Discovering the relationship between tourists and tourist spots in Japan

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Abstract

It is widely well-known that Japan currently faces serious problems with the declining birthrate and aging society. As actions to counteract our aging and shrinking population, revitalization of local economy is becoming the most effective economic development strategy. Obviously, tourism is considered as one of the effective policies to develop local economy today. To provide more practical evidence of tourism development, this paper is focusing on discovering the relationship between tourists and tourist spots using conventional regression model and 4-cell model developed on tourists and tourist spots. Moreover, as one of the successful factors, the importance of the development of public traffic among different tourist spots has been confirmed.

Keywords: Regional revitalization, tourist spot, tourism resource, travel time, four-cell model.

1. Introduction

Currently, Japan is facing the problems of declining birthrate and aging population. As population decline, low birthrate, and aging of the labor force, the economic activities will be discontinued which will cause many difficult issues for national economy and society. Thus, it is an important issue to revitalize local communities today obviously. In recent years, tourism has become one of the important policies for revitalization of regional cities and makes contribution to economic growth strategies if tourism is actively promoted. It will be easy to accurately provide tourism resources for regional revitalization if the relationship between tourism and the number of tourists clarified. This paper makes contribution to develop a new 4-cell model to measure the efforts to increase the number of tourists. And the validity of 4-cell model has been tested. Furthermore, we confirmed that to develop public traffic among different tourist spots could be considered as one of the important success factors for tourists increasing.

This paper is structured as follows: Section 2 reviewed typical literature of this research. In Section 3, the paper explicates four-cell model and associated hypotheses. Section 4 introduced the determinants of successful tourism. Analysis and discussion of the relationship between the four-cell cell and the distance between tourist spots is carried out in Section 5. The conclusions

and managerial implications are proffered in the final section.

2. Background

Obviously, tourism is considered as one of the effective policies to develop local economy today. A plethora of literature have been published over past decades. Kudo et al. once proposed a new method of event collection for tourist information distribution to foreign tourists using SNS data [1]. Aihara analyzed tourist's behavior and thoughts using big data [2]. Moreover, Okamura and Fukushige stressed the importance of repeater tourists, and conducted an empirical analysis on how to promote repeater tourists in Kansai area [3]. Butler presented a concept of a recognizable cycle in the evolution of tourist areas and explained the issue of continuing decline in the environment quality and the attractiveness of many tourist areas using a basic s curve [4]. Accordingly, as actions to counteract our aging and shrinking population, tourism is becoming the most effective economic development strategy, especially revitalization of regional areas today. However, the research of analyzing the determinants of tourism, and evaluating the results of tourists' promotion policy are still sparse. To provide more practical evidence of tourism development, this paper is focusing on discovering the relationship between tourists and tourist spots using conventional regression model and 4-cell model based on the relationship between tourists and tourism spots. Furthermore, as one of the successful factors, the importance of the development of public traffic among different tourist spots has been confirmed.

3. Four-cell model and 4 Hypotheses

It is crucial to observe and evaluate changes in the number of tourists and tourist spots in chronological order. Accordingly, the relationship between the change of the number of tourists and the number of tourist elements are calculated. A 4-cell model proposed in this paper is targeted at 13 prefectures in Japan, and data on customers increasing for 7 types of tourism elements is collected for 7 years, while the number of 7 types of tourism elements maintained in each of the 13 prefectures is used [5-6]. By using this, it becomes possible to collectively express and compare fluctuations in the number of tourists and the number of tourist facilities. An example is shown in Figure 1.

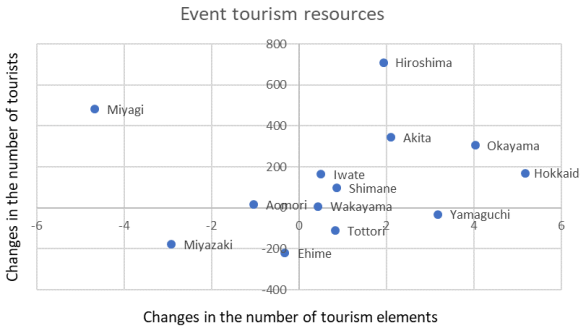

Figure 1. Calculation result of 4-cell model for event.

The horizontal axis and the vertical axis are designed for indicating the change of the number of tourist spots, and the increase or decrease of the number of tourists respectively.

Based on the 4-cell model, positioning is performed for each quadrant with building hypotheses for each quadrant and giving weighting factors, which is used as an index showing the tourism policy of each prefecture. The hypotheses are shown below.

H1. If it belongs to the first quadrant, it is successful as a tourism industry.

H2. If it belongs to the second quadrant, you can call it repeater.

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

H4. If it belongs to the fourth quadrant, it failed as a tourism industry.

Table 1. The planning and control components.

	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
Hotspring 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

Regarding Hypothesis 1, both the number of tourists and the number of tourist spots are increasing, and it is considered that the most desirable tourist attraction has been achieved, thus a weight of 4 is given to the first quadrant. For Hypothesis 2, the number of tourist spots is decreasing despite of the increasing in the number of tourists. It is suggested that from the references that the number of repeaters is involved in the number of tourists, and it is considered that the efforts of tourists who do not seek new tourist spots have been successful. Therefore, a weight of 3 is given to the second quadrant. Regarding 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, thus a weight of 2 is given to the third quadrant. Regarding Hypothesis 4, the number of tourists is decreasing despite of the increase in the number of tourist spots, indicating that supply and demand do not match with each other. This gives a weight of 1 to the fourth quadrant because it is considered that the desired tourism attraction has not been achieved. The result is shown in Table1.

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

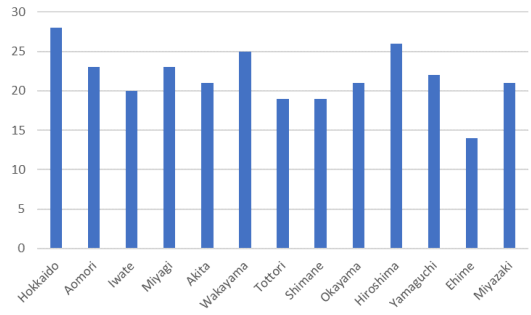

Figure 2. Evaluation index of the selected prefecture.

4. Determinants of successful tourism

We will examine the successful factors by representing the best two prefectures and the worst two prefectures that are considered to have succeeded in attracting tourism with the 4-cell model. To verify what factors are involved in attracting tourists, we focused on the time required to move between tourist spots. It is unlikely that tourists will visit their spots only for one factor. It is more likely that they will visit several tourist spots in the prefecture. Therefore, based upon the accessibility index proposed by the Ministry of Land, Infrastructure, Transport and Tourism [7-8], we calculated the evaluation travel time based on the travel time between tourist spots and compared it with the tourism trends of typical prefectures.

We selected famous tourist spots from Jaran Net [9] to check whether it is possible to access tourist spots from tourist spots, and when it is possible for travel time among tourist spots. If you use public transportation, use public transportation as a railroad. If not, the travel time as a car was measured respectively. The travel time between tourist spots is summarized in a matrix format.

The evaluation travel time is calculated by the following formula.

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

Tables 2 and 3 show a list of evaluation travel times for railways and highways in the four prefectures, respectively.

Table 2. Railroad evaluation Travel time average (min/km^2).

Hokkaido	Hiroshima	Shimane	Ehime
0.0027	0.0104	0.0146	0.0268

Table 3. Highway evaluation Travel time average (min/ km^2).

Hokkaido	Hiroshima	Shimane	Ehime
0.0021	0.0074	0.0107	0.0104

5. Analysis of the relationship between the 4-cell model and the distance between tourist spots

Comparing these calculation results with the tourist attraction evaluation index evaluated by the 4-cell model, the travel time per unit area of kilometers tends to be short in Hokkaido and Hiroshima prefectures, and Shimane and Ehime are moving. It was confirmed that it is time consuming. On the other hand, it is confirmed that the travel time per unit area of Hokkaido and Hiroshima was short even when using a car, but in Shimane and Ehime, the result was reversed in the case of railroads. The results are shown in Figure 3.

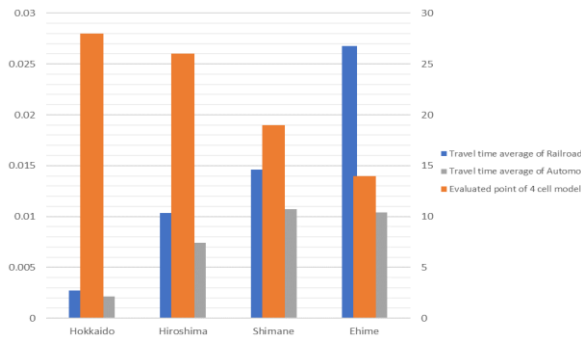

Figure 3. Relationship between evaluation value and distance between tourist spots.

In Figure 3, blue represents the value obtained by dividing the moving average time when using a railway and gray represents the value obtained by dividing the moving average time by the area. Orange represents the value of evaluation in the 4-cell model, and it is desirable that the value is high. From Fig. 3, there is an inversely proportional relationship between the evaluation value and the distance between tourist spots, and the correlation coefficient is -0.959, which is highly correlated with the number of tourists attracted between tourist spots. It was able to obtain a relationship with travel time.

6. Conclusion

This paper aimed at clarifying the factors of tourism and customers increasing to promote the accurate provision of tourism resources that will lead to regional revitalization in the age of declining population and aging population. We proposed a method to clarify the above purpose and verified its effectiveness. In the process of verification, it is confirmed that it is difficult to find out the factors which affect the number of tourists by a simple comparison between the number of tourists and the number of restaurants in the vicinity. Therefore, we proposed a new method to evaluate the tendency of attracting tourists by summarizing the factors of attracting tourists in Japan with the 4-cell model. Furthermore, we investigated the development status of the transportation network of the 4-cell model and the local indication itself and confirmed that there was a high correlation between the development status of public transportation and the index obtained by the proposed method. This result shows that the development of public transportation that connects tourist spots is one of the factors for the success of developing local tourism, and it is considered as development direction for future tourism policy planning.

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