A Determinants Analysis of the Michinoeki in Japan

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Abstract: - This paper examines determinants of Michinoeki, roadside rest station in English, in Japan. The Michinoeki with 27years history is a well-known typical successful model for revitalization of regional economy now. To our best knowledge, academic studies about Michinoeki have not been published yet. The authors have collected the data set in Kyushu Island, and investigated the history, status quo of Michinoeki. Based on data-set, the relationship between two explained variable: sales and number of the purchasers visited, and 11 determinants: Square meters of land space (SMLS), number of the visited cars (NVC), number of the visited large-size cars and trucks (NVLSCT), square meters of parking area (SMPA), total number of the restroom (TNR), square meters of free rest place (SMFRP), seats of the free rest space (SFRS), weekdays' traffic near the station (WTNS), holidays' traffic near the station (HTNS), population of the city located (PCL); total expenses including maintenance cost (TEIMC) have been analyzed using regression model. The contributions of this paper are: 1) introduce the framework of the Michinoeki, 2) collect the dataset and test seven hypotheses to clarify the determinants, and 3) discuss the managerial implication of the Michinoeki.

Key-Words: - Michinoeki (Road-side rest station), SMLS, NVC, NVLSCT, revitalization of regional economy

1 Introduction

The main object of Abenomics is regional revitalization. How to activate regional economy is becoming a crucial issue of the Japanese government. Many trial and error such as value-chain of the natural food and market of the local brew are considered as the successful examples of the regional revitalization [1]. Recently Michinoeki, roadside rest station, is becoming one of the new commercial areas to contribute the development of the regional economies.

To our best knowledge, only a few academic studies about Michinoeki have been published [2-4]. The contributions of this paper are: 1) introduce the framework of the Michinoeki, 2) collect the dataset and test seven hypotheses to clarify the determinants, and 3) discuss the managerial implication of the Michinoeki.

This paper is structured as follows. Section 2 introduces the history of the Michinoeki and its background. In section 3, the paper explicates data collection and the calculation of regression model using specific internal and external variables. Section 4 shows the results and discusses our findings based on regional comparisons and determinants analysis. The conclusion and directions for further research are proffered in the final section.

2 Background

Many researchers recognized the importance of region in innovation ecosystem. Storper once stressed that regions are keystones of the global economic organization just as firms, sectors and nations do. Regions are the places where traded and untraded relationships develop in order to innovate [5]. Cooke and Morgan indicated that the ability of a region to cope with competitiveness challenges increasingly depends on the extent of collaboration

between its firms, and the ability of regional governments in supporting such collaboration [6].

Michinoeki roadside rest station for those driving car and/or truck to delivery is a special case as a successful model of innovative ecosystem. These stations are developed under the support of residents, farms, and local government. They locate along national highways and provide free parking space, restrooms, and regional and tourist information for car drivers and travelers. Therefore, Michinoeki is a specific area with three functions: providing rest space for visitors, spreading information, and alliance with regional society. Now Disaster prevention is becoming an important factor of Michinoeki after the Tsunami happened on 3.11 in Fukushima. The new concept originally proposed by Mr. Sakamoto, President of Funagata Firm in Yamaguchi, in 1990. The total number reaches 1,107 in Japan in January 2017.

3 Variables Selection and Model Building

According to the conventional theory of corporate strategy, internal resources and external environment of firms are considered as two important fields in strategy formation. Based on the resource-based view, the internal resources should be analyzed from value, Rarity, Inimitability, and Organization (VRIO) [7, 8]. Rarity could be the selection and display of goods, inimitability could be location and scale. In addition, the hierarchy and the team is the characteristics of the organization. In this paper, we selected seven variables as the internal resources and four variables as external environment. Square meters of land space (SMLS), number of the visited cars (NVC), number of the visited large-size cars and trucks (NVLSCT), square meters of parking area (SMPA), total number of the restroom (TNR), square meters of free rest place (SMFRP), are included in the internal resources. In addition, seats of the free rest space (SFRS), weekdays' traffic near the station (WTNS), holidays' traffic near the station (HTNS), population of the city located (PCL); total expenses including maintenance cost (TEIMC) are selected as external environment. Thus, we will have following equation:

$$y = a_1 SMLS + a_2 NVC + a_3 NVLSCT + a_4 SMPA + a_5 TNR + a_6 SMFRP + a_7 SFRS + a_8 WTNS + a_9 HTNS + a_{10} PCL + a_{11} TEIMC + \varepsilon \quad (1)$$

where

•SMLS: square meters of land space
•NVC: number of the visited cars
•NVLSCT: number of the visited large-size cars and trucks
•SMPA: square meters of parking area
•TNR: total number of the restroom
•SMFRP: square meters of free rest place
•SFRS: seats of the free rest space
•WTNS: weekdays' traffic near the Michinoeki
•HTNS: holidays' traffic near the Michinoeki
•PCL: population of the city located
•TEIMC: total expenses including maintenance cost
•ε: error term

All the data are collected from headquarter of the Michinoeki.

4 Hypotheses

The SMLS is defined as the size of the land space including houses and gardens. It is one of the indexes to express the scale of the Michinoeki. The NVC means the number of the car visited, and the NVLSCT is a special term referred to the large-size car and trucks visited the Michinoeki during the investigation year. The reason why the lar-size car and truck visit Michinoeki is that the drivers of the trucks want to have a space for rest, and the passengers of the sightseeing bus not only want to have space to rest but also want to buy far products such as vegetables and fruits. Those two indexes have close relationship with square meters of parking area (SMPA) total number of the restrooms (TNR), and square meters of free rest places (SMFPR) which contribute sales of the Michinoeki. Therefore, we suggest the following hypotheses regarding internal resources:

H1. *The SMLS will have strong impact on sales and/or the number of purchasers.*
H2. *The more NVC and NVLSCT, the higher sales and/or the number of purchasers.*
H3. B*y changing the SMPA and TNR, we will increasing sales and/or the number of purchasers.*
H4. *SMFRP and SFRS will have positive impacts on sales and/or the number of purchasers.*

The WTNS and the HTNS express the weekdays' traffic and holidays' traffic near the station respectively. As external variables of the Michinoeki, the population around Michinoeki is also considered as the important factor of its sales. Furthermore, the total expenses including maintenance cost is the important variable for its sustainability and survival. Therefore, following hypotheses hold:

H5. *The WTNS and HTNS will have strong impact on sales and/or the number of purchasers.*

Table 1. Regression Results of the regression models of sales and number of the purchasers.

	Models			
	Sales		Number of the Purchasers	
	Standardized coefficient	Probability	Standardized coefficient	Probability
SMLS	-0.1411*	0.0764	-0.2153**	0.0077
NVC	0.6526**	0	0.6231**	0
NVLSCT	0.1209	0.1638	0.1178	0.1766
SMPA	0.0994	0.1667	0.1034	0.1523
TNR	-0.1564	0.067	-0.063	0.4589
SMFRP	0.141*	0.0489	0.0265	0.7099
SFRS	0.0876	0.204	0.1479*	0.0341
WTNS	-0.2585	0.0819	-0.1181	0.4256
HTNS	0.4768**	0.0017	0.353*	0.0195
PCL	-0.0349	0.6072	-0.0407	0.5506
TEIMC	-0.1056	0.2229	-0.0473	0.5859
Intercept	0	0.6364	0	0.4937
Coefficient of determination		0.63958		0.63660
multiple correlation coefficient		0.79974		0.79787
Adjusted R-square		0.77292		0.77076
Data number		106		106
AIC		1425.03		2771.94
DW ratio		1.8504		1.7271

Note: ** p<0.01, * p<0.05.

H6. The more PCL, the higher sales and/or the number of purchasers.
H7. *By changing the TEIMC, we will increasing sales and/or the number of purchasers.*

5 Results and Discussions

We first calculate the relationship between the 11 variables and Sales and Number of the purchasers, and determine the significant variables using stepwise backward selection method. Moreover, we compare different regions, and common characteristic of all areas.

5.1 Sales and the number of Purchasers

The results of Sales and Number of the purchasers are shown in Table 1.

We iterated the experiments using stepwise backward selection method in order to find the significant variables. The results of the sales and the number of purchases are as Fig.1.

Results of the two models are similar. The value of SMLS is significant with negative value, while NVC and WTNS are significant with positive value in Fig. 1. Based on Fig. 1, H2 and H5 hold, but H1 does not hold because SMLS shows negative relationship with sales and the number of purchasers. The differences between sales and the number of purchasers are: 1) the value of NVLSV, SMFRP

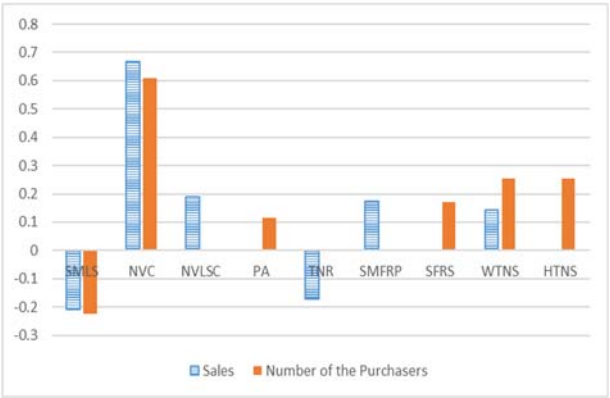

Fig. 1. Determinants of Sales and Number of the Purchasers.

have positive impact, but TNR has negative impact on sales while the value SMPA, SFRS and HTNS have strong positive impact on the number of purchasers. Therefore, H2 and H4 holds for sales, H3, H4 and H5 hold for the number of purchasers. One of the most interesting things is the value of SMLS for sales and the number of purchasers and TNR for sales are negative. Much more discussions are required.

5.2 Area Analysis

Arear analysis is an important approach to find the common and unique characteristics of different areas. Fig. 2 illustrates the results of Fukuoka and Miyazaki.

The determination coefficients of Fukuoka and Miyazaki are 0.99and 0.84 respectively. H2 hold because the values of NVC and NVLSCT are positive. It means that the number of cars and large-size cars or trucks contribute the sales of Michinoeki in Fukuoka and Miyazaki both. The WTNS are significant with negative values, and the value of

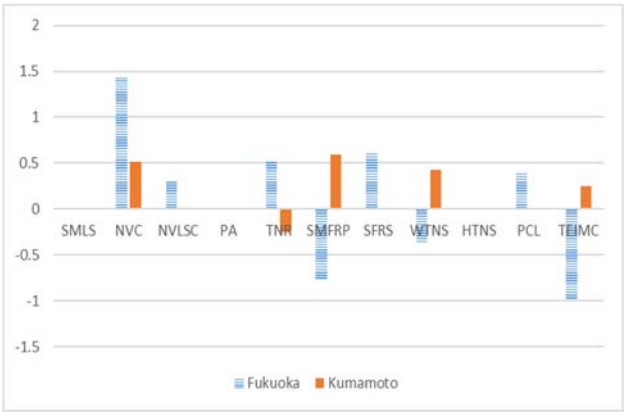

Fig. 2. Determinants of Fukuoka and Miyazaki.

HTNS is positive in Miyazaki. Most of the drivers and passengers buy something on holidays, take a rest or just do window-shopping during weekdays. Compared with Miyazaki, the value of TNR, SERS and PCL are negative significantly. It means that not only the tourists, but also the local residents buy something even their purpose is just take a rest. Therefore, Michinoeki in Fukuoka are for tourists and local residents while the Michinoeki in Miyazaki are for tourists. The values of TEIMC are negative significantly. It means that it is a task how to use the maintenance fee effectively.

The determination coefficient is 0.85 in Kumamoto. The determinants of Fukuoka and Kumamoto are shown as Fig 3.

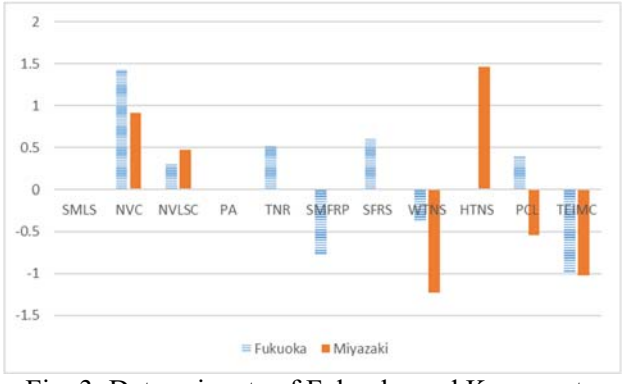

Fig. 3. Determinants of Fukuoka and Kumamoto.

The values of NVC, SMERO, WTNS, and TEIMC are positive. Then H2, H3, H4, H5 and H7 hold. The value of TNR is negative. It means there are enough restroom in Kumamoto. Compared with Fukuoka, it is obviously that the maintenance fee is used effectively because it contributes the sales.

The determination coefficient of Kagoshima is 0.76. Fig. 4 depicts the detailed information of the parameters of each variables.

Compared with Fig. 2, we find that Kagoshima is similar with Miyazaki. The value of SMLS, SMPA, TNR, and HTNS are positive while PCL

Fig. 4. Determinants of Fukuoka and Kagoshima.

and TEIMC are negative significantly. Therefore, the main contributors of sales are tourists.

The determination coefficient of Oita is 0.89. The detailed information is shown in Fig. 5.

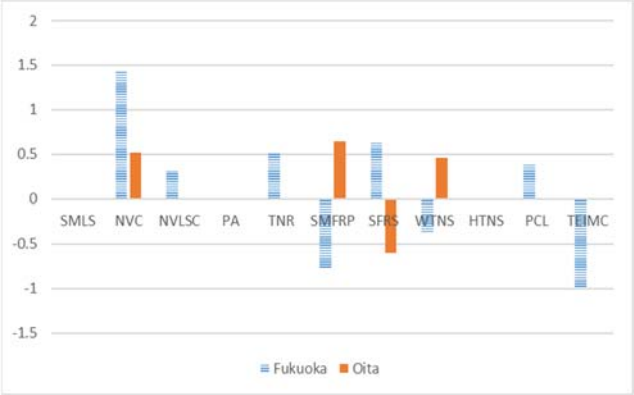

Fig. 5. Determinants of Fukuoka and Oita.

The value of SFRS is negative means the more visitors sitting in rest space, the less sales. H4 does not hold for Oita. Most visitors having a break in Oita just consider Michinoeki as a stopping spot but not a shopping center.

The determination coefficient of Saka and Nagasaki is 0.76. The value of SMPA and HTNS are positive. Therefore, we may say the sales are determined by tourists.

The determinants of all area is listed in Table 2.

Based on the analysis mentioned above and Table 2, all hypotheses hold or partly hold except H1 and H7. The sales of Michinoeki do not depends on its scale of land space. Does it means that the size of all Michinoeki is large enough? Much more

Table 2. Determinants of all areas.

	Fukuoka	Saga & Nagasaki	Kumamoto	Oita	Miyazaki	Kagoshima
SMLS						1.0094*
NVC	1.4267**		0.5182**	0.5132**	0.9109**	
NVLSCT	0.3106*				0.4756*	
PA		0.34*				0.5359*
TNR	0.5151*		-0.254*			0.8449*
SMFRP	-0.7722*		0.592**	0.6415**		
SFRS	0.6209**			-0.6007**		
WTNS	-0.3827*		0.4263**	0.4559**	-1.2246**	
HTNS		0.7172**			1.4604**	0.6848*
PCL	0.39**				-0.5359**	-1.5494**
TEIMC	-0.98**		0.251*		-1.023**	-1.4651**

Note: ** $p<0.01$, * $p<0.05$.

dataset is required. Most of the coefficients of TEIMC are negative; it is contrary to our expectation. The maintenance fee will be useful to renewal its facilities, and maintain the quality of its services. Much more discussions are required to explain why negative relationships exist.

6 Conclusion

In this paper, we proposed seven hypotheses for finding effective determinants of the successful Michinoeki. We collected the data form Kyushu arear and find that all hypotheses hold except H1 and H7. Much more dataset and discussions are required for understanding the important factors. Furthermore, internal and external variables do not limit in 11 factors, much more factors, such as assortments, quality, price and services of Michinoeki, should be collected. In the future, the models tested in this study should be investigated using data drawn from other area, such as, Honshu Island, and Hokkaido for comparative research as well as replicating the current findings.

Acknowledgements

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