

# Investigating the Moderating Role of Platform Strategies- Evidence from China's Online Film Platforms

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**Abstract:** This paper studies the interaction between vertical integration and platform ecosystem, two co-existing intra-organizational forms. Specifically, the work investigates the moderating role of platform strategies on the relationship between vertical integration and performance. The study analyzes data from 1922 cinemas of China's film industry that is undergoing business transformation as a result of the emergence of online film platforms. The results suggest that self-established platforms can enhance the impact of vertical integration on cinema performance. The findings also reveal that vertical integration and third-party platforms may be substitutable for a cinema. Finally, directions for future research is discussed.

Key words: Platform strategies, Vertical integration, Online film platform, Performance

## 1. INTRODUCTION

IT-enabled business transformation involves two significant organizational changes: redefinition of business scope<sup>[1,2]</sup> and the rise of digital platforms<sup>[3,4]</sup>. The two changes are not isolated but interrelated. Digital platforms play the major role in reshaping industrial structure and changing the boundaries of industries<sup>[5]</sup>. China's film industry provides a rare example to investigate the role of digital platforms in reshaping industry structure. The industry had maintained its off-line business model until some of China's online platforms launched group purchase of film tickets in 2011. Since then, the proportion of online ticketing in box office has been soaring. In the second quarter of 2015, online ticket sales accounted for 69.18% of total box office. The emergence of online platforms has driven the annual growth of the film industry to more than 30%<sup>[6]</sup>, well above the growth of the countries' GDP.

Vertical integration between distributors and theaters is an important industrial organization in the film industry around the world. The industrial organization can effectively mitigate uncertain demand, and improve operation efficiency to a certain degree in the pre-digital-economy era<sup>[7]</sup>. However, China's online platforms have moved into the market by means of group purchase at the beginning stage and online seat selection at the current stage. Further, the online platforms try to develop platform-centric business ecosystems. So cinemas have to deal with two intra-organizational forms simultaneously: vertical- integrated exhibition chains and platform ecosystems. This paper will explore the impact of platform strategies adopted by cinemas on their performance. Specially, the paper will investigate the moderating effects of platform strategies on the relationship between vertical integration and cinema performance. To the best of our knowledge, this is the first paper empirically explore the compatibility between digital platforms and traditional organizational forms. It can deepen our understanding on the role of digital platforms in business transformation and industry convergence.

## 2. THEORETICAL FRAMEWORK AND HYPOTHESES

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## 2.1 Theoretical framework

In the context of China's film industry, the institutional arrangement of exhibition chains has two categories based on the relationship between a distributor and a cinema: investment-based and contract-based. It is different from the institutional arrangement in western countries, where an exhibition chain invests and owns all cinemas in it. The related concepts are defined in table 1.

**Table 1. Definition of concepts**

Concepts	Definitions	Examples
Exhibition chain	A firm composed of one distributor and cinemas by means of capital investment or agreements for the purpose of coordinate operation under one brand	Wanda, Guangdong Dadi, China Film Stellar Theater Chain
Self-established online platform	Electronic-commerce platforms that provide online ticketing service, and is established by exhibition-chain firms	<a href="http://www.wandafilm.com">www.wandafilm.com</a> , <a href="http://www.dadicinema.com">www.dadicinema.com</a> , <a href="http://www.jycinema.com">www.jycinema.com</a>
Third-party platform	Electronic-commerce platforms that provide online ticketing service, but is not established by exhibition-chain firms	Maoyan, Mtime, Gewara, <a href="http://ticket.taobao.com/">http://ticket.taobao.com/</a>
Degree of Multihoming on third-party platforms	Refer to how many third-party platforms a cinema participate in simultaneously	If a cinema simultaneously participates in Maoyan and Mtime, then its degree of the multihoming is 2.

## 2.2 Main effect

Studies on the incentive sources of vertical integration can be classified into two schools: neoclassical theories of imperfect market and transaction cost economies/incomplete contracts. Neoclassical theories of vertical integration is fundamentally based on the presumption that vertical integration, and non-standard vertical arrangements, reflected responses to market power that existed in upstream and downstream market and/or reflected efforts to create or exploit market power. In this way, vertical integration is institutional arrangement to avoid double marginalization, internalize horizontal externalities, leverage market foreclosure and secure uncertain supply input<sup>[8]</sup>. Transaction cost economies regard asset specificity as the main determinant of vertical integration in light of incomplete contracts. Empirical results support efficiency motivations for vertical integration and asset specificity as an important causal factor influencing vertical-integration decision.

One of the natures of the film industry is extremely uncertain demand, which makes it difficult to predict the box office of a film. Vertical integration is a useful way to deal with the nature. It can partially solve the problem of incomplete contracts between distributors and exhibitors, which can give rise to underinvestment in cinemas, unsecure input from distributors, and underreporting of revenues<sup>[7]</sup>. In the context of China's film industry, investment-based relationship is regarded as a higher degree of vertical integration, while contract-based relationship is regarded as a lower degree, which can be cancelled upon the termination of a contract. Investment-based vertical integration can internalize vertical externalities<sup>[8]</sup> and effectively reduce opportunistic behavior<sup>[9]</sup>. Additionally, investment-based vertical integration can bring benefits of operation efficiency such as well coordination and leverage of brand advantage. Therefore, we present the following hypothesis:

H1 The vertical-integration degree of a cinema is positively correlated to performance of a cinema.

## 2.3 Moderating effects

When an exhibition chain runs an online platform, it can better coordinate its relationship with vertically integrated cinemas than those exhibition chains that have not established an online platform. An exhibition chain can achieve better synergy effects by leveraging resource, process and strategic complementarity between its online platforms and its cinemas<sup>[10]</sup>. As for resources, an online platform has strong information collection, aggregation and processing capabilities due to the open nature of the Internet and the design of its information system. If exhibition chain establishes an online platform, it can increase the size of its customers by leveraging installed base of its online platform, and enhance customer loyalty by taking advantage of online communities<sup>[11]</sup>. As for processes, an online platform and cinemas can develop an interoperable information system so as to streamline consumption process and even establish a closed-loop process. A customer makes a decision after reading recommendations on an online platform, and then booking his/her seat and pay the ticket online, finally the customer may give his/her own opinions on the movie or cinema, which further drive more consumption<sup>[12]</sup>. As for strategies, an exhibition chain with an online platform can improve operation efficiency by coordinated marketing and operation strategy implementation<sup>[13]</sup>. Therefore, we posit the following hypothesis:

H2 A self-established online platform of a cinema can positively moderate the impact of vertical integration on the performance of the cinema.

For a given cinema, exhibition chains and platform ecosystems are two inter-organizational forms and also two institutional arrangements. Exhibition chains as a form of vertical integration focus on improving film distribution, and online film platforms is originally dedicated to matching film demand with supply<sup>[7]</sup>. The two parties may complement each other when online platforms can increase potential demand for a cinema and even an exhibition chain. However, we argue that the substitute relationship between the two parties dominate their complementary relationship due to the following reasons. Firstly, an online platform and an exhibition chain have overlapping functions in a film industry, including film marketing and distribution. Actually, some of China's online platforms have obtained license of film distribution granted by the SARFT. Secondly, the two inter-organizational forms may compete for resources and power in the industry, among others, the resources and capabilities of a cinema<sup>[14]</sup>. In this way, a cinema may exist in two competing intra-organizational forms, and have to follow two sets of rules of governance<sup>[15]</sup>. The two competing intra-organizational forms may have conflict requirements on resources and capabilities of a cinema. Therefore, we posit the following hypothesis:

H3 The platform-multihoming degree of a cinema can negatively moderate the impact of vertical integration on the performance of a cinema.

## 3. METHODOLOGY

### 3.1 Data

This paper treats a cinema as the unit of analysis. The samples of this paper are selected based on the following three requirements. Firstly, a sample cinema must adopt computer-aided ticket system (CTS). According to *The Circular on Strengthening Computer-aided Ticketing by Cinemas or Exhibition Chains* released by the State Administration of Radio, Film and Television (SARFT), any cinema installing CTS must adopt CTS compatible with terminals of SAFT, and upload their box-office data to SARFT everyday. The rule objectively increases data availability and guarantees data quality for research. Secondly, the cinema must participate in an exhibition chain. The degree of vertical integration is an independent variable of this paper, thus we exclude any independent cinema from our sample. Thirdly, the cinema must have viewer rating on Maoyan, Gewara and Mtime, three online film platforms in China. We select them for they represent three types of online film platforms. Maoyan is a subsidiary of China's largest

group-purchase platform, Gewara is an online platform dedicated to local entertainment, and Mtime has focused on film information and fan communities. Meanwhile, the three platforms accounted for 59.30% of online ticketing in 2014 according to *Online Film Market Report of China in 2014* released by Analysys International. The sampling period of this paper is December 2014. A total of 1922 cinemas meet the above-mentioned three requirements during the period.

The data of this paper have three sources. Firstly, data about the box office and average price, seats, and screens of a cinema are from Entgroup Company, which sorts box-office data uploaded by cinemas to the SARFT. Secondly, data about cinema rating and the degree of cinemas' multihoming on third-party platforms are snatched from the websites of the three online platforms. Data about self-established platforms or vertical integration of an exhibition chain are from websites of exhibition chains. Thirdly, data about consumption expenditure of urban residents are from 2015 annual statistics of corresponding provinces, municipalities or autonomous regions.

### 3.2 Variables

(1) Independent variables. *Integration<sub>i</sub>* captures the degree of vertical integration between a cinema and an exhibition chain. It is a dumb variable. If a cinema is invested by an exhibition chain, then its value is 1. If a cinema participates in an exhibition chain only based on agreements, then its value is 0.

(2) Dependent variable. Drawing on previous literature<sup>[7]</sup>, this paper adopts the performance of a cinema as a dependent variable. The variable is measured by the box office of a cinema, which can be justified by the fact that not only cinemas but China's film industry is heavily dependent on box offices.

(3) Moderating variables. Both *Selfplat<sub>i</sub>* and *Multihoming<sub>i</sub>* capture platform strategies of a cinema. *Multihoming<sub>i</sub>* represents the degree of a cinema's participation in third-party online platforms. It is measured by how many third-party film platforms a cinema participates in. Participation herein means that a participant cinema allows customers to select seats and make the payment on the platform. Therefore, *Multihoming<sub>i</sub>* is an ordinal categorical variable, with possible values of 0, 1, 2, and 3. *Selfplat<sub>i</sub>* represents whether or not an exhibition chain with which a cinema is with has established its own online platform. It is a dumb variable. If an exhibition chain establishes an online platform, its value is 1, or its value is 0.

(4) Control variables. This paper includes five control variables, i.e. *Quality<sub>i</sub>*, *Seats<sub>i</sub>*, *Screens<sub>i</sub>*, *Price<sub>i</sub>* and *Exp<sub>i</sub>*. The former four variables capture attributes of a cinema, and the last one captures the attribute of local customers. *Quality<sub>i</sub>* represents the quality of a cinema, measured by the average rating score of cinema on the three online platforms. *Seats<sub>i</sub>* represents the capacity of a cinema to accommodate customers, measured by the total number of the cinema. *Screens<sub>i</sub>* represents the capacity of a cinema to exhibit films simultaneously, measured by the total number of screens of the cinema. *Price<sub>i</sub>* represents the market power of a cinema, measured by the average price of a cinema in the sample period. *Exp<sub>i</sub>* represents consumption capability of local customers, measured by consumption expenditures of urban residents per capita.

### 3.3 Model specification

Cross-sectional samples of this paper may results in the problem of heterodasticity. This paper adopts White test, which neither depends on normal distribution of samples nor requires order of independent variables. The test results show that heterodasticity exists. Therefore the model is estimated by an OLS method with White heterodasticity-consistent standard errors. The estimation methods can realize asymptotically efficient statistical inference with a large sample<sup>[16]</sup>.

We also checked for potential problems of multicollinearity by calculating variance inflation factors (VIF). Individual VIF values greater than 10 indicate problems of multicollinearity (Neteretal, 1989), along with

average VIF values greater than six. Although some correlation coefficients in Table 2 have moderate values, the VIF values are at acceptable levels (mean VIF=1.16). Consequently, no problems of multicollinearity exist.

**Table 2. Descriptive statistics and correlations**

Variable	Mean	SD	1	2	3	4	5	6	7	8
1.Seats <sub><i>i</i></sub>	885.752	437.157	1.000							
2.Screens <sub><i>i</i></sub>	6.099	2.402	0.713***	1.000						
3.Price <sub><i>i</i></sub>	33.878	6.385	0.268***	0.277***	1.000					
4.Exp <sub><i>i</i></sub>	21491.0	5827.0	0.251***	0.255***	0.439***	1.000				
5.Quality <sub><i>i</i></sub>	7.957	0.620	0.162***	0.164***	-0.009***	-0.036***	1.000			
6.Integration <sub><i>i</i></sub>	0.468	0.499	0.125***	0.159***	0.038***	0.009***	0.073***	1.000		
7.Selfplat <sub><i>i</i></sub>	0.404	0.491	0.029***	0.017***	0.043***	-0.024***	0.040***	0.274***	1.000	
8.Multihoming <sub><i>i</i></sub>	1.956	0.775	0.405***	0.377***	0.241***	0.254***	0.148***	0.279***	0.179***	1.000

Notes: \*\*\* p<0.01.

#### 4. RESULTS

Table 3 displays the main empirical models to test our hypotheses. Model 1 is a baseline model, including control variables related to demand-side and supply-side attributes that may affect the main and moderating impacts. Model 2 includes the independent variables related to the existing form of industrial organization (*Integration<sub>i</sub>*). Model 3 includes moderators related to platform strategies adopted by cinemas, i.e., establishing own online platforms (*Selfplat<sub>i</sub>*) and multihoming on third-party platforms (*Multihoming<sub>i</sub>*). Model 4 and 5 include interactions terms between an independent variable and moderators.

In model 2, the results show that *Integration<sub>i</sub>* has a significant and positive impact on the performance of a cinema. As expected, this find confirms that the higher degree of vertical integration can improve cinema performance, thus supporting H1. The result of Model 4 reveals how *Selfplat<sub>i</sub>* moderates the impact of *Integration<sub>i</sub>* on cinema performance. The coefficient of the interaction term is significant and positive, indicating that *Selfplat<sub>i</sub>* exerting a positive moderating impact. The results of Model 5 show the moderating role of *Multihoming<sub>i</sub>* on the impact of *Integration<sub>i</sub>* on cinema performance. The coefficient of the interaction term between *Integration<sub>i</sub>* and *Multihoming<sub>i</sub>* is significantly negative, indicating that *Multihoming<sub>i</sub>* exerting a positive moderating impact. Thus H2 and H3 are supported.

**Table3. Regression results**

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Seats<sub>i</sub></i>	0.496*** (6.352)	0.594*** (7.141)	0.435*** (5.690)	0.430*** (5.611)	0.443*** (5.794)
<i>Screens<sub>i</sub></i>	1.583*** (14.779)	1.488*** (13.492)	1.278*** (12.627)	1.285*** (12.731)	1.239*** (12.244)
<i>Price<sub>i</sub></i>	2.073*** (10.812)	2.185*** (11.616)	2.074*** (13.304)	2.059*** (13.173)	2.079*** (13.361)
<i>Exp<sub>i</sub></i>	-0.730*** (-11.180)	-0.450*** (-6.342)	-0.402*** (-6.620)	-0.391*** (-6.461)	-0.414*** (-6.859)
<i>Quality<sub>i</sub></i>	-1.763*** (-7.192)	-1.810*** (-7.425)	-1.515*** (-6.946)	-1.509*** (-6.955)	-1.511*** (-6.955)
<i>Integration<sub>i</sub></i>		0.174*** (4.195)	-0.044 (-1.086)	-0.118** (-2.153)	0.254** (2.293)
<i>Selfplat<sub>i</sub></i>			0.047	-0.050	0.081**

			(1.179)	(-0.822)	(2.011)
<i>Multihoming<sub>i</sub></i>			0.594*** (17.994)	0.583*** (17.478)	0.686*** (16.528)
<i>Integration<sub>i</sub></i> <i>*Selfplat<sub>i</sub></i>				0.191** (2.471)	
<i>Integration<sub>i</sub></i> <i>*Multihoming<sub>i</sub></i>					-0.215*** (-3.349)
$R^2$	0.548	0.551	0.637	0.638	0.640
<i>Adjusted R<sup>2</sup></i>	0.547	0.550	0.636	0.637	0.638
$\Delta R^2$		0.003***	0.105**	0.001**	0.003**

Notes: values in parentheses are t statistics. \*\*\* represents 1% significance, and \*\* represents 5% significance.  $\Delta R^2$  in model 4 and 5 is based on comparison with model 3.

## 5. CONCLUSIONS

This paper confirms the role of vertical integration in improving cinema performance, in consistent with findings of previous literature [7]. The paper further finds that third-party platforms and vertically-integrated exhibition chains may substitute each other in terms of their contribution to cinema performance, while exhibition chains can take advantage from self-established platforms.

Then the question rises why cinemas owned by an exhibition chain are willing to participate in an online platform. Third-party platforms are a double-edged sword for exhibition chains. On one hand, Internet platforms possess a huge size of installed base and an online community, which can help cinemas to attract customers. On the other hand, online platforms may expose cinemas or exhibition chains to fiercer competition by sufficiently informing customers. What's more, when a lot of cinemas of the same region participate in online platforms, the effect of crowding out may dominate network effects of an online platform. An online platform may even gain customers' loyalty who are originally loyal to a cinema or an exhibition chain. In the film-related business ecosystem, exhibition chains have been aware of cross-boundary competition from online platforms. For example, Maoyan, China's largest online film platform, registered online film ticketing worth of RMB5 billion in 2014, exceeding the box office of RMB4.2 billion of Wanda Cinemas, the largest exhibition chain in the country.

This paper has some limitations. Firstly, the interaction of the two intra-organizational forms can be further explored in some aspects. For example, China's third-party film platforms are more concentrated than exhibition chains in terms of market share. In 2014, top three online film platforms accounted for more than 62.47% of online ticketing, while top eight exhibition chains accounted for 59.34% of box office. How the concentration or other features of the two intra-organizational forms co-evolve may deepen our understanding on intra-organizational change in the digital era. Secondly, in this paper we regard online platforms and exhibition chains as two intra-organizational forms, which actually are also institutional arrangement. Under different institutional arrangement, the governance mechanism may change. For instance, interface or transaction rules should be different, and it's an interesting to explore how a cinema handles the two governance mechanisms simultaneously. It can be directions for future research.

## ACKNOWLEDGEMENT

The authors appreciate all the helpful and insightful comments by anonymous reviewers. The authors owe their thanks to the financial support provided by the National Science Foundation of China (NSFC project Nos. 71103079, 71173036), and Humanities and Social Science Project of Ministry of Education (No. 15YJA630065).

The authors also owe thanks to financial support by China Institute of Manufacturing Development (SK20140090-16), Project of Ministry of Education on Development Reports (13JBG004).

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