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THE IMPACT OF DIGITAL ECONOMY ON THE LOW-CARBON TRADE COMPETITIVENESS OF CHINA'S MANUFACTURING INDUSTRY

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Abstract

As China commits to peak carbon emissions before 2030 and achieve carbon neutrality before 2060, the booming digital economy presents great opportunities to transform and upgrade the manufacturing industry for low-carbon development. Leveraging the digital economy to drive manufacturing upgrades is critical for meeting China's climate goals, enhancing the low-carbon trade competitiveness of manufacturing, and accelerating China's shift from a manufacturing leader to a manufacturing powerhouse. This study investigates the impact of the digital economy on the low-carbon trade competitiveness of China's manufacturing industry, using panel data from 30 Chinese provinces from 2010 to 2020. We develop a digital economy development index and a manufacturing transformation and upgrading index, and test their relationships using a mediation model. Our results show that the digital economy has a significant positive impact on low-carbon trade competitiveness, both directly (β=1.45, $p<0.01$) and indirectly through promoting manufacturing transformation and upgrading (β=0.84, $p<0.01$). The mediating effect accounts for 38% of the total effect. We also find regional heterogeneity, with the eastern region showing the strongest impact. Our findings suggest that promoting digital economy development and manufacturing upgrading are critical for enhancing the low-carbon competitiveness of China's manufacturing sector. Therefore, China should vigorously develop the digital economy and fully utilize its potential to optimize manufacturing resource allocation, reduce pollution, improve energy efficiency, and strengthen the multifaceted low-carbon trade competitiveness of manufacturing.

Key words: digital economy, low-carbon trade, manufacturing, intermediary effect

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