

Essays on Rising School Spending and Economic Growth

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The Contribution of Rising School Quality to U.S. Economic Growth (Job Market Paper)

This paper explores how much U.S. labor quality has increased due to rising school spending. Schooling investments in the U.S. increased dramatically during the 20th century. According to the Current Population Survey March Supplement, the mean years of schooling for the U.S. workforce rose from about 11 years in 1967 to more than 13 years in 2000. On top of that, public school spending per pupil in elementary and secondary schools for the cohorts appearing in either survey more than tripled on average. While both of these are potential sources of real income growth in the U.S., the measure of labor quality growth used by the Bureau of Labor Statistics (BLS) is determined mainly by increases in the mean years of schooling, and fails to capture the impact of changes in education quality on the human capital of the workforce. The BLS reports that labor quality grew by 0.22 percent per year between 1967 and 2000; if increased school spending improved school quality, then the BLS may miss a significant part of the contribution of labor quality growth to U.S. labor productivity growth.

In order to understand the role of school spending in human capital accumulation, I develop a simple schooling model. An important characteristic of the model is that human capital depends not only on the amount of time spent in school, but also on the level of expenditures while in attendance. The productivity of school spending is governed by the elasticity of human capital production with respect to school spending. In this study, I propose a new way of estimating this elasticity, and quantify the impact of a nine-fold increase in school spending per pupil on U.S. labor productivity growth.

To estimate the productivity of school spending in increasing the human capital of the workforce, I examine how earnings of younger cohorts compare to those of older cohorts who received their schooling at earlier dates. I also examine how the estimated Mincer return to schooling has evolved over time. Empirical returns to schooling doubled between 1967 and 2000, while mean years of education increased. If we allow for the marginal return to schooling to decline with the level of education, then increased returns to schooling can only be explained by a rise in either school quality or skill premiums. For illustration, suppose that individual human capital does not increase with experience at all. If school quality indeed improved due to rising school spending, then in cross-sectional data we should observe higher earnings for younger cohorts than for older cohorts. Since experience has no effect on human capital, rising school quality can be quantified by accounting for earnings differences across cohorts in cross-sectional data, conditional on years of schooling. The increases in returns to schooling unexplained by the estimated increases in school quality can then be attributed to a rising skill premium.

Earnings do increase with work experience, because individuals accumulate human capital through work experience in addition to schooling, but the above logic is still valid. To be consistent both with rising school quality and with increasing experience-earnings profiles in cross-sectional data, it must be that individual human capital stocks increase very rapidly with work experience. Individual human capital profiles cannot be too steep after the completion of schooling, however, or else individuals would leave school earlier than we observe, substituting expenditure on schooling for time in school. Individual post-schooling human capital profiles, identified in this manner, allow us to estimate the proportion of labor quality growth that is due to rising school expenditures by disentangling the impact of rising school quality and differences in work experience upon cross-sectional earnings differences across cohorts.

My findings are that rising school spending is half as important as increases in mean years of schooling for U.S. labor quality growth, and that total labor quality growth explains about one quarter of the growth in labor productivity between 1967 and 2000. The growth in human capital of the workforce in response to rising school spending explains only a quarter of the increases in empirical returns to schooling, and a rising skill premium explains the rest. Given a nine-fold increase in school spending per pupil, U.S. labor quality growth has been fairly modest. Controlling for the rise in skill premium is important--failing to do so would double the estimated importance of the increased expenditure to growth in human capital.

Explaining Rising School Spending in the U.S. (Work in Progress)

Although U.S. public school spending per pupil increased dramatically during the 20th century, I find that its impact on labor quality growth has been fairly modest. This finding raises a question: Why did school spending increase so drastically, despite not being very productive?

One important factor is an anticipated rise in the skill premium. Even though school spending is not very productive at increasing human capital, an anticipated increase in skill premium gives individuals an incentive to increase spending on schooling, by raising the return on spending. Empirical evidence suggests that technological progress in the U.S. has favored skilled labor, thereby steadily increasing the demand for skilled labor throughout the 20th century. Accordingly, an anticipated rise in skill premium can potentially explain increased school spending in the U.S. over that period. This paper assesses the degree to which increased school spending in the U.S. is caused by the rise in skill premium.

Not only does the rise in skill premium increase average spending on education over time, but it also has cross-sectional implications. If individuals anticipate high levels of education to be valued more in the market, individuals who choose more years of schooling would expect a higher wage growth in the future, and therefore spend relatively more money, in addition to more time, in acquiring education. Expenditures on schooling would then fan out over time, consistent with what I see in the Current Expenditure Survey (CEX) data.