

Capital-Labor Substitution in Low-Skilled Labor-Intensive Manufacturing Industries in the United States

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Abstract:

This paper investigates how firms adjust capital-labor ratios when wage costs increase. Exploiting state-by-year variations in minimum wage, I analyze manufacturing firms' responses to the change in the labor cost across the United States over a 23-year period using data from three restricted-use establishment-level surveys: the Annual Survey of Manufacturers (ASM), the Census of Manufactures (CM) and the Longitudinal Business Database (LBD). By comparing plants that are bound and unbound by the minimum wage, I find that when the hourly wage of production workers increases by 1 percent, manufacturing plants reduce total hours worked by production workers by 0.6 percent, and increase capital expenditures on machinery and equipment by 3.9 percent. The reduction in the average hours worked per production worker, rather than a reduction in the number of production workers, drives 81.8 percent of the total decline in total production hours. The estimated elasticity of substitution between capital and labor is 0.68. I also find evidence that following increases in the hourly wage, some establishments respond by exiting the market. Following the wage increases, no statistically significant changes emerge in output, materials or profit. Manufacturing plants' productivity tends to increase one year after the wage increases.