ASSESSING THE IMPACT OF PUBLIC DIRECT INVESTMENT IN RUSSIAN FILM INDUSTRY

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Introduction

The Russian film distribution market has experienced many difficulties in recent years. In 2019, according to the Cinema Fund, the share of domestic films was no more than 23

This study proposes a new approach to assessing direct government support for cinema in Russia. In conditions of poor development of this topic in scientific publications and limited data, it can help government authorities adjust their economic policies towards achieving their goals in cinematography.

In the presented research work, the object of research is Russian feature films financed by the Cinema Fund, as well as films not financed by any government agency. The subject of research is the differences between such films in quantitative (box office) and qualitative (viewer ratings) indicators. The main goal is to assess the effect of direct investment from the Cinema Fund on the Russian film industry. To achieve the goal, the author has the following tasks:

1. carry out an analysis of theoretical and empirical articles to identify approaches to econometric modeling of government policy in the field of cinema and select explained variables suitable for different government goals;
2. carry out a comparison of financed and unfinanced films to overcome problems of unbalanced sampling;
3. collect data on the factors influencing the success of a film to build an empirical model;
4. obtain econometric estimates, formulate conclusions about the effect of measures to support cinema in Russia and make recommendations to the authorities.

The work is organized as follows:

- Chapter 1 provides a review of the literature on the modeling of public policy in cinema, and also presents an analysis of the structure of Russian support measures;

- Chapter 2 provides the primary analysis of the statistical data used and the results of the matching model;

  Chapter 3 provides an econometric assessment of the effect of government funding. In conclusion, the main results and conclusions of the work are presented.

1 Approaches to analyzing government support for cinema

This chapter provides an analysis of the reasons, methods and purposes of government financial support for cinema, including in Russia. Analysis of the results of testing the effect of such support in foreign literature allows the author to select explained and explanatory variables for econometric modeling.

1.1. Review of literature on international experience of government financing of film projects

1.1.1 Reasons and methods of government intervention

There are several economic reasons for the presence of government intervention in the film industry. Maloney, Paolini and Pulini [1] highlight the following.

First, cinema can be considered a meritorious good. Meritorious goods are goods or services, the consumption of which, as a rule, brings great benefit to society and at the same time falls outside the freedom of private choice and preference. The absence of government intervention, where the authorities in this case most often take on the role of a more informed agent about the usefulness of the good and subsidize or directly provide it, can lead to insufficient production of such a good/service and, accordingly, society does not receive positive externalities. Common examples of such benefits include primary school education and vaccination. Films are cultural products and are recognized to bring benefits in the form of aesthetic pleasure and spiritual development.

Secondly, additional positive externalities are obtained through the promotion of education, which is often required by the state when participating in financing. Fiction films help to develop critical thinking among schoolchildren; through historical dramas they can get acquainted with past events. Documentary films can educate even adults.

Thirdly, the state stimulates the production of films at a more social level - to lay down elements of affirmation of national identity. This brings additional social and cultural benefits to society.

State support measures are:

- indirect (providing tax benefits, discounts and distribution assistance);
- direct (grants, investments).

1.1.2 Goals of public policy and means of measuring them

As a rule, the state sets itself several goals when participating in film financing. McKenzie, Rossiter and Shin [2] name the following as the main ones:

1. Help in generating income for business and the economy. Here, first of all, we are talking about the "recoupment" of the film. For example, by helping with the production budget, production studios receive a high-quality product and positive profits while continuing to supply films to other market participants - distribution companies, cinemas and audiences. Those, in turn, maximize profit or utility.

2. Informing the audience, entertaining them, educating them and inspiring them.

3. Cultural impact on the population - development of understanding of themselves, their identity and national interests.

4. Development of craft skills, including work on projects of various sizes.

5. Assistance in competing in the domestic market with foreign analogues and popularizing national cinema abroad.

It is important to understand that the significance of a funded project in the opinion of the state may not intersect with the success of its distribution, therefore, in order to assess the policy being pursued, academic research suggests considering different explained variables for different purposes.

The first of the above goals is most easily quantified in terms of box office receipts. They are the main factor that determines the financial success of a film at the box office. McKenzie and Wahls [3] also suggest using the first week of box office receipts because they believe that the largest portion of cash generated occurs during this time and provides a strong signal of expected final earnings. This approach may make it possible not to wait until the end of distribution to use a film in the sample, because in the results of [3], there was no difference in scores for total and weekly indicators. In more recent work, McKenzie, Rossiter and Shin [2] took a simplified financial return on investment (ROI) ratio - the ratio of revenue (collections) to the production budget. This indicator, according to the authors, is closest to the concept of "recoupment" of a film.

For other purposes, variables for understanding the quality of a film are more suitable, i.e. how good a product the state financed. The extent to which a film is culturally understood and well received by the public in all of the above works is reflected with
using ratings from viewers and critics on IMBD or other services. These ratings also reduce the uncertainty of those who have not yet gone to the cinema, forming an opinion on how much the film is worth seeing, presumably influencing the popularity of the film, its value, etc. In addition, the number of nominations and awards at domestic and foreign cinemas was used to assess cultural impact. awards and festivals.

To understand the global impact of a financed and released film, you can also use the number of awards and participation in festivals, but then exclusively foreign ones. The authors of [2] in their study for Australia suggested using the number of countries in which the film was shown. They have identified three markets for themselves - domestic, US and UK.

1.1.3 Approaches to modeling the effect of government funding

In the reviewed literature, the assessment of the role of government funding mainly occurs in the following way: a set of explanatory variables is taken, among which is the fact of funding and/or its volume, and regressed on one of the explained variables listed in paragraph 1.1.2.

According to the classification of Genssle, Budzinski and Astakhova [4], sets of explanatory variables for the success of a film can be divided into three types.

First, there are brand factors. These include the popularity of the film's actors and directors. The use of famous personalities in the filming process serves as a signal to consumers and investors about the quality of the product due to the likely presence of past good experiences from watching other films featuring these people. Additionally, the superstar effect can increase demand for a film through the network effect—where the utility of a good or service increases based on the number of consumers. This also includes a sign of a sequel and a franchise - that the film is the beginning or continuation of one story. This appears to reduce uncertainty about the minimum quality expectations for a work. Finally, the action and comedy genres send lighter messages than documentaries or biopics. Consumers are more likely to like their favorite genre because... it suits their preferences better. Genres that are popular with a wide audience have a positive impact on box office receipts.

Secondly, there are rental factors. This is the production budget and the number of copies of the film for cinemas. Increased investment seems to increase expectations for the quality of the film. Next is the seasonality of the film's release. In progress

[4] confirmed for Russia that in 2017, the proximity of a national holiday was associated with greater cinema attendance.

Third, evaluation-related variables. These include the number and significance of average critic ratings and audience ratings. At the same time, critics can either be reliable experts for the masses and stimulate collections with good reviews from them, or they can be too elitist and differ from general preferences. Among other things, this includes the so-called "media presence". Extensive media coverage of an upcoming film (particularly advertising expenditures) results in better first-week box office receipts, slower decline in sales, and a longer theatrical run for the film.

According to the results [4] on the 100 highest-grossing foreign films shown in Russia in 2012-2016. The authors found a positive effect and significance on the fame of actors/directors, sequel, budget and copies, audience ratings and presence in the media space, as well as adventure films. Foreign criticism had a negative significant effect. Produced

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Returning to public funding, in study [2] the basic model is formulated as:

$$Y_i = \alpha I_i + X_i'\beta + \varepsilon_i, \tag{1.1}$$

where i is the unique index of the film, Y_i is the selected explained variable, I_i is direct investment in the film from the state in two forms - a dummy variable for the presence of investment and investment in monetary terms relative to to the maximum investment of the film's release year (to reflect inter- and intra-year differences), X_i are control variables. The ratio of box office receipts to budget (ROI), IMBD ratings from viewers and critics, the number of screenings at festivals, and the number of countries for screening were selected as explained variables in different specifications (for the last two variables, a probit model was considered). Budget, year of release of the film, genre, and age rating of the film were taken as control variables. According to the authors, there could be other variables that may play a role in determining the success of a film (such as advertising). But in this study, only indicators observed by the financing agent during the investment decision were selected, i.e. before the production of the film, to make the analysis easier to understand and not be able to deal with the omitted variable problem due to missing data.

The results of model (1.1) indicate that new local government policies in Australia after 2008 (1997-2017 sample) was to increase the number of films financed by reducing the amount for each individual project, had a significant and positive effect on all stated explained variables, in contrast to the previous policy.

Earlier work [3] on Australian film data from 1997-2007. defined the second variable of direct financing as the product of a dummy variable and the amount of investment; also included the explanatory variables of the presence of a star, a sequel, and the number of copies, but no significant results were found for the policy. At the same time, other models from this work involving foreign films showed that an important condition for a strong increase in the quality of the model (increasing the information criterion R^2) and a significant variable is advertising costs (there were no data for domestic films), but specification to account for the possible endogeneity of this variable became an important statistical issue. The solution was to use the generalized method of moment and set an equation for advertising costs with the addition of information about the distributor.

A slightly different assessment method was demonstrated in article [1], with special attention to the genre features of Italian films of 2002-2011. The researchers used a panel approach, followed by grouping observations by year and comparing the results obtained by running a random and fixed effects model:

$$\ln \text{revenue}_i = \beta_0 + \beta_1 \ln \text{subsidies}_i + \beta_2 \text{comedy}_i + \beta_3 \text{drama}_i + \beta_4 \text{thriller}_i + \varepsilon_i \tag{1.2}$$

where revenue is film receipts, subsidies is the amount of investment from the state, the rest is film genres and error. There is also a specification with a division of genres into subsidized and non-subsidized.

Then, for such models, fixed effects were selected using the Hausman test and found:

1. negative effect on collections with government funding;
2. the greatest demand is for comedies, only then for thrillers and dramas;
3. there is a clear upward difference in the coefficients of unfinanced film genres, which emphasizes their greater impact on income;

The authors recommended, despite the success of the comedy, to distribute government resources towards thrillers and dramas, which could both have a positive effect on box office receipts and play a greater educational role.

Also [1] decided to identify the impact of subsidies on the quality indicator of films, the number of awards, with the addition of another explained variable: festivals
(participation in festivals):

$$\text{awards}_i = \beta_0 + +\beta_1 \text{festivals}_i + \beta_1 \ln \text{subsidies}_i + \beta_1 \ln \text{subsidies}_i + \beta_2 \text{comedy}_i + \beta_3 \text{drama}_i + \beta_4 \text{thriller}_i + \varepsilon_i$$

Again, there is a specification with a division of genres into subsidized and non-subsidized. Then the results were as follows:

1. participation in festivals does not lead to more awards;
2. with financing the likelihood of receiving a reward decreases;

   Dramas receive the most awards.

In general, all works noted the difficulty of working with this topic due to the lack of data on domestic financed films and the limited development of the field.

1.2. Analysis of the structure of the Russian system of measures to support Russian cinema

According to the main Federal Law of Russian legislation of 1996 “On state support of cinematography of the Russian Federation” [5], cinematography is an integral part of culture and art in our country and must be preserved and developed with the support of the state. Regulation can only occur within the framework of national films. The film is recognized as national:

1. with a producer of Russian citizenship and foreign investments no more than 50%;

2. with 70% Russian crew and authors;

3. with 50% works of Russian production and distribution organizations;

4. filmed in one of the languages of the nationalities of Russia and without the use of obscene language.

The main implementers of government control and support measures at the moment are the Ministry of Culture, the Federal Fund for Social and Economic Support of Domestic Cinematography (abbreviated as the Cinema Fund) and the Internet Development Institute. The main goals of state policy in the field of cinematography in accordance with the law [5], as well as orders [6] and resolutions [7] on the activities of relevant bodies include:

1. providing conditions for the creation of quality films that meet national interests;

2. popularization of national films in the Russian Federation and abroad.

The tasks of these bodies can be called:

1. Adoption of laws and legal acts in the field of cinematography.

2. Providing state support for films, including state financing (in whole or in part) of production and distribution. In this case, financing should not exceed 70% of the estimated cost of its production. The amount can reach up to 100% if these are debuts of graduates of specialized universities, non-fiction documentaries, including popular science films, and unique original animated films.

3. Promoting them at international film festivals and film markets, holding film events aimed at promoting domestic cinema.

Ensuring the availability of cinematography products and services for the population, increasing the supply of cinemas to the population, introducing digital film screening technologies.

In the Ministry of Culture, since 2008, cinematography affairs have been handled by the Department of Cinematography and Digital Development. The focus of support is on theatrical debut, documentary, author, author-animated and popular science films. To receive direct financial support, you need to submit an application and then defend yourself at an open pitching meeting in front of an expert council. Experts, as a rule, are people from this field - producers, distributors, screenwriters and directors. In addition to the general support measures listed, the Ministry issues national film certificates and distribution certificates, creates various registers of culturally significant films, and also supervises other government bodies in this area.

The Cinema Fund also provides support for distribution films through a pitching procedure, but to the so-called leaders of domestic film production, the list of which is determined according to its own methodology [8]. A legal entity is recognized as the leader of domestic film production in the current year based on the following criteria met over the last 5 full years:

1. the number of tickets sold for screenings in cinemas;
2. the company's operating period is from 3 years;
3. availability of at least 2 national films at the box office;
4. absence of unfulfilled obligations to the Cinema Fund.

The Cinema Fund is actively helping the Ministry of Culture to ensure a phased transition to domestic software, hall equipment and a unified development environment.

Since 2020, the Internet Development Institute has been mainly involved in supporting TV series on boarding platforms. In this case, competitions are announced for specific
directions (debut project, content for young people, etc.) with requirements for the content audience, number of views, project implementation period, etc. A prerequisite is that the project, in addition to its own platform, must also be distributed on social networks, instant messengers or video hosting sites.

In 2022, according to information from the Cinema Fund, the Institute received 76% (19 billion rubles) of the total budget funds for direct financing and supported 776 projects versus 111 from the Ministry of Culture and the Cinema Fund. Although the Institute's projects are not the object of study of the presented work, the popularity of the digital direction and its likely success on the part of large online cinemas greatly undermines confidence in the financing of film distribution. Indeed, the main goal of the Cinema Fund is to increase competition for domestic films, to increase the market share of national films, however, according to Table 1.1, the return on the films it finances has never exceeded 60%, and for the last four years this figure has been below 40%. It can be noted that the Cinema Fund on average finances more than 70% of the budget on a non-refundable basis, although it seems that the field of cinema with a larger share of non-refundable funds should be dealt with by the Ministry of Culture. In turn, Skobelev [9] connects the fact of non-recoupment with the affiliation of the organizations that received support with the Fund, as well as the inconsistency of some aspects of the formation of the list of leaders with global standards (less weight goes to awards, more weight to high attendance in cinemas).

Table 1.1 - Summary statistics for projects financed only by the Cinema Fund

Year	Qty projects, PC.	Sum financing, billion rubles	Share irrevocable financing, % of the budget	Payback (fees - budget >0) ,% projects
2015	33	1.9	78%	42%
2016	38	4.0	74%	39%
2017	30	3.4	78%	57%
2018	25	2.3	73%	56%
2019	26	3.2	71%	35%
2020	21	3.4	77%	38%
2021	24	3.2	81%	21%
2022	26	3.7	90%	23%

Conclusions

Based on all of the above, we can come to the following conclusions for the chapter.

Firstly, the main reasons for the need for government intervention in the film market is the creation of additional social and educational externalities for society, and the main goal of such a policy is the creation of high-quality and competitive films that meet national interests.

Secondly, the structure and statistics of the Russian market revealed the problematic nature of government assistance to film distribution. The literature recommends further evaluating the effect of such assistance using several indicators - fees, audience ratings, awards, etc.

Thirdly, to explain these indicators, it is also worth taking into account the factors of budget, number of copies of the film, fame of the film crew, criticism and advertising.

2 Research methodology and data used

In [2], when comparing statistics of box office receipts and budgets for groups of financed and unfinanced films, they noted that, firstly, they are very unbalanced. Basically, most of the film distribution is financed by the state. Secondly, it seems that due to the pitching procedure, the state can initially select the most promising projects that are more likely to pay off and be liked by the public, leaving in the selection of unfinanced films that are strongly inferior to them. These facts could, to some extent, influence the modeling results in the direction of positive effects from government policy on the chosen explained variables (collections, ratings, festivals).

In addition, if the sample for comparison with financed Russian projects contains many auteur films with little private investment, this may distort the results of the study. To overcome this imperfection, the current work proposes the following approach:

1. Select pairs of films financed by the Cinema Fund and not financed by the state in principle, which at the time of making an investment decision on them (by the state or private investors) according to the list of factors proposed in [2] known at that time - year of release, production budget , genre, age rating - are as similar as possible to each other.

2. Based on the differences in the subsequently selected explained variables for these pairs, using an econometric approach, determine the effect of government participation in financing. If possible, check the influence of other factors.

This approach has already been used to search for a premium in the yield of green bonds [10]. This chapter will implement the first point of this approach, as well as the selection and initial analysis of a set of factors for the selected films.

2.1. Formation of pairs of financed and unfinanced films

Propensity score matching (PSM) was chosen as the matching method. This methodological approach has been widely used in the financial literature to compare different types of financial instruments. The basic idea of PSM is that an observation from the control group is matched with a similar one from the test group according to the propensity score.

The propensity score is the conditional probability that an observation will be assigned to the control group (for example, that a film will be publicly funded). The general procedure for this study is described as:

1. Propensity score estimation using logistic regression:

$$e\left(x_i\right) = P\left(z_i = 1 \mid x_i\right) \tag{2.1}$$

where $i-$movie; $z_i = 1$ are films that received funding from the Cinema Fund, and $z_i = 0$ are films that did not receive any support; P - probability; x_i - factors; $e\left(x_i\right)$ - propensity scores from 0 to 1, because these are probabilities. Films from 2015-2019 were taken. (according to the author of the current study, since 2020 there have been many structural changes due to the shocks of covid restrictions and the departure of all major foreign competitors from the market) with available information on the production budget, genre (cartoon, comedy, thriller, other) and age limit $(0-6+, 12+, 16+, 18+)$. All these factors are proposed in [2]. The data sources were the UAIS database [11], Film Distributor Bulletin [12], and Kinopoisk [13].

2. Finding one-to-one pairs of funded and unfunded films on the propensity score using nearest neighbor matching, which requires a specification of

the distance between the control and test groups to determine the closest points to each other. In this case, these are propensity probabilities. Propensity score matching defaults to iterate in descending order from the highest propensity score, allowing movies that have the hardest time finding close matches to find the pair first.

3. Ensure that factors are balanced between control and test groups according to propensity scores. For this purpose, graphs of distributions and standardized differences are used. If the samples are not balanced, return to steps 1-2.

Before the matching, 140 films financed by the Cinema Fund and 124 films without funding were selected. As a result, 91 pairs of similar films were formed. Examples of pairs formed are given in Table 2.1. To determine how well the pairs were matched, Figure 2.1 and Figure 2.2 are presented.

Figure 2.1 shows the distribution of the propensity score in groups in order - unmatched test observations, matched test observations, matched control observations and unmatched control observations. Can

Table 2.1 - Examples of pairs of selected films after applying matching

FC	Name	Year	Budget, million rubles.	Genre	Rating
1	8 new dates	2015	77.40	Comedy	12+
0	8 best dates	2016	71.17	Comedy	12+
1	Policeman from Rublyovka. New Year's				
0	mayhem	2018	71	Comedy	16+
FC is a sign of financing by the Cinema Fund		2018	71	Comedy	16+

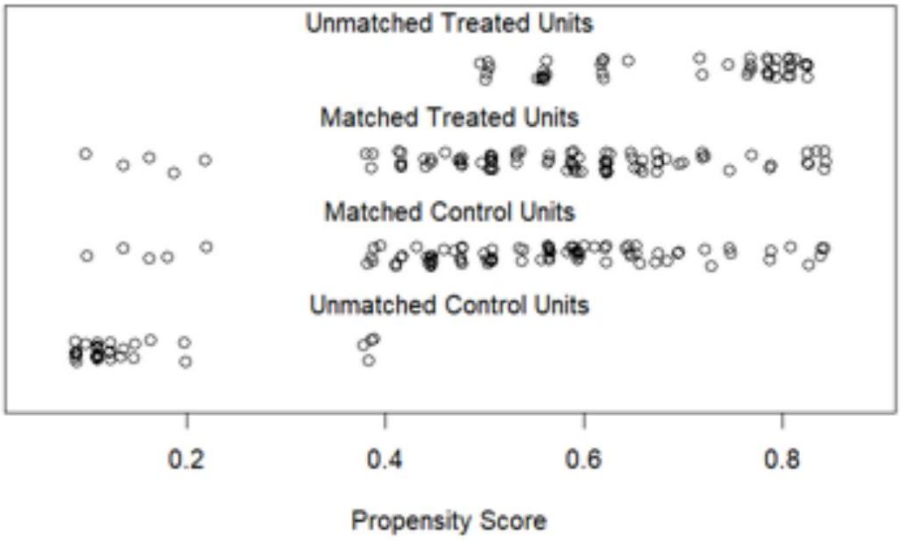

Figure 2.1 - Distribution of propensity scores in matching groups

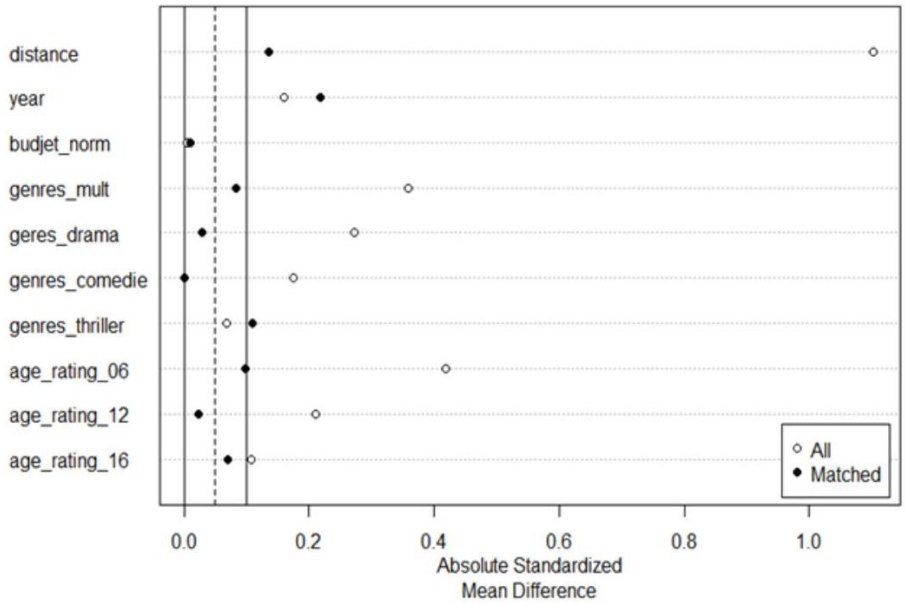

Figure 2.2 - absolute differences in standardized means for factors in the general and matched samples
note that the selected control and test variables are propensity matched.

Control variables that did not find a pair have a high propensity, while test variables that did not find a pair have a low propensity. This is expected, because this indicator measures the probability of hitting the control.

Figure 2.2 shows the absolute differences of standardized means (SMD, from English standardized mean differences) by factors. For almost all indicators, SMD decreased and amounted to less than 0.1. SMDs greater than 0.1 are usually a sign of imbalance between the experimental and control groups.

2.2 Selection and primary analysis of data for selected films

Table 2.3 provides a detailed description of the selected variables for the 182 films remaining after the match.

Table 2.1 - Detailed description of selected explanatory and explanatory variables

Type variable	Title	Description	Source
Explainable	ROI	Russian pine forests in rubles/production budget in rubles	
	rating_kp	Ratings of Russian viewers on Kinopoisk (from 1 to 10)	
Explanatory	support_share	Share of the budget financed by FC	UAIS ,Bulletin Film distributor , Kinopoisk
	is_sequelorprequel	Dummy variable whether the movie is prequel/sequel, i.e. part of the franchise	
	votes_rating_kp	Number of audience ratings on Kinopoisk	
	waiting_kp	Waiting rating for the Kinopoisk film before it output to screens (from 0% to 100%), proxy to fame of the film and advertising	
	votes_waiting_kp	Number of ratings of expectation rating	
	rating_actor	The sum of Google queries of the first 3 actors from the cast for the previous year, proxy for fame actors	
	rating_director	The sum of Google queries of the first director from caste for the previous year, proxy for director's fame	
	has_award	Dummy variable whether the film was nominated "Nicky"or "Golden Eagle"	
	has_festival	Dummy variable whether the film was nominated "Kinotavr"or "MIFF"	
	week	Number of the first week of rental, proxy for seasonality of the number of viewers depending on holidays	
	year	Year of the film	

In the role of a quantitative explained variable as an indicator of payback For a film, it is proposed to take an analogue of the simplified financial return on investment (ROI) coefficient, equal to the ratio of income (collections) to the production budget, and in the role of quality - audience ratings. For the remaining proposed measures from Chapter 1, no data were found for the Russian market. Of the entire set of possible explanatory factors from Chapter 1, only those from Table 2.3 were available. Monetary variables were adjusted for inflation and exchange rates.

Table 2.4 presents statistics on the selected indicators in the two groups of films. The ROI indicator is median lower for unfunded projects than for funded ones, while for the former, ROI is more volatile and can reach twice as high. The audience rating and expectation rating are approximately the same for the two groups, but the number of votes is on the side of the Cinema Fund films. 14 and 15 festival awards for financed and unfinanced films, respectively. It seems that the overall samples are very similar even in terms of success rates, which become known only after the investment. An econometric assessment needs to be made.

Table 2.3 - Statistics on selected indicators in groups of financed and unfinanced films

	Funded by FC				Unfunded			
	Median	Art. deviation	Min	Max	Median	Art. deviation	Min	Max
ROI	0.73	1.56	0.00	9.73	0.19	3.43	0.00	21.11
rating_kp	5.80	1.40	0.00	7.58	5.63	1.71	0.00	8.24
support_share	0.59	0.18	0.01	0.79	0.00	0.00	0.00	0.00
is_sequelorprequel	0.00	0.46	0.00	1.00	0.00	0.40	0.00	1.00
votes_rating_kp	26798	45086	283	204 358	9202	34091	21	148 872
waiting_kp	78.61	24.36	0.00	97.35	72.98	33.69	0.00	96.24
votes_waiting_kp	2361	5982	120	41619	835	2818	1	17332
raiting_actor	1507	1453	0	7023	954	1369	0	5787
raiting_director	0	353	0	2366	0	313	0	1337
has_award	0.00	0.25	0.00	1.00	0.00	0.23	0.00	1.00
has_festival	0.00	0.28	0.00	1.00	0.00	0.31	0.00	1.00
week	25.00	17.61	0.00	53.00	31.00	16.79	0.00	51.00
year	2016.00	1.39	2 015.00	2 019.00	2017.00	1.35	2 015.00	2 019.00

Conclusions

Thus, based on the research conducted in Chapter 2, the following conclusions can be drawn.

First, propensity score matching (PSM) can be used to overcome problems with sample imbalance and the inclusion of large numbers of low-quality or auteur films in the unfinanced film group.

Secondly, this study selected box office/budget and viewer ratings as the explained variables. For explanatory variables, all available ones from Chapter 1 were selected.

3 Testing the effect of state support in Russian cinema

In the presented chapter, econometric modeling of the premium from government funding is carried out based on the obtained pairs of films from [2], similar at the time of the investment decision. Conclusions based on the obtained assessments make it possible to formulate recommendations for ongoing public policy.

3.1. Selecting a Linear Model Specification

The specification of a difference linear model was chosen as the estimation model to identify the influence of spreads of the explained variables, i.e. availability of an award for financing the project by the Cinema Fund. This specification was also used in the financial literature [10], and this justified the comparison of pairs as one to one.

To estimate the explained variable ROI (receipts/budget), the model is specified as follows:

$$
\begin{aligned}
\Delta ROI_i &= \alpha_0 + \alpha_1 \Delta \text{ support\_share }_i + \alpha_2 \Delta \text{ is\_sequelprequel }_i \\
&+ \alpha_3 \Delta \text{ rating\_ } kp_i + \alpha_4 \Delta votes\_rating\_kp_i \\
&+ \alpha_5 \Delta \text{ waiting\_kp } p_i + \alpha_6 \Delta votes\_waiting\_kp_i \\
&+ \alpha_7 \Delta \text{ raiting\_actor }_i + \alpha_8 \Delta \text{ raiting\_director } r_i \\
&+ \alpha_9 \Delta \text{ has\_award }_i + \alpha_{10} \Delta \text{ has\_festival }_i \\
&+ \alpha_{11} \Delta \text{ week }_i + \alpha_{12} \text{ Dyear }_i \\
&+ \varepsilon_i
\end{aligned} \tag{1}
$$

where i is a pair of matched films from [2], Δ is the difference in the indicator between a film financed by the Cinema Fund and a non-financed film, ε_i are errors. A description of all variables used can be found in Table 2.3. It is important that all indicators used for matching were removed (except for the year, since for it the propensity even increased), because they are very close for pairs of funded and unfunded projects and form uninformative difference variables close to zero.

Model for audience ratings:

$$
\begin{aligned}
\Delta \text{ rating\_kp } p_i &= \alpha_0 + \alpha_1 \Delta \text{ support\_share } i_i + \alpha_2 \Delta \text{ is\_sequelprequel }_i \\
&+ \alpha_3 \Delta ROI_i + \alpha_4 \Delta votes\_rating\_kp_i \\
&+ \alpha_5 \Delta \text{ waiting\_kp } p_i + \alpha_6 \Delta votes\_waiting\_kp_i \\
&+ \alpha_7 \Delta \text{ raiting\_actor }_i + \alpha_8 \Delta \text{ raiting\_director }_i \\
&+ \alpha_9 \Delta \text{ has\_award }_i + \alpha_{10} \Delta \text{ has\_festival }_i \\
&+ \alpha_{11} \Delta \text{ week }_i + \alpha_{12} \text{ Dyear }_i \\
&+ \varepsilon_i
\end{aligned} \tag{2}
$$

where the indicators ROI and rating_kp are simply swapped.

Figure 3.1 for difference factors shows a correlation of no more than 0.5

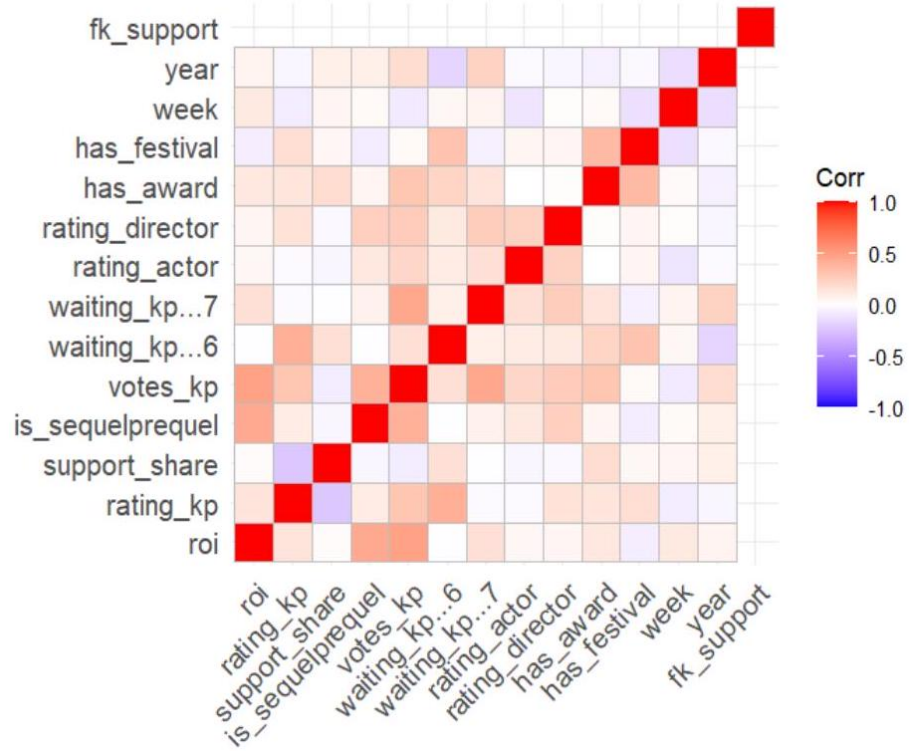

Figure 3.1 - Correlation matrix of all model variables

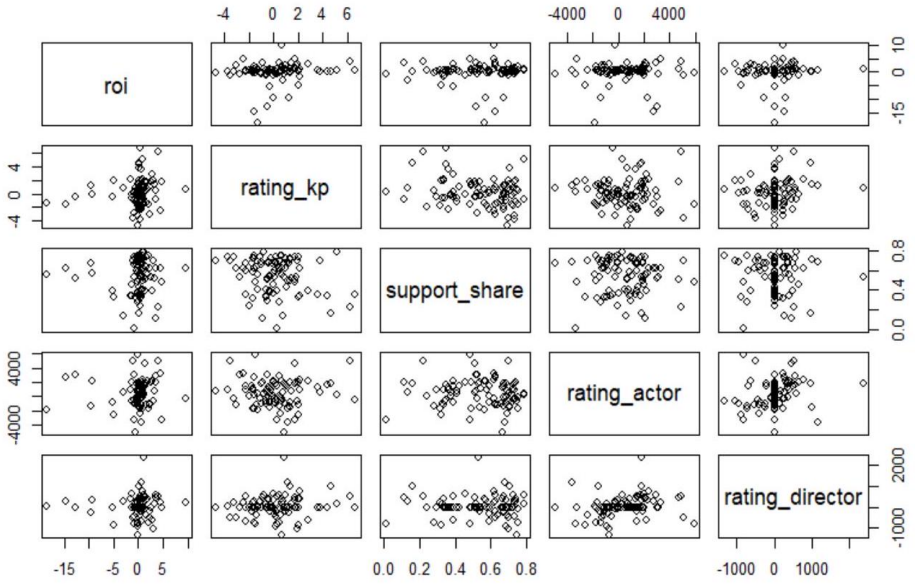

Figure 3.2 - Scatterplots of the main continuous variables of the models

for all indicators, and Figure 3.2 the presence of linear dependencies and the absence of the need for logarithms in models (which would complicate their use when calculating differences in indicators in models). However, it is worth noting that the data is censored (truncated, there are no negative values for some values - for example, the share of funding). Consequently, the estimates of models (3.1) and (3.2) will be biased, and only the signs and significance of the obtained coefficients can be interpreted.

3.2. Econometric assessment and results of selected models

Table 3.1 - Results of OLS estimation of model (3.1)

Variable	Score	St. error	p-value
α _0	-1.98^{*}	0.96	0.04
support_share	2.12	1.37	0.12
is_sequalprequel	1.93^{*}	0.88	0.03
rating_kp	0.16	0.19	0.40
votes_rating_kp	0.00^{**}	0.00	0.00
waiting_kp	-0.01	0.01	0.42
votes_waiting_kp	0.00	0.00	0.90
rating_actor	0.00	0.00	0.74
rating_director	0.00	0.00	0.15
has_award	-0.28	0.97	0.77
has_festival	-0.09	0.63	0.88
week	0.02	0.02	0.22
year	-0.16	0.24	0.52
N		9.26	
Corp. $\mathbf{R}^2$			

According to Table 3.1 of the coefficients, which represents the results of OLS estimation of model (3.1) with robust Huber-White standard errors, on average, other things being equal, for the difference in ROI between a funded project and an unfunded one, it is true that:

1. The constant is significant and negative, i.e. financing leads to a negative premium in ROI. Thus, the Film Fund does not help in the recoupment of films and its financing will cause the film to lose in competition with a film with private investment.

   There is a significant positive relationship between the fact that a film is part of a franchise and the government funding premium on ROI. Probably, sequels and prequels reduce the element of uncertainty in the quality of the product for both the investor and the viewer, because they are already familiar with the work in other parts and understand what to

expect from it. This may be a sign for the film to be selected for pitching by the Cinema Fund.

2. There is a significant positive relationship between the number of audience ratings on Kinopoisk (a proxy for a film's popularity) and the premium for government funding.

In model (3.1), an attempt was also made to replace the explained variable with
the amount of fees, and the explanatory variable of the share of budget financing for the amount of financing. Both variables turned out to be non-logarithmic based on their scatterplots. Then the significance and directions of the signs of the coefficients of such a specification were preserved, i.e. The conclusions above can also be applied to the simple sum of film box office receipts.

Table 3.2 - Results of OLS estimation of model (3.2)

Variable	Score	St. error	p-value
a_0	1.93^{**}	0.69	0.00
support_share	-3.55^{**}	1.24	0.00
is_sequalprequel	-0.15	0.25	0.33
ROI	0.05	0.05	0.54
votes_rating_kp	0.00^{**}	0.00	0.02
waiting_kp	0.00^{***}	0.01	0.00
votes_waitong_kp	-0.02^{*}	0.00	0.01
rating_actor	-0.00	0.00	0.09
rating_director	0.00	0.00	0.09
has_award	0.20	0.45	0.65
has_festival	0.06	0.34	0.87
week	-0.01	0.01	0.50
year	0.09	0.16	0.58
N		91	
Corp. $\mathbf{R^2}$		0.27	

***- significance by $< 1\%$ **- by 1%, * - by 5%

According to Table 3.2 of the coefficients of model (3.2) with robust standard errors on average, other things being equal, for the difference in ratings of Kinopoisk viewers between a funded project and an unfinanced one, it is true that:

1. The constant is significant and positive, i.e. funding leads to a positive premium in viewer ratings.

2. There is a significant negative relationship between the share of government support in the production budget and the government funding premium in audience ratings. The first two conclusions seem contradictory, however, the presence of public indignation under videos of well-known film reviewers (for example, Badcomedian) may indicate that people are unhappy with

how much the state spends on supporting a failed film in their opinion, but at the same time the public may be picking up a signal about the quality of the production film from the availability of funding (increased investment) and give it good ratings.

3. There is a significant positive relationship between the number of audience ratings on Kinopoisk (a proxy for a film's popularity) and its expectation rating (a proxy for advertising) and the premium for government funding. It seems that it would be a good recommendation for the Film Fund to participate not only in the production but also in the advertising budget of films to increase publicity. In addition, pay attention to the fact that the advertisement indicates funding from the Cinema Fund, because this increases people's ratings in a positive direction compared to unfunded projects.

4. There is a significant negative relationship between the number of expectancy ratings (a proxy for the expectedness of a film) and the government funding premium in audience ratings. Audiences probably don't like long waits. When issuing funds, the Cinema Fund can be recommended to put forward requirements for the absence of too long production of films and the deadlines for releasing them into distribution.

If we analyze how the results obtained relate to the goals set for the Cinema Fund, then we can say that the authorities are partially able to achieve them:

1. the creation of high-quality films that meet national interests is reflected in the presence of a positive effect from financing on audience ratings;

2. the popularization of national films, reflected in box office receipts, is less successful compared to the non-financed sector.

Conclusions

Based on all of the above, the following conclusions can be drawn.

First, it is convenient to estimate grouped pairs of films one-to-one using the method of difference linear models. The bonus for the amount of box office receipts and receipts/budget from the Cinema Fund funding turned out to be negative, while the bonus for audience ratings was positive, which indicates only partial fulfillment of the goals set for the state.

Secondly, the authorities can be recommended to pay attention to the financing of sequels, participate in the advertising budget and set deadlines for

Conclusion

Government funding of cinema may bring additional economic and social externalities to society, but the achievement of policy goals in Russia is often criticized and is

not widely covered in the literature on its assessment. This work is the result of a study of the Cinema Fund's direct investments in Russian films in 2015-2019. presents the following results and conclusions.

Firstly, from the structure of the Russian system of measures to support cinematography, it became clear that there are two goals for the financing of distribution films by the authorities - providing conditions for the creation of high-quality films that meet national interests, and their popularization in the country and abroad. Based on the analysis of theoretical and empirical articles, the indicators of audience ratings and Russian box office receipts were chosen to evaluate these goals, respectively, and the fame of actors and directors, the presence of a sequel, the expectation rating, the presence of awards and participation in festivals, intra-annual seasonality, etc. were chosen as control variables.

Secondly, when selecting a sample for the study, a new method was proposed to clear out small author's non-state-funded projects and overcome the strong imbalance of groups towards films with support - matching PSM films with a similar budget, year of production and genre-age characteristics. This made it possible to further use in the work a sample of films that were similar at the time of the investment decision, with and without financing, and to observe the difference in the selected explained variables in these groups.

Thirdly, testing of linear difference models of selected pairs of films showed that the premium for the sum of box office receipts and box office/budget from the Cinema Fund funding turned out to be significantly negative, and the premium for audience ratings was significantly positive, which indicates only partial fulfillment of the goals set for the state.

Fourthly, based on the significant coefficients of the model for control variables, as recommendations for the policy of direct public investment, it can be recommended to participate not only in production, but also in advertising support for films to increase the popularity of the film and, accordingly, fees and ratings and viewers with the obligatory indication of availability funding from the Cinema Fund; support the financing of franchises in which the element of uncertainty for the investor and viewer is reduced; try not to increase the financed share of the budget, because This
may cause public outrage.

As an area of improvement for current work, it would be interesting to:

- to evaluate the effect of investments by the Ministry of Culture in cinema (distribution of original films) and the Internet Development Institute (online series), and also compare them with each other;
- use several matching methods and choose the best one.

List of used literature

1. Meloni G., Paolini D., Pulina M. The great beauty: Public subsidies in the Italian movie industry //Italian Economic Journal. - 2015. - T. 1. - C.

445-455.

2. McKenzie J., Rossiter C., Shin S. Y. For love or money? Assessing outcomes from direct public investment in film //International Journal of Cultural Policy. - 2020. - Т. 26. - №. 4. С. 459-475.

3. McKenzie J., Walls W. D. Australian films at the Australian box office: Performance, distribution, and subsidies //Journal of Cultural Economics. - 2013. - Т. 37. - С. 247-269.

4. Gaenssle S., Budzinski O., Astakhova D. Conquering the box office: Factors influencing success of international movies in Russia //Review of Network Economics. - 2018. - Т. 17. №. 4. - С. 245-266.

5. Федеральный закон от 22.08.1996 № 126-ФЗ (ред. от 29.12.22) «О государственной поддержке кинематографии Российской Федерации» // Гарант [электронный ресурс]: URL: https://base.garant.ru/10135918/ (30.04.2022).

6. Приказ Министерства культуры от 13.05.2021 №736 «Об утверждении Положения о Департаменте кинематографии и цифрового развития» // culture.gov.ru [электронный ресурс]: URL: https://culture.gov.ru/documents/ob-utverzhdenii-polozheniya-odepartamente-kinematografii1312201701/ (30.04.2022).

7. Постановление Правительства РФ от 27.08.2018 № 1001 «О федеральном фонде социальной и экономической поддержки отечественной кинематографии» //Официальное опубликование правовых актов [электронный ресурс]: URL: http://publication.pravo.gov.ru/Document/View/0001201808300027 (30.04.2022).

8. Приказ Федерального фонда социальной и экономической поддержки отечественной кинематографии от 18.01.2022 №1 «Об утверждении методики отнесения организаций кинематографии к лидерам отечественного кинопроизводства и порядка отнесения организаций кинематографии к лидерам отечественного кинопроизводства» // fondkino.ru [электронный ресурс]: URL: https://www.fond-kino.ru/documents/official/ (30.04.2022).

9. Скобелев В. Л. Анализ состояния Российского рынка кинопродукции //Петербургский экономический журнал. - 2020. - №. 4. - С. 104-117.

10. Bachelet M. J., Becchetti L., Manfredonia S. The green bonds premium puzzle: The role of issuer characteristics and third-party verification //Sustainability. - 2019. - Т. 11. - №. 4. С. 1098.

11. ЕАИС [электронный ресурс]: Единая федеральная автоматизированная
информационная система сведений о показах фильмов в кинозалах, 2022. URL: https://ekinobilet.fond-kino.ru/government-support/ (30.04.2022).

12. Бюллетень Кинопрокатчика [электронный ресурс]: URL: https://ekinobilet.fond-kino.ru/government-support/ (30.04.2022).

13. Кинопоиск[электронный ресурс]: URL: https://www.kinopoisk.ru/lists/movies/country-2/ (30.04.2022).