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Study on the Differences in Consumption  
Behavior and Economic Ripple Effects by  
Residence of Foreign Visitors to Japan

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# **Study on the Differences in Consumption Behavior and Economic Ripple Effects by Residence of Foreign Visitors to Japan**

Kaisei Harada

## **ABSTRACT**

Tourists from various countries visit Japan every year, and their spending behavior at tourist attractions varies greatly from country to country. For example, Chinese tourists tend to spend money on "shopping" in Japan, while European tourists spend on "accommodation" and "food and beverage". On the other hand, if these tourists consume goods produced domestically, their consumption has a positive effect on the domestic economy, but if the goods are produced outside of Japan, some of the economic benefits flow out to foreign countries, and an efficient economic cycle within Japan may not be achieved. Therefore, this study analyzes the differences in consumption behavior among foreign visitors to Japan by region of residence and the associated economic ripple effects in Japan. The analysis data will be based on the "Survey of Consumption Trends of Foreign Visitors to Japan" published by the Japan Tourism Agency, a Japanese government agency, for the 10-year period from 2010 to 2020. First, changes in consumption trends by region of stay over the 10-year period will be analyzed using a regression model. Next, the 10-year average is substituted into the Input-Output model, a method for analyzing economic ripple effects, to calculate the positive economic ripple effects to Japan by industry. Detailed analysis results will be presented in the proceedings. The results of this study will contribute to the planning of promotional and attraction activities to develop the domestic economy by identifying effective consumption behaviors to enhance Japan's economic cycle.

*Keywords:* foreign visitors, Consumption Behavior, Economic Ripple Effects

## **1. Introduction**

Before the new coronavirus caused a global pandemic, tourism was a growing industry in many countries. According to the United Nations World Tourism Organization (UNWTO), the number of international tourists worldwide had increased from 673 million in 2000 to 956 million in 2010, an increase by 1.4 times, and to 1.46 billion in 2019, an increase by 1.5 times. It also showed that the region's tourism income from international tourists had increased from \$980 billion in 2010 to \$1.48 trillion in 2019, an increase by 1.5 times. This global increase in the number of international tourists was also seen in Japan.

Figure 1 shows the number of foreign visitors to Japan by nationality (left axis, line chart) and their total (right axis, bar graph). The total number of foreign visitors to Japan (bar graph) increased year-on-year in all years except 2009, when the global economy was in turmoil due to the Lehman Shock, and 2011, when the Great East Japan Earthquake occurred, with a record high of 31.8 million visitors in 2019. Compared to the 8.61 million visitors in 2010, the number of foreign visitors to Japan in 2019 is approximately 3.7 times higher, indicating that the growth rate of increase is higher than the global trend of international tourist growth. In addition, Japan has many tourists from Asian countries.

The top six regions in terms of the number of foreign visitors by nationality in 2019 are China, South Korea, Taiwan, Hong Kong, the U.S., and Thailand from the top, with five of these regions being in Asia. Visitors from China, South Korea, and Taiwan account for an outstandingly high 30.1%, 17.5%, and 15.3% of the total number of foreign visitors to Japan, respectively, with these three regions accounting for more than 60% of the total.

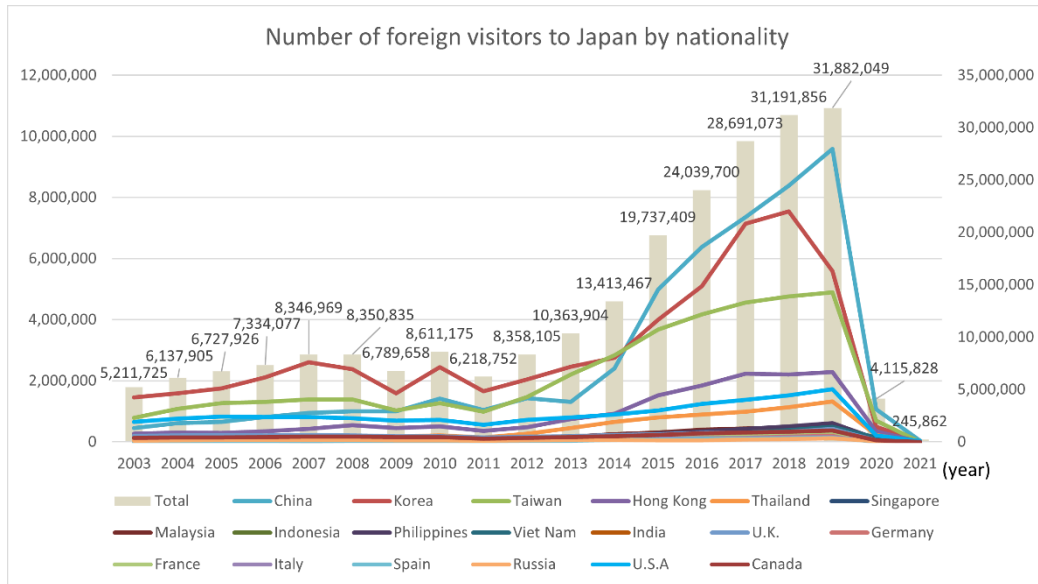


Figure 1 Number of foreign visitors to Japan by nationality

Figure 1 shows that the number of tourists visiting Japan varies greatly by nationality. It is thought that the purpose of visiting Japan and what they want to do in Japan differ between Asian regions, which are closer to Japan, and countries in Europe and other regions. By properly understanding these differences, it may be possible to devise a tourism policy that just fits their expectations. Therefore, this paper will conduct a detailed analysis of their expectations for tourism in Japan and their consumption trends in Japan. The analysis will be based on the "International Visitor Survey" conducted by the Japan Tourism Agency, one of the government agencies.

## 2. Literature review

Many previous studies on foreign visitors to Japan have used the "International Visitor Survey". The basic attribute information that can be read from the survey questionnaire is conducted by the Japan Tourism Agency (JTA), which is the competent authority. Specifically, a multifaceted analysis was conducted using survey questionnaire information, including respondents' attributes and travel information, travel expenditures, actual souvenir purchases, travel information sources, satisfaction levels and revisit intentions. As another example of research, Kurihara, Sakamoto, & Tomori (2015) analyzed the relationship between the number of visits to Japan and consumption trends using individual data in cooperation with the Japan Tourism Agency. Kurihara, Aratani, & Okamoto (2014) also show that there are differences in consumption trends by regional bloc in Japan depending on the nationality of inbound foreign visitors. One prior study that is particularly close to the analysis in this paper is that of Matsui, Hibino, Morichi, & Ieda (2016). They used five years of individual data from the "International Visitor

Survey" from 2010 to 2015, they analyzed in detail the characteristics of destinations visited by nationality for visitors to Japan from eight regions (Taiwan, South Korea, China, Hong Kong, Thailand, Australia, Malaysia, and Singapore). Their analysis is a useful example of analysis that succeeded in extracting visitor characteristics that can only be analyzed with individual data, such as showing that group tour participants and individual travelers have different tendencies in selecting places to visit, even if they are of the same nationality. In contrast, this paper uses aggregate data rather than individual data, but differentiates itself in that it uses open data published by the Japan Tourism Agency, which can be used by anyone, as well as in the different years and regions covered by the analysis. On the other hand, studies linking the consumption of foreign visitors to Japan and economic ripple effects have been reported by the Japan Tourism Agency on a yearly basis using the "International Visitor Survey" to analyze the economic effects of their consumption on the Japanese economy. In addition, Makita (2018) and Aoki (2019) have analyzed the economic effects of inbound foreign tourist spending in specific regions of Japan. In contrast to these, this paper analyzes the differences in economic effects on Japanese industry by nationality by calculating the economic ripple effects of foreign visitors to Japan by nationality.

### **3. Methodology**

#### **3.1 International Visitor Survey**

The Survey of Consumption Trends of Foreign Visitors to Japan is a government statistic conducted by the Japan Tourism Agency for the purpose of clarifying consumption trends among visitors to Japan and obtaining basic data for planning and evaluating measures to attract foreign tourists. And this survey targets foreign visitors leaving Japan, excluding those staying in Japan for more than one year, and is conducted quarterly at various airports and seaports in Japan by means of interviews using tablet terminals or paper survey sheets, with a target of 33,840 votes. In this study, I focus on these three survey items "Wanted to do before visit to Japan? (Multiple answer OK)", "Where did you go in Japan?" and "How many did you spend during your current stay in Japan?" and analyze their characteristics by nationality. The analysis data will be based on averaged quarterly data for 2018. The reason for selecting 2018 is that "International Visitor Survey" has not been conducted since April-June 2020 due to the COVID-19 epidemic in Japan, and most of recent data is missing. In addition, due to the influence of the World rugby cup 2019 being held in Japan in 2019, unusual visit purposes and consumption trends were anticipated in some countries. Therefore, I selected 2018 as the data to be used, the most recent year for which I could capture the characteristics of the inbound data for the normal period.

#### **3.2 Analysis Methods**

##### **3.2.1 Principal Component Analysis**

Since this study will analyze "International Visitor Survey" by nationality, there is a concern that the number of explanatory variables to be analyzed is too large to conduct general statistical analysis such as multivariate analysis. Therefore, this study uses principal component analysis, a type of dimensionality reduction method. Principal component analysis is a transformation that projects the original data  $X(n \times m)$  onto a matrix  $A(m \times k)$  of eigenvectors, a new axis representing the characteristics of the original data, and the value transformed into each principal component is called the principal

component score  $Z=XA(n \times k)$ . In this study, the analysis focuses on the matrix of eigenvectors, which is the axis for projecting the features of the original data, and the principal component scores after the projection.

### **3.2.2 Input-Output Analysis**

Input-Output analysis is an analytical method that utilizes the inter-industry transaction dependence in the Input-Output table, a macroeconomic indicator that aggregates transactions of goods and services into a single matrix and can calculate the cumulative economic benefits that spill over to each industry in the region due to new demand generated in the region. In this study, I assumed that the amount of money spent in Japan by foreign tourists visiting Japan is new demand, and estimated the average amount spent by tourists by nationality and the amount of economic ripple effects. I have selected the latest 2015 edition of the Japanese Input-Output Table medium classification (107 sectors) published by the Japanese Ministry of Internal Affairs and Communications (MIC). I obtained this data from e-stats, the portal site for Japanese Government Statistics.

## **4. Result**

### **4.1 What to expect when traveling in Japan**

Figures 2 and 3 show plots of principal component scores and eigenvectors up to the second principal component for the 21 items asked in the "Wanted to do before visit to Japan?". The contribution of the first principal component is 67.8% and that of the second principal component is 14.8%, which means that 82.6% of the original data can be summarized up to the second principal component.

From Figure 2, looking at the axis (x-axis) of the first principal component, Asian countries are positioned on the right and European, North American, and Australian countries on the left. Therefore, it can be inferred that the eigenvector of the first principal component with a positive value indicates the characteristics of the Asian region, while the eigenvector with a negative value indicates the expectations of travelers from the European region, etc. before visiting Japan. It also reads as if the groups are divided into quadrants 1 through 4 within the Asian and European regions, etc., respectively. On the other hand, figure 3 shows that positive characteristics include "shopping" and "theme parks", while negative characteristics include "Experience Japanese history/culture", "Experience Japanese everyday life", and "Eat Japanese food". Among Europe, North America, Australia, and other regions, the second quadrant can be divided into the following characteristics include "Nature/scenery sightseeing", "Walking in shopping districts" and "Stay in a Japanese-style inn", and in the third quadrant, "Drink Japanese alcoholic beverages". The two countries in the fourth quadrant are characterized as "None of the above," suggesting that there were expectations for Japan that were not fully grasped in this survey. In summary, Asian countries in the first quadrant, such as China, Hong Kong, Taiwan, and Thailand, are mainly interested in goods consumption, while European, North American, and Australian countries are mainly interested in experience consumption. Among them, Spain and Australia were looking forward to experiencing Japanese culture, the U.K. and Germany were looking forward to Japanese sake, and Korea and India had expectations of Japan that could not be captured by the survey.

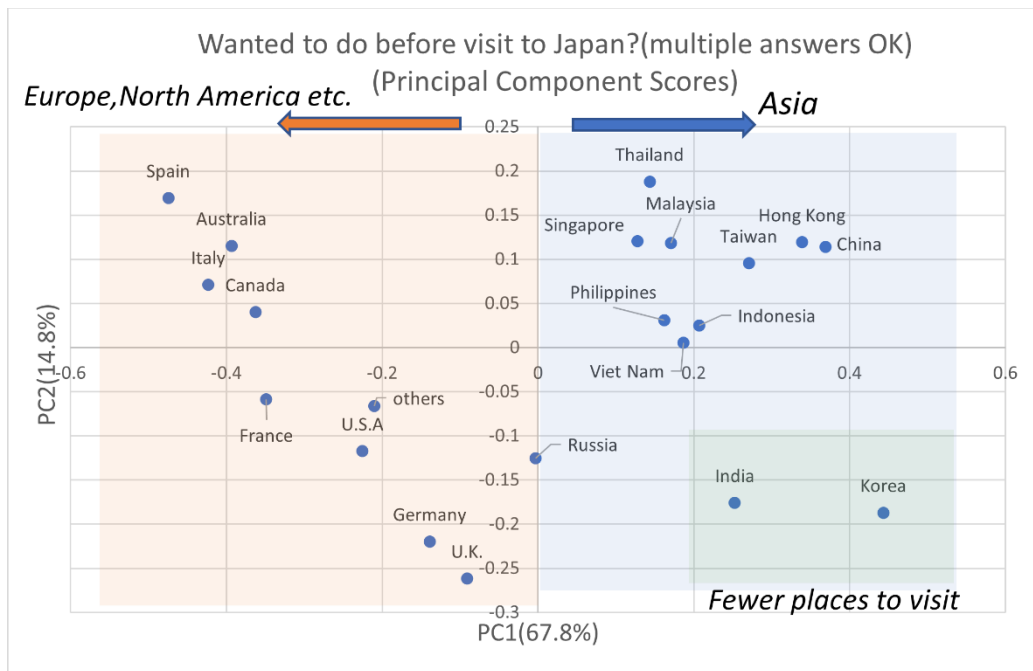


Figure 2 Wanted to do before visit to Japan? (Multiple answers OK)  
(Principal Component Scores)

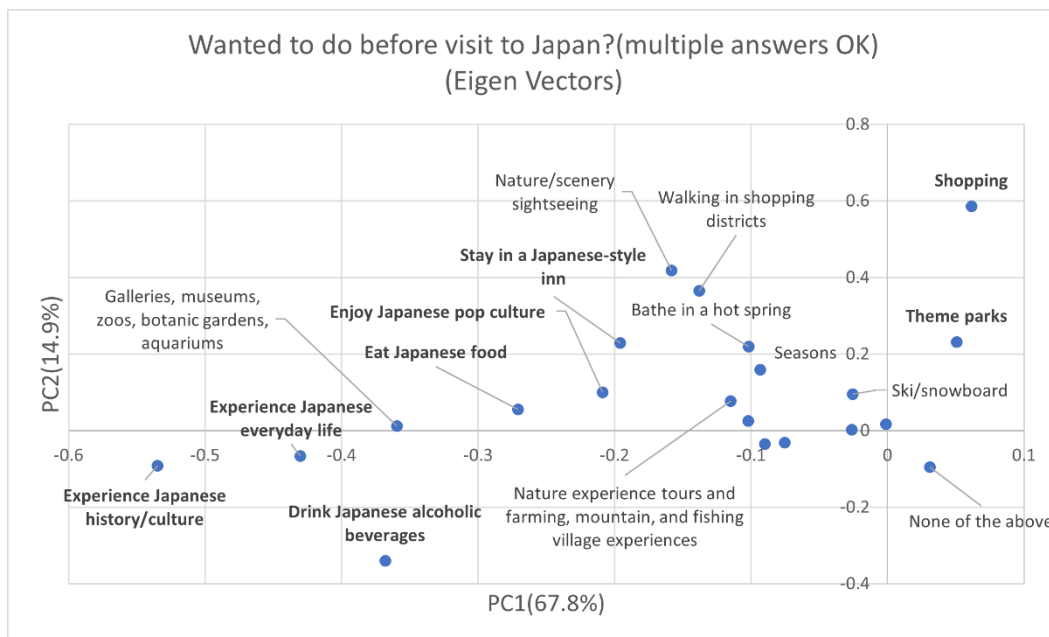


Figure 3 Wanted to do before visit to Japan? (Multiple answers OK)  
(Eigen Vectors)

#### 4.2 Economic ripple effects and spillover multipliers for Japanese industries

In this analysis, I apply an Input-Output analysis to consumption by nationality.” International Visitor Survey” examines the amount spent in Japan for a total of 39 items, including bus fare, museums, pharmaceuticals, confectionery, alcoholic beverages, and electrical appliances. The consumption amounts for these 39 items were converted into final demand for each industry by referring to the corresponding table of input-output

items published by the Ministry of Internal Affairs and Communications in Japan. We also standardized the final demand for each industry by dividing the total value of consumption by the value of final demand for each industry by nationality. Finally, by applying an input-output analysis to the standardized final demand figures, we analyze the impact of consumption behavior by nationality on Japanese industry and the magnitude of that impact.

Figures 4 and 5 plot the principal component scores and eigenvectors up to the second principal component by applying principal component analysis to the economic ripple effect amount resulting from applying an inter-industry analysis to the standardized consumption amounts by nationality. Figure 4 shows the cumulative economic ripple effect amount, and the economic ripple effect multiplier, which indicates the magnitude of the economic impact on Japan, is expressed by color. From Figure 4, looking at the axis (x-axis) of the first principal component, countries such as Europe, North America, Australia, and India are positioned on the right, and Asian countries excluding India are positioned on the left. Therefore, the eigenvector of the first principal component with a positive value is the economic impact on industries generated by travelers from the European region, etc., and the eigenvector with a negative value is the economic impact on industries generated by travelers from the Asian region. In terms of the economic ripple effect multiplier, the value is larger in the region on the right and smaller in the region on the left. In other words, the positive economic impact of consumption behavior in European region, etc. on the Japanese economy is larger.

Figure 5, the characteristics of the industries with the largest economic impact are “Drinking and eating service” and “Railroads” in the first quadrant, “food” and “Amusement and recreation services” in the second quadrant, “cosmetics”, “Medicaments”, “Organic chemical products”, and “Household electronic appliances” in the third quadrant, and “Accommodation” in the fourth quadrant. When viewed in conjunction with Figure 4, in the first quadrant, France, Spain, Italy, and other countries have a positive economic impact on the food service and transportation industries. In the second quadrant, many Asian countries have an impact on the food industry, theme park industry, etc. The third quadrant belongs only to China and has a significant impact on the cosmetics industry. The fourth quadrant includes countries such as India, the United Kingdom, the United States, Germany, and Australia, which have a significant impact on the lodging industry. Since the economic ripple effect is highly dependent on the domestic self-sufficiency ratio of each industry, the economic ripple effect multiplier is particularly high in countries that spend a large amount of money in the service industry, which tends to have a high self-sufficiency ratio. In other words, countries in Europe, where people tend to spend more on lodging, food, and beverage, etc., have a higher economic impact multiplier and are more likely to have a larger positive economic impact on Japan. On the other hand, in processing industries such as secondary industries, where raw materials must be imported, the self-sufficiency ratio tends to be lower than in service industries. Thus, the Asian region, which spends more money on food and cosmetics, has a smaller positive economic impact on Japan than, for example, the European region. However, since the economic ripple effect multiplier is more than twice as large, it can be assumed that twice the money they spend has a positive impact on each industry in Japan.

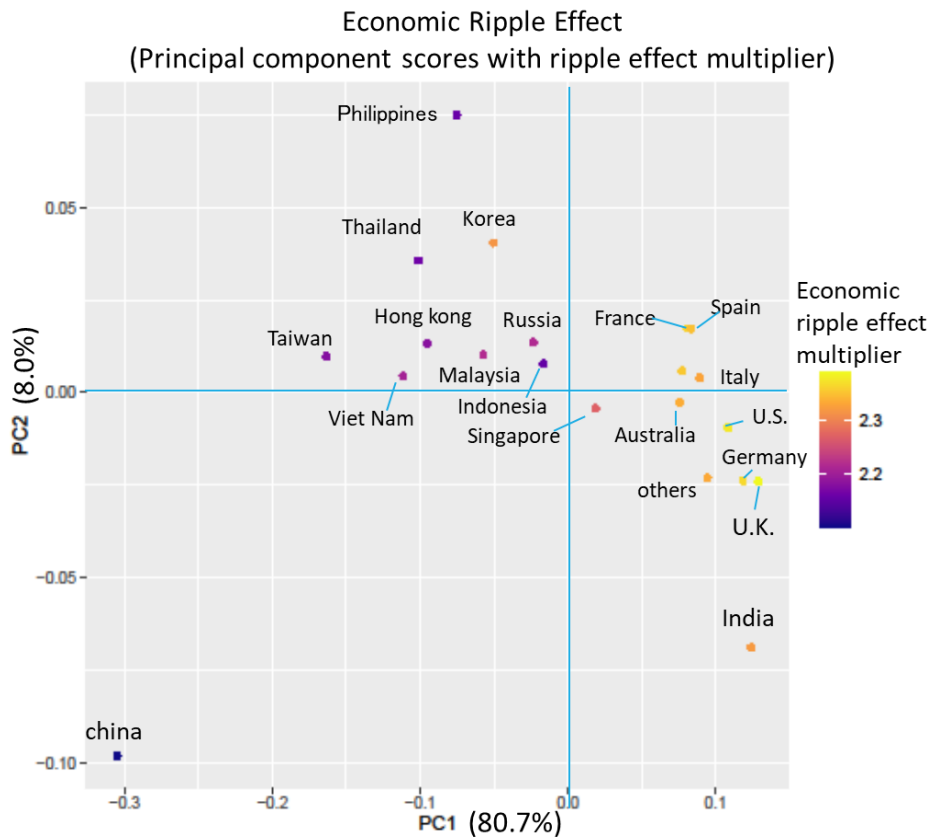


Figure 4 Economic Ripple Effect of consumption in Japan by nationality (Principal Component Scores)

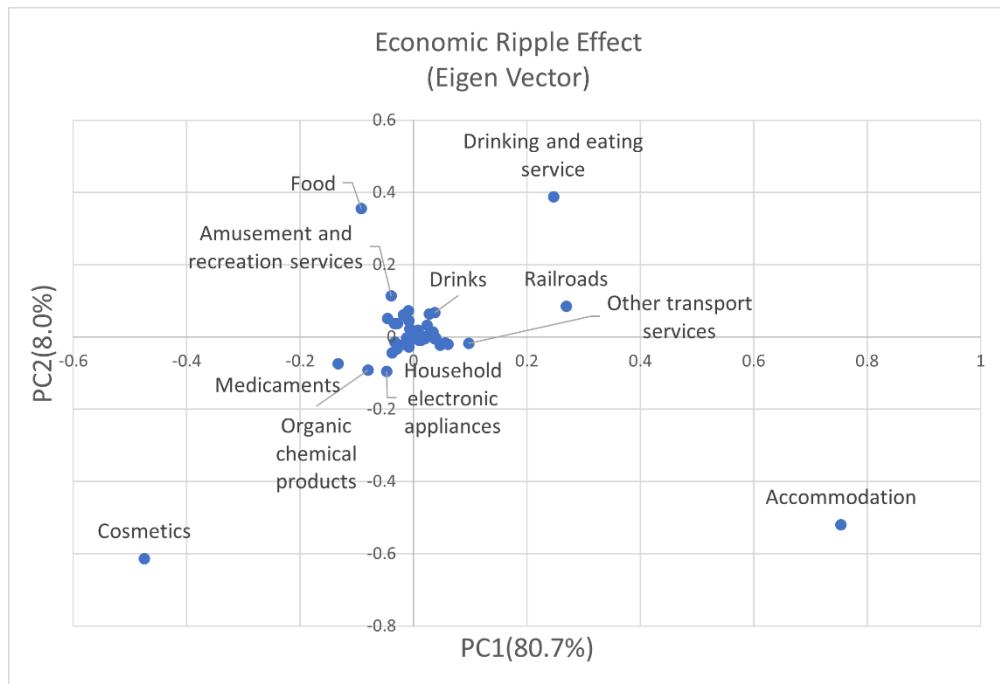


Figure 5 Economic Ripple Effect of consumption in Japan by nationality (Eigen Vectors)



## 5. Conclusion

This study analyzed the expectations of foreign visitors to Japan and the economic impact of their consumption on Japanese industry. In both cases, the expectations of Asian and European tourists differed greatly, with Asian tourists seeking shopping for food and beverages, cosmetics, etc., and European tourists seeking to experience Japanese culture. International travel will be curtailed after 2020 due to the global pandemic of COVID-19, a trend that is continuing as of January 2023, but the restrictions are gradually loosening. It is highly desirable to implement tourism policies in line with the countries' wishes so that visitors to Japan can experience the wonders of Japan.

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