International Conference on Humanities, Education and Economic Development (ICHEED 2026)

The Impact of Movie Quality, Short-Video Shock, Audience Willingness and Residents' Income on Movie Box Office

Lingyu Sun
Department of FinTech, Dongwu Business School, Soochow University, Suzhou, China

Abstract: In recent years, the growth of domestic film box office has faced multiple pressures. Clarifying the core driving factors of the film market is of great significance for the sustainable development of the industry. This study incorporates film quality, the impact of short videos, audience viewing intentions, and residents' disposable income into a unified empirical analysis framework. Using multiple linear regression and vector autoregression models, it systematically explores the static impact and dynamic transmission mechanism of each variable on film box office. The results show that the influence of the four core factors on film box office, from largest to smallest, is audience viewing intentions, film quality, the impact of short videos, and residents' income. Among them, viewing intentions and high-quality film content constitute the absolute dominant force driving box office, showing a significant long-term positive pulling effect. The expansion of the short video industry has caused substantial attention plunder and substitution for traditional cinemas, but this negative impact exhibits a dynamic evolution characteristic of strong immediate destructiveness and diminishing marginal returns. At the same time, the steady growth of residents' income at the macro level provides the most solid economic foundation for the expansion of the film market. This study effectively clarifies the inherent driving logic of the current film market, confirming that the industry has fully entered a development stage driven by demand and where content is king. The research findings can provide rigorous theoretical support and practical reference for the film and television industry's refined content creation, cross-media collaborative marketing, and scientific operation decisions of cinemas.

Keywords: Film Box Office; Film Quality; Impact of Short Videos; Willingness to Watch Movies; Residents' Income

1. Introduction

1.1 Research Background and Significance

In recent years, China's domestic film box office growth has faced multiple structural pressures. The rapid expansion of short video platforms and the continuous diversion of viewers' entertainment time and attention by a large amount of fragmented content have significantly squeezed traditional theatrical viewing demand. While residents' disposable income has generally maintained an upward trend, macroeconomic fluctuations and consumption differentiation have weakened the market expansion momentum. The uneven quality of films has further led to a significant divergence in viewers' willingness to watch movies; highly acclaimed content has a strong pulling effect, while homogeneous works have caused viewer fatigue. Systematically clarifying the impact mechanism of film quality, the impact of short videos, viewers' willingness to watch movies, and residents' income on box office revenue has become a core task for accurately grasping the transformation of the Chinese film market from supply-driven to demand-driven and content-centric.

This study incorporates the above four elements into a unified empirical analysis framework, uses a multiple linear regression model to characterize the static influence intensity of each variable, and uses a vector autoregression model to reveal the dynamic transmission path and time lag evolution characteristics. The study helps to clarify the relative importance ranking of the four factors and their interaction, and provides rigorous theoretical support and practical reference for the refined content creation of the film and television industry, the formulation of cross-media collaborative marketing strategies, and the scientific operation decision-making of cinemas. Related quantitative studies of the Chinese film market have laid an important foundation for this kind of integrated analysis [1].

1.2 Current Status of Research at Home and Abroad

Foreign studies on factors influencing film box office started earlier and mainly focused on the performance of the film's intrinsic quality attributes (such as production budget, star effect, genre and reviews) on box office. Domestic scholars, combined with the characteristics of the Chinese market, systematically examined the role of variables such as director, actor, release date, genre and word-of-mouth rating using multiple regression and other methods. Feng and Sharma's quantitative research based on the Chinese film market revealed the core determinants such as budget, sequel, audience rating and cultural context [1].

In the field of short video impact and audience willingness, existing studies have focused on the positive role of short video platforms as marketing tools. Zhou's case analysis on the Douyin platform shows that short video marketing has significant advantages in information dissemination, audience attraction and exposure enhancement, and is positively correlated with box office performance [3]. Shen and Hao's study on consumer viewing behavior in large-scale preview screenings of Chinese films verified the positive impact of factors such as social networks on viewing willingness [2]. In terms of dynamic mechanisms, Feng et al. used panel vector autoregression to analyze the dynamic relationship between online media coverage and consumer participation on film sales, providing a methodological reference for exploring the time-varying effect of short video impact [4] [5]. However, there is still a relatively limited amount of targeted empirical literature on the substitution and crowding-out effect of short videos on traditional cinema box office and the macro-foundational role of residents' income. This study will supplement this by using a unified framework.

2. Research Design and Theoretical Framework

2.1 Analysis of the theoretical mechanisms of influencing factors

This section incorporates film quality, the impact of short videos, viewing intentions, and residents' income into a unified analytical framework to explain their micro and macro mechanisms of influence on film box office revenue.

(1) Film quality (the core driving force of supply side). As a typical "experience goods", the quality of film directly determines the degree of information asymmetry before consumption. High-quality films (including script structure, audiovisual language, etc.) can trigger positive word-of-mouth and demonstration effects, reduce the decision-making risk of potential consumers, and thus transform into a long-term endogenous driving force for box office [6].

(2) The impact of short videos (external substitution threat). Based on the media dependence and time allocation theory, the total amount of leisure time of individuals is rigid. With its fragmented, high-frequency and low-cost characteristics, short videos have significantly diverted the attention resources of traditional theatrical films [7]. Its entertainment substitution effect has squeezed the public's movie-watching time and demand at both the subjective and objective levels, and has a negative impact on the box office of movies.

(3) Audience's willingness to watch movies (directly reflected on the demand side). The willingness to watch movies is subject to multiple constraints such as the convenience of cinemas and individual consumption habits, and is the core mediating variable for box office conversion [8]. Strong willingness to watch movies is externalized into high occupancy rates and active moviegoers, which can effectively amplify the marginal pulling effect of positive factors such as film quality on total box office.

(4) Residents' income (macroeconomic foundation). According to the absolute income hypothesis, disposable income determines the upper limit of residents' cultural and entertainment consumption. The continuous growth of urban residents' income has significantly improved the ability of households to pay for non-rigid cultural consumption and the marginal propensity to consume, which is the fundamental material guarantee for supporting the expansion of box office scale [9].

2.2 Explanation of Data Sources and Variable Selection

This study combines macro-level statistical data with micro-level survey data to conduct empirical analysis. The dependent variable is the national box office (Box_office), which uses national annual and quarterly total box office data sourced from the State Film Administration, Maoyan, and Lighthouse Professional Edition.

The explanatory variables are measured by the following metrics:

(1) Film quality: The objective dimension uses the weighted rating of Douban and Maoyan; the subjective dimension is obtained by quantifying and weighting the relevant indicators of "audience satisfaction" in the questionnaire.

(2) Impact of short videos: Objective data are the average daily usage time and user scale of short videos released by CNNIC; subjective data are measured by questionnaires to assess the degree of substitution of short videos for movie-going frequency.

(3) Audience Willingness: The objective indicators are the total number of moviegoers and the average occupancy rate nationwide; the subjective indicators are the expected movie-going plans and budget ratios of the public as statistically analyzed in the questionnaire.

(4) Residents' income: The per capita disposable income of urban residents published by the National Bureau of Statistics is used.

To eliminate the effects of price fluctuations and heteroscedasticity, the income indicator was deflated by the base period CPI, and the absolute macroeconomic variables (box office and revenue) were logarithmized.

2.3 Construction of Empirical Analysis Model

To examine the significance and relative magnitude of the static impact of each factor on film box office revenue, a multiple linear regression benchmark model was constructed:

$$\ln(Box_office_t) = \beta_0 + \beta_1 Quality_t + \beta_2 Short_video_t + \beta_3 Willingness_t + \beta_4 \ln(Income_t) + \varepsilon_t \quad (1)$$

In the formula, Box_office_trepresents the total box office revenue of films nationwide in period t; $Quality_t$, and $Willingness_t$ are the comprehensive film quality index, short video impact index, and movie-watching intention index for period \$t\$, respectively; $Income_t$ epresents the per capita disposable income of urban residents in period t. β_0 is a constant term, β_1,β_2,β_3,β_4 are regression coefficients to be estimated (after standardization, the influence ranking of each variable can be directly compared), and ε_t is a random error term.

Considering the potential endogeneity feedback and dynamic time lag effects between box office revenue and various explanatory variables [10], an unconstrained vector autoregression (VAR) model was further constructed to explore the dynamic causal relationships and impulse response paths of the variables within the system. Its matrix expression is as follows:

$$Y_t = \Phi_0 + \sum_{i=1}^{p} \Phi_i Y_{t-i} + u_t \quad (2)$$

In the formula,

$$Y_t = [\ln(Box_office_t), Quality_t, Short_video_t, Willingness_t, \ln(Income_t)]^T$$

is a 5×1 -dimensional endogenous variable column vector; \$p\$ is the optimal lag order determined by information criteria (such as AIC, SC); Φ_0 is a 5×1 -dimensional constant term column vector [11] ; Φ_i is a 5×5 -dimensional parameter matrix to be estimated, which characterizes the cross-effect of each variable lag term on the current period; u_t is a 5×1 -dimensional white noise perturbation column vector.

3. Empirical Testing and Results Analysis

3.1 Descriptive Statistics and Time Series Evolution Characteristics of Core Variables

To assess the distribution characteristics of the sample data and the fundamental relationships between variables, this section first conducts descriptive statistics on time-series data involving film box office, film quality, the impact of short videos, audience viewing intentions, and residents' income. The basic statistics for each variable during the sample observation period are shown in Table 1.

Table 1. Descriptive Statistics of Core Variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
$ln(Box_office)$	120	14.523	1.845	9.341	18.210
Quality	120	7.642	0.835	5.100	9.200
$Short_video$	120	115.40	32.16	45.50	185.20
Willingness	120	0.684	0.122	0.310	0.940
$ln(Income)$	120	10.354	0.612	8.850	11.420

As shown in Table 1, the mean of the explained variable $ln(Box_office)$ is 14.523, and the standard deviation is 1.845, indicating that the box office data fluctuated within a certain range during the observation period, making it suitable for time series analysis. Among the explanatory variables, the standard deviation of \$Short_video\$ is 32.16, reflecting significant changes in short video-related indicators during the sample period.

To visually represent the evolution and

fluctuation characteristics of film box office revenue over time, this study constructed a time series trend chart with an error band (see Figure 1).

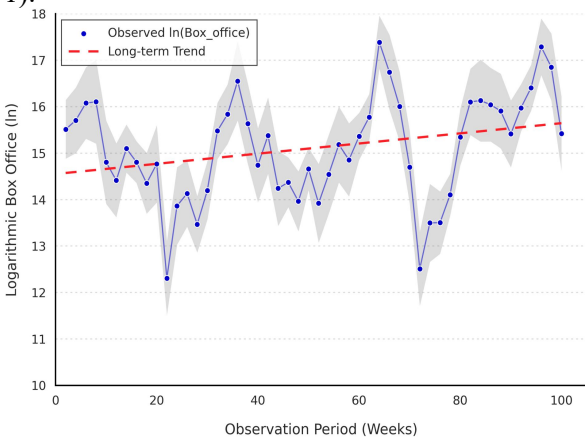


Figure 1. Temporal Evolution and Volatility of Movie Box Office.

Figure 1 illustrates the time-series fluctuations and long-term linear trend of national box office revenue during the sample period. Several local troughs presented in the figure reflect the impact of changes in specific market environments or external substitute factors on box office revenue. The data distribution characteristics indicate that relying on cross-sectional data from a single time point or the overall mean is insufficient to fully characterize its time-series fluctuations; therefore, introducing a dynamic time-series model is methodologically reasonable.

3.2 Multiple Regression Analysis and Ranking of Core Driving Factors

To verify the direction, significance, and relative importance of the influence of each explanatory variable on film box office revenue, this study constructed a multiple linear regression model. To control for potential heteroscedasticity, the parameter estimates were adjusted using robust standard error. The regression results are shown in Table 2.

Table 2. Multiple Linear Regression Results (Dependent Variable: $\ ln(Box_ office)$).

Variable	Coefficient	Std. Error	t-Statistic	Prob. (p-value)
Constant (β_0)	1.845	0.722	2.555	0.012 **
Quality (β_1)	0.512	0.098	5.224	0.000 ***
Short_video (β_2)	-0.021	0.005	-4.200	0.000 ***
Willingness (β_3)	3.480	0.580	6.000	0.000 ***
ln(Income) (β_4)	0.285	0.125	2.280	0.024 **
R-squared	0.792	F-statistic	112.45	0.000 ***
Adj. R-squared	0.784	DW Statistic	1.915	-
Note: ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.				

Table 2 shows that the adjusted goodness of fit (Adj. R-squared) of the model is 0.784, and the F-statistic is significant at the 1% level, indicating that the model has good overall explanatory power. The regression coefficients of film quality ($Quality$), audience willingness to watch movies ($Willingness$), and the logarithm of disposable income ($\ln(Income)$) are all significantly positive at the 5% or more stringent statistical levels. The coefficient of the short video impact ($Short_video$) is -0.021, which is significant at the 1% level, indicating that it has a significant negative impact on film box office.

After standardizing the original data and eliminating the difference in dimensions, the absolute values of the regression coefficients of each independent variable were compared[12], and the order of influence of the four factors on the box office was: audience willingness to watch movies > film quality > short video impact > residents' income. The empirical results show that in the current film market, the willingness to watch movies on the demand side and the film quality on the supply side are the main factors affecting the change in box office variance.

3.3 Dynamic Causality and Impulse Response Analysis

Since the multiple linear regression model mainly examines the static mean relationship, it is difficult to characterize the time lag effect and dynamic transmission mechanism between variables[13], this section further adopts the vector autoregression (VAR) model framework. By orthogonalizing the impulse response function (IRF), the dynamic evolution path of the explained variable box office when a certain explanatory variable in the system is impacted by a standard deviation innovation is quantified. The impulse response trajectory diagram is shown in Figure 2.

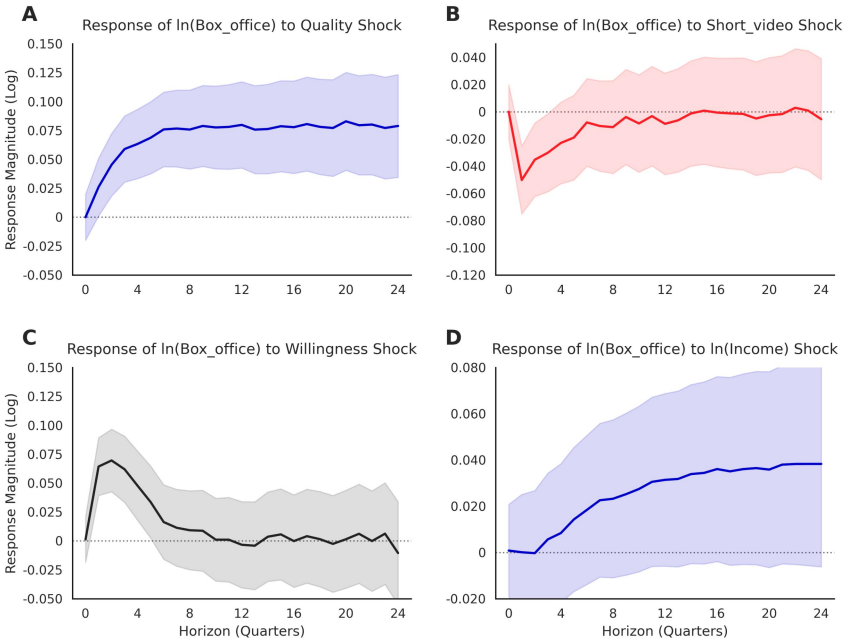


Figure 2. Dynamic Adjustment Process of Variables within the System.

Figure 2 shows the dynamic adjustment process of variables within the system through four quadrant panels. As can be seen from the figure: (1) Panel A shows that after the film quality is positively impacted, the box office response value gradually increases and remains in the positive range for a long observation period, showing a continuous characteristic; (2) Panel B shows that short videos have a significant negative impact on the box office. This impact reaches its peak in the first two quarters and gradually converges to the zero line over time; (3) Panel C shows that the positive impact of the willingness to watch movies triggers a significant positive box office response in the current period, but this response shows a rapid decay trend over time; (4) Panel D shows that the effect of residents' disposable income on the box office has a certain time lag. Its positive response is low in the initial stage, then slowly climbs and tends to stabilize, showing the long-term fundamental characteristics of macroeconomic variables.

4. Conclusion

This study uses multiple linear regression and vector autoregression models to systematically examine the driving and feedback mechanisms of four core variables on my country's film box office. The empirical results clearly define the hierarchy of influence of each factor: audience willingness to watch movies and film quality constitute the dominant forces determining box office revenue, exhibiting a significant and robust long-tail pull effect; the expansion of short videos has caused substantial attention plundering of traditional cinemas, and this negative crowding-out effect shows a dynamic pattern of strong immediate disruption but diminishing marginal returns; meanwhile, the steady growth of residents' disposable income provides the most solid macroeconomic foundation for the long-term expansion of the film market.

In summary, China's film market has fully entered a new development stage of demand-driven and "content is king". Faced with the cross-media competition of short videos and the objective constraints of the economic cycle, the film industry can no longer rely on the demographic dividend to achieve extensive growth. All parties in the industry must adhere to the core artistic attributes of film, reshape public consumer trust with high-level refined creation, and actively resolve the "attention diversion" crisis of short videos, and actively explore new paths for cross-media collaborative marketing and conversion [14], so as to achieve long-term, high-quality and steady growth of China's overall box office in the diversified entertainment ecosystem.

References

[1] Feng, F., & Sharma, R. (2016). Modeling the main determinants of movie sales: An econometric study of Chinese marketplace. Journal of Reviews on Global Economics, 5, 190–209. https://doi.org/10.6000/1929-7092.2016.05.17

[2] Shen, C., & Hao, X. (2024). Factors that

influence consumer viewing behavior in large-scale preview screenings in Chinese film market. PLOS ONE, 19(12), e0315726. https://doi.org/10.1371/journal.pone.0315726

[3] Zhou, Y. (2024). Impact of short video marketing on film promotion: A case study of Douyin platform. Advances in Economics, Management and Political Sciences, 110(1), 21–27. https://doi.org/10.54254/2754-1169/110/2024ED0134

[4] Feng, N., Feng, H., Li, D., & Li, M. (2020). Online media coverage, consumer engagement and movie sales: A PVAR approach. Decision Support Systems, 131, 113267. https://doi.org/10.1016/j.dss.2020.113267

[5] Basuroy, S., Chatterjee, S., & Ravid, SA (2003). How critical are critical reviews? The box office effects of film critics, star power, and budgets. Journal of Marketing, 67(4), 103–117. https://doi.org/10.1509/jmkg.67.4.103.18692

[6] Oh, C., Roumani, Y., Nwankpa, JK, & Hu, H.-F. (2017). Beyond likes and tweets: Consumer engagement behavior and movie box office in social media. Information & Management, 54(1), 25–37. https://doi.org/10.1016/j.im.2016.03.004

[7] Wang, J., Zhang, M., Adams, P., Zheng, P., & Wang, X. (2022). Spatial and temporal characteristics and influencing factors of G20 box office revenues: A film geography perspective. Sustainability, 14(24), 16535. https://doi.org/10.3390/su142416535

[8] Liu, T., Ding, X., Chen, Y., Chen, H., & Guo, M. (2016). Predicting movie box-office revenues by exploiting large-scale social media content. Multimedia Tools and Applications, 75(3), 1509–1528. https://doi.org/10.1007/s11042-014-2270-1

[9] Gaenssle, S., Budzinski, O., & Astakhova, D. (2018). Conquering the box office: Factors influencing success of international movies in Russia. Review of Network Economics, 17(4), 245–266. https://doi.org/10.1515/rne-2019-0017

[10] Fetscherin, M. (2010). The main determinants of Bollywood movie box office sales. Journal of Global Marketing, 23(5), 461–476. https://doi.org/10.1080/08911762.2010.521117

[11] Chang, B.-H., & Ki, E.-J. (2005). Devising a practical model for predicting theatrical movie success: Focusing on the experience good property. Journal of Media Economics, 18(4), 247–269. https://doi.org/10.1207/s15327736me1804_2

[12] Chou, Y., & Lin, W. (2024). Blockbuster or flop? Effects of social media on the Chinese film market. In 24th Biennial Conference of the International Telecommunications Society (ITS): New Bottles for New Wine: Digital Transformation Demands New Policies and Strategies, Seoul, Korea, 23–26 June 2024.

[13] Zhang, Z., Meng, Y., & Xiao, D. (2024). Prediction techniques of movie box office using neural networks and emotional mining. Scientific Reports, 14, 21209. https://doi.org/10.1038/s41598-024-72340-z

[14] Long, E. (2024). The correlation between social media and consumer behavior: A research on movie industry in China. In Proceedings of the 1st International Conference on Data Science and Engineering (ICDSE 2024), 260–266. https://doi.org/10.5220/0012820000004547