Green Dot Charter Schools

A Cost-Benefit Analysis of the Proposal to Turn Around Failing High Schools

Megan Lebow

In the current education policy climate, increased pressure has been placed on improving failing high schools that graduate fewer than half of their students. One policy proposal that has gained support proposes replacing these failing schools with successful charter school models. This paper examines the benefits of utilizing the Green Dot charter schools as a "turnaround" model with reference to the costs. If an expanded network of Green Dot charter schools will continue to operate at its current level of effectiveness, then this policy would prove to be cost-beneficial.

Introduction

In mid-May 2009, Secretary of Education Arne Duncan sat down with the Chairman of the Green Dot Charter school network, Steve Barr. The discussion on the table was what Secretary Duncan has dubbed "dropout factories" or high schools with extremely low graduation rates. As Green Dot has a reputation for taking over low performing high schools, sometimes hostilely, and turning them into more successful environments, Duncan informally proposed providing Green Dot with several billion dollars of funding in exchange for Green Dot's help in "turning around" the lowest 1 percent or 4,000 public schools in the country.

According to the federal budget summary for fiscal year 2010, these

"dropout factories" currently fail to graduate at least 60 percent of their student bodies, and those that do graduate are poorly prepared for college or a post-high school career. Green Dot currently runs 17 charter schools, all of which have seen increased success when compared to the schools in which they were established. Green Dot schools revolutionize the public schools they take over by breaking them into smaller academies, with more localized principal and teacher-centered control and longer school days. Each class at Green Dot serves 140 students, or a maximum of 560 students in each school (Green Dot 2009). Finally, Green Dot works hard to ensure that the majority of the network's funding goes directly to the classroom, with only 6 percent of all funding going towards central office costs.

Literature Review

Recent work on the charter school movement has not been particularly positive with reference to the impact of charter schools. Buddin and Zimmer's 2006 work suggests that charter schools may not have an impact on student achievement that is any greater than that of traditional public schools and in some cases may even have a negative impact. Though this research does not paint an optimistic picture of charter schools' potential for success, it does not indicate that there are no successful charter school networks in existence. Furthermore, Green Dot's own data demonstrates that their schools have had a significant impact on high school graduation rates for the past ten years (Green Dot 2009). For this reason, this cost-benefit analysis (CBA) will assume that Green Dot is a successful model of high school dropout prevention but will not attempt to generalize its results to the potential success of other charter school networks.

Though the Green Dot Charter School network provides a new approach to reforming the high school dropout problem, dropout prevention programs are by no means new to the education policy scene. In 1965, Weisbrod completed a cost-benefit analysis of a dropout prevention program in the St. Louis Public Schools. Though his study lacks external validity with reference to current day programs due to changes in employment opportunities, it does provide a useful framework for assessing a

program like Green Dot. Weisbrod's analysis captured the chief benefits of dropout prevention by comparing lifetime income streams of dropouts and high school graduates. He also measured the reduction in transfer payments and the increase in tax revenue as benefits. As tax revenue is already captured as a part of income, it will not be measured in this cost-benefit analysis of Green Dot Charter School network. Measuring tax revenue separately would lead to an overestimate of overall benefits. Weisbrod also notes a number of less tangible benefits that stem from dropout prevention, such as increased participation in civic and philanthropic activity and reduced crime and delinquency. Though the former remains an intangible benefit that is very difficult to measure, the latter will be accounted for in this analysis by using Belfield's 2006 work and Sum et al.'s 2009 work on the price of crime associated with high school dropouts. Finally, Weisbrod comments that his final benefits might be a slight underestimate, as some program participants will not simply graduate from high school, but will also go on to complete a post-secondary degree. For this reason, this analysis will also include a projection of Green Dot pupils that are likely to graduate from college.

Though Green Dot is not simply intended to be a dropout prevention program, Hummel-Rossi and Ashdown's 2002 paper on the use of cost-benefit and cost-effectiveness studies in education explains why a structure similar to that of a dropout prevention program can be used. Green Dot's intent is not simply to ensure that students graduate from high school but to also raise their academic achievement with an eye to what lies beyond; however, Hummel-Rossi and Ashdown (2002) make the case that the dropout rate is often used as a proxy for student achievement. It is much easier to discover a correlation between high school graduation and salary then it is to find a correlation between standardized test scores and salary. For this reason, this CBA will use high school and college graduation as measures of student achievement using the justification that they will capture the predicted salary increase better than other measures, while acknowledging that this may lead to an underestimation of overall benefits that may be associated with higher student achievement not captured by graduation rates.

Methods

All costs and benefits are calculated based on the assumption that Green Dot "turns around" 4,000 schools, each serving 560 students. For the purpose of this analysis, it is assumed that these schools all incur uniform costs and serve the student population with uniform needs. The costs and benefits are examined for the first class to enroll in Green Dot for all four years of high school. Considering that there are 4,000 schools and 140 students per class, the first class will represent 560,000 students. This analysis will assume that all students who do not dropout take four years to graduate. Though three classes will graduate before this group, having received at least some of the benefits of a Green Dot education, their benefits will not be included for the purpose of this analysis nor will the analysis include the future benefits for classes that will graduate from Green Dot after the first class. Because Green Dot's costs actually decrease over time, the difference between cost and benefits for the first class will serve as a conservative estimate of how beneficial the program will be over time and will provide a simplified analysis that still allows for effective judgment of the merits of the program.

All costs are generated based on current Green Dot budget information from its Los Angeles schools. Additionally, estimates of Green Dot's impact on high school and college graduation rates are utilized to calculate both the costs and the benefits. It is difficult to generate precise estimates of the graduation rate of Green Dot Charter schools for a number of reasons. To begin with, Green Dot is a relatively new program. The first Green Dot school opened its doors in 2000 in Los Angeles, with four other schools following in the next few years. These schools have had tremendous academic success, graduating up to 70 percent more of their students than comparable area high schools (Green Dot 2009); however, these Green Dot schools reflect a more traditional charter school model. The schools recruit students from the community, and the students' parents enroll them in a lottery to gain admission to the school. The students' parents demonstrate a level of parental investment that may make these students more advantaged than other high school students in the Los Angeles area of comparable socioeconomic backgrounds.

Because this selective group is not likely to be representative of those in

a failing high school, this CBA will focus on the Locke High School transformation project, a more recent effort to "turn around" a failing school. Green Dot took over Locke High School in 2007 and reopened it as five smaller academies in the fall of 2008. These schools will be used to provide a baseline assumption of effectiveness. In the spring of 2009, the Locke Charter Schools saw a 20 percent increase in their graduation rates (Green Dot 2009). Though students benefited from only a year of Green Dot's structure, the 20 percent improvement in high school graduation will form the baseline assumption for the benefits examined in this analysis, providing a low estimate for what the actual benefits are anticipated to be, assuming that students who benefited from four years at Green Dot would have even higher graduation rates. If the class that is utilized for the analysis starts with 560,000 students and a graduation rate of 50 percent, this means 280,000 students will graduate. A 50 percent graduation rate will be used as the status quo graduation rate for the schools that Green Dot seeks to "turn around." An increase of 20 percent brings the graduation rate to 60 percent, meaning an additional 56,000 students will graduate.

Green Dot's college attendance rate presents a similar issue. Currently 76 percent of all Green Dot graduates go on to a four-year college, with the majority of the remainder attending a two-year program (Green Dot 2009); however, this data does not reflect students graduating from Green Dot's turnaround model. For this reason, data on college attendance and graduation will be taken from a similar turnaround model, Mastery Charter School in Philadelphia. Sixty-seven percent of all students graduating from Mastery Charter School attended a four-year college with only 20 percent dropping out before the degree was completed (Mastery Charter Schools 2010). This number is certainly not ideal since the student population in Philadelphia is sure to be somewhat different than that of Los Angeles; however, data on Locke High School's college graduation rate is not yet available. Since Mastery Charter School is a similar "turnaround" model and works with a similar low-income population, it will be assumed for the purpose of this analysis that their student populations are similar enough to generalize across. Therefore, this figure will be used to generate costs of attending college and benefits of obtaining a college degree for Green Dot graduates.

Costs

This CBA determines costs using a modified ingredients method (Levin and McEwan 2001). First, all possible costs associated with running a single Green Dot school were calculated. Costs included operating costs, private student costs, per pupil expenditures associated with additional years of school, and opportunity costs for teachers who were qualified to enter other professional fields. One limitation in this approach stemmed from the lack of specific operating cost data available. Green Dot provides data on its aggregate operating cost in the first years of operation, but these expenditures are not itemized. This may affect external validity as specific operating costs, such as teachers salary and facility expenditures, differ greatly from state to state.

Operating Costs

The largest cost associated with establishing 4,000 new Green Dot schools is the annual operating cost of running each school. Each Green Dot school has startup costs of $1.5 million over the course of the first four years of operation (Green Dot 2009). This money is chiefly solicited from private foundations and grants, though in Secretary Duncan's proposal some of it would likely be covered by grants from the Department of Education. Because this cost is being invested in a human resource project, a 3 percent discount rate over four years will be used to account for the time component of this cost, based on the guidelines provided by the Office of Management and Budget (1992). A discount rate of 3 percent will be used across the analysis. The operating cost of this expansion would be $20,684,155,543.

Some of these startup costs are offset by the fact that Green Dot receives less state and local school district funding per pupil than the average Los Angeles Unified School District school. Green Dot receives $10,276 per student while the average school receives $12,810 per student (Green Dot 2009). It is possible that Green Dot currently does not have the capacity to provide resources for as many special education students or English language learners, which would explain Green Dot's lower costs. This calculation may be an underestimate if newly established Green Dot schools serve greater numbers of these populations and receive additional funding

for their services. For the purpose of this analysis it is assumed that the student population served by the new schools will be similar to the current schools, and the funding will reflect this similarity. This difference will account for *decreased* costs of $5,432,932,657.

Finally, included in annual operating costs will be the cost of running the Green Dot central office. These costs are also primarily generated through grants and private foundations and is particularly difficult to estimate because there is no clear data on where these 4,000 additional schools will be open and how many central offices will be required to run them. Because any estimate made about this would be purely conjecture, central office costs are estimated by using the current per pupil cost for the existing central office. Currently Green Dot spends $2,411.84 per student on their central office in Los Angeles (Green Dot 2006). This number will be used to estimate the cost of central offices for the new schools. Central office activities cannot practically be separated into tasks serving each specific class or student; therefore, the total number of students, 2.24 million, will be used to predict central office costs rather than simply the per class estimate. This assumes that any central office task goes to benefit all students currently enrolled in the program and not simply the single class being used for the remainder of the cost predictions. The total central office costs are estimated at $5,742,917,032.

In total, these numbers will account for a school operating cost of $20,994,119,920. After the first four years, Green Dot schools operate solely using district and state funds, so the costs will be much lower for future classes.

Retainment Costs

The second largest cost for implementation of this program stems from the yearly cost associated with educating students who would have otherwise dropped out. Though the majority of students drop out of high school before or during senior year, a number of students drop out earlier. Assuming Green Dot schools prevent 56,000 students from dropping out of high school during the course of their four years in school, the table below represents how many students the schools will prevent from dropping out each year.

For the purpose of this analysis, it is assumed that once a dropout is

prevented from leaving, he or she remains in school until graduation. It is also assumed that a student who dropped out before or during a given year did so before the per pupil allocation of funds for that given year. For that reason, this cost is likely to be overestimated. Each additional year that a student stays in school costs the state and local district an additional $10,276, and costs are discounted at the 3 percent rate. This results in a total retention cost of $1,002,557,243.

Similarly, just as it costs the school more per pupil who does not drop-out, there are also private student costs associated with remaining in school. In 2008, the U.S. Department of Agriculture ran a study predicting the average cost of raising a child. With a sixth of these costs being spent on education and childcare, the average low-income family spends $26,645 on a child's education and childcare or $1,417 a year. These costs are likely an overestimate as parents spend more on childcare and education when their children are younger. Since this study was conducted in 2008, this figure must be converted to 2009 dollars using the consumer price index (CPI), for a cost of $1,398 private student costs per year.

Assuming $1,398 private student costs per child for each additional year, the numbers calculated above are used to determine how many additional years each student will spend in school, and the numbers are discounted over time, using the 3 percent rate for a total cost of $136,414,518.

Table 1:
Percent of Dropouts Prevented per Year of High School

Year	Percent Dropping Out Before or During Year	Number Prevented from Dropping Out
9th Grade (Year One)	12.6%	7,056
10th Grade (Year Two)	14.2%	7,952
11th Grade (Year Three)	19.0%	10,640
12th Grade (Year Four)	55.2%	30,912

Note: Percent of dropouts each year of high school provided by California State Department of Education, 2009.

Source: Author's calculations.

Opportunity Costs

Most Green Dot teachers are similar to the public school teaching population in that they obtained an undergraduate or graduate level teaching degree; however, the math and science teachers are somewhat unique in this regard. Currently 75 percent of Green Dot math and science teachers hold a degree in math, science, economics or a related field (Green Dot 2009). For this reason, these teachers would be earning a higher salary if they were to use their degree in a more traditional field. This loss of salary must be accounted for as an opportunity cost that is forgone when these teachers decide to enter the teaching field. Green Dot teachers in Los Angeles belong to their own teachers' union that operates independent of the local union, while Green Dot teachers in New York City have joined the United Federation of Teachers. Though Steve Barr has expressed some willingness to work with the teachers' unions in developing new schools, for the purpose of this analysis it is assumed that the new schools are independent or not unionized. Because these teachers make more than teachers in the local union, the opportunity cost estimated here could be an underestimate of how much potential salary is lost in the pursuit of a teaching career. Green Dot salaries are taken from the current Los Angeles Green Dot salary schedule (Green Dot 2009). Salaries that would have been made were these teachers in a math or science related-industry are estimated from Ferguson's 2009 work. As it is much more difficult to estimate these industries' salary progressions, salary increases are estimated based on the current rate of inflation only. Each Green Dot school has approximately eight math and science teachers, six of whom hold a degree in a science or math-related field (Green Dot 2009). With 4,000 new schools, this is the equivalent of 24,000 teachers and results in an opportunity cost of $555,405,000. It is possible that this hiring practice would not be sustainable with so many teachers needed. If that is the case, then more teachers with traditional teaching degrees would be hired and this calculation would be an overestimate.

Cost of College

The final cost associated with Green Dot Charter Schools is the additional cost associated with sending students to college who would not have attended without Green Dot's influence. Based on the success of similar turnaround models, this analysis estimates that Green Dot will send 67 percent of its students to a four-year college, with 80 percent of those students graduating. This is compared to a national average for low-income schools of 38 percent attendance and 60 percent graduation (National Center For Education Statistics 2005). Assuming that Green Dot graduates 336,000 students in the class being analyzed, this means that Green Dot will send 118,720 additional students to college compared to an area school with similar demographics, and 116,256 of these students will graduate. The average cost of college for these students will be $7,020 a year for those who attend public schools and $26,273 for those who attend private school. Based on national averages, 80 percent or 93,005 students will attend public schools and 20 percent or 23,251 students will attend private schools (Lee and Clery 2004). Many of these students will be eligible for

Table 2:
Total Costs of Green Dot's First Class

Cost	Total	Who Pays
Operating Costs	$20,994,119,920	Private Foundation (Taxpayers actually benefit) **or** Taxpayers via the Department of Education in Duncan's proposal
Yearly Per Pupil Costs	$1,002,557,243	Taxpayers
Private Yearly Per Pupil Costs	$136,414,518	Students
Teacher Opportunity Cost	$555,408,000	Society as a whole
College Attendance	$4,298,925,835	Taxpayers and Students
Total	**$26,987,425,520**	

Source: Author's calculations.

government loans or grants, so this cost will be borne by a combination of individuals and taxpayers. The cost for students attending private universities will be $2,220,934,720 compared with a cost of $2,077,991,115 for the students attending public universities. Information on when students drop out of college was unobtainable; therefore, the costs of those who attend college but do not graduate are not included. Though these students make up a small fraction of the total additional students, this cost may be underestimated.

The total cost associated with the increased college attendance and graduation rate is $4,298,925,835.

Benefits

Lifetime Earnings

The greatest benefits that are achieved through the implementation of 4,000 new Green Dot Charters comes from the changes in lifetime earnings experienced by those who graduate from high school and go on to college as a result of the higher quality high school education that they receive. As earlier discussed, if the high school graduation rate increases by 20 percent, this means the additional graduation of 56,000 students. In order to accurately calculate lifetime earnings, it must be determined how many of these students pursue higher education and how many students terminate their educational experience with a high school diploma. In Weisbrod's 1965 analysis, he proposes that the students who would have dropped out of college without any intervention perhaps have lower IQs and are less academically capable than their peers who were previously on track; however, since the 1960s, research in this area has evolved. As Rouse explains in her 2005 work, it is difficult to find a correlation between academic ability and high school graduation when controlling for the other factors that contribute to a student's academic success. For this reason, this analysis assumes that those who graduate from high school solely due to Green Dot's intervention will attend college at the same rate as their peers who would have graduated regardless. This means that of the 56,000 graduates,

30,016 will attend and graduate from college, while 25,984 will not continue with their education after high school. Furthermore, 86,240 students who would have completed high school anyway, are additionally motivated to attend and graduate from college as a result of Green Dot's intervention.

Rouse (2005) estimates that the difference in lifetime earnings for a high school dropout and a high school graduate is $260,000 in 2004 dollars, or $295,597.68 in 2009 dollars using the CPI. With 25,948 additional students graduating solely from high school, this is equivalent to a benefit of $7,670,168,678.

Based on "synthetic" estimates of the work-life earnings from Day and Newburger (2002), those who complete college will make $1,200,000 more in lifetime earnings than those who solely graduate from high school. As 86,240 Green Dot students who would have solely graduated from high school will now graduate from college, this means an aggregate benefit of $103,488,000,000. Similarly those who complete college will make $1,400,000 more in lifetime earnings than those who dropout of high school. As 30,016 students who would have been high school dropouts without Green Dot's intervention will now go on to college, this means aggregate benefits of $42,022,400,00. The total benefit of change in lifetime earnings of those who attend college is $145,510,400,000. These benefits might be underestimates because the U.S. Census Bureau data that Day and Newburger use assumes full-time work throughout the life span, and high school dropouts are much more likely to be unemployed. Furthermore, this analysis is likely to underestimate the benefits provided by Green Dot as it does not account for those who pursue Associate's Degrees or complete some college and are likely to have higher earnings as a result. Finally, the total benefits figure may be an underestimate because the census bureau data includes people who obtain Graduate Equivalence Degrees (GEDs) in its subset of high school dropouts. As people with GEDs are likely to have slightly higher incomes, this could skew the average dropout income and underestimate difference in wages.

Social Benefits

The final benefit analyzed is the decrease in social costs as a result of fewer high school dropouts. Sum et al. (2009) estimate that each high school dropout costs taxpayers $5,200 in social costs over the course of his or her lifetime. These costs include welfare benefits and other social services as well the cost of incarceration for a population that has a much higher crime rate. This is contrasted with the average high school graduate who contributes an additional $287,000 over the course of his or her lifetime. When you remove the $60,000 difference in income tax paid by high school graduates compared to dropouts, which is already accounted for by the difference in lifetime earnings, you get a social benefit of graduating of $232,000 per individual. If Green Dot graduates 56,000 additional students, this results in decreased social costs of $12,992,000,000. This is likely an underestimate as Sum et al. do not account for the social costs of crime or police forces affiliated with criminal activity.

Sensitivity Analysis

At first blush, transforming the lowest performing 1 percent of high schools into Green Dot schools seems overwhelmingly beneficial. The largest benefit comes not from reducing the trend of the "dropout factories" and ensuring more students graduate from high school but from the increased

Table 3:
Total Benefits of Green Dot's First Class

Benefit	Total	Who Benefits
Difference in Lifetime Earnings for High School Graduates	$7,670,168,678	Students and Society as a whole
Difference in Lifetime Earnings for College Graduates	$145,510,400,000	Students and Society as a whole
Decreased Social Costs	$12,992,000,000	Society as a whole
Total	**$166,172,568,700**	

Source: Author's calculations.

number of students who go on to graduate from college after exposure to such a program. It is not unreasonable to suggest that Green Dot would have a large effect on the number of students graduating from college, as part of the success of its high school graduation stems from an emphasis on students' future capabilities and college readiness. However, Green Dot graduates complete college at a rate of 53.6 percent, which is significantly larger than the 22.8 percent that graduate from college after attending high schools serving similar socioeconomic populations. This sensitivity analysis will examine assumptions about rates of college graduation as well as the rates of high school graduation that would motivate this change.

Applying Weisbrod's (1965) research, students who would have dropped out of high school without Green Dot's intervention are likely less capable than their graduating peers. This assumption will not reduce Green Dot's college attendance rate, but all 67 percent of students that go on to college will be from the population that would have graduated from high school regardless of where they had attended school. Because the same number of students will be attending college and the same number of students will be graduating from Green Dot, the costs of this proposal will remain unchanged; however, the benefits will be altered. All 56,000 students who would have dropped out will see their incomes increase by $295,597.68, or $16,553,470,080 overall. The 116,256 students who will go to college as a result of Green Dot's intervention would have previously been high school graduates, so they will see an increase in lifetime incomes of $1.2 million, for a total of $139,507,200,000. This proposal will result in total benefits of $169,052,670,111 compared with costs of $26,987,425,510.

The second assumption is that Green Dot does not improve college attendance at all and that Green Dot graduates attend college at the same rate as students from schools with similar populations. This assumption indicates that 38 percent of Green Dot graduates will attend college and 60 percent of those attending will graduate. This group will include 22.8 percent of students who would have dropped out as well as 22.8 percent of those who would have graduated regardless. Because those who would have graduated regardless are benefiting from Green Dot's intervention, only the 22.8 percent of dropouts now graduating from high school are included

Table 4:
Sensitivity Analysis

Baseline Assumption	Per Pupil Per Year Expenditure	Private Student Costs	Costs of College	Total Costs*	Income Benefits of High School Degree	Income Benefits of College Degree	Social Benefits	Benefits
20 percent increase in HS Graduation; 53.6 percent College Graduation	$1,002,557,243	$136,414,518	$4,298,925,835	**$26,987,425,510**	$7,670,168,678	$145,510,400,000	$12,992,000,000	**$166,172,568,700**
Same Rates with no previous dropouts in college	$1,002,557,243	$136,414,518	$4,298,925,835	**$26,987,425,510**	$16,553,470,080	$139,507,200,000	$12,992,000,000	**$169,052,200,000**
20 percent increase in HS Graduation; 22.8 percent College Graduation	$1,002,557,243	$136,414,518	$472,160,999	**$23,160,663,670**	$12,779,278,900	$17,875,200,000	$12,992,000,000	**$43,646,478,900**
10 percent increase in HS Graduation; 22.8 percent College Graduation	$501,278,622	$68,207,259	$236,082,000	**$22,355,095,800**	$6,389,639,451	$8,937,600,000	$6,496,000,000	**$21,823,239,450**

* Total cost calculations include the additional fixed costs not listed in this table.

Source: Author's calculations.

as a benefit. Assuming 12,768 total new students attend college, college costs will be $472,160,999, for total costs of $23,160,663,670. Benefits will be altered to include the lifetime earnings of the previous dropouts now graduating from high school. A $1.4 million increase in lifetime earnings from 12,768 students will result in a total benefit of $17,875,200,000. The remaining 43,232 previous high school dropouts will increase their lifetime earnings by $295,597, for a total of $12,779,278,900. This will result in total benefits of $43,646,478,900, which still significantly outweigh the costs.

As it is unlikely that Green Dot would actually decrease the rate of college graduation, the final assumption for analysis alters the rate of high school graduation. A 20 percent increase in graduation rate is conservative, considering that all of the existing Green Dot schools have boasted a significantly higher success rate when able to work with a class of students for four years; however, because these are young programs and it is unknown how replicable their results will be over the long term, this CBA will look at a more conservative success rate. For the final analysis, it is assumed that Green Dot increases high school graduation rate by 10 percent and that its college graduate rate remains commensurate with similar schools at 22.8 percent.

These assumptions will not change the start-up costs, nor will they change the opportunity cost associated with the science and math teachers. A lower rate of high school graduation will change the yearly per pupil expenditures from the state and local government, as 28,000 students will be staying in school rather than 56,000. This will result in a cost of $501,278,622. The per pupil per year expenditure will remain the same.

The change in graduation rate will similarly affect the private per pupil yearly expenditures, which will be reduced to $68,207,259. Finally, the college costs will be reduced. No additional previous high school graduates will be attending and graduating from college and only 6,384 students who would have previously dropped out will earn a college degree, resulting in a cost of $236,082,000. The total costs under these assumptions will be $22,355,095,800.

The benefits will be altered significantly. The lifetime earnings will not be impacted for any of the students that would have graduated from high

school without Green Dot. For those that would have dropped out, 6,384 will graduate from college, while 21,616 additional students will earn a high school degree. The students graduating from high school will increase their lifetime earnings by $295,597 for a total of $6,389,639,451. Those that graduate from college will have increased lifetime earnings by $1.4 million for a total of $8,937,600,000. Finally, the social benefits of $232,000 over each student's lifetime will be realized for 28,000 students rather than 56,000. This will result in total social benefits of $6,496,000,000 and total overall benefits of $21,823,239,450. These benefits are slightly lower than the costs of operating Green Dot schools; however, a number of unlikely assumptions are necessarily made before the costs of the program can be demonstrated to outweigh the benefits.

Limitations

As shown in the sensitivity analysis, in almost all potential situations, the benefits of transforming the lowest performing 1 percent of high schools into Green Dot Charter schools far outweigh the costs. It should also be kept in mind that there are other benefits to Green Dot Charter schools not included in this analysis. For example, Green Dot Charter schools will have generational benefits as well as immediate benefits for the students who are enrolled. As Weisbrod notes in his 1965 study, children whose parents drop out of high school are much less likely to graduate from high school themselves. The children of Green Dot students who have graduated from high school will now be more likely to graduate even if they are not exposed to the enriched academic environment that Green Dot provides. These benefits are difficult to predict and were not included in this analysis but certainly represent an additional benefit to both society and the individuals whose parents were Green Dot students.

Other categories of benefits to keep in mind are those that would be realized by students who attended Green Dot for part of high school and those realized by future Green Dot classes. Green Dot will graduate three classes of students before graduating a class that they serve for four full years of high school. Based on Green Dot's work with Locke High School,

it seems likely that it will have some positive impact on these first three classes. It is difficult to tease out the effects that Green Dot will have on these students compared to the work of their previous teachers and administrations. It is likely that the schools would know of their tenuous academic standing before Green Dot took over and would have begun implementing reform efforts in advance of Green Dot taking over the school. For that reason, the benefits that students receive from Green Dot are not included in this analysis.

A further unmeasured benefit stems from the fact that Green Dot schools will most likely graduate additional classes following the graduation of the class whose benefits have been analyzed. The costs of educating these classes will almost certainly be lower. After the $1.5 million in the first four years, Green Dot schools have historically operated only on their per pupil allocation from the state and the school district. The benefits that these classes derive are considerably more difficult to predict. Many Green Dot schools will become more effective over time as teachers grow more experienced and the administration becomes better acquainted with the populations they are serving. These schools will likely experience an even larger difference between their costs and benefits than the class analyzed above; however, it is also possible that some schools will become less effective over time as founding staff members leave and initial enthusiasm for the school's mission peters out. This analysis does not attempt to predict the trajectory that each school will take, given that the oldest current Green Dot school has only been in operation for eight years. Similarly, it is impossible to predict how long Green Dot schools will be in operation and how many classes they will each graduate in their life span. Because of these uncertainties, and because the first class graduating demonstrated overwhelmingly higher benefits than costs, future classes have not been included in this analysis. While it is likely that these classes would only increase the cost-benefit gap, there are too many uncertainties involved to definitively reach a conclusion.

Finally, there is one issue with charter schools in general that could potentially nullify the benefits demonstrated above. Many charter schools like Green Dot are known for emphasizing high academic standards and

strict codes of discipline. This model leads to higher test scores and graduation rates; however, along the way these schools often discourage pupils who cannot work within this rigorous structure. It is possible that Green Dot's rigor will encourage the families of students who are the most likely to drop out to leave Green Dot for another, less demanding school. This would result in a Green Dot "turnaround" school that looks much like the original model and serves primarily students who are already motivated to push themselves to succeed. In this case, Green Dot's success would be a product of the students and families with which it worked rather than any of the school's features, indicating that Green Dot did not have any benefit but was simply perpetuating the status quo with a very different sub-population than these "dropout factories" traditionally serve. Though this issue would likely not nullify all of Green Dot's benefits, it is a very real concern that must be kept in mind when assessing program effectiveness.

Future Analysis

Though all of the above issues suggest that benefits might be underestimated, there are several other limitations that suggest directions for further research. The first issue stems from the estimates used when calculating costs. All estimates for per pupil expenditures represent an aggregate cost taken from California, while the benefit calculations for lifetime earnings are taken from an aggregate national measurement. Since the Green Dot "turnaround" schools will be open throughout the nation, per pupil expenditures and school property costs will likely vary in each location. It is unlikely that these costs will vary to a large enough extent to reverse the findings of the cost-benefit analysis, but it should certainly be kept in mind that it may be more beneficial to open Green Dot Charter schools in some states compared to others. An analysis calculating the likely cost-benefit ratio in a more diverse range of states would demonstrate a higher degree of external validity and would be a beneficial future step.

Similarly, the aggregate per pupil expenditure used above may not accurately capture the different levels of funding required for each individual student. A special education student or English language learned is certain

to need additional funding that will not be captured by the aggregate per pupil expenditure provided. If some of the new schools cater specifically to these populations, they are certain to require higher levels of funding that this analysis does not capture. These populations will not necessarily have the same returns to scale as those in the general population. It is possible that Green Dot is not as effective at ensuring that these populations graduate, as this would not be captured in the aggregate graduation rates that they provide. For these reasons, it would be beneficial to do further research on Green Dot's effect on these subgroups in an effort to ensure it is beneficial for all populations the program seeks to serve.

Recommendations

The consequences of dropping out of high school are severe. They include such factors as lower lifetime earnings, increased likelihood of incarceration and crime, and an average age of death that is nine years below that of those who graduate. Based on the findings of this CBA, Secretary Duncan's proposal to replace the lowest-performing 1 percent of public high schools with 4,000 Green Dot Charter schools seems to be an overwhelmingly positive policy. It offers a program with tremendous benefits at comparatively low costs; however, the implementation of this program cannot be recommended categorically due to issues of scale and issues of external validity. This policy proposal involves transforming a program that is comprised of seventeen total schools in two major urban areas into 4,000 schools in diverse regions across the United States. Yet, it is unknown if this program is replicable on such a large scale. Green Dot has not seen enough expansion to be able to determine whether its mission and methods can be translated to many different locations concurrently. It is possible that growth of this size would result in diluted versions of the Green Dot model that were no more effective than the schools they replaced. It is also possible that this program would not work as well in rural areas where many resources that are easily accessed in urban areas are not readily available. Currently, Green Dot is able to operate on a relatively small budget, and it is not clear that it would be similarly successful in more remote areas where schools receive less

per pupil funding and where students face a different range of challenges.

Rather than recommending that this policy be implemented at once, Secretary Duncan should exercise caution. The Locke transformation project is only in its second year, so the data used for this analysis is necessarily limited. Before drawing conclusions about the program's effectiveness, it would be beneficial to wait until the first class has graduated from Locke High School to ensure that the data confirms the predictions modeled in this analysis. After determining Lock High School's success, the Secretary's proposal could be implemented in several steps. To begin, it would be prudent to expand the program to a number of pilot locations, to test whether the model works outside of urban centers and whether Green Dot has the organizational wherewithal to manage, for example, 100 schools at once. It is also recommended that Secretary Duncan marshal the Department of Education's resources to ensure that the students that graduate from Green Dot largely represent those who were enrolled as freshman, rather than those who were recruited after original enrollees elected to attend less challenging schools. Only after determining the success of this pilot, measuring its effectiveness in increasing graduation and college attendance rates in its new locations, and ensuring that it can continue to operate under the same financial constraints with this degree of expansion should the program be fully implemented. Though the cost-benefit analysis demonstrates a potentially cost-effective and beneficial program, it cannot be recommended until some of these uncertainties are removed and Secretary Duncan is able to provide more convincing evidence that the success of a small number of schools can be replicated on a much larger scale.

References

Altmann, Aviva. 2009. Fundraising suggestions for school sites: A resource guide for teachers and administrators. Presented at the Green Dot workshop, January, in Los Angeles, California.

Belfield, Clive R. 2006. The economic consequences of raising the high school graduation rate for black males: The effects on crime. Working Paper.

Educational Demographics Office. Dropouts by ethic designation by

grade. California Department of Education. http://dq.cde.ca.gov/dataquest/DropoutReporting/GradeEth.aspx?cDistrictName=State&cCountyCode=00&cDistrictCode=0000000&cSchoolCode=0000000&Level=State&TheReport=GradeEth&ProgramName=All&cYear=2007-08&cAggSum=StTotGrade&cGender=B (accessed December 10, 2009).

Day, Jennifer C., and Eric C. Newburger. 2002. The big payoff: educational attainment and synthetic estimates of work-life earnings. *U.S. Census Bureau*, 1-13.

Ferguson, D. Chris. and Greg Gilpin. 2009. Wage frictions and teacher quality: An empirical analysis of differential effects across subject areas. Working Paper.

Fox, Mary Ann, Brooke A. Connolly, and Thomas D. Snyder. 2005. Youth indicators 2005: Trends in the well-being of American youth. *National Center for Educational Statistics* 5: 1-124.

Green Dot Public School. School Results. http://www.greendot.org

———. 2006. Green dot public schools. *Proceedings of the Board meeting* (pp. 1-31). Los Angeles.

Hummel-Rossi, Barbara A., and Jane Ashdown. 2002. The state of cost-benefit and cost-effectiveness analyses in education. *Review of Educational Research* 72: 1-30

Lee, John and Sue Clery. 2004. Key Trends in Higher Education. *American Academic*, 21-36.

Levin, Henry M. and Patrick J. McEwan. 2001. *Cost-Effectiveness Analysis*. Thousand Oaks, California: Sage (accessed December 10, 2009).

Mastery Charter Schools. Results. http://www.masterycharter.org/Results.html

National Center for Education Statistics. 2005. Youth Indicators, 2005: Trends in the Well-Being of American Youth.

Office of Management and Budget. 1992. Circular A-94: Guidelines and discount rates for benefit-cost analysis of federal programs.

Rouse, Cecelia E. 2005. The Labor market consequences of an inadequate education. *National Bureau of Economic Research*, 1-37.

Sum, Andrew, Ishwar Khatiwada, Joseph McLaughlin, and Sheila Palma.

2009. Joblessness and jailing for high school dropouts and the high cost for taxpayers. *Center for Labor Market Studies.*

Weisbrod, Burton A. 1965. Preventing high school dropouts. In *Measuring benefits of government investments*, ed. Robert Dorfman.Washington, DC: Brookings Institute, 117-171.

Zimmer, Ron, and Richard Buddin. 2006. Charter school performance in two large urban districts. *Journal of Urban Economics* 60: 307-326.

Megan Lebow is in her second and final year of the Master of Public Policy program at the George Washington University. She earned a Masters of Science in education degree from Bank Street College and a Bachelors of Arts degree in psychology from Harvard University. Megan was a middle school teacher in the New York City Public School system and currently works at the National Council on Teacher Quality.

The author would like to thank Lauren Alfred and Kelsey McCoy for all their hard work on this article. She would also like to thank Professor Joseph Cordes and Yas Nakib for their guidance. Finally, she is extremely grateful to Jocelyn Lebow and Jason Sambolt for their patience and advice throughout the writing process.