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Economic Impact of Inbound Tourism in Tokyo and Its Regional Spillovers: A Multi-Regional Input-Output Analysis

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Background

Tokyo remains the most visited destination for inbound tourists in Japan. Inbound tourism generated substantial local economic impact across sectors such as accommodation, food services, retail, transportation, and recreation, with effects extending to neighboring prefectures. An Input-Output table is an analytical framework used to describe the economic interdependencies between different sectors within one economy in a matrix form. Multi-Regional Input-Output (MRIO) tables capture inter-industry and interregional linkages, enabling analysis of both direct and spillover effects. This framework provides a comprehensive view of how inbound tourism influences regional economies.

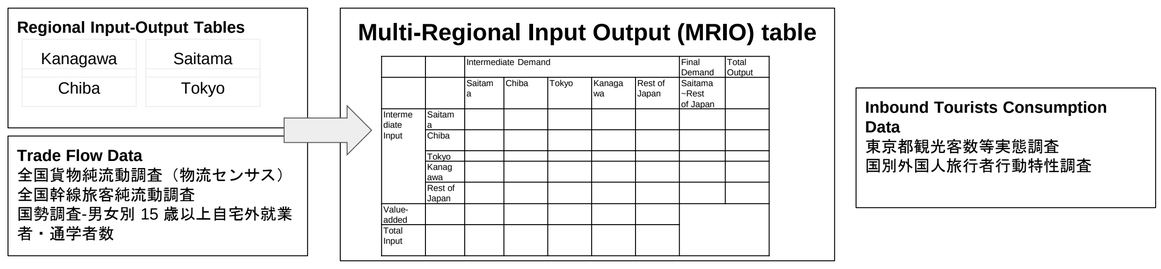
Objective

- Develop a multi-regional input output (MRIO) table, consisting of One Metropolis, Three Prefectures (Itto Sanken)
- Analyze the economic impact of inbound tourism in Tokyo and its spillover effects across the neighboring prefectures using input-output model

Dataset

- The main datasets are 2015 Input-Output Tables for Tokyo, Saitama, Chiba and Kanagawa, respectively.
- We use Freight Census Data, employees' commuting of the National Census and Survey on Trunk Passenger Flow to estimate the trade flow between prefectures
- Inbound tourism expenditure data were sourced from the 2015 Tokyo Tourist Survey and Foreign Visitor Behavior Survey, and mapped to producing sectors as final demand in the input–output model.

Framework



1. MRIO Table Construction

Sector classifications were first aligned across the four regional tables.

Trade flows were estimated via a doubly constrained gravity model and adjusted by RAS method, then used to link regional IO tables into a consistent four-region MRIO table.

2. Input Output Model

The induced production resulting from international visitor spending can be calculated as:

$$\Delta \boldsymbol{X} = (\boldsymbol{I} - \boldsymbol{A})^{-1} \Delta \boldsymbol{Y} \tag{1}$$

where $\Delta \boldsymbol{X}$ is the change in total output across industries, $\Delta \boldsymbol{Y}$ is the change in final demand caused by inbound tourism, $\boldsymbol{A}$ is the input coefficient matrix, and $(\boldsymbol{I} - \boldsymbol{A})^{-1}$ is the Leontief inverse matrix. This equation reflects both direct and indirect production effects triggered by tourism-related final demand across all sectors.

3. Structural Path Analysis

To supply the production of the tourism-related sector, there are multiple paths originating from a complex network of intersectoral linkages. To determine the key paths in the supply chain, we decompose the Leontief inverse matrix $(\mathbf{I} - \mathbf{A})^{-1}$ by applying its Taylor series expansion.

$$\Delta \boldsymbol{X} = (\boldsymbol{I} - \boldsymbol{A})^{-1} \Delta \boldsymbol{Y} = \boldsymbol{I} \Delta \boldsymbol{Y} + \boldsymbol{A} \Delta \boldsymbol{Y} + \boldsymbol{A}^2 \Delta \boldsymbol{Y} + \boldsymbol{A}^3 \Delta \boldsymbol{Y} + \cdots \tag{2}$$

where $\boldsymbol{A}^t \Delta \boldsymbol{Y}$ represents the impact from the t-th production layer. By tracing these layered contributions, structural path analysis enables the identification of the most influential supply chain that contribute to the tourism-induced economic impact.

Result

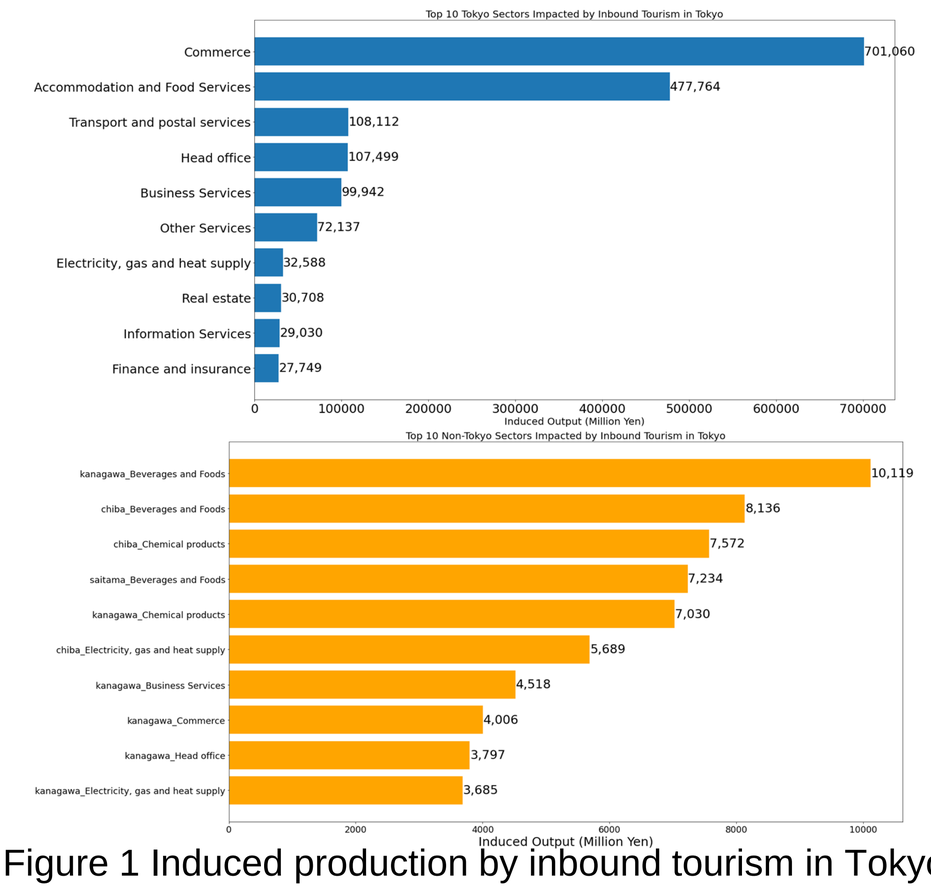


Figure 1 Induced production by inbound tourism in Tokyo

Sector	Affected Region	Tourism Sector Multiplier	Non-Tourism Sector Multiplier	Total Multiplier	Sector	Affected Region	Tourism Sector Multiplier	Non-Tourism Sector Multiplier	Total Multiplier
Commerce	Tokyo	1.1615	1.2055	2.3670	Accommodation and Food services	Tokyo	1.0046	0.0156	1.0202
	Saitama	0.0558	0.4280	0.4838		Saitama	0.0001	0.0001	0.0002
	Chiba	0.0524	0.4309	0.4833		Chiba	0.0000	0.0001	0.0001
	Kanagawa	0.0460	0.3598	0.4058		Kanagawa	0.0001	0.0001	0.0002
Transport and postal services	Tokyo	1.1448	0.4220	1.5668	Other Services	Tokyo	1.0740	0.4233	1.4972
	Saitama	0.0269	0.1943	0.2212		Saitama	0.0080	0.0577	0.0657
	Chiba	0.0242	0.1482	0.1724		Chiba	0.0067	0.0475	0.0541
	Kanagawa	0.0228	0.1548	0.1776		Kanagawa	0.0077	0.0577	0.0654

Table 1 Production Multiplier of Tourism Sectors

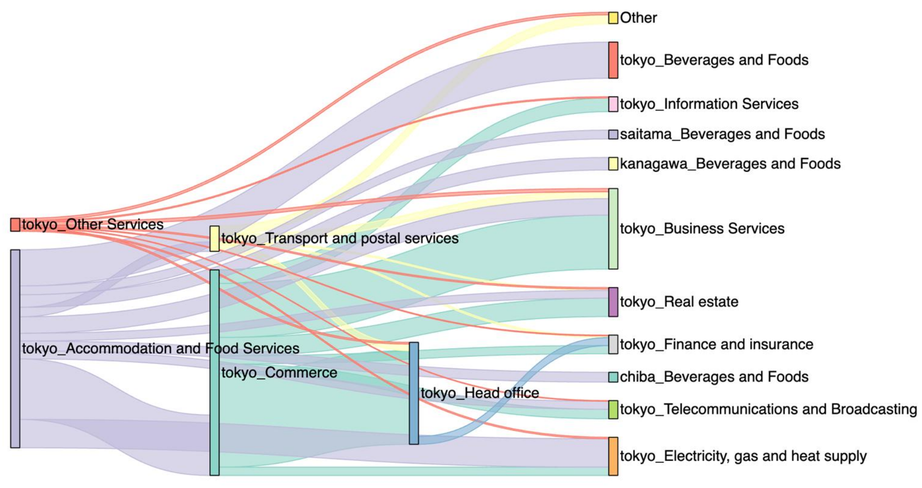


Figure 2 Structural Path Analysis of Tourism Sectors

Conclusions

Based on inbound tourism expenditures in Tokyo, we observed significant induced production effects within Tokyo, particularly in the tertiary sector. The Commerce sector exhibited the largest overall impact, both within Tokyo and in neighboring prefectures. In surrounding prefectures, spillover effects were concentrated in upstream manufacturing sectors such as Beverages and Foods and Chemical Products, rather than in tourism-related industries. These patterns reflect the dominant role of Tokyo's service-based economy in absorbing tourism demand, with indirect effects partially transmitted through upstream interregional supply chains.