Research on brand spillover effect of China's IP movie based on signal theory

Hongyang Ji[1,a], Boya Liao[2,b], Jingwei Cheng[3,c*]

[1]Hongyang Ji, School of Economics and Management, Communication University of China, Beijing, 100024, China
[2]Boya Liao, School of Economics and Management, Communication University of China, Beijing, 100024, China
[3]Jingwei Cheng, assistant professor, master's supervisor, School of Economics and Management, Communication University of China, Beijing, 100024, China

[a]2683680649@qq.com, [b]liaoboya101@163.com
[c*]chengjingwei@126.com

Abstract. In recent years, many IP movies have achieved excellent box office results in China's movie market, and brand spillover effects are generated due to the fact that the IP itself may transmit quality signals. In this paper, 338 IP movies in the Chinese movie market from 2014 to 2023 are taken as research objects to investigate whether there were brand spillover effects on these IP movies. At the same time, the quadrant classification chart based on "adaptation" and "series" creatively defines the classification of IP movies, and explores the brand spillover effect mechanism of different types of IP movies.

Keywords: IP movie, brand spillover effect, signaling theory.

1 Introduction

With the booming development of China's movie market, the creation and production of IP movies have become more prosperous. Among the current top ten Chinese movie box office grosses, seven are IP movies, whose total box office grosses exceed RMB 32.2 billion, with a significant trend of revenue growth. Nowadays the domestic IP movie market in China has the largest number of domestic audiences, with the highest box office revenue, the best benefits, and the complete development of the whole industry chain[1]. Its rise and popularity not only demonstrates the diversity of the market and artistic expression, but also reflects consumers' preference for familiar brands and stories, revealing the great potential and attractiveness of domestic IP movies.

The explosion of IP movies is not accidental; the IP itself may send some kind of powerful signal through the established brand and story, that not only evokes empathy but also stimulates anticipation and curiosity among audiences about the new work, which in turn may have a brand spillover effect.

Z. Zhan et al. (eds.), *Proceedings of the 2024 10th International Conference on Humanities and Social Science Research (ICHSSR 2024)*, Advances in Social Science, Education and Humanities Research 858,
https://doi.org/10.2991/978-2-38476-277-4_157

The brand spillover effect originated from Anderson's (1983)[2] research, which refers to the fact that consumer acceptance of a new product is positively or negatively affected by previous products of the same brand, and this theory has been widely recognized and deepened in subsequent academic research and industrial applications[3].

Movie producers in China have begun to realize that by leveraging the brand value and audience base of existing IPs, they can effectively reduce the risk of marketing and increase the market expectation and acceptance of their movies[4]. However, comparing with the North American film market, where studios tend to prioritize box office as the indicator for choosing movie brands, does the same indicator apply to the Chinese film market? With the multiple and deep integration of domestic movie marketing and propagation, public opinion are often not directly related to movie ratings[5], existing literatures have not yet been able to answer the above questions as to what factors more strongly influence domestic audiences' preference for IP movies.

Based on this, this paper regards subjective and objective information such as ratings and box office of the original or previous IP movie as key quality signals, and explores how these signals generate brand spillover effects, and thus influence consumers' movie-going decisions. This study tries to reveal the path and effect of brand spillover effect of IP movies, which provides scientific basis for the optimization of movie production, distribution and marketing strategies[6].

2 Literature Review and Hypothesis Construction

2.1 IP Movie Concept and Classification

Regarding the definition of IP movies, "IP" is the abbreviation of "Intellectual Property", refering to the rights of people to intellectual achievements according to economic law. In the film industry, IP movies emphasize the cinematic transformation of existing intellectual achievements, including literary works, games, music, character images, concepts, settings, etc., all of which can be artistically processed into IP movies. Many scholars have found that the creation of IP does not only include movies transformed from crossover, but also many IPs that are originally produced. Peng Kan (2015)[7], in studying the development and operation mechanism of Hollywood IP movies, argues that the IP development of Hollywood movies is mainly manifested in cross-border adaptation and serialization.

IP movies transmit different signals to different groups. On the one hand, for the audience who have known the IP beforehand, the IP itself acts as a signal, which has a direct promotion effect on the box office of the film. The reason is that the fan economy effect after the IP attracts fans to make movie watching decisions[8]. On the other hand, for the audience who have not known the IP, IP movies can influence the audience's viewing decision through other quality signals. Hou Yong (2014) et al. believed that the market performance of the former ones will directly affect the submovie's market performance through the brand spillover effect. In short, whether a movie is based on an existing IP or a series of previous movies, its former work has

the essential factor of brand spillover effect, which is in line with the definition of IP movie.

To sum up, this paper defines IP movies as both movies adapted from literary works, games, dramas and other intellectual work, and series of movies based on original IP derived from film elements. As the two concepts we define and categorize IP movies are"adaptation" and "series", which are overlapping concepts, so we use the classification quadrant diagram of IP movies based on whether they are adaptations or not and whether they are series or not as an innovative solution, which is shown in Figure 1.

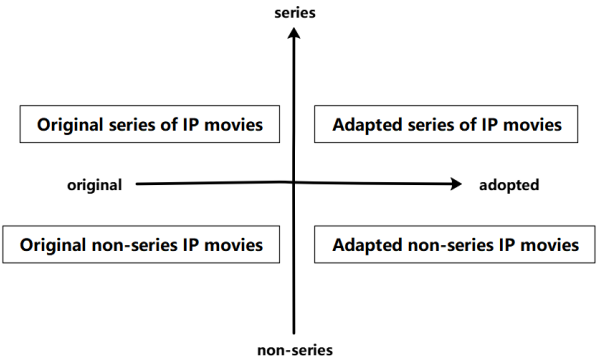

Fig. 1. Quadrant diagram for categorizing IP movies

Based on the quadrant order, the concepts defining the various types of IP movies are as follows:

1. Adapted series IP movies:

Refers to IP movies that are adapted from any kind of intellectual achievements, and in which the contents, images, concepts, settings, etc. are the core of the filming of a number of movies to form a series. Adaptation series of IP movies in China's film market are mainly presented in the form of comic book to movie and novel to movie. It has the characteristics of both adaptation IP movies and series IP movies, especially its original or previous works have a greater variety of potential brand spillover effect signals than non-IP movies.

2. Original series IP movies:

Refers to movies in which there is no relevant intellectual work to draw on before the filming of the series. The first film in original series of IP movies has the effect of creating an IP, and subsequent movies can be called IP movies, attracting many IP followers to watch the series. And their brand spillover effect is mainly generated through the box office and rating of the previous movie in the same series, and this paper referring to the latest previous one of the IP movie collectively as "the previous work".

3. Original non-series IP movies:

Refer to IP movies that have already created IP through the first movie but have not yet filmed a sequel, such as "Zootopia", whose peripheral products and theme parks have been widely welcomed, reflecting the brand spillover effect of the movie, but its sequel "Zootopia 2" has not yet been released. So this type of IP movie is outside the scope of the research of this paper.

4. Adapted non-series IP movies:

Refer to IP movies that are cinematic adaptations of existing creative intelligence achievement, and have not been filmed as sequels. In the Chinese movie market, such IP movies are mainly presented in the form of movie adaptations of literary works, such as "Youth" and "The Taking of Tiger Mountain". The characteristics of this kind of IP movie is more difficult to make a sequel due to the limited length of the literary works themselves, and when the brand spillover effect works, it mainly works through the rating information of the literary works, which are referred to as "the original works" in this paper.

2.2 Signaling Theory and the Brand Spillover Effect of IP Movies

The key measurement for IP movies in this paper is whether the IP in the movie has brand spillover effect. The concept of spillover effect was pioneered by Marshall (1890) [9]in "Principles of Economics", as it refers to the extent to which adoption decisions for new products are positively or negatively influenced by a pioneer product of the same brand or sub-brands. Anderson (1983) was the first to find that one product under the same brand has an impact on the sales of other products.

In recent years, more and more scholars apply the brand spillover effect to the explanation of the phenomenon of high box office of movies. Xia Weiguo developed the classical Bass model and constructed a new product diffusion model under brand spillover effect; Tang Zhongjun constructed a progressive sequel movie demand diffusion model and pointed out that it should be based on the brand spillover effect; Kang (2021)[10] proposed an improved generalized Bass diffusion model for box office forecasting in the Korean movie market. Meanwhile, Hou Yong et al. (2014) analyzed the formation mechanism of brand spillover effect of sequel movies, and found that both box office and reputation of the previous movie can lead to the movie brand spillover effect, which affects those of the sequel movie. In the related studies of sequel movies, Basuroy and Chatterjee (2010)[11] found that the shorter the release interval between sequels and their predecessors and the higher the frequency, the higher the box office.

Synthesizing the above studies, this paper proposes the following hypothesis:

H1: The high box office phenomenon of IP movies is due to the existence of brand spillover effects.

Wernerfelt[12] analyzed the advantages of brand spillovers using signaling theory, saying that the very act of extending a product line implies to consumers the high quality of that brand. For the movie industry, making an IP movie is an extension of

the product line of the previous or original movie, and for audiences, the high quality of the original or previous movie can be used as a signal to predict the quality of the IP movie, prompting non-viewers to watch it and the IP loyalists to follow it. Moreover, Hou Yong et al. defined specific signals as the box office and ratings of the previous movie, this paper follows the same idea.

In order to explore the reasons for the high box office phenomenon of IP movies, this study divides the quality information of IP movies into proprietary quality information and shared quality information (as shown in Table 1). The former is the information that distinguishes IP movies from ordinary movies and may lead to brand spillover effect. The shared movie information are signals that all types of movies have and are not discussed in this paper.

Table 1. Quality signals of IP movies

IP Movie Quality Information	Proprietary quality information	Subjective quality information	Ratings for the previous IP movie in the series
			Adaptation IP movie original s core
		Objective quality information	previous work to the IP movie series at the box office
	Shared quality information	Information from the filmmakers	Production costs, trailers, posters, premieres .....
		Other information	Audience ratings, media reviews .....

The proprietary quality information of IP movies can be further classified as subjective quality information and objective quality information, specific content as the table above. The subjective information including the ratings of the previous movie in the series and that of the original novels and other works of which the IP movie is adapted, as all the ratings come from individual subjectivity. We take the rating of the latest movie in the series on DouBan as the key index of subjective information. While the objective quality information specifically means the Chinese movie market box office of the previous part of the IP movie. Based on this, we put forward the following hypotheses:

H2a: Subjective quality information can work as a signal to generate brand spillover effects and influence the box office.

H2b: Objective quality information can work as a signal to generate brand spillover effects and influence the box office.

Based on the above categorization of IP movies, the quantity and quality of signals delivered by different types of IP movies are differ, and thus the effect of their brand spillover effect may also vary. Therefore, hypothesis is that:

H3a: The brand spillover effect of original series IP movies is greater than that of adapted non-series IP movies.

Adapted series of IP movies combine the quality information of the two types of movies mentioned above, theoretically there are more signals that can work to gener-

ate brand spillover effects and influence audience's decision. Accordingly we proposes the following hypothesis:

H3b: The brand spillover effect of adapted series IP movies is greater than that of original series of IP movies.

3 Data Sources, Variable Selection and Research Design

In this paper, we take the signal type as the classification basis to study whether there is brand spillover effect of IP movies, and whether the subjective or objective information can function as signals, so as to prove whether H1 and H2 are valid or not. Then we follow the innovation classification of different types of IP movies to validate wheter the subjective or objective information functions more effective as signals, so as to verify H2. And also investigates the effects of brand spillover effects of different types of IP movies, so as to prove whether H3 is valid.

3.1 Data Description

In this paper, eligible IP movies in China's movie market from 2014-2023 are taken as research objects, the specific requirements of eligible IP movies include: the previous IP movie is released in mainland China with known box office and ratings, the ratings of the original movie are known, and the cumulative box office is more than 5 million RMB, etc.and 338 IP movies are obtained in the end. Based on the above classification, 129 adapted series IP movies, 76 original series IP movies and 133 adapted non-series IP movies were obtained.

In this paper, the dependent variable is defined as the percentage of box office of IP movies, i.e.

$$\text{Percentage of IP movie box office} = \frac{\textit{Chinese movie market box office of this movie}}{\textit{total box office of Chinese films in this year of release}} * 100\%$$

Such processing can exclude differences due to yearly changes of movie market.

The independent variables are the ratings and the box office of the previous movie and the ratings of the original movie, which are the information that the audience can directly contact with before making the decision of pruchasing tickets of the IP movie. The variable date come from Douban and Maoyan platform, which have strong authority of data sources. The stata regression is used to analyse the causal relationship and explanatory power of the independent variable to the dependent variable.Meanwhile, IP movies' ratings and production costs are selected as control variables to control the endogeneity problem. As the ratings and production costs of IP movies have correlation to the box office percentage of IP movies, so we also take them into consideration. All the data come from professional platforms or film official reports, and linear interpolation is adopted to supplement the missing values. The data variable names and descriptive statistics are shown in Table 2.

Table 2. Data sources and descriptive statistics

variable name	maximum values	minimum value	average value	(statistics) standard deviation
IP movies (n=338)				
Percentage of IP movie box office (Pbox,%)	13.528	0.005	0.838	0.015
IP Movie previous work Box Office (Fbox)	57.753	0.046	3.835	6.838
IP Movie previous work Score (Fscore)	9.2	2.7	6.814	1.255
IP Movie Original Score (Oscore)	9.7	4.3	7.962	0.927
IP Movie Score (score)	8.9	2.5	6.193	1.343
IP movie production cost (cost)	13	0.02	1.396	1.965
Original series of IP movies (n=76)				
Percentage of IP movie box office (Pbox,%)	13.528	0.009	1.483	0.024
IP Movie previous work Box Office (Fbox)	57.753	0.064	5.489	8.792
IP Movie previous work Score (Fscore)	8.9	3.0	7.024	1.243
IP Movie Score (score)	8.6	2.7	6.250	1.293
IP movie production cost (cost)	13	0.03	1.787	2.249
Adaptation of IP movie series (n=129)				
Percentage of IP movie box office (Pbox,%)	7.337	0.012	0.694	0.011
IP Movie previous work Box Office (Fbox)	46.811	0.046	2.860	5.162
IP Movie previous work Score (Fscore)	9.2	2.7	6.691	1.250
IP Movie Original Score (Oscore)	9.6	4.3	8.170	0.879
IP Movie Score (score)	8.8	2.5	6.392	1.190
IP movie production cost (cost)	11	0.02	1.001	1.534
Adapted non-series IP movies (n=133)				
Percentage of IP movie box office (Pbox,%)	7.283	0.005	0.610	0.010
IP Movie Original Score (Oscore)	9.7	5.2	7.759	0.931
IP Movie Score (score)	8.9	2.8	5.968	1.481
IP movie production cost (cost)	10.8	0.03	1.558	2.106

3.2 Analysis of Empirical Results

The study first validates the brand spillover effect of IP movies by constructing Models 1 to 3, exploring one by one whether the box office of the previous movie, the rating of the previous movie, and the rating of the original movie can work as signals to generate brand spillover effects. For different types of IP movies, the signaling role

of the independent variables may differ, so Models 4 to 6 are constructed, and regressions are conducted from the perspectives of original series IP movies, adapted series IP movies and adapted non-series IP movies respectively, and the optimal subset of independent variables and control variables are selected to explain their brand spillover effects.

Among them, the independent variables of original series IP movies are the box office and rating of the previous movie (Fbox and Fscore), that of adapted non-series IP movies is the rating of the original movie (Oscore), and that of adapted series IP movies are the box office rating of the previous movie and the rating of the original movie (Fbox, Fscore and Oscore).

The results of the regression are shown in the table below:

Table 3. Regression results

variant	Model 1 (IP movie with box office information about its predecessor)	Model 2 (IP movie with information about the previous movie's rating)	Model 3 (IP movie with original rating information)	Model 4 (Original Series IP Movie)	Model 5 (Adaptation of an IP movie series)	Model 6 (Adaptation of a non-series IP movie)
Constants (cons)	-0.819*** (0.004)	-0.695*** (0.004)	-0.333*** (0.005)	1.301*** (0.010)	-0.128*** (0.002)	-0.941*** (0.007)
IP Movie previous work Box Office (Fbox)	0.155*** (0.000)			0.183*** (0.000)	0.076*** (0.000)	
IP Movie previous work Score (Fcore)		-0.013 (0.001)		-0.032 (0.002)	0.006. (0.001)	
IP Movie Original Score (Oscore)			0.003 (0.001)		-0.059 (0.001)	0.146* (0.001)
IP Movie Score (score)	0.147*** (0.001)	0.145** (0.001)	0.105** (0.000)	0.271* (0.001)	0.105** (0.001)	0.050 (0.001)
IP movie production cost (cost)	0.219*** (0.001)	0.662*** (0.000)	0.249*** (0.000)	0.173 (0.001)	0.371*** (0.001)	0.079** (0.000)
R^2	0.6889	0.5399	0.2546	0.6644	0.8005	0.0786
Adjustment R^2	0.6842	0.5331	0.2459	0.6455	0.7924	0.0570

Remarks:*, **, *** indicate significant at the 10%, 5% and 1% levels, respectively; standard errors in parentheses; all variables in the regression have VIF values less than 5 to exclude the effect of covariance.

As shown in Table 3, when regressing on all IP movies as a sample, objective information such as box office can function as a signal, generating brand spillover effects and influencing the audience's decision to watch IP movies, while subjective information such as ratings is not significant overall and cannot function as a signal. Therefore H1 holds, H2b holds, and H2a does not hold.

When regressing the three classifications of IP movies as samples respectively, for the original series of IP movies, the previous work box office has a positive causal relationship on the box office percentage of the series of IP movies. And the figure of R^2 suggests that the previous work box office is more capable of explaining the changes in the box office of IP movies. While the previous work rating can not be used as a signal to influence the box office of the original series of IP movies, H2b is valid and H2a is not valid. For the adapted series of IP movies, the result on the box office percentage and the previous work box office is consistent with the former category. But the influence of previous and original works' score is not significant, indicating that neither of these two factors can be used as signal to influence the box office of the adapted series of IP movies, H2b is valid and H2a is not valid. And for adapted non-series IP movies, H2a still holds.

Combining the regression results above, it can be concluded that under the innovation classification, H2a does not fully hold, and H2b still holds.

For viewers of series IP movies, the box office of the previous work is more objective and persuasive, so it can be used as a signal to generate brand spillover effect. While the previous work's rating is more subjective, and for the viewers who love the IP, the negative evaluation of others may not influence them, so it cannot be consider as signal. For viewers adapting non-series IP movies, the quality of the movie can be assessed only through the ratings, so the original ratings can be used as a signal to influence the viewers' decision to watch the movie, but its explanatory power is relatively weak.

The study measures the effect of brand spillover effect with the magnitude of the coefficient of the independent variable. For original series IP movies, since only the previous work box office generates brand spillover effect, and the coefficient indicates that for every unit of increase in the previous work box office of the original series IP movies, the percentage of box office of the IP movies will increase by 0.183% on average. For adapted series IP movies, since only the previous work box office generates brand spillover effects, the figure goes down to 0.076% on average. For adapted non-series IP movies, their original movie ratings generate brand spillover effect, and the coefficient comes to 0.146% on average. Therefore, the brand spillover effect of original series IP movies is stronger than that of adapted non-series IP movies, while the effect of adapted series IP movies is the weakest, H3b holds and H3a does not hold.

The ratings of both the original and previous work of the original series of IP movies cannot function as signals, which is closely related to the characteristics of their movies. This kind of IP movies are mainly anime theatrical releases, such as the do-

mestic "Boonie Bears" and the Japanese manga "Detective Conan", etc., which have accumulated a group of loyal fans when the anime was broadcasted, and the rating information of other viewers will not have an impact on them, so the brand spillover effect is relatively weak. This reflects that anime IP itself has an extremely strong brand spillover effect, therefore other signals are weakened.

4 Conclusions

From the above regression, the following conclusions can be drawn:

(1) Research bases on the information type shows that objective information such as box office can be used as a signal to generate brand spillover effects, while subjective information such as ratings cannot be used as a signal. The results confirm that movie box office data is relatively more persuasive to audiences. So the box office of the previous movie should be the focus of the studio's advertising, and be delivered to more IP movie viewers.

(2) The study based on the innovation classification of IP movies shows that both the box office of the previous IP movie and the rating of the original movie can be used as signals to positively affect the box office percentage of the IP movie, while the rating of the previous movie cannot be used as a signal to generate brand spillover effects. In terms of effect, the brand spillover effect of original series IP movies is greater than that of adapted non-series IP movies, while although adapted series IP movies theoretically have multiple signals, but leads to its lower brand spillover effect due to the high stickiness of its original audience group. Therefore, when the film makers shoot the adaptation of series IP movies, it’s suggested to focus on the IP anime characters, etc., which is conducive to guiding the audience.

The findings of this paper have the following main implications:

First of all, this paper creatively puts forward four types of IP movies based on the characteristics of "adaptation" and "series", and researches the definition, classification and characteristics of IP movies, which provides a theoretical basis for the subsequent research.

Secondly, this paper analyzes the IP movies released in the Chinese film market in the past ten years, and concludes that the previous box office of a series of IP movies can play the brand spillover effect as a signal with strong explanatory power. The results of this paper provide some practical reference for movie promotion.

Finally, this paper lays a foundation for studying the brand spillover effect of anime IP. For the adaptation of series IP movies, the viewing choice of its audience group almost unaffected by other information of the series. Therefore, a good promotion of the anime IP itself may form a strong brand spillover effect.

As for the limitations of the study, first, this paper selects the IP movie data of the Chinese movie market in the past ten years, which is a short span and the sample size of IP movies is small, and will continue to expand the scope of the related research; second, there is a lack of sufficient data and quantitative indicators for the influence of the animation IP itself, and will continue to collect data to study its brand spillover effect.

References

1. Fu Y. Research on the development of domestic IP movie market [D]. Jiangxi University of Finance and Economics,2019.
2. Anderson A. Spreading Activation Theory of Memory [J]. Journal of Verbal Learning and Verbal Behavior, 1983, 22(3): 261-95.
3. Xia W G, ZHANG X, HOU G M. A study of new product diffusion model under brand spillover--Taking movies as an example[J]. Research Science,2021,42(10):122-130. DOI: 10.19571/j.cnki.1000-2995.2021.10.014.
4. Hou Y, WANG T N, LI X Y. The formation mechanism of brand spillover effect of sequel movie: from the perspective of signaling theory and brand extension theory [J]. Management Review,2014,26(7):125-137.
5. Eliashberg J., Elberse A., Leenders. M.A. The Motion Picture Industry: Critical Issues in Practice, Current Research, and New Research Directions [J]. Marketing Science, 2006, 25(6): 638-661.
6. Li L, Wang P, Song S G, The spillover effect of Chinese brands implanted in Hollywood movies[J]. Business Research,2017(05): 17-22. DOI: 10.13902/j.cnki.syyj.2017.05.003.
7. Peng K. IP development and operation mechanism of Hollywood movies[J]. Contemporary Cinema,2015(09):13-17.
8. Hu Z G. The impact of intellectual property rights adaptation on movies-analysis based on IP movie box office[J]. Finance and economics,2019(04):109-112.
9. Marshall. Principles of Economics [M]. Zhu Zhitai, Chen Liangbi, Translation. Beijing: Commercial Press, 2019.
10. Kang, D. (2021) 'Box-office forecasting in Korea using search trend data: a modified generalized Bass diffusion model'., Electronic Commerce Research, 21(1), pp. 41-72. doi:10.1007/s10660-020-09456-7.
11. Basuroy S, Chatterjee S. Fast and frequent: Investigating box office revenues of motion picture sequels[J]. (7):798-803.
12. Wernerfelt B. Embrella Branding as a Signal of New Product Quality: An Example of Signaling by Posting a Bond[J]. Rand Journal of Economics,1988,19 (3):458-466.