

**The fiscal returns to public educational investments  
in African American males\***

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## **Abstract**

This paper calculates the public savings (financial benefits) from greater public investments in the education of African American males. Over one-fifth of each age cohort of black males in the U.S. is not a high school graduate. We identify five interventions that would – based on credible research – increase the graduation rate; we also report the public cost of each intervention. We then calculate the lifetime public benefits in terms of increased tax revenues and lower spending on health and crime. In present values for a black male aged 20, these public benefits amount to \$256,700 per new graduate and the median intervention would cost only \$90,700. The benefit/cost ratio is 2.83 for each marginal high school graduate. Including the social benefits of graduation, the total benefits are \$930,900 per marginal black male graduate. The benefit-cost ratio for the median intervention then rises to 10.26. These results suggest that increased investments in education for black males at risk of dropping out of high school should be an economic priority. It also contributes significantly to a more equitable society.

## 1. Introduction

Among all of the major demographic groups in the U.S., African-American (black) males experience the poorest educational outcomes.<sup>1</sup> Whether measuring such outcomes in terms of test scores, high school graduation, post-secondary attendance, or college graduation, African-American males lag substantially behind other groups. It is widely recognized that unequal educational outcomes lead to unequal economic consequences throughout the life course. In particular, individuals with low attainment and poor quality education—these often overlap—can expect to face inferior employment prospects, low wages, poor health, and greater involvement in the criminal justice system.

Educational inequality for black males is a moral issue, but it is also an economic one: poor education leads to large social costs in the form of lower societal income and economic growth, lower tax revenues, and higher costs of such public services as health, criminal justice, and public assistance. Thus, it is possible to assess efforts to improve educational outcomes for black males as a public investment which might yield high returns.

In this article we undertake a comprehensive assessment of the public returns to investments for improving educational attainments of black males. We begin by documenting the extent of educational inequality between blacks and whites. Next, we identify educational interventions which would increase the rate of high school graduation and we calculate their public costs. Then we summarize the fiscal and social benefits of increasing the numbers of black male high school graduates in terms of higher tax revenues, reduced public costs for health services, and reduced costs of criminal justice services.<sup>2</sup> Finally, we will combine these data into estimating net present values and benefit-cost analyses. We show that it is in the economic interest of the taxpayer and society to invest more in education for these individuals. If successful, these investments would most likely pay off without an efficiency-equity trade-off.

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<sup>1</sup> For brevity, we use ‘black’ and ‘African-American’ interchangeably; ‘graduation’ refers to high school.

<sup>2</sup> In other simulations, we have included the costs of reliance on welfare by education level. However, these amounts are very small: most welfare is tied to families and children and is time-limited.

## **2. Educational status of black males**

The relative educational status of black males in the U.S. is stark (unless stated otherwise, figures below are from KewalRamani et al., 2007) The disparities are evident across many educational metrics. In a thorough analysis of black–white skills gaps, Neal (2006) reports significant differences in attainment (and graduation rates). In 2000, black males aged 26-30 had on average 0.72 fewer years of education than white males (the gap for females was 0.62). This gap was closing from the 1950-60s, but it appears to have stalled since 1990s.

Test scores show a similar disparity. NAEP reading results for 2005 show 36% of the population ‘below basic’ in 4<sup>th</sup> grade, 27% in 8<sup>th</sup> grade, and 27% in 12<sup>th</sup> grade. For all blacks (male and female), the proportions ‘below basic’ are 58%, 48%, and 46% respectively. Similarly, NAEP math tests show 20% of the population ‘below basic’ in 4<sup>th</sup> grade, 31% in 8<sup>th</sup> grade, and 39% in 12<sup>th</sup> grade; for all blacks the respective figures are 40%, 58%, and 70%. These gaps are not closing. Although the reading and math black–white gaps fell during the 1980s, they have stabilized since: the 2004 gaps are almost exactly the same as the 1996 gaps. In 1978, male white/black NAEP math scores were 306/268, a 38-point gap; by 1986 the gap was 29 points, and from 1996 to 2004, it remained at 28 points.

Also, black males are disproportionately in special education and suspended or expelled from school (Holzman, 2006). The national K-12 rate of grade repetition is 12.1% for males; for black males it is 22.6%. For suspension, the national rate is 14.9% and for black males it is 24.2%; for expulsions, the rates are 2.9% and 6.7% respectively.

These schooling differences affect college prospects. Blacks are slightly less likely to take the SAT than others, but their verbal scores average 434 compared to the national average of 503; for math, the respective figures are 429 and 518. Blacks are less likely to go to college, more likely to attend a two-year rather than a four-year college, and less likely to complete their degree. But college-level differences are not close to those in the K-12 education system. Whereas 42% of whites aged 18-24 are enrolled in college, the rate for blacks is 32% (NCES, 2005, Table 184). Whereas almost 25% of all college degrees are associate’s degrees, the rate for blacks is higher, but it is only 30%. Overwhelmingly, therefore, the disparities between black college students and other

college students is much smaller than the disparities evident through elementary and secondary school.

Importantly, these outcome differences do not fully capture differences in education investment because they do not account for school quality or college quality. Generally, schooling resources that black children receive are inferior to those of white children (Duncombe and Yinger, 2005).<sup>3</sup> Based on data from the Education Trust (2006), in over half of all states, government funding in high-minority school districts is *less* than in low-minority districts.<sup>4</sup> Across the U.S. the average shortfall is \$900-\$1200 per year. Therefore, as an approximation, total public K-12 educational investment per black student is \$20,000 *less* than per white student.<sup>5</sup> Of course, this disparity is understated by the amount of further or compensatory expenditure that is needed to equalize educational outcomes of children from disadvantaged families.

Of course, we recognize that many of these educational differences have their origins in family circumstance (Neal, 2006, Table 11; Jencks and Phillips, 1998; KewalRamani et al., 2007). Of U.S. families with children in 2005, 67% of children lived with two married parents, 25% with a single mother, and 8% with a single father. For blacks, only 36% lived with two married parents, 55% lived with a single mother, and 9% with a single father. Whereas 16% of families in the U.S. live below the poverty line, the rate is 30% for black families. Interestingly, young blacks do not drink, smoke or use drugs at rates above those of the rest of the population. In fact, previous month usage among 12-17 year olds nationally is 18% for alcohol, 12% for cigarettes, and 8% for marijuana; for black males the respective figures are 10%, 6%, and 6%. Nevertheless, the effects of low household income and unstable family structure simply compound the effect of low quality schooling opportunities.

Our focus for raising the quality of schooling is on high school graduation. We select this measure because graduation captures both cognitive and non-cognitive attributes that are important for success in adulthood. It is usually a minimum

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<sup>3</sup> At the college level, black high school graduates are more likely to attend two-year colleges rather than four-year colleges; the latter have larger state subventions (NCES, 2005).

<sup>4</sup> This is so for several reasons. Funds are not in practice allocated using equity-driven formulae. Title I includes a factor explicitly allocating more funds to high spending states. Little information exists on where resources actually flow at the student level. Spending on teachers is higher in wealthier districts.

<sup>5</sup> The calculation is: \$1000 per K-12 year plus the cost of 0.8 years of schooling at \$8500 per year.

requirement for further training and higher education and it opens up a range of future possibilities. It is also a goal that is far from the reach of many young black males.

Table 1 shows attainment levels by race/ethnicity for those aged 20 (allowing for those who graduate late).<sup>6</sup> Each age cohort of black males is approximately 305,000 persons. Of this black male population, 22% are high school dropouts; the corresponding figure for white males is 14%. College progression rates are lower for black males also, but the disparity is much smaller conditional on high school graduation. Simply to equalize black and white graduation rates would require an additional 24,000 black males to graduate each year. Below we calculate the economic consequences of failing to ensure graduation per black male student and for the aggregate situation where black male graduation rates are lower than white male rates.

### **3. Interventions to increase high school graduation rates for black males**

To identify effective interventions for increasing high school graduation rates for black males, we undertook a wide literature search.<sup>7</sup> Of the hundreds of articles and reports we retrieved, very few met the criteria of demonstrating interventions that raised graduation rates on the basis of rigorous and systematic evaluation. Only five studies met our criteria of using a credible evaluation design and yielding improvements in graduation rates.<sup>8</sup> The interventions in these studies are summarized in Table 2.

Two of the selected interventions take place at pre-school. The Perry Preschool program (PPP) is a high quality pre-school program that was the focus of an experimental study using random assignment in the 1960s in which participants and non-participants were followed-up to age 40 (Belfield, Nores, Barnett & Schweinhart, 2006). The Chicago child-parent centers (CPC) was established in 1967 to provide early education

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<sup>6</sup> We use Current Population Survey data accounting for two ways in which the CPS is less than ideal. First, we adjust for persons who are incarcerated - these are not counted in the CPS - using incarceration rate data by education level from Raphael (2004). Second, we adjust for GED receipt, which is not equivalent to a high school diploma, using data from the NELS derived by Rumberger (2004).

<sup>7</sup> This included searches of journal articles, search engines and Columbia University libraries. Special scrutiny was given to reports from three organizations with substantial experience in educational evaluations: Manpower Development Research Corporation, the Rand Corporation, and Mathematica Policy Research (we appreciate the assistance of Fred Doolittle at MDRC and Mark Dynarski at MPR).

<sup>8</sup> We were especially interested in studies using experimental or quasi-experimental methods or strong econometric identification strategy. In some cases the evaluations of interventions were of very poor quality. In other cases the evaluations suggested that there was little educational impact.

and family-support services emphasizing math and reading skills and using high staff-student ratios and parental education. The evaluation used a quasi-experimental design to compare the performance of CPC participants with a matched control group of non-participants; members of both groups were followed-up to age 20 (Reynolds, Temple, Robertson, and Mann, 2002).

Importantly, we include these pre-school interventions because they have the strongest evidence in their favor. However, pre-school reforms are unlikely to help black children unless the reforms are focussed on upgrades to the quality of existing programs. Black children already enroll in pre-school programs at relatively high rates. As of 2005, enrollment in center-based care for children aged 3-5 is 57% nationally for poor students and 63% for non-poor students. For black students it is 65% for poor students and 68% for non-poor students. Many of these children are in Head Start, but Head Start is reasonably effective and state programs often fail to spend as much as Head Start.

Class size reduction (CSR) is based upon the Tennessee Project Star experimental study in which students were randomly assigned to larger classes (22 students) or smaller ones (15 students) for up to four years from kindergarten to third grade (Finn et al., 2005). The teacher salary increase (TSR) study focused on the effects of raising teacher salaries on graduation rates using state data with a 10 year time lag assumed before the increased graduation rates would show (Loeb and Page, 2000). The underlying assumption of this study is that higher teacher salaries will attract more qualified and effective teachers to replace those who leave, and this will raise graduation rates. Finally, First Thing First (FTF) is a high school reform; it reflects closely the present wave of urban, high school, reform with its emphasis on small learning communities, instructional improvement, and teacher advocacy for each student (Quint, Bloom, Black and Stephens, 2005). The research design was a discontinuous time-series on data from the site that has accumulated the most extensive FTF experience, Kansas City, Kansas.

Each intervention showed positive impacts on graduation rates. Column 3 of Table 2 shows the estimated new high school graduates if the intervention was delivered to 100 students. The educational effectiveness is based upon the evaluations of each of the reforms: PPP is the most effective at 19 new graduates; TSI would yield 5 new

graduates.<sup>9</sup> All interventions are replicable, and although none are limited only to black males, all but the TSI address predominantly black students.<sup>10</sup> Thus we have reasonable grounds for expecting similar effects if the interventions were implemented today.

We now turn to the public costs of these interventions. Costs were taken from studies that accounted directly for the resources and their prices for each intervention or were computed from the additional resources required using the ingredients approach (Levin and McEwan, 2001).<sup>11</sup> Besides the direct costs of the intervention, the cost of two additional years of schooling for each added graduate was calculated, as well as the state college subsidies for those additional graduates who might be expected to pursue higher education. Since these new high school graduates were likely to have lower academic achievement and socioeconomic status than existing graduates, we estimated college continuation and completion rates accordingly.<sup>12</sup> Thus, the total public cost of raising graduation rates of black males is the sum of the direct program (intervention) costs and the additional publicly-funded schooling and college induced by the intervention. To ensure consistent accounting, all money figures are expressed as present values at age 20 with a discount rate of 3.5 percent and using 2004 prices.<sup>13</sup>

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<sup>9</sup> Since they occur at different educational levels, these interventions may be combined to strengthen the effects. For example, it appears that the impact of CSI on student achievement is greater the higher the salary of teachers. Presumably, higher quality teachers associated with higher salaries are able to use smaller class size more productively (see Peevely, Hedges, and Nye, 2005).

<sup>10</sup> In PPP and CPC almost all participants were black. In CSR, we use graduation rates for students on free lunch, populations with a high concentration of blacks in the experimental setting. For FTF, about half of the students were black. For TSI, the data are based upon state averages and may understate the expected improvement in graduation rates for black males because of their relatively small number in the overall student population (about 3%) and because many reforms have shown larger impacts for minorities.

<sup>11</sup> For example, costs of PPP and CPC were taken directly from the studies and converted to 2004 prices (see Table Notes). Costing of CSR was based on the need for more teachers and classrooms and for FTF more teachers and counselors. For TSI we estimated a 10% increase in salaries and benefits. Both PPP and CPC reduced grade retentions and assignments to special education, thus saving public costs. These cost savings have been deducted to obtain “net” costs of producing additional high school graduates.

<sup>12</sup> We used the NELS88 follow-up of eighth graders to estimate college participation six years later. Among black male graduates in the lowest quartile on reading scores, about 18% and 16% were in two-year and four-year colleges. According to the 1996/01 BPS five year completion rates for the bottom third of socioeconomic status are 50%. Thus, for our calculations, one of twelve of the new high school graduates is expected to complete a four-year degree and one of six a two-year degree.

<sup>13</sup> The choice of the appropriate discount rate is a subject of debate. A discussion of the issues and the choice of 3.5% is in Moore, Boardman, Vining, Weimer, & Greenberg (2004). Because the interventions occur at different ages and yet could all be implemented immediately (albeit on a different cohort of children), we choose age 20 as the focal year. Costs or benefits before that age are uprated (inflated) by 3.5% and after that age are discounted by 3.5%.

The end columns of Table 2 show the program costs per student, the program costs per new high school graduate, and the total educational costs per new high school graduate. The program costs per student refer to all students who receive the intervention, but of course many of these would have graduated even in its absence (we assume these persons cannot be identified *ex ante*). Program costs vary from \$13,100 to \$2,900. Costs per additional graduate refer to the public costs when divided by only the additional graduates that are produced. These vary from \$34,300 to \$95,500. The final column shows the total public cost when educational progression has been accounted for.

Assuming that the intervention is delivered to 100 students whose graduation probabilities are unknown, the total public cost per new high school graduate ranges from \$59,100 to \$120,200. The lowest public cost per additional graduate is found for FTF (because it is implemented in high school it is the least affected by adjusting to present value at age 20). Although TSI is associated with the highest cost among these alternatives, we remind the reader that the TSI result is an average for all students, and there are good reasons for expecting that success rates might be considerably higher, even double, for black males. Krueger and Whitmore (2001) re-evaluated the Tennessee Class Size Reduction data: they found the gain for blacks was 7-10 percentile points (versus 3-4 percentile points for whites) and that during the years of class size reduction, K-3, the test score gap between blacks and whites declined by 38% and by about 15% thereafter. If a similar doubling of the average effect were to result from higher salaries for teachers, the TSI cost per additional graduate would fall to among the lowest.

There are many alternative interventions which may be effective. We do not include this in our analysis either because they have not been proven to be effective (especially for black males) or because there is inadequate information on their costs. Interventions not selected include: reforms to re-allocate teachers or improve the quality of the teaching profession<sup>14</sup>; family engagement or involvement programs<sup>15</sup>; policies that would raise family income<sup>16</sup>; privatization reforms<sup>17</sup>; neighborhood interventions<sup>18</sup>;

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<sup>14</sup> According to Hanushek (2006) there is simply no reliable evidence on policies that would improve allocation or raise teacher quality.

<sup>15</sup> Family engagement programs have been found to raise literacy levels in early grades (Senechal 2006). But family involvement in school decision-making has not been found to be widely effective.

<sup>16</sup> In our review of the literature in Belfield and Levin (2007c) we found that increasing family incomes might be effective if the increase in income were permanent or if it were targeted at young families.

small school reforms<sup>19</sup>; and specific programs (e.g. AVID) for which the evidence is inadequate. We do not that some reforms, such as the high school mentoring and advisement program Check & Connect, have been found to be effective and are very likely to be cost-effective.

To expand the range of effective interventions we considered interventions that raise test scores as a mediator for higher graduation probabilities. Evidence using the NELS-88 shows that a one standard deviation increase in 8<sup>th</sup> grade test scores is associated with a probability of dropping out that is almost 50% lower (Rumberger and Larsen, 1998). However, our own analysis of NELS-88 reveals this relationship to be sensitive to race, sex, and subject of study (Belfield and Levin, 2007b). That is, the association between graduation and test scores for black males is strongest through reading test scores (for other males it is through math scores and for females both subjects are strongly influences). Also, there is no correlation between test scores and graduation probabilities for those with test scores above the median. Finally, we are not aware of studies that relate early grade test scores to subsequent graduation probabilities (with the exception of the STAR experiment, Finn et al., 2005).

#### **4. Public benefits of additional black male graduates**

Additional black male high school graduates not only have better life chances for themselves, but they also provide public benefits via government savings. Here we briefly review the methods for deriving these public benefits and we calculate the effects per graduate (for full details, see Belfield 2006; Muennig 2006; and Rouse 2006).

##### **4.1 Additional tax revenues**

Table 3 shows the labor market outcomes by educational attainment for black males aged 21-64 (CPS data, see Rouse, 2006). Strikingly, black male high school dropouts are less likely to participate in the labor force or be employed (or work continuously). Across all black males (regardless of employment status), dropouts report considerably lower earnings than graduates. In addition, graduates are more likely to have health insurance

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<sup>17</sup> Privatization reforms include competition, charter schools, and vouchers. The research in this field is very partisan, but few of the benefits of privatization have been significant.

<sup>18</sup> The Moving to Opportunity program found few benefits to the families involved.

<sup>19</sup> Small schools are probably more efficient (Kuziemko 2005) but they are expensive to create.

and pension coverage. These differences in labor market status translate not only into higher earnings, but also higher tax revenues as a public benefit over the lifetime.

Rouse (2006) follows a three step procedure to estimate the additional tax revenues per new high school graduate. First, she estimates the age-earnings profiles of black males with different education levels. Data from the 2003 and 2004 CPS are combined to get an adequate sample size of about 11,000 black males aged 21-64. From these data, Rouse estimates the additional lifetime income associated with graduation and higher education (assuming productivity growth of 1.5% pa). Second, she uses the NBER TAXSIM to estimate the federal and state taxes on these incomes. Third, the lifetime figures are converted to present values at age 20, using a 3.5% discount rate.

This method is likely to produce conservative results. Although earlier economic literature assumed that the measured returns to schooling or the schooling coefficient in earnings functions was overstated because of unmeasured differences in ability associated with the schooling variable, a variety of more recent studies do not confirm that expectation. Studies of twins and siblings with different levels of education as well as those using instrumental variables have found that the “naïve” coefficient in earnings functions does not appear to be biased upward.<sup>20</sup> Accordingly, no adjustment is made for differential ability in these estimates. Importantly, CPS data include “high school equivalency” in their definitions of education, meaning those who passed the GED exam – about 14% of all black males – are treated as high school graduates.<sup>21</sup> Yet although the GED is popularly referred to as a “high school equivalency”, it is not: GED recipients’ earnings profiles are closer to those of dropouts than to high school graduates (Cameron and Heckman, 1993). Thus, the differential earnings associated with high school completion is understated in CPS data since the presence of GED recipients biases downward the additional income that is associated with actual high school completion.

This method yields significant differences in earnings and tax contributions across education levels. These are reported in the top panel of Table 4. Whereas the present value lifetime earnings of black male dropouts are \$292,200 at age 20, the respective

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<sup>20</sup> See the review in Rouse (2006). Levin (1972) assumed a 25 percent downward adjustment in additional earnings for an ability correction.

<sup>21</sup> The CPS does not adjust for the probability of incarceration. At age 20 about 19 percent of black male high school dropouts are incarcerated; for black male high school graduates the percentage declines to 8 percent. All income and tax revenue estimates take this into account.

figures are \$601,800 for high school graduates and \$1,479,000 for those with a BA degree or above. There are correspondingly large differences in tax payments. These are reported in the second two panels of Table 4, depending on whether the individual files taxes as a single person or as the head of a household. We apply the average of these two tax calculations. A black male dropout contributes \$118,000 in income taxes over his lifetime; the respective figures are \$222,400 for high school graduates and \$607,000 for college graduates. To these we add property tax and sales taxes, which increase all values by 5%.<sup>22</sup>

The bottom panels of Table 4 show the present value differences between high school dropouts and persons with higher attainment. Assuming that a new high school graduate would have a small probability of going on to college and completing a degree, we can calculate the present value income and tax gains per new black male high school graduate. Both are substantial. The individual is anticipated to earn \$423,5000 more if he graduates from high school. (These large earnings figures raise a significant query as to why individuals do not accumulate more education: the implied private discount rate is over 40%). Overall, the present value at age 20 of the extra tax revenue associated with each additional high school graduate would be about \$167,600. In itself, this is more than is currently spent on each student over their K-12 schooling.

#### **4.2 Projected savings in public health costs**

High school graduates have improved health status, lower rates of mortality, and fewer social problems (Lantz, House, Lepkowski, Williams, Mero & Chen, 1998). This is true for blacks and whites, but the lower educational levels of black males contributes to less-healthy lifestyles and poorer health status such that their life expectancy is considerably shorter than for white males: Arias, Anderson, Kung, Murphy, & Kochanek (2003:116) report that as of 2001 black male life expectancy was 69 years compared to 75 years for white males, a shockingly large gap.

Because of poorer job prospects and low incomes, black male dropouts are unlikely to have private health care coverage. By default they must depend upon health

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<sup>22</sup> Sales tax was calculated for each state as per capita tax revenues divided into personal per capita income; a national average was obtained using state population weights. This figure was multiplied by the after-tax difference in incomes between dropouts and graduates (factoring in college progression rates). Sources for these data were: Federation of Tax Administrators; U.S. Dept. of Commerce; Bureau of Economic Analysis; and the Survey of Current Business.

care that is publicly or philanthropically financed. The largest insurer for those under age 65, Medicaid, is a means-test program for which eligibility depends upon low income. Participation in Medicaid declines with education because those with more education are more likely to have higher incomes; this makes them ineligible, as well as being more likely to have private health insurance (as shown in Table 3). In addition, those who qualify for Social Security Disability Income (SSDI) receive benefits from Medicare. For example, kidney disease is the most important qualifying condition, a condition for which persons with lower educational attainments are especially at risk (Wong, Shapiro, Boscardin, and Ettner, 2002). Functional limitations prior to age 65 are also a basis for SSDI benefits, and these are higher for persons with less education (Cutler and Lleras-Muney, 2006).

The estimates for differences in public costs of health care by educational level are derived from the 2002 Medical Expenditure Panel Survey (MEPS). This is a nationally representative sample of more than 40,000 non-institutionalized civilians with over-sampling of households with incomes less than twice the poverty line. The MEPS data also contains socio-demographic data as well as the medical expenditures (we can also measure health-related quality of life). These estimates were combined with enrollment costs from the National Health Accounts (NHA) to estimate aggregate health expenditures (Arnett, Blank, Brown, & Cowan, 1990).

Two analyses were performed. First, a regression analysis was used to predict coverage by public insurance with controls for age, race, gender, and ethnicity. Second, per capita public insurance costs were estimated for black males at different educational levels. The latter includes costs not captured in the MEPS such as government payments to hospitals that serve disproportionately low income populations.<sup>23</sup> For black males aged 18-24, the gradients of public coverage are steep: 81% of those with less than 9 years of education have publicly reimbursed care; but only 28% of college graduates.. Table 6 shows the differences in expenditure by education level. While African American males with 9-11 years of education consume nearly \$110,000 dollars of public healthcare over their lifetimes, college graduates consume less than \$40,000. Over the

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<sup>23</sup> The analysis also calculated health-related quality of life scores for black males which were shown to be positively related to education and negatively related to age.

lifetime, we estimate the savings in public health costs for each high school graduate relative to dropout at about \$33,500 in present value terms at age 20 using a 3.5 percent discount rate. If high school and college graduates have the same risk of death as non-graduates, then savings increase.

Finally, it is possible to calculate the societal burden of low education on public health costs. From the societal perspective, gains are measured in QALYs (or years of perfect health), which have a value of roughly \$80,000 excluding productivity costs (Muennig, 2005). The average African American male will gain about 1.6 QALYs from an intervention that promotes him to a high school graduate. This amounts to roughly \$129,000 worth of additional healthy life per individual.

### **4.3 Projected savings in criminal justice costs**

High school graduates are much less likely to commit crimes than dropouts (Lochner and Moretti 2004). With an average rate of institutionalization for all black males 18-65 at 8%, the rate is 19% for dropouts, 8% for graduates, and 1% for college graduates (Raphael 2004). For younger cohorts, roughly one-quarter of black male dropouts is incarcerated (Harrison and Karberg 2003). Based on data for California, over the early lifetime up to age 35 a black male dropout is almost certain to have been incarcerated for some period (Raphael, 2004); nationally, the probability is approximately 60 percent (Pettit and Western, 2004). For black male high school graduates the likelihood is less than 20 percent.<sup>24</sup> Importantly, overall rates of incarceration for black males are 6 to 8 times those of white males (Pettit and Western 2004).

Belfield (2006) divides the economic burden of crime for the public sector into four categories: criminal justice system operation (police, courts); costs of incarceration including parole and probation; public restitution to victims; and crime prevention expenditures by government agencies. He examines the relationship between graduation and five types of crime: murder; rape/sexual assault; violent crime (robbery, aggravated assault); property crime (burglary, larceny); and drug offenses. Each of these crime types imposes high public costs and is lower for those with more education. The effect of

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<sup>24</sup> BJS (2003) data reported by Bonczar (2003) shows 9 percent of black males aged 18-24 were ever incarcerated in the 1990s; the rate for those aged 25-34 is 20 percent. Raphael (2004, Table 4) shows rates for high school dropouts of 19 percent (ages 18-24), 114 percent (ages 25-34), and 123 percent (ages 35-44); for high school graduates the rates are 2 percent, 15 percent, and 16 percent respectively.

education on the commission of these crimes is based on results from Lochner and Moretti (2004). Unit costs are estimated from a range of sources, including Bureau of Justice Statistics and the FBI Uniform Crime Rate data.

The total annual cost savings per new expected high school graduate are reported in Table 7. Over the lifetime, the minimum public costs of criminal justice that would be saved by converting a high school dropout to a graduate would be at least \$55,500.<sup>25</sup> This figure is large and is just for the year of being 20 and only for generating a new high school graduate (i.e., family resources and local environments are not improved). Importantly, it does not include any beneficial impacts on juvenile crime (specifically, before age 20).

#### **4.4 Social gains from high school graduation**

Taxpayers are not the only ones who would reap economic benefits from increases in educational attainment: the general society would benefit. The social gains to the state include the savings to the taxpayer, but there are three additional components.

First, there is the increase in private income earned by each new graduate. This increase in net income can be calculated as the change in gross income minus the tax payments. Second, there are savings to society from reductions in crime. The fiscal consequences of inadequate education are a function of the budgets for the criminal justice system, but clearly the victims of crime bear the largest burden in terms of reduced quality of life and monetary losses (e.g. time off work). Moreover, all persons make private expenditures for insurance and other protections to prevent being the victim of crime or to cushion its financial impact. We also note that many victims of crime are the same race as the perpetrators and perpetrators' family members may also be included as victims: if fathers are incarcerated there are more single parent households, total family income is lower, and welfare dependency is higher.

Unfortunately, these costs are much harder than fiscal costs to estimate with precision: Ludwig (2006) estimates these social costs are 4.5 times larger than the fiscal

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<sup>25</sup> This estimate is understated for two reasons and should be viewed as highly conservative because the five specific types of crime listed here account for, perhaps, 80 percent of the differential costs associated with education. Detailed data on the public costs associated with other crimes is not readily available. Also, the costs of juvenile crime before the age of 20 are not included. Thus, we believe that the public benefit in reducing the costs of criminal justice through raising educational attainments is even higher than this estimate and should be interpreted in that light.

costs; data reported by Miller et al. (1996) yields a factor that is closer to 2.5. Following convention, the more conservative ratio is applied here.

Second, health status has an economic value (Culter and Lleras-Muney, 2006). Based on calculations by Peter Muennig, the improvement in black male health per new high school graduate would be as high as 1.47 QALYs. Over the lifetime, this health improvement is valued at approximately \$182,000.

Finally, there are externalities from education on economic growth: workers with more human capital might also make their co-workers' more productive and attract investment into the state. Reviewing the literature, McMahon (2006) estimates these externalities to be worth 37-61% of the total market returns to education. So, if the net private earnings advantage is \$1,000; the externality is (conservatively) \$370. In an extensive review of the cross-country evidence, Pritchett (2006) suggests that the effect is quite small and possibly zero. However, this evidence draws upon many countries with very different economic structures from the U.S. Therefore, we estimate that the first-best externalities are 37% of the total private income benefits.

These are very large numbers, reflecting the facts that the primary beneficiary of additional education is the individual, and that the main burden of crime is on the victim and not the taxpayer.

## **5. Public investment returns**

When we add up the three public benefits to education, they are substantial. Specifically, the value of just the public benefits embodied in additional tax revenues and reductions in the cost of public health and crime amounts to almost \$256,700 per new high school graduate. Yet, these public benefits of investment in better education must be weighed against the public costs to ascertain the returns to the investment. Table 9 shows the net present values of the lifetime public benefits of graduation for black males for each of the five potential interventions. The savings are reported in the top panel, with the total costs for each of the five interventions reported just below. The benefit/cost ratio ranges from about two to greater than four among the alternatives meaning that for every dollar invested in raising high school completion among this group, there are two to four dollars in public benefits. Even more impressive is the large surplus of benefits over costs for

each additional graduate. For each additional black male high school graduate the net public benefit in present value at age 20 is between \$136,400 and \$197,600. Taking the median intervention, the net present value is \$166,000, which is over ten times the cost of delivering the intervention to one single student.<sup>26</sup>

Social savings are also reported in Table 9. These savings total \$930,900 and are composed of three large elements: fiscal benefits, net private earnings gains, and externalities. Of course, when these savings are applied, the benefit-cost ratios are significantly higher and each intervention easily reaches a threshold ratio of 1.

One other source of underestimation is that there are a number of newer, promising interventions. These may have even more powerful effects as they reflect a convergence of agreement on what is needed to ensure graduation: small school size; high levels of personalization; high academic expectations; strong counseling; parental engagement; extended-time school sessions; and competent and appropriate personnel.<sup>27</sup> However, they have not been rigorously evaluated yet.

Given our research method, these results are probably understatements of the total public savings. Issues related to the sensitivity of our models are reported in Table 10. The cost savings do not include public assistance, a full accounting of the criminal justice costs for juveniles, intra-family benefits, or the deadweight loss of taxation.<sup>28</sup> They assume that interventions cannot be reasonably targeted to youth on the margin of graduation, but must be given to all. In fact, the public school system is concentrated by minority status (KewalRamini et al., 2007). Black students make up 17% of the 48.4 million public school students. However, one-third of all students in the 20 largest

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<sup>26</sup> To give an aggregate picture of the potential for reaping public benefits of educational improvements for black males, we report the net savings from simply equalizing the graduation rates of black and white males for a single cohort of 20 year olds. The net fiscal benefit would range from \$3.27 billion to \$4.74 billion, with a median figure of \$3.98 billion.

<sup>27</sup> *Small size* describes a small school in which students and staff are known to each other and accountable. *Personalization* refers to a caring environment in which individual personal and academic needs are addressed. *High academic expectations* call for a demanding level of study that each student is expected to meet. *Strong counseling* refers to the availability of personnel to guide students facing personal challenges. *Parental engagement* enlists parents in support of the educational accomplishments of their child and the school. *Extended time* refers to longer time in school. *Competent and appropriate personnel* refer not only to teaching qualifications of personnel, but also to their commitment to the school. These changes should not be done on an individual basis but together to comprise a different schooling experience (Quint, 2006).

<sup>28</sup> Costs of public assistance are difficult to calculate because they are mainly embodied in the TANF program which provides support for children in low income families. But, most of this funding goes to single mothers, even though fathers' behavior is clearly influential.

districts are black; and 12% of all black students are in one of six school districts (New York City, Chicago, Broward, Philadelphia, Detroit, and Prince Georges, MD). Thus, it is possible to target reforms to specific districts.

On the other side, there are factors that we have not included that are likely to lower the benefit-cost ratios. These are: (a) increasing the number of graduates will reduce their wages; (b) marginal graduates are not the same as average graduates; (c) an assumption of zero college progression; and (d) a higher discount rate on future benefits. Certainly a higher discount rate will reduce the net present values of educational investments, but our rate is the ‘industry standard’ recommended by Moore et al. (2003). The assumption of zero college progression is extreme, given the high rates of college attendance even amongst students in the lowest ability quartiles.

More considerable is the concern over whether the expansion of graduates will reduce relative wages. First, we note that we are explicit in representing the marginal graduate rather than an entire cohort change. Given the low quality of schooling that many black males face, it may be reasonable to assume that some who do not graduate are similar to those who, with better schools, are graduates presently. Second, we note that the annual age cohort of black males is 300,000 persons in a national labor force with over 120 million high school graduates. Moreover, among all of the sub-populations, black males face the biggest challenge in the labor market. Despite the nation’s strong economic growth in the 1990s, black male adults did see lower rates of unemployment, but they also experienced lower employment and labor force participation rates and significantly higher incarceration rates (Holzer and Offner, 2005). There is also some evidence that economic mobility is lowest for blacks: those in the poorest quartile are very unlikely to move up across generations (Isaacs, 2007).

Nevertheless, an increase in the supply of graduates *ceteris paribus* must reduce the wage. Goldin and Katz (2007) review trends in education–earnings premia over the post-war period. For high school graduates over dropouts, the premium trended sharply downward from 1945-60, was flat from 1960-1980, and trended upward from 1980-2005. (For college students over high school graduates the pattern was the same except the most recent upswing was stronger). Much of this pattern can be explained by changes in (relative) supply: the ratio of graduates to dropouts grew by 5.6% pa from 1960-80 but

only by 2.5% pa from 1980-2005 (with large-scale immigration). Overall, the trend clearly shows a general increase in the overall education-earnings premia since 1980. Moreover, changes in relative demand for educated workers are hard to explain without at least some reference to changes in the education level of the workforce; an increase in supply of educated workers may in part create the demand for more skilled products (skill-biased technological change). This would imply that the *ceteris paribus* assumption might be relaxed.

However, if skill prices diverge from wages, the reduction may be masked. Heckman et al. (1998) argue that wage compression is likely in the short run as the returns to skill rise because the low-skilled work harder (facing an imminent wage cut) and the high-skilled train more (to take advantage of rising returns to skill). Current wage gaps might reflect the same process in reverse: the low-skilled are accumulating more skill and the high-skilled are not (but instead are cashing in). Although it is possible the current gaps overstate the long run gap, the secular trend caused by skill-biased technical change is so great that it swamps these effects and any changes in the elasticity of substitution between low-skill and high-skill workers. From Heckman et al. (1998a, 6), “a policy that reverses this trend [in rising relative wages from 1979 to 1987 for skilled workers] requires a once and for all increase of approximately 20% in the number of high-skill persons in the workforce... For a 1990 workforce of 120 million, it is necessary to transform about 5.4 million people to college equivalents to reverse the decade long erosion of real wages.” Even if all black male dropouts were to become graduates, the number of college equivalents would not exceed 200,000 annually.

Finally, we note that there is a further general equilibrium effect to consider. In the model of Heckman et al. (1998b), if there is a policy to increase college enrollment, those who would have otherwise gone to college lose out because they have to pay for the policy (independent of changing skill prices). Yet, this effect would be negated if the policy generated a positive fiscal return and this was internalized by potential college graduates.

## **6. Conclusion**

This is a case where greater equity produces greater efficiency in the use of public resources. Yet, these high public returns also pose a quandary for financing these educational improvements. Over half the public benefits accrue to the federal government, but it pays less than 10% of the cost of K-12 schooling. Thus, the incentive structure for reaping the benefits is not well-aligned with the tax system.

Other than education, there is a dearth of solutions to this situation; those that are offered tend to be reactive, such as making sure ex-offenders get job training programs, rather than proactive changes that would avoid involvement in the criminal justice system in the first place (Pouncy, 2005). Given the estimates derived here, showing underinvestment and high returns, it makes economic sense to consider effective educational investments in black male high school dropouts as a high priority.

## References

- Arias, E., Anderson, R., Kung, H., Murphy, S. & Kochanek, K. (2003). Deaths: final data for 2001. *National Vital Statistics Reports*, 52.
- Arnett, R.H., Blank, L.A., Brown, A.P., Cowan, C.A. *et al.* (1990). Revisions to the national health accounts and methodology. *Health Care Finance Review*, 11, 42-54.
- Belfield, C.R. (2006). The consequences of raising the graduation rate for black males: the effects on crime. Working Paper, Teachers College, New York.
- Belfield, C.R., Nores, M., Barnett, S.W., & Schweinhart, L.J. (2006). The High/Scope Perry Preschool Program. *The Journal of Human Resources*, 41 (1), 162-190.
- Cameron, S.V. & Heckman, J.J. (1993). The nonequivalence of high school equivalents. *Journal of Labor Economics*, 11 (1), 1-47.
- Cutler, D., & Lleras-Muney, A. (2006). Education and health. Presented at the Health Effects of Non-Health Policy Conference (Bethesda, MD).
- Duncombe, W., & Yinger, J.. (2005). How much more does a disadvantaged student cost? *Economics of Education Review*, 24, 513-532.
- Education Trust. (2006). *The Funding Gap 2005: Low Income and Minority Students Short-Changed By Most States*. Washington, DC: The Education Trust.
- Finn, J.D., Gerber, S.B., & Boyd-Zaharias, J. (2005). Small classes in the early grades, academic achievement, and graduating from high school. *Journal of Educational Psychology*, 97, 214-223.
- Harrison, P.M., & Karberg, J. (2003). Prison and jail inmates at midyear 2002. *Bureau of Justice Statistics Bulletin, NCJ 198877*. Washington, D.C.: U.S. Dept of Justice.
- Heckman, J, Lochner, L and C Taber. (1998). *American Economic Review*, 88, 381-386.
- Heckman, JJ, L Lochner, and C Taber. (1998). Explaining rising wage inequality: Explorations with a dynamic general equilibrium model of labor earnings with heterogeneous agents. *Review of Economic Dynamics*, 1, 1-58.
- Holzer, H.J. and P. Offner. (2006). Trends in employment outcomes of young black men, 1970-2000. In R.B. Mincy (Ed.), *Black males left behind* (pp.11-38) . Washington, DC: Urban Institute.
- Holzman, M. 2006. *Public Education and Black Male Students: The State Report Card*. [www.schottfoundation.org](http://www.schottfoundation.org)
- Jencks, C., & Phillips, M. (1998). *The Black-White Test Gap*. Washington, DC: Brookings Institution Press.

- Krueger, A.B., & Whitmore, D.M. (2001). Would smaller classes help close the black-white achievement gap? Working Paper # 451, Princeton University.
- Lantz, P.M., House, J.S., Lepkowski, J.M., Williams, D.R., Mero, R.P., & Chen, J. (1998). Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of U.S. adults. *Journal of the American Medical Association*, 279, 1703-08.
- Levin, H.M., & McEwan, P.J. (2001). *Cost-Effectiveness Analysis: Methods and Applications*. Thousand Oaks, CA: Sage Publications.
- Levin, H.M. (1972). The cost to the nation of inadequate education, Select Senate Committee on Equal Educational Opportunity, 92<sup>nd</sup> Congress. Washington, D. C.: U.S. Government Printing Office.
- Lochner, L., & Moretti, E. (2004). The effect of education on crime: evidence from prison inmates, arrests, and self-Reports. *American Economic Review*, 94, 155-89.
- Loeb, S. & Page, M.E. (2000). Examining the link between teacher wages and student outcomes: the importance of alternative labor market opportunities and non-pecuniary variation. *The Review of Economics and Statistics*, 82, 393-408.
- Moore, M.A., Boardman, A.E., Vining, A.R., Weimer, D.L., & Greenberg, D.H. (2004). Just give me a number! practical values for the social discount rate. *Journal of Policy Analysis and Management*, 23, 789-812.
- Muennig, P. (2006). The Consequences of Inadequate Education for Black Males: The Effects on Health, Working Paper, Teachers College Equity Symposium.
- NCES. (2005). *Digest of Educational Statistics*. Washington, DC: NCES.
- Neal, D. (2006). Why has black-white skill convergence stopped? In E. Hanushek & F. Welch (Eds.), *Handbook of the Economics of Education*. New York: Elsevier.
- Peevely, G., Hedges, L. & Nye, B.A. (2005). The Relationship of Class Size Effects and Teacher Salary. *Journal of Education Finance*, 31, 101-109.
- Pettit, B., & Western, B. (2004). Mass imprisonment and the life course: Race and Class Inequality in U.S. Incarceration. *American Sociological Review*, 69, 151-69.
- Pouncy, H. (2006). Toward a fruitful policy discourse about less-educated young men. In R.B. Mincy (Ed.), *Black males left behind* (pp.293-310). Washington, DC: Urban Institute.
- Quint, J., Bloom, H.S., Rebeck Black, A. & Stephens, L., with Akey, T.M. (2005). The Challenge of scaling up educational reform: findings and lessons from First Things First. New York: Manpower Development Research Corporation.

- Quint, J. (2006). Meeting five critical challenges of high school reform. New York: Manpower Development Research Corporation.
- Raphael, S. (2004). The socioeconomic status of black males: the increasing importance of incarceration. Working Paper, University of California—Berkeley.
- Reynolds, A.J., Temple, J.A., Robertson, D.L., & Mann, E.A. (2002). Age 21 cost-benefit analysis of the Title I Chicago Child-Parent Centers. *Educational Evaluation and Policy Analysis*, 24, 267-303.
- Rumberger, R. (2004). Why students drop out of school. In G. Orfield (Ed.). *Dropouts in America*. Cambridge, MA: Harvard University Press.
- Rouse, C.E. (2006). The economic consequences of inadequate education for black males: the effects on labor market income and tax revenue. Working Paper, Teachers College Equity Symposium.
- Wong, M.D., Shapiro, M.F., Boscardin W.J., & Ettner, S.L. (2002). Contribution of major diseases to disparities in mortality. *New England Journal of Medicine*, 347, 1585-92.
- KewalRamini, A, Gilbertson, L, Fox, M and S Provasnik. (2007). *Status and Trends in the Education of Racial and Ethnic Minorities*. (NCES 2007-039). NCES Washington, DC.

**Table 1**  
**Highest level of educational attainment for those aged 20**

	<i>Black males</i>		<i>White males</i>	
Less than 9th grade	6,000	2%	18,000	1%
High school dropout	67,000	22%	193,000	14%
High school graduate	99,000	33%	402,000	29%
Some college or above	133,000	44%	757,000	56%
Total cohort size	305,000		1,369,000	

*Source:* Current Population Survey, March 2005.

*Notes:* Race-specific adjustments are made for institutionalization and GED receipt.

**Table 2**  
**Interventions that demonstrably raise the high school graduation rate**

<i>Intervention</i>	<i>Details of the intervention</i>	<i>Extra high school graduates if intervention is given to 100 students</i>	<i>Program costs per student<sup>a</sup></i>	<i>Program costs per new high school graduate<sup>b</sup></i>	<i>Total educational costs per new high school graduate<sup>c</sup></i>	
PPP	Perry pre-school program	1.8 years of a center-based program for 2.5 hours per weekday, child:teacher ratio of 5:1; home visits; and group meetings of parents.	19	\$12,532	\$65,959	\$90,694
CSR	Class size reduction	4 years of schooling (grades K-3) with class size reduced from 25 to 15.	18	\$13,075	\$72,638	\$97,373
FTF	First Things First	Comprehensive school reform of: small learning communities with dedicated teachers; family advocates; and instructional improvement efforts.	16	\$5,493	\$34,331	\$59,066
CPC	Chicago child-parent center program	Center-based pre-school program: parental involvement, outreach and health/nutrition services. Based in public schools.	11	\$4,728	\$42,979	\$67,714
TSI	Teacher salary increase	10% increase in teacher salaries for all years K-12.	5	\$2,865	\$95,503	\$120,238

*Sources:* PPP: Belfield et al. (2006); CSR: Finn et al. (2005); FTF : Quint (2005) ; CPC: Reynolds et al. (2002); TSI : Loeb and Page (2000). Costs are expressed in present values at age 20 using a 3.5% discount rate. <sup>a</sup> Cost per student counts the costs of delivering the intervention. <sup>b</sup> Cost per new high school graduate counts the costs of delivering the intervention to 100 students. <sup>c</sup> Total costs are program costs plus the induced costs from extra attainment in high school and college (\$24,735).

**Table 3**  
**Mean labor market outcomes by educational attainment for black males aged 21-64**

	<i>High school dropout</i>	<i>High school diploma</i>	<i>High school diploma or more</i>
Employed	48.8%	67.3%	71.9%
Unemployed	10.0%	8.7%	7.8%
Discouraged worker	1.3%	0.9%	0.6%
Not in the labor force – other	39.9%	23.1%	19.7%
Number of weeks worked last year	25.4	35.5	38.0
Employer provides pension plan	33.1%	50.7%	58.0%
Covered by employer/union-provided health insurance	23.2%	42.8%	48.9%
Annual earnings (all persons)	\$12,262	\$22,199	\$31,230

Note: Sample includes men aged 21-64. All means are weighted. Data is from March Supplement of the *Current Population Survey*, 2003 and 2004. Annual earnings includes all persons, working or not.

**Table 4**  
**Present Value of Lifetime Earnings and Taxes Paid by black males**

	<i>High school dropout</i>	<i>High school graduate</i>	<i>Some college</i>	<i>BA degree or more</i>
<b>Earnings</b>	\$292,174	\$601,845	\$858,755	\$1,478,989
<b>Taxes paid:</b>				
<b>Individual basis</b>	\$87,730	\$182,922	\$265,876	\$505,057
<b>Family basis</b>	\$148,183	\$261,914	\$391,305	\$708,823
<b>Average</b>	\$117,957	\$222,418	\$328,951	\$606,940
	<b>Difference over dropout</b>			
		<i>High school graduate</i>	<i>Some college</i>	<i>BA degree or more</i>
<b>Earnings</b>	baseline	\$309,672	\$566,581	\$1,186,815
<b>Taxes paid:</b>				
<b>Individual basis</b>	baseline	\$95,192	\$178,146	\$417,326
<b>Family basis</b>	baseline	\$113,731	\$243,122	\$560,640
<b>Average</b>	baseline	\$104,462	\$210,634	\$488,983

*Note:* 2004 dollars. Figures corrected for incarceration probabilities. Discount rate is 3.5%. Productivity growth is assumed as 1.5%.

*Source:* March Supplement of the *Current Population Survey*, 2003 and 2004.

**Table 5**

**Total Present Value Lifetime Tax Revenue Gains**

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	<i>Lifetime Tax Revenue Gains</i>
<hr/>	
Per expected high school graduate:	
Baseline: income taxes only	\$ 154,200
Baseline + sales and property taxes	\$ 167,623
Baseline without Social Security taxes	
Federal government	\$ 83,434
State/local government	\$ 18,934

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*Notes:* An expected high school graduate is one who probabilistically either: terminates education after graduation (prob.=0.75); completes some college (prob.=0.17); or completes a BA degree (prob.=0.08). Federal income taxes do not include Social Security taxes. Discount rate is 3.5%.

**Table 6**  
**Lifetime Present Value Public Medical Costs by Education**

	<b>High school dropout</b>	<b>High school graduate</b>	<b>Some college</b>	<b>College graduate</b>
<b>Absolute:</b>				
With differential mortality	\$108,585	\$83,179	\$57,421	\$37,346
Without differential mortality	\$108,585	\$81,268	\$56,198	\$36,174
<b>Advantage over dropouts:</b>				
With differential mortality		\$25,406	\$51,164	\$71,239
Without differential mortality		\$27,317	\$52,837	\$72,411

*Notes:* In all analyses, subjects die at a rate equal to that of non-graduates. In the baseline analysis, high school graduates are assumed to be at 76% the risk of annual mortality of non-graduates. Likewise, college graduates are assumed to have 63% of the risk of non-graduates. Discount rate of 3.5%.

**Table 7**  
**Lifetime Present Value Public Medical Cost-Savings**

	<b>PV Cost-savings</b>
Per Expected High School Graduate:	
With differential mortality	\$33,518
Without differential mortality	\$35,253

*Notes:* An expected high school graduate is one who probabilistically either: terminates education after graduation (prob.=0.75); completes some college (prob.=0.17); or completes a BA degree (prob.=0.08). For the cohort of black males aged 20, there are 67,000 high school dropouts. Equating black and white male graduation rates entails 24,000 additional high school graduates.

**Table 8**  
**Total Present Value Lifetime Cost-Savings from Reduced Criminal Activity per black male expected high school graduate**

	<b>Total fiscal savings</b>
<hr/>	
Per expected high school graduate:	
Baseline (federal and state)	\$55,524
By government agency (baseline model):	
Federal government	\$5,634
State/local government	\$49,891

*Notes:* Annual criminal activity is reported by Levin et al. (2007). Criminal activity is assumed to decay to zero by age 65. The decay rate is based on the actual incidence of crime for each age group (UCR, 2004, Table 1). Impacts on incarceration reported by Lochner and Moretti (2004); it adjusts for the lower UCR crime figures compared to NCVS; and it assumes that these estimates only account for 80% of all crimes in value terms.

**Table 9**  
**Estimated fiscal and social net benefits per black male high school graduate**

<i>Present values at age 20 per new high school graduate</i>					
<i>(Discount rate of 3.5%)</i>					
Tax revenues					\$167,623
Health cost savings					\$33,518
Crime cost savings					\$55,524
<b>Total fiscal benefits</b>					<b>\$256,665</b>
<b>Net private benefits</b>					<b>\$258,000</b>
<b>Externalities:</b>					
Health valuation					\$182,000
Victim costs of crime					\$138,800
Productivity gains					\$95,400
<b>Total social benefits</b>					<b>\$930,900</b>
	<b><u>FTF</u></b>	<b><u>CPC</u></b>	<b><u>PPP</u></b>	<b><u>CSR</u></b>	<b><u>TSI</u></b>
<b>Total costs</b>	<b>\$59,066</b>	<b>\$67,714</b>	<b>\$90,694</b>	<b>\$97,373</b>	<b>\$120,238</b>
<b>Fiscal Benefit/cost ratio</b>	4.35	3.79	2.83	2.64	2.13
<b>Net present value</b>	\$197,599	\$188,951	\$165,971	\$159,292	\$136,427
<b>Social Benefit / Cost ratio</b>	15.75	13.75	10.26	9.56	7.74

**Table 10**  
**Sensitivity tests**

Factors that would <u>raise</u> the benefit-cost ratios	Factors that would <u>reduce</u> the benefit-cost ratios
<p><b>Omitted impacts:</b></p> <ol style="list-style-type: none"> <li>1. Juvenile crime</li> <li>2. Intra-family impacts</li> <li>3. Teen pregnancy</li> <li>4. Deadweight loss in collecting taxes</li> <li>5. Wealth accumulation</li> <li>6. More intensive education for those who would graduate anyway</li> </ol> <p><b>Understated impacts:</b></p> <ol style="list-style-type: none"> <li>7. Interventions can be targeted</li> <li>8. Undercounting of persons in poverty</li> </ol>	<p><b>Overstated impacts:</b></p> <ol style="list-style-type: none"> <li>A. Fall in wages with more graduates in the labor market</li> <li>B. No college progression</li> <li>C. Marginal graduate not the same as the average graduate</li> <li>D. Discount rate too low</li> </ol> <p><b>Increasing average costs:</b></p> <ol style="list-style-type: none"> <li>E. Upward-sloping Average Cost curve for delivery of interventions</li> </ol>