Intra-Product Specialization, Firm Ownership Heterogeneity, and Interregional Manufacturing Relocation in China: A New Measurement and Its Economic-Environmental Implications

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Abstract: Under the background of intra-product specialization, the industry relocation (IR) units have shifted from the entire industry to fragmented industrial chain segments. However, existing IR measurements fail to capture the new characteristic, making it imperative to construct a novel IR measurement framework compatible with intra-product specialization. Domestic and foreign enterprises differ systematically in production structure, value chain participation, and business decision-making. Therefore, there are significant differences in their IR and economic-environmental impacts. Currently, whether inter-regional IR in China can simultaneously advance economic growth and green low-carbon development remains contested. Moreover, there has been no research that examines whether there are differences in the economic-environmental impacts between the domestic and foreign enterprisesâ€™ IR.
In view of this, this study constructs a novel IR measurement method within the framework of intra-product specialization, distinguishes the heterogeneity of domestic and foreign enterprises, and systematically examines the trend of interregional manufacturing relocation (MR) in China and its economic and environmental synergy effects. This studyâ€™s main conclusions are as follows. (1) From 2002 to 2017, the Chinaâ€™s inter-regional MR scale continued to expand. After the international financial crisis, the MR scale of domestic enterprises significantly exceeded that of foreign enterprises. (2) There are significant differences in mode, industry and path between domestic and foreign enterprisesâ€™ MR. Foreign enterprises has consistently focused on the intermediate product-driven MR, while domestic enterprises shifted from being dominated by final product-driven MR to a dual focus on final and intermediate product-driven MR after 2012. Foreign enterprisesâ€™ MR focuses on technology-intensive industries, while domestic enterprisesâ€™ MR exhibits a gradient upgrading feature: first labor-intensive industries, then capital-intensive industries, and finally technology-intensive industries. After 2012, foreign enterprisesâ€™ MR shifted from a single-polar agglomeration in coastal areas to diversified expansion in the central and southwestern regions, while domestic enterprisesâ€™ MR changed from the entire production chain relocation to the gradient allocation to coastal and central-western regions based on production stagesâ€™ value added. (3) Foreign enterprisesâ€™ MR has reduced the total carbon emission intensity per unit of value added. Domestic enterprisesâ€™ MR has overcome the â€œtrading pollution for growthâ€• predicament by optimizing relocation model and path since 2012. It has significantly increased value added while reducing the overall carbon emissions, becoming an important driving force for promoting economic growth and the green and low-carbon transformation.
This studyâ€™s main contribution is: (1) A new industry relocation measurement framework compatible with intra-product specialization based on the input-output model is constructed. Industry relocation is decomposed into intermediate and final product-driven industry relocation, providing a valuable complement to existing measurement approaches. (2) This study reveals differences between domestic and foreign enterprises in terms of relocation patterns, relocation pathways, and industrial distribution, thereby providing new empirical evidence for understanding the micro-level mechanisms underlying the spatial restructuring of Chinaâ€™s manufacturing sector. (3) This study quantitatively assesses the impacts of domestic and foreign enterprisesâ€™ relocation as well as intermediate and final production-driven relocation on value added, carbon emissions, and carbon emission intensity per unit of value added at both the national and regional levels in China, thereby providing a scientific basis for formulating differentiated regional policies that balance economic development with carbon emission reduction.

Keywords: manufacturing relocation; intra-product specialization; firm ownership heterogeneity; economic-environmental implications