How Artificial Intelligence Innovation Reshapes China's Production Network and Trade Structure :An Analysis Based on the Innovation Flow Table

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Artificial Intelligence (AI) is reshaping the structure of economic systems with unprecedented depth. However, existing research mostly adopts a macro perspective focusing on technological innovation or input-output relationships, failing to link technology with the production-use relationships of intermediate goods. This makes it difficult to reveal AI's structural impact on the intermediate goods market. To address this, based on Chinese patent data and input-output tables, this paper measures the direct input-output linkages between industries for AI technological innovation and non-AI technological innovation, defining them as innovation flow tables. It further establishes an intermediate goods-augmented technological progress model that distinguishes between AI innovation and non-AI innovation, elucidating the impact of AI innovation on the intermediate goods market and trade networks. Empirical findings reveal that AI innovation possesses scale expansion effects, cost-saving effects, and structural upgrading effects, profoundly altering the structure of China's production network. In intermediate goods trade, it exhibits upward absorption, downward substitution, and export expansion effects. Furthermore, this paper identifies the mechanism through which AI innovation disseminates its influence by promoting non-AI innovation. It also finds that core AI algorithm and software innovation play a primary role, with the secondary industry serving as the main channel for these effects. Finally, this paper provides new empirical evidence and policy insights for AI-driven industrial transformation.