

Construction of China's Green GDP Input-Output Model

Topic: YSI and Development Programme (1) (Discussants: Sanjiv Mahajan and Peipei Tian)

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The global economy is undergoing rapid development. As a prominent developing country, China possesses a substantial economic scale, with its GDP steadily increasing year by year. However, such rapid economic growth has often come at the expense of natural resources and environmental integrity. To ensure that the national economic accounting system accurately and comprehensively reflects economic growth, it is imperative to incorporate resource and environmental factors into its framework. Practical experience in economic and social development demonstrates that the current System of National Accounts (SNA), rooted in traditional value-determination theory, inadequately captures the intricate relationships among resources, the environment, economic growth, and social development. Moreover, it largely overlooks the significant costs incurred by resource depletion and environmental degradation in pursuit of economic progress.

In recent years, the United Nations has introduced successive versions of the System of Environmental Economic Accounting (SEEA) to supplement the SNA, encouraging nations to account for resource depletion and environmental degradation alongside conventional economic metrics. Building on this foundation, and utilizing input-output analysis, this study develops a theoretical framework integrating economy, resources, and environment. It establishes a green GDP input-output model designed to transcend the limitations of traditional GDP accounting, which focuses solely on economic dimensions. The proposed model aims to quantify and account for the value of resources and the environment, enabling a more accurate assessment of green development.

The approach modifies the traditional input-output table by incorporating resource depletion and environmental degradation into the column input section, reflecting the environmental costs associated with economic activities. The row output section remains largely unchanged, except for the inclusion of adjustment items in the final use category to balance the table and account for resource and environmental expenditures.

Existing literature includes studies on China's green GDP competitive input-output tables, yet the green GDP non-competitive input-output table proposed here represents a novel contribution. Although prior research has explored green input-output accounting, these studies typically focus on quantifying resource depletion and environmental degradation without effectively integrating these factors into GDP calculations. By contrast, this study not only captures the value of resource depletion and environmental degradation within the green GDP input-output table but also calculates green GDP using the production, income, and expenditure approaches. This comprehensive methodology elevates green GDP from a supplementary indicator to a central metric in economic assessment.

Furthermore, the study includes an empirical application of the model. China's annual input-output tables, regularly published by the National Bureau of Statistics, serve as the foundational dataset. To compile the green GDP input-output table, it is necessary to calculate the values associated with resource depletion and environmental degradation and integrate these adjustments into the dataset. Using available data, this study estimates the impacts of selected economic activities on resource depletion and environmental degradation. The data used are derived from statistical yearbooks and official government bulletins issued by the National Bureau of Statistics, ensuring reliability and credibility.

In summary, this study addresses a critical gap in green GDP accounting by integrating resource depletion and environmental degradation into the input-output framework. The proposed model not only highlights the economic costs of environmental and resource impacts but also facilitates the calculation of green GDP using multiple accounting methods. This advancement enables green GDP to transition from a secondary status to a core indicator, fostering a more balanced and sustainable approach to economic development.