





# The Impact of Subsidies on Film Quality: Empirical Evidence from France, Korea, the United Kingdom, and United States

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## ABSTRACT

There is a widespread belief that the higher the level of subsidies, the better the performance of film industries (both in quantity and quality). This article focuses on film quality—evaluated by audiences and critics—and scrutinizes this assumption through four selected countries—France, Korea, UK, and US. The main findings of this article are summarized through two points. First, despite the Korean film industry receiving the lowest level of public support, its film quality is higher than that of other selected countries. Second, the impact of subsidies on film quality turns out to be positive for the French, UK, and US films while it is negative or nil for Korean films. Although these results reflect partly differences in the background of each film industry and its public support in the four countries, they suggest that the effectiveness of subsidies and enhancement of film quality can be best achieved by better designing the subsidy schemes—not by increasing their amount.

## KEYWORDS

Film industry; subsidy; film quality; impact assessment; cultural policy

## Introduction

It is generally believed that subsidies can revive and/or boost a film industry. The key premise though behind such a policy approach should be to ensure a wide reception of films among as large an audience as possible.<sup>1</sup> In this respect, the core question should be how to use subsidies to increase the number of admissions. Seeking answers to this requires a comprehensive understanding of the film industry, which consists of three main functions: production, distribution, and exhibition (Eliashberg, Elberse, and Leenders 2006; Küng 2008; Vickery and Hawkins 2008). Subsidies should thus facilitate the production, distribution, and exhibition of a large number of films.

Among these functions, production is the most important to take into consideration when analyzing the impact of subsidies on the film industry for two reasons: (1) most of the subsidies are given out to producers (Murschetz, Teichmann, and Karmasin 2018, 8); (2) while securing wide distribution and exhibition is important, these

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<https://doi.org/10.1080/10632921.2022.2120141>

and the number of awards. In line with Bagella and Becchetti (1999) and Meloni, Paolini, and Pulina (2015), McKenzie and Walls (2013) also reveal that subsidies have no impact on the box office performance of films when examining approximately 220 Australian films that were released between 1997 and 2007.

Jansen's (2005) study goes one step further. It analyzes the impact of subsidies on the number of admissions of 120 German films released between 1993 and 1998. Interestingly, he finds that subsidies tend to help well-established producers who have consistently had above-average success for their films. In other words, it is only a few films that have a positive effect from subsidies, suggesting that this measure has a discriminatory impact.

Comparing the main attributes of these existing studies reveals two interesting points that show the direction to improve and supplement the existing research on the relationship between subsidies and quality of films (see Table 1). First, as they deal with only one country with a limited number of samples, the above results can be country specific. Therefore, this article expands the coverage to several countries that have a large film production and consumption.

Second, in order to measure film quality, most existing studies use box office performance, except Meloni, Paolini, and Pulina (2015), who include the number of awards received at international film festivals (see Table 1). Interestingly, these two measurements are heterogeneous and do not have a significant correlation (Eliashberg and Shugan 1997; Basuroy, Chatterjee, and Ravid 2003). More precisely, box office performance is derived from the evaluation of the general audience whereas the number of awards is from that of film specialists.

Still, utilizing the box office performance—either the number of admissions or the gross revenues—can be problematic as it is highly distorted with differences in the size of population and the standard of living of sample countries. The number of awards received from international film festivals can also be problematic. While the evaluation by specialists is important, the number of awards can be easily driven by factors unrelated to quality, such as political or hegemonic considerations. For example, film festivals like the Academy Awards can turn into politically-charged events (Fretts 2019). Furthermore, the recent leadership struggle between traditional and new media outlets regarding distribution and exhibition can additionally hinder films to garner

**Table 1.** Comparison of existing studies.

	S1	S2	S3	S4	This study
No. of sample countries	1 (Italy)	1 (Italy)	1 (Germany)	1 (Australia)	4 (France, Korea, UK, and US)
No. of samples	977	754	120	226	3,996
Sample period	12 years (1985–1996)	10 years (2002–2011)	6 years (1993–1998)	11 years (1997–2007)	10 years (2009–2018)
Dependent variable	• Box office performance	• Box office performance • No. of awards	• Box office performance	• Box office performance	• audience's evaluation • critics' evaluation

Notes: S1 – Bagella and Becchetti (1999); S2 – Meloni, Paolini, and Pulina (2015); S3 – Jansen (2005); S4 – McKenzie and Walls (2013).

awards as shown with the films produced by Netflix such as *Okja* and *The Meyerowitz Stories* that competed at the 2017 Cannes Film Festival (Terrazas 2017). More importantly, the number of awards is not an adequate measurement, as such events consist of films from countries of various sizes and differing resources in competition with one another; thus comparative quality.

In light of this, it is necessary to distinguish the conceptual characteristics of previously adopted measurements; one is evaluated by the general audience such as box office performance while the other is assessed by the film specialists (or professional critics) such as the number of awards. In this article, they are labeled as “audience’s evaluation” and “critics’ evaluation,” respectively. Both characteristics are utilized in this article; however, the precedent indicators utilized in existing studies should be replaced by less distorted but more stable ones.

## Sample country selection, data, and sources

### Sample country selection

To improve the country specificity issue, it is necessary to have a greater number of countries, but these must be ones that are comparable in terms of size in production and consumption. In other words, selected countries should produce a significant number of films that then require a meaningfully large consumption market. This ensures the ability to test and compare the impact of subsidies on film quality without much misrepresentation. In this respect, seven countries—China, France, India, Japan, Korea, UK, and US—make for ideal candidates; they are all ranked in global top 10 in terms of box office revenues according to MPAA (2019) (see Table 2).

The most important element in selecting sample countries is whether these countries have reliable data for subsidies and comparable film production and exhibition capacities as this article tests the impact of subsidies on film quality. In this regard, China, India, and Japan are not chosen for this article; reliable subsidy data for China and India are not available and the Japanese film industry is largely oriented toward animation or *anime*. When the remaining countries are compared, the possible distortions

**Table 2.** Global film industry profile.

Rank	No. of films produced* (2017)	No. of box office admissions* (2017, million)	Total box office revenues** (2019, billion USD)	Population*** (2019, million)
1	India (1,986 <sup>a</sup> )	India (1,981.0)	<b>US (11.4)</b>	China (1,397.7)
2	China (874)	China (1,620.0)	China (9.3)	India (1,366.4)
3	<b>US (660)</b>	<b>US (1,239.7)</b>	Japan (2.4)	<b>US (328.2)</b>
4	Japan (594)	Mexico (337.9)	<b>Korea (1.6)</b>	Japan (126.2)
5	<b>Korea (494)</b>	<b>Korea (219.9)</b>	<b>UK (1.6)</b>	Germany (83.1)
6	<b>France (300)</b>	Russia (212.6)	<b>France (1.6)</b>	<b>France (67.1)</b>
7	<b>UK (285)</b>	<b>France (205.9)</b>	India (1.6)	<b>UK (66.8)</b>
8	Spain (241)	Brazil (181.2)	Germany (1.2)	<b>Korea (51.7)</b>
9	Germany (233)	Japan (174.5)	Mexico (1.0)	Spain (47.1)
10	Argentina (220)	<b>UK (170.6)</b>	Australia (0.9)	Argentina (44.9)

Notes: 1. Nigeria is known to produce a great number of films, but due to lack of recent data, it is not included;

2. Russia includes former-CIS countries; 3. The total box office revenues for the US include that of Canada; 4.

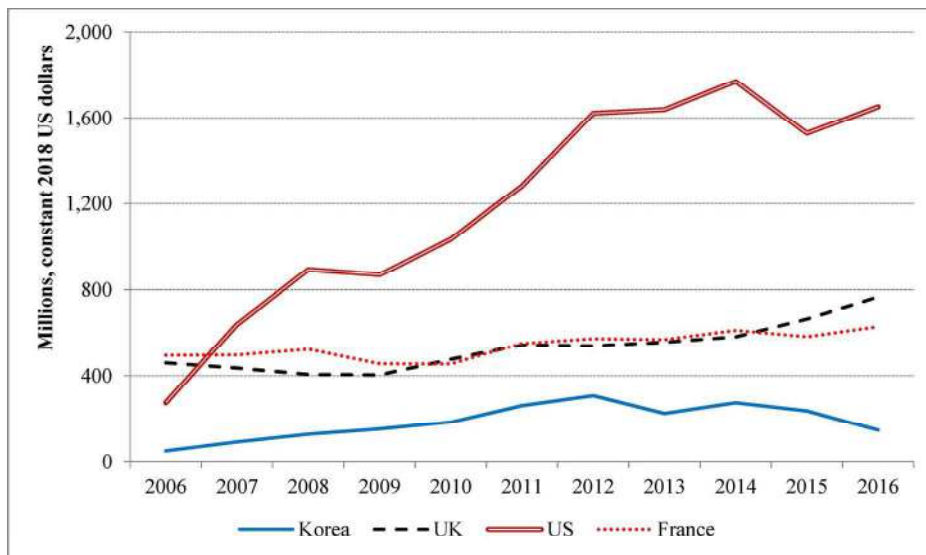
a-data based on 2016; 5. The most updated data are utilized, but before 2020 due to the COVID-19 pandemic.

Data sources: \* UNESCO Institute for Statistics (n.d.); \*\* MPAA (2019); \*\*\* World Bank (n.d.).



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**Figure 1.** The trend of subsidies (2006–2016). Data sources: Based on Parc and Messerlin (2018); British Film Institute (n.d.), Centre national du cinéma et de l’image animée (n.d.), MCST (n.d.), and Thom (personal communication, December 7, 2017).

National Lottery, Channel 4, and the BBC among others—and the UK film production tax relief schemes. Korean data are derived from the Korean Film Council (2009, 2014, 2017) and the MCST (n.d.) and, as stressed above, they include the funds managed by the “Fund of funds.” For the US, the data have been compiled by Thom (personal communication, December 7, 2017), which covers all the tax relief schemes operated by the individual states of the US.

### Film quality data

Regarding the indicators of film quality, this study maintains two characteristics, thus both evaluations by audiences and critics, which are similar to what Meloni, Paolini, and Pulina (2015) have done. However, existing studies usually rely on box office performance such as the amount of revenues or the number of admissions for the audience’s evaluation. Although these indicators are useful, they can be highly skewed by the contrasting sizes of each country’s population when compared directly. Furthermore, they can be significantly affected by various marketing strategies by the distributors and exhibitors, and the market power of the big studios (Gunter 2018; Zufryden 2000). Alongside this, the number of awards for the critic’s evaluation should be replaced by other indicators that would be less distorted by the politics, interests of certain groups, and the comparative issue highlighted before.

Given these reasons, this article utilizes the ratings of the general audience and professional film critics that are less sensitive to exogenous and non-quality-related elements. The data for these ratings are obtained from three specialized websites: IMDb, Metacritic (MC), and Rotten Tomatoes (RT). These websites are less country-specific when compared with other data used in existing studies to cover a

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**Table 3.** Descriptive statistics for the quality data.

	IMDb		MC		RT	
	Ratings	No. of observations	Ratings	No. of observations	Ratings	No. of observations
<b>A. Aggregated country data (means)</b>						
Mean	6.34	31,135.71	61.26	20.94	65.89	79.40
Count. <sup>a</sup>	40	40	40	40	40	40
Max.	6.73	115,369.86	78.00	32.56	88.50	173.22
Min.	5.88	449.03	51.14	7.75	49.19	8.73
Std. dev. <sup>b</sup>	0.20	40,370.70	6.58	7.27	9.61	47.19
<b>B. Disaggregated film data</b>						
Mean	6.34	50,026.51	56.51	27.39	58.86	117.64
Count. <sup>c</sup>	3,996	3,995	2,321	2,348	2,643	2,666
Max.	9.4	1,656,501	100	60	100	484
Min.	0	5	7	1	0	5
Std. dev. <sup>b</sup>	1.02	111,689	17.15	13.17	28.2	92.86

Notes: <sup>a</sup>Number of countries for the period (four countries for 10 years). <sup>b</sup>std. dev.: standard deviation. <sup>c</sup>Number of total films; The number of films evaluated and the figure for ratings do not match each other as a few films have ratings without mentioning the number of voters.

**Table 4.** Film quality comparison: Average ratings by country (2009–2018).

		France	Korea	UK	US
Absolute ratings	IMDb	6.09	6.48	6.41	6.36
	MC	63.3	67.0	60.3	54.5
	RT	69.3	75.2	64.2	54.9
Relative ratings	IMDb	93.9	100.0	98.9	98.1
	MC	94.5	100.0	90.1	81.3
	RT	92.2	100.0	85.3	73.0

critics' evaluation following behind Korean films. In this context, it is noteworthy to recall the fact that the Korean film industry has the lowest level of subsidies.

## Empirical model and tests

### Empirical model

In order to analyze the annual evolution of the impact of subsidies—or public support—on film quality in each country, we test the following model:

$$\ln \text{AverageQuality}_{it} = e * \ln \text{PublicSupport}_{it-3} + FE_i + FE_t \quad (1)$$

$\text{AverageQuality}_{it}$  is the average quality of films in country  $i$  during year  $t$ : it is defined by the annual average ratings of IMDb, MC, and RT, respectively.  $\text{PublicSupport}_{it-3}$  is the total amount of subsidies that the film industry of each country received  $i$  in year  $t-3$  as subsidies, in general, are given around 3 years in advance of the actual release of films as explained before.

$e$  is the coefficient to be estimated and captures the relationship between subsidies and film quality. This coefficient tells us, therefore, if there is a positive or negative—or even no relation—between public support and film quality. The absolute value of this coefficient also reflects the intensity of the relationship between the two. As a result, a positive and large  $e$  coefficient signals a strong positive relation between public

support and film quality. On the contrary a negative and small  $e$  signals a negative and weak relationship between the two. Depending on the fixed effects included, and as is explained in more detail below, the relationship between the two takes the form of a linkage between the levels of public support and film quality or that of a relation between yearly changes of the two variables.

As  $AverageQuality_{it}$  and  $PublicSupport_{it-3}$  are expressed in logarithmic terms, the coefficients  $e$  can be approximately interpreted as changes in percentage.  $FE_i$  is a country fixed effect and  $FE_t$  is a year fixed effect. Fixed effects are an increasingly used econometric technique due to their ability to capture measurable and nonmeasurable factors. They involve using dummy variables—taking a variable of zero or one—to capture all the factors that follow the same pattern of the fixed effect without having to include these factors in the econometric model.

Year fixed effects capture all factors that were common for all countries during a given year, such as the 2008 global financial crisis, trend changes in films, and so on. Year fixed effects absorb not only the impact of all the factors that we could potentially measure, but also those that are impossible to measure on film quality and that are common to all countries in a given year.

Country fixed effects similarly capture any country-specific factors during the studied period in this article. For instance, it could be the existence of the *chronologie des médias* in France that hinders the development of the domestic film industry in the era of digitization, the insecurity in the UK film industry caused by Brexit, the blacklist controversy in the Korean film industry under the previous administration or any impactful policy that is implemented in one of the sample countries during the period covered in this article.

### Basic tests

Table 5 presents the results from estimating Equation (1). Column 1 shows the results without any fixed effect. Column 2 introduces year fixed effects—a specific shock common to all the selected countries. Its results should be interpreted in terms of levels, that is, how the level of film quality varies when the level of public support varies. Column 3 introduces country fixed effects—all the characteristics of a country are constant during the period. Its estimated coefficients should thus be interpreted as relating annual changes in film quality to annual changes in subsidies. Finally, Column 4 introduces both year and country fixed effects. It should be stressed that this specification is extremely demanding and might suffer from an attenuation bias that pushes coefficients  $e$  toward zero.

Section A in Table 5 focuses on the audience's evaluation. In Column 1, the correlation coefficient between the level of subsidies and the level of film quality is negative but not statistically significant. Controlling for year fixed effects shows that a higher level of subsidies has a negative impact on film quality—a relationship statistically significant at the 5% level, as shown in Column 2. Controlling for country fixed effects reveals a coefficient positive and statistically significant at the ten percent level as shown in Column 3. In other words, when quality is evaluated by audiences (IMDb ratings), there is a positive impact of subsidies on film quality. In

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**Robustness test 1: Excluding countries without country fixed effects**

When each country is excluded at a time from the dataset, the result of each estimation can differ substantially from the other ones—leading possibly to conclusions different from the ones achieved so far. Table 6 presents the results in the absence of any fixed effects—hence, it focuses on the level of subsidies and the level of film quality. In other words, the results shown in Table 6 should be compared with those of Column 1 in Table 5.

On the basis of the audience's evaluation, the coefficients of Section A in Table 6 reveal the “singularity” of the position for Korea among the four countries. When excluding Korea from the sample, the estimated coefficient shifts from negative, as shown in Column 1 of Table 5, to positive and statistically significant as shown in Column 6 of Table 6. By contrast, excluding, each at a time, the three other countries (Columns 5, 7, and 8 in Table 6) do not change the negative sign of the coefficients—as shown in Columns 5, 7, and 8 in Table 6 when compared with the basic tests shown in Column 1 of Table 5.

Combined, these changes reveal that Korea is different from the other three countries in terms of film quality as evaluated by audiences. For instance, higher levels of subsidies in France, the UK, and the US are usually associated with higher levels of quality. However, the case of Korea reveals a situation where lower levels of subsidies is associated with higher film quality.

**Table 6.** Excluding each country without fixed effects.

	France 5	Korea 6	UK 7	US 8
<b>A. Audience's evaluation (IMDb)</b>				
LnPublicSupport	−0.0047 (0.004)	0.018a (0.006)	−0.0090 (0.005)	−0.022b (0.009)
Constant	1.89a (0.027)	1.72a (0.044)	1.90a (0.034)	1.97a (0.055)
Year fixed effects	France	Korea	UK	US
Country fixed effects	No	No	No	No
R <sup>2</sup>	0.034	0.084	0.062	0.15
Rmse	0.023	0.029	0.031	0.034
Observations	30	30	30	30
<b>B. Critics' evaluation (MC)</b>				
LnPublicSupport	−0.094a (0.015)	−0.065b (0.031)	−0.088a (0.015)	−0.083a (0.020)
Constant	4.67a (0.101)	4.50a (0.210)	4.65a (0.099)	4.64a (0.122)
Year fixed effects	France	Korea	UK	US
Country fixed effects	No	No	No	No
R <sup>2</sup>	0.52	0.16	0.43	0.32
Rmse	0.081	0.072	0.091	0.077
Observations	30	30	30	30
<b>C. Critics' evaluation (RT)</b>				
LnPublicSupport	−0.13a (0.017)	−0.084c (0.049)	−0.12a (0.017)	−0.10a (0.023)
Constant	4.95a (0.113)	4.67a (0.328)	4.95a (0.108)	4.84a (0.134)
Year fixed effects	France	Korea	UK	US
Country fixed effects	No	No	No	No
R <sup>2</sup>	0.54	0.12	0.48	0.34
Rmse	0.11	0.11	0.12	0.092
Observations	30	30	30	30

Note: Standard errors in parentheses. Statistically significant at <sup>a</sup> 1%, <sup>b</sup> 5%, and <sup>c</sup> 10%.

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Turning to the critics' evaluation shown in Sections B and C in [Tables 7](#), one can see again that Korea holds a unique position among the four countries. In Column 3 of [Table 5](#), the coefficients of public support are negative though not statistically significant. However, excluding Korea from the sample in the case of country fixed effect shifts the coefficients to positive and statistically significant as shown in Column 10 in Sections B and C of [Table 7](#). These shifts mirror the fact that an increase in subsidies is associated with an increase in the average film quality in France, the UK, and the US whereas, in Korea, it is associated with either no significant change or a decrease in film quality when quality of films is evaluated by critics.

## Conclusion

Film quality is the key factor for a film industry's long-term sustainable prosperity. To achieve this goal, a large number of countries have offered all kinds of subsidies to their film industries. This article focuses on the impact of subsidies on film quality that is widely assumed as being positive. Compared with the existing literature on this topic, this article has offered several novel points that shed new light on the relationship between subsidies and film quality. While existing studies usually deal with only one country, ours compares four countries, France, Korea, the UK, and the US, that all have large film industries in terms of production and consumption, but different level of subsidies. Moreover, it distinguishes between two different evaluations—one from the general audience and the other from film critics—to measure film quality. Based on such a distinction, this article utilizes the ratings of films by audiences and critics—labeled as audience's evaluation and critic's evaluation—to propose a more refined analysis on the impact of subsidies on film quality differently from other existing studies.

The three main results of the article are as follows. First, the average quality of Korean films is higher than the average quality of the French, UK, and US films, a crucial result that goes against the general perception that a larger amount of subsidies systematically results in higher quality films. Our result is very meaningful as both audiences and film critics are in line with one another.

Second, when focusing on the relationship between the level of public support and that of quality, countries with a higher level of public support produce films with lower level of quality. It is worth stressing that, when considering the audience's evaluation, this result is driven by Korea, where a comparatively higher quality is associated with lower level of public support.

Third, when we take country fixed effects into account, there is a positive impact from an increase of subsidies upon film quality when evaluated by audiences, and this is also true for the quality of French, UK, and US films as perceived by film critics. By contrast, increases in subsidies have not shown any enhancement of film quality when the quality of a film is evaluated by critics in the case of Korean films.

A closer examination shows that the second and third results are not incompatible, but they reveal differences in the efficiency of public support among the four countries. There are two possible explanations for these differences: either the quality of Korean films is good irrespective of the amount of public support or one dollar of support delivers significantly more in terms of film quality in Korea than in the other three countries. The first explanation emphasizes the active involvement of private companies. In Korea, when

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