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

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The COVID-19 pandemic brought significant risks to the tourism industry, exemplified by Japan's experience. 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, and Structural Path Decomposition (SPD) 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 SPD framework was applied to identify key supply chains associated with economic, social, and environmental impacts, respectively.

The pandemic caused a loss of 33 million foreign tourists in Japan, leading to economic losses of 3.44 trillion JPY (22.7 billion USD), social losses affecting 869,000 individuals, and environmental benefits equivalent to a reduction of 11.6 Mt-CO2 emissions. Key sectors impacted included hotels, eating and drinking services, and rail passenger transport. These sectors significantly influence electricity demand and indirectly reduce CO2 emissions from the electric-supply industry. Decomposition results further showed that hotels are strongly connected with electricity and waste management.

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 in industries to enhance business conditions while simultaneously reducing environmental impact. and 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.