

# The characteristics of accommodations in the early period of tourism development: The case of Okinawa

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## ABSTRACT

### Keywords:

Early period of tourism destination,  
Regression model,  
Principal component analysis,  
Island development,  
Okinawa,  
History of Japanese economy.

This paper aims at demonstrating the characteristics of the accommodations in the early period of the tourism development and determining the relationships between these characteristics and the price before it became a well-developed tourism destination focusing on Okinawa, Japan. Before Okinawa was returned to Japan, tourism markets were limited due to political reasons, though, tourism industries were developed and became a popular tourism site after the return of Okinawa. First, this paper conducted a principal component analysis (PCA) to identify the characteristics of the tourism accommodations. Two characteristics were obtained: one is for the characteristics of Western style hotels, the other is for Japanese-style accommodations which feature in traditional Japanese style rooms. Then a regression model was carried out to estimate the relationships between the price of accommodations and the characteristics obtained from the PCA. The estimation model showed that the characteristics of the Western style hotels more strongly influenced to the price, compared with those of the Japanese-style accommodations. Further, regional dummy variables were added to the model, which showed the price differences of accommodations between the cities and peripheral areas. Based on these results, Western style facilities were found to be more expensive before tourism development took off, and they were limited only in the part of areas in Okinawa.

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## 1. Introduction

Economic activities are generally limited in island regions because of their geographical characteristics, such as smallness, remoteness, or their nature environment (Briguglio, 1995). In Japan, small islands are spread all over the nation. Tourism is likely to be one of the significant industries in the most of islands, and many of islands in Japan are also applicable for this typical pattern.

Okinawa is located in the southern part of Japan and is one of the representative regions of this pattern. In 1972, Okinawa was returned to Japan by the U.S. government, which prompted tourism development. Since then, Okinawa's tourism development has been growing and the patterns of development was almost typical cases as tourism lifecycle development (Butler, 1980). Previous papers focused on the process of development in Okinawa to consider the change in the tourism market (Matsuhaka, 1995, Miyagi 2010). Their discussion points focused on the process of the development and considered the present situations. Meanwhile, the early period of development was inadequately discussed from a statistical perspective, particularly the regional differences in the tourism destinations.

This paper considers the early periods of tourism development in Okinawa and discusses the characteristics of the accommodations. In some previous works, they have considered the social situations using a qualitative approach although descriptive data was indicated (Kakazu, 2011; Perez, 2013). Meanwhile, the statistical approach such as multivariate analysis was less examined in those works. Besides, perspectives were basically focused on the prefectural level in previous works. However, Nguyen (2017) demonstrated the pattern of the development such as the transportations and resort with the spatial approach and found the process of the development from the mainland to outer islands. Hence, this study discusses the regional differences between the urban and periphery areas of Okinawa. This perspective could be significant to deepening the understanding of the mechanism of tourism development, especially in island regions where tourism is significant for the society and economy.

## 2. Literature Review

Okinawa is a prefecture that owns many of the island regions in Japan. Owing to this regional characteristic, tourism has been one of the most significant industries for its regional economics. Hence, previous works focused on Okinawa considered the perspectives of tourism. For

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example, Umemura (2005) used the gravity model to discuss tourism demand in Okinawa from the perspective of economics. His study showed that tourism demand in Okinawa came more from regions near Tokyo rather than the metropolitan areas, such as Osaka and Nagoya. Owing to this market bias, the difference between the actual value and theoretical value of the statistical model was considered.

Meanwhile, other previous studies analyzed the process and effect of tourism development. For example, Kakazu (2011) discussed the sustainable tourism from the island economic perspectives. Perez (2013) also considered the tourism in Okinawa with the descriptive approach and showed the development process. Sugita and Mizoo (1998) discussed the effect of air transport on tourism in Okinawa. They explained the effect of factors such as low air fare, advertising campaigns, and hotel investments by air transport companies on tourism development in Okinawa. They also pointed out that the International Ocean Exposition, an event that took place in 1975, is the turning point of tourism development in Okinawa. Furthermore, Miyagi (2010) applied a tourism area life cycle approach and divided the development process into five phases. Miyagi's (2010) paper mainly discussed the hotel industry in the context of tourism development. A significant period for the development of the hotel industry was around the time the International Ocean Exposition took place in 1975. From these studies, it can be observed that the 1970s was an important decade for tourism development in Okinawa, and the International Ocean Exposition in 1975 was the turning point.

In the 1970s, amid economic development, the tourism market began to open up for the Japanese, although the younger generation still faced regulations for international travel (Takahashi, 2021). However, compared to international tourism destinations, the island regions in Japan were more popular as tourist destinations among the young generations. Miyagi (2009) explained that the island boom in tourism destinations occurred from the late 60s among the young generations. It was regarded that islands in Tokyo, such as the Izu islands, attracted younger tourists because of their sites for outdoor activities like camping, sea bathing, or surfing (Konno et al., 1972; Ochiai et al., 1982). With the improvement in transportation systems from the 1970s to the 1980s, the island boom then spread to other island regions, and Okinawa was one of the representative destinations in this movement. Therefore, tourism industries in Okinawa also have since grown (Nguyen, 2017).

This paper focuses on the characteristics of accommodations in Okinawa soon after it was returned to Japan since it is crucial to consider tourism during this period in the tourism history of Okinawa. Although the statistical approach is taken advantageous for discussing the characteristics in this study, previous papers that focused on the characteristics of the accommodation

industry employed hedonic approaches to discuss the relationships between the price and characteristics of the accommodations such as location, room size. Espinet et al., (2003) analyzed the data of holiday hotels in Spain and revealed that hotel rank, locations, and facilities such as parking affected the hotel price. Furthermore, Chen and Rothschild (2010) focused on a hotel in Taipei and revealed that the price was lower in the city center compared to outside the cities because of the resort development in the suburb of Taipei and the competition among hotels in the city.

Although previous studies discussed the development process through modern situations, research on a cross-sectional perspective on the factors that prompted the development remains limited. Focusing on the early situations of tourism development would be significant for demonstrating the situation of a specific stage in the tourism area life cycle process, that is, the situation before capital investments flowed in from the mainland.

### 3. Methodology

In the 1960s to 1970s, tourism industries were still immature in Okinawa. Therefore, regional differences existed between urban areas such as Naha and Koza in the mainland, and rural areas such as Yaeyama and Miyako in the southern island regions. To demonstrate such regional differences, this paper carried out a principal component analysis (PCA) to examine the characteristics of the accommodations using principal component loading. Besides, this paper utilises principal component scores obtained from the PCA model to compare the differences among the regions.

Second, this paper also composed a regression model to discuss the relationships between the price of the accommodations and the characteristics obtained from the results of the PCA. Using a hedonic approach, the model equations were composed with the price of the accommodations as the response variable, and the characteristics and attributes data as the explanatory variables. In hedonic approach, the equations were often shown as the function forms such as below.

$$p = f(z_1, z_2, \dots, z_i) \dots (1)$$

Where "p" shows the price vectors of the products, and "z1, z2, ..., zi" shows the attributes vector of the products. This study focused on the accommodations. Therefore, price shows the price of accommodations while attributes would be the characteristics of the accommodations. Equations 1 changes to the regression model with the logarithm to estimate the relationships between price and attributes as below.

$$\log(p) = a_0 + a_1z_1 + a_2z_2 + \dots + a_iz_i + e_i \dots (2)$$

Where "a" is coefficients and "e" shows the error terms of the model. In this study, principal component analysis is carried out to analyze the characteristics of the

**Table 1 List of Variables**

Variables	Definition
Price	Price of the Accommodations. The original data shows high and low price in each of accommodations. Median values were calculated for the response variable for estimation model.
Western Style Room	The number of the Western style rooms. Unit is the rooms
Japanese Style Room	The number of the Japanese style rooms. Unit is the rooms
The Capacity of Western Style Room	The capacity of the Western style rooms. Unit is people
The Capacity of Japanese Style Room	The capacity of the Japanese style rooms. Unit is people
Restaurant	Dummy variables of the restaurant. Yes=1, No=0
Parking lot	Dummy Variables of the parking lot. Yes=1, No=0

Source: Tourism Survey of Okinawa (1973)

accommodations. Hence, the principal component scores were used as the explanatory variables.

The data set is shown in Table 1. The data were collected from Kanko Yoran (tourism survey of Okinawa Prefecture) published in 1973. These data included the size of the Western and Japanese-style rooms, facilities (e.g. parking lot and restaurants), and the high and low prices of the accommodations in 1972. For the PCA, variables such as the size of both Western and Japanese-style rooms, facilities such as the parking lot and restraint, were used. Although the price of the accommodations was used as the response variables in the regression model, some indicated both high and low values while others showed either one. In this study, the median values were calculated to compose the model and were used for the response.

#### 4. Results

##### Principal component analysis

**Table 2 Result of Principal Component Analysis**

Variables	PC1	PC2
Western Style Room	0.88	-0.19
Japanese Style Room	0.1	0.86
The Capacity of Western Style Room	0.79	-0.26
The Capacity of Japanese Style Room	0.42	0.79
Restaurant	0.78	-0.07
Parking lot	0.8	0.01
Eigen Value	2.85	1.47
Contribution Ratio	0.47	0.24
Cumulative Contribution Ratio	0.47	0.72

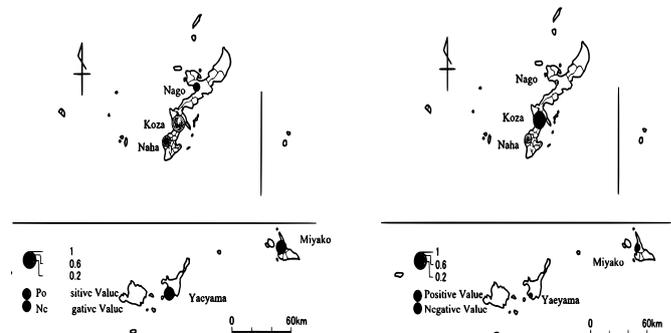
Source: The results calculated by using tourism survey of Okinawa (1973)

Table 2 shows the results of the PCA. Two principal components were obtained using the criteria, which is a value more than 1.00 for the eigenvalue generally used to determine the number of principal components. Cumulative contribution ratio was 0.72, which indicates that two principal components explained almost 72% in all of the principal components. Hence, this paper chose the principal components until the second components.

In the first principal component loading, the variables shown in the category of the Western style rooms, such as ‘number of Western style rooms’ and ‘capacity of Western

style room’, indicated the high values. Moreover, the variables shown in the category of the facilities, such as the restaurant and parking, also indicated similar values to those of the category of Western style rooms. From these results, the first principal components, ‘PC1’, were structured by the variables of Western style rooms and the extra facilities, such as the restaurant and parking lot. Thus, PC1 was interpreted as the components of Western style hotels. Meanwhile, the variables ‘number of Japanese-style rooms’ and ‘capacity of Japanese-style rooms’ indicated the high values for the second principal component loadings. Hence, the second principal components, ‘PC2’, were interpreted as the Japanese-style accommodations.

**Figure 1: Mean of the principal component scores among the cities.**



Note: Left is for principal score of PC1, Right is for principal score of PC2

Source: The results calculated by using tourism survey of Okinawa (1973)

To consider the regional differences, this paper compares the principal component scores among the cities. In 1972, accommodations just existed in five cities: Naha, Koza, Nago, Miyako, and Yaeyama. Naha, Koza, and Nago were located in the mainland, while the others were in different islands. Figure 1 shows the mean of the principal component scores in each of the cities. Koza and Naha obtained higher principal component scores of PC1 mainly constructed by the variables of the Western style hotels. Although Naha is the capital city of Okinawa, Koza, which became an Okinawan city in 1974, was also one of the larger cities in the prefecture. After the war, U.S. military bases were constructed in Okinawa, and Koza is one of the

centre places of them. While tourists from Japan were the main target, tourists from the U.S. have also visited Okinawa, especially Koza, because of its location environment. Hence, the average principal component scores of PC1 showed a higher value in Koza compared to Naha. Meanwhile, the PC2 obtained a comparatively higher average principal component scores in Naha. In contrast, the other cities showed lower scores. Furthermore, Koza showed a negative value, which is the opposite result of the scores of PC1.

From the results of the PCA, the characteristics of the accommodations were divided into two: Western style accommodation equipped with some facilities and Japanese-style accommodation. Moreover, the regional differences of the accommodations existed among the cities. Naha is the capital city of Okinawa, where both Western and Japanese-style accommodations were located. Besides, Koza, where a huge U.S. military base was located, obtained a positive score for the first principal component, while the score of the second principal component was negative. Hence, Western style hotels was the more dominant form of accommodation in this city. Meanwhile, it seems that regional differences on the aggregation of the accommodations existed among the cities in Okinawa.

**Regression Model**

Table 3 shows the results of the regression model, which was used with the principal component scores obtained through the PCA to show the characteristics of the accommodations as the explanatory variables. Meanwhile, the response variables were those of the price of the accommodations calculated by the median values since some indicated both high and low prices, while others showed only a high or low price.

**Table 3: Result of the Regression Model**

	Model 1		Model 2	
(Intercept)	7,798	***	7,919	***
	(0.026)		(0.048)	
PC1	0,414	***	0,352	***
	(0.023)		(0.031)	
PC2	-0,049	**	-0,05	**
	(0.023)		(0.025)	
Koza			-0,029	
			(0.072)	
Nago			-0,18	**
			(0.085)	
Miyako			-0,176	**
			(0.084)	
Yaeyama			-0,285	***
			(0.087)	
F-stat	130,7	***	49,35	***
R <sup>2</sup>	0,617		0,6431	
N	162		162	

Note: Standard errors shown in parentheses. Significance Level \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: The results calculated by using tourism survey of Okinawa (1973)

This study carried out two estimation models. In model 1, the variables of the principal component scores were only used for the explanatory variables, while the dummy variables along with the cities were added to model 2. First, the coefficients of PC1 and PC2 were statistically significant in both models. PC1 shows the characteristics of Western style hotels, and PC2 is for the characteristics of Japanese-style accommodations. The coefficients of PC1 showed higher values than those of PC2, which showed negative values. These results indicate that accommodations that were equipped with the Western style were likely to be priced higher compared with the Japanese-style accommodations.

The dummy variables were added into the regression model along with the cities. To avoid multicollinearity, this paper excluded the variable of Naha. For this treatment, the coefficients were interpreted as the differences between the price of Naha and that of other cities. The results showed that all coefficients had negative values, and they were significant for all of the dummy variables without Koza. The price of the accommodations was higher in Naha compared with other cities, excluding Koza. All in all, these results showed that the high-priced hotels were aggregated in urban areas in Okinawa, such as Naha and Koza. The peripheral area and remote islands only had a few accommodations, and price differences existed between the urban and peripheral areas.

**5. Discussion**

By PCA, the characteristics of the accommodations were integrated into two principal components. This paper interpreted the Western style hotels and Japanese-style accommodations for each component. In 1972, Okinawa had not yet developed into a tourism destination, and resort hotels, especially those capitalised from outside the region, were limited. In fact, based on the comparison of the principal component scores, accommodations characterised by the Western style were found in Naha and Koza cities. Meanwhile, Japanese-style accommodations were fewer in all of cities but Naha, and the other cities such as Nago, Yaeyama, Miyako were fewer in this moment. According to Miyagi (2010), many hotels began construction after the International Ocean Exposition in 1975, and many of them were aggregated in the cities in the southern part of the mainland, such as in Naha. Hence, regional differences between the tourism destinations existed, and areas such as the northern peripheral area and remote islands from the mainland, remained undeveloped during this period. The result of the PCA reflects this situation.

This paper carried out a regression model to estimate the effect of accommodation price as a hedonic approach. The result showed that the component of Western style hotels more strongly affected price compared to that of the Japanese-style accommodations. From this result, it can be said that the Western style hotels were more luxurious than the Japanese-style ones during this period. In the 1970s, the

tourism market in Japan was still immature, and the available accommodations were simple, unlike in the modern times wherein the types of facilities are diversified. Thus, the results showed that the characteristics of the Western style hotels more strongly affected the price of accommodations.

In addition, dummy variables along with the cities showed the differences between the urban and peripheral areas in the remote islands. This result suggests that tourism development only began in parts of the cities of Naha and Koza, where many of the Western style hotels were located. Meanwhile, the peripheral areas and remote islands from the mainland were still less developed. This result contradicts the case of Taipei, where well-developed resorts are located outside of the city (Chen et al., 2010). In Okinawa, many accommodations were constructed in all the regions, including remote areas, after the International Ocean Exposition in Okinawa through investments from outside firms, such as air transportation companies. Although previous study focused on the modern days, the difference in the result could be due to the degree of development of the tourism destination. In the case of Okinawa, tourism facilities were only aggregated in the urban areas before tourism development began.

## **6. Conclusion**

This paper aims at showing the characteristics of the accommodations in the early period of the tourism development and determining the relationships between these characteristics and the price before it became a well-developed tourism destination focusing on Okinawa, Japan. First, principal component analysis was carried out to determine the characteristics of the accommodations during this period. Two components were captured from the results: Western style hotels, and Japanese-style accommodations. Furthermore, the principal component scores were used to compare the regional differences of the characteristics. The Western style hotels were aggregated in cities such as Naha and Koza, which were located in the southern part of the Okinawa mainland, while they were few in other cities located in the northern part and remote islands. Meanwhile, Japanese-style accommodations were aggregated in Naha, while few could be found in Koza, in which a U.S. military base was located. This finding indicates that Naha and Koza were main tourism sites at the beginning of the period of tourism development as the accommodations were aggregated in these locations; however, the characteristics of the accommodations differed. Western style hotels dominated Koza, while both styles could be found in Naha. Meanwhile, the other cities were less developed as tourism destinations, and the accommodations were fewer compared to the Naha and Koza located in the southern part of the mainland in Okinawa.

In addition, a regression model was composed to analyze the relationships between the price of accommodations and the accommodation characteristics estimated by the PCA.

The result shows that Western style hotels had a higher coefficient for price compared to that of the Japanese-style accommodations. Western style hotels were more expensive than Japanese-style accommodations in Okinawa during this period. Moreover, the dummy variables that indicated the differences among the cities show that the accommodations in the peripheral areas were lower priced than those in Naha and Koza, where many accommodations were located. Therefore, the Western style hotels were considered as more luxurious, and were only found in the part of areas before the tourism development started.

Although Okinawa has developed as a tourism destination at present, its degree of development was limited in the early period of tourism development. This paper found that tourism development started from the main area in the early period, and the price was higher in the main area than peripheral areas. Meanwhile, this paper couldn't compare the different period because of the data limitations. As Nguyen (2017) revealed, Okinawa underwent drastic development and spread to the several islands, as well as main islands. Therefore, it would be difficult to show the data such as the price in official statistics.

However, the result was significant for tourism developing studies since the pattern of the development is different in each of the regions along with their characteristics. In practical perspectives, the method of tourism development was no correct answer. Therefore, the empirical studies would be needed with historical data, as well as the modern data.

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### Abstract

*This paper aims at demonstrating the characteristics of the accommodations in the early period of the tourism development and determining the relationships between these characteristics and the price before it became a well-developed tourism destination focusing on Okinawa, Japan. Before Okinawa was returned to Japan, tourism markets were limited due to political reasons, though, tourism industries were developed and became a popular tourism site after the return of Okinawa. First, this paper conducted a principal component analysis (PCA) to identify the characteristics of the tourism accommodations. Two characteristics were obtained: one is for the characteristics of Western style hotels, the other is for Japanese-style accommodations which feature in traditional Japanese style rooms. Then a regression model was carried out to estimate the relationships between the price of accommodations and the characteristics obtained from the PCA. The estimation model showed that the characteristics of the Western style hotels more strongly influenced to the price, compared with those of the Japanese-style accommodations. Further, regional dummy variables were added to the model, which showed the price differences of accommodations between the cities and peripheral areas. Based on these results, Western style facilities were found to be more expensive before tourism development took off, and they were limited only in the part of areas in Okinawa.*

**Keywords:** *Early period of tourism destination, Regression model, Principal component analysis, Island development, Okinawa, History of Japanese economy*

### Authors

Full Name	Author contribution roles	Contribution rate
<b>Kantaro Takahashi:</b>	<i>Conceptualism, Methodology, Software, Validation, Formal Analysis, Investigation, Resources, Data Curation, Writing - Original Draft, Writing - Review &amp; Editing, Visualization, Supervision, Project administration, Funding acquisition</i>	100%

**Author statement:** *Author(s) declare(s) that All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. **Declaration of Conflicting Interests:** The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article*

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