

## MODELLING HOTEL RANKING MOBILITY

*José-Luis Ximénez-de-Sandoval*

The American College in Spain  
jose Luis.xs@uma.es

*Antonio Fernández-Morales*

*Antonio Guevara-Plaza*

Universidad de Málaga  
afdez@uma.es, guevara@uma.es

### INTRODUCTION

Despite the revolution that companies such as TripAdvisor or Booking have brought to the tourism sector, the study of the mobility of these famous hotel rankings, that is, the analysis of the evolution of the positions that the establishments occupy in the classification over time, has received very little attention in the scientific literature.

Without questioning the honesty and rigor of those who design and manage these rankings, given their recognized lack of transparency and the growing influence they exert in the hotel industry, it is surprising that up until now there is any kind of supervision or control by public or private institutions over them, auditing and verifying their proper functioning. For all these reasons, we believe that it is a researcher's duty, to try to find out how these rankings work, and to detect and warn about possible inefficiencies or anomalies in their behavior.

This research paper wants to shed light on the functioning of hotel rankings, analyzing the mobility of the TripAdvisor hotel ranking.

### RANKING MOBILITY

The implications that the greater or lesser mobility of the ranking may have for the different agents involved are worthy of consideration, showing a wide range of important positive and negative consequences for the tourism industry.

For example, in cities with little mobility, hotels remain in the same (or similar) positions over time, and therefore establishments located at the top of the ranking will continue with high probability in the same area in the coming months or years. Likewise, those located in the middle and lower zones will also remain in those areas of the ranking

in the future. Therefore, it would not make sense to relate the position in the ranking (and its unlikely improvement) with staff incentives and remuneration policies in the short or medium term.

For customers, a ranking with little mobility facilitates the decision making process. If the hotel of your interest has always been in the same positions week by week, month by month, this will give you a certain sense of security, and will help you to opt for that establishment that has been among the bests hotels over a long period.

## METHODOLOGY AND DATA

We define the Individual Trajectory of an establishment as the sequence of the different positions it has occupied in the classification over a period of time. Each individual trajectory can then be represented mathematically through a vector that we will call Individual Trajectory Vector ( $\mathbf{m}$ ) of dimension T, where each of the elements ( $m_i$ ) that make up the vector can take values between 1 and Q, where T is the number of observations that are included in the study for each hotel, and Q the number of zones (quantiles) in which the ranking will be divided.

$$\mathbf{m} = (m_1 \ m_2 \ m_3 \ \dots \ m_T)$$

From the data collected in the path vector we can define a series of variables that will help us to know the behavior of a hotel over time, and ultimately measure its degree of mobility. The variables that we have defined are related to the number of ranking areas in which the hotel or restaurant has been during the studied period ( $IP_1$ ), the number of runs observed in its trajectory ( $IP_2$ ), the difference between the first and the last element of the vector trajectory ( $IP_3$ ), and the difference between the largest and smallest element of the trajectory vector. ( $IP_4$ ).

The present study analyzes the quarterly evolution over a one year period (from June 2015 to June 2016) of the TripAdvisor Hotel Rankings of the six largest Spanish cities by number of inhabitants, which are also the only ones that exceed the barrier of 500,000 inhabitants (Madrid, Barcelona, Valencia, Seville, Zaragoza and Malaga). Once the information was processed, trajectory vectors were obtained for a sample of 771 establishments, showing five positions in the ranking for each hotel (June, September and December 2015 and March and June 2016).

The rankings have been divided into deciles ( $Q = 10$ ). The value  $Q = 1$  corresponds to the highest area, where the best positions are found, while  $Q = 10$ , refers to the lowest area where the worst ranked establishments are located.

## RESULTS

Regarding the  $IP_1$  gauge, 79% of hotels that in June 2015 were in the highest zone of the ranking, have not moved from that area during the whole year. In general, most hotels have been placed in two areas of the ranking (52.79%). The number of establishments in the sample that have remained in the same area (33.20%) is considerable. The number

of hotels that have moved four or five different deciles (1.69%) is almost insignificant and these would correspond to hotels with a high degree of mobility. On average, hotels have moved 1.82 deciles during the study period, a value that shows a very low level of mobility.

Regarding the  $IP_2$  indicator, the hotels present an average of 2.13 runs during the study period, a value that once again indicates a very low level of mobility.

The  $IP_3$  indicator shows us that 49.50% of the hotels have not modified their position in the ranking between the initial and final period. A large majority of establishments (88.07%) have modified their position in the ranking between the initial and final period by just one decile. The average value of this variable in absolute value is certainly low (0.683 deciles), evidencing very low levels of mobility.

Finally, when analyzing the  $IP_4$  indicator, very little mobility is also observed. 33.20% of the hotels have not varied their position in the ranking between the maximum and the lowest decile.

For the 83.26% of the hotels in the sample, the distance between the maximum and minimum point was only one decile. The average value of this variable, as in the previous gauges, is very low (0.91 deciles).

## CONCLUSIONS

Among the contributions of this work, we would like to highlight, firstly, that this study introduces a new line of research in tourism that has hardly been explored to date, focusing on the study of hotel (and restaurant) ranking mobility, mainly on the renowned rankings of TripAdvisor and Booking.

Secondly, we have presented the main concepts and definitions to lay the foundations for future studies in this new field. Thus, the concepts of ranking have been defined, distinguishing between solid and liquid rankings, and defining ranking mobility, from a macro and micro perspective, and also introducing the concept of trajectory vector.

Thirdly, we have created a model to quantify mobility and analyze its evolution over time. For this purpose, four partial mobility indicators were defined to quantify several aspects of ranking mobility: variability ( $IP_1$ ), runs ( $IP_2$ ), distance first-last status ( $IP_3$ ) and maximum-minimum distance ( $IP_4$ ). All these indicators have been calculated for a sample of 771 hotels in the six largest Spanish cities by number of inhabitants (Madrid, Barcelona, Valencia, Seville, Zaragoza and Malaga).

All the analyzed variables from the trajectories of the hotels indicate a very low degree of mobility. In short, the mobility of the rankings exists, although no one had measured it until now. We have done it for the first time, and the results show that it is very low. What we have not wanted to do is to judge it, that is, to consider it as a positive or negative characteristic in itself. We will always find in a city some groups interested in solid rankings. But in the same city we will also find other groups interested in the ranking being liquid. Hence, we have addressed mobility as a very complex concept, with innumerable pros and cons for the different agents involved in the hospitality industry. Ranking mobility will be both positive for some and negative for others.

Finally, and because this is an introductory investigation, we would like to invite young researchers, and experts in tourism to participate in this new challenge to bring light to these instruments; the rankings, which have reached an influence that was unimaginable only a few years ago.