

INFLUENCE FACTORS ON BRAZILIAN BOX-OFFICE

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Cite as:

Mello Maria Fernanda, Shiraishi Guilherme, Reed Bergmann Daniel (2021), INFLUENCE FACTORS ON BRAZILIAN BOX-OFFICE . *Proceedings of the European Marketing Academy*, 50th, (94738)

Paper from the 50th Annual EMAC Conference, Madrid, May 25-28, 2021



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Abstract:

The Brazilian film industry is currently experiencing an opportunity for growth; more and more people in the country are going to the cinemas to watch both national and international films that are on display. Based on this potential for expansion and because of its economic importance, we sought to understand how a Brazilian film stands out to obtain the expected financial return in terms of the box office. To do so, we proposed the conception of a regression model, which verified the relations between the revenue of a film in theaters and the independent variables listed. Finally, the model presented six variables capable of explaining the film revenue: Screens, Popularity, Star Power, Distributor, Youtube Views and Twitter.

Keywords: cinema, box-office, regression

Track: International Marketing & Marketing in Emerging Countries

1. Introduction

In Brazil, the film industry has a growth trend. Between 2011 and 2018, there was an increase of 14% of cinema tickets sold, also the industry is a relevant part of the Brazilian economy, moving, in 2018, around U\$ 685 million in tickets (Ancine, 2018). Given its size and trend, it is essential to understand the factors and particularities that govern this industry in the country to better exploit its potential. Thus, the goal of this research is to study in an exploratory way the factors that involve the film industry in Brazil through the understanding of what are the variables that influence the financial success in the cinemas of a Brazilian film. As so, it is proposed to carry out a linear regression model on a database, prepared by the Authors, with 120 Brazilian films shown in Brazil between 2011 and 2018 through an adapted replication of the model proposed in Selvaretnam and Yang (2015)

2. Literature Review

2.1 Influence factors on box-office observed in Selvaretnam and Yang (2015)

According to Selvaretnam and Yang (2015) it is feasible to construct an empirical regression to describe the relationship between a film's revenue and its descriptive variables. In the study carried out by these authors, 78 American films were analysed with the variables:

$$\begin{aligned} \ln \text{Revenue}_i = & \beta_0 + \beta_1 \text{Star Power}_{1i} + \beta_2 \ln \text{Star Power}_{2i} + \beta_3 \ln \text{Star Power}_{2i}^2 + \beta_4 \ln \text{Screens}_i \\ & + \beta_5 \ln \text{Screens}_i^2 + \beta_6 \ln \text{Screens}_i^3 + \beta_7 \text{Reviews}_i + \beta_8 \text{Distributor}_i + \beta_9 \text{Ratings}_i + \beta_{10} \text{Sequel}_i + \\ & \beta_{11} \text{Awards}_i + \beta_{12} \ln \text{Budget}_i + \beta_{13} \ln \text{Budget}_i^2 + \beta_{14} \text{Genre}_i + \beta_{15} \text{Seasonality}_i + u_i \end{aligned} \quad (1)$$

However, it was found that there are particularities and opportunities for changing the model's descriptive factors. Not all variables in the equation 1 are relevant to the Brazilian reality and new ways of evaluating and disseminating films have become a reality since 2015 (Autran, 2009). In view of this challenge, an approximate set of variables was chosen that could be extracted from Brazilian databases without compromising the validity of the constructs used in the original model. The concepts and principles used in each of the variables presented for the study are detailed below.

Dependent Variable – Revenue: the revenue of a film is the variable that will be explored in this study, verifying its behaviour according to the input of the independent variables. It is the revenue, not the profit, that will determine whether a film was successful or not for two reasons: data on the profit of films is difficult to find in public sources, given that

a film's budget can be extrapolated and previous studies (Ravid, 1999; De Vany and Walls, 1999) used the revenue as a measure of financial success for films.

Star Power: on the Brazilian market, according to Donoghue (2014), actors who are known for performing on television programs are vital elements in the success of a Brazilian film, especially those who work on the Globo television network, which is dominant in tv audience in the country. However, there are divergences in the literature on the measurement of this variable since there is a lack of concrete and public information on the salaries paid to the actors, thus making it difficult to use the same method (Elberse, 2007).

Screens: it showcases the maximum number of screens occupied by a film during its period in theaters in Brazilian cinemas. It is common sense to think that the more accessible a film is to its viewers, the more viewers it will have (Selvaretnam and Yang, 2015).

Review: the presence of specialized critics is common in several types of industries, such as gastronomic, technological and literary (Basuroy et al, 2003). Their opinion aims to guide and influence the consumer about their purchase based on their experiences and knowledge on a given subject. Moon et al (2010) argue that specialized criticism has an even greater power of influence over the consumer during the week of the film's release when amateur reviews or opinions from the general public are almost non-existent.

Distributor: the distributor of a film is the company that holds the marketing rights (licenses) of those (Barone, 2008). In other words, it is the company responsible for negotiating with the exhibitors (cinema screens) how and when the film will be presented to the public. In Brazil, it is possible to observe an oligopolistic structure, in which the distributors Downtown / Paris and Imagem have a market share of 80.3% (Ancine, 2017).

Sequel: it is interesting to analyse whether a film is a sequel or not, because if this then it will already minimum consumer base (those who enjoyed the previous film) regardless of its quality and promotional communication. In addition, according to De Vany and Walls (1999), sequential films usually open in approximately twice as many screens as an average film. On the other hand, sequential films may not outperform the success of its predecessor due to the following factors: sequences tend to be more costly than their predecessor because the actors and crew renegotiate contracts based on the success of the previous film (Ravid, 1999) and because they are usually classified as worse than its predecessor due to the high expectations of viewers (Moon et al, 2010).

Budget: this variable shows how much a film has, in Brazilian Reais, to carry out its production, marketing and distribution actions. In theory, the bigger the budget, the more

resources the film will have to carry out promotional campaigns in order to make it more known and desirable to potential consumers (Ravid, 1999).

Rating: according to Steibel (2014), "the Rating is a regulatory process in which alerts are inserted in audiovisual works and games so that parents and guardians are aware of the possible influences on the formation of children and adolescents of the content to be consumed". This is an interesting variable to be addressed because a film that has a free rating, for example, can be watched by more people than a film that is only available to people over 18 years old.

Genre: as previous studies have identified (De Vany and Walls, 1999; Hixson, 2005), the genre of a film is an important factor for viewers in the purchase choice process.

Seasonality: It is possible to consider that depending on the time of year the film is released; it may be more successful because, for example, during national holidays more people will have free time to go to the cinema (Eliashberg and Shugan, 1997).

2.2 Government Funding (Subsidy)

In Brazil, the National Cinema Agency (ANCINE) is the regulatory body for cinematographic activity at the federal level, with the task of conducting the subsidy processes and regulating and supervising the cinema and audiovisual market in Brazil (Autran, 2009). These subsidies aim to promote Brazilian cinematographic activity so that the government act as a sponsor, providing income, that is, an increase in the budget, to Brazilian films. According to ANCINE (2019), this sponsorship is essential to stimulate and protect a sector that has a strategic nature for the country given its importance in the construction and affirmation of the national identity and its capacity for generating jobs and foreign exchange to Brazil.

1.2 Social Media Factors

In 2015 the internet became the second type of media most used by Brazilians, behind only television (Secretaria de Comunicação Social da Presidência da República, 2015). In this context, it is intended to assess whether the information that navigates on social media is capable of influencing the behaviour of consumers of Brazilian films through the following variables:

Popularity: IMDB is the most popular website in the world for movie research (IMDB, 2019). Due to its relevance, it is interesting to trace a variable that seeks to verify if

the films that are the most searched on IMDB are the same that consumers will eventually go to the cinemas to watch. The variable captured the data obtained in the MovieMeter ranking, made available by IMDB itself, which is precisely designed to indicate a high level of awareness and / or interest in the film on the website (IMDB, 2019).

Youtube Views: A movie trailer is a short video that seeks to present the plot and genre of it in order to arouse interest in the potential consumer, that is, it is a promotional marketing mechanism aiming to attract consumers to purchase the final product (Hixson, 2005). Of about ten billion videos watched online annually, movie trailers occupy the third place, after news and videos created by independent users, with the Youtube website being the main platform to watch these.

Facebook and Twitter: Kotler et al (2014) consider that social media are a force of great importance for the current marketing of companies, it is even on these platforms that the phenomenon of communication called word of mouth occurs, which is the sharing of information between users about their intentions or plans to buy a product and the sharing of experiences and / or attitudes after consumption between users (Rui et al, 2013). In the present study, we sought to analyse how users react on the social media platforms Facebook and Twitter.

3. Method

The database used in the present study was developed by the authors. Data on the box-office results of films in Brazil were found in the annual report “Listagem de Filmes Brasileiros Lançados” made available by the Brazilian Film and Audiovisual Observatory of the National Film Agency (OCA / ANCINE). From this report and looking for a representative sample of the market, 15 films were selected between 2011 and 2018, that is, 120 films in total, chosen randomly and stratified by revenue, which was divided annually between low, medium and high according to the distribution of the population.

The research carried out consisted of an econometric statistical analysis, carried out from a multiple linear regression analysis, which sought to establish the existence and intensity of relations between a single dependent variable and two or more independent variables, in order to enable the forecast for future cases (Gujarati and Porter, 2011). The method used for the regression was Ordinary Least Squares (OLS) because it is the same used in the base study by Selvaretnam and Yang (2015) and also it provides the smallest possible

sum of residues, in order to be the best unbiased estimator according to Gujarati and Porter (2011). For the result analysis, we focused on: the regression coefficients; the intensity of the association measured by the square of the adjusted multiple correlation coefficient (adjusted R^2); in the variables that appear to be important for the model under a 5% level of significance and in the reliability, measures presented by the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (BIC) (Gujarati and Porter, 2011).

For the comparison of two or more regression models, the model with the highest adjusted R^2 , lowest AIC and lowest BIC values will be preferable. For the purpose of individual adjustment of the independent variables, the linearization process proposed by Mosteller and Turkey, apud Cohen (2014), according to the original model by Selvaretnam and Yang (2015) was used.

4. Findings

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Revenue	14,1	14,5	2,59	7,48	18,6
Seasonality_1	0,242	0,00	0,430	0,00	1,00
Seasonality_2	0,242	0,00	0,430	0,00	1,00
Seasonality_3	0,217	0,00	0,414	0,00	1,00
Screens	4,67	5,06	1,59	0,00	7,06
Genre_1	0,400	0,00	0,492	0,00	1,00
Genre_2	0,408	0,00	0,494	0,00	1,00
Sequel	0,133	0,00	0,341	0,00	1,00
Budget	15,2	15,5	1,01	9,21	17,0
Star Power	168,	60,9	409,	1,61	3,63e+03
Rating	0,400	0,00	0,492	0,00	1,00
Distributor	0,442	0,00	0,499	0,00	1,00
Review	5,67	6,00	1,99	1,00	10,0
Popularity	48,2	27,9	79,7	0,0110	526,
Facebook	9,79	10,1	2,90	0,693	16,2
Youtube Views	12,0	12,1	1,77	7,40	15,4
Twitter	5,55	5,79	2,27	0,00	12,1
Subsidy	14,1	15,0	3,17	0,00	16,1

Table 1. Descriptive Statistics.

In order for the variables to be included in the regression model, it was necessary to check the degree of correlation between them, because in the presence of multicollinearity it

would be necessary to remove variables that were highly correlated with each other (values greater than or equal to 80%) to generate a model more parsimonious and with more accurate estimates. After this verification, it was identified that, a priori, all variables could be candidates to be included in the regression model

4.1 Regression results

The equation submitted was equation 2 and it provided the results shown on tables 2 and 3 bellow.

$$\ln\text{Revenue}_i = \beta_0 + \beta_1\text{Seasonality_1}_i + \beta_2\text{Seasonality_2}_i + \beta_3\text{Seasonality_3}_i + \beta_4\ln\text{Screens}_i + \beta_5\ln\text{Screens}_i^2 + \beta_6\ln\text{Screens}_i^3 + \beta_7\text{Genre_1}_i + \beta_8\text{Genre_2}_i + \beta_9\text{Sequel}_i + \beta_{10}\ln\text{Budget}_i + \beta_{11}\ln\text{Budget}_i^2 + \beta_{12}\text{Star Power}_i + \beta_{13}\text{Star Power}_i^2 + \beta_{14}\text{Rating}_i + \beta_{15}\text{Distributor}_i + \beta_{16}\text{Review}_i + \beta_{17}\ln\text{Subsidy}_i + \beta_{18}\text{Popularity}_i + \beta_{19}\ln\text{Youtube Views}_i + \beta_{20}\ln\text{Facebook}_i + \beta_{21}\ln\text{Twitter}_i$$

(2)

	<i>Coefficient</i>	<i>Standard Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	5,55398	5,64908	0,9832	0,3279	
Seasonality_1	-0,180569	0,261351	-0,6909	0,4912	
Seasonality_2	-0,109920	0,241210	-0,4557	0,6496	
Seasonality_3	0,106149	0,240609	0,4412	0,6601	
Screens	-2,39865	0,721811	-3,323	0,0012	***
Screens ²	0,657288	0,201075	3,269	0,0015	***
Screens ³	-0,0423647	0,0171911	-2,464	0,0154	**
Genre_1	-0,00731925	0,322263	-0,02271	0,9819	
Genre_2	-0,388266	0,308814	-1,257	0,2116	
Sequel	0,463356	0,256295	1,808	0,0737	*
Budget	0,809856	0,896481	0,9034	0,3685	
Budget ²	-0,0273410	0,0347788	-0,7861	0,4337	
Star Power	-0,00287415	0,00116168	-2,474	0,0151	**

Star Power ²	8,80072e-07	2,97758e-07	2,956	0,0039	***
Rating	-0,166216	0,177782	-0,9349	0,3521	
Distributor	0,389992	0,199609	1,954	0,0535	*
Review	0,0545179	0,0542374	1,005	0,3173	
Subsidy	0,0105392	0,0334701	0,3149	0,7535	
Popularity	-0,00734872	0,00181019	-4,060	<0,0001	***
Youtube Views	0,179233	0,0817737	2,192	0,0307	**
Twitter	0,291740	0,0557843	5,230	<0,0001	***

Table 2. OLS using observations 1-120 for equation 2.

Note: The Newey-West method was used to correct the errors of the regression model regarding their heteroscedasticity and their autocorrelation. Source: Elaborated by the Authors, 2019.

Mean dependent var.	14,10408	Std. Dev. Dependent var.	2,590436
R ²	0,901563	Adjusted R ²	0,881677
F (20, 99)	64,19449	value P(F)	1,24e-47
Log-likelihood	-144,8893	Akaike Information Criterion	331,7786
Schwarz Information Criterion	390,3160	Hannan-Quinn Information Criterion	355,5509

Table 3. Reliability measures for equation 2.

5. Discussion

The final regression model showed that Screens, Star Power, Distributor, Popularity, Youtube Views and Twitter explain satisfactorily the variations in the turnover of Brazilian films with a 95% confidence interval. As so, a Brazilian film will have more revenue when it is in more cinema screens, the main actor is popular on IMDB StarMeter ranking, the distributor is either Downtown / Paris or Imagem, it is well searched on IMDB, is well viewed on Youtube and is more commented by users on Twitter. These variables, therefore, that the agents of the Brazilian film industry, such as producers, distributors and exhibitors, must keep in mind when making a film.

First, we will compare the results of the model presented above with that of Selvaretnam and Yang (2015). The authors, unfortunately, did not provide the results of their

model under the criteria AIC and BIC nor the adjusted R^2 , having only the value of R^2 . From this perspective, the authors' model had 0.8982 while the present study had an R^2 of 0.901563. Both studies proved to be good predictors of a film's revenue. In addition, the variables found by Selvaretnam and Yang (2015) for the American cinema market are able to explain the behaviour of the Brazilian market when combined with the variables of Subsidy and social media. Secondly, the base study returned only 3 variables with a 95% confidence interval, “Star Power”, “Screens” and “Reviews”, being the first and the second also relevant in the present study, therefore showcasing similarities between American and Brazilian consumers. As considerations, the model was favorable when adding the variable Subsidy, because this way it managed to adapt to the Brazilian reality. And that, as discussed in the Theoretical Review, the internet is increasingly the means used by the population to access information, so that the insertion of digital variables was timely and should be listed in future studies.

Regarding the impacts of the present study, we have: the Authors built a database with a representative sample of Brazilian films; the demonstration that the American study approach could be imported into the Brazilian context; and the search for understanding and explanation about the film industry in Brazil, its particularities and the discussion of actions to be prioritized by it in order to obtain greater revenues for films. In relation to future research on the Brazilian cinema market, we would recommend: (i) the use of a larger or more updated database; (ii) inclusion of amounts spent on promotional actions; (iii) given that the Twitter variable was relevant, in addition to the tweet values per hashtag, one could also measure an analysis of the feelings of the tweets, to ascertain the type of comment about the film; (v) the use of another method to measure Star Power variable, as pointed out in the Theoretical Review, there is still no consensus in studies on how to measure this variable. Therefore, it is possible to realize that there is still a lot of space and ideas for future research on the Brazilian film industry.

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