

How Genres and Age Restrictions Affect Global Box Office

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Abstract. The world's motion picture industry is an enormous market that provides hundreds of thousands of jobs and influences the society and culture in many countries of the world. This research dwells upon two aspects of the industry: production and distribution. Given the industry's importance for the society as well as the high social status of filmmakers, quantifying the output of a motion picture project and comparing it against the costs (the budget) seems relevant. This paper analyzes the budgets and box offices of 1,739 AAA motion pictures (1 million US dollars or more in budget) released from 1972 to 2014. The motion pictures are classified by genres at the higher level and then by age restrictions at the lower level; then their box offices are compared to budgets to estimate the profitability. To collect data, the team used a parser written in Python. The paper thus identifies the criteria that make a motion picture a success; it also detects correlation between the age restrictions and the profitability, defined herein as the box office to production budget ratio. One finding is that a motion picture is likely to be more profitable if it is part of a franchise rather than a stand-alone movie. The obtained dependencies are big data-based and are statistically stable. This means the findings can be used predictively at preproduction to avoid a box office flop.

1. Introduction

The motion picture industry is so large and advanced it affects the economy and culture of many countries. The global industry comprises motion picture corporations, production companies and independent studios, technical and commercial aspects of productions (e.g. scriptwriting, principal photography, and distribution), as well as certain social groups (actors, producers, and other agents involved in both photography and in festivals). This research dwells upon only two aspects of the industry: production and distribution.

Hollywood is the largest player in this industry with a turnover of 92 billion US dollars or 2,000 motion pictures per annum (Шульман, 2007), (Гасюк, 2012). The industry is well-developed in Europe, too. France alone annually hosts more than 165 motion picture festivals, including the world-famous Cannes Festival, with the locally made motion pictures accounting for about 42% of the box office.

Greatest profit is generated by franchise blockbusters, as it is easier to attract audience when a motion picture shares a title with a familiar hit. Hollywood's undeniable top positions are due to the its sheer scale coupled with the transnational status of motion picture corporations based there and their unique ability to make expensive motion pictures that match the tastes of people from across the globe.

The market is dominated by several major American studios: Warner Bros., Walt Disney Company (Buena Vista trademark), Universal Studios, Columbia Pictures, 20th Century Fox, and Paramount Pictures. Together with Metro-Goldwyn-Mayer and DreamWorks, they form the Motion Picture Association of America, MPAA. Figure 1 shows the proportion of major studios' releases in the total box office of 2014 (Box Office Mojo, 2015).

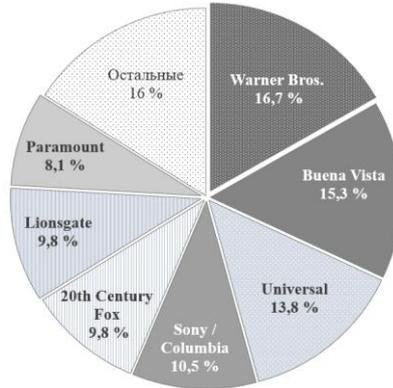


Figure 1. World's motion picture market in 2015.

The United States and Canada account for nearly a third of the world's total box office. Many of these studios also distribute motion pictures of other companies' making, which is another major source of revenue.

A motion picture is often released on the same day worldwide. Release might be delayed if the local distributors decide that the local market necessitates that; however, expensive motion pictures that are expected to have a huge box office are mainly released on the same day domestically and elsewhere. This helps combat piracy.

Theatrical run usually varies from two weeks to a year, although there are some exceptions; thus, Steven Spielberg's *E.T. the Extra-Terrestrial*, 1982, had a 16-month theatrical run. The picture generated 793 million US dollars in box office on a 10.5 million budget (IMDB, 1982).

International distribution always follows the same procedure (Hexpacob, 2008):

- a screening for regional distributors;
- discussion of plans to release the motion picture;
- analysis of the local market and its specifics (national holidays, censorship, competitors, etc.);
- making a decision on who of the local celebrities to invite for voicing;
- making a decision on whether to invite a star of the motion picture in a promotional tour to advertise the film.

Aside from box office, additional revenue is generated by selling DVDs and merchandising as well as by licensing the use of key characters and scenes in other arts, be it comics, books, or games based on the motion picture. Box office is the revenue generated by theatrical run. Further in this paper, box office means the total worldwide box office.

Proceeds from ticket sales are divided between theaters, distributors, and filmmakers as agreed (Shone, 2004), (Grover, 2009). If a distributor purchases exclusive rights to distribute a motion picture and operates its own network of theaters, it can claim up to 50% of the box office revenue. Otherwise, the box office is divided into three parts:

- filmmakers (the motion picture company, the producer, the director, the writer, the composer, etc.) get 35% to 45% in total;
- theaters keep 50% of the box office on average;
- distributors get a commission of up to 15% on average.

Percentages might vary depending on the location, its economy, and other factors. According to (Крол, 2010), the filmmakers only get 20% to 30%. Thus, the percentage of box office has to be agreed upon personally with every key person: screenwriter, director, producer, composer, etc.

Thus, director and producer Peter Jackson, co-producer and writer Frances Walsh, and co-writer Philippa Boyens got 20% of the box office in addition to their pay for the 2005 motion picture *King Kong*. The film generated 218 million US dollars in box office domestically and 550.5 million worldwide. Director and screenwriter George Lucas' revenue from *Star Wars Episode IV: A New Hope* totaled 40% of the film's net profits (Box Office Mojo, 2015).

Commercial success tends to lead to a sequel. A well-developed and time-tested concept helps save resources and gain more in revenue. A familiar title attracts greater audience, as people tend to have high expectations from franchises. A franchise is defined herein as a series of motion pictures following a single main arc. Aside from sequels, a franchise may comprise adaptations, remakes, and reboots.

The goal hereof is to find how age restrictions correlate with the box office and profitability. It is an attempt to identify that correlation for franchises and stand-alone motion pictures alike.

2. Materials and method

Data for this research was collected from <http://www.mpa.org> (box office statistics), <http://www.imdb.com> (budgets, box office statistics, release dates, and trivia), <http://www.boxofficemojo.com> (budget and box office data), <http://www.kinopoisk.ru> (marketing costs), <http://www.the-numbers.com> (DVD sales data), and <http://www.rottentomatoes.com> (news, reviews, and critical reception).

The research team processed data on 1,739 AAA motion pictures by the following majors: 20th Century Fox, New Line, Buena Vista, Paramount, DreamWorks SKG, Sony / Columbia, Focus Features, Universal, Lionsgate, Warner Bros., MGM/UA, Weinstein Company, and Miramax. The dataset contained titles, release years, genres, age restrictions, budgets, and box office statistics. Some entries had additional fields for plot details and the motion picture's relation to its franchise. In total, the team sourced 6,434 motion pictures from the main data source (Box Office Mojo, 2015), then filtered the array to leave only complete entries while excluding cartoons, documentaries, foreign films (mainly European), and films of unspecific genre. The 'AAA' label was attached to motion pictures exceeding 1 million US dollars in budget.

Further study was an attempt to classify them by genres at the higher level and then by age restrictions at the lower level; then their box offices were compared to budgets to estimate the profitability. Data was collected from the Internet and processed by a parser written in Python by Anastasia A. Zubareva (Bezdenzhnykh). The parser program processed the content of all the necessary pages of the above sites.

3. Results

DVDs, computer games, TV release, etc. generate revenue, but it is minor compared to the box office. Besides, such data is rarely available in full; thus, this research only used box office stats. Since marketing costs, proceeds from and losses to legal claims, etc. are rarely publicized, the presented analysis was based on budget (production costs) alone.

The single metric of success this research employed was the profitability, i.e. the global box office to budget ratio. Following expert conventions (Thorsten Hennig-Thurau, 2009), (Антонов, 2009), (Геттигев, 2012), a motion picture was only deemed successful if its box office is at least three times the budget.

Classification was based on age restrictions. Analysis of motion pictures and their profitability in the light of age restrictions produced a finding that despite the popular opinion (Cunningham, 2012) that PG-13 (parental guidance) have the largest audience, R (restricted) motion pictures from the generated database were nearly equally numerous (782 PG-13 entries and 717 R entries) while featuring higher profitability (3.6 for PG-13 and 4.2 for R).

Beside these two categories, the data array contained unrestricted motion pictures (13 G films, 2.6 in average profitability) as well as 2 NC-17 films, which were non-profitable at 0.8.

Noteworthy are PG¹ motion pictures, a category similar to PG-13. This category accounted for 225 motion pictures in the database, e.g. only a third of the PG-13 or R categories; however, it also contained extremely successful and outstandingly profitable projects, e.g. E.T. the Extra-Terrestrial (158.6), Star Wars: Episode IV – A New Hope, Star Wars: Episode VI – Return of the Jedi (95 and 70, respectively).

Motion pictures in this category are mainly family, adventure, romantic, and comedy films, which prevents moving them to a separate category for analysis. Interestingly, the most profitable PG motion pictures (up to 20) were all shot prior to 1990. The authors hereof believe a high profitability does not correlate to the PG rating.

The resulting table (Table 1.) below summarizes the profitability by genre and rating (averaged for each genre and age restriction combination). 3 is the break-even threshold.

Table 1. How age restrictions affect motion picture profitability for different genres.

Genre	PG-13	R	Total motion pictures
Comedy	4.3	5	239 (124/115)
Horror film	5	6.3	196 (64/132)
Action	2.9	2.5	193 (122/71)
Thriller	2.5	3.4	186 (63/123)
Romantic	3.8	4.2	143 (98/45)
Drama	3	4.1	117 (56/61)
Crime	1.8	3.3	76 (17/59)
Science fiction	2.6	3.4	64 (48/16)
Comedy-drama	5.7	3.4	53 (27/26)
Fantasy	4.4	1.9	42 (38/4)
Sports films	3.2	2.7	41 (33/8)
Adventure	2.9	1.3	35 (30/5)
Musical	3.1	1.8	25 (17/8)

Source: author-collected data.

4. Discussion

Analysis leads to the following findings.

- R-films lead in terms of profitability across a variety of genres: comedies, horror films, thrillers, dramas, and crime films.
- Except action films, the PG-13 category leads only in musicals, sports, and adventure motion pictures, all of which are less common.

This leads to a finding that comedies, horror films, romantic films, and dramas perform better if the age restriction is higher. However, for comedy-dramas, a broader audience (PG-13) is preferable.

At risk are thrillers, crime films, and sci-fi: these should be R-rated, as PG-13 motion pictures in these genres tend to not break even. On the other hand, fantasy, sports, musical, and adventure films perform better if rated lower.

¹ PG means that parental guidance is recommended but not mandatory. Meanwhile, PG-13 means that for persons under 13, parental guidance is **strongly** recommended.

Family films (105 in the sample) are never R-rated. 92 of them are PG films. The table omits war-themed and historical films as well as westerns, since these genres are uncommon, and their box office does not correlate with age restrictions at all.

Analysis also proves that franchising is the most cost-effective solution. From 1972 to 2014, there were released 1,479 stand-alone and 260 franchised motion pictures. The former have an average profitability of 3.5 against 7 for franchised movies, despite having a 1.5 times smaller budget.

5. Conclusion

This paper analyzes the budgets and box offices of 1,739 AAA motion pictures released in 1972–2014.

It identifies the criteria that make a motion picture a success; it also detects correlation between the age restrictions and the profitability. One finding is that a motion picture is likely to be more profitable if it is part of a franchise rather than a stand-alone movie. The obtained dependencies are big data-based and are statistically stable. This means the findings can be used predictively when analyzing the deliverables to avoid a box office flop; this means the paper presents a potential risk management tool for the motion picture industry.

The data collection tool (a parser) has numerous other applications, as it can collect market data on a wide range of uniquely-labeled, attribute-sharing products.

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