**Signifikan:** Jurnal Ilmu Ekonomi
Volume 14(2), 2025: 521 - 536
P-ISSN: 2087-2046; E-ISSN: 2476-9223
https://doi.org/10.15408/sjie.v14i2.46490

# Do Tourism-Related Sectors Drive Most of the Economy in Toba Regency? A RAS-based Regional Input-Output Analysis

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**JEL Classification:**
D57
R15
R58

*Received: 23 June 2025*

*Revised: 8 September 2025*

*Accepted: 12 September 2025*

*Available online: October 2025*

*Published regularly: October 2025*

## ABSTRACT

**Research Originality:** This study constructs the first regional Input–Output (RIO) table for Toba Regency in 2023, utilizing the iterative RAS technique to adapt provincial coefficients to local macroeconomic data.

**Research Objectives:** To estimate sectoral interlinkages, multiplier effects, and labor intensity for Toba Regency, and to identify strategic sectors that can drive regional economic growth and inform evidence-based policymaking.

**Research Methods:** The 2016 North Sumatra I–O table was regionalized into a 22-sector Toba Regency table through RAS, with row and column sums adjusted to match Toba Regency GRDP by industry and expenditure. The resulting table was analyzed to calculate backward and forward linkages, output multipliers, and labor intensity.

**Empirical Results:** The local economy is primarily driven by paper manufacturing, agriculture, and construction, while the tourism sector contributes only 6.2 percent of output and exhibits weak forward linkages. This finding suggests limited integration of tourism-related activities into the local supply chain. Electricity, business services, and agriculture emerge as growth drivers, while wage disparities persist in low-productivity service sectors.

**Implications:** The approach can guide other subnational governments in producing localized Input–Output (I–O) tables, thereby enhancing evidence-based policymaking.

**Keywords:**

Input-Output analysis; RAS technique; sectoral interlinkages; regional growth diagnostics; regional development policy

**How to Cite:**

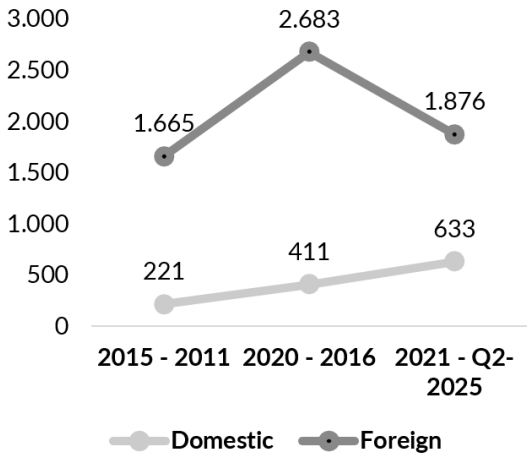
Susanti, H., Revindo, M.D., Iskandar, S.D., Nusantoro, N., & Sabrina, S. (2025). Do Tourism-Related Sectors Drive Most of the Economy in Toba Regency? A RAS-based Regional Input-Output Analysis. *Signifikan: Jurnal Ilmu Ekonomi*, *14*(2), 521-536. https://doi.org/10.15408/sjie.v14i2.46490.

## INTRODUCTION

Regional development planning requires accurate and timely information on the structure of local economies and the interlinkages between sectors. Input-Output (I–O) analysis, first introduced by Leontief (1936), remains the most widely applied tool for this purpose, enabling policymakers to estimate the ripple effects of sectoral changes on output, employment, income, and regional supply chains. Its ability to reveal backward and forward linkages is valuable for identifying key sectors, quantifying multiplier effects, and assessing structural change (Dietzenbacher et al., 2019; Miller & Blair, 2009).

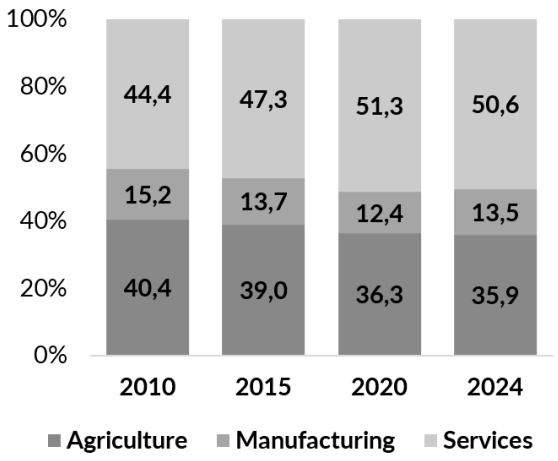
In Indonesia, official I–O tables are published by Statistics Indonesia (BPS) at the national and provincial levels. These tables are typically updated every five years and released with considerable delay. For example, the 2016 I–O table was released in 2020, and the 2020 table is expected in 2025. At the regency and city levels, I–O tables are rarely available because survey-based data collection is costly and complex, making subnational availability reliant on local government initiatives. As a result, policymakers at the regional and city levels often lack up-to-date transactional data to support their policymaking decisions. A small but growing set of local studies has begun to fill this gap. Examples include a 54x54 regional I–O (RIO) table for Tegal Regency, a 2020 RIO for Pangandaran Regency built from the West Java I–O table, and a recent RIO for Mataram City (Mumtaz & Sukarsih, 2021; Hendriany et al., 2024; Wibawanindah et al., 2024). These studies show that localized I–O is feasible and valuable, but coverage remains uneven.

**Figure 1. Investment Realization in Toba Regency (IDR billion)**




Source: CEIC

**Figure 2. Contribution of Main Economic Activities to Toba Regency GRDP (%)**




Source: CEIC

This study addresses the gap in the Toba Regency. Designated a Super Priority Tourism Destination in 2016, the region has experienced significant structural changes. Foreign direct investment surged in the early years, peaking during large tourism infrastructure projects, then declined as those projects concluded. Meanwhile, domestic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investment has expanded steadily and is now more than three times its pre-designation level, indicating greater reliance on local capital and a shift in resource allocation toward tourism-related development. These investment patterns align with the process of structural transformation. As shown in Figure 2, the share of the services sector (excluding construction) rose from 44.4 percent of Gross Regional Domestic Product (GRDP) in 2010 to 50.6 percent in 2024, while agriculture fell from 40.4 percent to 35.9 percent and manufacturing declined slightly from 15.2 percent to 13.5 percent. These dynamics reflect a gradual reorientation from primary and manufacturing activities toward a service-led growth, suggesting the need for a regency-level I–O table that captures evolving sectoral interlinkages and investment flows.

An RIO table would be constructed through a full or hybrid survey to measure intersectoral flows with the greatest accuracy (Stoeckl, 2012). However, such surveys are expensive and time-consuming, which makes them impractical for most regencies and municipalities. Consequently, regional economists often rely on non-survey methods to derive subnational I–O tables from national or provincial data. Among these, the Location Quotients (LQ) technique is the most common approach to adjust national coefficients based on the relative sectoral shares of regional and national output (Lampiris et al., 2020; Lamonica & Chelli, 2018), before applying the RAS technique to balance the RIO table. However, LQ methods assume identical production technologies across regions and often depend on outdated or incomplete sectoral share data. In rapidly evolving economies such as that of Toba Regency, where tourism-oriented policies are shifting production patterns, these assumptions can distort multiplier estimates and misrepresent both backward and forward linkages.

This study constructs a 2023 RIO table for Toba Regency to describe how the transformation driven by tourism is reshaping the economic structure. Existing work on Indonesia is primarily at the provincial level. To our knowledge, no study has reported sectoral linkages at the Toba Regency level or outlined a practical workflow that local governments can reuse when surveys are not feasible. Using updated subnational accounts and RAS balancing, we map sectoral linkages, multipliers, and labor intensity in Toba Regency. The table provides an initial map of where spillovers are strong and where supply chains remain shallow. The contribution of this study is both empirical and methodological, offering a reproducible template for regency-level I–O analysis and a baseline for tracking structural change in Toba Regency over time.

## METHODS

This study covers the Toba Regency I–O analysis for the year 2023, utilizing a 22-sector classification. Sector detail is expanded from the standard Statistics Indonesia (BPS) report of 17 sectors to 22 sectors, allowing for the separate identification of pulp and paper, accommodation, food and beverage services, wholesale and retail trade (excluding motor vehicles), and the land transport sectors, which are significant in explaining the economic structure of Toba Regency. In developing the Toba Regency I–O table, we start

from 2016 North Sumatra I–O table as the parent matrix for technical coefficients and combine it with 2023 Toba Regency's GRDP by industry (to anchor primary inputs and sector structure) and GRDP by expenditure (to anchor the composition of final demand: households, Non-Profit Institutions Serving Households (NPISH), government, Gross Fixed Capital Formation (GFCF), inventory change, exports, and imports). Employment and wage statistics were also merged to construct labor-intensity indicators.

The I–O table is a foundational tool for studying the interrelationships among sectors in a complex economic system. It captures all transactions of goods and services between industries (intermediate demand), final users (final demand), and value-added components such as labor and profits. Table 1 illustrates the structure of the I–O table. Let $X_{ij}$ denote the delivery of goods or services from the sector $i$ to sector $j$ for intermediate use; $F_i$ the final demand for the output of sector $i$; $V_j$ the value added generated by sector $j$; $X_i$ the total output of sector i (row total); and $X_j$ the total input of sector j (column total). The three quadrants, intermediate demand (Quadrant I), final demand (Quadrant II), and value added (Quadrant III), satisfy the balance conditions $\sum_j X_{ij} + F_i = X_i$ and $\sum_i X_{ij} + V_j = X_j$ for every sector. Accounting conventions follow Miller and Blair (2009) and BPS practice.

**Table 1. Input-Output Model Framework**

| **INPUT OUTPUT** | | **INTERMEDIATE DEMAND** (Quadrant I) | | | | **FINAL DEMAND** (Quadrant II) | **TOTAL OUTPUT** |
|---|---|---|---|---|---|---|---|
| | | **SECTOR** | | | | | |
| | | **1** ($j$ = 1) | **2** ($j$ = 1) | ... | ***n*** ($j = n$) | | |
| **SECTOR 1** | ($i$ = 1) | $X_{11}$ | $X_{12}$ | ... | $X_{1n}$ | $F_1$ | $X_1$ |
| **2** | ($i$ = 2) | $X_{21}$ | $X_{22}$ | ... | $X_{2n}$ | $F_2$ | $X_2$ |
| ... | ... | ... | ... | ... | ... | ... | ... |
| **n** | ($i = n$) | $X_{n1}$ | $Xn_2$ | ... | $X_{nn}$ | $F_n$ | $X_n$ |
| **GROSS VALUE ADDED** (Quadrant III) | | $V_1$ | $V_2$ | | $V_n$ | | |
| **TOTAL INPUT** | | $X_1$ | $X_2$ | ... | $X_n$ | | |

Source: BPS-Statistics Indonesia (2021)

Notation: $X_{ij}$ : input from sector $i$ used to produce output from sector $j$; $V_j$ : gross value added of sector $j$; $X_j$ : total input from sector $j$; $X_i$ : total output from sector $i$; $F_i$ : final demand from sector $i$

Since regency or municipal tables are rarely surveyed, the provincial table is regionalized to Toba using the RAS technique. RAS belongs to the iterative proportional fitting family and is widely used for non-survey regionalization. Nobel laureate Richard Stone formalizes the technique (Marangoni & Rossignoli 2016; Stone 1961). Given a base input coefficient matrix $A = (a_{ij})$ from the North Sumatra I–O table, RAS finds diagonal matrices $r = diag(r_i)$


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(row multipliers) and $s = diag(s_j)$ (column multipliers) such that the updated matrix $A_t = rAs$ matches target row and columns sums (sectoral totals). Here $r_i$ scales row $i$ and $s_j$ scales column $j$. For example, if $r_1 = 0.5$ and $r_2 = 2.0$ (with $s = 1.0$), the proportion of input 1 utilized in year $t$ is reduced to half of its base-year level, while the use of input 2 doubles. *If* $s_j = 0.5$ for a given column, the intermediate inputs share decreases by half. Thus, to maintain the total proportion of both equal to 1, the amount of primary input must adjust accordingly.

Although the RAS technique is often regarded as a simplified approach that may not fully capture the detailed economic conditions of a region, it remains a practical alternative for updating I–O tables by incorporating various macroeconomic assumptions. Furthermore, this technique is a replicable and transparent solution for regionalizing I–O tables when detailed data are unavailable (Flegg & Tohmo, 2013; Lampiris et al., 2020).

Using the RAS technique, provincial technical coefficients serve as priors; row and column totals are reconciled to Toba's 2023 macroeconomic targets through alternating row and column scaling until all margins match. Primary inputs by sector are taken from GRDP by industry, with imported primary inputs proxied by applying provincial import-to-input ratios where regency data are unavailable. Final-demand totals are taken from GRDP by expenditure; their initial sectoral allocation follows the provincial pattern and is then adjusted during the balancing. The process proceeds in three linked stages: (1) an initial balance to align primary inputs and total output with Toba totals; (2) an adjustment of the sectoral allocation of final demand to match expenditure aggregates; and (3) a final balance to ensure consistency across intermediate flows, primary inputs, and final demand (see Figure 3). Convergence is assessed by the reduction of margin errors below preset tolerances, alongside checks for non-negativity and structural plausibility (e.g., reasonable input shares and import propensities).

From the balanced table, we compute output multipliers, linkage indices, and labor-intensity measures. The structure of IO table (**Table 1**) allows us to measure multipliers and linkages. Define technical coefficients $a_{ij} = X_{ij}/X_j$ i.e., the share of inputs in sector $j$ sourced from sector $i$. Let $x = X_i$ be gross output and $f = [F_i]$ final demand. The demand-driven model is $x = Lf$ where $L = (I - A)^{-1}$ is the Leontief inverse. Type-I output (backward) multipliers for sector $j$ are the column sums $\sum_i \ell_{ij}$ of $L$. For supply-side responsiveness, we also report forward effects using the Ghosh formulation, with allocation coefficients $b_{ij} = X_{ij}/X_i$ and the Ghosh inverse $G = (I - B)^{-1}$. To summarize intersectoral relationships, we use linkage indices with $= L = \ell_{ij}$: (1) backward linkage (power of dispersion) for sector $j$:

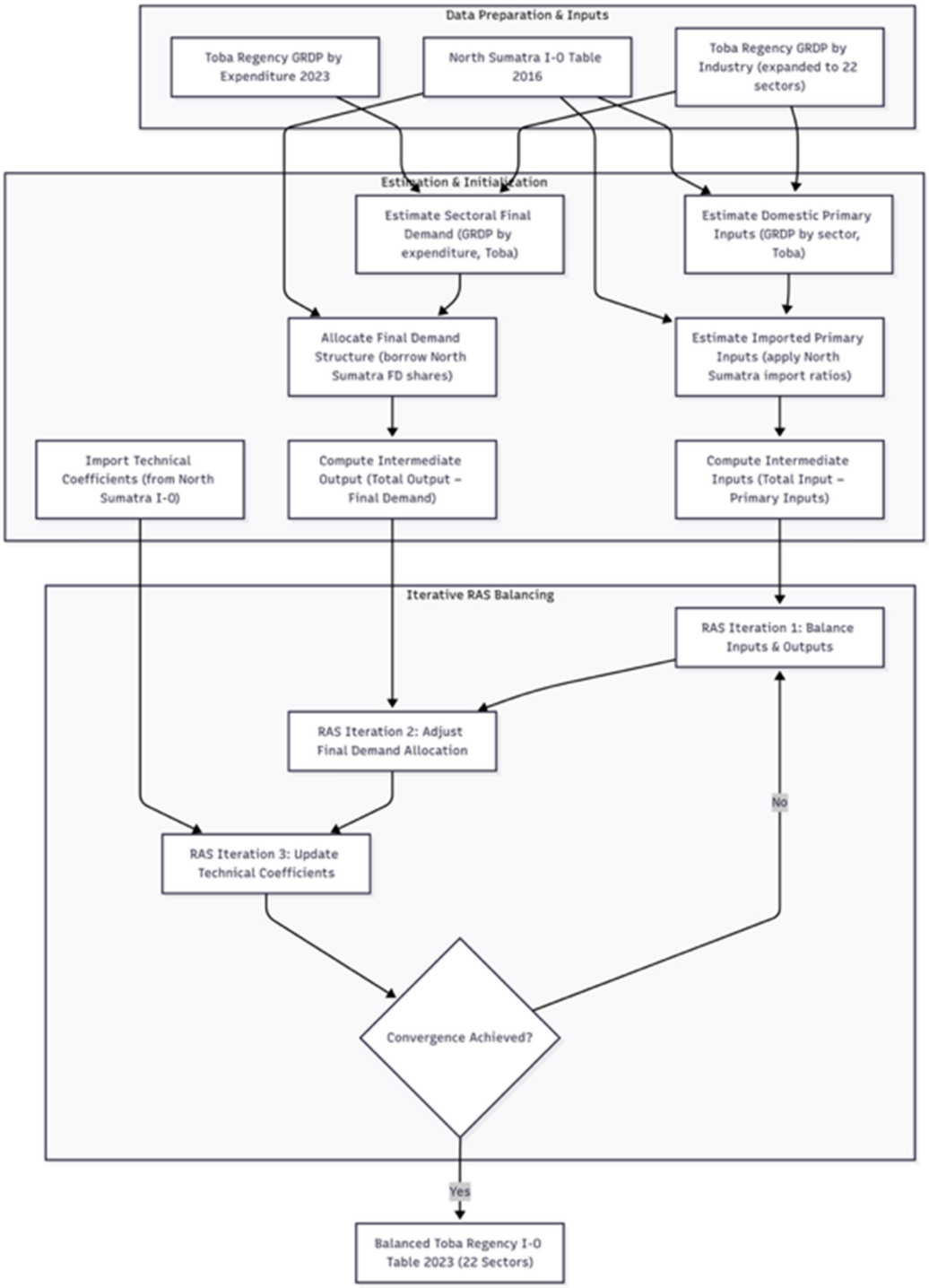
$$BL_j = \frac{n \sum_{i=1}^{n} \ell_{ij}}{\sum_{i=1}^{n} \sum_{j=1}^{n} \ell_{ij}}$$

$BL_j$ quantifies the extent to which a particular sector stimulates outputs and income creation across all sectors through demand for its products. The forward linkage (degree of sensitivity), which measures how responsive a sector is to the demand for its products from other sectors, for sector $i$ is formulated as:

$$FL_j = \frac{n \sum_{j=1}^{n} \ell_{ij}}{\sum_{i=1}^{n} \sum_{j=1}^{n} \ell_{ij}}$$

Sectors with values of *BL* and *FL* greater than one are classified as key sectors. Employment and wage effects of a final-demand vector *f* are obtained by premultiplying *L* by sectoral jobs or output and wage-bill or output coefficients.

**Figure 3. Regionalization Using the RAS Technique Framework**




Source: Authors' illustration (2025)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Moreover, the development of the RIO table for the Toba Regency also includes RAS convergence paths, margin matching errors, and sensitivity to import ratios. Nevertheless, we acknowledge that the main limitations of this technique are its reliance on provincial import or input profiles and the lack of survey microflows, which are typical constraints in non-survey regionalization. We mitigate these through robustness checks and transparent assumptions.

## RESULTS AND DISCUSSION

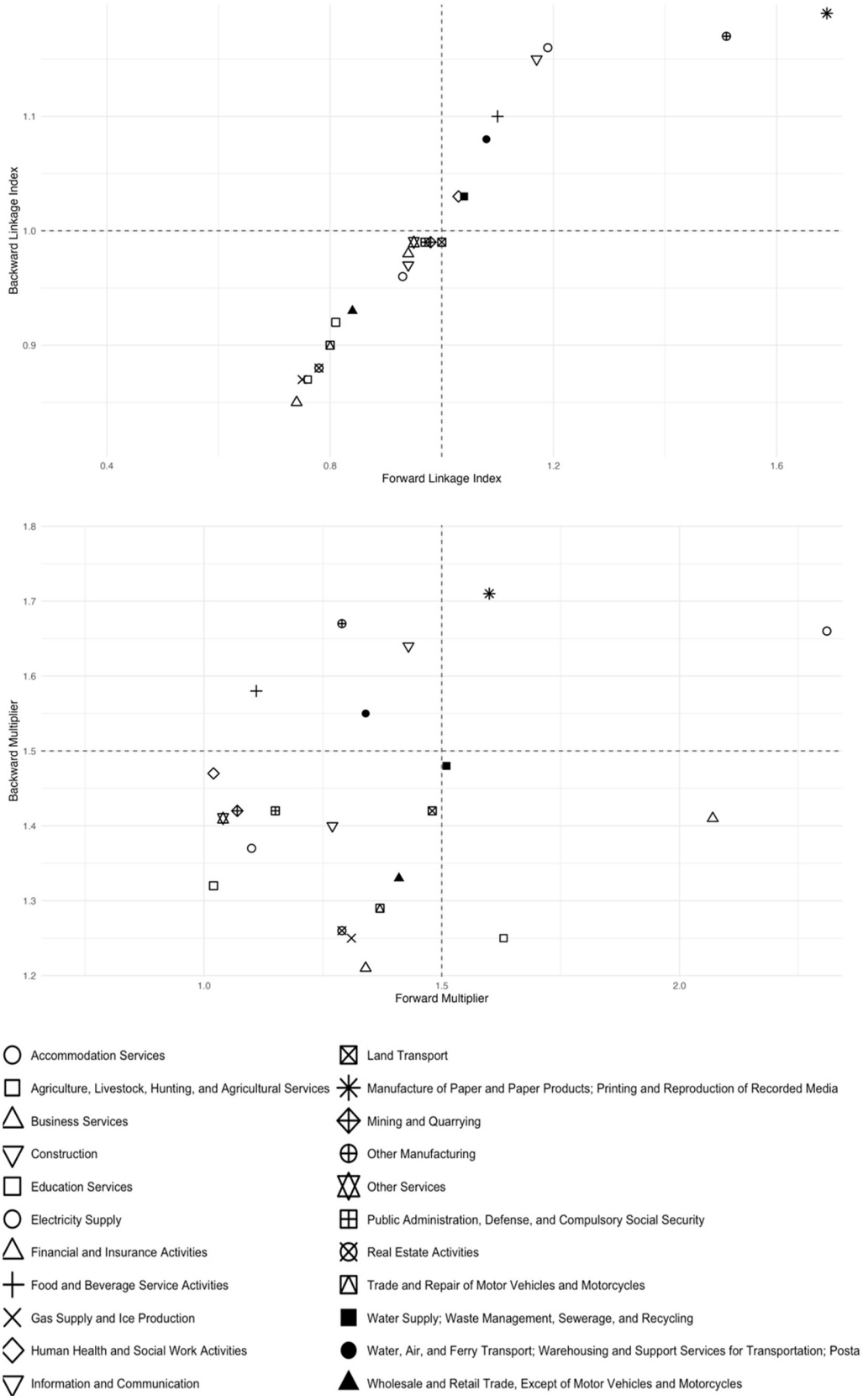
Regionalizing North Sumatra's I–O table with the RAS technique changes the story for Toba Regency. RAS preserves the provincial matrix structure while rebalancing row and column totals to local margins, thereby reducing the overestimation that can bias multiplier and linkage measures in lower-level jurisdictions (Lahr & de Mesnard, 2004; Miller & Blair, 2009). Recent evidence from Holý and Šafr (2023) also indicates that subnational RAS applications more effectively capture the economic structure of smaller economies, thereby producing more credible policy simulations.

The key finding is that tourism-related sectors do not yet drive most of Toba's economy. Accommodation, food and beverage services, land and water transport, and wholesale or retail together contribute only about 6.16 percent of the total supply. Instead, the economy is anchored by paper and paper products (22.4 percent), agriculture (21.8 percent), and construction (18.9 percent), which together account for more than half of the total supply. This finding is consistent with the literature, which notes how reliance on aggregated data for smaller jurisdictions can distort sectoral prioritization in economic planning (Jackson & Murray, 2004).

Final demand composition helps explain the result. Toba is mainly consumption and export-led. Household consumption accounts for roughly 38 percent of final demand and dominates basic goods and services (around 60 percent of agriculture's final demand and nearly 70 percent in food and beverages). Exports account for approximately 34 percent of the overall economy, with a notable concentration in the paper and agricultural sectors. GFCF is about 16 percent of total demand and is driven mainly by construction (83 percent of construction's final demand). Compared to the province, Toba Regency exhibits weaker investment intensity and a narrower export base, suggesting that applying provincial data directly would overstate the investment-led growth potential of the region.

Multiplier and linkage results further reflect the role of key productive sectors (see Figure 4). In the linkages graph, Quadrant I (high backward and high forward) is occupied by paper and paper products, and other manufacturing. These sectors both buy from many local suppliers and sell inputs to other sectors. However, no core tourism sector is located in this area. Quadrant II (high backward, low forward) encompasses construction and tourism-related services, with the strongest pull, as well as food and beverage services and transportation. They buy many inputs but sell few to other producers. Their effect can grow if hotels and restaurants buy more from

**Figure 4. Sectoral Linkages and Multipliers Diagram (Quadrant I – IV, clockwise)**




Source: Authors' calculation (2025)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local farms and SMEs. Quadrant III (low backward and low forward) encompasses accommodation and other services, such as education, health, finance, and real estate, which exhibit small production spillovers. Quadrant IV (low backward, high forward) typically includes wholesale or retail trade and water or waste management, which do not require significant capital investment. However, they support many other sectors in their operations.

In the multipliers chart, the most significant backward multiplier is in the paper and paper products sector, followed by other manufacturing, electricity, and construction. Extra demand in these sectors triggers the biggest upstream response. Within the tourism sector, food and beverages, as well as transport, exhibit above-average levels of backward integration, enabling them to strengthen local supply chains when sourcing is local. Accommodation sits lower, which matches its lighter use of intermediate inputs. On the forward side, paper manufacturing and other manufacturing are the most influential downstream enablers, followed by electricity supply, water supply, or waste management. These sectors provide essential inputs that many sectors need.

By contrast, sectors oriented toward final consumption, including education, health, accommodation, and food services, exhibit relatively modest forward multipliers, consistent with their limited role in supplying intermediate inputs. All in all, the combination of high multipliers and high linkage indices indicates priority sectors where investment can produce substantial ripple effects. Conversely, relatively weak linkage indices for agriculture and tourism-related services suggest opportunities to strengthen integration, such as connecting local farms to hospitality supply chains or developing logistics infrastructure to better link rural producers to urban markets.

Moreover, labor analysis adds another layer to the understanding of sectoral performance. Tourism-related sectors employ a large number of workers but have low labor compensation shares, particularly in the accommodation and land transport sectors. In contrast, wholesale and retail, agriculture, construction, and paper manufacturing allocate larger portions of value added to labor. Similar patterns, characterized by high employment and low wage shares in tourism, are observed in regional applications and help explain the modest inclusive-growth effects that can occur without complementary policies. The policy challenge is to raise productivity and wages among workers in many sectors, and to create pathways into higher-productivity segments that already have strong multipliers and linkages.

A brief comparison with Bali, Indonesia's most tourism-intensive province, shows why a tourism-led narrative does not yet fit Toba Regency. Tourism Satellite Account for Bali (built on an I–O base) reported tourism shares near 52 percent of output and 46 percent of GRDP in 2007, documenting a truly tourism-driven structure. More recent technical work for Bali continues to utilize I-O-based frameworks (including environmental extensions), highlighting the central role of tourism in the economy (Mohan et al., 2021). The 6 percent tourism supply share in Toba is still far from the benchmarks in Bali.

Why is the tourism role in Toba Regency still small despite its super priority status? The RAS results highlight four key practical reasons: leakages in critical inputs (imported food, beverages, fuels, and equipment), a shallow local supplier base, weak logistics, seasonality with a narrow product mix, and gaps in water, waste, and power management. International evidence suggests tourism only reshapes an RIO structure when the local production capacity is upgraded and procurement shifts to local firms (e.g., supplier certification, logistics warehouse near tourism clusters, and skills pipelines) (Gao, Su, & Wang, 2019). From a regionalization standpoint, systematically raising local content can also improve the empirical fit of technical coefficients over time (Flegg & Tohmo, 2013; Zhao & Choi, 2015).

The policy path for Toba Regency, therefore, should be a two-track. First, protect and upgrade the high multiplier paper manufacturing, construction, and utilities. Second, promote local content in tourism through local-procurement targets and utility upgrades, whose forward multipliers benefit both tourism and non-tourism activities. Product diversification can increase length of stay and visitor spending, dampening seasonality and improving the incentives for private investment.

Overall, the RAS table not only corrects for aggregation bias but also provides a granular foundation for strategic economic planning. By identifying sectors with both strong multipliers and linkage effects, policymakers can prioritize interventions with the greatest potential to stimulate growth, diversify the production base, and integrate underdeveloped sectors into the regional value chains of Toba Regency.

## CONCLUSION

The 2023 RIO table of Toba Regency, developed with the RAS technique at each stage, can explain the input and output structure of the regency's economy. The table equips policymakers in Toba Regency with a practical tool to identify sectoral priorities, strengthen local value chains, and promote inclusive growth. It reveals a relatively balanced economy led by the paper and paper products manufacturing, agriculture, and construction sectors. Final demand dominates the economic activity, with most sectors driven by household consumption and exports (approximately 38 percent and 34 percent of final demand, respectively), while investment lags behind the provincial average. The relatively low share of intermediate demand indicates that many sectors are consumption-oriented and not yet fully integrated into regional production chains.

Despite their prominence in local development plans, tourism-related activities contribute only modestly to total output and demonstrate weak backward and forward linkages. Within the tourism sector, the food and beverage and transport sectors have above-average backward pull, but accommodation remains weak. By contrast, enabling sectors such as electricity, business services, and agriculture exhibit strong linkages and high multipliers, making them strategic targets for economic expansion. Labor market results also reveal significant wage and employment disparities, with a substantial


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share of jobs concentrated in low-productivity service sectors, underscoring the need to enhance access to higher-value, more productive employment opportunities. Policy should follow a twin-track approach: (1) protect and upgrade the enabler sectors by improving utilities and cutting logistics costs; and (2) raise local content in tourism activities through supplier local purchasing targets, supplier and labor skills upgrading.

Although the RAS technique is effective for constructing RIO tables from limited data, it has inherent limitations. These limitations include the inability to capture technological progress or sectoral changes over time. To improve the reliability of regional economic planning, the RAS technique should be complemented with periodic surveys and stakeholder consultations. Nonetheless, the methodology and resulting framework presented in this paper can serve as a benchmark for other regencies or municipalities aiming to develop their own RIO tables. Regular updates using hybrid approaches that integrate RAS with targeted field data will further enhance the accuracy and utility of such models for formulating regional-level policies.

## ACKNOWLEDGEMENT

We thank Setya Agung Riyadi and Nanda Puspita for their contribution to the construction of the RAS technique.

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## Appendix 1. 2023 I–O Table of Toba Regency (in IDR million)

| Economic Sector | Sector Code (22) | Agriculture, Livestock, Hunting, and Agricultural Services | Mining and Quarrying | Manufacture of Paper and Paper Products; Printing and Reproduction of Recorded Media | Other Manufacturing | Electricity Supply | Gas Supply and Ice Production | Water Supply; Waste Management, Sewerage, and Recycling | Construction | Trade and Repair of Motor Vehicles and Motorcycles | Wholesale and Retail Trade, Except of Motor Vehicles and Motorcycles | Land Transport | Water, Air, and Ferry Transport; Warehousing and Support Services for Transportation; Postal and Courier Services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | I-01 | I-02 | I-03 | I-04 | I-05 | I-06 | I-07 | I-08 | I-09 | I-10 | I-11 | I-12 |
| Agriculture, Livestock, Hunting, and Agricultural Services | I-01 | 580,150 | 2,596 | 736,231 | 34,279 | 19 | 22 | 186 | 198,259 | 1,179 | 268 | - | 55 |
| Mining and Quarrying | I-02 | 16 | 248 | 22 | 13 | 27 | 0 | 0 | 1,944 | 178 | 17 | 48 | 13 |
| Manufacture of Paper and Paper Products; Printing and Reproduction of Recorded Media | I-03 | 12,630 | 913 | 1,054,850 | 2,474 | 728 | 10 | 383 | 123,066 | 160,402 | 5,085 | 62,025 | 17,097 |
| Other Manufacturing | I-04 | 1,675 | 24 | 2,115 | 434 | 87 | 0 | 6 | 6,185 | 3,445 | 95 | 954 | 458 |
| Electricity Supply | I-05 | 445 | 62 | 896 | 110 | 10,948 | 1 | 15 | 22,586 | 5,650 | 333 | 316 | 522 |
| Gas Supply and Ice Production | I-06 | 11 | 6 | 4 | 1 | 2 | 0 | 0 | 9 | 4 | 5 | 1 | 0 |
| Water Supply; Waste Management, Sewerage, and Recycling | I-07 | 110 | 18 | 165 | 18 | 2 | 0 | 3 | 789 | 310 | 24 | 127 | 121 |
| Construction | I-08 | 87,569 | 2,620 | 5,324 | 999 | 791 | 0 | 889 | 758,071 | 5,186 | 339 | 1,304 | 218 |
| Trade and Repair of Motor Vehicles and Motorcycles | I-09 | 41,698 | 5,276 | 98,235 | 4,093 | 6,145 | 23 | 354 | 104,551 | 226,597 | 4,975 | 54,769 | 29,186 |
| Wholesale and Retail Trade, Except of Motor Vehicles and Motorcycles | I-10 | 2,305 | 70 | 7,002 | 251 | 515 | 1 | 9 | 6,858 | 5,040 | 105 | 1,338 | 437 |
| Land Transport | I-11 | 26,414 | 1,730 | 14,362 | 768 | 803 | 5 | 76 | 38,534 | 40,679 | 4,761 | 6,933 | 5,446 |
| Water, Air, and Ferry Transport; Warehousing and Support Services for Transportation; Postal and Courier Services | I-12 | 4,139 | 241 | 2,686 | 160 | 353 | 1 | 13 | 9,274 | 5,109 | 599 | 501 | 6,005 |
| Accommodation Services | I-13 | 187 | 272 | 448 | 31 | 58 | 0 | 20 | 6,463 | 1,988 | 119 | 103 | 1,181 |
| Food and Beverage Service Activities | I-14 | 229 | 7 | 45 | 2 | 32 | 0 | 20 | 818 | 256 | 23 | 96 | 59 |
| Information and Communication | I-15 | 278 | 224 | 801 | 105 | 256 | 1 | 13 | 6,161 | 13,676 | 457 | 4,258 | 1,815 |
| Financial and Insurance Activities | I-16 | 3,557 | 14 | 267 | 39 | 881 | 0 | 13 | 5,706 | 12,821 | 374 | 3,943 | 101 |
| Real Estate Activities | I-17 | - | 265 | 3,898 | 94 | - | - | 29 | 9,009 | 31,015 | 1,278 | 4,930 | 768 |
| Business Services | I-18 | 2,323 | 616 | 3,415 | 156 | 3,616 | 3 | 50 | 39,784 | 28,178 | 2,712 | 7,608 | 1,895 |
| Public Administration, Defense, and Compulsory Social Security | I-19 | 1,945 | 0 | - | 67 | 335 | - | 254 | 118,650 | - | - | 14 | 455 |
| Education Services | I-20 | 26 | 24 | 141 | 10 | 11 | 0 | 4 | 589 | 1,057 | 36 | 17 | 125 |
| Human Health and Social Work Activities | I-21 | 503 | 1 | 55 | 2 | 5 | 0 | 1 | 82 | 48 | 2 | 13 | 24 |
| Other Services | I-22 | 46 | 9 | 45 | 4 | 0 | 0 | 1 | 263 | 80 | 5 | 13 | 18 |
| Total Domestic Intermediate Demand | 190d | 766,257 | 15,238 | 1,931,009 | 44,108 | 25,615 | 67 | 2,341 | 1,457,651 | 542,897 | 21,613 | 149,310 | 66,001 |
| Total Imported Intermediate Demand | 2000 | 241,359 | 9,415 | 1,111,451 | 12,363 | 26,866 | 50 | 952 | 658,111 | 314,938 | 10,098 | 127,880 | 33,504 |
| Total Intermediate Demand | 1900 | 1,007,616 | 24,653 | 3,042,460 | 56,471 | 52,481 | 117 | 3,293 | 2,115,762 | 857,835 | 31,711 | 277,190 | 99,505 |
| Labor Compensation | 2010 | 923,691 | 9,234 | 622,374 | 4,275 | 1,473 | 9 | 479 | 563,943 | 753,979 | 24,810 | 43,187 | 29,041 |
| Gross Operating Surplus (including mixed income) | 2020 | 2,043,843 | 16,659 | 293,939 | 23,097 | 7,490 | 247 | 3,611 | 770,172 | 1,061,187 | 39,815 | 203,398 | 44,416 |
| Taxes less subsidies on other production | 2040 | 23,356 | 107 | 140,215 | 1,600 | (3,050) | 0 | 20 | 17,446 | 5,385 | 84 | 498 | 180 |
| Gross Value Added | 2090 | 2,990,890 | 26,000 | 1,056,528 | 28,972 | 5,914 | 256 | 4,110 | 1,351,560 | 1,820,551 | 64,709 | 247,083 | 73,637 |
| Total Input | 2100 | 3,998,506 | 50,653 | 4,098,988 | 85,443 | 58,395 | 373 | 7,403 | 3,467,322 | 2,678,386 | 96,420 | 524,272 | 173,142 |


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https://doi.org/10.15408/sjie.v14i2.46490

| Economic Sector | Sector Code (22) | Accommodation Services | Food and Beverage Service Activities | Information and Commu-nication | Financial and Insurance Activities | Real Estate Activities | Business Services | Public Administration, Defense, and Compulsory Social Security | Education Services | Human Health and Social Work Activities | Other Services | Total Intermediate Demand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | I-13 | I-14 | I-15 | I-16 | I-17 | I-18 | I-19 | I-20 | I-21 | I-22 | 1800 |
| Agriculture, Livestock, Hunting, and Agricultural Services | I-01 | 6,549 | 17,445 | 0 | 16 | - | - | 13,383 | 8,047 | 16,780 | 1,994 | 1,617,458 |
| Mining and Quarrying | I-02 | 9 | 2 | 9 | 6 | 6 | 13 | 74 | 11 | 6 | 1 | 2,664 |
| Manufacture of Paper and Paper Products; Printing and Reproduction of Recorded Media | I-03 | 18,757 | 696 | 13,624 | 6,191 | 6,935 | 16,445 | 96,169 | 30,491 | 9,824 | 431 | 1,639,226 |
| Other Manufacturing | I-04 | 654 | 85 | 98 | 51 | 33 | 133 | 479 | 185 | 355 | 17 | 17,569 |
| Electricity Supply | I-05 | 2,913 | 17 | 323 | 106 | 476 | 434 | 1,221 | 365 | 242 | 22 | 48,003 |
| Gas Supply and Ice Production | I-06 | 24 | 1 | 0 | 0 | 0 | 2 | 11 | 3 | 1 | 0 | 87 |
| Water Supply; Waste Management, Sewerage, and Recycling | I-07 | 699 | 5 | 73 | 18 | 59 | 113 | 48 | 89 | 20 | 5 | 2,817 |
| Construction | I-08 | 2,212 | 40 | 24,886 | 13,450 | 28,529 | 347 | 112,216 | 10,870 | 4,044 | 2,876 | 1,062,780 |
| Trade and Repair of Motor Vehicles and Motorcycles | I-09 | 55,638 | 1,157 | 3,692 | 2,396 | 4,055 | 8,851 | 27,151 | 7,052 | 9,091 | 459 | 695,444 |
| Wholesale and Retail Trade, Except of Motor Vehicles and Motorcycles | I-10 | 731 | 100 | 123 | 74 | 54 | 183 | 882 | 313 | 442 | 19 | 26,851 |
| Land Transport | I-11 | 2,167 | 158 | 553 | 431 | 992 | 4,660 | 23,464 | 1,911 | 1,657 | 91 | 176,596 |
| Water, Air, and Ferry Transport; Warehousing and Support Services for Transportation; Postal and Courier Services | I-12 | 748 | 33 | 147 | 135 | 237 | 1,004 | 10,967 | 428 | 265 | 16 | 43,062 |
| Accommodation Services | I-13 | 2,268 | 4 | 69 | 88 | 141 | 1,129 | 11,132 | 3,214 | 1,619 | 127 | 30,662 |
| Food and Beverage Service Activities | I-14 | 770 | 5 | 15 | 10 | 20 | 148 | 1,028 | 167 | 52 | 9 | 3,811 |
| Information and Communication | I-15 | 4,297 | 25 | 1,711 | 559 | 415 | 730 | 2,413 | 878 | 363 | 30 | 39,465 |
| Financial and Insurance Activities | I-16 | 818 | 4 | 96 | 513 | 1,244 | 667 | 12,411 | 1,618 | 2,645 | 21 | 47,754 |
| Real Estate Activities | I-17 | 1,527 | 140 | 1,494 | 187 | 17,994 | 1,375 | 1,486 | 988 | 738 | 158 | 77,373 |
| Business Services | I-18 | 1,383 | 259 | 1,461 | 923 | 1,001 | 1,971 | 11,570 | 1,710 | 993 | 119 | 111,747 |
| Public Administration, Defense, and Compulsory Social Security | I-19 | 27 | 0 | 0 | 217 | 1,327 | 1,547 | 3,774 | 271 | 261 | 0 | 129,144 |
| Education Services | I-20 | 111 | 2 | 116 | 121 | 5 | 323 | 1,004 | 1,278 | 206 | 10 | 5,215 |
| Human Health and Social Work Activities | I-21 | 32 | 1 | 1 | 11 | 2 | 7 | 41 | 61 | 2,299 | 9 | 3,199 |
| Other Services | I-22 | 65 | 1 | 12 | 4 | 22 | 36 | 22 | 52 | 25 | 29 | 752 |
| Total Domestic Intermediate Demand | 190d | 102,400 | 20,181 | 48,505 | 25,506 | 63,547 | 40,120 | 330,946 | 70,000 | 51,927 | 6,444 | 5,781,681 |
| Total Imported Intermediate Demand | 2000 | 53,070 | 5,943 | 28,117 | 14,228 | 35,274 | 18,468 | 110,975 | 34,093 | 23,096 | 2,355 | 2,872,608 |
| Total Intermediate Demand | 1900 | 155,470 | 26,124 | 76,622 | 39,734 | 98,821 | 58,588 | 441,921 | 104,093 | 75,023 | 8,798 | 8,654,289 |
| Labor Compensation | 2010 | 47,699 | 7,910 | 23,116 | 52,413 | 12,242 | 41,085 | 473,417 | 158,212 | 32,743 | 5,544 | 3,830,876 |
| Gross Operating Surplus (including mixed income) | 2020 | 171,003 | 10,487 | 95,768 | 97,219 | 245,772 | 47,475 | 310,903 | 73,385 | 47,744 | 8,530 | 5,616,159 |
| Taxes less subsidies on other production | 2040 | 11,794 | 157 | 456 | 218 | 10,176 | 329 | - | 143 | 44 | 56 | 209,215 |
| Gross Value Added | 2090 | 230,496 | 18,554 | 119,340 | 149,850 | 268,190 | 88,890 | 784,320 | 231,740 | 80,530 | 14,130 | 9,656,250 |
| Total Input | 2100 | 385,966 | 44,678 | 195,962 | 189,584 | 367,011 | 147,478 | 1,226,241 | 335,833 | 155,553 | 22,928 | 18,310,539 |

| Economic Sector | Sector Code (22) | Household | Non-profit Institutions Serving Households (NPISHs) | Government | Gross Fixed Capital Formation - (GFCF) | Inventory Changes | Exports | Total Final Demand | Total Output |
|---|---|---|---|---|---|---|---|---|---|
| | | 3011 | 3012 | 3020 | 3030 | 3041 | 3080 | 3090 | 3100 |
| Agriculture, Livestock, Hunting, and Agricultural Services | I-01 | 1,432,960 | - | - | 16,360 | 91,544 | 840,184 | 2,381,048 | 3,998,506 |
| Mining and Quarrying | I-02 | 33 | - | 0 | 8 | 1,255 | 46,693 | 47,989 | 50,653 |
| Manufacture of Paper and Paper Products; Printing and Reproduction of Recorded Media | I-03 | 505,002 | 21 | 6,009 | 1,380 | (42,212) | 1,989,562 | 2,459,762 | 4,098,988 |
| Other Manufacturing | I-04 | 26,571 | 22 | 245 | 69 | 2,495 | 38,473 | 67,874 | 85,443 |
| Electricity Supply | I-05 | 10,374 | - | - | 0 | - | 19 | 10,392 | 58,395 |
| Gas Supply and Ice Production | I-06 | 5 | - | 0 | 0 | (27) | 307 | 286 | 373 |
| Water Supply; Waste Management, Sewerage, and Recycling | I-07 | 3,200 | - | 100 | 0 | 12 | 1,274 | 4,586 | 7,403 |
| Construction | I-08 | 406,315 | - | 1 | 1,991,883 | (71) | 6,415 | 2,404,542 | 3,467,322 |
| Trade and Repair of Motor Vehicles and Motorcycles | I-09 | 969,545 | 132 | 1,557 | 3,376 | 46,035 | 962,297 | 1,982,941 | 2,678,386 |
| Wholesale and Retail Trade, Except of Motor Vehicles and Motorcycles | I-10 | 37,499 | 10 | 124 | 270 | 3,673 | 27,993 | 69,569 | 96,420 |
| Land Transport | I-11 | 271,504 | 11 | 127 | 289 | 3,851 | 71,894 | 347,676 | 524,272 |
| Water, Air, and Ferry Transport; Warehousing and Support Services for Transportation; Postal and Courier Services | I-12 | 79,363 | 3 | 83 | 76 | 718 | 49,838 | 130,080 | 173,142 |
| Accommodation Services | I-13 | 49,252 | 3,007 | 7 | 5 | 64 | 302,969 | 355,304 | 385,966 |
| Food and Beverage Service Activities | I-14 | 28,533 | 9,853 | 15 | 2 | 9 | 2,455 | 40,867 | 44,678 |
| Information and Communication | I-15 | 117,687 | 1 | 531 | 129 | 176 | 37,974 | 156,497 | 195,962 |
| Financial and Insurance Activities | I-16 | 64,538 | - | 1,616 | 1 | 7 | 75,667 | 141,830 | 189,584 |
| Real Estate Activities | I-17 | 266,228 | - | - | - | - | 23,410 | 289,638 | 367,011 |
| Business Services | I-18 | 7,567 | 0 | 2 | 160 | 61 | 27,939 | 35,731 | 147,478 |
| Public Administration, Defense, and Compulsory Social Security | I-19 | 2,162 | - | 1,077,508 | 40 | - | 17,388 | 1,097,098 | 1,226,241 |
| Education Services | I-20 | 158,289 | 73,185 | 93,422 | 1 | 15 | 5,705 | 330,618 | 335,833 |
| Human Health and Social Work Activities | I-21 | 63,148 | 52,981 | 22,388 | 3 | 37 | 13,796 | 152,354 | 155,553 |
| Other Services | I-22 | 3,169 | 18,667 | 32 | 2 | 11 | 296 | 22,176 | 22,928 |
| Total Domestic Intermediate Demand | 190d | 4,502,944 | 157,893 | 1,203,765 | 2,014,053 | 107,652 | 4,542,550 | 12,528,858 | 18,310,539 |
| Total Imported Intermediate Demand | 2000 | 690,946 | 11,317 | 80,135 | 97,687 | 22,998 | 90,700 | 993,782 | 3,866,390 |
| Total Intermediate Demand | 1900 | 5,193,890 | 169,210 | 1,283,900 | 2,111,740 | 130,650 | 4,633,250 | 13,522,640 | 22,176,929 |
| Labor Compensation | 2010 | | | | | | | | |
| Gross Operating Surplus (including mixed income) | 2020 | | | | | | | | |
| Taxes less subsidies on other production | 2040 | | | | | | | | |
| Gross Value Added | 2090 | | | | | | | | |
| Total Input | 2100 | | | | | | | | |


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