

The Impact of Distribution Channels on Budget Hotel Performance

Abstract

While distribution channels substantially influence revenue management for hotels, previous studies have rarely provided empirical evidence for the impact of different use of distribution channels on hotel performance. This study investigates the current practice of distribution management in the budget hotel industry in China. Using a data set from the operation of budget hotels in multiple cities in China and two-stage least square regression analysis, the results demonstrate the impact of different distribution channels and their combinations on RevPAR. This study provides insights for distribution management in budget hotel market.

Keywords: Hotel Distribution Channels; RevPAR; Budget Hotels; China; Revenue Management

1. Introduction

Budget hotels have been identified as an important and distinctive segment in the travel and hospitality industry since mid of 1990s (Fiorentino, 1995). With a unique market position of offering good service quality and value for money, the importance of the budget hotel sector has successfully captured a different customer segment (i.e., value-conscious travelers) (Gilbert and Arnold, 1989), and is still growing rapidly in three major areas in the world – U.S., Europe, and Asia (Ruetz and Marvel, 2011). It is expected that the increase in the number of travelers that prefer to stay at accommodations with lower prices will continue to support growth in the budget hotel segment, especially in developing economies wherein middle-class population and service sectors are expanding (Canadean Ltd, 2017; Ruetz and Marvel, 2011).

In the line of research on hotel revenue management, scholars have emphasized the impact of distribution channels on hotel performance (Guillet and Mohammed, 2015; Scaglione et al., 2018). Due to the perishable nature of lodging products, having the right mix of distribution channels is particularly helpful for hoteliers to recruit customers and maximize revenue opportunities (Choi and Kimes, 2002; O'Connor and Frew, 2002; Toh et al., 2011a). Thus, scholars have highlighted the importance for hotel management to “evaluate the effects of distribution-channel management on their current revenue-management practices and determine how to benefit from it” (Choi and Kimes, 2002, p. 23). However, while previous studies mainly focus on investigating pricing strategies across different channels, limited empirical studies have been conducted to understand the impact of different use of distribution channels on budget hotel performance (Guillet and Mohammed, 2015).

This study investigates the relationship between different use of distribution channels and revenue per available room (RevPAR) in the budget hotels in China. As new distribution channels such as social and mobile applications keep emerging, practitioners continue to face

challenges in maintaining a balance between market exposure and revenue optimization (Carroll and Siguaw, 2003; O'Connor and Frew, 2002). More insights are needed to understand how hoteliers can enhance performance using an appropriate mix of distribution channels (Enz, 2003). Through investigating a dataset of budget hotel performance acquired from a cloud-based property management system (PMS) supplier in China, this study empirically explores the relationship between distribution channels utilization and RevPAR using two-stage least squares regression. The practical implications of this study may help practitioners develop more effective distribution strategies.

2. Literature review

This section first reviews distribution management in hospitality and its relationship with hotel performance. This is followed by a discussion of the nature of the budget hotel business and the different perspectives that researchers have studied budget hotel performance. Finally, to provide readers with a deeper understanding about the budget hotel market in China, its major players, current development progress, and distribution channels are summarized.

2.1. Distribution channel management and hotel performance

Distribution channel management is one of the core activities of hospitality revenue management (Guillet and Mohammed, 2015; David-Negre et al., 2018). Traditionally, hoteliers rely on a global distribution system (GDS) and central reservation system (CRS) where intermediaries play a highly important role in room sales. Until the past three decades, booking methods such as telephone calls and walk-ins were mainly used to make room reservations. As electronic channels started comprising the largest portion of sales after the growth of the World Wide Web in the 1990s, lodging suppliers began to invest in both direct and third-party online distribution channels to match customers' preferences for booking online (Amaro and Duarte,

2013; Kim and Kim, 2004; O'Connor, 2001, 2003; Sahay, 2007; Toh et al., 2011a; Wong and Law, 2005). These online channels have created opportunities for lodging suppliers to reduce costs, maximize exposure and market share, boost booking volumes, and increase revenues (Buhalis, 1999; Frazier and Antia, 1995; Moriarty and Moran, 1990; Toh et al., 2011b).

The practice of inventory distribution in the lodging industry is relatively complex and conflicting. Undoubtedly, hoteliers prefer to sell directly to minimize loss of control and commission fees (Kang et al., 2007; Stangl et al., 2016). Direct channels also allow hoteliers to customize service and communicate with customers more directly and efficiently (Kang et al., 2007). Meanwhile, although intermediaries such as online travel agencies (OTAs) are perceived by hoteliers as relatively less profitable and sustainable, they remain important to create and satisfy demand (Kang et al., 2007) because contemporary consumers heavily rely on intermediaries to search for travel information and cheaper rates (Law et al., 2004; Masiero and Law, 2016).

The digital era has given rise to new types of booking channels: “SoLoMo” applications that are social-, location-, and mobile-based. These mobile social media channels enable customers to be more spontaneous in their actions and access information more easily, which has further simplified the booking process (Kim and Connolly, 2012; Thakran and Verma, 2013). Furthermore, advanced social media functions, such as WeChat, empower one-to-one interactions between service providers and consumers through a variety of channels such as voice messages, emojis and social communities. Through these channels, hoteliers can provide different types of customer services, such as contextual travel advice and membership services, in a timely manner (Tong, 2017). As mobile penetration continues to increase worldwide, travelers are increasingly relying on these SoLoMo channels to search information and make bookings (Kim and Connolly, 2012).

In both theory and practice, a multiple channel distribution strategy rather than a single channel is more beneficial to hoteliers (Thakran and Verma, 2013). Although third parties compete with hotels' direct channels (i.e., channel conflicts), hoteliers need simultaneous distribution routes (i.e., online and offline, direct and indirect) to minimize cost and perishable inventory (O'Connor and Frew, 2002; Thakran and Verma, 2013; Toh et al., 2011a). A multiple channel strategy is especially beneficial for small hotels with relatively lower scale, capital, market exposure, and popularity (Bastakis et al., 2004; Toh et al., 2011a), because they need a variety of channels to drive higher awareness, booking volumes and revenues (Beritelli and Schegg, 2016; Dabas and Manaktola, 2007; Mahmoud, 2015). Meanwhile, determining an effective portfolio of distribution channels is challenging and has always been an important question to answer (Beritelli and Schegg, 2016; Enz, 2003; Gazzoli et al., 2008; Kracht and Wang, 2010; O'Connor and Frew, 2002).

Previous studies in revenue management have explored distribution channel management practices (Gazzoli et al., 2008; Guillet and Mohammad, 2015; Hui et al., 2009; Kimes, 2016; Law et al., 2007; Toh et al., 2011a), yet the majority focuses on investigating pricing across different distribution channels. This is because researchers are generally interested in studying hoteliers' pricing strategies to attract direct bookings from travel agencies and optimize yield. Hence, much recent research attention still centers on hoteliers' integration of various pricing and inventory management tools into distribution channel management (Abrate and Viglia, 2016; Ivanov and Ayas, 2017; Lee, 2016; Riasi et al., 2017). Non-pricing tools such as distribution channel utilization and combination are under researched (Guillet and Mohammad, 2015; Ivanov and Ayas, 2017). Distribution channel management involves a range of complicated factors (e.g., capacity allocation, demand fluctuation, customer responses) to be considered in the process (Vinod, 2004). Revenue management is also becoming more dynamic as new models and

competitions keep emerging (Cetin et al., 2016). More empirical evidence is needed to further understand the impact of distribution channels on hotel performance.

2.2 Budget hotel operation and performance

Budget hotels are often called “limited service” hotels or “economy lodging” (Fiorentino, 1995). In general, budget hotels refer to accommodation units provided for short-stay travelers on low budgets (Senior and Morphew, 1990). While the operation of budget hotels across different continents might vary slightly, the main differences between budget hotels and upscale hotels rest on price and scope of service (Fiorentino, 1995; Senior and Morphew, 1990). Budget hotels have a relatively lower tariff structure and operating costs. They emphasize comfortable and simple accommodations, and thus the range of facilities and services is minimal. In short, a budget hotel operates based on the principles of economies of scale and standardization. Its competitive advantages are reasonable price and service consistency (Fiorentino, 1995; Senior and Morphew, 1990).

According to previous research, the performance of budget hotels is affected by a number of critical success factors such as location, product and service quality, pricing and marketing strategies, managerial and operational efficiency, human resources, company culture, and aesthetic perception (Avcikurt et al., 2011; Brotherton, 2004; Hua et al., 2009; Zhang et al., 2013). Recently, researchers are increasingly interested in exploring the research question from the consumer’s perspective. Ren et al. (2016) found that four dimensions of customer experience (i.e., tangible and sensorial experience, staff aspect, aesthetic perception, location) significantly affect customer satisfaction with budget hotels in China. Rahimi and Kozak (2017) investigated customer relationship management practices in budget hotels and concluded the primary role of value for money on customer satisfaction. Researchers also gauged customers’ perception of the

various features in budget hotels (Mohsin and Lengler, 2015); and the extent to which customers' perception of website quality affects booking intention (Li et al., 2017). However, few studies investigate the impact of distribution channel management on budget hotel performance despite the recognition of its importance.

2.3. Hotel distribution and the budget hotel sector in China

As the Chinese population's disposable income rapidly increased in the 1990s, free independent travelers emerged as a new group of travel consumers. During that time, hotel industry players in China started to offer products and services with various price and quality levels based on the needs of different consumer groups. It was also the time when the lodging industry in China divided into different sectors (e.g., upscale and budget hotel sectors) (Cao and Kong, 2010). Competition and business structures in the lodging industry reached further complexity and sophistication with the rise of the Internet in the 1990s. Ever since the announcement of the "Internet+" policy by the government, China has become the country with the highest number of Internet users in the world with over 738 million (Statista, 2017). Chinese scholars have concluded that the Internet will continue to become the mainstream selling platform of the hotel industry in the near future (Jin, 2007; Liao, 2009; Lou and Wu, 2007). Meanwhile, the mobile tourism market is also expanding in the country. Mobile sales of travel products reached over 50 billion CNY in 2015 Q1. Accommodation bookings made through mobile channels captured the highest portion of the online travel market (64.5%) (Jiang and Jiang, 2015). However, rather than celebrating the benefits brought by the Internet, hoteliers in China are struggling with channel conflicts with OTAs (Jiang and Jiang, 2015; Cao and Kong, 2010). In 2009, online bookings made through OTAs reached 3.74 billion CNY, led by companies such as Ctrip and Elong (Cao and Kong, 2010). In addition, although many hoteliers

in China have developed their own official online booking platforms, their bargaining power remains relatively low as their direct online channels lag behind those of OTAs (Cao and Kong, 2010; Liao, 2009; Xu, 2015).

After their success in the U.S. and Europe, budget hotels have emerged as a popular trend in China's lodging market due to high demand and return on investment (Hua et al., 2009; Shen, 2008; Zhang, 2004). Since the first budget hotel opened in 1997, the number of budget hotels in the country has grown from fewer than 500 in 2004 to more than 16,000 in 2014 (Hancock, 2017). Such high demand is driven by the rise of affluent Chinese populations and the rapid development of infrastructure in the country, which result in a higher number of domestic travelers for both business and leisure (Fannin, 2010). With its unique positioning and the overall increase in disposable income among Chinese citizens, the budget hotel sector in China has high potential for continuous growth in the near future (Chan and Ni, 2011).

TABLE 1. Top 10 Budget Hotel Management Companies in China

Brand	Number of Hotels	Number of Rooms
Home Inn	1,772	214,070
7 Days Inn	1,345	133,497
Hua Zhu	1,035	113,650
Jin Jiang Inns	690	83,860
Green Tree Inn	664	60,708
Super 8	449	36,259
Vienna Hotel Group	105	17,734
99 Inn	247	15,192
Pod Inns	163	12,204
Ibis	67	11,219

Source: InnTie Shanghai Hotel Management Consulting
<http://m.traveldaily.cn/images/201305/7e93b7d9110286ed.pdf>

Table 1 shows the major players in China's budget hotel industry. The leading companies mainly operate and expand their businesses through direct chain management, franchising, and licensing (Pan, 2015). After experiencing rapid growth from 2000 to 2009, the industry started

declining in terms of net profits (Table 2). As the market has become more competitive, the Chinese budget hotel sector has faced problems and difficulties in boosting RevPAR and reducing cost. As a result, practitioners are seeking ways to achieve sustainable growth and development (Li and Guo, 2014). Relevant studies in the Chinese literature have pointed out the failure to control cost as one of the biggest weaknesses of the budget hotel sector (Feng, 2006). They suggest the employment of effective online distribution channels as the potential solution, which can help budget hotels control costs without sacrificing service quality (Fan and Li, 2017; Li and Guo, 2014; Lui and Sun, 2017).

TABLE 2. Growth of Budget Hotels in China

Year	Number of budget hotels	Number of Rooms	Growth Rate
2000	23	3,236	41.25%
2001	36	4,741	46.51%
2002	50	6,048	27.57%
2003	87	10,292	70.17%
2004	166	19,199	86.54%
2005	522	56,854	196.13%
2006	906	98,817	73.81%
2007	1698	188,788	91.05%
2008	2805	312,930	65.76%
2009	3757	412,840	31.93%
2010	5120	544,210	31.82%
2011	7314	747,045	37.27%
2012	8313	837,220	12.07%

Source: InnTie Shanghai Hotel Management Consulting:
<http://m.traveldaily.cn/images/201305/7e93b7d9110286ed.pdf>

Similar to the West, budget hotels in China also distribute products through direct and indirect channels (Li and Guo, 2014; Lu and Gao, 2012). However, Chinese scholars have found that, currently, the budget hotel sector generally still relies on traditional methods such as telephone calls and walk-ins to sell rooms (Fan and Li, 2017). Their research recommends that budget hotels employ more online marketing to catch up with the competition and achieve long-term sustainability (Zhou, 2017). At the same time, they should also strengthen other third-party channels such as destination marketing organization (DMO) sites to explore new markets (Feng,

2006). Witnessing the boom in social media and online payment in China, Chinese scholars further suggest that budget hotels should grasp the opportunities created by social media and mobile applications to reduce operational cost, spread word-of-mouth, and deliver higher customer value (Tong, 2017).

Although they benefit from their unique market niche, budget hotels face challenges from other industry players as well as those businesses that provide similar types of accommodations (e.g. bed-and-breakfast) (Chan and Ni, 2011; Hancock, 2017). In order to stay competitive and grow, budget hotels in China rely on multiple channels (i.e., direct and indirect, online and offline) for product distribution to reduce cost and maximize revenues. Effective management of distribution channels has thus become critical for the financial performance of budget hotels. However, empirical studies that look into the impact of distribution channel management on hotel performance in the budget hotel context is limited. Specifically, insights regarding the business models and distribution channel utilization of the budget hotel sector in China can rarely be found in the extant literature. More empirical evidence is required to further understand the practice of distribution management and its impact on hotel performance in China.

3. Methodology

3.1 Data collection and operationalization of variables

This study employs a dataset that includes the daily operational data from 100 budget hotels in China. The dataset was acquired from a property management system (PMS) supplier, who provides cloud-based PMS to budget hotels in China. The dataset was acquired under a collaborative scheme between the research team and the PMS supplier. For the purpose of confidentiality and data safety, the budget hotels were randomly selected from the company's database that stores around 15,000 hotels' data, and the hotel names were modified to prevent

recognition. Out of the 100 selected hotels, 21 are owned by two parent companies and depend solely on direct distribution channels, which is distinguishably different from the strategies of other companies in the dataset. As a result, these 21 hotels were excluded from the analysis to keep homogeneity in the sample. A total of 33,916 operational data points from 79 budget hotels were included in the analysis, representing the period from 1 January to 31 December 2017. The variables in the dataset include booking date, day of week (Monday to Sunday), hotel name, hotel affiliation (parent company), city, booking channel (offline, OTA, call center, WeChat, and other technology), daily room income, total number of rooms, average daily revenue (ADR), and whether the hotel is a chain or independent business.

The data was cleaned and converted for analysis. Table 3 presents the variables involved in this study. Budget hotel performance, as the dependent variable in this study, is measured by RevPAR (total room income divided by total number of rooms). Incorporating occupancy rate and average daily rate, RevPAR has been widely recognized as a universal measure for comparing performance across hotels of different sizes (Gallagher and Mansour, 2000; Ismail et al., 2002). The independent variables include distribution channel, combinations of distribution channels, ADR, hotel chain attribute (“yes” or “no”), city types, day of the week and a seasonality variable “month”. In China, the National Bureau of Statistics (<http://www.stats.gov.cn/>) classifies the Chinese cities based on multiple indicators such as GDP, population, geographic scope, and average income. Previous studies suggested that economic development level in destinations indirectly associates with hotel performance because the economic level indicates the activeness of business travelers, events, and leisure travelers in the destination (Roubi and Littelljohn, 2004; Tran, 2015; Zhang and Enemark, 2016). Therefore, in this study, the city type is controlled to better identify the impact of distribution channels on the performance of budget hotels. The combinations of distribution channel are developed based on

227 the strategic combinations that have really been used by the hotels in the sample. Also, for the
228 three most frequent distribution channels (Offline, OTAs and WeChat) we have built a
229 comparison index for each hotel which measure quantitatively the different use of each of these
230 three channels in each channel combination. The analysis focuses on the impact of distribution
231 channels and their combinations on RevPAR in the control of ADR, hotel chain attribute, city
232 types, and day of the week.

233 **TABLE 3.** Summary and Description of Variables

Variables	Description	Operationalization
RevPAR	Revenue per available room	Total room income/total number of rooms
Average daily rate (ADR)	Daily room rate	Scale variable
Hotel chain	Properties owned by hotel chain companies	Nominal-dichotomous 0=non-chain hotels 1=chain hotels
China city level	All cities are categorized into six levels according to indexes such as population size and economic development – City type 1, City type 2, City type 3, City type 4, *City type 5 , City type 6	Nominal-dichotomous 0=no bookings 1=bookings received
Weekday/weekend	The day of the week on which a booking was made – Mon, Tue, Wed, Thu, Fri, Sat, *Sun	Nominal-dichotomous 0=no bookings 1=bookings received
<i>Month</i>	The month in which a booking was made – *Jan , Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec	Nominal-dichotomous 0=no bookings 1=bookings received
<i>Distribution channel:</i>		
Offline (OFF)	All offline channels (walk-ins and traditional travel agents)	Nominal-dichotomous 0=no bookings 1=bookings received
OTA	Online travel agents	Nominal-dichotomous 0=no bookings 1=bookings received
*Call center (CC)	Hotel-operated call center	Nominal-dichotomous 0=no bookings 1=bookings received
WeChat (WC)	Booking channel based on the mobile app WeChat (mobile social application)	Nominal-dichotomous 0=no bookings 1=bookings received
*Other technology (OT)	The Jin Fang Ka hotel operator, which provides a range of services from reservation and member service to online payment and social networking	Nominal-dichotomous 0=no bookings 1=bookings received
<i>Distribution Channel Combinations:</i>		
OFF_OTA_CC_WC_OT	Combination of different distribution strategies	Nominal-dichotomous 0=no bookings 1=bookings received
OFF_OTA_CC_WC		
OTA_OTA_CC_OT		
OFF_OTA_WC		
OFF_OTA		
OFF_CC_WC		
OFF_WC		
OFF		
*OT_CC		
Comparison index	The different use of a channel in a combination of channels	The difference between a hotel's percent use of channel <i>i</i> and channel <i>j</i> in a combination of channels.

***Baseline variables**

In order to analyze the relationship between distribution channels and RevPAR, and determine the optimum channel combination in the budget hotel industry, regression models are employed. In order to diminish the potential impact of outliers, the semi-logarithmic specification is used by taking logarithms of the dependent variable (*RevPAR*); this semi-logarithmic specification, in turn, permits a direct interpretation of the parameters as they show the percentage impact that a change of one unit in the independent variable has on the dependent variable. The empirical model is as follows:

$$\ln(RevPAR_{itd}) = \alpha + \sum_{h=1}^H \beta_h x_{hit} + \beta_p Price_{itd} + \sum_{j=1}^J \beta_j x_{jit}$$

where *RevPAR_{itd}* is the revenue per available room for hotel *i* in time *t* and channel *d*; α is the constant term; β_h are the coefficients associated with the *h*-th independent variable *x_{hit}* related to distribution channels; β_p is the coefficient that shows the effects of price set for hotel *i* in time *t* by channel *d*; β_j are the coefficients associated with the *j*-th independent variable *x_{jit}* that represent other control variables (day of the week, month, city and ADR); and ε_{itd} is the error term that follows a normal distribution.

On estimating this model, a potential endogeneity issue might arise as the error term might be correlated with the price variable (e.g. RevPAR and price can be driven by factors affecting simultaneously on both). To handle this potential endogeneity, we resort to the two-stage least squares (2SLS) regression and adapt -for each of the distribution channels analyzed in this empirical application- the proposal of Abrate and Viglia (2017) of instrumenting the variable “price” as the average price for the other days of the study period.

4. Results

Table 4 presents the descriptive statistics of the sample. The budget hotels in the sample are located in 35 cities in China. The majority of these hotels are independently operated (83.85%), while the minority are owned by hotel chains. Across the six city levels, city types 1, 2 and 4 have the highest number of budget hotels. The booking days data shows similar booking volume across the seven days of the week. The average number of bookings made during weekdays and weekends is similar (approximately 4,845 on average). The ADR ranges from CNY 7.18 to 908, with an average of CNY 311.21. The majority of budget hotels (57.57%) have an ADR range between CNY 90 and 150. In regard to booking channels, the recorded bookings were made through ten different booking channels, which were further categorized into five main groups based on their nature and characteristics. A large majority of bookings were made through offline channels (77.77%), followed by OTAs (16.14%), WeChat (4.9%), other technology (0.62%) and a call center (0.58%). Lastly, in terms of distribution channel combinations, the most commonly adopted combination is OFF_OTA_WC (18.58%), followed by OFF_OTA (17.08%), and OFF_OTA_CC_WC (13.23%). The rest of the distribution strategies only account for approximately 13.37% of total bookings.

275 **TABLE 4.** Descriptive Statistics

Variables (N = 33,916)	Frequency	Percentage (%)
<i>Distribution Channels</i>		
Offline (OFF)	26,375	77.77%
OTA	5,475	16.14%
WeChat (WC)	1,662	4.90%
*Other Technology (OT)	209	0.62%
*Call Center (CC)	195	0.58%
<i>Distribution Strategies</i>		
OFF_OTA_WC	6,300	18.58%
OFF_OTA	5,793	17.08%
OFF_OTA_CC_WC	4,488	13.23%
OFF_CC_WC	2,118	6.24%
OFF_WC	1,220	3.60%
OTA_OTA_CC_OT	678	1.99%
OFF_OTA_CC_WC_OT	523	1.54%
*OT_CC		
<i>Hotel Chain (yes or no)</i>		
No	28,439	83.85%
Yes	5,477	16.15%
<i>City Level</i>		
City type 2	12,652	37.30%
City type 1	8,908	26.27%
City type 4	5,708	16.83%
City type 6	2,525	7.44%
City type 3	2,503	7.38%
*City type 5	1,432	4.22%
<i>Day of Week</i>		
Saturday	4,959	14.62%
*Sunday	4,880	14.39%
Friday	4,868	14.35%
Thursday	4,813	14.19%
Tuesday	4,801	14.16%
Wednesday	4,798	14.15%
Monday	4,797	14.14%
<i>ADR</i>		
CNY 90 ~ 150	19,525	57.57%
CNY 150 ~ 200	7,596	22.39%
CNY > 200	4,767	14.06%
CNY < 90	2,030	5.98%
*Baseline variables		

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The results of the two-stage least square analysis are shown in Table 5. Before estimating the models, the potential existence of collinearity is tested. The Condition Index are all below the recommended value of 30 (Hair et al., 1995). Exception to this rule is the control variable “months” which presents a value higher than 30. Consequently, we have estimated the base model with and without controlling for monthly seasonality to effectively confirm that similar results are obtained (see Models 1 and 2 in Table 5). The independent variables explain approximately 65% of the variations in the dependent variable (i.e., RevPAR). The significance level of the F-statistics ($F=2450.4$, $p=0.000$) indicates the model as a good fit for the data. The variables OFFLINE, OTA and WECHAT represent the effect of using these distribution channels on the RevPAR for a specific day. The coefficient of OFFLINE (2.9010) indicates a 290% increase in RevPAR when offline channels are used compared to the base line variables (i.e., a call center and other technology). Similarly, the use of OTA and WECHAT significantly enhances RevPAR by 53.38% and 46.27%, respectively, compared with the use of a call center and other technology. While the effect of CHAIN is negative because it significantly reduces RevPAR by 85.94%, the positive coefficient of the interaction effect between CHAIN and OFFLINE (0.9121) indicates that the negative effect of CHAIN on RevPAR diminishes when bookings are made offline. The positive effect of the offline channel is enhanced by the fact that the hotel belongs to a chain. Likewise, the significant and positive coefficient of the interaction effects between WECHAT and CHAIN (1.3761) means that the negative effect of CHAIN on RevPAR is reduced by 137.6% when WeChat channel is adopted. In line with Baron and Kenny’s (1986) analysis of moderation, this is the case wherein a dichotomous independent variable has an impact on the effect of another dichotomous independent variable. In particular,

the variable CHAIN is a moderator of OFFLINE, OTA and WECHAT, so the effects of the latter vary depending on the former.

In terms of distribution channel combinations, all combinations significantly enhance RevPAR performance compared with the baseline variable (i.e., OT_CC). The variables linked to the combinations of channels show the general, synergetic effect of a hotel using more than one channel. That is, the different combinations of distribution channels exert different levels of impact on RevPAR. Although the use of offline channels is related to the greatest effect on RevPAR, combining offline with other channels significantly improves RevPAR performance. The combination of OFF, OTA, CC and OT exerts the highest impact on RevPAR (an improvement of 65.21%). The second most profitable combination is OFF_WC (an improvement of 52.01%), followed by the use of all channels (48.39% improvement), OFF_OTA_WC (35.68% improvement), OFF_CC_WC (31.01% improvement), OFF_OTA (23.67% improvement), and OFF_OTA_CC_WC (3.25% improvement).

Additionally, apart from the qualitative composition of each combination, it is relevant analyze its quantitative composition. Focusing on the three most employed channels (offline, OTA and WeChat) we delve deeper into the differences in the proportions of use of these channels within each combination. Accordingly, we have estimated three additional models with an extra variable that measures the use of each channel in a quantitative way. Model 3 shows the comparison between offline and OTA channels, with a negative and significant parameter, which indicates that combinations with an intense use of one of them and a scarce use of the other lead to lower levels of RevPAR; in other words, more similar proportions between these two channels bring about better results. Models 4 and 5 present the comparisons between offline and WeChat and OTA and WeChat, respectively. Both parameters are significant and negative. The same

reasoning as before applies: similar proportions of use result in higher RevPAR levels. Note, however, that the parameters obtained for these two comparisons are significantly greater than the Offline-OTA comparison ($-0.068 > -0.2974$; Wald test=137.7; $p < 0.001$ and $-0.068 > -0.3276$; Wald test=176.4; $p < 0.001$). This means that finding a symmetric balance between Offline and WeChat, and OTA and WeChat is more relevant, as asymmetric proportions reduce more drastically RevPAR.

Control variables are introduced to reaffirm the effects of the independent variables of interest in this study (i.e., distribution channels and their combinations). The control variables include the booking day of the week, city type and ADR. The significant coefficient of FRI (0.1006) and SAT (0.1714) indicates that bookings made during weekends are significantly superior to those of weekdays compared to the baseline (Sunday). The significant coefficients among the city type variables signify that being in city type 1, 4 and 6 significantly increases RevPAR by 14.45%, 12.35% and 34.26%, respectively, compared to the base line (i.e., city type 5). Finally, all the months are significantly greater than the baseline (January), with AUG having the highest impact on RevPAR, standing at 31.6%.

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TABLE 5. Results of Two-Stage Least Square Analysis

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeffs.	SD	Coeffs.	SD	Coeffs.	SD	Coeffs.	SD	Coeffs.	SD
C	0.7774**	0.0459	0.5795**	0.0482	0.6404**	0.0512	0.8621**	0.0549	0.5981**	0.0482
OFFLINE	2.9010**	0.0397	2.9118**	0.0396	2.9139**	0.0396	2.9218**	0.0395	2.9131**	0.0395
OTA	0.5338**	0.0409	0.5337**	0.0407	0.5208**	0.0409	0.5079**	0.0408	0.5677**	0.0409
WECHAT	0.4627**	0.0444	0.4668**	0.0442	0.4590**	0.0443	0.4320**	0.0443	0.4661**	0.0441
ADR	0.0031**	0.0001	0.0031**	0.0001	0.0031**	0.0001	0.0030**	0.0001	0.0032**	0.0001
CHAIN	-0.8594**	0.2057	-0.8613**	0.2045	-0.8764**	0.2046	-0.8954**	0.2044	-0.8257**	0.2044
OFFLINE*CHAIN	0.9121**	0.2060	0.9146**	0.2048	0.9245**	0.2048	0.9428**	0.2046	0.8980**	0.2046
OTA*CHAIN	0.3769	0.2072	0.3759	0.2060	0.3920	0.2060	0.4029	0.2058	0.3283	0.2058
WECHAT*CHAIN	1.3761**	0.2111	1.3752**	0.2098	1.3842**	0.2099	1.3928**	0.2097	1.3516**	0.2096
OFF_OTA_CC_WC_OT	0.4839**	0.0334	0.4801**	0.0332	0.4388**	0.0353	0.3708**	0.0347	0.5586**	0.0345
OFF_OTA_CC_WC	0.0325*	0.0133	0.0359**	0.0132	0.0048	0.0159	-0.0652**	0.0162	0.0740**	0.0140
OFF_OTA_CC_OT	0.6521**	0.0309	0.6536**	0.0307	0.6097**	0.0332	0.5253**	0.0329	0.7235**	0.0318
OFF_OTA_WC	0.3568**	0.0130	0.3602**	0.0130	0.3102**	0.0194	0.2003**	0.0198	0.4250**	0.0152
OFF_OTA	0.2367**	0.0125	0.2398**	0.0125	0.1966**	0.0176	0.1457**	0.0153	0.3441**	0.0178
OFF_CC_WC	0.3101**	0.0177	0.3158**	0.0176	0.3046**	0.0179	0.2170**	0.0199	0.2611**	0.0188
OFF_WC	0.5201**	0.0254	0.5204**	0.0253	0.5170**	0.0253	0.4770**	0.0256	0.4889**	0.0256
MON	-0.0051	0.0148	-0.0048	0.0147	-0.0049	0.0147	-0.0050	0.0147	-0.0048	0.0147
TUE	-0.0049	0.0148	-0.0059	0.0147	-0.0059	0.0147	-0.0058	0.0147	-0.0057	0.0147
WED	0.0111	0.0148	0.0081	0.0147	0.0080	0.0147	0.0080	0.0147	0.0082	0.0147
THU	0.0138	0.0148	0.0098	0.0147	0.0099	0.0147	0.0103	0.0147	0.0098	0.0147
FRI	0.1006**	0.0147	0.1013**	0.0147	0.1016**	0.0147	0.1022**	0.0147	0.1011**	0.0147
SAT	0.1714**	0.0147	0.1699**	0.0146	0.1704**	0.0146	0.1717**	0.0146	0.1694**	0.0146
CITYTYPE1	0.1445**	0.0206	0.1408**	0.0205	0.1515**	0.0207	0.1550**	0.0205	0.1052**	0.0209
CITYTYPE2	-0.0310	0.0197	-0.0369	0.0196	-0.0241	0.0200	-0.0043	0.0199	-0.0625**	0.0199
CITYTYPE3	0.0300	0.0234	0.0246	0.0233	0.0325	0.0234	0.0459*	0.0233	0.0102	0.0233
CITYTYPE4	0.1235**	0.0210	0.1059**	0.0209	0.1170**	0.0212	0.1351**	0.0211	0.0844**	0.0211
CITYTYPE6	0.3426**	0.0240	0.3348**	0.0239	0.3427**	0.0240	0.3484**	0.0239	0.3118**	0.0241
FEB			0.1373**	0.0221	0.1384**	0.0221	0.1405**	0.0220	0.1354**	0.0220
MAR			0.1889**	0.0213	0.1898**	0.0213	0.1911**	0.0213	0.1873**	0.0213
APR			0.2825**	0.0213	0.2825**	0.0213	0.2833**	0.0213	0.2835**	0.0213
MAY			0.2020**	0.0209	0.2020**	0.0209	0.2029**	0.0209	0.2025**	0.0209
JUN			0.2633**	0.0208	0.2627**	0.0208	0.2617**	0.0208	0.2642**	0.0208
JUL			0.2840**	0.0199	0.2840**	0.0199	0.2846**	0.0199	0.2847**	0.0199
AUG			0.3165**	0.0198	0.3167**	0.0198	0.3176**	0.0198	0.3165**	0.0198
SEP			0.1378**	0.0200	0.1372**	0.0200	0.1362**	0.0200	0.1391**	0.0200
OCT			0.1890**	0.0199	0.1890**	0.0199	0.1901**	0.0199	0.1901**	0.0199
NOV			0.1476**	0.0200	0.1472**	0.0200	0.1469**	0.0200	0.1486**	0.0200
DEC			0.1518**	0.0198	0.1518**	0.0198	0.1520**	0.0198	0.1520**	0.0198
%Offline-%OTA					-0.0681**	0.0195				
%Offline-%WeChat							-0.2975**	0.0278		
%OTA-%WeChat									-0.3276**	0.0398
R-squared	0.6596		0.6638		0.6638		0.6644		0.6645	

Adjusted R-squared	0.6593	0.6634	0.6634	0.6640	0.6641
F-statistic	2450.4**	1756.9**	1710.9**	1716.8**	1716.03**

Dependent variable: LOG (total room income/number of rooms)

* $p < 0.05$, ** $p < 0.01$

Table 6 shows the results of the comparison between channel combinations. The parameters are ranked from highest to lowest, and the Wald test statistics show the significant differences of the paired comparisons between two consecutive parameters. The test statistic of the Wald test is defined as $(\hat{\theta} - \theta) / se(\hat{\theta})$ which is assumed to follow a normal distribution, where $\hat{\theta}$ shows the maximum likelihood estimates and θ shows the values of the parameters to which the estimates are compared. To illustrate, the Wald test value of 12.31 shows a significant difference at 1% between 0.5201 and 0.6521, indicating a significant difference between the channel combination of OFF_WC and OFF_OTA_CC_OT. Likewise, a significant difference between the parameters of the channel combination of OFF_OTA_WC (0.3568) and OFF_OTA_CC_WC_OT (0.4839) is indicated by the Wald test value of 13.81 at 1% level. The Wald test value of 6.00 shows a significant difference at 5% between 0.3101 and 0.3568, indicating a significant difference between the channel combination of OFF_CC_WC and OFF_OTA_WC. Similarly, the pairs of OFF_OTA (0.2367) and OFF_CC_WC (0.3101), and OFF_OTA_CC_WC (0.0325) and OFF_OTA (0.2367), are also significantly different at 1% level. In sum, all paired comparisons, except for OFF_OTA_CC_WC_OT (0.4839) and OFF_WC (0.5201), are significantly different at 5% level.

TABLE 6. Comparison between Channel Combinations

Channel Combination	Parameter	Wald Test
OFF_OTA_CC_OT	0.6521	
OFF_WC	0.5201	12.31**
OFF_OTA_CC_WC_OT	0.4839	0.79
OFF_OTA_WC	0.3568	13.81**
OFF_CC_WC	0.3101	6.00*
OFF_OTA	0.2367	13.60**

OFF	OTA	CC	WC	0.0325	182.21**
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* $p < 0.05$, ** $p < 0.01$

5. Conclusion and discussion

5.1 Summary and discussion of findings

This study explores the impact of distribution channels and their combinations on RevPAR using a dataset obtained from the budget hotel industry in China. The results demonstrate the various impact levels of different distribution channels and their combinations on RevPAR. In terms of independent distribution channels, bookings made through offline channels (i.e., walk-ins and traditional travel agents) have the highest positive impact on RevPAR, followed by OTA and WeChat. Although industry reports have been showing that contemporary consumers prefer to book travel products online (Phocuswright, 2017; Statista, 2018), budget hotels in China generate the best RevPAR from offline channels. Such a finding can be explained by the unique characteristics of budget hotels and the Chinese market. First, different from high-end hotel customers, budget hotel customers demand less conventional hotel services. Their bookings are motivated mainly by utilitarian purposes such as convenience (Roper and Carmouche, 1989), and they may simply walk into a budget hotel depending on their location without prior booking. Similar findings have been discussed in previous research on New Zealand hostels, which found backpackers still prefer to book through traditional channels such as walk-ins (Pearce and Taniguchi, 2008). Second, the characteristics of the Chinese market may also contribute to this finding. The oversupply of hotel rooms in China (Fung, 2016) lowers customers' needs to secure a room. In addition, Chinese citizens, as the major customer source for budget hotels in the country (Cao and Kong, 2010; Huang et al., 2014), have close relationships with traditional travel agencies and thus prefer to book with them rather than

making online bookings (Peltier, 2016). This perhaps explains why budget hotel operators in China still rely on offline channels and have held off on adopting new digital channels (Fan and Li, 2017; Tong, 2017; Zhou, 2017).

In regard to the combinations of distribution channels, all combinations that perform significantly better than the baseline (i.e., OT_CC) involve offline channels, reaffirming the importance of offline channels for budget hotels as indicated above. Adopting all channels (OFF_OTA_CC_WC_OT) does not necessarily produce the best result in this specific context. This is reasonable and echoes the need to identify the optimal distribution mix to balance cost and sales opportunities (Beritelli and Schegg, 2016; Enz, 2003; Gazzoli et al., 2008; Huang et al., 2009; Kracht and Wang, 2010; O'Connor and Frew, 2002). In fact, our analysis of the proportions of use of a channel in each combination attest to these findings: not any proportions of two channels bring about the same results. The optimal strategy combines offline, OTA, call center and other technologies. This is consistent with previous research finding about Chinese consumers' preferences for making travel bookings through OTAs, a call center, and platforms that offer extra customer services such as loyalty programs and hotel promotions (Zhang et al., 2013). The second-best combination (i.e., OFF_WC) is worth further attention. In addition to offline channels, adopting WeChat alone produces better effects than any other strategies, highlighting the profitability of mobile direct channels. The fact that mobile technologies have transformed travel behaviors (Wang and Fesenmaier, 2013; Wang et al., 2014), and the high WeChat adoption rate (WeChat monthly active users reached 1 billion in 2018) (Hollander, 2018), support this finding. Lastly, the negative impact of chain status on RevPAR, as indicated by interaction effects, implies that domestic budget hotels are performing better than their international competitors. This finding is consistent with previous research that found that

Chinese customers demonstrate higher ratings of brand choice intention and brand loyalty for domestic hotels compared to international hotels (Hsu, 2015).

5.2 Theoretical and practical implications

This study makes several contributions to extant literature. First, this study explores not only the impact of each single distribution channel but also the impact of different combinations of distribution channels. While distribution channel management has been recognized as an important component of revenue management, the effects of different use of distribution channels have rarely been empirically tested. Second, amongst the factors that were identified as influential to RevPAR, the influence of distribution channels and their combinations have rarely been considered. This study provides empirical evidence for this. Third, empirical studies of budget hotels are limited in the literature. This study contributes empirical evidence to enrich the current literature on budget hotels.

Practically, the findings may help budget hotel operators— especially those in China— improve RevPAR through better distribution channel management. Based on the current use of distribution combinations (Table 5), budget hotels in China are not maximizing their sales opportunities, as the optimal distribution channel combination only accounts for 1.99% of the sample. Similarly, the utilization of the second-most ideal strategy (i.e., the combination of offline and WeChat channels) is also extremely low and only accounts for 3.6% in the sample. Instead, the most adopted combinations are those that have relatively lower impacts on RevPAR. Practitioners should adjust their current distribution management practices accordingly to improve RevPAR. Specifically, they should further develop their mobile strategy given the benefits of such direct channels over OTAs.

Upon completion of data analysis, the main findings and managerial implications were shared with practitioners. A total of 25 directors in charge of budget hotel chains in China provided feedback. These hoteliers were located in 13 different cities including Shanghai, Chengdu, Beijing, Guangzhou, Wuhan, Shenyang, Wuxi, Nanchang, Nanjing, Changchun, Shanxi, Jinan, and Xian. The majority considered the findings reasonable, and raised a number of “how” questions related to the implementation and operation of specific distribution channels. For example, while the majority agreed with the advantages of mobile social media channels and offline channels, they questioned how the potential of these channels could be further exerted (e.g., how to design more attractive digital contents, better understand user characteristics, and attract new customers). Additionally, hoteliers indicated their desire for models that help identify the appropriate rate, cost, and portion of inventory assigned/allocated to different distribution channels. While these questions can become great ideas for future research, they also provide further explanation for the practical implications of this study. It becomes apparent that the reason behind the relatively low utilization of the optimal distribution channel combination is a general lack of knowledge about distribution channel management in the budget hotel industry. Although practitioners want to improve their current practices, they need more knowledge and guidance as they are unsure how to use different channels effectively.

5.3 Limitations and future research

The findings and conclusion of this study should be interpreted and implemented with cautious due to several limitations from the dataset and the research design. First, this study uses data collected from mainland China. The variables analyzed in this study are unique to the China market. The findings from this study should be applied only in regions with similar traits because markets located in different areas may vary due to different characteristics and influential factors.

Future studies may collect empirical evidence from other countries or regions with different characteristics to triangulate the findings of this study. Second, this study employed only quantitative data, which cannot shed light on the reasons behind the different use of distribution channels. The logic of managers in budget hotels directs the different use of distribution channels. However, the interviews with hotel managers is beyond the scope of this study. Future study can explore the cognitive maps that managers follow to develop their distribution strategies. **Third, based on hoteliers' feedback, future research can investigate the current practices of different distribution channels and compare customers' reactions. A comprehensive analysis of the growth and potential of emerging distribution channels will also be useful. Future research can also consider developing forecasting models that helps operators to optimize the revenues generated through different distribution channels.**

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