

Economic, Social and Environmental Consequences of the Decline in Foreign Tourist Demand in Japan due to the COVID-19 Pandemic

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Travel restrictions owing to the COVID-19 pandemic dramatically reduced the number of foreign visitors to Japan. Although Japan has doubled inbound revenue since 2012, that of 2020 was approximately 85% less than previous year due to the pandemic. Moreover, tourism is closely connected to various industries such as eating services. Therefore, the loss of tourism demand spills over into other domestic industries. The impacts spread across economy, society, and environment in Japan. When policymakers consider countermeasures against the COVID-19 pandemic, they should comprehensively evaluate the economic, social, and environmental impacts of the pandemic and efficiently allocate limited resources to important stakeholders. However, there are some difficulties in quantifying the impacts of the pandemic exactly and comprehensively. Considering this situation, the research question of this study is to evaluate the exact impacts of the pandemic and identify stakeholders indirectly affected by inbound markets because industries are closely connected in various markets.

The novelties of this study are to identify important stakeholders (i.e., key industrial sectors) in the supply chains associated with the inbound final demand and to suggest concrete policies to not only recover the economic activities centered around the key sectors largely affected by the pandemic but also mitigate CO₂ emissions associated with the tourism supply chains.

We developed a novel analysis framework combining an input-output analysis framework with a counterfactual model (with and without the pandemic) to determine the final demand by foreign visitors and to quantify the direct and indirect value-added losses (economic impact), employment-opportunities losses (social impact), and CO₂ reductions (environmental impact) caused by the decline in foreign tourism in Japan. In the counterfactual model, we used a linear trend model specified by using the ordinary least squares method.

We used the number of foreign visitors to Japan from the Japan National Tourism Organization, the per capita travel consumptions of visitors from 21 countries and regions to Japan from the Japan Tourism Agency was used to estimate, the 2015 input-output table from the Ministry of Internal Affairs and Communications, and the embodied energy and emission intensity data from 3EID (Nansai et al., 2022).

These direct losses of final demand directly and indirectly induced 5.8 trillion JPY (44.1 billion U.S.\$) of value-added loss (economic impact), loss of labor opportunities of 980 thousand people (social impact), and 14.1 Mt-CO₂ of CO₂ reduction (environmental impact). Our data, which identified the impacts by industrial sectors, can be used to provide evaluation criteria for the distribution of limited resource taking into those three aspects.

These three aspects (economic, social, and environmental) were strongly affected by hotels, eating and drinking services, and rail passenger transport, which account for a large part of tourist consumption tendency. In particular, accommodations and eating and drinking services induce a huge electricity demand and indirectly contribute to the reduction of CO₂ emissions from the electric-supply industry. Accordingly, we suggest two important factors for the development of the most sustainable and efficient countermeasures: recovery of economic and social losses and reduction of the CO₂ emissions associated with the inbound final demand. Firstly, to recover the

economic and social loss, we recommend that the government should offer stipends for each sector depending on the magnitude of the loss, and our data can be used to provide evaluation criteria for the distribution. Policymakers should consider ways to restore the economy, identified by the amount of value-added loss. The results of our analysis cover not only the direct effect, which is easy to recognize without any calculations, but also the indirect and income effects, which are more difficult to estimate and more easily overlooked. Therefore, if policymakers aim to consider ways to reduce unemployment risks due to the pandemic, they can use the result of the social impact in the same way as the economic impact. Secondly, we recommend that the government incorporates a mechanism into the counter-COVID-19 measures to determine the incentives that should be distributed to the industries to improve business conditions while reducing their environmental impact. The main source of CO₂ emissions in Japan's inbound-related supply chain is the sector that generates electricity to supply the hotel and eating and drinking service industries. Ultimately, efforts must be made to reduce the CO₂ emissions associated with economic activities in the two industries.