### "To book or not to book": Exploring the determinants of successful Airbnb bookings across multiple geographies

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- \* Introduction
- \* Literature review
- \* Research gaps
- \* Objectives of the study
- \* Conceptual framework
- \* Data
- Empirical modeling
- \* Results
- \* Conclusion



## Introduction

- rentals; for example, online platforms such as Airbnb, VRBO, and HomeAway have pioneered the use of shared accommodations.
- through "co-created value" in the form of brand identity, pre-defined set of amenities, and trust that peer-to-peer shared homes lack.
- destination selection, impact on tourism employment, and user behaviour and experiences.

\* The sharing economy phenomenon, also called collaborative consumption, involves the activities of sharing, or renting surplus or idle capacity of products and services offered by individuals within a peer-to-peer network or community, in exchange of payments or some alternative services.

\* The sharing economy has rapidly grown in the recent past, especially in the tourism and hospitality sectors, mostly for short-term shared-home

\* Each Airbnb home is unique in feature (in terms of host profile, exact location, neighbourhood, variance in price per night, accommodation capacity of guests, amenities offered, and reviews received from previous guests). In contrast, conventional hotels offer reputational features

\* Existing academic research on Airbnb has examined pricing prediction and strategy, impact on the hotel industry, impact on room rents,



## Literature

- \* Belk, (2014) and Jiang and Tian, (2018): defined sharing economy as a peer-to-peer (P2P) activity of offering, sharing, or acquiring access to products and services that is often facilitated by a community-based digital platform.
- In recent years, the sharing economy has rapidly grown in the tourism and hospitality sectors, especially for short-term home rentals, Gansky, (2010), and Sundararajan, (2013).
- \* Many scholars have examined the effectiveness of user-generated content (UGC) (such as product reviews) on the sellers' online sales in ecommerce, **Mudambi and Schuff, (2010),** and **Salehan and Kim, (2016).**
- \* Liang et al., (2020) opined that in addition to UGC, Marketer-generated content (MGC) is also very important when studying the factors that encourage online sales (or booking in this place).
- It becomes the responsibility of both parties to enable successful value co-creation during consumption of these collaborative services.
   (Ramaswamy and Ozcan, 2018).
- \* Efficient reputation and trust-building mechanisms installed in Airbnb include the superhost feature, Liang et al. (2017), profile photos, Ert, and Fleischer, (2016); Fagerstrøm et al. (2017), verified host identity, Tussyadiah (2016), and membership duration on the platform Xie and Mao, (2017); Xu, (2019).
- \* Wang and Nicolau (2017) reported heterogeneity effects of pricing determinants for Airbnb properties across different cities. We have thus studied in depth the determinants of successful Airbnb bookings across different geographies.



# Layout of an Airbnb listing page

| Type of place   | Price Instant Book                                      | More filters      | Price Instant B          |
|---|---|-------------------|--------------------------|
| Entire p<br>Have a  | place   |                   | The average nigh         |
| Private<br>Have yo<br>spaces                                    | room<br>our own room and share some                     | common            |                          |
| Hotel ro<br>Have a<br>hotel, h                                  | private or shared room in a bou<br>ostel, and more      | Jtique            | \$ 10                    |
|   |   |                   |                          |
| Small d<br>Fulham   | ouble/single r  | oom in            | TR                       |
| London  |   | MGC               | MGC                      |
| <ul> <li>Private roo</li> <li>2 guests</li> </ul>               | n in townhouse  | ed bathroom       |                          |
| <ul> <li>Sylvan is a Superhosts</li> <li>providing g</li> </ul> | are experienced, highly rated<br>reat stays for guests. | hosts who are con | n <mark>mitted to</mark> |
|   |   |                   |                          |
| Sparkling c     10 recent g                                     | <b>lean</b><br>Jests said this place was sparl          | kling clean. UGC  |                          |



## Research gaps

The current literature lacks a detailed examination of the predictors that lead to successful reservations for these shared-homes. Further, incumbent machine-learning models (Wang and Nicolau, 2017; Chattopadhyay and Mitra, 2019; Biswas et al., 2020; Xu, 2020) ignore the effect of previously unbooked shared-homes while travellers search for lodgings. Additionally, current studies overlook the presence of geography-specific features that influence these important predictors.





#### We seek answers to the following research questions:

- rental listings?

### Objectives

1. What are the major determinants of successful bookings on Airbnb shared-

2. How do these determinants vary across different geographies of the world?



# Conceptual framework

|               | Space Description   |
|---------------|---|
| _             | Textual Sum   |
| L<br>Sj<br>Sj | ength of Space<br>pace Positive Sentim<br>pace Negative Sentin              |
|               |   |
|               | Superhost<br>Profile Photo<br>Membership<br>Response Time<br>Multiple Prope |
|               | Locati  |
|               | Exact Location<br>Social Neighbourho  |
|               | Star R<br>Star Ratin  |
| N             | eighbourhood Differ   |
|               | F   |
| A<br>Fa       | ccommodation capac<br>acilities   |
|               | <b>Booking H</b><br>Instant Booking   |
|               | Review S  |
|               | Cleanliness Scor<br>Communication<br>Value for Money                        |



## Choice of variables

| S. No. | Variable                                | Brief Description   | Literature Source                       |
|--------|---|---|---|
| 1      | Length of Space Description             | Count of words used in space to describe Airbnb listing (Numeric)   | Zhang et al., 2018a; Liang et al., 2020 |
| 2      | Positive Sentiment of Space Description | Positive sentiment content of home Space description (Numeric)      | Ma et al. (2018)                        |
| 3      | Negative Sentiment of Space Description | Negative sentiment content of home Space description (Numeric)      | Ma et al. (2018)                        |
| 4      | Is Superhost                            | Being a super host (Binary)   | Liang et al. (2017); Gunter (2018)      |
| 5      | Profile Photo                           | Presence of host's profile photo on Airbnb listing details (Binary) | Ert et al. (2016)                       |
| 6      | Membership                              | The duration of years spent by the host on Airbnb (Numeric)         | Self-developed for this study           |
| 7      | Response Time                           | How soon the host responds to queries (Categorical)                 | Developed from Liang et al. (2020)      |
| 8      | Total Listings                          | Count of total homes owned by the host (Numeric)                    | Liang et al. (2017); Xie and Mao (2017) |
| 9      | Exact Location                          | Location is Exact (Binary)  | Self-developed for this study           |
| 11     | Stars                                   | Average star rating (out of 5) assigned to Airbnb listing (Numeric) | Martin-Fuentes et al. (2018)            |
| 12     | Price Difference                        | The difference from the median price in a neighbourhood (Numeric)   | Self-developed for this study           |



## Choice of variables (contd.)

| <b>S. No.</b> | Variable               | Brief Description  | Literature Source              |
|---------------|------------------------|--|--------------------------------|
| 13            | Accommodation Capacity | Number of people that can be accommodated in the Airbnb listing (Numeric)          | Liang et al. (2017)            |
| 14            | Facilities             | Number of unique amenities offered at the Airbnb listing (Numeric)                 | Chattopadhyay and Mitra (2019) |
| 15            | Instant Booking        | Whether the Airbnb listing allows instant booking (Binary)                         | Wang and Nicolau (2017)        |
| 16            | Cleanliness            | Avg. rating (out of 5) for cleanliness given by guests (Numeric)                   | Ju et al. (2019)               |
| 17            | Communication          | Avg. rating (out of 5) for communication given by guests (Numeric)                 | Xu (2020)                      |
| 18            | Value for Money        | Avg. ratings (out of 5) for value-for-money set by guests (Numeric)                | Ju et al. (2019)               |
|               | Dependent variable     |  |                                |
| 19            | Count of Bookings      | Proxied by the number of customer reviews received by the Airbnb listing (Numeric) | Xu (2020); Liang et al. (2020) |





sources publicly available information from the Airbnb website.

- cities in the four continents (Europe, Australia, Asia-Pacific, and North America).
- \* We also found that a significant number of listings did not receive any bookings at all.

## )ata

\* We collected the data for shared-home rentals for this study from <u>http://insideairbnb.com/</u>, a third-party open-access website that

\* Our study consisted of the shared-homes listed on Airbnb and active between October 2009 and September 2020 across the twenty

## Data details

|              | City              | No. of Listings | Non-booked Listings | Date Compiled    |
|--------------|-------------------|-----------------|---------------------|------------------|
| Europe       | Amsterdam         | 18,782          | 2,291               | 09 October, 2020 |
|              | Athens            | 9,455           | 2,184               | 25 October, 2020 |
|              | Barcelona         | 19,896          | 5,878               | 12 October, 2020 |
|              | Copenhagen        | 8,528           | 2,301               | 27 October, 2020 |
|              | Dublin            | 7,965           | 1,448               | 19 October, 2020 |
|              | Geneva            | 1,979           | 446                 | 27 October, 2020 |
| Australia    | Melbourne         | 20,007          | 4,465               | 11 October, 2020 |
|              | Sydney            | 34,276          | 9,610               | 11 October, 2020 |
|              | Tasmania          | 4,818           | 360                 | 07 October, 2020 |
|              | Western Australia | 9,257           | 2,035               | 26 October, 2020 |
| Asia Pacific | Beijing           | 27,439          | 12,455              | 26 October, 2020 |
|              | Hong Kong         | 7,209           | 3,232               | 25 October, 2020 |
|              | Shanghai          | 35,572          | 16,602              | 26 October, 2020 |
|              | Tokyo             | 11,715          | 2,396               | 27 October, 2020 |
| USA          | Austin            | 10,305          | 2,687               | 19 October, 2020 |
|              | Boston            | 3,254           | 891                 | 24 October, 2020 |
|              | Chicago           | 6,295           | 1,141               | 24 October, 2020 |
|              | Hawaii            | 21,523          | 5,498               | 19 October, 2020 |
|              | New York          | 44,666          | 10,518              | 05 October, 2020 |
|              | Seattle           | 4,335           | 827                 | 25 October, 2020 |



homes" (Asia-Pacific)

Figure 1: Density plots for "Count of customer reviews received by Airbnb

# Empirical model

- \*\*
- \* form:

#### log

- An alternative modelling is thought of to take care of over-dispersion in the data; this is done by using Hurdle models. \*\*
- •

$$P(Y_{i} = y_{i}) = \begin{cases} w_{0} & , y_{i} = 0\\ (1 - w_{0})\frac{e^{-\lambda_{i}\lambda_{i}y_{i}}}{(1 - e^{-\lambda_{i}})y_{i}!} & , y_{i} > 0 \end{cases}$$
where  $0 < w_{0} < 1$  and  $w_{0} = w_{0}(z_{i})$  satisfy  $logit(w_{0}) = log(\frac{w_{0}}{1 - w_{0}}) = \sum_{j=1}^{m} z_{ij}\delta_{j}$ 
and  $z_{i} = (z_{i1} = 1, z_{i2}, ..., z_{im})$  is the *i*<sup>th</sup> row of the covariate matrix Z and  $\delta = (\delta_{1}, \delta_{2}, ..., \delta_{m})$  are unknow.  
The value of  $\lambda_{i}$  is most commonly parametrized using a log-linear model of the following form:  $(\lambda_{i})$  model, and *m* is the number of the independent variables.

The underlying assumption is that the count of consumer reviews have a Poisson incidence rate  $\gamma_i$ , which is parametrized by a set of k regressors (the X-s). The number of successful bookings for the  $i^{th}$  Airbnb home be  $y_i$  such that  $y_i$  follows a Poisson distribution with mean  $\mu_i$ ,  $y_i \sim Po(\mu_i)$  and is given by the functional

$$_{e}(\mu_{i}) = \beta_{i0} + \beta_{i1}X_{i1} + \beta_{i2}X_{i2} + \dots + \beta_{in}X_{in}$$

We consider a hurdle-at-zero Poisson Regression model in which the response variable  $Y_i$  (i = 1, ..., m) has the distribution given by the function below:  $, y_i = 0$ 

n *m*-dimensional column vector of parameters.

=  $\sum x_{ij}\beta_j \cdot \beta'_j$  s are the independent variables in the regression j=1





Figure 3: Top ten predictors using Hurdle Negative Binomial for Airbnb Europe

## Results







## Conclusions

- Airbnb home across all geographies.
- continents.
- \* *Star ratings* positively affect room-reservations for all geographies.
- neighbourhood median price.
- a consistently negative effect on the subsequent Airbnb reservations.
- on the Airbnb peer-to-peer platform across all geographies.

\* This study recognized the prominence of the following predictors to explain the count of successful bookings at Airbnb shared-homes across the four continents: space description and textual summary, host, location, star ratings, price difference, home, booking policy, and review scores from guests.

\* Among space description and textual summary attributes, length of space description is significant, while there is a minimal influence of sentiments for any

\* Among *host-based* predictors, *superhost badge* and *response-time* are the strongest influencers, while the effect of *host profile-photo* is not strong across all

\* We find a strong "price-stickiness" effect among the Asia-Pacific cities that cause bookings to decrease when the *price per night* deviates too much from the

\* Cities that have many business visitors are strongly affected by *instant booking option*, while other cities are not much affected. Accommodation capacity has

\* Guest review scores reveal that good communication and quick response to the queries posted by potential guests can strongly motivate successful reservations





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