ICT Production without ICT Capital? â€“Trade Integration and the Puzzle of Chinaâ€™s ICT Investment Slowdown

Topic: Input-Output Modelling: Innovation and R&D policies
Author: David Tao Liang

This paper examines a striking paradox in Chinaâ€™s growth experience: the rapid rise of information and communication technology (ICT) manufacturing alongside a declining role of ICT capital intensity in labor productivity growth. Following WTO accession, China became deeply integrated into global ICT production networks and emerged as a major exporter of ICT goods. However, growth accounting results show that the contribution of ICT capital intensity to labor productivity growth has been modest and has declined since the early 2000s.
Using newly constructed China Industrial Productivity (CIP)/China KLEMS industry-level data on output and factor inputs, which distinguish between ICT and non-ICT capital, I first document that non-ICT capital accounts for the majority of capital deepening in China. Building on the framework of Chenery, Shishido, and Watanabe (1962) and Fukao and Paul (2021), I employ a standard Leontief inputâ€“output model to analyze the structural transformation of Chinaâ€™s ICT-producing industries. In contrast to other equipment-manufacturing sectors driven primarily by domestic investment demand, the expansion of ICT manufacturing has been largely export-oriented and heavily reliant on imported intermediate inputs, particularly semiconductor components.
An international comparison further shows that, compared to advanced economies, the contribution of ICT capital intensity to economic growth in China has been significantly smaller. Finally, I explore several potential explanations for the slowdown in Chinaâ€™s ICT investment growth and test the hypotheses empirically. The results show that the slowdown is not primarily driven by structural transformation, but rather by a reallocation of investment toward real estate and state-led infrastructure. In addition, constraints on complementary inputs, such as shortages of IT-skilled labor and weak investment in R&D, and the expansion of ICT service sectors may have also contributed to the weak growth of Chinaâ€™s ICT investment.

Keywords: Information and Communication Technology, ICT investment slowdown, ICT international trade, labor productivity, structural change.
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