Information Technology, Communication Technology, and Changes in Skill Structure: Evidence from Danish Firms

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Abstract

This paper studies the distinct effects of information technologies (ITs) and communication technologies (CTs) on firm’s skill-structure, using a unique panel dataset of Danish firms containing detailed information on firm’s investments in ICT as well as their skill-structure, all measured in prices. We argue that IT complements workers in performing complex tasks and substitutes workers in performing non-complex tasks, while CT substitutes workers in performing complex tasks and complements workers in performing non-complex tasks. Specifically, we test three sets of hypotheses. First, firm’s investments in IT should be followed by an increase in the relative demand for skilled labor, while their investments in CT should lead to an increase in the relative demand for unskilled workers. Second, reductions in the relative cost of skills should increase the probability of firm’s investments in IT and reduce the probability of firm’s investments in CT. Finally, firm’s investments in IT should have larger impact on productivity in skill-intensive firms, while firm’s investments in CT should have larger impact on productivity in non-skill intensive firms. We find support of each of these three hypotheses and thereby provide evidence of "information-skill complementarity" and "communication-skill substitution".

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