Digital supply, use, and input-output tables for China from 2000 to 2020

Topic: Special Session: Digital Input-output Accounting: Methodology and Applications (2)
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Digital technology has profoundly transformed the production and consumption of goods and services worldwide in recent decades. The growing digitalisationâ€”the integration of digital technologies, data, and their interconnections into the economyâ€”is evident, for example, in the automation of tasks previously performed by humans and the increasing reliance on digital tools for communication and professional work. Its expanding impact on businesses and consumption is also apparent in the surge of online purchases. Meanwhile, the rapid growth of the digital economy has brought significant environmental implications. For instance, the carbon footprint of the information and communications technology sector in 2020 was estimated to account for 1.5 to 3.2 percent of global greenhouse gas emissions. Despite these profound influences, the explicit impacts of digitalisation often remain invisible in the conventional national accounts produced by countries. This limits the scope of research on critical economic and environmental issues, such as measuring the contribution of the digital economy to gross domestic product (GDP) and tracing the environmental footprint of digitalisation. To enhance the visibility of digitalisation in macroeconomic statistics and address the growing demand for a useful database for relevant research, we compile a series of digital supply, use, and input-output tables for China, covering the period from 2000 to 2020.

The increasing impact of digitalisation has been picked up by a growing number of international organizations and governments, prompting intensified efforts to delineate and improve its visibility in national accounts and refine methods for measuring the digital economy. However, due to the absence of a standardized framework or a definitive definition of the digital economy, previous work has been conducted on a relatively ad hoc basis, with different organisations and countries adopting different definitions and methodologies for estimating the digital economy. The United States, Europe, China, Canada, and Australia have all begun measuring the digital economy. These measurements were conducted by identifying certain digital products, such as information and communication technology (ICT) products, and calculating the value-added created from their production. Yet, this approach struggles to fully capture the broader economic impact of digitalisation, particularly the digitalisation of non-digital products. As a result, existing estimates may underestimate the true extent of digital transformation across industries.

To address these challenges, the Organization for Economic Cooperation and Development (OECD) developed digital supply and use table (SUT) as a conceptual framework, providing a more structured method for studying digital economy. Several countries, including Canada and the Netherlands, have begun adopting this framework and conduct experimental research on the compilation of national digital SUTs. To facilitate the measurement of the digital economy and support relevant research and policy making, the National Bureau of Statistics (NBS) of China released the Statistical Classification of Digital Economy and Its Core Industries (2021) in 2021. The classification defines the statistical scope of the digital economy into digital industries and the digitalisation of conventional industries. It also identifies a list of core digital industries. However, despite the urgent need for digital SUTs in China, none have been made available yet.

Based on the OECD framework and the classification from the NBS of China, we make the first attempt to compile digital SUTs for China. The digital SUTs framework offers flexibility in capturing the multidimensional nature of the digital economy. Our approach extends conventional SUTs by introducing both digital products/industries and the digitalisation of conventional sectors. These lead to additional rows and columns in the digital SUTs compared with their conventional counterparts. We propose a novel four-step process to construct the digital SUTs, and subsequently convert them into digital input-output tables (IOTs), which consist of 40 non-digitalised conventional products, 40 digitalised conventional products, and 14 digital products. IOTs are a powerful tool for analyzing

interindustry linkages, and heterogeneous IOTs have been developed to capture variations across firm types and trade regimes. However, there are no digital IOTs available for explicitly capturing the impact of digitalisation. To address this gap, we transform the digital SUTs into IOTs and apply them to measure the contribution of the digital economy to China's GDP.