

## **ICT Investment as Produced Input in Growth Accounting**

Topic: Input-Output Theory and Methodology - III

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The information and communication technology (ICT) industry has experienced rapid production cost reduction in recent decades. The price decline of ICT investment goods gave rise to the extra proportional ICT capital deepening. Further, general machinery and transportation equipment incorporate increasingly ICT products like chips.

This paper traces the currently unmeasured contribution of the investment-specific technical change of the ICT industry through multiple channels to long-term economic growth. The growth accounting framework derives the productivity decomposition based on a dynamic input-output model with a forward-looking perspective. The model follows Barro (2021), treats consumption as the only final output, and assigns the investment goods as an intermediate input in the intertemporal view.

Since the ICT industry has been highly globalized since the 1990s, we use the world input-output tables from 1995 to 2009 from the WIOD (World Input-output Database) and reassign them into dynamic input-output tables, each spanning over five years. In this way, the intertemporal effect from different sectors and countries can be measured in the model. The data on capital stock and international and domestic capital flows of the investment goods is derived from the capital input dataset of EUKLEMS and capital flow data in the world input-output tables with some country-industry proportional mapping. Three asset types of ICT capital, including IT equipment, communication equipment, and software, and three asset types of non-ICT capital, including transportation equipment, other machinery, and non-residential construction, are considered.

This paper shows that ICT contribution is much more significant than the already documented scale during the IT boom period from 1995 to the early 2000s. The productivity contribution of ICT technical progress from the past and other sectors and countries is decomposed and can be helpful to digitalization and trade policymaking.