Is ICT the Key to Development?

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ABSTRACT

Using panel data for 52 developed and developing countries over the period 1998-2006, this article examines the links between information and communication technology diffusion and human development. We conducted a panel regression analysis of the investments per capita in healthcare, education and information and communication technology against human development index scores. Using a quantile regression approach, our findings suggest that changes in healthcare, education and information and communication technology provision have a stronger impact on human development index scores for less developed than for highly developed countries. Furthermore, at lower levels of development education fosters development directly and also indirectly through their enhanced effects on ICT. At higher levels of development education has only an indirect effect on development through the return to ICT.

Keywords: Human Development Index, Information and Communication Technology, Panel Data, Quantile Regression

INTRODUCTION

Policy makers and researchers hold ambiguous views on information and communication technology (ICT) diffusion and its role in poverty reduction and sustainable development. Many consider ICT to be the only possible mean of achieving development within a reasonable time frame, through technological leapfrogging (World Summit on the Information Society, 2003; 2005). There are, however, alternative views that consider ICT of no great value or even may be unfavorable to the less developed nations (UNDP, 2004). They have argued that governments of poor countries should focus attention on basic education, healthcare, electricity and clean water instead of costly ICT infrastructure (Ngwenyama, Andoh-Baidoo, Bollou & Morawczynski, 2006).

Many developed countries in North America, Western Europe and South East Asia have achieved growth and development with the adoption and use of ICT in sectors of their economies. Based on the assumption that ICT foster development, there has been a joint effort among national governments and international organizations to compose and implement information and communication technology for development (ICT4D) strategies. These strategies have put pressure on national
governments to invest both human and financial resources for the ICT expansion (Morawczynski & Ngwenyama, 2007). Consequently, many developing nations have implemented market liberalization and invested huge sums of money into their ICT infrastructure. However, few studies have been conducted to assess the effectiveness of these investments (Bollou & Ngwenyama, 2008).

The empirical literature presents also ambiguous conclusions concerning the link between ICT use and economic growth in developing countries. Earlier studies have failed to find a relationship between ICT and productivity growth in developing countries. While qualitative studies support the belief that ICT is critical to economic growth and development, researchers have not succeeded in finding strong quantitative empirical evidence (Dewan & Kraemer, 2000; Oliner & Sichel, 2000; Schreyer, 2000; Pohjola, 2001, Zhang & Lee, 2007). In essence the contribution of ICT to growth and development is not automatic and depends on the appropriate application and effective use of these technologies as well as on the investment in complementary factors (e.g. human resources, research and development, etc) (Lee, Gholami & Tong, 2005, Molla & Licker, 2005).

Since investments in ICT are made at the expense of the provision of basic services like education and healthcare, many have questioned if this is the right path for less developed countries to achieve development. Some studies caution against the assumption that such linkages would indeed occur in the case of developing countries. For example, Avgerou (1998) and Morales-Gomez & Melesse (1998) argue that the transfer of ICT to developing countries may not contribute to economic development the same way it did in industrial countries, and that it may be best to localize technology and focus on its use in education.

In contrast to the earlier studies, the empirical findings of more recent studies indicated that ICT dissemination fosters economic development in developing countries as well (e.g. Baliamoune-Lutz, 2003). Ngwenyama, Andoh-Baidoo, Bollou & Morawczynski (2006) and Morawczynski & Ngwenyama (2007) found that complementary investment in healthcare, education and ICT significantly impact human development measures in five West African countries. However, Ngwenyama, Andoh-Baidoo, Bollou & Morawczynski (2006) suggest that the relationship between the investment variables (ICT, health and education) is complex and requires more sophisticated statistical analysis beyond ordinary regression. The International Telecommunication Union (ITU) has also pointed out that there is little research measuring the impact of ICT expansion in developing countries (ITU, 2006).

Bollou & Ngwenyama (2008) argue that demonstrating ICT value especially in the context of developing countries is important because of the challenges involving the development of ICT policy and the UN’s inability to state firmly if there are benefits to these investments. Therefore, this article aims to contribute to this line of research. Firstly, our main objective is to assess the role that the provision of ICT, healthcare and education plays on the human development index. Until the constitution of the human development index (HDI), there has not been a standardized measure of human development. As such, a comprehensive analysis between nations was difficult (Morawczynski & Ngwenyama, 2007). Moreover, we aim to identify different responses of the HDI score to these policy variables depending on the degree of the country’s development. To do so, we use a panel of 52 highly developed industrialised countries as well as less developed countries over the period 1998-2006.

Morawczynski & Ngwenyama (2007) aggregated all ICT in one category and suggested future research should investigate how different communication technologies such as telephony or the Internet are impacting human development. Thus, our second objective is to analyse the extent to which different communication technologies such as the use of PCs, telephony or Internet impact human development. Finally, we also assess the role that education attain-
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