Consumption Changes during COVID-19 through the Analysis of Credit Card Usage : Focused on Jeju Province

Dong-Hwa YOON[1], Kwon-Min YANG[2], Hyeon-Gon OH[3], Mincheol KIM[4], Mona CHANG[5]

Abstract

Purpose: This study is to analyze the changes of consumption patterns to diagnose the economic impacts on consumers' market during COVID-19, and to suggest implications to overcome the new social and economic crisis of Jeju Island. **Research design, data, and methodology**: We collected a set of credit card transaction records issued by BC Card Company from merchants in Jeju Special Self-Governing Province for past 4 years from 2017 to 2020 from the Jeju Data Hub run by Jeju Special Self-Governing Province. The big data contains details of approved credit card transactions including the approval numbers, amount, locations and types of merchants, time and age of users, etc. The researchers summed up amount in monthly basis, transforming big data to small data to analyze the changes of consumption before and after COVID-19. **Results**: Sales fell sharply in transportation industries including airlines, and overall consumption by age group decreased while the decrease in consumption among the seniors was relatively small. The sales of Yeon-dong and Yongdam-dong in Jeju City also fell significantly compared to other regions. As a result of the paired t-test of all 73 samples in Jeju City, the p-value of the mean consumption of the credit card in 2019 and 2020 is significant, statistically proven that the total consumption amount in the two years is different. **Conclusions**: We found there are sensitive spots that can be strategically approached based on the changes in consumption patterns by industry, region, and age although most of companies and small businesses have been hit by COVID-19. It is necessary for local companies and for the government to be focusing their support on upgrading services, in order to prevent declining sales and job instability for their employees, creating strategies to retain jobs and prevent customer churn in the face of the crisis. As Jeju Province is highly dependent on the tertiary industry, including tourism, it is suggested to create various strategies to overcome the crisis of the pandemic by constantly monitoring the sales trends of local companies.

Keywords: Credit card usage, COVID-19, Jeju Island, Big data, Tourism destination

JEL Classification Code: E21, L83, Z30

1. Introduction

The novel coronavirus (COVID-19), which occurred at the end of 2019, brought a serious crisis to the global economy including the global division of labor, supply chain systems, tourism as well as employment in each

[1] Co-first author, Master student, Data Science for sustainable Growth, Jeju National University, Korea. Tel: +82- 64-754-3182, Email: kathy1548@jejunu.ac.kr

[2] Co-first author, Jejutechnopark. Tel: +82- 64-720-3735, Email: minieng@jejutp.or.kr

[3] Co-corresponding author, Researcher, Smartcoop, Korea. Tel: +82- 64- 721-9788, Email: ohg@smartcoop.kr

[4] Co-corresponding author, Professor, Faculty of Data Science for sustainable Growth & Chief of Tourism, Business, and Economic Research Institute, Jeju National University, Korea. Tel: +82-64-754-3182, Email: mck1292@jejunu.ac.kr

[5] Co-corresponding author, Postdoctoral Researcher, BK21 Social Data Science Research Center at Jeju National University, Korea. Tel: +82-64-754-3179, Email: cmn6861@jejunu.ac.kr

industry (Padhan & Prabheesh, 2021; Maliszewska, Mattoo, & Van Der Mensbrugghe, 2020). As a result, most countries in the world have canceled or reduced various cultural events to implement social distancing, maintained sporting events without spectators, thus certain sectors, such as airlines and travel agents are being directly hit hard as online video conferencing have become commonplace and restrictions were tightened on travel to other countries (McKibbin & Fernando, 2020).

COVID-19 has shown a situation in which the reality of countries around the world dealing with the pandemic is unraveling. The U.S. and major European countries, which have been called advanced countries, are shaking in their status as they show a lack of social awareness, such as hoarding and non-compliance with quarantine rules, as well as problems in the public sector such as failure in quarantine and collapse of health and medical systems (Choi, 2020). Even now, more than a year and a half after the first outbreak, the impact of COVID-19 continues to affect the daily life of the people as well as the overall domestic industry. Since February 2020, when the COVID-19 outbreak has spread in earnest, contactless teaching and learning methods have become commonplace through online classes in elementary, middle, high schools and universities, and social distancing, etc. COVID-19 has reduced offline activities such as eating out and traveling, and has also changed consumer consumption patterns (Bounie, Camara, & Galbraith, 2020).

In this regard, according to the analysis of consumption trends in Jeju Island in 2020 after the onset of COVID-19 presented by the Jeju Tourism Organization (2020), the consumption of Jeju residents decreased by 1.6%, and the number of domestic tourists decreased by about 25% and foreign visitors by about 87%, thus the total number of tourists decreased by about 32% when comparing the two years of 2019 and 2020. As a result, the reduction in consumer spending by tourists has had a significant impact on the tourism industry such as restaurants and travel agencies in Jeju Province (Lee & You, 2020). Likewise, COVID-19 is identified as the direct cause of the decline of the global tourism industry (Kreiner & Ram, 2020). In contrast, online sales and consumption of retail products increased significantly due to the alternative consumption behavior of the majority of consumers due to social distancing and restrictions on movement. Concerns about a slowdown in the local economy are growing. As IT technology that has been steadily developed and logistics innovation such as same day delivery and early morning delivery services are combined, even fresh food market, which was a traditional offline consumption area, is rapidly shifting to online consumption, there are concerns about the long-term and structural impact of local commercial areas even after COVID-19 (Shin & Yu, 2020).

In particular, Jeju Island, the largest tourist destination in Korea, is still the most visited tourist destination by Koreans, and the tertiary industry including tourism accounts for more than 70% of Jeju's economy (Chang & Lim, 2021). So, local public opinion raises concerns about the economic impact of a sharp decline in tourists and the spread of COVID-19 in the region due to a continuous influx of tourists as COVID-19 spreads (Koh, 2021).

In this unprecedented pandemic situation that is unfolding in different ways all over the world, employment and consumption are shrinking, and new socio-economic aspects caused by COVID-19 are further intensifying (Fernandes, 2020). In each industry, the need to respond sensitively to changes and consequences before and after COVID-19 is required. Therefore, the academia should analyze the necessary information and data to present the results of the analysis and implications that are helpful to the industry. Accordingly, the researchers started research with the purpose of presenting the results obtained by using the technique of converting to small data in order to improve the readability of big data in a specific field accumulated in Jeju Island over the past four years.

In other words, the researchers have decided to look at the effects of the outbreak of COVID-19 on the local commercial area from various angles through big data analysis of credit card payment history targeting the spatial scope of Jeju Island, the Jeju Special Self-Governing Province. This is to provide the basic data that serves as a basis for discussion on the newly faced social disaster and its impact so that each stakeholder is able to implement it by increasing the accuracy and accessibility.

The next chapter introduces the impact of COVID-19, changes in the Jeju tourism industry, and the theoretical background of big data and credit card data in the tourism industry. In Chapter 3, the data collection process and scope of the data presented in this study. In addition, the hypotheses and analysis methods of this study are described while the results of the analysis are presented in Chapter 4. Finally, the conclusions and implications are discussed in Chapter 5.

2. Literature Review

2.1. The impact of COVID-19 and tourism industry of Jeju

The world has experienced public health emergencies related to infectious diseases such as SARS, swine flu, and MERS, which spread to economic crises, business closures, and protests (An & Liu, 2020). Notably, the tourism industry faced a crisis in which the number of tourists halved compared to the previous year due to the

MERS outbreak in 2015 (Kim, 2015). At the beginning of the crisis, the damage suffered in the service industry, especially in the travel and transportation sectors, caused greater economic damage than the previous SARS (Lee, 2021). Accordingly, the central and local governments, as well as the tourism industry workers and the tourism industry, worked together in order to restore tourism demand and showed a recovery of more than half within a few months (Kim, 2015). As a result of efforts to revitalize the tourism industry through exchanges between countries, it was able to show a recovery trend in a relatively short period of time (Lee, 2021).

However, the crisis of the tourism industry due to the COVID-19 pandemic is still in progress (Lee, 2021; Koh, 2021; Uğur & Akbıyık, 2020). The food service industry, a representative retail business and the tourism industry, which was booming during a calm period, suffered a huge loss. In addition, changes or new trends are continuing in various fields of society (An & Liu, 2020). Subsequently, research on survival strategies of each industry in the face of the global pandemic crisis is being actively conducted.

For example, as analyzed by Hwang & Kim (2020), consumers who are sensitive to dietary trends value preference for special foods and satisfaction with them. And enterprises often take this advantage in business to turn a crisis into an opportunity to grow. For instance, even though many consumers were reluctant to use restaurants due to COVID-19, the delivery application immediately became a trend as soon as its service started, allowing some of the restaurants to maintain their business. In August 2020, the average monthly payment per person through the delivery app was around U$ 70 dollars per month. Analysts explain that the number of payments and the average monthly spending recorded the highest ever (Kang, 2020). Meanwhile, sales of home cooking appliances like electric oven, induction hobs, and coffee machine have increased in parallel with the popularity of delivery applications due to the impact of COVID-19. Obviously, consumption of stockpiled foods such as instant noodles and frozen foods also increased (Lee & Kim, 2021).

Trends in the tourism industry are also changing due to COVID-19. In 2017, 61.5% of Koreans said that they preferred overseas travel in a survey on their preference for overseas travel (Yoon & Jang, 2019), but demand for domestic travel instead of overseas travel was recommended and interest surged for reasons like recommendations to refrain from moving and blocking overseas travel (Ko & Yang, 2020). Moreover, a method of spending leisure time in near places is becoming more and more prevalent as a travel trend rather than a long-distance travelling that requires time and money (Kim & Lee, 2021). COVID-19 is also having an impact on the selection of tourist destinations. In other words, wellness tourism, which aims to heal mental and psychological health by finding nature, is expected to grow further in the future as interest in viruses, immunity, and health increases (Jeong & Lee, 2020). In addition, Jeju Tourism Organization (2020) analyzed that keywords and related keyword searches for camping and Oreum have increased as Jeju tourism trends especially after COVID-19. In particular, backpacking and car camping were mentioned a lot in the type of camping, and solo travel and outdoor related keywords are frequently mentioned due to the impact of COVID-19, meaning that individual tourism is emerging instead of group tour.

Nevertheless, before COVID-19, there were concerns that Jeju Island should prepare for overtourism, a phenomenon that causes economic and environmental problems in the local community when the number of tourists exceeds the local tourism capacity (Chang, Choi, & Kim, 2020). Now, many tourists visiting Jeju Island show satisfaction with Jeju tourism due to the decrease in tourists after COVID-19, and there seem to be a positive effect recognized by residents as a result of COVID-19. However, the tourism sectors in Jeju Island are still facing a crisis due to the economic downturn as its proportion of Jeju economy is larger than other provinces (Park, Nam, & Yang, 2021).

The motivation of this study started the assumption that it may not be desirable to consider the regional economy and the tourism economy separately in the case of Jeju Island, which is geographically separated from the mainland and highly dependent on the tourism industry. On the other hands, researchers collected big data focusing on credit card consumption and discussed the changed economy in Jeju Island before and after COVID-19 in order to analyze the local economy in terms of consumption and how to deal with it.

2.2. Big data analysis related to tourism industry big data and credit card

Big data related research on tourism can be classified into three types (Shim, Choi, & Shim, 2018). That is, a method of analyzing unstructured text using texts that can be collected online, a method of analyzing location-based data provided through satellite devices such as GPS (Global Positioning System) or mobile communication data, and other existing comprehensive methods.

First, analysis using online text is the most used among these three types of big data analysis. Online texts such as blogs and social networking services (SNS) are used as data for this. Text mining is a representative analysis technique using online texts. It uses natural language processing technology from a text-based database to discover useful patterns and information from previously unknown text data. Analysts get automatically extracted and inferred information of interest through text mining (Hotho, Nürnberger & Paaß, 2005; Uğur & Akbıyık, 2020). In a study on the factors and measurement of tourist destination image components from text mining using this

technique, useful information is provided by tourist destination types after extracting the tourist destination image expressed through direct recognition of tourists from online reviews (Shim & Kim, 2016). In addition, tourism demand forecasting through text mining provides actual demand forecast results through an online search engine (Park & Shin, 2017; Onan, 2021).

The second type is an analysis using GPS location and mobile communication data. For example, Ahn & Ahn (2021) presented a tourism strategy by focusing on credit card usage data and spatial information system extracted from telecommunication company data in a study on tourism revitalization plans in Yongin-si based on tourism big data. In other words, by using location data from one of the three major domestic telecommunication companies, it is an active tourism strategy that will expand the demand for revisiting tourists in Yongin-si. They proposed strategies to increase temporal and geographical accessibility of tourist destinations from the analysis.

The third method is to analyze the existing comprehensive tourism-related big data. For example, Oh & Lee (2015) studied the perception of tourism-related big data analysis and found that there are various tourism categories such as family trips, overseas trips, and solo trips, as well as the high status of Jeju Island's tourism in Korea. It was emphasized that data on single-person tourism is being highlighted, and that data related to government policies and tourism development are relatively insignificant. Concurrently, Koh & Jeong (2021) found that it is possible to analyze tourism big data policy outcomes using tourists' navigation and mobile communication big data, so that it is possible to analyze in-depth understanding of trends in the tourism industry through this. However, there are difficulties in collecting new big data in reading changes in tourism purposes after the pandemic in the special situation. Thus, it can also contribute to presenting a governance model for industry, government, and academia if existing statistics that go beyond big data-based analysis are utilized according to them.

On the other hand, in the study that applied the meta-analysis method to the previous studies published in major Korean journals from 1989 to 2015, most of the research related to domestic tourism development was collected through questionnaires. It was pointed out that there is a concentration and that expenditure by industry may have been included in the existing research data even if it was not for tourism purposes (Kim & Lim, 2020).

As such, various big data and analysis methods are being used in tourism-related research, and among them credit card big data that can be collected in Korea is very valuable in understanding the overall characteristics of consumers and tourists in research related to domestic private consumption as well as research on the tourism industry. In particular, a representative case in establishing a breaking news monitoring system for abnormal signs of private consumption is a study using credit card big data (An, 2017).

For example, if an individual who is about to start a business understands the situation of start-up and closure in a specific industry, it will be possible to identify trends in the market (Kim & Kim, 2019). In other words, according to the results of analysis research on the start-up and closure of individual entrepreneurs based on big data, it can be seen that the number of start-ups in their 60s has increased the most recently. This is believed to be the cause of the retirement of the baby boomer generation. By type of business, pharmacies and gas stations are continuously decreasing, while sports facilities, indoor golf/fitness, hobbies/entertainment, etc. are continuously increasing. It can be analyzed that changes in people's lifestyle in consumption are continuously affecting business start-ups. In addition, it is interpreted that the closure rate is relatively low compared to other industries due to the high barriers to entry because specialized knowledge and qualifications are required in the case of the medical and automobile industries.

On the other hand, according to the data compiled by Shinhan Card Company on the amount of credit card spending by foreigners who visited Korea before and after COVID-19, in the first half of 2020, the total amount of spending decreased by 32.9% compared to the previous year. The decrease amounted to 66.1% as a result of estimating only the tourism industry (Jeon, 2020). The published data is a survey data of 17 local provincial and metropolitan city governments across the country. In the case of Jeju Island, the decrease in tourism-related spending by foreign visitors was 68.7%, which is close to the average decrease.

The big data collected based on the amount of credit card usage is relatively useful for understanding and analyzing changes and trends in consumption, start-ups, or changes in people's lives, but it is difficult to see that consumption is directly related to the tourism industry. In addition to research, there are limitations to contributing to the real economy of the region (Shim, Choi, & Shim, 2018). The limitations of this include uncertainty about the residence of credit card consumers in the study area, ambiguity in the classification of tourism spending from total spending, and the problem of having multiple personal credit cards. This would be a common problem, especially in most touristic areas with free movement.

In summary, it is necessary to consider more about how useful credit card data is in the tourism industry than the value of tourism-related big data and the usefulness and applicability of the results of the analysis. Therefore, this study started with a discussion that it is necessary to consider not only the consumption of tourists but also the consumption patterns of the entire retail market in the province based on the reality that Jeju Island is an independent island and the proportion of tourism industry is very high. In addition, there is a suggestion whose purpose is focused on classification and prediction due to the nature of big data research, there are not only

constraint in collection and analysis, but there are limitations in interpretation and implication of the results of the analysis, and the causal relationship between the research subject and the results is also limited (Choi et al., 2021). Although it cannot surpass big data in volume, velocity, and variety, the researchers intend to try a study that combines the accuracy of big data with the explanatory power of small data.

3. Research design and methodology

3.1. Data collection

In this study, the spatial scope of the analysis was set as Jeju Special Self-Governing Province. The total population of Jeju Special Self-Governing Province is 696,950 people as of June 2021 (Jeju Special Self-Governing Province Jeju Statistics Portal, 2021), including both domestic and foreign residents, and Jeju has the characteristic of an island as one of the local provincial governments. 2019 data released by Statistics Korea according to the report, the tertiary service industry including the tourism industry accounts for 79.99% of the total sales of all industries in the province, and 86.75% based on the total number of employees (Korea Statistical Information Service, 2021).

Table 1: Jeju Tourists' Status 2019-2020   (Unit: number of tourists)

Year 2019				Year 2020			
Month	Domestic	International	Total	Month	Domestic	International	Total
Jan	1,024,130	106,713	1,130,843	Jan	1,104,438	145,608	1,250,046
Feb	998,890	111,927	1,110,817	Feb	599,575	29,229	628,804
Mar	1,038,223	126,611	1,164,834	Mar	477,176	3,586	480,762
Apr	1,158,666	139,360	1,298,026	Apr	541,099	1,159	542,258
May	1,176,059	147,807	1,323,866	May	765,616	2,486	768,102
Jun	1,155,020	152,197	1,307,217	Jun	860,528	2,889	863,417
Jul	1,157,447	152,629	1,310,076	Jul	988,094	4,382	992,476
Aug	1,243,132	178,323	1,421,455	Aug	1,127,097	5,998	1,133,095
Sep	1,032,478	149,038	1,181,516	Sep	726,169	3,508	729,677
Oct	1,128,247	135,475	1,263,722	Oct	1,072,455	5,788	1,078,243
Nov	1,177,768	145,783	1,323,551	Nov	1,138,369	5,331	1,143,700
Dec	1,143,772	147,851	1,291,623	Dec	623,062	2,803	625,865
Total Ratio (%)	88.80	11.20	100.00	Total Ratio (%)	97.92	2.08	100.00
Total	13,433,832	1,693,714	15,127,546	Total	10,023,678	212,767	10,236,445
Year-on-year growth rate (%)					*-25.38*	*-87.44*	*-32.33*

Note: The original data is available at Jeju Tourism Association (Visit Jeju.com) and reconstructed by researchers.

In this study, monthly aggregate data for credit card transaction approval of BC Card affiliates located in Jeju Special Self-Governing Province from 2017 to 2020 were used. This study aims to improve readability by turning it into small data based on the accuracy of the data, which is a characteristic of this study. It can be said that the process of classifying and rearranging data by industry, region, region, and age through the preprocessing process of the data combined by year is an important part of the analysis work. The information contained in the raw data of the big data is the number of approvals, the amount of approval, the location of the affiliated store, the category of the merchant business, the time of transaction, the age of the customers, etc.

In addition, tourist data for two years (2019-2020) provided by the Jeju Tourism Association was used as a reference in order to check the relationship between Jeju residents and other users among credit card data. Credit card big data is provided by the Jeju Big Data Center of Jeju Special Self-Governing Province (Jeju Data Hub, 2021).

Therefore, in this study, through the analysis of the credit card approval transaction amount collected for the last 4 years, the trend of the Jeju tourism industry was taken into consideration together with the retail consumption including the tourism industry. In the verification process, the period of analysis subject was set to 24 months from January 2019 to December 2020. **Table 1** above shows the changes and rates of changes in the number of

domestic and foreign tourists who entered Jeju Island for 24 months in 2019 and 2020 (Jeju Tourism Association, 2021).

In 2019, there were about 15 million tourists to Jeju Island, of which 88.8% were domestic tourists and 11.2% were foreign tourists. Due to the restrictions on overseas travel due to concerns about the pandemic, the number of foreign tourists in 2019 dropped by more than 87% to 200,000 from close to 1.7 million, but the number of domestic decreased only 25% from 13 million to 10 million, relatively far less than foreign tourists. The decrease is a result that proves that there is a sharp contrast between the demand for overseas and domestic travel even in such pandemic situation. In other words, even though the tourism industry is being hit by COVID-19, it can be seen that the tourism business, especially the domestic tourism sector, presents the justification for preparing for the post-COVID-19 outbreak. Therefore, it is necessary to analyze and verify changes in overall consumption behavior of local Koreans including visitors to Jeju Island before and after COVID-19.

3.2. Research hypothesis

In this study, first, the BC card approval sales amount collected in Jeju Island from 2017 to 2020 is used as research data to analyze changes and trends by merchant, region, detailed location, and age based on the amount consumed. The analysis method in the first stage used the frequency based on the credit card approval amount and the percentage for each category. For the statistical test of the difference between the two years, the alternative hypotheses to be revealed in this study are as follows.

H1. There is a difference in the amount of credit card consumption in Jeju Island during the two years of 2019 and 2020, pre and post COVID-19.

In the next section, we discuss the data utilization and analysis methods as well as programs used for this study.

3.3. Methodology

Jeju City and Seogwipo City regions of Jeju Special Self-Governing Province, which are spatial units of the analysis data, 73 eup, myeon, and dong were divided into a total of four sub-regions for aggregating data as well each distinct data. Ages ranged from teens to 70s, and gender-specific data were secured, but the analysis in this study was omitted for follow-up studies.

In addition, in order to verify the difference in consumption before and after COVID-19, 73 eup, myeon, and dong were sampled, and a significance t-test was carried on the difference in total credit card approved transactions for two years in 2019 and 2020. The verification procedure for the sample size was performed through the G*Power 3.1.9.7 program, and the paired sample t-test was analyzed using IBM SPSS 24 version.

Although the data of previous studies related to COVID-19 are limited to keyword references, this study is a second data analysis study aimed at establishing local governments' economic policies and deriving suggestions based on BC card consumption for marketing small business owners to overcome the limitations of the present keyword references analysis.

4. Results

4.1. Analysis of credit card approval transaction amount by sector

As discussed early, the researchers intend to present detailed results of the analysis based on four classification criteria for the consumed amount based on the BC card approval for the four years before and after COVID-19 from 2017 to 2020 in this chapter. Through the first data, the results of changes in the tertiary industry in Jeju are presented according to the classification criteria by industrial divisions. Second, the results of consumption changes analyzed by dividing the whole of Jeju into four large regions are presented. Thirdly, researchers present analyzed results of the changes in consumption in individual regions for 73 eup, myeon, and dong in the province, and finally, the results of the analysis of the change and difference in consumption by age.

Therefore, as a result of filtering the credit card consumption in Jeju Island over the past 4 years by classifying them into 6 medium categories for a total of 42 industries, as shown in **Table 2** below, the total approved transactions showed a slight upward trend from 2017. However, they are showing a sharp decline in 2020. By industry, the general retail industry accounts for the largest share every year, followed by the food and beverage business, lodging industry, travel/event/rental (rental car and sporting goods), sports/entertainment/personal service business, and transportation sector. During the COVID-19 outbreak, total consumption decreased by about

14% on average. In particular, the transportation industry decreased by more than 61%, and in addition, the lodging industry and the travel industry showed a clear decrease in consumption compared to other industries by 27.91% and 24.67%, respectively.

Table 2: Credit card usage by industry in Jeju   (Unit: million won)

No.	Category	2017	2018	2019	2020	Total
1	Retail	970,723	993,553	994,131	924,825	3,883,232
	Year-on-year growth rate (%)		*2.35*	*0.06*	*-6.97*	
2	Transportation	66,535	67,174	63,686	24,301	221,696
	Year-on-year growth rate (%)		*0.96*	*-5.19*	*-61.84*	
3	Lodging	152,963	153,845	157,113	113,270	577,191
	Year-on-year growth rate (%)		*0.58*	*2.12*	*-27.91*	
4	Restaurants & pubs	666,430	672,150	679,860	566,450	2,584,890
	Year-on-year growth rate (%)		*0.86*	*1.15*	*-16.68*	
5	Tour, event, rental service (car & sports equipment)	103,552	95,260	94,087	70,877	363,776
	Year-on-year growth rate (%)		*-8.01*	*-1.23*	*-24.67*	
6	Sports, entertainment, & personal service	68,524	63,412	67,454	66,884	266,275
	Year-on-year growth rate (%)		*-7.46*	*6.37*	*-0.85*	
	Total	**2,028,727**	**2,045,394**	**2,056,331**	**1,766,608**	**7,897,059**
	Year-on-year growth rate (%)		*0.82*	*0.53*	*-14.09*	

Table 3 below is an analysis of changes in consumption by region. When Jeju Province is classified into four administrative districts, it can be seen that the consumption in dong of Jeju-si (city and downtown areas), which is the most densely populated with duty-free shops, shopping malls, and markets, has accounted for more than 50% of the total consumption every year for the past four years. In addition, the region where consumption decreased the most before and after COVID-19 was also dong areas of Jeju City, and considering that the overall average consumption decrease rate in Jeju Island was 14% compared to the previous year, it decreased by 17%, which is higher than the average. In the case of suburbs (eup and myeon) of Jeju-si and Seogwipo-si, the decrease was relatively small compared to the downtown area at 5.50% and 8.38%, respectively.

Table 3: Credit card usage by region   (Unit: million won)

No.	Region	2017	2018	2019	2020	Total
1	Jeju City (*Dong*)	1,210,698	1,213,263	1,203,302	997,339	4,624,603
	Year-on-year growth rate (%)		*0.21*	*-0.82*	***-17.12***	
2	Jeju Rural Area (*Eup, Myeon*)	252,031	260,611	271,434	256,518	1,040,594
	Year-on-year growth rate (%)		*3.40*	*4.15*	*-5.50*	
3	Seogwipo City (*Dong*)	355,258	349,063	348,588	299,278	1,352,186
	Year-on-year growth rate (%)		*-1.74*	*-0.14*	***-14.15***	
4	Seogwipo Rural Area (*Eup, Myeon*)	210,740	222,456	233,007	213,472	879,675
	Year-on-year growth rate (%)		*5.56*	*4.74*	*-8.38*	
	Total	**2,028,727**	**2,045,394**	**2,056,331**	**1,766,608**	**7,897,059**

While the above analysis data divided Jeju into downtown (city, dong) and rural area (eup/myeon) according to the administrative district standards of eup, myeon, and dong, the following **Table 4** shows the total 73 eup/myeon areas of Jeju. Eups, myeons and dongs are subdivided, and data from the top 10 areas, which accounts for about 51% of the total consumption change data by region based on the total approved amount over the past four years, are extracted and compared. As a result of the analysis, for the past 4 years, Yeondong, Nohyeong-dong, and Yongdam 2-dong of Jeju-si have consistently ranked 1st, 2nd, and 3rd among all eup, myeon, and dong in Jeju Province. The three suburbs in the top 10 are Aewol-eup, Hallim-eup, and Jocheon-eup, all of which belong

to Jeju City. In Seogwipo-si, Seogwi-dong is the only city to occupy 6th place, indicating that consumption in this area is concentrated in that area.

Table 4: Top 10 Credit card spending towns (Unit: million won)

Rank	Town	2017	2018	2019	2020	Total	Cum Ratio (%)
1	Yeon-dong	251,224	251,275	237,734	163,483	903,716	11.44
Year-on-year growth rate (%)			*0.02*	*-5.39*	***-31.23***		
2	Nohyeong-dong	159,246	159,884	157,907	141,781	618,818	19.28
Year-on-year growth rate (%)			*0.40*	*-1.24*	*-10.21*		
3	Yongdam-2dong	165,345	157,613	157,669	126,445	607,072	26.97
Year-on-year growth rate (%)			*-4.68*	*0.04*	***-19.80***		
4	Aewol-eup	85,411	85,627	89,610	85,756	346,404	31.35
Year-on-year growth rate (%)			*0.25*	*4.65*	*-4.30*		
5	Ido-2dong	77,083	78,715	76,225	68,208	300,231	35.16
Year-on-year growth rate (%)			*2.12*	*-3.16*	*-10.52*		
6	Seogwi-dong	80,133	75,649	74,284	62,666	292,732	38.86
Year-on-year growth rate (%)			*-5.60*	*-1.80*	***-15.64***		
7	Ildo-2dong	69,297	69,705	67,894	62,654	269,550	42.28
Year-on-year growth rate (%)			*0.59*	*-2.60*	*-7.72*		
8	Donam-dong	59,535	62,718	64,086	53,371	239,710	45.31
Year-on-year growth rate (%)			*5.35*	*2.18*	***-16.72***		
9	Hallim-eup	54,539	58,222	59,399	58,608	230,768	48.23
Year-on-year growth rate (%)			*6.75*	*2.02*	*-1.33*		
10	Jocheon-eup	55,844	57,562	59,986	53,026	226,418	51.10
Year-on-year growth rate (%)			*3.08*	*4.21*	*-11.60*		

On the other hand, in the case of Yeondong, Jeju City, where the amount of credit card approval was far ahead of other regions, it was significantly lower than the average consumption decrease rate of 14% before and after COVID-19, and the decrease rate was about 31%. In addition, the decrease in Yongdam 2-dong (19.80%) and Donam-dong (16.72%) in Jeju-si and Seogwi-dong in Seogwipo-si (15.64%) was also higher than the average. In contrast, in the case of Nohyeong-dong, Jeju-si, which ranks second in total consumption in Jeju, the decrease was only 10.21%. Moreover, the decrease in Jocheon-eup in consumption was 11.60%, the highest among the three suburbs while Aewol-eup and Hallim-eup showed a decrease of 4.30% and 1.33%, which was far below the average decrease.

Next, **Table 5** below shows the results of analyzing the credit card approval amount by age for the past 4 years. Ages are classified into seven groups, from teenagers to those in their 70s including data of unknown ages, which accounts for about 28% of the total amount. In other words, among the remaining 72% of consumption, which can be classified by age, the age group that consumed the most was in their 40s (19.70%), followed by those in their 50s (18.68%) and 30s (14.19%). However, considering that the overall average consumption decreased by about 14% before and after COVID-19, in 2020, the decrease in consumption among teenagers was the most noticeable at 32.29%, followed by the decrease in consumption among those in their 40s was 16.16%, which was higher than the average. In addition, it can be seen that the decrease in the amount of credit card approval for corporations whose age is not revealed also increased by more than 20%.

Table 5: Credit card usage by age group (Unit: million won)

No.	Age group	2017	2018	2019	2020	Total	Ratio (%)
1	**10s**	838	2,247	4,227	2,862	10,174	**0.13**
Year-on-year growth rate (%)			*168.14*	*88.12*	***-32.29***		
2	**20s**	120,003	140,514	162,809	141,020	564,346	**7.15**
Year-on-year growth rate (%)			*17.09*	*15.87*	*-13.38*		
3	**30s**	292,489	287,393	287,614	252,808	1,120,304	**14.19**
Year-on-year growth rate (%)			*-1.74*	*0.08*	*-12.10*		

No.	Age group	2017	2018	2019	2020	Total	Ratio (%)
4	40s	411,431	407,323	400,725	335,957	1,555,436	19.70
Year-on-year growth rate (%)			-1.00	-1.62	-16.16		
5	50s	391,127	382,153	369,731	332,101	1,475,112	18.68
Year-on-year growth rate (%)			-2.29	-3.25	-10.18		
6	60s	194,516	187,104	176,553	169,922	728,095	9.22
Year-on-year growth rate (%)			-3.81	-5.64	-3.76		
7	70s	60,276	58,387	55,125	53,250	227,038	2.87
Year-on-year growth rate (%)			-3.13	-5.59	-3.40		
8	Corporation	558,047	580,272	599,546	478,688	2,216,554	28.07
Year-on-year growth rate (%)			3.98	3.32	-20.16		
Total		2,028,727	2,045,394	2,056,331	1,766,608	7,897,059	100.00

As mentioned above, unlike the steady increase in consumption from 2017 to 2019, the overall decrease in consumption across the tertiary industry and all regions and age groups in Jeju Island was confirmed due to the spread of COVID-19 in 2020. In the next chapter, among the results of the change trend and rate of change presented above, researchers verify the difference before and after COVID-19 in the decrease in consumption for each region through statistical verification.

4.2. Paired t-test

The analyzed data and results presented in section 4.1 of this study are based on the trend of change in credit card consumption in Jeju Island from 2017 to 2020 and the rate of decline in consumption decrease due to the recent COVID-19 by industry, region, and age. In this chapter, researchers select data that can be statistically verified and perform a statistical comparison test on the result if there is a difference in the change in total consumption in 2019 and 2020.

In order to secure the number of samples that can be used for the paired t-test for the purpose of pre and post comparison among credit card consumption data in 2019 and 2020 in each classification unit. The researchers conducted a study for the comparison test using the data from 73 eup, myeon, and dong in Jeju-do. Here, the statistical power differs depending on the research field, but in general, it is recommended to calculate the significance level and effect size based on the analysis method (Kang, Bang, & Ko, 2009).

In the G*power program, search based on a two-tailed test (significance level 95%) and medium effect size (0.5) through the menu (Means: Wilcoxon signed-rank test-matched pairs) for paired sample analysis during the t-test. As a result, it was confirmed that the minimum number of samples to secure power was 57. Cohen (1988) recommends referring to precedents in similar previous studies for the general tendency to apply the median size (0.5) to the effect size to secure statistical power. In this study, even if the effect size is considered to be lower than the median size, the number of 73 samples from all eup, myeon, dong in the island is considered sufficient, so it was judged that there would be no difficulty in executing the corresponding sample t-test provided by the SPSS program.

The results of the analysis are shown in **Tables 6** and **7** below. In other words, as a result of comparing changes in average values in 2019 (before) and 2020 (after) by looking at credit card consumption in 73 regions as a sample, the pre- and post- correlation is 98.9% (p = .000), which is very high. The similarity was found to be high (**Table 6**). As a result of the pre-test and post-test difference analysis, the t value was 3.519, which is greater than 1.96, supporting the judgment that the p value is significant as a result of the two-sided test (**Table 7**). Therefore, '*there is a difference in the amount of credit card consumption in Jeju Island during the two years of 2019 and 2020, pre and post COVID-19*', supporting the hypothesis of this study.

Table 6: Paired Samples Statistics

		Mean	n	Std. Deviation	Std. Error Mean
Pair 1	Year 2019	28168915340.29	73	39941622015.432	4674813261.560
	Year 2020	24200106104.27	73	31905206531.579	3734221973.985
Paired Samples Test					
			n	Correlation	Sig.
Pair 1	Year 2019 & Year 2020		73	.989	.000

Table 7: Paired Samples Test

		Paired Difference					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Year 2019 - Year 2020	3968809236.014	9636572993.712	1127875558.223	1720430402.968	6217188069.060	3.519	72	.001

5. Conclusion

The researchers analyzed the changes and trends in consumption by industry, region, and age based on BC credit card approval amount generated in Jeju Special Self-Governing Province over the past four years (2017-2020), the scope of this study so far. In addition, the hypothesis was tested by statistical analysis through the Paired Samples t Test on credit card consumption before and after the outbreak of COVID-19 in 2019 and 2020. The overall opinions on this study are summarized as follows.

First, as a result of examining the 42 industries where consumption of the tertiary service industry occurred by categorizing them into 6 divisions, it can be seen that the consumption of credit cards in the transportation industry decreased sharply in 2020, and the economic blow to the aviation industry can be recognized through this. As Lim (2020) pointed out, the aviation industry is closely related to the tourism industry, so the sharp drop in demand for tourism due to COVID-19 may lead to a great depression and a long-term recession in the air transportation industry in the future. In particular, as low-cost airlines may be more affected, there is a concern about unemployment caused by airline austerity, so Jeju residents should pay attention to job-related issues for air transport workers.

Second, it is possible to confirm once again the reality that 50% or more of Jeju Island's local commercial districts are experiencing difficulties in business operation in the aftermath of COVID-19. Particularly we found that there is a regional variation in the same downtown area. The decrease in consumption amounted to only 10% in Nohyeong-dong, Jeju-si, but, in contrast, more than 30% in Yeon-dong and 20% in Yongdam 2-dong, the adjacent area where duty-free shops and tourist retail stores were concentrated was observed. In the case of Nohyeong-dong, it can be seen that the Dream Tower was built and started business in 2020, which could be attributed to job creation and increased tourist attraction in the region (Sun, 2021). However, in the case of integrated resorts that have already been opened, the Jeju tourism industry have been severely affected by the COVID-19 crisis (The Chosunilbo, 2020). As a result of analyzing the impact on the tourism industry, we have presented numerically how serious the aftermath of COVID-19 is. The Bank of Korea presented numerically how serious the aftermath of COVID-19 was in the data as a result of analyzing the impact of various similar crises on the tourism industry in Jeju Island. Through this, it can be seen that Jeju Island is very vulnerable to external shocks and the demand for it has contracted, especially in tourism-related industries (The Bank of Korea, 2021).

Finally, the change in consumption behavior by different age groups can be detected through the result of analysis on the trend of change by age. At the same time, while teenagers' spending fell to the lowest level after COVID-19, spending in areas where non-contact activities were possibly increased, and due to restrictions on outside activities, leading online consumption rather than offline (Fashion Post, 2020). It is unreasonable to conclude that the result of this analysis of the decline in consumption among teenagers in Jeju Island was a unilateral decrease in consumption by teenagers. Besides, while credit card consumption of the middle-aged and elderly people in their 40s and 50s, the parents' generation, decreased, the decrease in the consumption amount of the elderly in their 60s and 70s was comparatively smaller than middle-aged people. This could lead the result that support and nurturing for the development of wellness products unique to Jeju Island and the maintenance of the industry are necessary for the elderly who are relatively economically free.

Through this study, it was revealed that the degree of difference varies according to the classification criteria from various aspects regarding the commonality with existing data on the changes before and after COVID-19 and the consumption contraction situation in the Jeju service industry. We would like to suggest the need for a micro-approach of businesses and administrative authorities.

The government can try policies to expand employees' work capabilities and revitalize systems to prevent salary cuts, regardless of government support for low-cost airlines and other transportation industries not only simply compensating for labor costs but also putting their efforts to meet the satisfaction level of each company's service. Meanwhile, it is expected that Jeju Island will establish a concrete plan to actively share opinions of residents and industry workers on the elements of balanced regional development and economic conflicts through differentiated crisis response measures for key industries in each region and reflect them in policies. Finally, it is considered that

each countermeasure is necessary from the perspective of each age group and region for the contracted tourism demand due to the external shock, that is, COVID-19. Furthermore, we would like to propose an active retention marketing strategy (Galletta et al., 2017; Toubes, Araújo Vila, & Fraiz, 2021) to retain new customers as well as existing loyal customers in response to sluggish domestic demand.

With the above, the researchers tried to suggest a way to overcome the crisis in the tourism industry through the change in consumption activity based on the consumed amount of credit card that occurred in Jeju Island before and after COVID-19. However, since the data used in this study is limited to the data from BC credit card company only, there will be a difference in each analysis result from the actual consumption. Additionally, the fact that data of tourists and residents who do not use credit cards was not collected remains a limitation of the study. Therefore, in future research, more comprehensive data should be collected to cover the entire consumer market if possible, and systematic categories and analyzes are expected accordingly.

Acknowledgement

References

Ahn, E, & Ahn, J. (2021). A Study on the Revitalization of Local Tourism in Yongin City Based on Tourism Bigdata Analytics: Focusing on Geographic Information System Analytics Combining Mobile Communication and Credit Card Data. *Journal of the Korea Convergence Society*, *12*(4), 207-216.

Ahn, S. H., Lee, Z., & Ha, J. E. (2017). Establishment of quick model for private consumption symptom. *The Journal of Bigdata*, *2*(1), 59-69.

An, D., & Liu, X. (2020). The Phantom and Countermeasures of COVID-19 on the Chinese Tourism Industry. *Tourism Research*, *45*(2), 309-325.

Bounie, D., Camara, Y., & Galbraith, J. W. (2020). Consumers' Mobility, Expenditure and Online-Offline Substitution Response to COVID-19: Evidence from French Transaction Data. *Available at SSRN 3588373*.

Chang, M., & Lim, H. (2021). Structural Relations of Positive Tourism Impacts on Residents Attitude and Support for Tourism Development in Jeju. *Journal of Tourism & Industry Research*, *41*, 13-26.

Chang, M., Choi, K., & Kim, M. (2020). On Factors Affecting Tourism Capacity (Overtourism): Using Logit Analysis. *Journal of Tourism & Industry Research*, *40*, 15-23.

Choi, B. D. (2020). *Paradigm Shift before and after COVID-19*. Suwon Research Institute. Retrieved from https://www.suwon.re.kr/board/board.phpbotable=oonlinesl&wrid=6

Choi, K. W., Kang, J., Kim, M. C., & and Kim, J., (2021). Compromise between Small Data and Big Data. *Journal of Tourism & Industry Research*, *41*(2), 21-31

Cohen, J. (1988*). Statistical power analysis for the behavioral sciences* (2nd ed.). US: Lawrence Erlbaum Associates.

Fashion Post. (October 16, 2020). *Where, how, and what do teenagers want to buy?*. Fashion Post. Retrieved from https://fpost.co.kr/board/bbs/board.php?bo_table=special&wr_id=513

Fernandes, N. (2020). Economic effects of coronavirus outbreak (COVID-19) on the world economy. *Available at SSRN 3557504*.

Galletta, A., Carnevale, L., Celesti, A., Fazio, M., & Villari, M. (2017). A cloud-based system for improving retention marketing loyalty programs in industry 4.0: a study on big data storage implications. *IEEE Access*, *6*, 5485-5492.

Hotho, A., Nürnberger, A., & Paaß, G. (2005, May). A brief survey of text mining. In *Ldv Forum* (Vol. 20, No. 1, pp. 19-62).

Hwang, K., & Kim, H. (2020). The Effect of Dietary Trend Changed by COVID-19 Consumption Value on Behavioral Intention. *Tourism Research*, *45*(4), 705-727.

Jeju Data Hub. (2021). *[Consumption, Economy] Group/Individual Tourist Consumption Data*. Jeju Data Hub. Retrieved from https://www.jejudata hub .net/data/view/data/603

Jeju Tourism Association. (2021). *Jeju Tourism Statistics-Monthly Statistics*. Jeju Tourism Association. Retrieved from http://visitjeju.or.kr/web/bbs/bbsList.do?pageIndex =2&sBbsId=TOURSTAT&bbsId=TOURSTAT&noticeNum=&authNum=&sKeyOpt=1&sKey=

Jeju Tourism Organization. (2020). *Analysis of consumption impact on Jeju Island in 2020 due to COVID-19*. Jeju Tourism Organization. Retrieved from http://ijto.or.kr/korean/Bd/view.php?btable=policy&bno=54&pds_skin=&p=1&lcate=

Jeju Tourism Organization. (2020). *Trend Analysis for Jeju Tourism: Before vs After COVID-19*. Jeju Tourism Organization. Retrieved from https://ijto.or.kr/korean/Bd/view.php?btable=pds&bno=332&pds_skin=&p=1&lcate=2

Jeong, D., & Lee, S. (2020). COVID-19 changes the future of travel. Issues & Analysis, 1-25.

Jeon, J. Y. (2020). Status of foreigners' credit card spending in tourism sector in the first half of 2020. *Korea Tourism Policy, 81*, 112-119.

Kang, E. S. (2020). "I didn't go to a restaurant because of COVID-19 and made delivery"... The payment amount for delivery app reached the maximum in August". News 1. Retrieved from https://m.news1.kr/articles/?4051486&212#_enliple

Kang, J. H., Bang, K. S., & Ko, Power Analysis in Experimental Designs with t test Analysis. *Journal of Korean Academic Society of Nursing Education, 15*(1), 120-127.

Kim, D. K., (2015). The impact of risks, crises and disasters on the tourism industry and countermeasures. *Korea Tourism Policy, 61*, 26-33.

Kim, H. S., & Lee, K. (2021). Virtual Travel according to the Development of Information Media and the Changes in Tourism After COVID-19. *Journal of the Korean Geographical Society*, *56*(1), 1-14.

Kim, J., & Kim, H. (2019). Analysis of Start-up and Closing of Individual Business Using Credit Card Big Data. Journal of Digital Contents Society 20(10), 2035-2044.

Kim, S., & Lim, H. (2020). Content Analysis of Tourism Development Trend in KCI Journals. *Tourism & Leisure Research*, *32*(1), 27-51.

Koh, S. (2021). A Study on the Changes in the Perceptions of Tourism in Jeju Local Residents Before and after COVID-19. *Journal of The Korean Association of Regional Geographers*, *27*(2), 164-178.

Koh, S. Y., & Jeong, G. (2021). Policy Achievements and Tasks for Using Big-Data in Regional Tourism: The Case of Jeju Special Self-Governing Province. *Korea Academy Industrial Cooperation Society*, *22*(3), 579-586.

Korea Statistical Information Service. (2021). *The number of businesses, number of employees and sales by industry of Jeju Special Self-Governing Province*. Korea Statistical information Service. Retrieved from https://kosis.kr/statHtml/ statHtml.do?orgId=101&tblId=INH_1K52C08_39&vw_cd=&list_id=00000024&scrId=&seqNo=&lang_mode=ko&ob j_var_id=&itm_id=&conn_path=R1&path=

Kreiner, N. C., & Ram, Y. (2020). National tourism strategies during the Covid-19 pandemic. *Annals of tourism research*.

Lee, H. M. (2021). Comparative analysis on Tourism Issue in Accordance with Pandemic Influenza Using Text Mining Method: Focusing on the Comparison of SARS, H1N1 influenza, MERS, and Covid-19. *Korean Hospitality and Tourism Academe, 30*(4), 181-200.

Lee, H. S., & Kim, J. H. (2021). Analysis of Food Consumption Behavior due to COVID-19: Focusing on MZ Generation. *Journal of Digital Convergence, 19*(3), 47-54.

Lee, M., & You, J. (2020). The Socio-Economic Effects of COVID-19: Focusing on Consumer Expenditure and Labor Market. *Asia-Pacific Journal of Business & Commerce*, *12*(3), 121-141.

Lim, J. P., (2020). Crisis management and challenges of the air transport industry caused by COVID-19. *International Journal of Tourism and Hospitality Research, 34*(7), 139-154.

Maliszewska, M., Mattoo, A., & Van Der Mensbrugghe, D. (2020). The potential impact of COVID-19 on GDP and trade: A preliminary assessment. *World Bank Policy Research Working Paper*, (9211).

McKibbin, W., & Fernando, R. (2020). The economic impact of COVID-19. *Economics in the Time of COVID-19*, *45*(10.1162).

Oh, I. K., Lee, T. S., & Chon, C. N. (2015). A Study on Awareness of Korea Tourism through Big Data Analysis. *Journal of Tourism Science, 39*(10), 107-126.

Onan, A. (2021). Sentiment analysis on massive open online course evaluations: a text mining and deep learning approach. *Computer Applications in Engineering Education*, *29*(3), 572-589.

Padhan, R., & Prabheesh, K. P. (2021). The economics of COVID-19 pandemic: A survey. *Economic Analysis and Policy*, *70*, 220-237.

Park, S. M., Nam, G. E., & Yang, S. W. (2021). An Empirical Analysis on the change of Jeju-do's Overtourism with WTTC's Overtourism Indicators. Proceedings of the conference of the Digital Contents Society, *41*(1), 250-253.

Park, S., Shin, J. O., Song, S., & Jeong, C. (2017). Forecasting Tourism Demand using Text Mining Techniques: Focused on an Online Search Engine. *Journal of Tourism Science, 41*(1), 13-27.

Shim, W., Choi, S., & Shim, C. (2018). Identifying Major Issues of Tourism Analysis Using Big Data: Focused on Mobile and Credit Card Data. *Journal of Tourism Studies, 30*(3), 3-22.

Shin, G., & Y, M. (2020). The COVID-19 era, contact-free consumption and survival strategies of retailers. Issues & Analysis, 1-25.

Sim, Y., & Kim, H. (2016). A Study of Destination Image and Measurement Using Text Mining. *Journal of Tourism Science*, *40*(7), 221-245.

Sun. J. (2021). *A study on the High-Rise Policy of Jeju Area Evaluation and Proposal-Targeting Chinese tourists and international students*- (Doctoral dissertation, Graduate school Jeju National University).

The Bank of Korea. (February 3, 2021). *Impacts and ripple effects of external crisis shocks on tourism-related industries in Jeju Island*. The Bank of Korea. Retrieved from http://www.bok.or.kr/portal/search/search.do

The Chosunilbo. (August 04, 2020). *Casinos on Jeju Island Face Bankruptcy*. The Chosunilbo. Retrieved from http://english. chosun.com/site/data/html_dir/2020/08/04/2020080401906.html

Toubes, D. R., Araújo Vila, N., & Fraiz Brea, J. A. (2021). Changes in consumption patterns and tourist promotion after the COVID-19 pandemic. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*(5), 1332-1352.

Uğur, N. G., & Akbıyık, A. (2020). Impacts of COVID-19 on global tourism industry: A cross-regional comparison. *Tourism Management Perspectives*, *36*, 100744.

Yang, T., & Ko, J., (2020). Differentiated Marketing Strategies of Templestay at Suguksa. *The Journal of Buddhism and Society*, *12*(1), 110-135.

Yoon, H., & Jang, J. (2019). A Research on the Cabin Service Quality Factors in a National Carrier affecting Overseas Tourist's Experience and Satisfaction. *Journal of the Korea Academia-Industrial Cooperation Society, 20*(9), 188-197.