The Triple Bottom Line Analysis of the Decline in Foreign Tourist Demand in Japan due to the COVID-19 Pandemic: A Counterfactual Structural Path Analysis

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The COVID-19 pandemic brought significant risks to the tourism industry, exemplified by Japan's experience. Despite adopting policies to boost tourism, including visa easing and expanded shipping routes, Japan faced an 87% decline in foreign visitors in 2020 due to lockdown measures. This led to substantial economic losses. While the pandemic has somewhat subsided by 2024, the tourism industry remains vulnerable to potential pandemics and other disasters, such as earthquakes and terrorism, given its reliance on human mobility. Recognizing the importance of the tourism sector, the Japanese government must formulate disaster preparedness policies, considering economic, social, and environmental aspects. This study aims to quantitatively assess the detailed impacts of the COVID-19 pandemic on the tourism industry using Input-Output analysis, SDA analysis, and SPA analysis.

To evaluate the economic, social, and environmental repercussions of the COVID-19 pandemic in 2020, two scenarios were defined: one with and one without the pandemic. The 'with-COVID' scenario reflects the actual conditions, incorporating the 2020 foreign visitor numbers to Japan and per capita commodity consumption. Conversely, the 'non-COVID' scenario serves as a counterfactual, estimating foreign visitor numbers and commodity consumption as if the pandemic did not occur. In each scenario, a new consumption-endogenous input-output analysis framework was developed, encompassing a counterfactual model for both pandemic and non-pandemic situations. This allowed for an examination of the direct, indirect, and income-induced economic, social, and environmental effects resulting from the decline in travel consumption by foreign visitors in 2020. Furthermore, a counterfactual Structural Decomposition Analysis (SDA) framework was constructed, considering economic structures with and without the pandemic. This assisted in identifying primary factors contributing to changes in economic, social, and environmental effects. Ultimately, a Structural Path Analysis (SPA) framework was applied to identify key supply chains associated with economic, social, and environmental impacts, respectively."

Our findings revealed that the pandemic caused a decrease of 33 million foreign tourists in Japan, resulting in economic losses of 5.88 trillion JPY (approximately 39.6 billion U.S. dollars as of October 15, 2023), social losses affecting 956 thousand people, and environmental benefits equivalent to 12.9 Mt-CO2 emissions. 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, hotels and eating and drinking services induce a huge electricity demand and indirectly contribute to the reduction of CO2 emissions from the electric-supply industry.
Decomposition results further showed that the sharp decline in final demand by foreign visitors to Japan due to the COVID-19 pandemic led to a 100.4% reduction in value added. Conversely, a shift in the production structure under the pandemic contributed to a 2.9% increase in CO2 emissions.

In conclusion, we propose two crucial factors for the development of the most sustainable and efficient countermeasures: (1) the recovery of economic and social losses and (2) the reduction of CO2 emissions associated with inbound final demand. To address economic and social losses, the government should provide sector-specific stipends based on the magnitude of the losses, and our data can serve as evaluation criteria for distribution. Our analysis encompasses not only the easily

recognizable direct effects but also the more challenging-to-estimate and often overlooked indirect and income effects.

To sustain the reduction of CO2 emissions linked to inbound final demand, we recommend the government integrate a mechanism into counter-COVID-19 measures. This mechanism should determine incentives for industries to enhance business conditions while simultaneously reducing environmental impact.

As of February 2024, the risk of another pandemic due to the emergence of a mutant strain cannot be entirely dismissed. Furthermore, the vulnerability of inbound tourism-related industries revealed in this study is susceptible to risks beyond COVID-19. This study offers crucial insights for stakeholders to consider in measures implemented by the Japanese government in the event of a future pandemic recurrence or unforeseen disasters.