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Hollywood Rules

The View from Wall Street

Wall Street hedge fund manager Kim Meyer was fuming. He tossed the morning paper on his desk in aggravation. For the third time this month, he had gotten burned. He had bet against the success of *Spider-Man 3*, *Shrek the Third*, and the third of the *Pirates of the Caribbean* films. But he had been proven wrong on all three counts—each film had grossed more than $100 million on its opening weekend. "Stupid sequels," he muttered. "Why couldn't the film industry come up with anything original?"

But more importantly, Meyer was beginning to wonder if his cautious nature was holding him back. For the last two years, he had watched some of his colleagues in the financial industry trot out to Hollywood and wrap up hundreds of millions of dollars in these odd new slate financing deals that lacked any kind of proven track record. Meyer was many things, but a lemming was not one of them. A number of especially high-profile deals had gone down in recent months. Since January, Goldman Sachs had announced a $200 million deal with Lionsgate; Morgan Stanley had inked $350 million in deals with Focus Pictures and Paramount Vantage; and entertainment finance company Relativity Media was at it again, this time structuring a billion-dollar deal with Citigroup to co-finance at least forty-five films in the next five years. Over the last few years, Relativity had generated more than $4 billion in slate financing deals.

What did these people know that he did not?

He clearly needed more insight into film funding. Underestimating could be just as deadly as overestimating, and the time had come for intelligently exploring serious investments in movie slates. He tapped his fingers on his desk, thinking. Then he hit the intercom button on his phone, saying, "Joan, where's that DVD you got from that MBA out in L.A. last week? I'd like to review it. See if you can set something up this week with him, too." He would clearly need to talk to the big studio executives, but a range of perspectives would be key. The MBA may have come out of left field, but apparently his first sixty seconds had been intriguing enough for his secretary to refrain from chucking the DVD with the rest of the junk mail. Meyer threw a couple of darts at his board and walked over to the wall of windows. On this foggy morning, gray mist obscured his ordinarily phenomenal view. "Show me the money!" he yelled to no one in particular.

The View from Hollywood

Dave Griffith hung up the phone, stunned by the big break that had just fallen in his lap. Apparently he had thirty minutes to sell Hollywood to a top Wall Street fund manager. Barely able to contain his excitement, the recent MBA graduate glanced around his Los Angeles apartment packed with film posters and memorabilia, and a line from *The Godfather* popped into his head: "I'm gonna make him an offer he can't refuse." For as long as he could remember, Griffith had loved films. Joining the Hollywood industry as a movie producer seemed to offer the perfect blend for his analytical skills and creative talents. This undertaking brought along the ambitious task of attracting investors who believed in a movie's potential and were willing to accept the risks of Tinseltown—one of Hollywood's many nicknames. Investment volumes of $100 million per product were not limited to the movie industry, but what separated film from other product innovation was the high degree of uncertainty involved: each film was an innovation, past experiences had limited relevance, and it was not possible to correct inherent errors or to fit a product to consumer wishes after finishing production. You could pay through the nose to line up star power such as Arnold Schwarzenegger and directors such as Steven Spielberg, but if viewers were less than impressed, it was, "*Hasta la vista, baby.*"

Griffith had taken a big step towards realizing his first project by getting the appointment with Meyer. The potential financier was known for his bilious temperament, and Griffith knew preparation was key. Convincing an investor required big effort, especially because a good story, great pictures, art, and cinematic passion had to be complemented by convincing financials. He had performed an in-depth study of 2006 movies using regression analysis, and his data set contained the top 150 movies with a wide range of variables potentially driving movie success. He walked over to his desk and glanced at his stacks of research. He had done his homework, but nagging questions remained: Would his analysis help his production decisions at all? And most importantly, would it convince Meyer? "May the Force be with me," Griffith thought.

Wall Street's Engagement in Hollywood

Wall Street began taking a serious interest in the movie industry when slate financing arrangements (SFAs) were first created in 2004. Key characteristics distinguishing SFAs from other forms of outside investment included the investment group's ability to: (1) participate in a group of movies rather than just a single film, (2) choose the films on the slate prior to closing the transaction, (3) benefit from the full array of revenue streams from each film rather than just a specific media, (4) share the worldwide revenues of each film rather than just revenues from specific territories, and (5) be assured that a major studio was party to the arrangement and committed to providing theatrical distribution for each film on the slate. SFAs typically involved a group of ten or more pictures produced over several years to spread risk in the portfolio. Consequently, all the films on the slate needed to be made before performance could really be determined, because the biggest blockbuster might be the last movie in the bundle.

Between 2005 and 2007, hedge funds had invested around $13 billion in producing 150 movies.[1] This amounted to a yearly share of about one third of the U.S. movie industry's total financial requirements, and the remaining funding came from traditional film industry sources and lenders.

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[1] Michael Hiltzik and Josh Friedman, "Hollywood´s Hedged Bets," *Los Angeles Times*, February 16, 2008.

A number of factors led to Tinseltown's sudden appearance on Wall Street's radar screen. The first few years of the new millennium witnessed an explosion of private equity and hedge-fund capital—fund managers suddenly found themselves in search of safe and effective outlets for literally billions of dollars. As the real estate and stock markets began to lag, deals averaging nine figures and up that were guaranteed by Hollywood studios became increasingly more attractive diversification tools. The revenue base for motion picture content was rapidly expanding as international markets grew and entertainment technologies (including home equipment, hand-held devices, and gaming systems) proliferated.

In addition, power became centralized within a handful of conglomerate-owned major studios and the industry subsequently underwent corporatization, which made Wall Street more comfortable investing in film. The consolidation movement began in 1996 when Disney merged with Capital Cities/ABC. By 2005 every major studio was controlled by a conglomerate. As publicly traded corporations, the studios adhered to far more transparent accounting procedures. Financial data about the performance of films worldwide and across all media became more accurate and available, making it easier for financial managers and analysts to assess and handle risks.

Studios welcomed Wall Street money largely because they had no choice. By the middle of the 1990s, booming entertainment technologies and skyrocketing international box-office grosses had created insatiable demand for films. Sheer volume of new products was essential for satisfying the appetites of, among other things, the new DVD market, cable stations, video rental stores, digital satellite services, and the Internet. Hollywood also came to realize that "event films" laden with star power and special effects (such as *Titanic*, *Jurassic Park*, and *Independence Day*) were capable of generating astounding revenues overseas. *Titanic* became the largest box-office smash in history, grossing more than $1.8 billion worldwide. Meanwhile, overseas' box-office revenues for non-event Hollywood films began to suffer, perhaps due to an increase in international (more locally produced) filmmaking. These factors led to a significant ramping up of the number of Hollywood films released each year, the rise in direct-to-video movies that could be fast-tracked to entertainment markets, and an emphasis on blockbuster "tentpole" productions.

Tentpoles were the powerful drivers of the rest of a studio's slate, and the projects generally involved massive amounts of money for production and promotion—for example, Warner Brothers had *Harry Potter* and *Batman*, Paramount had the *Mission: Impossible* series, Buena Vista had *Pirates of the Caribbean*, and Sony Pictures had *Spider-Man*. According to the Motion Picture Association of America (MPAA), the average film in 2006 cost $100.3 million to produce and market, and the average top-ten movie cost approximately double that. Advertising budgets alone involved an average of $34.5 million, with top-ten movies spending as much as $52 million. For every Hollywood blockbuster, there were countless box-office flops and financial bankruptcies. As other funding sources began to dry up in the early 2000s, and parent companies started to tighten purse strings, the studios needed to raise capital from somewhere new. Investors were able to capitalize on the credit crunch and had a much wider range of projects to choose from—studios needed partners for everything from independent and art house films to powerhouse franchises such as *Batman* and *Superman*.

Slate design became both an art and a science, and investors all seemed to have their own pet theories on what constituted a successful slate. *The Hollywood Reporter* described some of the varied approaches—one company favored movies targeting males ages eighteen to thirty-four, others preferred the independent film sector or had a computerized model to calculate their investments.

Movie Market in Numbers

The movie industry grossed $9.49 billion domestically in 2006 and released a record 607 films, according to the MPAA. International box-office sales reached an all-time high of $25.82 billion, an 11 percent increase over 2005.

Consistent with 2005 figures, films rated PG-13 comprised the majority of top-grossing films. PG and PG-13 films accounted for 85 percent of the top twenty films of 2006. Most movies receive an R rating, but when it comes to grossing, R-rated films lag behind the smaller groups of PG-13 and PG movies. Only 10 percent of 2010 top twenty films were rated R, and only 5 percent were rated G.

On the distributor side, four players dominated the market and grossed more than $1 billion each from U.S. releases: Sony Pictures, Buena Vista, Twentieth Century Fox, and Warner Brothers.

The MPAA reported a rebound in admissions for 2006 after a three-year downward trend. Ticket sales increased 3.3 percent from 2005 with 1.45 billion admissions recorded. Movies drew more people than theme parks and major league sporting events combined.

Disney's *Pirates of the Caribbean: Dead Man's Chest* spearheaded the rebound, grossing more than $1 billion worldwide (one of only three films to ever accomplish the feat). Its record-breaking run began Friday, July 7, 2006, with a $55.8 million opening. After sweeping the all-time single day, opening day, and Friday titles, the film went on to steal the number-one spot for opening weekend, Sunday, and Tuesday single-day sales. It was the fastest film to reach $100 million (achieved in two days), $200 million (eight days), $300 million (sixteen days), and even $1 billion (sixty-three days).

Despite *Pirates*' impressive statistics, 2006 was no one-hit wonder year. Sixty-three films grossed more than $50 million at the domestic box office, a 12.5 percent increase from 2005.

Making Money from Movie Production

Money earned at the cinema box office was split between exhibitor and distributor, after the costs of exhibition were deducted. In a sliding-scale agreement, the distributor started with a minimum share of 70 percent, and the percentage was reduced ten percentage points in favor of the exhibitor for every two weeks of runtime.

The first run of a movie comprised about seven years and included revenue strings from primary and secondary markets: domestic and foreign box office, DVD sales, and rentals as well as licenses for pay and free television. Domestic box-office gross—especially domestic box-office gross on opening weekend—typically provided a strong indication of the success or failure of a movie.

Griffith looked up from his numbers, thoughtfully. Of course, there were exceptions to this rule.

One of the highest profile box-office flops of recent years was *The Shawshank Redemption*, based on a Steven King novella. It came up against an already saturated box office with powerhouses such as *Forrest Gump*, and audiences opted for almost anything but this depressing

prison drama. Despite seven Oscar nominations, its box-office take was pathetic. But the film's fortune changed once the movie was released on video. Bolstered by the Oscar endorsements, *Shawshank* became the most rented video of 1995, going on to be voted the best movie not to have won an Oscar in the BBC's Radio Times polls in 2004 and 2008.[2] The moral of the story, it seemed, was that dismissing a movie based on box-office success alone could be myopic.

Similarly, a number of films that squeaked by at home excelled overseas—particularly when star power was involved. Brad Pitt's *Troy*, Colin Farrell's *Alexander*, and even films with more moderate stars, such as Renee Zellweger and Hugh Grant in *Bridget Jones's Diary*, each took around 75 percent or more of their grosses from the foreign box office.

However, generalizations are always useful, and as such, opening weekends are an important benchmark. As a fund manager, Meyer would be very interested in success drivers of films that had a strong historical precedent. Griffith's data set of the top 150 movies by box-office sales in 2006 would be an essential springboard for further discussion regarding slate design, production decisions, investment risks, and rewards. See **Table 1** for information included in the data set.

Table 1: Griffith's Data Set Information

Category	Detail
Movie	Title of the film
Opening gross	Box-office gross on the first weekend in U.S. dollars
Total U.S. gross	Total domestic box-office gross in U.S. dollars
Total non-U.S. gross	Total foreign box-office gross in U.S. dollars
Budget	Production costs stated in U.S. dollars
Opening theatres	Number of theatres showing the movie on the release date. In cases where both limited and wide releases exist, the wide release number is given
Known story	Adaptations of a short story, book, comic, graphic novel, game, play, or TV production as well as remakes of previous movies 1, based on original screenplay 0
Sequel	Completed stories and first part of a sequel coded 0, following parts 1
Origin_United States	Dummy coded 1 if the movie was mostly filmed in the United States, 0 otherwise
Genre	Contextual aggregation into action, adventure, animation, comedy, documentary, drama, fantasy, horror, musical, thriller
Summer	Dummy coded 1 if the movie was released in the summer season, 0 otherwise
Holiday	Dummy coded 1 if the movie was released on a holiday, 0 otherwise
Christmas	Dummy coded 1 if the movie was released during the Christmas season
MPAA	Rating of the movie by the Motion Picture Association of America for general audience (G), parental guidance suggested (PG), parental guidance strongly cautioned (PG-13), restricted for persons who are older than 16 or who are accompanied by an adult (R), not rated (NR)
MPAA_D	A dummy variable with the value 1 if the movie was rated R and 0 otherwise.
Critics' opinion	Summarized evaluations of published journalistic critics by metacritics.com on a scale from 0 (strongly unfavorable) to 100 (strongly favorable)
Oscar nominations	Number of nominations received in all categories
Oscars won	Number of Oscars won in all categories

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[2] BBC Online Entertainment News, "Shawshank Tops Oscar Failure Poll," last modified September 22, 2004, http://news.bbc.co.uk/ 2/hi/entertainment/3680338.stm; and "Shawshank Leads Oscar Losers Poll," last modified Februrary 24, 2008, http://news.bbc.co.uk/ 2/hi/entertainment/7261504.stm.

Griffith knew that some important drivers of a film's success could only be influenced in preproduction, while others could be tweaked in postproduction as needed. He knew he would need to highlight these as he pondered the most compelling strategies for both explaining and inspiring investments in film finance. Industry wisdom declared that nothing was certain, but Griffith firmly believed that some well-placed math could shift suspense levels from Hitchcock proportions to something more akin to Disney. He set about trying to anticipate Meyer's questions and concerns so that he could maximize his persuasiveness.

As Griffith took a closer look at his data set of the top 150 movies by box-office sales in 2006, he quickly noticed that it was missing data on the production budgets of quite a few of those movies. In addition, he realized that there were a few outliers. For example, the movie *Borat* had a modest budget (by Hollywood standards) of $18 million but then brought in total box-office (U.S. and non-U.S.) gross revenue exceeding $260 million. An example of another extreme outlier was the movie *Pirates of the Caribbean: Dead Man's Chest*, with a staggering budget of $225 million and a mind-blowing total box-office gross revenue of more than $1 billion ("That's a one with nine zeros!" Griffith was thinking). Griffith knew that such extreme outliers would pose severe difficulties to his analysis. Therefore, he decided that for his initial analysis he would remove all outliers as well as all movies with missing data. In fact, he only included movies with a known budget between $20 million and $100 million. There are seventy-five such movies in the data file that accompanies this case. Griffith conjectured that movies in exactly this "price range" would be of interest to Meyer. However, he also knew all too well that his restricted data set would limit the generality of the conclusions that could be drawn from any type of analysis.

Analysis

This section presents a four-part analysis that will help you determine the most effective way for Griffith to showcase his data set to Meyer. Use the data in the accompanying spreadsheet to answer the following ten questions, which will lead you through an overview and an examination of the myriad factors involved in producing movies.

Set the Stage

1. To obtain an initial overview of the data, calculate the minimum, average, and maximum values of the variables—opening gross, total U.S. gross, total non-U.S. gross, and opening theatres. How many of the movies in the data set are comedies and how many movies are R-rated?

2. Michael London (of *Sideways* fame) declared in *The Hollywood Reporter*, "The studio business historically returns around 12 percent a year."[3] Griffith knew any investor would want justification for such a statement.

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[3] Stephen Galloway, "Capital Gang: Investment Firms and Hedge Funds Are Bullish on Hollywood Again, Sinking Millions into Production Deals with Major Studios and Independents," *Hollywood Reporter*, April 11, 2006.

    a. Calculate the U.S. return on investment (ROI) (simply defined as the difference of total U.S. box-office gross and budget divided by budget, ignoring any form of discounting) for each movie in the data set.

    b. Provide a 95 percent confidence interval for the mean U.S. ROI of movies.

    c. Show that the mean U.S. ROI is significantly larger than the 12 percent London cited.

Before Production

3. While any genre can produce a blockbuster, Griffith suspected that some categories are more likely to do so than others. If he could stack the deck in his favor through storyline selection, he did not want to pass up the opportunity.

    a. Compare the total U.S. box-office gross of movies from the comedy genre with movies from other genres. Is there a statistically significant difference between the total U.S. gross of comedies and non-comedy movies?

    b. Griffith was not so sure about the results, because they were contrary to his gut feelings. Maybe higher revenue accompanied higher investments? Calculate additionally the difference of U.S. ROIs from movies of the comedy genre and of other movie genres. Is there a statistically significant difference between the U.S. ROIs?

4. Prevailing wisdom maintained that R-rated movies performed better than other movies.

    a. Is there a statistically significant difference between the total U.S. gross of R-rated movies and movies with other ratings?

5. Believed to be among the preproduction factors driving success were budget (which expresses both the cost of the film and the quality of the actors as expressed by their fee), genre (comedy vs. non-comedy), MPAA rating (R-rated vs. other rating), and audiences' familiarity with the story (whether the film is a sequel or an adaptation of a known story).

    a. Based on the described beliefs, determine a sound regression model predicting total U.S. box-office gross of movies prior to production.

    b. Drop all variables from the regression that are not significant at a 10 percent level of significance. Report the final regression.

    c. Holding all other explanatory variables in your regression fixed, which movies have higher total U.S. gross, those that are a sequel or those that are not?

Before Opening Weekend

6. Griffith knew the age-old Hollywood wisdom that the opening weekend is absolutely critical for the overall commercial success of a movie. Therefore, both the release date (whether during the summer, on a U.S. holiday, or around Christmas) and the number of movie theatres in which a movie is shown during opening weekend are assumed to be very

important. These factors are believed to strongly influence revenue during the opening weekend and, thereby, to have a strong impact on the overall commercial success of a movie.

   a. Determine a sound regression model predicting opening weekend box-office gross revenue. Consider both the preproduction success factors as well as the factors describing the opening weekend.

   b. Drop all variables from the regression that are not significant at a 10 percent level of significance. Report the final regression.

   c. Carefully interpret the slope coefficient of each variable in the regression.

   d. Suppose the number of movie theatres showing a movie on the opening weekend increases by one hundred. Provide a point estimate and a 95 percent confidence interval for the expected change in the opening weekend box-office revenue.

7. Griffith also knew the even stronger version of that age-old Hollywood wisdom which stated that 25 percent of a movie's U.S. box-office gross revenue came in during the opening weekend. All this conventional wisdom made him curious to examine the relationship between total U.S. box-office gross and opening weekend box-office gross.

   a. Run a simple linear regression predicting total U.S. box-office gross from opening weekend box-office gross.

   b. If the stronger version of that age-old wisdom were true, that is, if indeed 25 percent of a movie's U.S. box-office gross revenue came in during the opening weekend, what would the value of the slope coefficient in the linear regression model have to be?

   c. Can the age-old wisdom be rejected based on the simple linear regression?

   d. Critique the statistical analysis in part (c).

   e. Determine a sound regression model predicting total U.S. box-office gross from opening weekend box-office gross.

   f. Examine the validity of the age-old wisdom using the new regression.

   g. What proportion of the variation in total U.S. box-office gross revenue can be explained by variation in the opening weekend box-office gross revenue?

After Opening Weekend

8. Investors often wonder just how much influence press reviews have on box-office admissions. If Meyer turned out to be a *Flags of Our Fathers* fan who blamed the failure of his favorite film on the evil critics, how would Griffith respond?

   a. Determine a sound regression model predicting total U.S. box-office gross revenue. Consider all factors known after the opening weekend, including those known before

production and those known only before opening weekend, as well as the opening box-office gross and the critics' opinion score.

b. Drop all variables from the regression that are not significant at a 10 percent level of significance. Report the final regression.

c. Consider a movie with the characteristics of *Flags of Our Fathers*. Using the regression from part (b), provide a point estimate and a 95 percent prediction interval for the total U.S. gross revenue of a movie with such characteristics.

d. Advise Griffith on how much he should be willing to invest in order to influence the critics to gain an extra ten points in the opinion score of a movie with the characteristics of *Flags of Our Fathers*, thereby earning such a film a score of eighty-nine points instead of seventy-nine points.

9. Griffith surmised that poor reviews affected the total U.S. box-office gross of comedies less strongly than the total U.S. gross of movies from other genres. In particular, he theorized that the critics' opinion score had a significantly smaller influence on total U.S. box-office gross for comedies than for non-comedies.

a. Modify your regression from Question 8 to examine Griffith's claim. Can you prove his theory?

10. Standard paychecks for A-list stars such as George Clooney or Brad Pitt are routinely on the order of $15 million or more. Producers hope that famous faces in a film will guarantee packed movie theatres. Griffith concluded that it is not really a large budget *per se* that has a strong positive effect on total U.S. box-office gross revenue. Instead the number of star movie actors in a film drives up total U.S. gross. He regretted that he did not have any data on the number of movie stars in his data set to examine his claim.

a. Consider a variable called "star power" that reports the number of A-list stars for a movie. If you had data for this variable and added it to your regression from Question 9, what would have to be true for the slope coefficient of star power and how would the slope coefficient of the budget variable have to change for Griffith's conclusion to be correct?