

**Labor Productivity and the Impact of Information and Communication Technologies:
A Panel Data Analysis of Developed and Developing Countries**

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In most of the recent analyses, investments in Information and Communication Technology (ICT) seem to have shown their productive effects at the industry and firm level. However, this fact has not been confirmed at the aggregate level.

The aim of this study is to shed more light on the possible effects of ICT spending on the level and growth rate of labor productivity at the aggregate level. Due to lack of ICT capital data, we will use ICT spending data which include household consumption, government spending and private sector investments. This is justified by considering government spending as a special kind of social capital. In addition, household consumption for ICT is considered as a durable good whose private use by workers, at home, strengthens their existing skills.

A production function is employed to investigate whether ICT spending affects labor productivity on a panel of 43 countries in the 1993-2001 period, using panel data techniques. The required data on capital stocks were estimated using the perpetual inventory method and the Penn World Table data as initial values. The data for ICT spending were taken from WITSA (World Information Technology and Services Alliance), while output and labor data were taken from the Penn World Table database and the International Labor Office (ILO), respectively. All values are expressed in purchasing power parity in order to make the data compatible across countries.

When running the conventional cross sectional times series regression, we find evidence for a positive and significant relationship between ICT spending and the level of labor productivity, although the ICT coefficient exhibits a great variability. Furthermore, the hardware variable has a high positive and significant impact, while the software and telecommunication spending variables are not significant at both the level and growth rate of labour productivity. However, the expenses for other Information Technology (IT) products and services, in example IT office equipment or IT services, show a significant and negative impact. This result is justified by the fact that these expenses are not directly or indirectly linked to any kind of productive activity. Contrary to previous evidence, this paper suggests that ICT spending has beneficial effects on productivity of both developed and developing countries.