

## **Sectoral interlinkages and the role of natural gas sector in India: An intertemporal economic impacts analysis**

Topic: Input-output Analysis for Policy Making (2)

Author: Alok Aditya

This study aims to provide a comprehensive economic assessment of the natural gas sector and its impacts on sectoral output, employment, income, and price level. One of the significant contributions of this study is that it aims to capture the policy dynamics within natural gas and the rest of the economy by incorporating an intertemporal analysis of the effect. It employs the input-output (I-O) method to analyze the sectoral interlinkages and impact of exogenous change in the natural gas sector on the rest of the economy. The findings reveal stronger forward linkages compared to backward ones. The intertemporal dynamics of natural gas show consistent patterns in sectoral linkages, income, and employment impacts, with the strongly linked mining, manufacturing, construction, transportation, and services sectors. This study significantly contributes to sectoral linkage analysis by incorporating both demand-driven and supply-driven input-output frameworks, allowing for a comprehensive exploration of natural gas sector interlinkages. It also examines the intertemporal impact of natural gas allocation on production, value addition, income, and employment, highlighting changes due to different allocation policies. The intertemporal dynamics of natural gas show consistent patterns in sectoral linkages, income, and employment impacts, with the strongly linked mining, manufacturing, construction, transportation, and services sectors. In 2019-20, linkages shifted toward crude Petroleum and services like business, financial, and transport sectors, reflecting policy changes and increased investment in city gas distribution and technology. While income effects slightly increased, employment effects declined, indicating a shift from labour- to capital-intensive production. The findings suggest investment in natural gas upstream sectors to improve its backward linkages while investment in midstream infrastructure to boost the forward linkages. It also suggests formulating gas allocation policies for India based on the sectoral interlinkages of the sector. As India moves toward a balanced energy mix, natural gas will drive growth across sectors. Understanding these linkages is essential for effective policymaking and strategic planning in India's evolving economy.