

Estimating the Benefit of High School for College-Bound Students*

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Abstract

Studies based on instrumental variable techniques suggest that the value of a high school education is large for potential dropouts, yet we know much less about the size of the benefit for students who will go on to post-secondary education. To help fill this gap, I measure the value-added of a year of high-school mathematics for university-bound students using a recent Ontario secondary school reform. The subject specificity of this reform makes it possible to identify the benefit of an extra year of mathematics despite the presence of self-selection: one can use subjects unaffected by the reform to control for potential ability differences between control and treatment groups. Further, the richness of the data allows me to generalize the standard difference-in-differences estimator, correcting for heterogeneity in ability measurement across subjects. The estimated value-added to an extra year of mathematics is small for these students, of the order of 17 percent of a standard deviation in university grades. This evidence helps to explain why the literature finds only modest effects of taking more mathematics in high school on wages, the small monetary gain being due to a lack of subject-specific human capital accumulation. Within- and between-sample comparisons also suggest that the extra year of mathematics benefits lower ability students more than higher-ability students.

Keywords: Human Capital, High School Curriculum, Education Reform, Mathematics, Factor Model

JEL Classification: I20, I21, I28

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