

Statistical relation between foreign visitors to Japan for business and the amount of Japan's total trade

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Abstract

The world economy has suffered great damage due to the COVID-19 pandemic. China and North Korea enforced some strict infection control measures and 'zero-COVID strategy' is adhered, which limits human behavior including interactions. Although Japan is a little loosely regulated, the economic situation is becoming tougher and Japan is turning to a 'living with COVID strategy', which is adopted in Western countries. Also, accepting measures of visitors for sightseeing purposes are being relaxed in Japan to avoid becoming a tourism isolated country. It is important that the trade volume does not stagnate more than anything. The following questionnaire survey is being conducted with foreigners entering Japan, namely choosing one of three categories (sightseeing, business, others) as the visiting purpose. The relationship between the number of visitors who chose the business-category as the visiting purpose and the total trade is examined in this paper. As a result, it is recognized that there is a relationship, except when COVID-19 is widespread, and also there is especially a correlation between the number of visitors for business from China, USA, Taiwan and Thailand (except for South Korea) and the total trade of those countries, and it can be indicated using a simple linear regression. Total trade could be understood to be unaffected largely by the outbreak of infectious disease. The increase or decrease of visitors for business could be predicted using the simple regression equation in normal time.

Keywords

inbound tourist, total trade, visit on business-purpose, scattering diagram, COVID-19

1. Introduction

The world's social system is in turmoil because the pandemic COVID-19 continues even in 2022. Moreover, duplicate cases of great damage to the world economy are occurring, for example Russia invading the Ukraine. The invasion has had a great impact on the world because Russia and the Ukraine are both exporting countries of food and energy resources. The exchanging population is sluggish except for refugees due to the invasion. In Japan, economic indicators temporarily deteriorated due to COVID-19 (especially in the tourism industry), and national life is becoming more difficult by the decrease of imported volume of food and energy. However, the performance of large companies is on the rise in sales and profits. Infectious diseases have some effects on the tourism industry and some manufacturing industries, namely not only domestic tourists but also foreign tourists decrease sharply, and the service industry (including the transportation industry) will receive damage. It is necessary to build a new strategy to recover, for example improving the efficiency of business. Consequently, it is essential to introduce new strategies including DX (Digital Transformation) to aim for an early recovery.

Japan has adopted a 'zero-COVID strategy' so far, like China and North Korea, and banned foreign tourists from entering the country. In early 2022, Japan was the only country that had

adopted the strategy in G7 (Group of Seven), and the prostration of the Japanese tourism industry had reached its limit. Japan must make a policy change to a 'living with COVID strategy', like other G7 countries, for the industry to recover early. Although Japan's total trade decreased year-on-year in 2020 due to the occurrence of COVID-19, it has shown signs of recovery from 2021. The tourism industry has been recovering by relaxing immigration, as in Western countries, since July 2022.

The relationship between the number of foreign visitors to Japan for business (commercial) purposes and Japan's total trade is examined in this paper. A linear relationship was recognized between the number of visitors for business and total trade (except for South Korea). Total trade does not change largely even under the COVID-19 pandemic. Namely, the total trade with mainland China is also not changing largely before and after the outbreak of COVID-19 even if the visitor number decreases largely. It is recognized that the economic relationship between the countries is strong judging from the total trade amount of both countries. Total trade is almost unaffected by external factors (disasters and infectious diseases etc.). The characteristics of the number of foreign visitors to Japan for sightseeing have already been reported [Oyabu et al., 2022].

2. Number of visitors for business and Japan's total trade

Trade statistics of Japan were published by Ministry of Finance, namely Japan's total trade dropped from 155.5×10^{12} yen in 2019 to 136.4×10^{12} yen in 2020 and recovered to 167.8×10^{12}

yen (approximately a 23 % increase from the previous year) in 2021 [Ministry of Finance, 2022]. There was little knowledge of COVID-19 and trade volume was shrinking in 2020 [Oyabu *et al.*, 2021]. The 'living with COVID strategy' was adopted in Europe and America in 2021, and the volume expanded.

The number of foreigners visiting Japan was on the rise steadily until 2019 and it recorded 31.88 million (the travel consumption was 4.8 trillion yen) in the year [Oyabu *et al.*, 2019]. It was 4.12 million in 2020 (single digit decrease) and was 0.246 million (single digit reduction moreover) in 2021 due to Japan's border control measures. Similarly, the number of visitors for business decreased sharply. It is expected to increase in 2022 because the 'living with COVID strategy' is adopted even in Japan.

In this study, a hypothesis, in which there is some relevance between the visitor number for business and total trade, is made and the verification is performed using a scatter diagram. The visitors for sightseeing purpose occupied around 90 % of the total foreign visitors until 2019 [Oyabu *et al.*, 2022]. The transitions of the number of foreign visitors for business and the total trade are shown in Figure 1. The visitors for business are decreasing sharply in 2020 and the decreasing rate in the total trade is small. The total trade records highs ever in 2021 [Ministry of Finance, 2022]. The correlation diagram for both

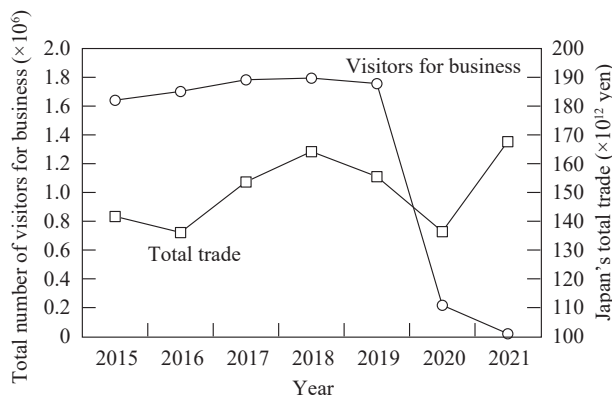


Figure 1: Number of visitors to Japan for business and Japan's total trade

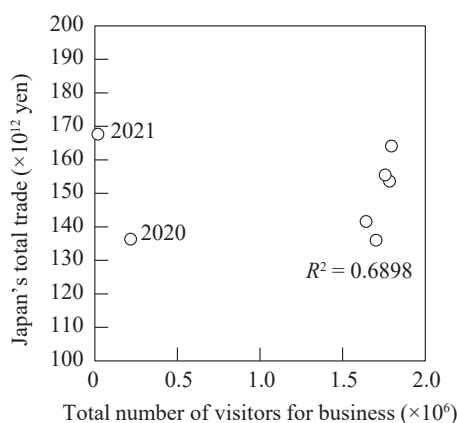


Figure 2: Correlation diagram of number of visitors for business and total trade

characteristics is indicated in Figure 2. The visitor number for business is small in 2020 and 2021, and these plots are located on the left side in the figure [Japan Tourism Agency, 2022]. There is a correlation in 2015 to 2019 if the data for 2 years (2020 and 2021) are omitted. The two years were during the COVID-19 pandemic. The coefficient of determination R^2 is 0.6898 ($R = 0.83$) and the value is quite large. It is thought that there is a strong correlation between the visitor number and total trade if there are not an infectious disease and important issues between nations.

The breakdown by nation of the visitors for business in 2019 (before COVID-19) is indicated in Figure 3. The top four countries/region exceed 58 % of the total, that is, China 21.25 %, South Korea 17.79 %, USA 12.31 %, and Taiwan 6.98 %. The value occupies less than 50 % if the USA, being far from Japan, is excluded. The visitors from these three countries/regions occupy about half of the total. On the other hand, the breakdown by nation of the total trade in 2019 is represented in Figure 4. The USA occupied the first place until 2006 and the percentage of total trade occupied 17.4 % of Japan's total trade. China occupied the first place from 2007 and the rate was 17.7 %. China occupied 21.3 % in 2019 [Ministry of Finance, 2022]. The number of visitors from South Korea for business in 2019 is in second place and the total trade of South Korea is in 3rd place. The Supply chain ties between Japan and the USA tends to weaken as the distance between the countries is far compared to China. As a result, the total trade with China increases and the one for the USA decreases as a percentage [Sun *et al.*,

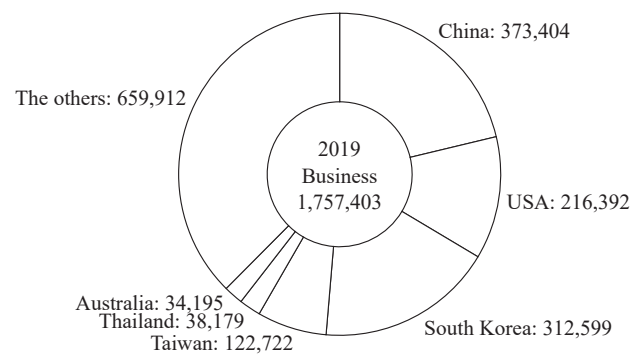


Figure 3: Number of visitors for business in 2019 before COVID-19

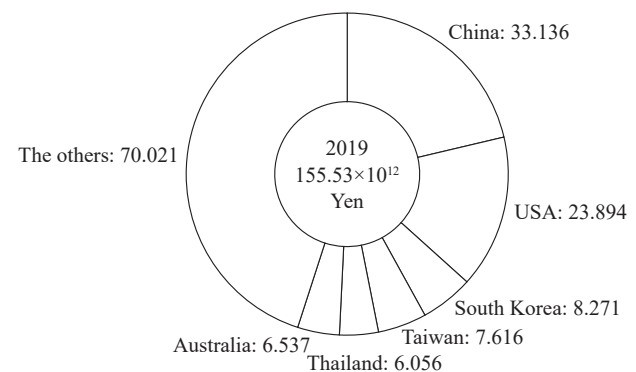


Figure 4: Breakdown of total amount of trade in 2019

2019]. The increasing trend with China will continue because there is a high potential unless there are serious issues (including an infectious disease outbreak) between the countries. China is a neighboring country and the market size is large. It is essential to strive to build good relationships in all fields including not only trade but also human exchange.

The correlation diagram of the number of visitors for business purpose from each country and the trade amount in 2019 is demonstrated in Figure 5. There is a strong correlation except for the plot of South Korea. The amount of trade with South Korea is small although the number of visitors is large. It is thought that bilateral relations are also influential, namely there are some historical issues such as the comfort women issue. And, a strong supply chain could not be built. There is a potential to increase the trade amount if the issues between the countries are resolved in the future. The improvement measures of the relationship, which can be acceptable in both South Korea and Japan, are urgently required.

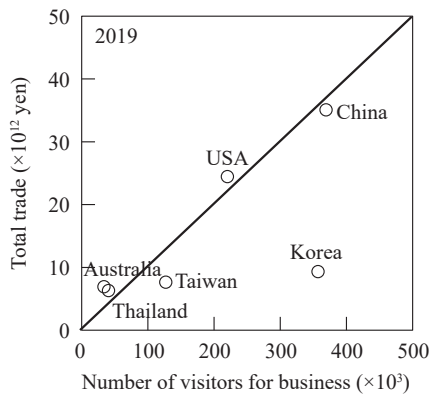


Figure 5: Correlation diagram of number of visitors for business and total trade in the main countries in 2019

3. Number of visitors for business purpose and the trade amount under COVID-19

The number of foreigners visiting Japan dramatically decreased due to COVID-19 since September 2020. The total number was about 4.16 million in 2020, and the percentages for the three purposes were as follows:

- Sightseeing: 80.48 %
- Business: 5.25 %
- Others: 14.27 %

The measures against COVID-19 were not implemented until January 2020 and the number was the same as usual in the month. It decreased to 1.1 million in February and decreased to thousands after that. The monthly transition of the number is indicated in Figure 6. Moreover, it decreased by the Japanese ‘shoreline operations’ (immigration restrictions) in 2021 and the total number was reported to be 245,862 (provisional value) by Japan National Tourism Organization (JNTO). The monthly transition of the number in 2021 is indicated in Figure 7. There

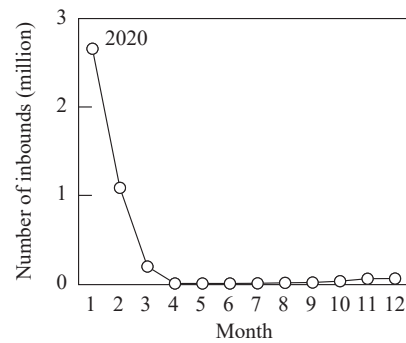


Figure 6: Monthly data of foreigners who visited Japan in 2020

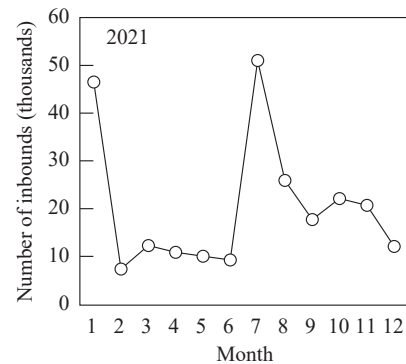


Figure 7: Monthly data of foreigners who visited Japan in 2021

are about 50,000 immigrants in January and May and about 10,000 to 20,000 visitors in other months. These characteristics strongly depend on Japanese immigration restrictions executed intermittently. The percentages for the three purposes in 2021 were as follows:

- Sightseeing: 27.00 %
- Business: 7.46 %
- Others: 65.54 %

The percentage for sightseeing drops largely compared to 2020 and the others increase. The number of visitors for sightseeing purpose decreases remarkably due to Japanese immigration restrictions when an infectious disease is occurring. It occupies around 90 % of the total in normal times. On the other hand, the percentage of others (overseas study, and visiting relatives etc.) increases.

There are no big changes in the total trade compared with the number of foreigners visiting Japan during COVID-19. The breakdown of Japan’s total trade in 2020 is shown in Figure 8. The value decreases by 12 % compared with the one in 2019, and other countries decrease except for China and the USA [Inoue et al., 2022]. It is thought that Japan has strong economic ties with these two countries. The scatter diagram between the trade amounts of major nations and the number of visitors for business purpose is expressed in Figure 9. This figure has the same format as Figure 5. The plot for South Korea is off the trend line, and is located in the lower right of the figure. This trend is similar to 2019. Although the number of foreign visi-

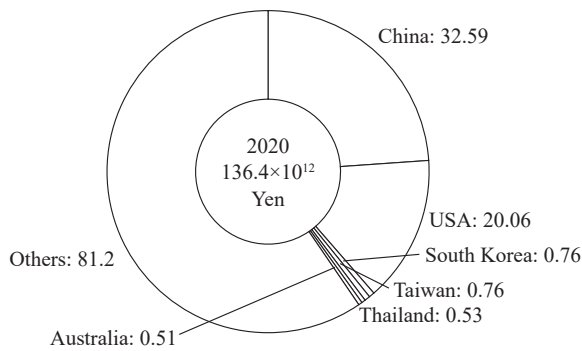


Figure 8: Breakdown of total trade in 2020

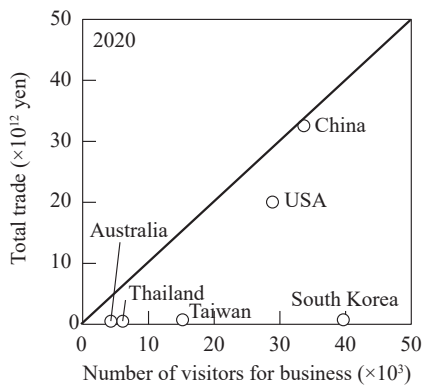


Figure 9: Correlation diagram of number of visitors for business and total trade in the top countries in 2020

tors to Japan will decrease when an infectious disease spreads, the decrease in total trade is small compared with the decrease in the number, because the logistics in each country forms a chain and the interdependence is high. The interdependence between South Korea (the closest neighboring country) and Japan in trade is comparatively low, however the number of visitors is large. The trade stability could be constructed when a logistic network forms a strong supply chain even when an infectious disease is occurring. Major countries (including Thailand and Australia in addition to China) must be included in the chain.

4. Characteristics of China

China has the largest proportion in Japan's total trade and number of visitors. The percentage of China in total trade occupies 21.3 % in 2019 (before the outbreak of COVID-19) and it is the largest. And, the number of Chinese visitors occupies 30 % and it is also the largest. The number of visitors from South Korea occupies 17.5 % and the percentage is second place but the ratio of the total trade (5.3 %) is third place. The percentage of the USA in total trade is second place. There is a twisting phenomenon in the percentages [Kim *et al.*, 2021]. It is a peculiar characteristic. The number of visitors for business purpose from China was maintaining just under 400 thousand before the outbreak of COVID-19 and was slightly on the rise. It decreased largely in 2020 and it was 3.8 thousand in 2021. The number for sightseeing purpose had almost the same ten-

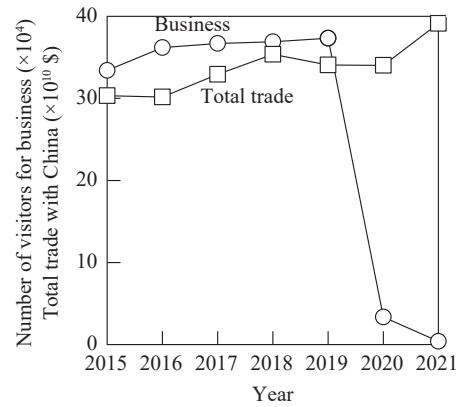


Figure 10: Number of Chinese visitors to Japan for business and total amount of trade with China

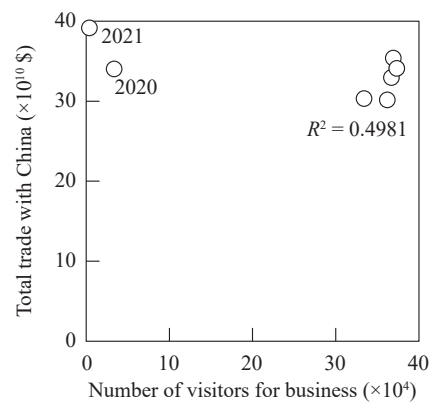


Figure 11: Correlation diagram of number of Chinese visitors for business and total amount of trade with China

density. The transition of the business-purpose number is shown in Figure 10. The figure is very similar to Figure 1. The scatter diagram was introduced in the same way as in Figure 2 and the result is shown in Figure 11. The derived coefficient of determination R^2 is 0.4981 before the outbreak of COVID-19 (from 2015 to 2019) and the correlation coefficient R is 0.7 which is lower than the case of Figure 2. The one for the USA is 0.5987 ($R = 0.774$). It is necessary to understand the data of these countries. The number of total visitors from China in 2021 was only 42,239 and the percentages are as follows:

- Sightseeing: 9.12 %
- Business: 9.08 %
- Others: 81.80 %

Both numbers of foreign visitors to Japan and Japanese departures decrease largely when an infectious disease occurs. These values depend strongly on the entry measures of each country. It is difficult to predict the number of immigrants in the case of an emergency, such as the pandemic of an infectious disease, because it is affected by many factors, for example the source of infection, drug and vaccine developmental statement, mobility of persons, and compliance rate for infection control

measures.

Japan's travel and tourism development capabilities ranked 1st place in 2021 for the first time according to a World Economic Forum (WEF) announcement [Katagiri, 2022; World Economic Forum, 2022]. The transportation infrastructure and cultural and natural resources fields were highly rated in the examination, and it was said some improvements were required in terms of environment sustainability and price competitiveness. It is necessary to have productivity improvement measures using DX to increase price competitiveness. It is important to build and verify government-led improvement measures in the fields of disasters (including infection) and the environment. And, a raising of the awareness of each and every citizen is required. Whole measures lead to the increase in non-resident population and the basis of a diplomacy understanding of Japan. It is necessary moreover to enhance tourism development capabilities. It is also thought these indexes lead to an increase in the amount of trade. All stakeholders have to keep an eye on these indexes.

5. Conclusion

The number of foreign visitors for business purpose and the trade amount are examined in this study. There are big differences in the number and amount before and after the COVID-19 outbreak. A single-digit decrease in the number of foreign visitors was observed and it was a drop of several tens of percent in the trade amount. There was a strong correlation ($R = 0.83$) between the number of visitors for business purpose and the trade amount before COVID-19. The R was 0.70 in the case of China and the value was somewhat smaller. There is a peculiar relationship in the case of South Korea, namely the amount is small, regardless of the large number of visitors. The decrease rate of trade amount is small even if the number of foreign visitors was significantly reduced due to the COVID-19 pandemic or large-scale natural disaster. The amount is on the rise in units of several years. Especially the trade amounts with China and the USA do not fall too much, namely these countries have strong economic ties with Japan. The rates of visitors for sightseeing and business purposes decrease and the rate of others (visiting relatives, etc.) increases greatly during an infectious disease pandemic in spite of the decrease in the total number of foreign visitors. Japan has to keep an eye on the trends of visitors to Japan and trade amount during infectious diseases and disasters from now on. And, the nation has to be constantly establishing a flexible domestic system, moreover it is essential to increase productivity in rural areas.

The characteristics of visitors in each region will be understood through future work. Especially, the Hokuriku area will be examined because the characteristics of the area are greatly different from Japan as a whole.

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