Technical Change and the Demand for Skills by U.S. Industries

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Abstract. Previous studies have explained the demand for skills, usually measured by schooling attainment, by either factor price substitution, capital-skill complementarity, or technology-skill complementarity. We explore this demand with direct job-based measures of cognitive (CS), interactive (IS), and motor (MS) skills in a single model that includes all three sets of possible determinants. The results raise doubts about the adequacy of schooling as a measure of skill and TFP growth as an index of technical change. We find little support for capital-skill complementarity; capital-intensity and its growth are significantly inversely related to CS and MS levels and growth. Technical change is unambiguously linked to increasing CS, rising professional/technical shares, and declining operative/laborer shares. The effects on MS and IS are mixed, but young capital increases craft shares, and computer-intensity decreases supervisory and clerical/service shares.

A good match between the demand for skills and their supply is a prerequisite for any well-functioning economy. This is no simple matter, particularly in the current period of rapid changes in the technology and organization of production, since new skills and capabilities usually require both considerable time to develop and costly personal and institutional adjustments. The widely perceived inadequacy of education and job training in the U.S. has become an increasing source of concern for policy makers, but before better training processes can be designed, a necessary first step is to anticipate future demands for skills in the workplace. Whether this can be done very well depends in part on our ability to describe and explain recent trends in skill composition.

Previous econometric studies of interindustry differences in skills and skill growth have focused on the effects of factor prices and capital-intensity on indices of schooling attainment. The results of these tests have been interpreted to provide strong support for the

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