

DETERMINING FACTORS OF CZECH FILM ATTENDANCE IN THE YEARS 2003–2017

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Abstract: *The paper analyzes the determining factors affecting Czech film attendance in the years 2003–2017 and places this topic into the context of the information asymmetry faced by film-goers. Using the regression (OLS) model and a unique population-level dataset (415 observations), the hypothesis of a positive relationship between film attendance and audience rating is confirmed. The increase in audience ratings by Czech-Slovak Film Database website's users by one percentage point is, ceteris paribus, associated with an increase in attendance by 1.8%. Factors which have proven to determine film attendance also include: specific genres; film sequels; casting of a popular actor, actress or director; the personality of the director Zdeněk Troška; the Czech Lion Awards; and a premiere in certain years. In the decision-making process of a viewer who faces information asymmetry one can rely on these determinants as economic signals and on viewer ratings as information from an intermediary.*

Keywords: *Film, Experience good, Signaling, Information asymmetry, User rating, Decision-making process.*

1. INTRODUCTION

This article will deal with a relatively little mapped film market environment. Its significance lies not only in the great popularity of film as a consumer good, but also in the economic nature of film as the so-called *experience good*, for which the consumer's benefit reached by consuming it is not known in advance. This creates an environment of information asymmetry in the film market. Economics is able to find the means and tools through which consumers cope with the information superiority of filmmakers - economic signaling and information provided by a third party (specifically, viewers' ratings of a given film by users of specialized Internet sites). The aim of this article is to confirm the importance of viewer ratings in the consumer's decision-making in selecting a given film through the econometric model, the ordinary least squares (OLS) method. Specifically, the attendance of all Czech films made in 2003–2017 will be modeled and a unique dataset will be used at the level of the population sample (415 observations). This model will also find other important determinants of the attendance of Czech films and factors that influence the decision-making process of the viewer.

2. LITERATURE REVIEW

The nature of film as an economic good is very specific, it is the so-called experience good - it is characterized in particular by providing the consumer with the benefit of an experience or an impression. At the same time, the consumer is only able to assess the benefit after the actual consumption and it can only be foreseen to a limited extent. This fact is also associated with unfavorable information asymmetry for consumers - all information about the quality of a given film and about the potential benefit it can bring to the viewer is held by the director (or producer) of the film. The filmmakers (especially high-budget filmmakers) also have market surveys,

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test screenings, etc. carried out before the film is released, which further increases their profits. (Basuroy, Desai, Talukdar, 2006) This situation is quite similar to that described by, for example, Akerlof (1970) in the car market - the consumer does not have enough information about the quality of the goods on offer and the situation leads to the displacement of quality goods by poor quality ones. Fortunately, however, there are tools to overcome this unfavorable situation and thus reduce the cost of choosing a car (or film) from the consumer's perspective. The two most important such tools are economic signaling and information provided by market intermediaries.

Film makers are motivated to send economic signals to consumers, as large-scale films in particular often represent hundreds of millions of dollars of investment with relatively high risk and uncertain returns (this environment is therefore risky for both sides). This context is mentioned, for example, by De Vany and Walls (1999) who mention, for example, hiring known actors as a strategy of producers trying to cope with this risk. This not only makes the film more accessible to the viewer, but also signals the high quality of the film, especially when hiring a known (i.e. expensive) actor or actress. High investment signals expectations of return and confidence in high attendance. (Moon, Bergey and Iacobucci, 2010) The *star power* is a commonly used variable in models, but the problem is its quantification, since performing an experiment (comparing the film with and without an actor) is practically impossible. Nevertheless, Levin, Levin and Heath (1997) confirmed, through a behavioral experiment, a significantly higher attractiveness of the film, which includes a well-known actor. Nelson and Glotfelty (2012) conclude that replacing an average actor with a movie star will result in an average profit gain of more than \$16,000,000. Desai and Basuroy (2005) also found that the influence of *star power* is not so significant in familiar genres and that success can therefore be achieved also with film from major genres, but with a worse cast. Since several previous researchers have used various popular actor charts as a proxy for the star power variable (e.g. Sawhney and Eliahsberg (1996)), a similar proxy is also used in this work, see below. A frequently used variable and determinant is the film's budget, which signals the filmmakers' belief in a return on their investment. High-budget filmmakers also often put these resources into the visual form of the film, which is even stronger in genres, such as animation and action films. This determinant was elaborated, for example, by Basuroy, Chatterjee and Ravid (2003) and other authors mentioned below. Film awards are another important signal – these allow the film to stand out among competing films of a given year and at the same time represent a source of information from mediators, i.e. well-known film critics, film academies, etc. Many researchers, such as Terry, Butler, and De'Armond (2011) use the award-winning variable (most often in the form of an Oscar) in their models. Last but not least, whether it is a sequel, prequel, remake or reboot can also be considered as signaling. Consumers are already familiar with the characters, story, motives, etc., so part of the fan base is already secured. According to Basuroy, Desai and Talukdar (2006) or Terry, Butler and De'Armond (2011), these factors, among other things, have a positive effect on attendance in the form of the film's higher budget. Moon, Bergey and Iacobucci (2010) also pointed out that sequels do generate higher attendance (or profits), but also lower viewer and critics ratings.

Information provided by a third party is the second tool for overcoming information asymmetry, especially reviews of given films (in print, on the Internet, etc.) – as mentioned, for example, by Elliot and Simmons (2008). At present, dedicated Internet sites are very important sources of these reviews; in addition to reviews, they bring together film fans and catalog information about movies, their filmmakers and actors. Therefore, these sites provide also additional information for potentially better-quality consumer decision-making in this market. The specific Internet

sites that provide these services and information include the American *Internet Movie Database* or, for example, *Rotten Tomatoes*. *The Czech-Slovak Film Database* is the most famous in the Czech Republic, and it served as the main source of data in this work. Moon, Bergey and Iacobucci (2010) point out the ability of these entities to reduce information asymmetry and get the signals mentioned to consumers. According to Basuroy, Desai and Talukdar (2006), these mediators generally weaken the strength of the signals - the impact of these reviews on filmmakers' profits is thus positive, according to the authors. A very beneficial by-product of reviews (both user and professional) is word-of-mouth; in this context, Basuroy, Chatterjee and Ravid (2003) examined whether users are in the position of predictors or influencers.

Considering the method used and the data used in the calculations below, the study by Terry, Butler and De'Armond (2011) should be mentioned in more detail. Based on the observations of 505 American films from 2001-2003, these authors explained the profit of the given film based on reviews (from the Rotten Tomatoes site), genres, sequel, season, Oscar nomination, budget, and number of cinemas. Using the least-squares method, the authors estimated that a 10% increase in the rating of the film on Rotten Tomatoes increases, *ceteris paribus*, the film revenues by \$7,000,000. Compared to children's films, adult films have a *ceteris paribus* loss of \$12,000,000, sequels and prequels generate \$18,000,000 more profit, and finally an Oscar nomination is, *ceteris paribus*, worth \$6,000,000. A more recent study by Pangarker and Smite (2013) also confirms the important positive role of the budget, film prizes and sequels in determining the film's profit, while attributing less importance to reviews, genre and premieres during the holiday season.

3. DATA

The regression model data include a total of 415 films (i.e., 415 observations) that were filmed and screened in the Czech Republic between 2003–2017 and were attended by at least 500 people. The primary source of data was the data of the Union of Film Distributors (UFD) and information obtained from the website of the Czech-Slovak Film Database (CSFD). Since 1992, the UFD has been associating all (17 in total) film distributors operating in the CR, and the CSFD is the largest Czech website, associating over 700,000 film fans. (CSFD, 2018a) In addition to reviews, the CSFD provides information on each filmmaker, the cast, etc., and its importance in the Czech environment is also evidenced by multiple victories in the prestigious Czech poll *Křišťálová lupa/Crystal Magnifier*. (Křišťálová lupa, 2018) This website is, therefore, an ideal example of an information channel that has the potential to both convey signals to consumers and to provide information as a market intermediary. Its role is thus consistent with the above-mentioned authors, such as Moon, Bergey and Iacobucci (2010) or Terry, Butler and De'Armond (2011).

The UFD provided mainly data on the endogenous variable – attendance of films (variable *attendance*) in the number of viewers. The main exogenous variable is the percentage rating of the given film on the CSFD website (variable *rating*), assuming a positive association of ratings and attendance (in line with Moon, Bergey and Iacobucci (2010) or Dellarocas, Neveen and Zhang (2005)). Dummy variables of film genres (*variables action, fairy/tale, documentary, drama, history, horror, comedy, romance and thriller*) served as control variables. The importance of genres is accentuated by, for example, Desai and Basuroy (2005). In addition, dummy variables *sequel* is included as control variable in the model (including all sequels, prequels, remakes, and reboots) in accordance with Basuroy, Desai and Talukdar (2006) or, for example, Terry, Butler

and De'Armond (2011). Other dummy variables (in accordance with Sawhney and Eliahsberg (1996)) include the presence of a popular actor, actress, or director (variables *actor*, *actress*, *director*) taken from the popular CSFD charts. The prerequisite is again a positive association in accordance with the works of Nelson and Glotfelty (2012) or Desai and Basuroy (2005). Also included in the model is the dummy variable *cesky_lev* representing the prestigious Český lev/Czech Lion film award (according to, for example, Terry, Butler and De'Armond (2011)). (CFTA, 2018). The source of all mentioned dummy variables, except for *cesky_lev*, was the CSFD website.

The popular Czech director Zdeněk Troška, who is known for making highly viewer successful but poorly rated films is a special case. This director thus represents a phenomenon of filmmakers who maintain a huge fan base (he is the 52nd most popular director on the Czech-Slovak Film Database website (CSFD, 2018b)) despite very negative reviews (the average rating of his films in the period under review is 30.7%). In addition, Troška's films are almost exclusively genre fairy tales and comedies, so if a significant association with attendance proves, the above-mentioned thesis by Desai and Basuroy will apply (2005) on the positive influence of certain genres overcoming even the negative impact of bad ratings. Therefore, the dummy variable *Troska* is included in the model. To abstract the influence of individual years, the model also includes dummy variables of individual years (*year_2003*, *year_2004* etc.) and summer months (*july_august*). The positive association of attendance with summer months can be assumed in connection with the opening of summer cinemas, ongoing summer holidays (higher attendance of children, etc.). This assumption is consistent, for example, with Sochay's (1994) article.

Unfortunately, important variables such as budget and advertising spending cannot be fully traced under the conditions of Czech cinematography and, therefore, could not be included in the model. This is because filmmakers are not obliged to publish this information and it is, therefore, only available for certain films and in an incomplete form.

4. MODEL, EMPIRICAL RESULTS

Using the dataset described above, the following theoretical regression model was estimated using the least squares method:

$$\begin{aligned} \log(\text{attendance}_i) = & \beta_0 + \beta_1 \text{rating}_i + \beta_2 \text{action}_i + \beta_3 \text{fairy_tale}_i + \beta_4 \text{documentary}_i + \beta_5 \text{drama}_i \\ & + \beta_6 \text{history}_i + \beta_7 \text{horror}_i + \beta_8 \text{comedy}_i + \beta_9 \text{romance}_i + \beta_{10} \text{thriller}_i + \beta_{11} \text{sequel}_i \\ & + \beta_{12} \text{actor}_i + \beta_{13} \text{actress}_i + \beta_{14} \text{director}_i + \beta_{15} \text{troska}_i + \beta_{16} \text{cesky_lev}_i \\ & + \beta_{17} \text{july_august}_i + \beta_{18} \text{year_2003}_i + \beta_{19} \text{year_2004}_i + \beta_{20} \text{year_2005}_i \\ & + \beta_{21} \text{year_2006}_i + \beta_{22} \text{year_2007}_i + \beta_{23} \text{year_2008}_i + \beta_{24} \text{year_2009}_i \\ & + \beta_{25} \text{year_2010}_i + \beta_{26} \text{year_2011}_i + \beta_{27} \text{year_2012}_i + \beta_{28} \text{year_2013}_i \\ & + \beta_{29} \text{year_2014}_i + \beta_{30} \text{year_2015}_i + \beta_{31} \text{year_2016}_i + u_i \end{aligned}$$

The model was estimated using robust standard errors (HC1 variant within the Gretl software) due to heteroscedasticity (see White's test in Table 1). The semi-logarithmic form was chosen because of a favorable interpretation, to mitigate the effects of marginal observations, and because of a non-normative statistical distribution. The model does not show unacceptable multicollinearity, on the 1% significance level the model is significant (see F-test) and the model explains 52.5% variability of the endogenous variable.

Table 1. Regression Model of the Attendance of Czech Films (2003–2017)

Model 1: OLS, using observations 1-415

Dependent variable: $l_attendance$

Heteroskedasticity-robust standard errors, variant HC1

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	7.79697	0.473737	16.46	<0.0001	***
<i>rating</i>	0.0179494	0.00620445	2.893	0.0040	***
<i>action</i>	0.841727	0.788373	1.068	0.2863	
<i>fairy_tale</i>	0.689909	0.280634	2.458	0.0144	**
<i>documentary</i>	-0.788090	0.310352	-2.539	0.0115	**
<i>drama</i>	-0.443173	0.219384	-2.020	0.0441	**
<i>history</i>	0.594277	0.352030	1.688	0.0922	*
<i>horror</i>	-0.607343	0.589885	-1.030	0.3038	
<i>comedy</i>	0.974460	0.203482	4.789	<0.0001	***
<i>romance</i>	0.514566	0.264744	1.944	0.0527	*
<i>thriller</i>	0.453931	0.330221	1.375	0.1701	
<i>sequel</i>	1.21849	0.199955	6.094	<0.0001	***
<i>actor</i>	0.503446	0.174282	2.889	0.0041	***
<i>actress</i>	0.888992	0.159581	5.571	<0.0001	***
<i>director</i>	0.634945	0.167481	3.791	0.0002	***
<i>troska</i>	1.29369	0.366394	3.531	0.0005	***
<i>cesky_lev</i>	0.348669	0.179143	1.946	0.0523	*
<i>july_august</i>	0.0626857	0.236482	0.2651	0.7911	
<i>year_2003</i>	0.879740	0.402476	2.186	0.0294	**
<i>year_2004</i>	1.11513	0.373100	2.989	0.0030	***
<i>year_2005</i>	0.602906	0.394215	1.529	0.1270	
<i>year_2006</i>	0.718635	0.419119	1.715	0.0872	*
<i>year_2007</i>	1.16753	0.393729	2.965	0.0032	***
<i>year_2008</i>	1.54361	0.339074	4.552	<0.0001	***
<i>year_2009</i>	0.748287	0.319117	2.345	0.0195	**
<i>year_2010</i>	0.889944	0.419595	2.121	0.0346	**
<i>year_2011</i>	0.575520	0.350571	1.642	0.1015	
<i>year_2012</i>	0.344403	0.361450	0.9528	0.3413	
<i>year_2013</i>	0.260630	0.393948	0.6616	0.5086	
<i>year_2014</i>	0.00590467	0.338818	0.01743	0.9861	
<i>year_2015</i>	0.145579	0.388420	0.3748	0.7080	
<i>year_2016</i>	0.299879	0.348256	0.8611	0.3897	

Mean dependent var	10.36750	S.D. dependent var	1.858948
Sum squared resid	679.8600	S.E. of regression	1.332326
R-squared	0.524791	Adjusted R-squared	0.486328
F(31, 383)	25.19991	P-value(F)	7.20e-74

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 69.358

with p-value = $P(\text{Chi-square}(32) > 69.358) = 0.000143014$ **Source:** own processing

The main hypothesis is confirmed – audience rating is positively associated with higher attendance of a given film. The increase in audience ratings by Czech-Slovak Film Database users by one percentage point of the ratings is, *ceteris paribus*, associated with an increase in attendance

by 1.8%. Consequently, the conclusions of the above-mentioned works were confirmed, even in the Czech film environment. User ratings on the Czech-Slovak Film Database website really have great potential as a source of important information for consumer decision-making in the film market, and it is able to reduce his/her film costs for the selection of a given film and thus overcome information asymmetry. However, the issue of endogeneity and the unclear direction of causality should be taken into account, see e.g. Basuroy, Chatterjee and Ravid (2003).

Comedy turned out to be the genre most positively associated with attendance (*ceteris paribus* by 97.4% higher attendance), while documentary film was the most negatively associated (*ceteris paribus* by 78.8% less attendance). Thus, the advantage is for „simpler” genres and relatively traditional genres in the Czech environment (comedy, fairy tale, etc.). The assumption of the study by Desai and Basuroy (2005) was therefore confirmed. Among other favorable factors associated with higher attendance are sequels (*ceteris paribus* associated with 121.8% higher attendance) in accordance with studies by Pangarker and Smite (2013) or Terry, Butler and De’Armond (2011), as well as celebrities – actors, actresses or directors. The best choice here is the casting of a well-known actress, which is, *ceteris paribus*, associated with 88.9% higher attendance. Thus, the general assumptions of Nelson and Glotfelty (2012) and Desai and Basuroy (2005) were confirmed. A positive association was also shown in the case of the Czech Lion Award (in accordance with Terry, Butler and De’Armond, 2011), while the summer months, contrary to Sochay’s work (1994), proved to be insignificant. However, the positive association of attendance and particular years was confirmed, especially the period associated with the financial crisis (approx. 2006-2010).

The determinant of attendance in the form of the work of director Zdeněk Troška has proved to be undoubtedly significant – his films are, *ceteris paribus*, associated with a 129% higher attendance. An important part of this success can certainly be attributed to his popularity and the popularity of his films and motifs. At the same time, however, in his case this may be a very specific form of signaling, as Troška is very consistent in his work – both in terms of themes, cast and motifs, and in the opinions of viewers and expert critics on his work. His films are thus very easily predictable and practically do not undergo any dynamic development in time. As a result, in an environment of information asymmetry and a relatively high consumer cost related to film selection, Troška’s direction creates a very clear and consistent signal that helps consumers very easily create expectations about the film they are about to see. This significantly “cheapens” the consumption of Troška’s films and may consequently make them more affordable for consumers. However, it is very difficult to verify this hypothesis empirically; therefore, so far it is only speculation.

5. CONCLUSION

This article, based on the regression model (least squares method), confirmed the importance of the association of audience ratings and the attendance of Czech films. This was done on the basis of a dataset of all original Czech films made and presented between 2003–2017. A one percentage point higher rating on the Czech-Slovak Film Database website is related to, *ceteris paribus*, the 1.8% higher attendance of a given film. Audience ratings thus have the ability to provide the viewer with valuable information, reduce the cost of selecting (or consuming) films, and thus overcome information asymmetry (resulting from the nature of the film as the experience good). The Czech-Slovak Film Database website works as a means of transmitting economic signals (e.g. in the form of information about the film genre, the cast, etc.). In the Czech

cinematography environment, the findings of foreign studies – e.g. Basuroy, Desai and Talukdar (2006) or Moon, Bergey and Iacobucci (2010) – were confirmed, with the difference that these studies examined the impact of reviews by professional critics (unfortunately, such data is not available in the Czech environment).

Other significant positive determinants of the attendance of Czech films proved to be the fairytale, historical film, comedy and romantic film genres, sequels (or prequels, remakes or reboots), the presence of a favorite actor, actress or director, the production of director Zdeněk Troška, the Czech Lion Award, and finally, the screening period in certain years (especially during the financial crisis). The conclusions are again in line with the international studies by Desai and Basuroy (2005), Terry, Butler and De'Armond (2011), Nelson and Glotfelty (2012) and the other works mentioned above. Documentary and drama genres proved to be negative factors, while action film, horror and thriller genres proved to be insignificant (among other things, due to the absence of a tradition of these genres in the Czech film environment), and screening in the summer months. The significant positive factors stated therefore have the potential to fulfill their signaling function in the film market as described in the first part of the article. This article also discusses (though only theoretically) the ability of director Zdeněk Troška to reduce the cost of consumers' film selection through consistent (though in terms of audience ratings, relatively poor quality) production. It is possible to consider that such consistent production in fact raises stable expectations of viewers and thus helps them to overcome information asymmetry through these signals.

Future work and analyses on this topic (not only in the Czech environment) could make the results more accurate through better data, including more variables (especially budget and advertising costs, see Basuroy, Chatterjee and Ravid, 2013), or use time series analysis to exclude endogeneity. (see, e.g., Eliashberg and Shugan, 1997). Researchers (e.g. behavioral economists) could also confirm or refute the mentioned „Zdeněk Troška effect,” or find other similar filmmakers.

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