with the model specification.

Tables 3 and 4 offers regression analysis applied to various alternative specifications of the empirical model put forth in the previous section. The two specifications of the model put forth in Table 3 include standard ordinary least squares (OLS) estimates and a natural log transformation of the dependent variable (i.e., semi-log transformation). The parsimonious OLS specification provides the opportunity to interpret regression coefficients in the context of applicable dollar values. The Table 3 results also includes the natural logarithm transformation specification of the data for the dependent variable in an effort to control for the potential of heteroscedasticity associated with estimates of the determinants of movie revenue streams (King, 2007). The Table 3 regression results produce coefficients that are consistent in sign, magnitude, and statistical significance across both specifications. The data set includes 225 observations and explains over 62 percent of the variance in box office revenue based on the Table 3 R-square results for the two models. Nine out of the ten model independent variables are statistically significant at the ten percent level, eight out of ten at the five percent level. Table 4 offers a reduced model of box office revenue by movie genre as a function of NUMBER, RESTRICTED, OSCAR, CRITIC, and BUDGET. While the full model specification in Table 3 offers the most efficient estimates, the Table 4 results provide an opportunity to explore differences in performance determinants across genres. The Table 4 statistical significance of independent variables ranges from two to five, while the R-square results range from 45 percent to 74 percent. In contrast, the Table 4 results hit a high of all five independent variables being significant and an R-square of 74 for the action genre.

The first independent variable in the model relates to how a movie franchise performs at the box office as the number of movies in a franchise increases. The NUMBER variable has a negative coefficient of 9.3 million dollars per film and is statistically significant. The semi-log transformation replicates the statistical significance of the OLS result. The result implies eventual diminishing marginal returns for a given movie franchise. Much of the reason for the negative coefficient

relates to studios often trying to push the number of films in a franchise past the point of satiation in order to extract all of the economic rent available. Sequels exhibiting increasing marginal returns are likely to result in subsequent films until the return is negative. The Table 4 genre results replicate the satiation approach to sequels via negative and statistically significant coefficients for movies that are in the horror, action, and comedy classifications. The positive and statistically significant coefficient on the NUMBER variable for moves in the children genre is the exception. Disney, Universal, DreamWorks, and other studios that produce movies for youth appear to focus on building a franchise instead of pushing films to the point of diminishing marginal returns. Disney and Universal might be more protective of their brand given both have significant theme park and merchandise operations that generate revenue beyond the box office. In addition, it is usually easy to generate comedies and horror movies with relatively simple set designs or locations but creating animated movies is often a time consuming and expensive process for studios. A studio might only greenlight an animated movie in the children's genre when the script has been approved and the release has a reasonable chance of augmenting the franchise.

Another element that can affect the financial performance of a film is the rating assigned by the Motion Picture Association of America. The motion picture industry established the code as a means of giving advance information to parents and others about the theme and treatment of films. The adoption of the voluntary code was a proactive effort to prevent stringent forms of governmental controls. There are four possible ratings given to films in the research sample—G (general audiences), PG (parental guidance suggested), PG-13 (possibly unsuitable for children less than 13 years of age), and R (restricted; children not admitted unless accompanied by an adult). The conventional wisdom is that family product sells, while an adult theme or treatment has a limited customer base because of age restrictions limiting access to the lucrative teenage market (Terry & De'Armond, 2008). This hypothesis appears to hold for movies that are part of a franchise. Empirical results from the Table 3 OLS and semi-log models reveal a RESTRICTED variable that is negative and statistically significant. The domestic box office penalty associated with restricted movies is approximately $77 million in the OLS specification. Table 4 results further verify the results with negative and statistically coefficient on the box office revenue of horror and action movies with a restricted rating, although restricted is not statistically significant for the SCIFI and COMEDY genres.

The variables CRITIC and OSCAR explore the impact of critical acclaim from both a micro and macro perspective. Good reviews and award recognition are expected to stir curiosity and identify quality. The CRITIC variable is positive and statistically significant in both Table 3 regression specifications. The empirical results imply a 10% increase in positive critical ratings augments box office revenue by almost $12 million. Fifty-nine percent of the movies in the sample earning a 95% or higher critical approval are original movies in a franchise but original films are only twenty-seven percent of the sample. In general, the critics tend to favor the originality of the first movie in a franchise but are often less enthusiastic with subsequent offerings. Critical acclaim is an important determinant of the box office success of films, regardless to if it is the original parent movie or sequel. Table 4 results add the observation that critics play an important role in predicting the box office success of horror, action, and the science fiction genres but is not a statistically significant determinate for comedies or movies targeting children. Critical acclaim in the form of Academy Award nominations also

has a positive and statistically significant impact on box office revenue in both Table 3 specifications. Holding other model variables constant, the OLS empirical results imply the OSCAR variable has an associated regression coefficient of approximately $35 million. The perceived quality associated with an Academy Award combined with the curiosity from the publicity creates an important financial boom for recognized films. The Table 4 results imply that Academy Award nomination impact the box office success of all genres except horror movies. In general, horror movies are rarely in the running for Academy Awards beyond possible consideration in makeup or special effect categories.

Table 3 results indicate the BUDGET variable is a positive and statistically significant determinant of domestic box office revenue for movies that are part of a franchise in both the OLS and semi-log specifications. Big budget movies with high profile movie stars, brand name directors, expensive special effects, and large advertising budgets have an obvious advantage drawing crowds at the box office. Holding other variables constant, production budget returns 26 cents per dollar of expenditure. Big budget movies do not guarantee profits but production budget is a significant positive determinant of box office revenue. Table 4 results indicate budget has a positive and statistically significant impact on action and science fiction movies. Table 4 specifications for HORROR, COMEDY, and CHILDREN all have positive coefficients with respect to the impact of budget on domestic box office revenue but none are statistically significant.

Finally, the Table 3 model includes five genre variables and Table 4 offers the reduced model regression results with the data separated by genre. The genre variables ACTION SCIFI, COMEDY and CHILDREN all have positive coefficients and are statistically significant in both the OLS and semi-log specification in Table 3. The associated coefficient on action and science fiction movies lead the way at over $100,000 million. The comedy regression coefficient is $66 million in the full OLS model, while the coefficient for family movies is approximately $45 million. The HORROR movie genre yields approximately $62 million in marginal domestic box office revenue but the coefficient is not statistically significant in the OLS or semi-log specifications based on the high standard deviation in revenue. Action and science fiction movies are most likely to release a film with prospect of creating a franchise in mind. The notion of a space opera or following the continuing adventures of favorite action stars are fundamental principles of an ideal franchise. Studios do not usually have a series of sequels in mind when developing original films for the comedy and children's genres but that can quickly change upon initial signs of success at the box office. The horror movie genre is most likely to move to franchise status. Given that most horror movies have modest production budgets, a small financial success can be an impetus for the creation of a franchise. Freddy, Jason, Michael Myers, Jigsaw, Chucky, and Ghostface are characters from horror movies that launched franchises with four to eleven movies in the series. Although the Table 4 reduced form models of box office revenue by genre does not offer the specification depth of Table 3, the results offer an interesting perspective as discussed in the preceding paragraphs. An obvious observation is the Table 4 reduced model of NUMBER, RESTRICTED, OSCAR,CRITIC, and BUDGET is a great parsimonious model for the action movie genre given the .742 R-square and statistical significance of all five variables. In contrast, movies for children do not fit the reduced model with the same degree of efficiency given the R-square falls to .457 and only two model variables (NUMBER

and OSCAR) are statistically significant.

CONCLUSION

A successful movie franchise can be worth billions of dollars. Motion picture fans have a bankable dedication to the trials and tribulations of beloved characters and continuing narratives. This study examines the determinants of domestic box office revenue of movies that are part of a franchise for the years 1976-2014. This study provides evidence that critical acclaim, genre, budget, motion picture association rating, and numeric order or release within a series of films are significant determinants of domestic box office revenue. The most significant contribution to the literature is the observation that movie studios tend to push sequels in a franchise to diminishing marginal returns and beyond satiation. Horror, action, and comedy movies are genres where the number of movies released has a negative and statistically significant coefficient. Movies for children are an exception to the satiation observation, as a studio manages a successful franchise more carefully than other genres with the goal of achieving increasing returns per subsequent film release in order to manage box office, amusement park, and merchandise sources of revenue. Critical acclaim captured by a rating database such as the Rotten Tomatoes website and Oscar nominations are both positive and statistically significant determinants of box office revenue. The genre variables ACTION SCIFI, COMEDY and CHILDREN are statistically significant with positive coefficients ranging from $45 to $106 million from the OLS specification. The basic OLS model specification results indicate a $77 million penalty at the domestic box office for motion pictures in the research cohort with a restricted rating, which is a statistically significant determinant. Finally, production budget is a positive and statistically significant determinant of box office revenue for movies in a franchise, especially action and science fiction movies.

One avenue for future research into financial success of movies that are part of a franchise is to extend the research focus to include alternative forms of revenue streams such as the foreign box office and various home video markets. A second avenue for future research is to include variables relating to opening weekend performance, timeline between franchise releases, and impact of changes in director or star in subsequent releases. A third extension is to employ word of mouth and social media input as an alternate to traditional critic and award variables.

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TABLE 1
SUMMARY STATISTICS FOR MOVIE SEQUELS (1976-2014)

Variable	*Mean*	*Maximum*	*Minimum*	*Standard Dev.*
BOXOFFICE	226,659,713	1,166,136,900	6,223,200	165,129,062
NUMBER	2.90	11	1	2.02
HORROR	0.183	1	0	0.304
ACTION	0.192	1	0	0.310
SCIFI	0.188	1	0	0.307
COMEDY	0.179	1	0	0.300
CHILDERN	0.188	1	0	0.307
RESTRICTED	0.323	1	0	0.469
OSCAR	0.832	13	0	1.973
CRITIC	60.09	100	4	26.134
BUDGET	94,502,831	356,000,000	483,090	74,994,390

n = 225

TABLE 2
CORRELATION MATRIX

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
BOXOFFICE (1)	1										
NUMBER (2)	-.281	1									
HORROR (3)	-.476	.319	1								
ACTION (4)	.288	-.077	-.263	1							
SCIFI (5)	.279	.149	-.259	-.266	1						
COMEDY (6)	-.133	-.213	-.252	-.259	-.256	1					
CHILDERN (7)	.156	-.159	-.241	-.186	-.048	-.200	1				
RESTRICTED (8)	-.487	.156	.731	-.389	-.244	.011	-.354	1			
OSCAR (9)	.621	-.206	-.213	.082	.232	-.154	.033	-.244	1		
CRITIC (10)	.540	-.285	-.400	.206	.190	-.142	.222	-.303	.417	1	
BUDGET (11)	.383	.409	.013	.248	.289	.0328	.142	-.114	.126	.01	1

TABLE 3
DETERMINANTS OF DOMESTIC BOX OFFICE REVENUE FOR MOVIE SEQUELS (1976-2014)

Variable	Standard Regression Model Coefficient (t-statistic)	Natural Log Transformation Model Coefficient (t-statistic)
Intercept	74,405,491 (2.01)	18.1068 (9.57)
NUMBER	-9,236,088 (-2.33*)	-0.0607 (-3.29*)
HORROR	61,900,831 (1.56)	-0.1344 (-0.66)
ACTION	102,620,823 (3.15*)	0.3256 (2.08*)
SCIFI	105,971,495 (3.58*)	0.3913 (2.62*)
COMEDY	66,499,779 (2.12*)	0.2136 (2.02*)
CHILDERN	45,289,754 (1.70**)	0.1836 (1.78**)
RESTRICTED	-77,446,826 (-3.25*)	-0.2501 (-2.28*)
OSCAR	34,859,497 (8.61*)	0.0758 (3.72*)
CRITIC	1,189,048 (3.63*)	0.0094 (5.70*)
BUDGET	0.259,621 (1.99*)	0.0001 (3.47*)
R-square	0.624	0.671
F-Value	35.69*	37.34*

Notes: *p<.05, **p<.10.

TABLE 4
DETERMINANTS OF DOMESTIC BOX OFFICE REVENUE FOR MOVIE
SEQUEL BY GENRE
(1976-2014)

Variable	HORROR Coefficient (t-stat)	ACTION Coefficient (t-stat)	SCIFI Coefficient (t-stat)	COMEDY Coefficient (t-stat)	CHILDREN Coefficient (t-stat)
Intercept	108,947,049 (3.00)	194,076,983 (3.89)	-186,867,890 (-0.41)	116,971362 (2.03)	147,536,009 (1.57)
NUMBER	-12,208524 (-2.06*)	-22,330,449 (-2.80*)	25,688,785 (0.87)	-15,397,578 (-2.11*)	31,811,771 (1.93*)
RESTRICTED	-70,955,463 (-2.24*)	-113,936,803 (-3.37*)	-95,463 (-0.24)	-6,185,264 (-0.21)	Not Applicable
OSCAR	7,443,561 (0.18)	38,161,200 (6.10*)	25,115,293 (2.18*)	106,519,176 (5.21*)	57,289,790 (3.07*)
CRITIC	869,587 (4.28*)	1,158,864 (2.17*)	5,738,757 (2.09*)	832,491 (1.40)	639,824 (0.53)
BUDGET	0.0463 (0.13)	0.3974 (2.45*)	0.3801 (2.28*)	0.5805 (1.45)	0.4491 (0.99)
R-square	.588	.742	.672	.559	.457
F-Value	10.69*	31.77*	3.59*	9.89*	4.62*

Notes: *$p<.05$