Research Article

An Empirical Investigation on the Association Among Tourists and Japanese Tourism Destinations

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ARTICLE INFO

ABSTRACT

Currently, Japan is facing serious headwinds from declining birthrates as well as an aging society, and their economic consequences are widely known. Among many possible strategies to address the aging and shrinking population, the revitalizing the local economy in each prefecture become more prominent with an emphasis on spurring tourism. To shed light on this issue, this manuscript focuses on determining empirically the interrelationship between tourists and tourism destination characteristics using regression modelling. More specifically, the inter-linkages among tourists and tourism destinations are conducted by developing a 4-cell model. The results find support for the importance of the development of public traffic among different tourism destinations as a promising economic revitalization strategy.

1. Introduction

Japan is in the midst of confronting the economic consequences resulting from the dual problems of declining birthrates and an aging population. The declining population from low birthrates, and an aging labor force, many commercial problems may cause headwinds for its national economy and society-at-large. Thus, it is pivotal that strategies be implemented to revitalize commercial activities in local communities, which will contribute to the development of the overall Japanese economy. Recently, tourism, in particular, has been identified as an important sector for revitalizing regional cities in all prefectures that could contribute to economic growth approaches. Consequently, if the relationship between tourism and the number of tourists can be determined, it will be possible to allocate resources to spur tourism as a driving force towards

regional revitalization. This research makes a contribution to the literature by developing and empirically testing an innovative 4-cell model, which investigates the impact of strategies for increasing the number of tourists to tourism destinations.

This paper is organized as follows: In Section 2 the relevant literature is reviewed. Section 3, develops and explicates the four-cell model and its associated research hypotheses. Section 4 discusses the antecedents of successful tourism, while Section 5 analyzes and explicates the relationship between the four-cell model and the distance between touristic destinations. In the final section, managerial implications and conclusions are discussed.

2. Background

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Table 1. The planning and control characteristics in different prefectures.

	Hokkaido	Aomori	Iwate	Miyagi	Akita	Wakayama	Tottori	Shimane	Okayama	Hiroshima	Yamaguchi	Ehime	Miyazaki
Nature	1	2	1	1	3	1	2	4	1	2	1	4	1
History and culture	1	2	4	2	2	1	1	1	2	1	1	4	1
Hot spring and healthcare	1	3	1	2	3	2	2	3	3	1	4	4	4
Sports	1	1	3	2	3	3	3	3	2	1	1	1	2
Urban tourism	1	1	4	1	1	1	3	3	4	2	1	4	1
Event	1	2	1	2	1	1	4	1	1	1	4	3	3
Others	1	1	1	2	1	1	1	1	1	1	1	1	2

Many countries are primarily dependent on tourism. As such, they develop special schemes to foster tourism—as suggested by the plethora of literature published on Japanese tourism. For instance, using SNS data, Kudo et al. proposed a new method of event collection for tourist information distribution to foreign tourists [1]. Aihara analyzed tourist behavior and sentiments using big data [2] whereas Okamura and Fukushige's study emphasized the importance of promoting repeater tourists in Kansai area [3]. Butler presented a concept of a recognizable cycle on the evolution of tourist areas and explained the continuing decline in the environment quality and the attractiveness of many tourist areas using a basic S curve [4]. Accordingly, to counteract the deleterious effect the aging and declining population will have on the Japanese economy, the role of promoting tourism has taken on greater importance in becoming the most effective economic development strategy with a special focus on revitalization of regional tourism destinations in each prefecture in Japan. However, studies that identify the determinants of tourism and the effects of tourists' promotion strategies are scant. To provide more practical guidance for the development of tourism in Japan, this paper proposes a 4-cell model that investigates the interrelationships among tourists and tourism destinations using a regression analysis. Moreover, it seeks to find support for placing importance on the development of public traffic among different tourism destinations.

3. Four-cell model and 4 Hypotheses

It is crucial to observe and evaluate changes in the number of tourists and touristic destinations in chronological order. Accordingly, the linkage between the change in the number of tourists and different tourism characteristics is ascertained using the proposed 4-cell model on 13 Japanese prefectures. The longitudinal, data on 7 types of tourism features reported in Table 1 was drawn over a period of 7 years [5], [6]. By employing this procedure, it is possible to collectively express and compare fluctuations in the number of tourists and the number of tourist facilities—as depicted in Figure 1. The horizontal and vertical axis indicate the change of the number of tourism destinations, and the increase or decrease in the number of tourists, respectively.

Based on the 4-cell model, positioning was performed for each quadrant by assigning weights to different characteristics, which was used as an index indicating the tourism strategies for each prefecture. Based on the positioning, research hypotheses for each quadrant were proposed as follows:

H1. If it belongs to the first quadrant, the tourism industry can be considered successful.

H2. If it belongs to the second quadrant, tourism is also successful, albeit less.

H3. If it belongs to the third quadrant, tourism is declining.

H4. If it belongs to the fourth quadrant, tourism has failed.

With respect to Hypothesis 1, both the number of tourists and the number of tourism destinations are increasing, and is considered a desirable tourist attraction; thus, a weight of 4 is given to the first quadrant. For Hypothesis 2, the number of tourism attractions is decreasing despite of the increasing in the number of tourists suggesting that the number of visitors revisit the
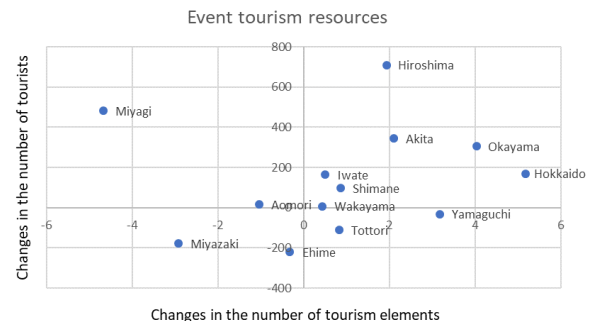

Figure 1. Results of 4-cell model

tourist spots as they do not venture to discover new tourism areas. Therefore, a weight of 3 is given to the second quadrant. With regard to hypothesis 3, both number of tourist spots and the number of tourists is decreasing, and it is possible that they are entering a period of decline. Accordingly, a weight of 2 is given to the third quadrant. Relative to hypothesis 4, the number of tourists is decreasing despite of the increase in the number of tourism attractions, thus indicating that there is a mismatch in supply and demand do not match. Therefore, a weight of 1 is assigned to the fourth quadrant as the desired tourism attraction has not been achieved. The findings for each prefecture and different tourism characteristics are depicted in Table1.

Figure 2 exhibits the evaluation index for calculating the tourism attraction status for each prefecture by summarizing the tourism elements belonging to each quadrant by considering the weight of each quadrant.
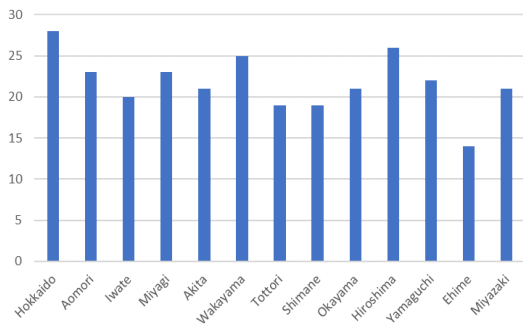

Figure 2. Evaluation index of the selected prefecture.

4. Determinants of successful tourism

The successful factors representing the best two prefectures and the least attractive two prefectures depicted in the 4-cell model. To identify the salient factors involved in attracting tourists, the study focused on the time required to move between tourism destinations. It is highly unlikely that tourists will visit tourism destinations considering only one characteristic. It is more likely that they will visit several tourism destinations in the prefecture. Therefore, based upon the accessibility index proposed by the Ministry of Land, Infrastructure, Transport and Tourism [7], [8], the travel time between different tourism destinations was compared with tourism trends of typical prefectures.

Next, famous tourism destinations were selected from Jaran Net [9] to ascertain whether it is possible to access different tourism destinations from nearby tourism attractions and the approximate travel time among these destinations. If public transportation was used, travel time was ascertained by rail. If not, the travel time by automobile was measured. The travel time between tourist spots is summarized in a matrix format in Tables 2 and 3 for railways and highways in the four prefectures, respectively.

The evaluation travel time is calculated by the following formula.

$$\text{Evaluation value of travel time} = \frac{\text{Travel time required}}{\text{Area of each prefecture}} \quad (1)$$

Equation (1) shows that evaluation value of travel time is calculated as a ratio between travel time required and the area of each prefecture. The reason why evaluation value of travel time should be divided by area of different prefecture is the area of each prefecture is different. For comparative study among different prefecture, a relative index is required.

The evaluation value of travel time of all prefectures has been calculated. Hokkaido, Hiroshima, Shimane, and Ehime as the typical examples of the best and the worst prefectures have been selected. Tables 2 and 3 show a list of evaluation value of travel times for railways and highways in the four prefectures, respectively.

Table 2. Evaluation value of average travel time for railroad (min/km^2).

Hokkaido	Hiroshima	Shimane	Ehime
0.0027	0.0104	0.0146	0.0268

Table 3. Evaluation value of average travel time for highway (min/ km^2).

Hokkaido	Hiroshima	Shimane	Ehime
0.0021	0.0074	0.0107	0.0104

5. Analysis of the relationship between the four-cell model and the distance between tourist spots

In comparing these results with the tourist attraction evaluation index specified in the 4-cell model, the travel time per unit area of kilometers tends to be short in Hokkaido and Hiroshima prefectures, while in the Shimane and Ehime prefectures are considerably

lengthier and more time consuming. On the other hand, the travel time per unit area of Hokkaido and Hiroshima prefectures was shorter even when using an automobile, but in Shimane and Ehime, the result was inverse by rail. As revealed by the findings illustrated in Figure 3, blue represents the value obtained by dividing the moving average time when using railways, while gray represents the value obtained by dividing the moving average time by area. The value of evaluation in the 4-cell model, and it is desirable, thus assigning a high value is represented by orange. As is evident from Figure 3, an inversely proportional relationship between the evaluation value and the distance between tourist spots is found with a correlation coefficient of -0.959, which indicates it is highly correlated with the number of tourists attracted to tourism destinations. However, relative to travel time, a positive result was obtained.
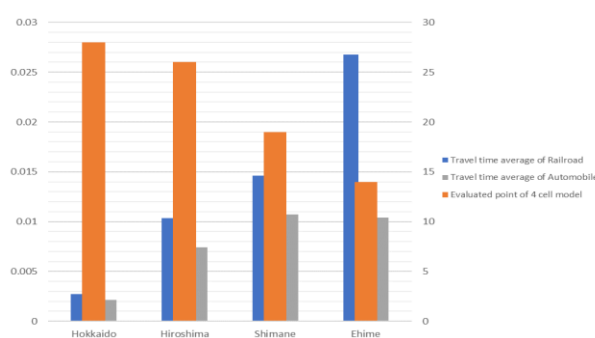

Figure 3. Relationship between evaluation value and distance between tourist spots.

6. Conclusion

This empirical research investigation attempted to identify the salient factors for promoting tourism in 13 Japanese prefectures such that appropriate provision of tourism resources will lead to regional revitalization in the age of declining population and aging population. This paper proposed a method to clarify the linkage between the number of tourists and tourism destinations. In study confirmed that it is difficult to ascertain the factors that affect the number of tourists by rudimentary contrasting the number of tourists and the number of restaurants in each attraction vicinity. Therefore, this study proposed a novel procedure for evaluating the tendency of attracting tourists by identifying the factors of attracting tourists in Japan with the 4-cell model.

Furthermore, the development status of the transportation network of the 4-cell model and the local indication itself confirmed that there is a high correlation among the development status of public transportation and the index obtained by the proposed method. This result indicates that the development of public transportation that connects tourist spots is one of the factors for the success of developing tourism in different prefectures. Accordingly, these findings should be considered in future research efforts for planning tourism policy.

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