How does the digital economy impact the manufacturing upgrading in the global value chain: Evidence of China

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Author: Kaiyao Wu

(1) The research questions.
In the global value chain, the digital economy has reshaped the innovation pattern and the profit distribution model. It has also become a key factor for the country to expand GVC participation and improve its position in the GVC. There are many studies on this in academic circles (Kim J et al., 2019; Banga K, 2022). Wang et al. (2017a, b)â€™s study on GVC participation and position has been applied in more and more empirical studies. Zhou R et al. (2022) measure the digitization degree by the proportion of the added value of the ICT industry in the added value of manufacturing exports, and show that the digitization of China's manufacturing industry can increase the forward participation of GVC in the manufacturing industry. Zhang Y et al. (2022) measured the level of the digital economy by the added value input of the basic sectors of the digital economy into each manufacturing sector, characterized the upgrade characteristics of GVC from the dual dimensions of breadth and height, and empirically tested the impact of the digital economy on China's manufacturing industry.
Even though these studies provide revealing insights, simply using the added value of the basic sectors of the digital economy inputted in the manufacturing industry is not enough to reflect the full impact of the digital economy on the manufacturing industry. Therefore, it is powerless to study the comprehensive and structural impact of the digital economy on GVC participation and position. Also, it cannot explain the mechanism of this structural impact.
Our research in this paper aims to fill the above gap.
(2) The data used.
OECD national input output tables (IOTs)
OECD Inter-Country Input-Output (ICIO) Tables
OECD Trade in value-added (TiVA)
UIBE GVC Database
China Science and Technology Statistical Yearbook
China Industrial Statistical Yearbook
(3) The method used.
a. Based on the added value of the digital economy, this paper uses input-output analysis technology and follows the evolution path of the digital economy (OECD2009). It divides the digital economy into three components: infrastructure, integration, and diffusion. So that we measure the total size and individual components of the digital economy.
b. According to the participation-position GVC upgrading coordinate framework, analyze the possible impact directions and mechanisms of the digital economy as a whole and its components on GVC upgrading, and propose research hypotheses on the overall impact, component impact, and impact mechanism of the digital economy on GVC upgrading.
c. Use panel regression method to conduct rigorous verification of the above assumptions such as benchmark model, endogeneity test, robustness test and heterology analysis.
(4) The novelty of the research.
a. The whole effect and component effect of the digital economy's impact on industrial GVC upgrading are proposed and empirical tests are carried out.
b. The cost-saving effect and factor allocation effect of digital economy affecting industrial GVC upgrading are proposed and empirically tested.