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# Online-to-offline (O2O) Platforms, Proprietary Platforms and Firm Performance

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**Abstract:** This paper studies the impact of O2O (Online-to-offline) platforms on the performance of participating firms. Specifically, the study uses a sample of 3406 cinemas to investigate the moderating effect of O2O platforms, particularly proprietary platforms, on the relationship between cinemas' resources and their performance. Resources are measured in two dimensions. One dimension is physical resources, measured by the number of seats, while the other dimension is intangible resources, measured by the operating duration of a cinema. The findings show that both O2O platforms and proprietary platforms have significantly positive impact on the relationship between the number of seats and firm performance. O2O platforms negatively moderate the relationship between duration and firm performance, while proprietary platforms positively moderate the relationship. Implications of the findings are discussed.

Keywords: O2O platforms, proprietary platforms, contingent resource-based view

## 1. INTRODUCTION

Online-to-offline (O2O) has risen as a business model of electronic commerce. Third-party data and analysis agency iMedia Research has published reports, which showed that the whole O2O markets in China had reached 665.94 billion yuan in 2016, with a year-on-year increase of 42.7%. The O2O model has been penetrated into many services, such as food, education, and medical industries. O2O is defined as a new generation of e-commerce that combines online searching and booking products and services, with consumption in brick-and-mortar stores<sup>[1]</sup>.

Digital platforms have become the information and business infrastructure of the digital economy<sup>[2]</sup>. O2O platforms have emerged, including both third-party and proprietary O2O platforms. For the third-party platforms, companies could benefit from its IT technology and a large installed base of users due to network effects<sup>[3]</sup>. However, the competition on the third-party platforms could be fierce, and the level of customers' loyalty is low. For the proprietary platforms, companies can collect data about consumers. As the concept of big data has been widely accepted, the value of the data could be important. In fact, data can be valuable resources for companies. In addition, proprietary platforms can build higher customers' loyalty.

A few studies have investigated the role of O2O platforms on firm performance<sup>[4]</sup>. Literature studies whether the characteristics of digital platforms will have influence on firm performance<sup>[5]</sup>, or whether some specific third-party platforms will influence firm performance<sup>[1]</sup>. However, extant literature concentrates on third-party platforms, and few researches investigate proprietary platforms. There are two reasons. Firstly, in O2O models, the third-party platform has occupied large market share, and thus has attracted a majority of related researches. Secondly, with the big data era coming, corporations in O2O industry need to control their own consumer' data, hence we hold proprietary platforms need to be emphasized. This paper intends to fill the gap between empirical researches. Specifically, this paper will explore the role of O2O platforms in the

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relationship between firm resources and performance. O2O platforms here include both third-party platforms and proprietary platforms.

This paper has two major contributions. Firstly, the paper contributes to the understanding of the contingent role of O2O platforms in the relationship between firms' resources and their performance. According to the contingent resource-based view, it's the combination of resources, rather than a single type of resource, renders competitive advantage in a specific context. Platforms can provide strategic complementary resources for participating firms<sup>[6]</sup>. However, few empirical papers examine the complementary role of platform resources. This paper intends to fill the gap. Secondly, this paper helps to understand the emerging O2O platforms. So far C2C and B2C platforms have been well studied. However, few papers have investigated O2O platforms, which play an increasingly important role on electronic commerce. The O2O business model has greatly increased firms' efficiency and improved consumers' experience. This paper investigates the impact on platform choice in the context of China's O2O platforms. The research and its results will have practical implications.

## 2. THEORETICAL FRAMEWORK AND HYPOTHESIS

This paper selects the motion picture industry as the context, focusing on cinemas' and exhibition-chain firm's behaviours. According to statistics from the China Report Network, online ticketing accounted for 83.9% market share of the film industry in China's first-tier cities in 2017, 83.5% market share in the country's second-tier cities, and 81.3% and 77.5% market share in the country's third and fourth-tier cities respectively. It shows that O2O platforms have become the main outlet for ticket sales in China's film industry. As O2O model has become a booming business in China<sup>[7]</sup>, local service firms (LSFs), such as cinemas, regard it as an opportunity to improve their performance by leveraging internet and information technologies<sup>[8]</sup>. The traditional value chain of china's motion picture industry is from producers, distributors, exhibition chains, and cinemas to the final viewers. All cinemas need to join one of the exhibition-chain firms to achieve screening permit. Box-office revenues will be divided between them. However, the emerging of digital platforms has reshaped the structure of china's motion picture industry. Due to network effects, digital platform can gather a large number of users<sup>[3]</sup>. When a supplier participates in a digital platform, it can access many demand-side users.

In this paper, we discuss three ways for exhibition-chain firms to build proprietary platforms. The first one is based on website which has booking function; the second one is APP software which will be available for the large number users of mobile phones; the third one is based on wechat official accounts platform which can have access to the users of WeChat. In addition to proprietary platforms, companies can also choose to join a third-party platform. In this paper, we will discuss the influence of companies' platform strategy on its performance. We want to find out the impact of O2O platforms and proprietary platforms on the relationship between cinemas' resources and their operating performance.

### 2.1 Online-to-offline platforms

The resource-based theory (RBT) has been one of the most important theories in business literature, which states that different firms have different resources, and valuable, rare, immobile and non-substitutable resources will bring firms competitive advantage<sup>[9]</sup> -<sup>[10]</sup>. However, resources rarely act alone in creating or sustaining competitive advantage<sup>[11]</sup>. This requires paying attention to the role of other resources or complementary resources, which are linked to primary resources in creating sustainable business value. Synergies between primary and complementary resources have been expected<sup>[12]</sup>. Thus, as an extension of RBT, contingent resource-based theory (CRBT) explains that the value of contingent resources upon the context and the linkages between the primary and complementary resources.

Primary resources have context dependency<sup>[12]</sup>. In the motion picture industry, seats and duration are discussed as two most important elements. Digital platforms in china not only have reshaped china's motion picture industry, but also provide important resources for participating firms.

The end users of different digital platforms can be different, and the quantity could be large<sup>[13]</sup>. Therefore, resources of companies can have access to a wide range of customers. A digital platform provides participants with both an IT infrastructure and a business infrastructure, including financial, marketing and logistics support, leading to a better performance<sup>[14]-[15]</sup>. In the context of the motion picture industry, O2O platforms have a large installed base of end users. Cinemas linking with these O2O platforms can take advantage of the user resources. Also, cinemas can leverage business functions embedded in digital platforms to market their movies and advertise their promotions, thus both the speed of access to customers and the efficiency of resources utilization will be promoted, and more box-office revenues will be created.

Digital platforms provide inside-out resources for suppliers, among others, IT infrastructure and cost-efficient IS operations. Firms linking with platforms can make use of platforms' IT infrastructure to improve its operation effectiveness and efficiency. In the context of China's motion picture industry, O2O platforms provide an electronic marketplace, which is capable of reducing transaction costs for both customers and cinemas by IT-enabled aggregation and matching services<sup>[3]-[16]</sup>. The distance between cinemas' resources and the customers has been greatly shorten, and the circulation speed of the resources could be enhanced. For example, an O2O platform enables customers to search, select seats and realize online payment, all of which, comparing to the traditional offline channel, can greatly reduce operation cost and improve resource utilization efficiency of cinemas. Further, online booking trend can help cinemas adjust movie schedules in such a way that cinemas' resource utilization can be improved and thus cinemas can generate more revenues. In sum, we present the following hypothesis:

H1: The higher service fees a cinema's audience pay, the stronger the relationship between the cinema's resources and its performance.

## 2.2 Proprietary platform

Proprietary platforms can enhance customers' loyalty. For one respect, due to local network effects and people's consumption habits, costumers attracted by proprietary platforms could be more loyal than those on third-party platforms; for the other respect, the combination of proprietary platforms and offline stores could provide users with personalized value-added services, which will improve consumers satisfaction<sup>[4]</sup> and consumers' loyalty could be consolidated. Therefore, the demand of consumers booking from proprietary platforms could be steady and accurate, resources utilization of cinemas will be enhanced, thus the box-office revenue of cinemas can be promoted.

Further, proprietary platforms give companies direct access to consumers' data. The installation of end users, information and business infrastructure differ between digital platforms. Thus, participation in multiple platforms will allow vendors to access large end users<sup>[13]</sup>, and have a more complete and accurate understanding of customers' needs. Further, upsurge in digitization and the increase in the amount of data have promoted companies to reexamine their fundamental business models and explore opportunities to improve and innovate<sup>[17]</sup>.

In context of China's motion picture industry, through digital platforms, consumers can buy movie tickets at anywhere any time. On one hand, cinemas have more channels to earn box-office revenues; on the other hand, cinemas and exhibition-chain firms may lose a valuable resource, i.e. consumers' data. As the internet economy booms in china, consumer's data has been a valuable resource, from which companies can know more about their target consumer groups<sup>[18]</sup>. Thus, it can be the complementary resources. The three different ways for exhibition-firms to build proprietary platforms will generate different knowledge information, and the data

collected from each channel will give firms different and abundant information about consumers. In addition, with more accurate information about the loyal customers of cinemas, higher resource allocation and integration efficiency could be expected. Moreover, adjusting movies schedules according to the analysis of the data could help cinemas make full use of its idle resources, thus more box-office revenues will be generated. In sum, we present the following hypothesis:

H2: The more proprietary platforms an exhibition chain has established, the stronger the relationship between resources of the chain's affiliated cinema and the cinema's performance.

### 3. METHODOLOGY

#### 3.1 DATA

This paper treats cinemas as the unit of analysis. We use cross-sectional data in the paper, with the sampling period from January 2017 to November 2017. The sample covers cinemas in both first-line and second-line cities of China. To ensure data's availability, selected sample cinemas all adopt computer-aided ticket system (CTS). Finally, we get a sample of 3406 cinemas. Data are collected from Entgroup database, a professional database about China's motion picture industry.

#### 3.2 Variables

(1) Dependent variable. In this article we use theater's performance as the explanatory variable, which is measured by the cinemas' box-office revenues. In china, box-office revenues are the main source of income for theaters. Therefore, it is reasonable to regard it as the cinemas' performance.

(2) Independent variable. This paper uses seats and duration to measure the resources of a cinema. The independent variable  $Seat_i$  represents the capacity of audience a cinema can accommodate, measured by the number of seats in the cinema.  $Duration_i$  represents operating duration of a cinema, measured by the number of business days from a cinema's establishment to the sampling period.

(3) Moderating variables. There are two moderating variables,  $Selfplat_i$  and  $Service_i$ .  $Selfplat_i$  represents an exhibition-chain firms' behavior of establishing proprietary platforms. In this paper, we discuss three ways for companies to build their proprietary platforms. The first is building a web site which has booking function; the second is developing an APP, and the third one is registering a wechat official accounts platform. All three ways will make both cinemas and exhibition-chain firms to have a direct channel toward consumers. When exhibition-chain firms have only one proprietary platform, the value of  $Selfplat_i$  is 1; when exhibition-chain firms have two proprietary platforms, the value of  $Selfplat_i$  is 2; when exhibition-chain firms have three proprietary platforms, the value of  $Selfplat_i$  is 3.

The moderating variable  $Service_i$  represents audience' platform usage, measured by platform-charged fees paid by customers. Both third-party platforms and propriety platforms will charge the service fees. However, through investigation, we find that unlike third-party platforms, propriety platforms charge it in a more flexible way. For example, some propriety platforms may only open to its members. That means consumers who may want to use the propriety platforms will have to grant membership first. Considering the local network effects cinemas have, to some extent, proprietary platform may help cinema managers distinguish the loyal customer and know more about their taste. In conclusion, the variable  $Service_i$  is a comprehensive indicator encompassing contribution of both third-party and propriety O2O platforms.

(4) Control variables. This paper includes four control variables, i.e.  $Onlineratio_i$ ,  $Screen_i$ ,  $Price_i$  and  $Attendance_i$ . Control variables capture the characteristics of the cinemas;  $Price_i$  reflects the market power of a cinema, measured by the average price of tickets at the cinema in the sample months;  $Attendance_i$  reflects the

operation efficiency of a cinema, measured by the ratio of the actual number of viewers and expect number of viewers in the sample months;  $Screen_i$  represents the ability of a cinema to exhibit firms simultaneously, measured by the total number of screens of a cinema.;  $Onlineratio_i$  represents the proportion of online revenue.

## 4. RESULTS

### 4.1 Descriptive statistics

Table 1 gives descriptive statistics of variables. For all variables, the standard deviations are smaller than their mean value. Variance inflation factor(VIF) was used to check whether the variables have the potential problems of multicollinearity. Result shows that the mean value of VIF is 1.61 and the maximum value of VIF is 2.99. Consequently, the potential possibility of multicollinearity could be excluded.

**Table 1. Descriptive statistics**

Variable	Mean	Std. Dev.	1	2	3	4	5	6	7
1. Price	3.5076	0.172	1.000						
2. $Screen_i$	6.637	2.736	0.2144***	1.000					
3. $onlineratio$	0.770	0.216	0.0631***	0.3488***	1.000				
4. $Attentance$	13.700	7.517	0.3432***	0.3112***	0.3491***	1.000			
5. $Duration$	6.897	1.282	0.1034***	-0.1113***	-0.0465***	0.2269***	1.000		
5. $Service$	12.486	1.696	0.3053***	0.4728***	0.5602***	0.6085***	0.3010***	1.000	
6. $Selfplat$	1.465	1.107	0.0695***	0.1480***	0.1475***	0.0556***	0.0120***	0.1246***	1.000
7. $Seat$	6.654	0.634	0.1779***	0.7087***	0.3318***	0.2158***	0.0305***	0.5853***	0.1722***

Notes: \*\*\* represents 1% significance, and \*\* represents 5% significance.

### 4.2 Regression results

Table 2 gives regression results. Model 1 is a baseline model, including control variables. Model 2 adds the independent variables  $Seats_i$  and  $Duration_i$  based on the Model 1. Model 3 includes moderators  $Service_i$  and  $Selfplat_i$ . Model 4 and 5 include interaction terms between the independent variable and moderators.

The result of Model 2 reveals that  $Seats_i$  and  $Duration_i$  have a significant and positive impact on the cinemas' operating performance. The coefficient of the interaction terms  $Seats_i * Selfplat_i$  and  $Duration_i * Selfplat_i$  are positive and significant, thus supporting H2. It demonstrates that, with all else being equal, cinemas have more propriety platforms tend to have stronger relationships between its resources and operating performance. The coefficient of the interaction term  $Seats_i * Service_i$  is positive and significant, however, the coefficient of the interaction term  $Duration * Service$  is negative and significant, thus H1 is supported partially. It demonstrates that cinemas with high level service fee tend to have stronger relationships between seats and operating performance.

To the interaction term  $Duration * Service$ , the regression result shows that, the higher a cinema's service fee, the weaker the relationship between its resources and its performance. Since service fee refers to the contribution of O2O platforms, we may explain it in two ways. First, well-established cinemas enjoy stable, large and loyal consumer groups. Even digital platforms provide convenient IT technology, the traditional ticket channel of these cinemas can be mature and familiar to customers. Second, customers of well-established cinemas may face higher switching cost. Well-established cinemas are more likely to establish mature offline channels, including membership. The mature offline operation will help improve customers' experience and enhance their loyalty. Further, customers of well-established cinemas tend to be older than those of newly-established ones. These old customers may meet difficulty in using digital platforms to book and pay their tickets. Thus, consumers of well-established cinemas have less willingness to use the O2O platform.

**Table 2. Regress result**

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Screen</i>	1.147*** (0.035)	0.064*** (0.042)	0.201*** (0.025)	0.195*** (0.025)	0.221*** (0.025)
<i>Onlineratio</i>	2.119*** (0.081)	2.203*** (0.067)	-0.676*** (0.052)	-0.687*** (0.052)	-0.640*** (0.051)
<i>Price<sub>i</sub></i>	1.455*** (0.094)	1.217*** (0.078)	0.809*** (0.044)	0.780*** (0.044)	0.768*** (0.045)
<i>Attendance</i>	0.087*** (0.002)	0.075*** (0.002)	0.028*** (0.001)	0.029*** (0.001)	0.031*** (0.008)
<i>Duration</i>		0.282*** (0.010)	0.088*** (0.006)	0.059*** (0.009)	0.385*** (0.027)
<i>Seat</i>		0.695*** (0.030)	0.225*** (0.019)	0.206*** (0.024)	0.061 (0.056)
<i>Selfplat</i>			0.035*** (0.006)	0.036*** (0.006)	0.037*** (0.006)
<i>Service</i>			0.606*** (0.008)	0.609*** (0.008)	0.588*** (0.032)
<i>Seat*Selfplat</i>				0.039*** (0.010)	
<i>Duration*Selfplat</i>				0.020*** (0.005)	
<i>Seat*Service</i>					0.028*** (0.004)
<i>Duration*Service</i>					-0.026*** (0.002)
Adjusted R <sup>2</sup>	0.704	0.798	0.922	0.923	0.926

Notes: Values in parentheses are standard errors. \*\*\* represents 1% significance.

## 5. CONCLUSIONS

This paper examines the impact of O2O platforms on the relationship between firms' resources and their performance in the context of China's motion picture industry. Generally, we find that linking with O2O platforms, including proprietary platforms, positively moderates the relationship between a firm's resources and its performance. The resources can be both physical and intangible. Therefore, cinemas' performance is not only affected by primary resources, but also influenced by platform strategy they choose. Companies must realize that, as internet economy booms, consumers' data has been an increasingly important resource. Third-party platforms will allow companies to benefit from their resources and capabilities. The increased potential customers will enhance cinemas' operating performance. However, building proprietary platforms is still an optional way. Considering the local network effect of cinemas and peoples' consumption habits, customers captured by proprietary platforms will be more loyal. Thus, these costumers deserve more attention from cinemas. Data about these costumers will be more instructive for cinemas.

Formulating a platform strategy is a complex thing. A lot of aspects needed to be considered, e.g. whether to join a third-party platform or whether to build a proprietary platform. Some factors should be taken into account, such as the characteristics of the industries and the companies, reputation and customers' habit. The findings show that proprietary platforms and cinemas can have a good synergy of resources. However, the result is different when O2O platforms are seen as a whole.

There are some limitations of this paper, which give directions for future research. First, we investigate the research question in the context of Chinese motion picture industry. To generalize the results of this paper, it is necessary to examine the relationship between platform choice and firms' performance in the context of other industries and other countries. Second, although the sample of this paper is large, cross-sectional data employed cannot reveal the change of the relationship over time. Future research can employ panel data to study the dynamics of the focal relationship. Third, the regression method we adopt can only test the correlation relationship. To establish causal link, future research can adopt methods like propensity score matching or

difference in difference.

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