Quantifying the Digital Economy using an Input Output Approach

Topic:
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Technological advancements have fundamentally changed how the world produces and consumes. With improving connectivity and lower device costs, applications of digital technologies are becoming increasingly pervasive. India has been at the forefront of this digital revolution. Quantifying and understanding the role of the digital economy in driving economic growth, employment and sustainable development is essential for both policymakers and the private sector to adopt appropriate strategies and align resources.

Capturing the size of the digital economy, and the linkages that comprise it, is therefore more important than ever before. Doing this requires a robust measurement system that enables continued estimation and monitoring. Past estimates have ranged from 5.4-5.6 % of GVA in 2015 to 8.5% of GVA in 2019 (Gajbhiye et al, 2022; ADB, 2021). The Ministry of Information Technology has estimated that Indiaâ€™s digital economy has the potential of an economic value of $1 trillion by 2025, supporting over 55 million workers. This paper provides an updated, more comprehensive, and more accurate estimate of Indiaâ€™s digital economy using input-output analysis. It uses a combination of various data sources to validate and refine the estimate.

It builds upon the Asian Development Bankâ€™s measurement framework to capture the digital economy, which estimates value added from the core digital economy , as well as forward linkages and backward linkages. ADBâ€™s methodology uses national input-output tables to create a satellite account of the digital economy. This paper first transforms Indiaâ€™s latest national supply use tables (SUT) of 2019-20 into an input-output table (IOT), and then adopts ADBâ€™s methodology.

â€˜Computer related servicesâ€™ and â€˜manufacturing or computer and peripheral equipmentâ€™ are industries that can be entirely classified as part of the â€˜coreâ€™ digital economy, defined as hardware, software publishing, web publishing, telecommunications services and specialized & support services. Given the level of aggregation of the SUT, and subsequent IOT, some industry categories comprise activities that would fall within the core digital economy as well as some that would not. These partially digital industries, â€˜Communicationâ€™ and â€˜Manufacture of electronic components, consumer electronics, magnetic and optical mediaâ€™, are partitioned into â€˜digitalâ€™ and â€˜non-digitalâ€™ portions using other data sources including the National Accounts Statistics and Annual Survey of Industries. Once industries of the input-output table are partitioned and classified as digital or non-digital, the Leontief coefficients and matrices are extracted to estimate the forward and backward linkages.

In addition to quantifying the digital economy, this analysis helps understand which sectors are driving growth in the core digital sectors. Simple output and value-added multipliers are also calculated, in order to distinguish the direct and induced effects.

The paper also identifies limitations of the input-output approach to capture the value-added from the digital economy in its entirety - particularly productivity gains attributable to digital inputs that are not reflected in their prices. It also points out challenges related to estimating contribution of emerging technologies, which are and will continue to remain important aspects of the rapidly evolving digital economy. The scarcity of appropriate and granular data poses a potential trade-off between accuracy and completeness in capturing the digital economy. The input-output approach provides greater accuracy and understanding of sectoral linkages at the cost of completeness. Relying on IO tables also enables comparison over time and across countries due to its standardization and consistency. The reliability of this method, however, depends on the reliability of the national SUTs and/or IOTs. Having a framework that is robust yet adaptive to the changing nature of the digital economy, supported by appropriate and regular data collection is increasingly important as the digital transformation encompasses more aspects of the economy.

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