

Robotic capital-skill complementarity

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The rise of artificial intelligence and automation is fueling anxiety about the replacement of workers with robots, computers and digital technologies. Such an increasing use of automated routines and robots in production process throughout nearly all sectors of the economy has spurred a sharper focus on the labor market implications. In this paper, we investigate the existence of complementarity/substitutability across several forms of capital with respect to three skill types: high-, medium- and low-skilled workers. By including a specific measure of robotic capital stock into different production functions, we test the robotic capital-skill complementarity hypothesis on two samples of countries and two-digit level industries, based on WIOD and EU KLEMS datasets. The robotic capital-skill complementarity hypothesis is examined using different frameworks of analysis and parametric nonlinear regression methods. Our main outcomes consistently point to lower elasticities of substitution between robotic capital and skilled labor, i.e. more complementarity. Such findings are extended and generalized by employing robotic, ICT and other capital, and three skill groups to looking for heterogeneous roles of elasticity in wage polarization. In this respect, robotic and ICT capital appear to be associated with a polarization of the wage distribution. In terms of policy implications, the evidence suggests measures aimed at improving productivity, wage and education differentials for lower-skilled labor. In essence, the study casts additional light on understanding the mechanisms underlying the current forces operating in the labor markets, especially in manufacturing industries of advanced and transition economies.

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