From Supply and Use Tables to an Inputâ€“Output Tables: Constructing a Transportation Satellite Account for China

Topic: Input-Output Accounts (1)
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Transportation Satellite Accounts (TSAs) extend the System of National Accounts by isolating transportation-related production and demand within a consistent accounting structure. However, no harmonized international standard governs the delineation of transportation activities, particularly with respect to internal (own-account) transport services embedded in non-transport industries. Conventional inputâ€“output tables typically classify only market transportation activities as a separate sector, while internal transportation services remain unobserved. This may lead to incomplete measurement of transportation-related production and inter-industry linkages.

This study develops a structured procedure for compiling a Transportation Satellite Account for China using the 2020 Supply and Use Tables (SUTs) and integrating it into a symmetric industry-by-industry inputâ€“output framework. The focus is methodological: to clarify how transportation activities can be consistently reclassified and transformed within an SUT-based accounting environment.

The analysis proceeds in two main stages. First, transportation-related outputs and intermediate inputs are reorganized within the SUT framework to distinguish commercial transportation from internal transportation activities. In the absence of direct survey data on own-account transport production, a labor-compensation-based allocation method is employed to approximate the scale and sectoral distribution of internal transportation services. The allocation preserves consistency with value-added aggregates reported in the original SUT. This step results in transportation-augmented supply and use tables in which transportation production is explicitly defined.

Second, the reconstructed satellite tables are converted into a symmetric industry-by-industry inputâ€“output table. A market-share matrix is derived to allocate product outputs to industries, and a corresponding transformation matrix is constructed under standard product-technology assumptions. The procedure maintains rowâ€“column balance and coherence with national accounts totals. The resulting symmetric table provides a basis for analyzing transportation-related intermediate demand within a consistent inputâ€“output structure.

On this basis, transportation infrastructure investment in China in 2020 is analyzed as an exogenous final-demand change to evaluate economic impact effects and to assess the multiplier effects and industrial driving role of the transportation sector within the national economy. The estimated output multiplier is 3.22, with total induced output of RMB 8,281.539 billion. The decomposition indicates that first-round indirect effects account for a substantial share of total induced production, reflecting backward linkages with upstream industries.

The empirical exercise serves primarily to demonstrate how the satellite-account-based inputâ€“output structure can be applied within a standard multiplier framework. The main contribution of the study lies not in the multiplier analysis itself, but in the transparent specification of a compilation and transformation procedure that links SUT reconstruction with symmetric inputâ€“output modeling. By explicitly incorporating internal transportation activities into the accounting system, the proposed framework provides a refined representation of transportation-related production within the inputâ€“output structure.

This study is intended to provide a methodological example for compiling Transportation Satellite Accounts within a supplyâ€“use framework and integrating them into symmetric inputâ€“output analysis. The proposed approach may serve as a reference for further refinement of transportation statistics and for supporting transportation policy formulation and industrial development assessment within a consistent accounting structure.