



## Assessing economic impact of ICT

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By *Dr. Bazlul Haque Khondker*

Recognising the importance of science and technology in general and of ICT (Information and Communications Technology), in particular, the government of Bangladesh has formulated the National Science and Technology Policy and National ICT Policy, 2009. The ICT Policy has articulated a vision in terms of expansion of information and communications technology and its huge potential in establishing a transparent, committed and accountable government, development of skilled manpower, improvement of social justice, and management of public services. The Vision 2021 has also attached special emphasis to ICT services by encouraging introduction and expansion of ICT services in a number of areas.

✘ During the last decade, the ICT sector in Bangladesh has made tremendous progress with an estimated annual growth of 20 per cent. Moreover, 21 of the 53 e-citizen services quick-win activities identified by Access to Information (A2I) Programme (based at the Prime Minister's Office) have already been launched. The rest of the activities are being pursued either independently by the implementing ministry/implementing agency.

Despite the progress in ICT sector, the country does face significant barriers to its further

expansion. Although the government's ICT infrastructure has improved notably, it is still limited mostly to offices in urban locations with access to computers also restricted mostly to higher level officials. The administrative structure needed for a coordinated approach to e-Government is also non-existent. The requisite policy and legal framework to enable growth of e-Government still has some major gaps with respect to guidelines for data standardisation, shared ICT resources, data security and privacy. ICT professionals also have pointed out a number of structural constraints acting against its expansion. These include lack of suitable content development for web, bureaucratic regulations, lack of support to local entrepreneurs in issuing tender, absence of proper content for web designing, lack of support for local firms in accessing nation-wide large scale projects etc (as expressed by key informants) and lack of innovative means of private sector engagement.

It has also been argued that one of the key constraints of conducting rigorous research in the ICT sector is lack of data, which has severely restricted the scope of analysing the challenges as well as prospects of this sector and the potential contribution of ICT services from a broader point of view. Despite data limitation, with a view to assessing the economic impact of ICT and identify the role of public and private sectors in realising the targets and goals of this sector, a study, based on existing literature, analysis of secondary household level data and key informant interview (KII) has been conducted (Bidisha et al. 2015). Among others, the study also attempted to shed light on the crucial relationship between ICT services and economic growth. This article is primarily based on the above mentioned study.

Empirical works on ICT and economic growth are still not commonly available perhaps mainly due to the non-availability of data and specification issues. The authors have used three different types of specifications for assessing the impact of ICT in Bangladesh. The choice of these specifications has been dictated mainly by data availability.

A simple time series (covering 26 years from 1988 to 2013) linear regression model (bivariate) linking per capita GDP (gross domestic product) growth and ICT indicators (i.e. bandwidth: used or availability) shows that 10 per cent incremental usage of bandwidth (GBPS) can lead to 1.39 per cent increase in GDP per capita whereas 10 per cent incremental usage of bandwidth leads to 0.057 incremental growth of GDP per capita. Similarly, 0.034 incremental economic growth could be achieved for a 10 per cent incremental usage of bandwidth which suggests that over three years, the country could gain around 1 per cent

GDP growth for 30 per cent incremental usage of bandwidth. On the other hand, extension of the simple model with the inclusion of macro variables shows that the magnitudes of the effects have been reduced but the directions of the impact remains stable with lower level of significance.

The estimated results of a cross-section econometric model based on HIES 2010 data reveals that a number of socio-economic factors may hinder ICT tools/services. For example, age of households head, family size along with children have negative impact of having ICT tools or on accessing ICT services. For the poor and wage income dependent households, similar effect is also observed. On the other hand, the plausible impact of education level, gender and access to utility services (e.g. electricity connection) appears positive for expansion of this sector. As expected, access to ICT services has been found to be higher among those belonging to higher income level. In fact, among others, income level has come out as the most critical factor- more specifically; the better-off households are accessing the ICT tools and services much more than their poorer counterparts. Further analysis shows that if a household possesses electricity connection, has at least a member working outside own district or abroad, and has access to formal financial institution, then these factors have positive impact on accessing ICT tools and ICT services. For rural poor household, the probability of accessing ICT tools and ICT services decreases by 0.09 and 0.18 respectively compared to the urban and non-poor household, holding other variables.

Bangladesh's input-output table for 2012 has been used to assess the technology structure of the ICT sector. 'Panel A' of Figure 1 shows the quantity of goods and services purchased from other sectors to produce one unit of ICT output (sum of these equals 0.35) where as Panel B shows input use structure of ICT sector. In economic jargon, this is also known as degree of endogeneity - a higher value suggests greater integration to the domestic economy and usually leads to higher backward linkages. The main purchases are from communication services, followed by professional and banking services. Among goods, the main expenditure is on machinery and equipment. Factor use is almost double of the input use (i.e. Panel B) implying that ICT is less integrated to the domestic economy compared to manufacturing and agricultural activities but would pull more of factors (e.g. labour and capital) in its expansion. In other words, it is a factor-intensive production activity and would rely on skilled professionals for further development.

Findings of the economic assessment point to large potential of the sector as well as some key challenges for further development. The existing literature proposes a number of strategies and policies for dealing with the existing challenges of the sector. In addition to ensuring supply of skilled professionals, another crucial factor is to provide incentives to the sector through fiscal and monetary policies and other means (e.g. effective regulation) to help further reduction of the prices of ICT tools and services for wider usages. Exemption of e-commerce from VAT can be a good policy tool in this regard. Cumbersome paperwork and regulations constrain implementation of innovative ideas. Reforming the existing policies is, therefore, the foremost important condition for development of this sector.

According to entrepreneurs, one of the key constraints to development of the ICT sector is lack of confidence of the government on local firms; hence it relies on foreign firms. Thus they call for giving priority to the local firms and to promote joint collaboration of local firms with foreign partners and/or development of local firms under the supervision of foreign experts. Furthermore, in the context of ICT services, content development is crucial and the government should facilitate the process by establishing a body of academicians and ICT experts who should be involved in conducting in-depth research on ICT.

Finally, understanding long-term linkages between ICT and development can only be materialised through high quality research in this area. One of the shortcomings, among others, is lack of long-term data for conducting such research. The government, therefore, should allocate sufficient fund for building a detailed data base on ICT activities which will eventually enable the researchers to conduct systematic study in this area with concrete policy focus.