

## **Impact of Accommodation Sharing on Tourist Attractions**

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## Abstract

The proliferation of accommodation-sharing platforms has changed the ways in which people travel and experience tourist attractions. However, the impact of accommodation sharing on attractions remains under-researched. To fill this gap in the research, we use a mixed methods approach to examine the spillover effect in two key tourism service suppliers. Using difference-in-differences estimations with two-way fixed effects, we find a 15.4% increase in an attraction's online popularity after the entry of accommodation sharing. This positive spillover effect is reduced when the density of commercially operated properties is higher. The qualitative findings speak to the mechanism behind the estimated spillover effect, which involves three dimensions of variation in accommodation sharing and the salient use of mobile technology in modern travel.

**Keywords:** Accommodation sharing; Tourist attraction; Online popularity; Difference-in-differences; Mixed methods

## INTRODUCTION

The advent of the sharing economy has introduced many new actors to the market and reconfigured economic activities worldwide (Zervas, Proserpio, & Byers, 2017). In the tourism and hospitality industry, the emergence of accommodation-sharing platforms has had a considerable impact on the dominant logic of the market (Viglia, Werthner, & Buhalis, 2016). New levels of service have emerged, along with new forms of connectivity between the new platforms and incumbent firms. Shifting the focus to the demand side, accommodation sharing streamlines users' communication and interaction with service suppliers. Mobile-based platforms have diversified the content and information channels available to tourists. They have also dramatically increased the accessibility of tailor-made information that is relevant to tourists' locational and motivational contexts (Buhalis & Foerste, 2015). Similarly, the entry of innovative suppliers has transformed the conventional ways of experiencing, consuming and evaluating tourism products and services (Bridges & Vásquez, 2018). The changes induced by those new entrants, especially the diversification brought by accommodation-sharing services (Dolnicar, 2017), have affected not only the ecosystem of tourism and hospitality (Leung, Xue,

& Wen, 2019) but also the ways in which people travel and experience tourist attractions and facilities (Tussyadiah & Pesonen, 2016).

As a disruptive innovation, the sharing economy has caused competitive and institutional turbulence in many sectors and industries by introducing a platform logic (Geissinger, Laurell, & Sandström, 2018). The online accommodation-sharing platform has emerged as a new business model in the tourism and hospitality industries (Guttentag, 2015), and its proliferation and disruptive impact on destination economies have garnered considerable research interest (Karlsson & Dolnicar, 2016). According to Mody, Suess and Dogru (2019), for example, unfavourable attitudes toward these disruptive influences, such as anti-Airbnb and anti-Uber attitudes, are expressed in recent studies and media reports. The commercialisation of the sharing economy, resulting in an increasing number of for-profit hosts in the accommodation-sharing market, has also led to critical debate on the competition between peer-to-peer sharing and traditional accommodation businesses (Xie & Kwok, 2017; Zervas et al., 2017). Recent studies, however, attach great importance to the positive and negative externalities generated by peer-to-peer accommodation-sharing services (Nieuwland & Van Melik, 2018). Their concerns are addressed using both market and non-market logic and with reference to various stakeholders in society (Gurran & Phibbs, 2017; Gutierrez, Garcia-Palomares, Romanillos, & Salas-Olmedo, 2017).

Nevertheless, to the best of our knowledge, only a limited number of empirical and conceptual studies address the socio-economic impact of peer-to-peer accommodation sharing. Gutierrez et al. (2017) focus on the locations of listings and their spatial association with tourist attractions and residential areas at the destinations. Gant (2016) considers tourism gentrification and urban inequalities. Fang, Ye and Law (2016) examine local tourism employment. The spillover effect of this new business model across local tourist attractions remains underexplored, especially in quantitative research (Zervas et al., 2017; Dolnicar, 2019). Different types of business entity differ in the impact of their market entry (Haveman & Nonnemaker, 2000). In the context of accommodation sharing, therefore, it is important to determine how private hosts (e.g., peers who share vacant space) differ from commercial hosts (hosts with formal business licenses) in terms of their impact on tourist attractions. Along with the market entry impact of accommodation sharing and its heterogeneous impacts by host type, the cumulative quantity of online reviews can be used to measure the online popularity of tourist attractions. Existing studies indicate that the distinction between virtual and real consumer communities has become blurred (Duan, Gu, & Whinston, 2008). **As a result,**

persuasive and awareness effects of online reviews on hotel performance have been widely examined (Viglia, Minazzi, & Buhalis, 2016; Yang, Park, & Hu, 2018). However, these studies were limited to demonstrate a distinct role of online reviews in affecting the performance of hotels, which inspired us to further investigate the online popularity of other hospitality businesses, such as tourist attractions. To fill the abovementioned gap in the research, this study sets out to achieve three research objectives. First, it aims to quantify the market entry impact of peer-to-peer accommodation-sharing services on the online popularity of tourist attractions. In addition to the average entry impact, we quantify the marginal entry effect of accommodation-sharing entities, i.e., how the online popularity of tourist attractions responds to an incremental increase in the supply of peer-to-peer accommodation-sharing services. Second, the study examines whether the entry impact of accommodation sharing varies with service provider type (i.e., private versus commercial hosts). Finally, the study unveils the mechanism underlying this impact by examining the views of travellers and managers involved in accommodation sharing on how and why accommodation sharing affects local tourist attractions.

We use a mixed methods approach to achieve the research objectives. First, we use a quasi-experimental design with a difference-in-differences approach to estimate the entry impact of two major accommodation-sharing service platforms on the online popularity of nearby tourist attractions in Beijing, China. The difference-in-differences strategy utilises two-way fixed effects to account for both time-invariant heterogeneity across attractions and unobserved temporal trends (year-month) that may confound the treatment effect, effectively mitigating underlying endogeneity issues, such as missing variable bias and reverse causality (Greene, 2008). In particular, the difference-in-differences estimates of the relationship between the entry and non-entry of accommodation-sharing services cast light on intra-industry dynamics in hospitality and tourism. Furthermore, exploring how different types of host facilitate such an impact offers insights into specific strategies for marketing operations and policy formulation in accommodation sharing. Second, we use a qualitative strategy to triangulate the findings of the quantitative analyses. By integrating the insights from the semi-structured in-depth interviews and participant observation to round out the findings of the difference-in-differences estimation, we unveil the mechanism behind the spillover effect of accommodation-sharing entry on local tourist attractions.

The study makes some theoretical and practical contributions to tourism and hospitality research. At a conceptual level, the study underlines an under-researched topic: the impact of

accommodation sharing on local tourist attractions. After quantifying this impact, we propose a two-tier spillover progress to triangulate the quantitative results and unveil the mechanism of the impact. At a practical level, this study provides marketing implications for service suppliers at a destination. We show that tourist attractions derive benefits from accommodation sharing due to the latter's inherent variation. This study also provides a bigger picture of the ecology of hospitality and tourism, as well as tourist experience in the age of the sharing economy and digital platforms. It demonstrates the importance of mobile technology in linking new disruptive businesses with conventional businesses and as a complement to the tourist experience of accommodation sharing.

The rest of this paper is organised as follows. The second and third sections present our hypotheses, which are based on the literature review. The fourth section describes the research methods used to estimate the entry impact of accommodation-sharing services on local tourist attractions. Our data collection, measures, experimental design and methodological triangulation are also covered in this section. **The fifth section presents the empirical results and two mechanisms behind the spillover effects.** The last section concludes the study.

## **SPILLOVER EFFECT OF ACCOMMODATION SHARING**

Spillover effects are the positive or negative externalities (external benefits or costs) that result from an economic activity (Yang & Wong, 2012). In spatial economics, the spillover effects of tourism are the indirect or unintentional effects of tourist flows on related industries, the host communities, adjacent regions (Leiper, 1979; Yang & Wong, 2012) or the spatial substitution of similar attractions/destinations (Zhou, Yang, Li, & Qu, 2017). Bergman and Schubert (2005) suggest that industry agglomeration or clustering within a region is a good example of the spillover effect. In destinations characterised by industrial agglomeration or geographical clusters of related tourism and hospitality businesses (Jackson & Murphy, 2002; Majewska, 2015), spillovers are prevalent across tourism and related industries. Previous studies of spillover effects in tourism have predominantly focused on the supply perspective (i.e., the integral role of tourism in destination development). Spillover effects are also referred to as 'demonstration effects', which are related to knowledge diffusion, competition or market access spillover (Weidenfeld, Williams, & Butler, 2010; Yang & Mao, 2018). This diffusion of new technologies into the market varies across space and time. The geographical proximity of inter-related industries often stimulates stronger externalities, which can be either positive or negative (Baptista, 2000). **Figure 1 summarises the existing studies on industrial spillovers,**

which encompass both the knowledge and innovation spillovers in abstract (or, circumstantial) terms, as well as the productivity or demand spillovers in concrete (or, consequential) terms. As the proximity (both of spatial and/or organisational) is featured prominently in the spillover effects, it is shown on the vertical axis.

*[Insert Figure 1 about here]*

To further address the debate on the sharing economy in tourism and hospitality, this study extends the research on geographical clustering and its spillover effects on different service sectors. Fundamentally, the supplies of tourism services available at a destination fall into two key categories: accommodation and attraction (Sparks, 2016). Tourist attractions experience spillover effects from the development of the surrounding businesses, including accommodation-sharing providers (Benckendorff, 2016). Due to the organic connection between attraction and accommodation in the tourism supply chain (Smith, 1994), the technology and information diffusion entailed in the business practices of accommodation-sharing platforms reshapes tourism production and consumption. For example, Airbnb provides new information on unique tourism experiences and travel inspiration beyond accommodation (The Airbnb Blog, 2017). Additionally, on the demand side, accommodation has been used as a starting point to analyse tourist dispersal patterns at destinations (Arbel & Pizam, 1977; McKercher, 2018). Pan, Litvin and O'Donnell's (2007) findings regarding tourist information search behaviour indicate that travellers tend to search for accommodation at the same time as searching for information on the destination and local attractions. This study extends analysis of the spillover effect to accommodation-sharing services, measuring their impact on neighbouring attractions, especially the online popularity of these attractions.

The assumption that accommodation sharing may have positive or negative spillover effects on tourist attractions is theoretically supported. First, the entry of a new firm, especially an advanced technology business, disturbs the current equilibrium in the market and helps to increase the productivity of the businesses associated with the new entrant (Blomström & Kokko, 1998). Similarly, Geissinger et al. (2018) define the sharing economy as a process of creative destruction that transforms and diversifies the way in which products and services on the market are exchanged while also potentially generating externalities for society. Spatial economics also emphasises the spillover effects of business clusters on the wider industrial agglomeration (Alcacer & Chung, 2014; Anderson & Neven, 1991). Furthermore, research has

demonstrated the role of geographic spillovers as positive externalities for adjacent competitors and innovations within the region (Van der Panne, 2004). The agglomeration of city hotels and increased number of hospitality service providers can be seen as examples of a concentration of similar organisations in the tourism and hospitality industries (Baum & Haveman, 1997; Hualchain, 1989; Lee & Jang, 2015). Second, as modern technology and society have become more complex, externalities have generated spontaneous unwanted side effects (Dahlman, 1979). From the business perspective, the entry of new firms has inefficient external effects on existing firms (Barnett & Yandle, 2009), resulting in a divergence of volatile spillovers in different industries and market conditions (Haveman & Nonnemaker, 2000). Finally, intensive competition between similar industries can generate negative spillovers and hinder market growth (Yang & Wong, 2012).

To identify and measure how accommodation-sharing services affect tourist attractions, this study assumes that the entry of an accommodation-sharing service has either a positive or a negative impact on neighbouring tourist attractions. Accordingly, we propose the following hypotheses:

*Hypothesis 1a: Peer-to-peer accommodation sharing has a positive effect on the online popularity of tourist attractions.*

*Hypothesis 1b: Peer-to-peer accommodation sharing has a negative effect on the online popularity of tourist attractions.*

## **MODERATION EFFECT OF DIFFERENT OWNERSHIP TYPES**

We further explore the variability of the spillover effects of different hosts – that is, private versus commercial – on the popularity of tourist attractions. Previous research has shown that different forms of business tend to have different degrees of spillover on related businesses (Haveman & Nonnemaker, 2000). Some studies also show that the nature of the firm, such as the level of know-how and technology, is a key factor that can accelerate or impede the diffusion of positive externalities (Konings, 2001; Teece, 1977). In the accommodation-sharing sector, either the typology of hosts (service providers) in terms of their motivation for hosting (Karlsson & Dolnicar, 2016) or the number of listings can explain the heterogeneity of peer-to-peer accommodation firms (Tussyadiah & Pesonen, 2016). Segmenting accommodation-sharing service providers by type allows us to disentangle how they each affect the online popularity of tourist attractions.

Traditionally, tourist accommodation can be divided into two types: commercial and non-commercial lodging establishments (Spolon & Rodrigues, 2017). Hotels are a good example of the former, and the latter can include the homes of friends and relatives or second homes. Similarly, accommodation-sharing services offer a mix of these two types of traditional concepts, but with a greater diversity of business models and service dimensions (Wu, Ma, & Xie, 2017). Hosts can be ordinary people or commercial providers (Dolnicar, 2017), and this typology explains the ownership types of accommodation-sharing properties. For private properties owned by ordinary people, Couchsurfing reflects the evolution of a non-commercial community into a for-profit model, and is a relevant example of a peer-to-peer interactive marketing platform that capitalises on its authentic experiences and connections (Pera, Viglia, & Furlan, 2016), which are more likely to occur outside the commercial realm (Molz, 2013). Unlike private hosts who share their spare residential spaces and daily lives (Dolnicar, 2017), commercial hosts operate their accommodation-sharing businesses in the sharing economy realm. Commercial hosts tend to be profit-oriented and own professionally managed properties (Fradkin, Grewal, & Holtz, 2018), and are defined in this study as registered business operators (Tujia, 2018). They have different levels of know-how and different types of business operations (Li, Moreno, & Zhang, 2016), which may lead to externalities different from those of privately owned properties. As the number of guests staying in commercially operated accommodation sharing grows, guests have to compete for saturated resources (urban space and tourist facilities) and have less access to various services; this may generate negative spillover effects on neighbouring tourist attractions.

In this context, the demand for accommodation sharing is driven by the personal nature, authenticity and diversity of experiences (Tussyadiah & Zach, 2017), which are often provided by private hosts but rarely found in commercially operated ‘cookie-cutter’ properties. If the ratio of commercially operated properties to overall accommodation sharing were to increase considerably, the unique appeal of accommodation sharing would decline (Guttentag, 2015). In this case, there would be fewer opportunities for privately owned accommodation sharing providers to differentiate themselves from traditional hotels and thereby attract visitors who celebrate diversity and seek authentic experiences (Dolnicar, 2017). We assume that the impacts of these two types of host on local tourist attractions vary accordingly. Therefore, we propose the following hypothesis:



*Hypothesis 2: The effect of peer-to-peer accommodation sharing on the online popularity of neighbouring tourist attractions is moderated by ownership type.*

## **METHODOLOGY**

### *Quantitative and qualitative data*

Two types of data are used in this study: quantitative and qualitative. The quantitative data consist of information on the supply of accommodation-sharing services and online popularity of tourist attractions in Beijing, China, which is a major destination that attracts massive numbers of domestic and international tourists who have recently experienced accommodation-sharing services. The qualitative data are drawn from fieldwork in Beijing comprising participant observation and in-depth interviews on different features of accommodation-sharing properties.

We first collected the quantitative data from Xiaozhu and Tujia, two major platforms in China's accommodation-sharing market.<sup>1</sup> A significant feature differentiating Tujia from Xiaozhu is that the former offers firm-owned, commercially operated properties, whereas Xiaozhu provides only peer-to-peer resident-owned, privately managed properties. Although both platforms offer travellers accommodation-sharing services at their intended destinations, they differ in the type of property ownership. This fits our research interest. Using automated Python scripts, we accessed and parsed the ownership type and geographic coordinates of 33,446 active properties from Xiaozhu and Tujia. We then calculated their distance from each of the nearby tourist attractions. Based on the relative distance between the accommodation-sharing properties and local tourist attractions, the urban scale of Beijing (i.e., a total area of 16,410 km<sup>2</sup> with an urban area of 1,368 km<sup>2</sup>) and several Beijing-based empirical studies of the distribution of transportation, retail districts and service districts (Yang, 2016) and the spatial characteristics of tourist attractions (Su, Dang, & Wu, 2004), we chose a 5-km radius from a local tourist attraction as an appropriate distance to study the impact of an

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<sup>1</sup> The accommodation-sharing economy in China has seen phenomenal growth. Its proliferation is best exemplified by the expansion of Xiaozhu and Tujia. Established in August 2012, Xiaozhu offers 500,000 listings in over 650 domestic destinations in China; see <http://www.xiaozhu.com/aboutus>. Debuting about one year earlier (December 2011) than Xiaozhu, Tujia provides more than 1 million accommodation sharing properties in 345 domestic destinations and 1,037 outbound destinations; see <https://content.tujia.com/About/Index.htm>. These two platforms offer accommodation-sharing services to travellers in their intended destinations, and have significantly outperformed Airbnb, the US-based pioneer of accommodation-sharing services in China, due to their competitive advantages in the home market.

accommodation-sharing entry on neighbouring tourist attractions. Based on Tobler's (1970) theoretical explanation of geographical proximity and empirical evidence of a significant correlation between the adjacent economic actors in terms of proximity dynamics (McCann & Folta, 2008; Miller, 2004; Rosenthal & Strange, 2004), we investigated the spillover effects of accommodation sharing on tourist attractions within a certain geographical distance. We also examined the impact of entry within a 1-km radius for robustness checks. To model the entry of accommodation sharing, we used the month of the first online traveller review of an accommodation-sharing property as the month of its entry. This is a rather conservative measure of the entry impact of accommodation-sharing services (Zervas et al. 2017). For any given month, we counted the cumulative number of accommodation-sharing properties within a 5-km radius of a tourist attraction as a measure of accommodation-sharing supply.

Second, the quantitative data consisted of 376,732 online traveller reviews of 124 tourist attractions from Qunar,<sup>2</sup> a primary online travel agent in China that allows travellers to purchase admission tickets/passes to tourist attractions and write reviews of their experiences at these attractions. By recursively paging through each tourist attraction on Qunar.com, we were able to capture every attraction in Beijing that had been visited and reviewed by tourists. Each online review is time-stamped, which allowed us to aggregate the volume of online reviews by attraction and month to structure a panel, which was then matched with the monthly entry and supply of accommodation-sharing properties within a 5-km radius of each tourist attraction.

The combined data comprise 4,121 observations made between September 2014 and August 2017 (35 months).<sup>3</sup> **Table 1** presents the temporal increase in accommodation-sharing properties in Beijing against the growth of tourist attractions from 2014 to 2017. **Figure 2** depicts the geographic diffusion of accommodation sharing against local tourist attractions in Beijing during the same study period. The temporal and geographic patterns of accommodation-sharing growth reveal significant variation. In particular, accommodation sharing varied considerably across tourist attractions with respect to entry timing and growth rate. This variability is exploited as our empirical strategy to identify the impact of accommodation sharing on the online popularity of tourist attractions.

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<sup>2</sup> Founded in May 2005 and headquartered in Beijing, Qunar is the most popular Chinese travel platform. Qunar's travel search scope covers over 4,190 online travel agencies, 770,000 hotels, 180,000 flight routes, 500,000 vacation routes, 10,000 tourist attractions, 242,000 daily group-buying deals and many more; see [http://www.qunar.com/site/en/Qunar.in.China\\_1.1.shtml](http://www.qunar.com/site/en/Qunar.in.China_1.1.shtml).

<sup>3</sup> Accommodation-sharing properties may be cross-listed on both Xiaozhu and Tujia. In this case, we keep only the unique property by dropping its duplicate.

*[Insert Table 1 about here]*

*[Insert Figure 2 about here]*

We also collected qualitative data to complement the quantitative data. To triangulate our qualitative insights with the findings of the quantitative data analysis, we designed semi-structured in-depth interviews to unveil the mechanism of the impact of accommodation sharing. The fieldwork was undertaken in May 2019 in Beijing, and the interviews were continued until saturation was reached. Participant observations and 21 in-depth interviews with guests were conducted at six accommodation-sharing properties, which were chosen by taking account of administrative districts, traditional tourist attraction areas and ownership types. The interviewee profile is shown in the Appendix. The interviewees were in the 18-54 age bracket, well educated (university student or graduates) and middle class. There was a higher proportion of females than males. These demographics correspond with the target segment of accommodation-sharing platforms, according to the interview with Hang, a manager of Tujia. To look at the issue more holistically, we also interviewed three industry delegates who managed or operated accommodation-sharing businesses. The average length of each interview was 40 minutes, and all of the transcripts of the interviews were coded using NVivo 11 and analysed inductively. The findings of the qualitative study suggest that the spillover effect has two main connections.

*Identification strategy: A quasi-experiment via difference-in-differences with two-way fixed effects estimations*

The goal of our empirical analysis is to quantify the spillover effect of accommodation-sharing entry on the online popularity of tourist attractions. In this context, the use of regular regression models for causal identification is challenging for three reasons. First, the estimated impact of the entry of accommodation sharing is likely to correlate with other unobservable factors in the local environment of a tourist attraction, which may in turn affect the online popularity of the attraction. Bearing this in mind, we begin by utilising the longitudinal nature of the data to account for time-invariant heterogeneity across attractions through attraction fixed effects.

Second, the entry of accommodation sharing and online popularity may be jointly influenced by unobserved temporal trends that apply to the entire accommodation-sharing market. Here, we may be concerned about broader macroeconomic factors, such as the increasing awareness and adoption of accommodation sharing by travellers as the service continues to grow. We address this possibility by incorporating time fixed effects in the form of year-month dummies.

Finally, although our two-way fixed effects can account for time-invariant factors that are associated with a tourist attraction or with cross-sectional trends or shocks to the entire accommodation-sharing market, some correlated unobservables may be intrinsically both attraction-specific and dynamic over time, exhibiting time-varying patterns that coincide with variations in the entry of accommodation sharing and the online popularity of tourist attractions.

We overcome the hurdles of causal effect identification by using a quasi-experiment design using the difference-in-differences approach (Angrist & Pischke, 2008) with two-way fixed effects estimations (Somaini & Wolak, 2016). As accommodation-sharing services are rolled out across different tourist attractions at different times, we are able to treat accommodation-sharing entry as a variable intervening in location and time against the online popularity of tourist attractions. **Table 2** illustrates our empirical strategy. Specifically, we use ‘before entry’ and ‘after entry’ to refer to the periods before and after the entry of accommodation-sharing services around a tourist attraction. Tourist attractions that have experienced the entry of accommodation sharing comprise the ‘treatment’ group, and tourist attractions that have not yet been affected by the entry of accommodation sharing serve as the ‘control’ group. In the difference-in-differences approach, the first difference compares the online popularity of tourist attractions before and after the entry of accommodation-sharing services, and the second difference compares the online popularity of tourist attractions that have yet to experience the entry of accommodation sharing with those that have yet to be affected by accommodation sharing. We also include a two-way fixed effect of attraction and time (year-month) to account for the unobservable heterogeneity and temporal trends across attractions and over time, which may confound the treatment effect.

*[Insert **Table 2** about here]*

### Model specification

To utilise the granularity of the longitudinal panel data, our temporal and geographic units of analysis are months and attractions. For each tourist attraction  $i$  in month  $t$ , the impact of the accommodation-sharing entry on its online popularity is as follows:

$$Y_{it} = \beta_1 Entered_i + \beta_2 Entered_i \times After_{it} + \gamma' Z_{it} + \mu_i + v_t + \varepsilon_{it}, \quad (1)$$

where  $Y_{it}$  takes the form of  $LogReviews_{it}$ , which is a proxy for the online popularity of a tourist attraction among travellers (Xie, Chen, & Wu, 2016).  $Entered_i$  indicates whether a tourist attraction  $i$  has experienced the entry of accommodation sharing around an attraction by the end of our study period.  $After_{it}$  indicates whether month  $t$  is after the entry of accommodation sharing in attraction  $i$ . Our research interest is  $\beta_2$ , which measures the impact on the online popularity of tourist attractions after the entry of accommodation sharing.  $Z_{it}$  is a vector of the control variables, including the lagged cumulative number of online traveller reviews,  $CumReviews_{it-1}$ , and the lagged average rating of these reviews,  $AvgRating_{it-1}$ , which are likely to affect the online popularity of tourist attractions in a given month.  $\mu_i$  and  $v_t$  represent the attraction fixed effects and time fixed effects, respectively. Finally,  $\varepsilon_{it}$  is the idiosyncratic error term.

To examine whether the impact of the accommodation-sharing entry varies by ownership type, we include a moderator to measure ownership type,  $ComRatio_{it}$ , to denote the ratio of commercially operated properties to privately operated properties within a 5-km radius of a tourist attraction in a given month. The resulting model for each tourist attraction  $i$  in month  $t$  is:

$$Y_{it} = \alpha_i + \beta_1 Entered_i + \beta_2 Entered_i \times After_{it} + \beta_3 Entered_i \times After_{it} \times ComRatio_{it} + \gamma' Z_{it} + \mu_i + v_t + \varepsilon_{it}, \quad (2)$$

where the specification remains consistent with Equation (1). We focus on  $\beta_3$  to estimate the moderation effect of ownership type on the impact of accommodation-sharing entry on the online popularity of tourist attractions. [Table 3](#) gives the definitions of the variables used in the estimations. [Table 4](#) shows the summary statistics and correlation matrix of these variables.

[Insert [Table 3](#) about here]

[Insert *Table 4* about here]

## RESULTS AND FINDINGS

### *Impact of accommodation-sharing entry: Main estimation*

We begin by reporting the estimation results of the impact of accommodation-sharing entry on the online popularity of tourist attractions, as per Equation (1). These results are presented in *Table 5*. We report five sets of results: a baseline ordinary least squares (OLS) difference-in-differences model (Column 1), a difference-in-differences model with attraction-level fixed effects (Column 2), a difference-in-differences model with year-month fixed effects (Column 3), and a difference-in-differences model with two-way fixed effects at both the attraction and time levels (Column 4). As a time-invariant measure,  $Entered_i$  is absorbed by the attraction fixed effects in Columns 2 and 4. The use of various specifications allows us to cross-check the robustness of the estimation results. We report the robust standard errors in all of our estimations.

The key independent variable of interest is  $Entered_i \times After_{it}$ . We observe that the entry of accommodation sharing is positively and significantly associated with the online popularity of local tourist attractions. As shown in Column 4, we find a 15.4% increase in the volume of online reviews of tourist attractions after the entry of accommodation sharing. Despite a slight inflation of magnitude, the estimates of the impact of accommodation-sharing entry in other columns are not qualitatively different from those in Column 4.

[Insert *Table 5* about here]

An important assumption of the difference-in-differences specification is that the affected and unaffected groups have parallel trends before the accommodation-sharing entry. We estimate a relative time model (Angrist & Pischke, 2008) to check its parallel trends assumption and verify the findings of the main specification. We find that the pre-treatment heterogeneity between the treated and control is about 0.3 and 0.4, and quite parallel, as shown in *Table 6*. After the entry, the difference gradually increases and reaches 0.7-0.8.

[Insert *Table 6* about here]

To ensure that accommodation sharing rather than other events drives the results, we conduct a placebo test in which we randomly assign a subset of tourist attractions without entry as if they were affected by the entry. Specifically, for each draw, we randomly treat 50% of the attractions as if they were subject to accommodation-sharing entry and replicate our main regressions to obtain the coefficients of the  $Entered_i \times After_{it}$  dummy. We repeat this process multiple times using bootstrapping simulations. **Figure 3** depicts the distributions of the estimated coefficients from simulations with 1,000 draws each. As we can see from the figure, most of the mass (of the distributions) centres around zero, and between -0.2 and 0.2 at worst. This suggests that none of the estimated coefficients are significantly different from zero (in a statistical sense) and that the ‘counterfactual’ accommodation-sharing entry constructed in the simulations does not affect *LogReviews*. The results of this placebo test further support our findings that accommodation-sharing entry drives the differences in attractions’ online popularity.

*[Insert **Figure 3** about here]*

### *Robustness checks*

We not only identify the impact of the accommodation-sharing entry, but also conduct additional checks to make sure the estimated impact is robust. **Table 7** presents two panels of the robustness checks.

In Panel (1), we estimate the ‘elasticities’ or marginal effect of how the online popularity of tourist attractions responds to the supply expansion associated with the entry of accommodation-sharing properties. We use  $Supply_{it}$ , which measures the cumulative number of accommodation-sharing properties (i.e., supply) available within the 5-km radius of a tourist attraction in a given month, to replace the dummy measure of  $Entered_i$  in Equation 1. To decrease the scale, we divide the monthly cumulative supply of accommodation-sharing properties by 100. We estimate the change in online popularity in response to each 100 property increase in the accommodation-sharing stock, which is the popularity elasticity of accommodation-sharing expansion. These point estimates, or ‘elasticities’, generalise our findings to inform marketing and policy discussions about accommodation sharing and serve as robustness checks for the entry impact estimated in **Table 5**. We present the corresponding results of robustness checks in **Table 7**. As shown in Column 4, we find that on average, each

1% increase in the accommodation-sharing supply (in 100) leads to a 0.19% increase in the online popularity of the tourist attractions.

In Panel (2), we conduct another robustness check by changing the geographical proximity to a 1-km radius when identifying the dummy entry of accommodation sharing to tourist attractions. The entry of accommodation sharing within the 1-km radius is associated with about 50.2% increase, on average, in the online popularity of local attractions. Such an impact is stronger than the estimated entry impact (15.4%) using the 5-km radius in our main estimation, because of increased geographical proximity. The finding indicates the robustness of our findings, because the measures of estimated entry impact using different geographical proximities remain qualitatively consistent and cross-validate each other.

*[Insert Table 7 about here]*

#### *Moderation effect of ownership types*

We next report the results of the difference-in-differences regressions based on Equation 2. Given the significantly positive impact of accommodation-sharing entry on the online popularity of tourist attractions, we further explore how the heterogeneity of service providers helps to drive such a positive impact. To this end, we compare the ownership of accommodation-sharing properties (commercially operated versus privately operated). Table 8 shows that a higher ratio of commercially operated accommodation-sharing properties is associated with a lower level of attraction popularity, and vice versa. This may happen because the demand for accommodation sharing is likely to be driven by the personal nature, authenticity and diversity of the experience, which is often provided by hosts who manage private properties but rarely found in commercially operated ‘cookie-cutter’ properties. As the ratio of commercially operated properties overwhelms that of private properties, there is less chance that accommodation sharing can differentiate itself from traditional hotels and attract more visitors. Therefore, the impact of accommodation sharing on the popularity of tourist destinations is discounted or mitigated when there are more commercially operated properties than private properties.

*[Insert Table 8 about here]*



## *Mechanism behind the spillover effect: A qualitative study*

### *Mechanism 1: Variation across location, cost and home experience*

With the evidence from the difference-in-differences estimations in hand, we shift toward the question of *why* accommodation sharing influences local tourist attractions. **To identify the causal relationship, the literature and field-based propositions are developed.** Beyond the economic and social factors suggested by the literature on accommodation sharing (Tussyadiah & Pesonen, 2016), we expand our horizons regarding logical candidates in terms of variation (Dolnicar, 2017) with three sub-dimensions: location (within transportation/attraction hubs), cost, and home experience **(including spatial diversity and integration with local community).** Unlike the agglomeration tendency of hotel location for the performance (Baum & Haveman, 1997), the spatial dispersion of accommodation sharing was evaluated along with the cost performance and diversity of experience. These factors may ultimately exert a positive spillover effect on the destination by extending tourists' length of stay and creating new opportunities to attract fresh visitors. **The following proposition and examples from the field research are presented:**

*Proposition 1: The variation of accommodation sharing in terms of location, cost, and home experience may change the ways in which tourists travel and consume (time and space) in a destination. This may also increase tourists' needs for more novel experiences and stimulate the positive spillover effects on neighbouring tourist attractions.*

The following extract from participant observation and field interviews describe how the variation in accommodation sharing bridges the positive spillover effect from accommodation sharing to the neighbouring attractions:

*'As for hotels, only the expensive ones can be guaranteed. For the first two days of my trip, I stayed at a hotel with my friend. Even though it wasn't in the heart of Beijing, we paid 2,000 RMB per night. But here (accommodation sharing), at the heart of the city, with many traditional attractions, the room is bigger, the house is very distinctive and it only costs 800 RMB per night, which is affordable for me. This encouraged me to stay in Beijing for longer and travel alone for one more week'* (Huan, independent traveller for videography).

*At one property located in an old alley in Beijing, I asked my host to introduce a neighbouring attraction. She (the host) firstly recommended that I visit Xidan commercial street or Qianmen. But when I asked more about the authentic Beijing, she told me the story of this alley (Zhuanta Hutong), which is named after an ancient pagoda (Zhuanta) in the Yuan Dynasty. I hadn't heard of it, even though I had lived in Beijing for six years. Following her recommendation, I walked to the pagoda courtyard, and was able to rediscover the cultural landscape and flavour of old Beijing. (Participant observation, Beijing field notes taken by author).*

The findings also indicate temporospatial representations of variation. Spatial diversity was described as one aspect of home experience, and the concept was shaped in comparison with standardised hotel rooms. Accommodation sharing not only allowed tourists to have enough travel time and explore more, but also gave them power over their daily itineraries:

*'We could have stayed at Sanlitun and the nearby Happy Valley Beijing due to the cheap price and good location of our Tujia home. We didn't need to compress our time; we were able to loosen our travel itinerary to see more places and enjoy more, even revisit an attraction as we wish' (Chen, travelling with friends).*

The following account offered by Stella describes the homely experience created through integration and familiarity with the local community, which provides another attribute of variation beyond the competitive advantage of accommodation sharing:

*'In the past, I've always visited Beijing alone and stayed at a hotel. This time, I came with my parents, and I was able to find this home with bigger rooms and a garden. Considering my parents' age and physical condition, I chose accommodation within walking distance of traditional attractions. We wandered around every morning and night, and saw the local people play Chinese chess or square dance in the park near our home. There was a vibrant local atmosphere, helping the elderly (her parents) to feel more intimate and comfortable' (Stella, travelling with her parents).*

#### *Mechanism 2: Salience of mobile technologies in contemporary travel*

Mobile information and communication technologies offer a critical point of connection between the spillover effects of accommodation sharing and those of other suppliers of tourism services, such as tourist attractions and restaurants. Technologies provide a foundation for the

growth of the sharing economy (Gössling, 2017; Leung, Xue, & Wen, 2019), and marketing channels for attracting customers and delivering interactive promotions: *‘We (Tujia) cooperate with various mobile platforms to attract each other’s users. Tujia’s inter-industrial collaborations encompass a wide range of partnerships – with Alipay, Feizhu, JingDong, Didi, as well as mobile banking applications’* (Hang, from Tujia). Even more importantly, through their acceptance and usage of mobile technologies, tourists take on the travel and lifestyle behaviour of locals. Hence:

*Proposition 2: Nowadays, accommodation sharing and other tourism services are increasingly interconnected through mobile technologies. This connectivity has changed tourists’ travel behaviour, and mediates the interplay between accommodation sharing and neighbouring tourist attractions.*

Specifically, mobile-based social networking services facilitate online host-guest interactions and tourism information exchange, and location-based services substitute for hotel services and supplement the experience of accommodation sharing:

*‘When travelling with my son, I have to pay attention to his meals. This is why I used to prefer a hotel when taking a family trip. Nowadays, I can order breakfast for him via Meituan (a food delivery application) as soon as he wakes up, and pay via Alipay or WeChat Pay with just one click. As a result, living in a homestay has become very convenient’* (Zhang, travelling with her spouse and son).

*‘I don’t need an icy concierge to give me a map or brochure, as I can connect with my host and other travellers online; it feels like I own my personal tour guide... (Thanks to this,) my friend and I were able to go to the local bazaar, enjoy local food and interact with local people’* (Ling, travelling with friends).

In terms of tourist attractions, the interviewees tended to rely on online reviews on Qunar and travel blogs on Qiongyou or Mafengwo (travel-related online communities) for information. They then booked their tickets through online travel agencies such as Qunar and Ctrip, and used mapping apps (Gaode or Baidu Maps) or Didi (ride-sharing apps like Uber and Lyft) to travel to the attractions. Tourism service industries are connected by mobile technologies.

The variation in accommodation sharing and the supplementary role of mobile technology lead tourists to visit attractions through a two-tier spillover process. In the first tier, as noted by Arbel and Pizam (1977), the proximity (within walking distance) of the hotel to the main attractions is a necessary condition for success. Tourists typically select their accommodation based on the main attraction or activity. In the second tier, as the expansion of existing knowledge, the findings show that the entry of accommodation sharing can attract more/new tourists by leveraging variation and ubiquitous mobile services. Consequently, more diverse demands for attractions arise from the heterogeneity and networking of accommodation sharing.

## **CONCLUSIONS AND IMPLICATIONS**

Following the rapid proliferation of accommodation sharing and its consequences, the connections between accommodation sharing and the incumbent tourism and hospitality systems need to be dealt with more comprehensively. To further quantify the dynamics of accommodation-sharing platforms in the broader context of tourism service supplies, this study extends our understanding of how the entry of accommodation-sharing services affects another key supplier in a destination, viz. a tourist attraction. The findings of this study suggest that the entry of accommodation-sharing suppliers has a quantifiable positive spillover effect on local tourist attractions. We estimate that tourist attractions become more popular in the virtual community when accommodation sharing is geographically nearby. Furthermore, we argue that this spillover effect is significantly moderated by an increase in the ratio of commercially operated properties, such that the commercialisation of property operation diminishes the positive spillover effects of accommodation sharing. Finally, this study complements the quantitative findings using qualitative insights from in-depth interviews. The mixed methods approach triangulates the findings to reveal not only the entry impact of accommodation sharing on tourist attractions, but also the mechanism behind this impact. To further determine the impact of accommodation sharing on tourist attractions, sequential methodological triangulation is conducted to address the spillover effect in terms of variation and mobile technologies. A two-tier spillover process is proposed to extend knowledge of the causal interplay between accommodation sharing and tourist attractions.

This study makes several contributions to our understanding of the impact of accommodation sharing on destinations. First, we extend the scope of the spillover effects of

accommodation-sharing services by examining their impact on tourist attractions. Expanding existing studies of the influence of a new disruptive business model on a long-established industry, we address different tourism service sectors, because a destination performs through connectivity and interdependency between multiple tourism service sectors. Therefore, the dominant knowledge and patterns of incumbent businesses have been shifted by accommodation-sharing platforms, and their variations influence the online popularity of tourist attractions. Notably, we also use the cumulative number of online reviews in our experimental verification of the online popularity of these attractions, because tourist reviews in online virtual communities have become a critical resource that can help the tourism and hospitality industry to understand its consumers' responses and therefore broaden its service horizons. Second, in light of the ongoing debate over the negative impacts of the sharing economy in the market and subsequent regulatory issues, this study puts forward a range of counter-arguments regarding the positive spillovers. In particular, it can be assumed from this study that the entry of accommodation-sharing services into the market can lead to the growth and diversification of demand, and that the benefits widely accrue to related tourism service industries and cities as a whole. Third, based on the theoretical background of externalities and spillovers, this study provides explicit descriptions of a horizontal spillover in two key tourism service suppliers that are geographically adjacent to each other. In particular, we show that the spillover effects of accommodation sharing on tourist attractions are significant when they are located within a 5-km radius. In response to Tobler's first law of geography (Tobler, 1970) and new theoretical approaches to proximity dynamics (Torre & Rallet, 2005), we prove that there is a positive correlation between tourism service economic actors that are geographically proximate. This empirical evidence can help to initiate the development of a spillover and spatial interaction theory that can be used to delineate the negative and positive spillover effects of accommodation-sharing services. This can help to determine what generates spillovers and how to synergise the spillover effect of innovative economy entities on related local industries.

The findings of this study have several practical implications for the tourism and hospitality industries. First, we identify a significant and positive effect on tourist attractions of both accommodation-sharing entry and the cumulative number of properties that are available. The insights obtained from this study not only provide inspiration for competitive positioning for new entrants, but may also help industries affected by the sharing economy to establish useful business and operational strategies to enhance their attractiveness. Second, our research findings show how the positive spillover effects are moderated by ownership

heterogeneity. By segmenting the operational types of entrepreneur, we estimate that a higher ratio of commercially operated properties can attenuate the positive spillover effect of accommodation-sharing services on the online popularity of neighbouring tourist attractions. Drawing on the economic theory of competitive analysis, this finding not only shows that the impact on growth and market entry varies across business operations, but also demonstrates that privately operated properties catering to authentic and personalised home experiences may attract various needs for local attractions (rather than stereotyped services of commercial properties).

We also provide useful information for policy formulation by revealing the mechanisms underpinning how accommodation-sharing services influence tourism industries in a destination region. As a new economic actor in the tourism and hospitality industry, accommodation-sharing services create a spillover effect in terms of geographical and industrial connections. In addition, their interaction with other tourism service sectors can be competitive or complementary. Therefore, a more comprehensive regulatory intervention to control accommodation-sharing services is needed, which should consider their propensity and impacts in the market.

Like any other social science study, this study has several limitations. First, due to the unavailability of data, we used the month of the first online review of an accommodation-sharing property as the month of entry, which might not precisely represent the time of the business entry. Therefore, the models that we estimated could have been subject to statistical bias. Although we used the longitudinal nature of the data to account for the time-invariant heterogeneity across attractions through the attractions' fixed effects, there may still have been a number of 'unobservable factors'. Second, of the various approaches to the use of online review data, this study adopted a functional approach to quantify the association between tourism service suppliers. Given that these reviews contain a wide variety of content, an approach such as semantic analysis of the review contents should be undertaken to explore how and why the tourist attractions are becoming more popular. Third, we defined tourist attractions based on the rating system by the Chinese authorities. Given the tremendous and various tourism demand in Beijing, the border of tourist attraction has been blurred. The representation of Beijing is diverse and fluid; it is no longer simply the iconic Forbidden City or Great Wall. According to the interviews and participant observation, this change applies in particular to the accommodation-sharing travellers. This study inspires future research on the more comprehensive spatial sense of tourist experience at a destination in terms of the new trends of

attractiveness. Fourth, this study's quantification of the positive spillovers of accommodation-sharing services are limited to Beijing; these impacts may differ across empirical settings. Further studies should focus on the spillover effects of accommodation-sharing services on various tourism and hospitality sectors in a variety of destinations to investigate their dynamics and impacts on competitive or complementary industries and on wider society.

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**Table 1** Growth of Accommodation Sharing in Beijing Over Time.

Year	Number of Attractions	Number of Properties	Annual Growth Rate of Properties
2014	81	1,178	-
2015	119	5,053	+329%
2016	124	15,059	+198%
2017	124	33,446	+122%

**Table 2** Design of the Difference-in-Differences Approach.

	<b>Before Entry</b>	<b>After Entry</b>
<b>Attractions with the entry of accommodation sharing</b>	O	X
<b>Attractions without the entry of accommodation sharing</b>	O	O

**Table 3** Variable Definitions.

Category	Variable	Definition
Dependent Variable	<i>LogReviews<sub>it</sub></i>	Logarithm of the cumulative number of online reviews of a tourist attraction in a given month
Primary Independent Variable	<i>Entered<sub>i</sub></i>	A dummy variable indicating whether a tourist attraction is a treatment attraction, which has experienced the entry of accommodation sharing in its 5-kilometer radius by the end of the study period, with a value of 1 = a treatment attraction that has experienced the accommodation-sharing entry and 0 = otherwise
	<i>After<sub>it</sub></i>	A dummy variable indicating whether a month is after the entry of accommodation sharing in a 5-kilometer radius of a tourist attraction, with a value of 1 = before the entry month and 0 = otherwise
	<i>LogSupply<sub>it</sub></i>	Logarithm of the cumulative number of accommodation-sharing properties (in 100) entering a 5-kilometer radius of a tourist attraction in a given month
Moderator	<i>ComRatio<sub>it</sub></i>	Ratio of commercially operated accommodation-sharing properties to privately operated ones within a 5-kilometer radius of a tourist attraction in a given month
Control Variable	<i>CumReviews<sub>it-1</sub></i>	Lagged cumulative number of online reviews (in 100) of a tourist attraction in a given month
	<i>AvgRating<sub>it-1</sub></i>	Lagged average rating of the cumulative number of online reviews of a tourist attraction in a given month
	<i>LogHotels<sub>i</sub></i>	Logarithm of the number of hotels within a 5-kilometer radius of a tourist attraction

**Table 4** Summary Statistics and Correlation Coefficients of Variables.

		Obs.	Mean	Std. Dev.	Min	Max	<u>Correlation Matrix</u>						
							(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	<i>LogReviews</i>	4,121	2.05	1.74	0	11.27	1						
(2)	<i>Entered</i>	4,121	0.88	0.33	0	1	0.11	1					
(3)	<i>After</i>	4,121	0.48	0.50	0	1	0.20	0.36	1				
(4)	<i>ComRatio</i>	4,121	2.05	1.74	0	11.27	-0.01	0.16	0.44	1			
(5)	<i>CumReviews</i>	4,121	14.51	77.01	0	527.44	0.02	-0.24	-0.04	-0.03	1		
(6)	<i>AvgRating</i>	4,121	3.54	1.43	0	5	0.28	0.08	0.13	-0.04	-0.12	1	
(7)	<i>LogHotels</i>	4,121	5.51	1.88	0	8.20	0.19	0.46	0.70	0.22	0.03	0.07	1



**Table 5** Effect of Accommodation-sharing Entry: Main Estimation.

D.V.: <i>LogReviews</i>	(1) OLS	(2) Fixed-effects	(3) OLS	(4) Fixed-effects
<i>Entered<sub>i</sub></i>	0.098 (0.093)		0.079 (0.084)	
<i>Entered<sub>i</sub> × After<sub>it</sub></i>	0.358*** (0.070)	0.305*** (0.084)	0.361*** (0.067)	0.154* (0.081)
<i>CumReviews<sub>it-1</sub></i>	0.001*** (0.000)	0.003** (0.001)	0.001*** (0.000)	0.001 (0.001)
<i>AvgRating<sub>it-1</sub></i>	0.322*** (0.022)	0.289*** (0.018)	0.362*** (0.034)	0.035 (0.028)
<i>LogHotels<sub>i</sub></i>	0.082*** (0.020)		0.078*** (0.019)	
Constant	0.188 (0.129)		0.382 (0.412)	
Observations	4,121	4,121	4,121	4,121
R-squared	0.115	0.360	0.263	0.526
Attraction fixed-effects	NO	YES	NO	YES
Month fixed-effects	NO	NO	YES	YES

Notes. Robust standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 6** Relative Time Model

Variables	<i>LogReviews</i>
D <sub>-6</sub>	0.353 (0.218)
D <sub>-5</sub>	0.376* (0.218)
D <sub>-4</sub>	0.334 (0.218)
D <sub>-3</sub>	0.498** (0.218)
D <sub>-2</sub>	0.237 (0.218)
D <sub>-1</sub>	0.386* (0.218)
D <sub>0</sub>	0.497** (0.219)
D <sub>1</sub>	0.566** (0.226)
D <sub>2</sub>	0.594** (0.246)
D <sub>3</sub>	0.805*** (0.251)
D <sub>4</sub>	0.458* (0.257)
D <sub>5</sub>	1.008*** (0.266)
D <sub>6</sub>	0.888*** (0.272)
1(After 6 month)	0.745*** (0.131)
<i>CumReviews<sub>it-1</sub></i>	-0.000 (0.001)
<i>AvgRating<sub>it-1</sub></i>	0.035 (0.028)
Observations	4,121
R-squared	0.531
Attraction fixed-effects	YES
Month fixed-effects	YES

**Table 7** Effect of Accommodation-sharing Entry: Robustness Checks.

D.V.: <i>LogReviews</i>	(1) OLS	(2) Fixed-effects	(3) OLS	(4) Fixed-effects
Panel (1) Using continuous accommodation-sharing supply (in 100)				
<i>Entered<sub>i</sub></i>	0.153 (0.094)		0.132 (0.085)	
<i>Entered<sub>i</sub> × LogSupply<sub>it</sub></i>	0.106*** (0.020)	0.214*** (0.027)	0.106*** (0.020)	0.191*** (0.035)
<i>CumReviews<sub>it-1</sub></i>	0.001*** (0.000)	0.001 (0.001)	0.001*** (0.000)	0.001 (0.001)
<i>AvgRating<sub>it-1</sub></i>	0.313*** (0.022)	0.255*** (0.019)	0.360*** (0.034)	0.029 (0.028)
<i>LogHotels<sub>i</sub></i>	0.039 (0.025)		0.035 (0.025)	
<i>Constant</i>	0.354*** (0.136)		0.606 (0.413)	
Observations	4,121	4,121	4,121	4,121
R-squared	0.116	0.368	0.264	0.529
Attraction fixed-effects	NO	YES	NO	YES
Month fixed-effects	NO	NO	YES	YES
Panel (2) Using a 1-kilometer radius to define the accommodation-sharing entry				
<i>Entered<sub>i</sub> (1km)</i>	-0.115* (0.066)		-0.135** (0.061)	
<i>Entered<sub>i</sub> × After<sub>it</sub> (1km)</i>	0.544*** (0.092)	0.579*** (0.100)	0.535*** (0.086)	0.502*** (0.093)
<i>CumReviews<sub>it-1</sub></i>	0.001** (0.000)	0.002 (0.001)	0.001** (0.000)	0.000 (0.001)
<i>AvgRating<sub>it-1</sub></i>	0.323*** (0.022)	0.291*** (0.018)	0.367*** (0.034)	0.034 (0.028)
<i>LogHotels<sub>i</sub></i>	0.148*** (0.018)		0.146*** (0.017)	
<i>Constant</i>	0.092 (0.114)		0.287 (0.392)	
R-squared	0.117	0.364	0.265	0.529
Attraction fixed-effects	NO	YES	NO	YES
Month fixed-effects	NO	NO	YES	YES

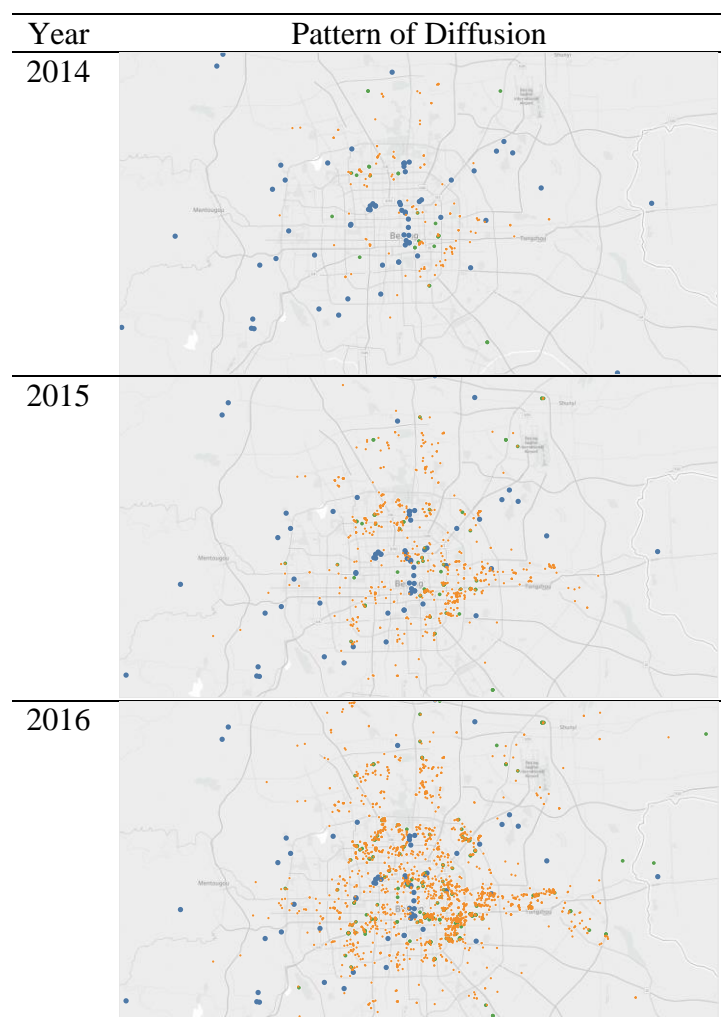
Notes. Robust standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 8** Effect of Accommodation-sharing Entry: Moderation of Ownership Structure.

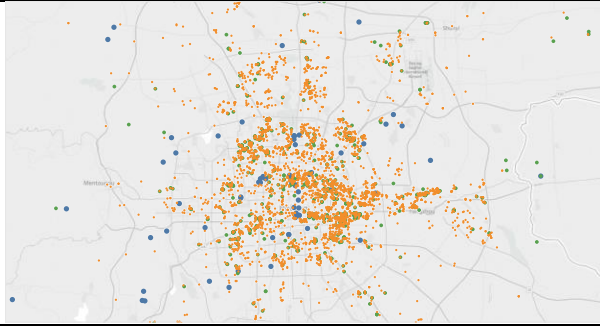
D.V.: <i>LogReviews</i>	(1) OLS	(2) Fixed-effects	(3) OLS	(4) Fixed-effects
<i>Entered<sub>i</sub></i>	0.225*** (0.086)		0.184** (0.080)	
<i>Entered<sub>i</sub> × After<sub>it</sub></i>	0.679*** (0.060)	0.499*** (0.090)	0.669*** (0.058)	0.320*** (0.088)
<i>Entered<sub>i</sub> × After<sub>it</sub> × ComRatio<sub>it</sub></i>	-1.225*** (0.189)	-1.567*** (0.254)	-1.044*** (0.178)	-1.113*** (0.227)
<i>CumReviews<sub>it-1</sub></i>	0.001*** (0.000)	0.002** (0.001)	0.001*** (0.000)	0.001 (0.001)
<i>AvgRating<sub>it-1</sub></i>	0.311*** (0.022)	0.278*** (0.018)	0.362*** (0.034)	0.034 (0.028)
Observations	4,121	4,121	4,121	4,121
R-squared	0.117	0.366	0.264	0.528
Attraction fixed-effects	NO	YES	NO	YES
Month fixed-effects	NO	NO	YES	YES

Notes. Robust standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

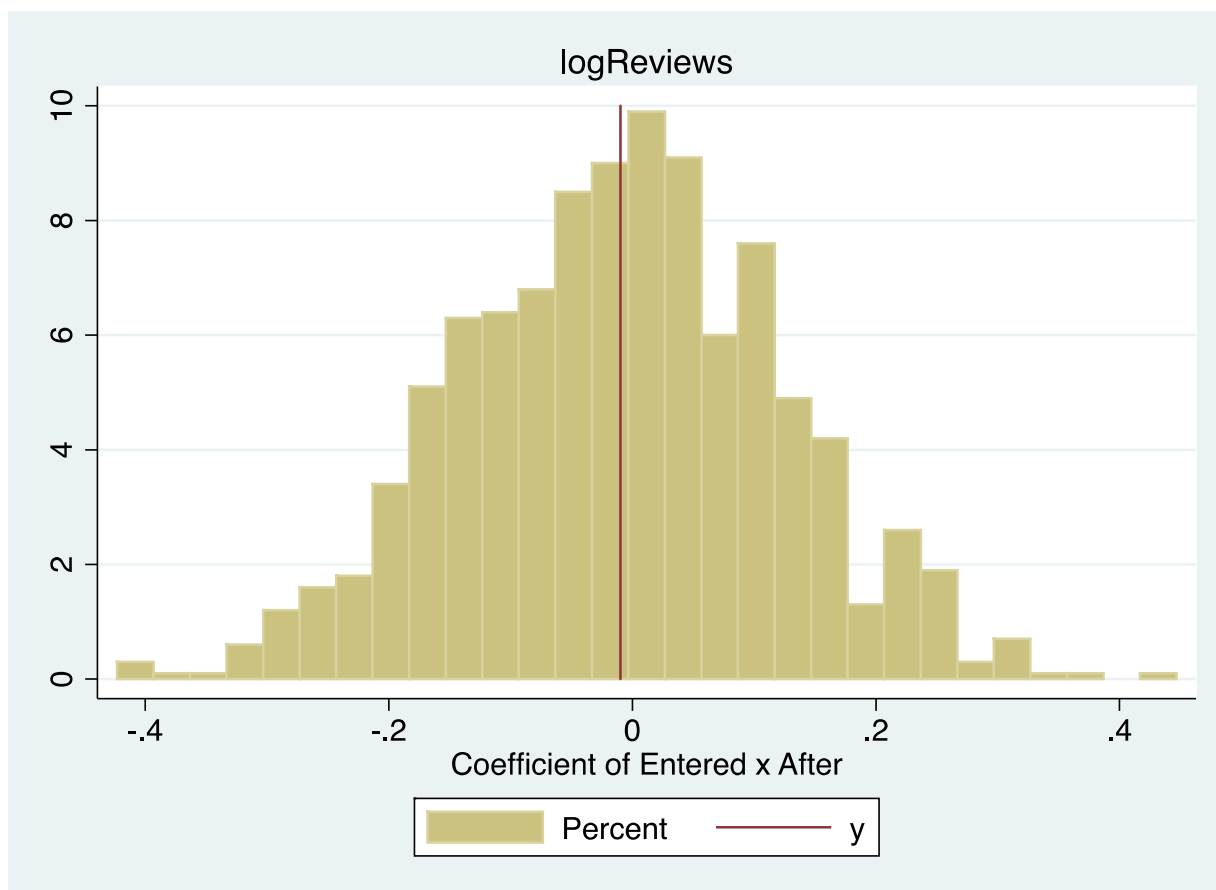
Proximity	Spatial ↑ Organisational	<b>Regional innovation models</b> (Asheim & Isaksen, 1997) Interactive innovation is facilitated by the positive externalities of geographical proximity and territorial agglomeration.	<b>Spatial spillover effect on tourism market shares</b> (Drakos & Kutan, 2003) The cross-country spillover effects (positive and negative substitution) of terrorism in one country on the market share of its competitors are evident and different.
		<b>Knowledge spillovers and importance of proximity for new entrants</b> (Alcacer & Chung, 2007) To maximise spillover, heterogeneous strategies for location decisions should be considered. These include ensuring proximity to certain potential spillover sources (e.g., academic innovation activity) and protecting one's competitive advantage by moving far from competitors.	<b>Spillover effect of tourism flows</b> (Yang & Wong, 2012) Differences in spillover effects of domestic/overseas flows amongst tourist destination cities.
		<b>Knowledge/innovation spillovers in tourism clusters (attractions)</b> (Weidenfeld, Williams, & Butler, 2010) In terms of tourist attractions, spatial proximity and product/market similarity facilitate knowledge and innovation spillovers.	<b>Positive spillover effect of attractions</b> (Zhou, Yang, Li, & Qu, 2017) Beyond the spatial substitution effects, the positive spillover effects of attractions on the destination and surrounding regions are demonstrated to underpin attraction-based interregional cooperation.
		<b>Diffusion process of new technologies</b> (Baptista, 2000) In terms of the diffusion of new technology in the industry, externalities are stronger when resulting from localised networking.	<b>Spillovers of international tourism demand</b> (Assaf, Li, Song & Tsionas, 2019) A key economic variable in one destination generates spillover effects on the tourism demand and other variables in neighbouring countries.
		<b>Positive knowledge spillover among lodging firms</b> (Zhang, Xiao, Gursoy, & Rao, 2015) Tacit knowledge spillover not only leads to hospitality firm agglomeration but also contributes to sustainable destination development.	<b>Externalities in economic activities, space and network</b> (Bergman & Schubert, 2005) In terms of innovation networks/clusters, spillovers within an industrial cluster refer to a positive-sum game. Therefore, once spillovers occur, the benefits accrue to the cluster and neighbouring cluster firms.
			<b>Spillovers of hotel productivities in different environments and time frames</b> (Yang & Mao, 2018) Productivity spillovers of foreign-invested hotels in China's hotel industry are identified; however, these positive spillovers decline over time due to possible crowding-out effects.
		Abstract/Circumstantial	Concrete/Consequential
Spillovers			



2017



**Figure 2** The Diffusion of Accommodation Sharing (Orange dots) in Beijing Against Tourist Attractions (Blue Dots).



**Figure 3** A Placebo Test with Bootstrapping.