

Making of Digital India: The Challenges in Measuring ICT Investment and its Growth Effects in India

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The role of information and communication technologies (ICT) in driving economic growth has been well established in the literature (see for instance Jorgenson et al, 2011; Inklaar et al., 2008; Jorgenson and Vu, 2005; Jorgenson et al, 2005; van Ark et al, 2003; Jorgenson, 2001). By reducing communication and transaction costs, and improving the quality of capital, ICT helps firms improve their productivity and growth. Given her linguistic and engineering skills, India has been pioneering in ICT exports, in particular export of software services since the 1990s. Taking its early bird advantage, India has maintained a relatively higher market presence in the software segment of IT industry (Saith, Vijayabaskar, 2005). However, there is hardly any attempt to understand how Indian industries have been taking advantage of the growth potential of ICT use in their production process. While there are a few studies trying to understand the contribution of ICT to aggregate economic growth¹, the evidence on the ICT's impact on growth at detailed industry level is even more limited. Available micro level evidence based on plant or firm level data is suggestive of a positive impact of ICT on growth and productivity in India's organized manufacturing sector.

Comparing firms in India and Brazil, Commander et al (2011) suggest the importance of better infrastructure and labor market policy for higher rates of ICT adoption. These policies might be imperative for increasing the ICT intensity in India's manufacturing, which is arguably low, as is evidenced by previous studies. Kite (2012 and 2013) observe positive ICT effects on productivity, and in particular the use of outsourced ICT makes larger contribution than in-house ICT. A recent study by Navyashree and Bhat (2016) analyzes the ICT investments and its growth effects in small and medium firms in food processing industry in India. Using Prowess data, they demonstrate a positive impact of ICT use on growth of small and medium enterprises. At a more aggregate level, Erumban and Das (2016) provide estimates of ICT contribution to growth for the aggregate manufacturing. They use ASI and NSSO data on ICT investment, respectively for registered and unregistered segments of the manufacturing sector. Their findings suggest a lower contribution of ICT to growth in the manufacturing, compared to the aggregate economy, thus implicitly suggesting a larger ICT contribution in the services sector.

This paper is first attempt to construct ICT investment and capital services series for the organized segment of manufacturing industries in India. The study extends the capital asset database in India KLEMS to include ICT investment, i.e. investment in hardware, software and communication equipment, in respect of different manufacturing industries. Using the newly constructed ICT capital services estimates, the paper will provide preliminary estimates of the contribution of ICT capital services to growth in aggregate economy as well as organized manufacturing sector in India. The lack of evidence on ICT contribution is due to the lack of appropriate data on ICT investment. Measuring ICT investment and prices are major challenges even in advanced economies. In this paper, we try to address some of the challenges in creating a fresh series on ICT capital for India following international practices.

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