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The Benefits to Taxpayers from Increases in Students' Educational Attainment

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Summary

Policymakers in most states face a fundamental challenge—motivating taxpayers to provide the funds required to meet mounting educational needs. The level of education needed to succeed in labor markets and support economic growth is increasing rapidly. But, in most states, public schools from kindergarten through the university level already face budgetary limits, and meeting the demands of the future will be expensive. Taxpayers who do not have children in public school frequently question why they should contribute more to the support of educational institutions, or why those who stand to benefit the most—the students—should not pay more for their education.

In this study, we explore the financial benefits that taxpayers enjoy as a result of increases in students' education levels. We specifically address three research questions: How do increases in an individual's educational attainment affect

- tax revenues
- program expenditures and revenues for a range of social support and insurance programs
- spending for prisons and jails?

We then subtract the costs of providing additional education to a student from the estimated effects of an increase in his or her education level on public spending and revenues to estimate the net benefit to taxpayers resulting from the increase in an individual's education.

Our findings indicate that an increase in a student's educational attainment—say, completing high school rather than dropping out—results in substantial benefits to taxpayers over time. For example, if a U.S.-born, Hispanic man who would have dropped out of high school were to obtain a high school diploma instead, the discounted present value of the net benefits to taxpayers equals about \$87,000 in 2002 dollars. The comparable result for a U.S.-born, Hispanic woman is almost as large, with net benefits equal to about \$83,000 in 2002 dollars. The results for other racial and ethnic groups are similar.

Our analysis focuses on the net benefits to taxpayers from increases in educational attainment. However, this is not a cost-benefit analysis of specific programs, since we

do not consider the costs of developing and operating programs and policies aimed at encouraging students to pursue higher education levels. Consequently, we do not know how the benefits from increases in education levels to taxpayers compare with the costs of policies and programs that induce students to increase their education. Our objective is to demonstrate that taxpayers gain certain benefits from programs and policies that result in greater educational attainment, even if the taxpayers do not have children in school, and that taxpayers should consequently consider these benefits in assessing the importance of developing and implementing programs and policies to increase education levels.

Analytic Approach

To address the research questions, we estimate the extent to which increased educational attainment will result in three types of benefits to taxpayers:

- increases in federal, state, and local tax revenues and increases in contributions to social support and insurance programs, such as Social Security and Medicare
- reductions in public expenditures on social support and insurance programs
- reductions in public expenditures on incarceration—the costs of operating state prisons and county and municipal jails.

By “increased educational attainment,” we mean more time in school, rather than “better” education in the sense of the schools doing a better job. Similarly, when we talk about additional spending on education, we mean the spending required to serve individuals in school longer; we do not consider the costs of programs aimed at inducing students to remain in school longer.

We use a nationally representative sample of roughly 40,000 individuals covered in all months of 2002 by the Survey of Income and Program Participation (SIPP) to model the effects of education level (some high school, high school graduation, some college, and college graduation) on public revenues and expenditures, depending on an individual's age, gender, and race/ethnicity—African-American (black), Asian, Hispanic, Native American, or non-Hispanic white (white).

We estimate the effects of education level on federal, state, and local tax payments and payments into social support and insurance programs throughout the entire working life of an adult, using appropriate survival rates. We use federal data to estimate payments of federal taxes and contributions to social support and insurance programs, such as Social Security and Medicare. State and local tax schedules vary across the country, so we use U.S. national average state and local tax schedules to estimate state and local tax payments.

We examine the effects of education level on program spending for eight of the country's largest social support and insurance programs for which sufficient data on program participation and program spending are available. Different segments of the population participate at different rates in social support and insurance programs. Consequently, we conduct separate analyses for different groups distinguished by gender and race/ethnicity. Because the social programs we examine are all national programs, we use the national sample to model the effects of educational attainment on (1) the likelihood that a person will enroll in a social support or insurance program and (2) the amount of benefit that a person will receive from a social support program upon enrollment.

Incarceration rates and the costs of operating prisons and jails vary across the country. Because federal prisons house a small percentage of prisoners, we focus on the effects of education on the costs of operating state prisons and local jails. We use U.S. national average data to estimate the effects of education level on the probability of incarceration in state prisons or in county and municipal jails for each combination of age, race/ethnicity, and gender. We use the national average cost per inmate of operating state prison system and county and municipal jails to estimate the effects of increased educational attainment on the costs of incarceration.

We use national average operating cost estimates for public secondary and post-secondary education systems to estimate the costs of providing additional education. We assume that the costs of providing additional education to a student equal the national average operating costs per student at each level of education. We subtract the costs of providing additional education from the resulting benefits to estimate the net benefits to taxpayers from increased educational attainment.

Because the benefits to taxpayers of additional education are spread over an individual's lifetime—as he or she pays more in taxes, places fewer demands on social support programs, and does not engender incarceration costs—we estimate the expected effects of increased education over each year of an individual's lifetime and then discount the annual benefits to calculate their current values at age 18. Because much of our data are for 2002, we discount all dollar amounts to 2002 dollars, at an annual rate of 3 percent. We then estimate the net benefit of increased educational attainment to taxpayers in 2002 dollars.

Because of data limitations in the SIPP, it is not possible to estimate similar effects for immigrants—those young enough to obtain additional U.S.-based education at the high school or postsecondary level—as for the native-born. For that reason, we focus our report on results for U.S.-born individuals. However, we did include immigrants in our sample and estimated models to differentiate between native- and foreign-born individuals. While not definitive, estimates for immigrants comparable to those we present here for the native-born suggest that the benefits from increased education for immigrants will be of a similar order of magnitude.

Payments for Taxes and Social Support and Insurance Programs

Greater educational attainment increases the likelihood that an individual will be employed and the level of his or her wages or salary when employed. The available evidence strongly indicates that more education increases an employed person's earnings capacity (their wage when employed) by at least 7 to 10 percent per additional year of schooling. The higher earnings realized by more highly educated people result in higher tax payments and higher payments to social support and insurance programs.

We model tax and social support and insurance payments as a function of education level, age, and demographic characteristics. For every population group, increases in an individual's education level result in substantial increases in payments into tax and social support and insurance programs. Graduating from college rather than ending schooling with some college provides the largest impact on tax payments, followed by obtaining a high school diploma rather than dropping out of high school. The difference between the tax payments made by a person with a high school diploma and an otherwise similar person with some college is smaller, but still substantial.

The effects of increases in education on tax and social insurance payments are generally greater for men than for women at all education levels and in all race/ethnic groups.

Spending for Social Support and Insurance Programs

Because an increase in educational attainment increases both the likelihood of employment and an individual's wages when employed, it reduces the likelihood that the individual will participate in social support programs. The higher earnings resulting from greater educational attainment also reduce the amount that a more highly educated person collects when he or she does participate in most social support programs.

Analyses focused on the benefits of increased education to students or to society as a whole generally view public assistance costs as transfer payments. From this perspective, reductions in social support payments resulting from increases in educational attainment simply reduce transfers from taxpayers to social support program participants, with no benefits to society as a whole except for reductions in the administrative costs of social support programs. But, from the perspective of taxpayers, who provide the funds that social support programs distribute to participants, reductions in the costs of social support programs resulting from increased education are a benefit.

We model participation in each of eight social support programs as a function of education level, age, and demographic characteristics. Except for Unemployment Insurance and Social Security, increases in an individual's education level result in substantial reductions in the likelihood of participation and in benefits paid when the individual participates. Unemployment Insurance is an exception in that the level

of compensation received depends on the person's last salary, which in turn depends on that person's level of education. Social Security is an exception in that the retirement compensation received under the retirement subprogram depends on the person's cumulative contribution during the entire time he or she spent in the work force, which in turn is highly sensitive to that individual's level of education.

The greatest reductions in spending on social support programs result from graduating from high school rather than dropping out. Beyond the high school diploma, some college has a greater impact for women and a college degree has greater impact for men.

Spending for Prisons and Jails

Research strongly demonstrates that education reduces the likelihood that an individual will engage in criminal activity. Increases in educational attainment consequently reduce the likelihood that an individual will be incarcerated. Reductions in the size of the prison and jail population decrease the costs of operating and maintaining correctional facilities. Because federal prisons hold a small share of inmates and account for a small fraction of nationwide incarceration, we concentrate on the savings that would be achieved on spending for state prisons and county and municipal jails.

Analyses of the effects of increased education on the costs of the criminal justice system often account not only for incarceration costs but also the other criminal justice system costs, such as police and adjudication. Because of resource limitation, we limited our analysis to the effects of increased education on incarceration costs.

Increases in educational attainment yield the greatest savings in incarceration costs among those who graduate from high school rather than dropping out. The savings to the public budget are less from those who have some college education rather than none, and rather little from those who graduate from college compared to settling for some college. Even for the highest-risk population subgroups of black and Hispanic men, a bachelor's degree results in just a small increase in incarceration savings compared with entering but not graduating college.

For both men and women, the primary savings on the costs of incarceration result from increased education within the black population. For each race/ethnicity group, the magnitude of savings within each female group is generally about one-tenth of that in the corresponding male group.

The Cost of Additional Education

Increasing educational attainment requires higher spending to provide the additional education. Our estimates are based on U.S. national average costs of public education.

In the 2001–2002 school year, the closest corresponding school year to the calendar year 2002, in which our data were collected, the national average current expenditure per student in average daily attendance (ADA) in public K–12 education was about \$7,700. That school year, it cost taxpayers about \$7,600 per full-time equivalent (FTE) student to provide additional education in a public two-year college and about \$10,000 per FTE to provide additional education in a public four-year college or university.

These are the additional costs of providing additional education. They do not include the costs of programs and policies aimed at motivating students to obtain additional education.

Net Benefits to Taxpayers

The net benefits to taxpayers of increased educational attainment equal the sum of the increases in public revenues and the reductions in public spending resulting from increased education minus the cost of providing the additional education.

To illustrate the calculations: On average, increasing a U.S.-born, white man's educational attainment from less than high school graduation to high school graduation would result in increased tax payments over his lifetime equal to \$54,000. (All the figures in this paragraph are presented in 2002 dollars, in discounted present value to age 18). The increase in his education level would also result in reduced future demands on social support programs and reduced future incarceration costs equal to about \$22,000 and \$13,000, respectively. Thus, the average total public benefits of increasing a U.S.-born, white male's education level from less than high school to high school graduate would equal about \$89,000. Providing the additional education would cost about \$15,000, so the net benefit to taxpayers would be about \$74,000. In sum, if a U.S.-born, white male who would drop out of high school were to instead graduate high school, taxpayers would realize net benefits equal, in discounted present value, to about \$74,000.

The benefits to taxpayers from increased educational attainment clearly exceed the costs of providing the additional education by a large margin for the members of every population group. Regardless of a student's gender or race/ethnicity, raising the level of education he or she attains creates high net benefits for the public budget.

Again, we note that these results pertain to the net benefits to taxpayers of increases in students' educational attainment. We do not consider the costs of developing and operating programs and policies aimed at inducing students to pursue higher education levels.

Sensitivity Analyses

To test how sensitive our results are to our estimates of the effects of increases in education level, we recalculated the benefits to taxpayers from an increase in education for each demographic group assuming that the effects of increases in education on tax payments, social program costs, and incarceration costs were each 25 percent smaller than our original estimate. Reducing the estimated effect of increasing education from less than high school to high school graduate by 25 percent resulted in a reduction in the discounted present value of lifetime net benefits to taxpayers of 28 to 34 percent, depending on the demographic group, for U.S.-born men and women. The results of similar sensitivity analyses for the effects of increasing education from high school graduate to some college and for the effect of increasing education from some college to college graduate were very similar.

The present value of net benefits to taxpayers from an increase in education are substantial even if we assume the effects of education on public revenues and costs are 25 percent smaller than our estimates. We estimate that the benefit to taxpayers from increasing an individual's education from less than high school to high school graduate is at least \$51,000 (present value, net of the cost of providing the additional education) for each U.S.-born demographic group. If we assume that the effect of increasing education from high school graduate to some college is 25 percent smaller than our estimate, the benefit to taxpayers is still at least \$24,000 (present value, net of the cost of providing the additional education), depending on the demographic group. For the increase in education from some college to college graduate, the benefit to taxpayers, assuming a 25-percent-smaller effect of education level, is at least \$53,000 (present value, net of the cost of providing the additional education), depending on the demographic group.

Putting the Results in Perspective

As noted previously, we use data collected in 2002 to estimate the models used in this analysis. In doing so, we assume that the estimated relationships between education level and governmental revenues and costs will remain approximately the same into the future. Specifically, we assume that the effects of education on earnings and, consequently, on tax payments and participation in social programs, in the future will be essentially the same as the effects observed in 2002. We also assume that federal, state, and local tax structures, social support programs, and incarceration patterns will not change substantially in the future.

Changes in some of these relationships are likely to occur at some future date. Consequently, the estimates presented here cannot be viewed as precise. However, the magnitudes of the estimates are generally so large that, even if changes in these rela-

tionships substantially reduce the effects of increased educational attainment on government revenues and costs, the net benefits to taxpayers will still be substantial. Moreover, changes that increase the effects of education level on government revenues and costs are more likely than are changes that reduce the effects. If such changes occur, the estimates presented here will understate the effects of increased educational attainment on government revenues and costs.

Our analysis assumes that the relationships observed in the data are causal. That is, we assume that the differences in contributions to government revenues and costs between more highly educated and less highly educated people are the result of the differences in their levels of education. There is abundant evidence that increased educational attainment leads to increases in earnings and that earnings are related to contributions to government revenues and costs. It is possible that some other factor is related to both the level of an individual's education and his or her contributions to government revenues and costs. But it is clear that education is a dominant factor, even if there are others. Moreover, the magnitude of the effect of education on earnings has grown consistently over time. Because we assume that the relationships between educational attainment and contributions to government revenues and costs that existed in 2002 will continue over time, our estimates do not reflect the effects of increases in the effect of educational attainment on earnings and, consequently, on government revenues and costs.

The bottom line is that these estimates, notwithstanding the inherent uncertainties in estimating future trends and patterns, show that increased educational attainment yields significant benefits to taxpayers. We recognize that the greatest gains accrue to those whose education levels are improved and that increases in educational attainment also provide numerous types of noneconomic benefits in addition to economic benefits. However, this analysis indicates that raising an individual's level of education creates high benefits for the public budget, benefits that should be considered in assessing the importance of finding, funding, and implementing programs aimed at increasing educational attainment.