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Digital divide: determinants and policies with special reference to Asia

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Abstract

Access to the new information and communication technologies (ICT) remains extremely unequally distributed across and within societies. While there have been a good deal of popular discussions about this ''digital divide'', not much is known about the quantitative significance of its various determinants. By undertaking a set of cross-country regressions, the paper finds that income, education, and infrastructure play a critical role in shaping the divide. Based on this analysis, the paper also offers some policy suggestions as to how to promote a wider diffusion of ICT in poorer societies.

JEL classification: O30; O10; P59; I30

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1. Introduction

Much has been written about the digital divide: the division of the world between those who have access to the new information and communications technology (ICT) and those

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who don't. This inequitable access to the ICT has implications for productivity and economic growth of rich and poor countries. For example, the UNDP (1999, p. 63) notes: ''The network society is creating parallel communications systems: one for those with income, education and literacy connections, giving plentiful information at low cost and high speed: the other are those without connections, blocked by high barriers of time, cost and uncertainty and dependent upon outdated information''. Similar concerns have been expressed by such authors as Dertouzos (1997) and Sachs (2000) with the latter claiming that a new map of the world has been created, this time based on technology. However, there are many others who are much more optimistic. For example, Negroponte (1998) opines that ICT has a ''leapfrogging'' characteristic that will enable the poor to catch up. As latecomers, developing countries can embrace existing technologies developed elsewhere and skip intermediate stages allowing them to save on considerable costs of development. In light of the contending viewpoints, it is important to learn what the basic economic determinants of the digital divide are and the ways to overcome it.

The organization of the paper is as follows. Section 2 provides a brief discussion of the various types of ICT, which constitute the backbone of the digital economy. Section 3 is devoted to a discussion of the determinants of ICT adoption. The quantitative analysis provided in this section suggests that there is a strong association between ICT adoption with the socio-economic characteristics of the country. In light of this discussion, the paper makes in Section 4 some inferences about the policy choices for developing countries that would like to promote ICT adoption. The discussion of this section is primarily focused on Asian countries. However, despite the particular empirical focus of the present analysis, it is hoped that the insights from this analysis would be equally applicable to other parts of the developing world. The paper provides some concluding remarks in Section 5.

2. Types of ICT

Depending on the type of use, the new ICT can be roughly divided into three broad categories. That is, the ICT for (1) computing; (2) communication; (3) Internet-enabled communication and computing.

2.1. Computing

With the invention of computers, which represent the most significant technological breakthrough of the last half of the 20th century, the cost of computing has declined exponentially over the years. And the usage of computers has increased by leaps and bounds with the introduction of personal computers (PCs). At the most general level, computers augment and improve thinking capabilities of individuals and organizations and enhance their efficiency. One important example relates to the business management system, known as ''enterprise resource planning'' (ERP), where new softwares enable firms to efficiently integrate all facets of business, including planning, manufacturing, sales, and marketing. Another example of an important use of computing is computer-aided manufacturing and computer-aided design (CAD/CAM) in the product design for the manufacturing process.