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INDUSTRIAL STRUCTURE, ENERGY CONSUMPTION STRUCTURE AND GREEN TOTAL FACTOR PRODUCTIVITY IN THE BEIJING-TIANJIN-HEBEI REGION

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Abstract

This study investigates the impacts of industrial and energy consumption structure optimization on green total factor productivity (GTFP) growth across the Beijing-Tianjin-Hebei region. Employing directional distance functions and the global Malmquist index, GTFP is measured incorporating undesired outputs. A dynamic spatial Durbin panel model examines the direct internal and indirect spillover effects of structural optimization factors on GTFP over 1998-2019, constructing metrics for rationalization and advancement. Findings reveal varied region-specific impacts and sensitivities. Industrial structure rationalization demonstrates negative localized effects while energy structure rationalization induces adverse spatial spillovers on neighbors. In contrast, advancement of both structures stimulates strong positive direct and indirect effects. As China transitions towards coordinated development and low-carbon growth, these results hold significant implications for technology strategies and policy design tailored to region-specific conditions.

Key words: Beijing-Tianjin-Hebei, dynamic spatial, Durbin panel model, energy consumption, green total factor productivity, industrial structure, structure optimization

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