

PRIVATE AND GOVERNMENT FISCAL COSTS AND BENEFITS OF THE MARYLAND DREAM ACT¹

By

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Executive Summary

This study presents the results of an evidence-based cost-benefit analysis of the Maryland Dream Act. It addresses the following three questions: (1) how many students will benefit from the Dream Act; (2) what will be the fiscal costs and benefits to the state, county and federal governments of the Dream Act; and (3) what will be the total net economic impacts of the Dream Act?

We estimate that approximately 185 students in each annual 18-year old cohort will be induced to graduate from high school in Maryland because of the Dream Act. In addition, a total of 435 students in each annual cohort will take advantage of the Dream Act to attend college. Of those who will take advantage of the Dream Act to attend college, 163 will be induced by the Dream Act to obtain more college education, while 272 will pay less for each year of college with the Dream Act than they would have in the absence of the Dream Act, but not increase their educational attainment.

This analysis suggests that even if the only consideration is the fiscal effects on state and local governments the net economic effects of the Maryland Dream Act will be positive, and the benefits will be substantial. The initial costs of the investment in education will be more than offset by increased tax revenues and lower incarceration costs from a more educated citizenry. Including private benefits increases the estimated net effects even further. The estimated total net economic benefits of the Dream Act for each annual cohort of students are approximately \$66 million in 2011 dollars.

In general, these results are not sensitive to changes in the assumptions underlying the analysis.

Table of Contents

I. INTRODUCTION 1

II. BACKGROUND..... 2

III. METHODOLOGY 4

 A. Estimating the Number of Individuals in Each Category..... 5

 1. Educational Attainment of Undocumented Immigrants in Maryland without the Dream Act 6

 2. Effect of the Dream Act on Educational Attainment 7

 B. Estimating Fiscal and Private Costs of the Dream Act 8

 1. The Fiscal Costs of Schooling 8

 2. Private Costs of Schooling (to the Student) 9

 3. Weighting: State-wide Weighted Average Costs..... 10

 C. Estimating Fiscal and Private Benefits of the Dream Act 11

 1. Private Benefits (to the Student): Increased Lifetime Earnings..... 12

 2. Fiscal Benefits..... 14

 C. Discounting Costs and Benefits 16

 D. Other Potential Costs 17

 E. Other Social Benefits..... 19

IV. RESULTS 20

 A. The Number of Students Who Will Benefit from the Dream Act..... 20

 B. The Fiscal Costs of Schooling..... 21

 C. Net Benefits..... 22

 1. Total Net Economic Benefits (Private Plus Fiscal Net Benefits) 22

 2. Fiscal Net Benefits to State, Local and Federal Governments..... 23

V. SENSITIVITY ANALYSIS..... 24

 A. Not Including Reductions in Spending on Incarceration in the Estimate of Fiscal Benefits 24

 B. Different Estimates of Returns to Education..... 25

C. Different Discount Rates	25
D. Different Assumptions about the Impact of the Dream Act on Educational Attainment.....	26
E. Different Assumptions of the pre-Dream Act Graduation and Enrollment Rates of Undocumented Immigrants	27
F. Different Assumptions about the Distribution of Students between Public and Private Universities	27
V. CONCLUSIONS.....	27

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I. INTRODUCTION

An important policy decision for many states is whether to allow in-state tuition rates at state colleges and universities to undocumented immigrants who have in all other respects established residency in that state. Thirteen states have adopted legislation that allows such policies, which are commonly referred to as “Dream Acts,” and several others are contemplating doing so. However, one state (Oklahoma) has already repealed its Dream Act and a referendum regarding the Maryland Dream Act is scheduled for November.

A critical issue in judging the desirability of such policies is whether they represent wise public investments, i.e., what are their fiscal costs and benefits, and do the social benefits of the Dream Act outweigh the social costs. In this study we use an evidence-based approach, relying on the results of empirical studies, to estimate the fiscal and private costs and benefits of the Maryland Dream Act.

The next section of this paper summarizes the key provisions of the Maryland Dream Act.

Section III discusses the methodology we used to estimate the economic impacts of the Dream Act. Briefly, we start by estimating the number of individuals in each of seven categories for each yearly cohort of 18 year olds. For each category, we also estimate the per student fiscal costs of providing schooling, the per student fiscal benefits of additional education induced by the Dream Act and the per student net private benefits of the Dream Act. Combining estimates of costs and benefits for each category of student with estimates of the number of students in each category yields the overall impacts.

Section IV presents the result of our analysis. In addition to reporting the fiscal costs and benefits separately for the federal government, state government and local governments we report private net benefits to the student along with total economic impacts. Broadly, undocumented immigrant who take advantage of the Dream Act fall into two categories: (A) those induced to obtain more education because the Dream Act lowers the private cost of education, and (B) those who pay lower tuition and fees at public universities because of the Dream Act, but are not induced to obtain more education by the Dream Act. Our analysis shows that the Dream Act results in net economic benefits for both of these types of students. If we consider only the fiscal benefits and

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cost to county and state governments in Maryland, for those who are induced to obtain more education by the Dream Act (category A) the present value of fiscal benefits exceeds the present value of fiscal costs. That is, to the extent that the Dream Act induces students to obtain more education, the Dream Act will have a positive impact on state and local government budgets. For students who would obtain the same education with or without the Dream Act (category B), there are no fiscal benefits (since fiscal benefits occur because students obtain more education) and the costs of schooling are shifted from the student to the government. That is, to the extent that the Dream Act simply lowers the private cost of education for undocumented immigrants but does not induce them to obtain more education, the Dream Act will have a negative impact on state and local government budgets. When we combine estimates of costs and benefits for each category of student with estimates of the number of students in each category we find that the net effect of the Maryland Dream Act on the economy will be positive, and the benefits will be substantial. Even if the only consideration is the fiscal effects on state and local governments, the impact of the Dream Act will be positive and large. The initial costs of the investment in education will be more than offset by increased tax revenues and lower government spending on incarceration and other government programs that result from a more educated citizenry.

Section V examines the sensitivity of our results to changes in the assumptions we make. These sensitivity analyses show that our results are robust, i.e., they hold for a wide range of variation in assumptions. Specifically, the following results hold under all sets of alternative assumptions that we consider: the total net economic benefits of the Dream Act are always positive and large; total net fiscal benefits to state government are always positive; and total net fiscal benefits to the federal government are always positive. Under some sets of alternative assumptions, the net fiscal benefits to county governments are negative. That is, the sensitivity analysis suggests that a redistribution of costs between different levels of government may occur with the Dream Act. The Dream Act may result in net fiscal losses for county governments even as state and federal government budgets gain.

II. BACKGROUND

On May 10, 2011 the Governor of Maryland signed the Maryland Dream Act, which allows undocumented immigrants who live in Maryland to pay in-state tuition at Maryland public community colleges and universities. On July 22, 2011 the Maryland Board of Elections officially certified that a petition drive had collected enough valid signatures to bring a veto referendum on the Dream Act. Maryland voters will vote yes or no on the Maryland Dream Act on the November 6, 2012.³

³ The ballot referendum will read:

Question 4

Referendum Petition

Public Institutions of Higher Education – Tuition Rates (Ch. 191 of the 2011 Legislative Session)

Establishes that individuals, including undocumented immigrants, are eligible to pay in-state tuition rates at community colleges in Maryland, provided the student meets certain conditions relating to attendance and graduation from a Maryland high school, filing of income taxes, intent to apply for permanent residency, and registration with the selective service system (if required); makes such students eligible to pay in-state tuition rates at a four-year public college or university if the student has first completed 60 credit hours or graduated from a community college in Maryland; provides that students qualifying for in-state tuition rates by this method will not be

To take advantage of the Maryland Dream Act, students must begin higher education at a Maryland public community college.⁴ After completing an associate's degree, or 60 credits (two years full-time study) at a community college, students can then continue their higher education at a Maryland public university or college at in-state tuition rates. Specifically, to qualify for the Dream Act, an undocumented immigrant must fulfill the following conditions:

- Beginning in the 2005-2006 school year, have attended a public or nonpublic secondary school in the state for at least 3 years;
- Beginning with the 2007-2008 school year, have graduated from a secondary school, or received the equivalent of a high school diploma, in Maryland;
- Provide documentation that the student or the student's parent or legal guardian has filed a Maryland income tax return for at least three years while the student was in high school, and for any year during the period since high school graduation;
- Register at a community college within four years of high school graduation;
- Begin, or have begun, higher education at a Maryland public community college no earlier than the Fall 2010 semester;
- Comply with the registration requirements of the selective service system;
- File an application to become a permanent resident within 30 days of becoming eligible to do so.

Note that undocumented immigrant students who currently attend 4-year public or private universities are not eligible for the benefits of the Dream Act unless they began higher education at a Maryland public community college (no later than the Fall 2010 semester).

counted as in-state students for purposes of counting undergraduate enrollment; and extends the time in which honorably discharged veterans may qualify for in-state tuition rates.

- **For the Referred Law**
- **Against the Referred Law**

⁴ If a student is a resident of the service area of the community college that they attend, they pay the in-county tuition rate. Other state residents pay the in-state tuition rate at community colleges. To qualify for the Dream Act students must begin, or have begun, higher education at a Maryland public community college no earlier than the Fall 2010 semester. This implies that many students who have already begun a community college or university in Maryland are not eligible for the Dream Act.

III. METHODOLOGY

The Dream Act lowers the cost of a college education for undocumented immigrants. This will induce some students to obtain more education than they would in the absence of the Dream Act. Within this broad category, economic impacts will vary among the following four sub-groups⁵:

A1. Because higher education becomes less expensive, students will be more likely to want to obtain higher education. Because a prerequisite for admission to college is a high school degree, the Dream Act will induce some high school students who would have dropped out without the Dream Act to graduate from high school.

A2. Those who would not have gone to college or university without the Dream Act and enter college but not complete a 4-year degree with the Dream Act.

A3. Those who would not have gone to college or university without the Dream Act might enter and complete college, receiving a 4-year university degree (i.e. BA, BS, etc.) with the Dream Act.

A4. Those who would have gone to college but not completed a 4-year degree without the Dream Act might complete a 4-year university degree because with the Dream Act.

Other individuals will benefit from the Dream Act by incurring lower costs to obtain higher education, without being induced to obtain more education than they would in the absence of the Dream Act. Within this broad category, economic impacts will vary among the following three sub-groups:

B1. Students who would obtain an Associate's degree from a Maryland community college with or without the Dream Act.

B2. Students who would obtain a 4-year degree from a Maryland public university without the Dream Act, but with the Dream Act will spend two years in public community college and then graduate from a 4-year Maryland public university.

B3. Students who would have obtained a 4-year degree from a private or out-of-state public university without the Dream Act, but with the Dream Act will spend two years in a public community college and then graduate from a 4-year Maryland public university.

In our analysis we estimate the number of individuals in each of these seven categories for each yearly cohort of 18 year olds. For each category, we also estimate the per student costs of providing schooling and the per student benefits of additional education induced by the Dream Act. We separate these costs and benefits between the federal government, state government, county governments, and private costs and benefits to the student.

⁵ While sub-groups A2, A3, and A4 are mutually exclusive of each other, subgroup A1 overlaps with the other three subgroups in category A.

A. Estimating the Number of Individuals in Each Category

The number of individuals eligible for the Dream Act in each year is the number of undocumented immigrants of the age cohort who graduate from high school (i.e. 18 year olds). The number of individuals in each of the categories of students who benefit from the Dream Act is equal to the total number of undocumented immigrants within each 18 year old cohort whom the Dream Act makes eligible for in-state tuition times the fraction of individuals that is in each category. Our estimates of the number of 18 year old undocumented immigrants in Maryland are based on the most widely cited estimates of the number and characteristics of undocumented immigrants in the United States, those of Jeffrey Passell and D’Vera Cohn of the Pew Hispanic Center. Specifically, we multiply the most recent estimate of the number of undocumented immigrants in Maryland (275,000 in 2010; Passell and Cohn, 2011) by the nationwide proportion of undocumented immigrants who are between the ages of 15 and 19 (Passell and Cohn, 2009). We assume that one-fifth of this five-year age group is eligible to graduate from high school each year, resulting in an estimate of 3697 undocumented immigrants in each annual cohort of 18-year olds who live in Maryland.

The fraction of individuals in each category depends on several sets of parameters. The first includes the college enrollment rate and college graduation rate of undocumented immigrants in Maryland without the Dream Act. We denote these parameters as E_0 and G_0 , respectively. The second set is the effect of the reduction in costs resulting from the Dream Act on several measures of the educational attainment of undocumented immigrants in Maryland, namely the high school graduation rate, the college enrollment rate and the college graduation rate. The final set of parameters consists of:

1. % of bachelor’s degrees earned by those who would be eligible for the benefits of the Dream Act that are received from public universities in the absence of the Dream Act;
2. % of those who would be eligible for the benefits of the Dream Act and earn a BA at a private or out-of-state public university in the absence of the DA who will take advantage of the Dream Act (i.e., complete two years at a Maryland community college and two years at a Maryland public 4-year college or university) if the Dream Act is in effect; and
3. % of those in each cohort who would enroll in college without the Dream Act who will graduate from college with the Dream Act.

We denote these parameters as α , π , and θ , respectively.

We denote the fraction of each cohort that is in category i as p_i . The fraction of each cohort that is in category A1 is the effect of the Dream Act on the high-school graduation rate of undocumented immigrants in Maryland. The fraction of each cohort that is in category A4, p_{A4} , is given by:

$$p_{A4} = \theta * E_0 - G_0$$

The definitions of subgroups imply that

$$p_{A4} + p_{B1} = E_0 - G_0$$

$$p_{A3} + p_{A4} = \Delta G$$

$$p_{A2} + p_{A3} = \Delta E$$

where ΔE and ΔG are the effects of the Dream Act on college enrollment and college graduation, respectively. It follows from these definitions that:

$$p_{B1} = (E_0 - G_0) - p_{A4}$$

$$p_{A3} = \Delta G - p_{A4}$$

$$p_{A2} = \Delta E - p_{A3}$$

Finally, p_{B2} and p_{B3} are given by:

$$p_{B2} = \alpha * G_0$$

$$p_{B3} = \pi * G_0$$

1. Educational Attainment of Undocumented Immigrants in Maryland without the Dream Act

Unfortunately, there is no available data regarding the number of undocumented immigrants living in Maryland who enroll in, or graduate from, Maryland community colleges or 4-year universities. Thus, there are no direct estimates of the level of educational attainment of a cohort of undocumented immigrants who attend Maryland high schools without the Dream Act. Instead, we estimate the college enrollment and college graduation rate of undocumented immigrants in Maryland without the Dream Act by extrapolating national estimates of these quantities.

A widely quoted estimate of the proportion of undocumented immigrants who graduate from high schools in the United States who then go on to enroll in college is between 5 and 10%. The estimates in Passel (2003) suggest that between 9% and 16% of undocumented immigrants of college age attend college. The proportion of 18-24 year old undocumented immigrants with some college education reported by Pasell and Cohn (2009) is 26%. However, this last estimate is likely an overestimate because many of the undocumented immigrants in the United States arrive with some college education or received their high school degree from abroad. We take a rough average of these numbers and set the college enrollment rate of undocumented immigrants in each cohort in the absence of the Maryland Dream Act to 10%.

Approximately 60% of students who enter a Maryland university graduate with a BA or BS degree (MHEC, 2012). Combining these conditional graduation rates with our estimated college enrollment rate results in an estimate of the college graduation rate of undocumented immigrants in each cohort in the absence of the Dream Act of 6%.

Data regarding two parameters are not available. The first is the fraction of bachelor's degrees earned by individuals who would be eligible for the benefits of the Dream Act that are earned from public universities in the absence of the Dream Act. In our base estimates we set this parameter equal to 50%. The second parameter for which data are not available is the fraction of individuals who would be eligible for the benefits of the Dream Act and earn a BA at a private or out-of-state public university in the absence of the DA that will take advantage of the Dream Act (i.e., complete two years at a Maryland community college and two years at a Maryland public 4-year college or university rather than earn a BA at a private or out-of-state public university) if it is in effect. In our base estimates we set this parameter equal to 25%.

2. Effect of the Dream Act on Educational Attainment

The Dream Act lowers the cost of college education for undocumented immigrants, and therefore can be expected to increase college enrollment and educational attainment. Our estimates of the effect of the Dream Act on the educational attainment of undocumented immigrants are based on existing empirical studies of the effects of in-state tuition laws in other states (Kaushal, 2008; Flores, 2010; Amuedo-Dorantes and Sparbe, 2012) as well as the broader literature on the effects of state policies that influence the amount students are required to pay for higher education on educational attainment (Bettinger, 2004; Bruce and Carruthers, 2011; Castleman and Long, 2012; Dynarski, 2008; Goldrick-Rab, 2011; Scott-Clayton, 2011)⁶.

One impact of the Dream Act will be to increase high school graduation because a high school degree is a prerequisite for college enrollment. Potochnick (2011) estimates that the causal impact of in-state tuition policies for undocumented immigrants has been to increase high school graduate rates in states where these laws were enacted by 7 percentage points. Kaushal (2008) estimates that in-state tuition policies have increased high school graduation rates by 3.4 percentage points. We take a rough average of these two estimates and set the magnitude by which the Maryland Dream Act will increase high school graduation rates as 5 percentage points.

Kaushal (2008) estimates that in-state tuition laws increased college enrollment rates of young non-citizen Mexican immigrants by 3.6 percentage points. Flores (2010) estimates suggest that in-state tuition laws increased college enrollment rates of undocumented immigrants by about 6%. Amuedo-Dorantes and Sparbe (2012) present a range of estimates between 3% and 6%, depending on the specification of the regression equation. In our base estimates, we take an average of these estimates and set the increase in college enrollment due to the Dream Act to four percentage points.

Relatively few empirical studies address the effects of changes in costs to students on the retention or completion rates of those who enroll in college. Among those studies that do address this issue are Bettinger (2004) and Goldrick-Rab and colleagues (2012). Bettinger (2004) found a positive effect of Pell Grants on college persistence although the magnitude of his estimates are sensitive to model and sample specification. Goldrick-Rab and colleagues (2012), on the other hand, found that financial aid awarded to first-time, traditional-aged Pell Grant recipients attending Wisconsin's public universities had little, if any. Our base estimates assume that the Dream Act will increase the graduation rates of those who would enroll in college without the Dream by 4 percentage points.

Our estimates of the number of students who will benefit from the Dream Act in each category are presented in table 1.

⁶ The former set of studies utilizes differences-in-differences analyses. The latter set of studies includes several that utilize RDDs, one that is based on a true experiment as well as several that utilize differences-in-differences analyses.

B. Estimating Fiscal and Private Costs of the Dream Act

For each year of higher education we estimate the following costs, before and after the Dream Act: (1) the private costs to students, (2) the fiscal costs to the Maryland state government, (3) the fiscal costs to local (county) governments, (4) the fiscal costs to the federal government and (5) total private plus fiscal costs. Our estimates are based on a comparison of how much is spent to educate a student before and after the Dream Act. Specifically, our estimates of the net costs of the Dream Act are based on the difference between what is spent to educate an undocumented immigrant student before the Dream Act and what is spent to educate an undocumented immigrant student after the Dream Act.

Private costs of the Dream Act to students include the tuition and fees paid by those who would not have gone to school without the Dream Act, plus the earnings foregone because these students are in school and not working. Costs to local, state and federal governments increase when students obtain more education at public institutions because these governments subsidize students in high schools, community colleges and universities. We measure costs to the different types governments as the per student subsidies going to the high schools, community college or 4-year universities.

1. The Fiscal Costs of Schooling

Fiscal costs are the changes in the subsidies that state, local and federal governments pay for educating students who take advantage of the Dream Act. Subsidies are the amount of money the state, local and federal governments give directly to schools, colleges and universities.⁷ We calculated the subsidies to each student for the last year of high school and each year of higher education at a public community college or 4-year public university, with and without the Dream Act. Our estimates assume that the government subsidy for each student is equal to the average per student subsidy, and that a student with an incomplete college education will complete two years of community college. While the federal government directly subsidizes public high school education, there are no direct federal subsidies to public community colleges and universities. Therefore, we assume that the fiscal costs to the federal government for college or university education are zero. Our estimates of fiscal costs of the Dream Act are the differences between subsidies with and without the Dream Act.

We assume that a high school drop-out is one who quits school one year before graduating. Our estimate of the fiscal cost to the Maryland state government of educating a high school student for one more year is the per student subsidy to the local school district.⁸ School districts in Maryland are defined by county. Our estimate of the fiscal cost to the county governments of

⁷ Whether or not the Dream Act is in place, undocumented immigrant students are not eligible for federal or state government-subsidized student aid.

⁸ State, local and Federal government subsidies to high school are “Costs per Pupil Belonging for the 2009-2010 school year,” reported by the Maryland Department of Education in *Selected Financial Data, Maryland Public Schools, 2009-2010: Part 3 – Analysis of Costs*. The distribution of costs between state, local and Federal governments is assumed to be in proportion to the total expenditures in each school district by each level of government (www.marylandpublicschools.org/MSDE/newsroom/special_reports/financial.htm).

educating a high school student for one more year is the per student subsidy to the local school district by the county government. The fiscal cost to the federal government for a year of high school is estimated as the federal government subsidy per high school student in each school district.

Our estimate of the fiscal costs to the Maryland state government of educating an additional student at a community college or university is the per student subsidy the state gives to that community college or university. In Maryland, state subsidies to community colleges are proportional to the number of in-state full-time equivalent (FTE) students at each community college, while the state subsidy to universities are proportional to the number of FTE undergraduate students (in-state plus out-of-state).⁹ For community colleges, we measure this subsidy as the state subsidy for each FTE credit student. For universities, we measure this subsidy as the state subsidy per full-time equivalent (FTE) undergraduate student.¹⁰ The reported state subsidies for universities do not distinguish between in-state and out-of-state students, nor whether the student is in the first, second, third or fourth year.

The fiscal cost to local (county) governments of educating an additional student at a community college is the per FTE credit student subsidy. There are no local government subsidies to 4-year public colleges and universities. The federal government does not provide funding to directly support the education of undocumented immigrant students at community colleges and universities. Therefore, our estimate of the fiscal cost to the federal government of additional community college and university students is zero.

Some students who will take advantage of the Dream Act would have gone to private universities in the absence of the Dream Act. Private universities receive state subsidies according to a formula based on the total number of students at each private university. This subsidy is equal to 0.16 of the per-student state subsidy to public universities.¹¹

Table 2 presents our estimates of the per student fiscal costs for each category of student who benefits from the Dream Act.

2. Private Costs of Schooling (to the Student)

Private costs to the student include the full tuition and fees for a full-time student. Costs to the student before the Dream Act are calculated at the out-of-state tuition and fees rates.¹² Costs to

⁹ The state legislature limits the percent of out-of-state students at each campus. However, only one campus (College Park) is close to this limit.

¹⁰ State and local government appropriations per FTE for community colleges and universities are for fiscal year 2010 from the Integrated Postsecondary Education Data System (IPEDS) survey database (nces.ed.gov/ipeds/datacenter).

¹¹ “*The Sellinger Program: Supporting Higher Education in the Maryland Tradition*” (www.micua.org/eSellinger.pdf).

¹² Legally, undocumented immigrants at Maryland public universities should pay out-of-state tuition and fees. If there are some undocumented immigrants currently paying in-state tuition and fees at public universities, then our estimates of the private benefits of the Dream Act will be an overestimate.

the student after the Dream Act are calculated at the in-county (for community colleges) or in-state (for universities) tuition and fees rates. Since undocumented students are not eligible for federal or state financial aid, we assume that students who are eligible for the Dream Act pay full tuition and fees.¹³ There are no tuition and fees for students in public high schools. We assume that students at private universities pay \$50,000 per year in tuition and fees.

Another private cost to the student is the opportunity cost of going to school—the earnings foregone because students are not working while going to school. We take this cost into account in our estimate of private benefits. In calculating the benefits of more education we compare the present value of lifetime earnings for workers with different levels of education. Lifetime earnings (discounted to the first year of college) will differ both because more educated workers earn more once they leave school and because workers with more education earned less than someone without education during the years in which they were in school.

3. Weighting: State-wide Weighted Average Costs

In the cost calculations we use a Maryland-wide average of costs for high school, community college or university. We calculate this average as a weighted mean of the costs in each school district, community college or university. For school districts and community colleges (which in Maryland are defined by county), we weight the costs in each county by the number of undocumented immigrant children in each county.¹⁴ For four-year public universities, we weight the costs by the number of in-state Full-time Equivalent undergraduate students (FTEs) at each university.¹⁵

¹³ The source of data on tuition and fees is the *Maryland Higher Education Commission (MHEC) Data Book 2012* (mhec.maryland.gov/publications/research/AnnualPublications/2012DataBook.pdf). We do not include estimates of the cost of room and board as a private cost, as these would be necessary whether one went to college or not. As specified in the Maryland Dream Act, immigrants are to pay in-county (“resident of service area”) tuition if they attend the community college in their county, or pay in-state/out-of-resident-area tuition if they attend a community college in another county (or service area).

Montgomery College already charges undocumented immigrant students in-county tuition rates. It is the only community college in Maryland to do so as a matter of policy. Montgomery College receives a county subsidy for these students, but no state subsidy. Also, the Dream Act will not change the tuition paid by these students. Montgomery College does not explicitly keep track of the number of undocumented students receiving in-county tuition benefits. In 2010, 732 students at Montgomery College paid in-county tuition rates but were not included in the FTE count to receive state subsidies (Department of Legislative Services, 2011). It is reasonable to assume that most of these students were undocumented immigrants.

¹⁴ The number of undocumented immigrant children in each county is estimated by the number of under 18 year old Hispanic or Latino non-citizens in each county, 2006-2010 averages from the American Community Survey. These numbers were calculated these using the American Fact Finder (factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

¹⁵ We estimate the number of in-state FTEs at each university by multiplying the total number of FTEs at each university by the proportion of in-state students at each university (the source of this data is the *Maryland Higher Education Commission (MHEC) Data Book 2012* (mhec.maryland.gov/publications/research/AnnualPublications/2012DataBook.pdf)).

The way in which we weight each community college or university matters; it significantly affects our calculations of costs. This is because per student state and county subsidies can differ greatly between community colleges. For example, because we estimate that approximately 80% of undocumented immigrant children in Maryland live in either Montgomery or Prince Georges counties, costs at community colleges in these counties are given a large weight in our calculations of average costs. This is important because, compared with most other community colleges in Maryland, Montgomery College and Prince Georges Community college receive lower subsidies from the state government, receive higher subsidies from the county governments, and charge higher tuition rates. The importance of weights can be illustrated by comparing means weighted by the number of undocumented immigrant children with the means that weight each community college equally. If we weight each community college equally, the mean state subsidy to community colleges is \$3,256 per year per student, compared with a mean state subsidy of \$2,997 per year per student when we weight by the number of undocumented immigrant children, while the unweighted mean county subsidy is \$3,610 per year per student compared with a mean county subsidy of \$4,299 per year per student when we weight by the number of undocumented immigrant children.

Spending per student also differs substantially among public universities. For example, at the University of Maryland College Park (UMCP) the annual state subsidy per FTE is \$10,857, compared with an annual state subsidy per FTE of \$1,301 at the University of Maryland University College (UMUC). Therefore, the impact of the Dream Act on fiscal costs to the state will depend on which university the students who take advantage of the Dream Act currently attend and/or will attend if the Dream Act is passed. If they attend, UMCP the cost to the state may be higher; if they attend UMUC the cost to the state will be lower. Our estimates assume that the proportion of undocumented immigrant children attending each public university will be the same as the proportion of current students.

C. Estimating Fiscal and Private Benefits of the Dream Act

We estimate: (i) benefits to the individual student, and (ii) fiscal benefits to the Maryland state government, local (county) governments in Maryland, and the federal government. Benefits to the Dream Act exist because the Dream Act induces some students to obtain more education. While many students who benefit from the Dream Act may obtain more education, some students who benefit from the Dream Act are those who would have gone to college without the Dream Act, and now take advantage of the Dream Act by going to a public community college and university. Although these students pay lower tuition and fees because of the Dream Act (and therefore the costs to the student are lower), the Dream Act does not induce them to obtain additional education. Since our estimates of benefits are based on the increase in education, for those students who would have gone to community college or university in the absence of the Dream Act there are no benefits to the Dream Act, because there is no increase in education for these students.

A large body of literature has identified many benefits that accrue to those students who obtain more education. One benefit of more education is that more-educated workers earn more over their lifetimes. Oreopoulos and Salvanes (2009) show that, in addition to higher earnings, more-educated workers are also more likely to receive fringe benefits such as medical insurance, pension contributions, paid vacations, stock options, and so on. More education also reduces the

probability that teens will engage in risky behavior. For example, more educated teens are less likely to have children. More educated individuals report higher job satisfaction, are more likely to engage in civic engagement activities such as volunteerism and voting, and exhibit healthier behaviors (Baum, Ma and Payea, 2010; Oreopoulos and Salvanes, 2009). In terms of health status, more-educated individuals are more likely to have access to preventive health care, less likely to smoke, more likely to exercise, less likely to have low birth weight babies, more likely to breast feed and less likely to be obese (Baum, Ma and Payea, 2010).

The fiscal benefits of the Dream Act include the increased income tax revenue, increased sales tax revenue, and increased property tax revenue that occur because more-educated individuals earn higher incomes. In addition, because more educated individuals are less likely to commit crimes and be incarcerated, are less likely to have children as teenagers, are less likely to receive income support (welfare), and are less likely to receive Medicare or other government health care subsidies, fiscal benefits should also include the reduction in public spending on these problems.

We are not able to measure all of these benefits, and instead focus on two consequences of more education: the increase in lifetime earnings (and resulting increase in tax revenue) and the decrease in the propensity to commit crimes. To the extent that there are other benefits to increased education, our estimates of the benefits of the Dream Act underestimate the true net economic benefits.

In calculating benefits we assume that: (1) students who graduate from Maryland community colleges and universities spend their entire working lives in Maryland, (2) students will be legal residents of the United States at graduation.¹⁶

1. Private Benefits (to the Student): Increased Lifetime Earnings

Benefits to the student are estimated as the increase in the present value of lifetime earnings caused by more education, minus the taxes paid by employees to the state, local and federal governments.

The increase in lifetime earnings caused by more education is estimated using estimates from the academic literature of the causal effect of education on earnings (often called the “rate of return” to education). We do not use the unadjusted earnings gap between those with and without more education because part of the difference in unadjusted earnings that we see between workers with different education levels in the cross-section is due to differences not caused by education, such as family background, pre-school experiences, innate intelligence, etc. There is an extensive econometric literature that estimates the causal effect of education on earnings, controlling for factors not related to schooling. Our base estimates of benefits use the estimates of rates of return to graduating from high school (vs. high school drop-out), to one year of community college (vs. high school graduate), to an Associate’s degree from a community college (vs. high school graduate) and to graduating from a 4-year university or college (vs. high school graduate).

¹⁶ This will be the case if the Federal Dream Act is passed. In the short term, President Obama’s recent executive order that undocumented students who graduate from college are eligible for legal residency in the United States makes it more likely that students will be legal residents of the United States at graduation from college.

Estimates of the rate of return to high school graduation are an average taken from several studies by Jaeger and Page (1996), Kane and Rouse (1992) and Rouse (2005).

Rate of return estimates for different levels of higher education are from Marcotte (2010). Marcotte (2010) estimates that the causal effect of one year of community college is to increase earnings by 5.1%, that an Associate's degree increases earnings by 12.2% beyond high school graduates, and that a university degree increases earnings by 45.4% beyond the earnings of a high school graduate.¹⁷ To estimate the causal effect of more education on earnings we start with the estimates of present value of median lifetime earnings by highest level of education attained from Caravale, Rose and Cheah (2011).¹⁸ To calculate the increase in present value of median lifetime earnings caused by graduating from high school we multiply the discounted lifetime earnings of high school drop-outs by the rate of return to graduating high school (16%). To calculate the increase in median lifetime earnings caused by one year of community college, an Associate's degree and a BA degree, we multiply the discounted lifetime earnings of a high school graduate by the appropriate rates of return.¹⁹

By using existing estimates of rates of return to education, we are assuming that returns in the future will be similar to returns in the past. It is well documented that returns to education have risen in the United States in the past 30 years. If returns continue to increase, our estimates of benefits may be understated. On the other hand, during the recent recession unemployment rates for the college- and university-educated have risen. If these higher unemployment rates for the college- and university-educated are not simply a temporary phenomenon due to the recession, but rather a permanent change, then our estimates of benefits may be overstated. Our estimates of the effect of the Dream Act on earnings do not include the benefits and costs of "legalization." For example, in our benefit calculations we compare the earnings of all workers (documented or undocumented) at each education level. Recent estimates from the literature of the earnings

¹⁷ We use the Marcotte (2010) estimates in part because these are the most recent and best estimates of specific returns to community college and 4-year university, recognizing that the rate of return to a 4-year university degree may be different from the rate of return to an Associate's degree, and that the rate of return to one year of college or university that results in an Associate's or BA degree may be different from one more year of college or university that does not result in a degree. More common in the literature are estimates of the rate of return to one more year of education that assume that each additional year of education causes the same percent increase in earnings. A literature review by Card (1999) reports that the estimates in the literature of the causal effect of an additional year of education vary between 5% and 11%. Literature reviews by Card (1999) and Rouse (2005) conclude that the consensus in the literature is that an additional year of education increases earnings by approximately 10%. To test the sensitivity of our results to our assumptions about the rate of return to education, we also estimate the net costs and benefits assuming a rate of return of 10% per year of education and a rate of return to 5% per year of education.

¹⁸ We adjust the estimates from Caravale, Rose and Cheah to take into account the higher median lifetime earnings in Maryland relative to the country as a whole. Specifically, we multiply median lifetime earnings by the factor by which median yearly earnings in Maryland exceed those in the country as a whole for high school drop-outs (17%) and high school graduates (20%). The source of these expansion factors is the American Community Survey, 2006-2010 five year averages, for all workers 25 years and older (factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

¹⁹ Note that because we are comparing the present value of lifetime earnings for workers with different levels of education, we are implicitly taking into account the earnings foregone because students are not working at the same time that they are going to school (the "opportunity cost" of schooling). Because we take the opportunity cost into account in our estimates of benefits, we do not also include it in our calculations of costs.

premium to legalization put the premium at around 5% (see Kandilov and Kandilov, 2010) and Kossoudji and Cobb-Clark, 2002). To the extent that the Dream Act induces more students to become legalized, our estimates therefore underestimate the private, state fiscal, local fiscal and social benefits of the Dream Act.

For the purposes of our estimates, we assume that someone with an incomplete university education completes 2 years of college and earns an Associate's degree. Our base estimates of benefits use the estimates of rates of return to graduating from high school (vs. high school dropout), to an associate's degree from a community college (vs. high school graduate) and to graduating from a 4-year university or college (vs. high school graduate). Estimates of the rate of return to high school graduation are an average taken from published studies by Jaeger and Page (1996), Kane and Rouse (1992) and Rouse (2005). Rate of return estimates for different levels of higher education are from Marcotte (2010). These studies estimate that the causal effect of earning a high school degree is to increase earnings by 16%, an associate's degree by 12.2% beyond the earnings of a high school graduate, and a university degree by 45.4% beyond the earnings of a high school graduate.

Table 3 presents our estimates of the increase in the present value of pre-tax earnings in each path by which students may take advantage of the Dream Act, in 2011 dollars.

2. Fiscal Benefits

The fiscal benefits of the Dream Act include the increased income tax revenue, increased sales tax revenue, and increased property tax revenue that occur because more-educated individuals earn higher incomes. In addition, because more educated individuals are less likely to commit crimes and be incarcerated, are less likely to receive income support (welfare), and are less likely to receive Medicare or other government health care subsidies, fiscal benefits should also include the reduction in public spending on these problems. However, because of the difficulties with measuring other fiscal benefits, in the estimates presented in this study we include only measure of: increased income tax revenue, increased sales tax revenue, increased Medicare tax revenue and reduced spending on incarceration. To the extent that there are other fiscal cost savings from a more educated citizenry, this study underestimates the net fiscal benefits of the Dream Act.

a. Increased Tax Revenue

Our estimates of the increased tax revenues to the state government include the present value of the increased income tax revenue and increased sales tax revenue that occur because of the increase in lifetime earnings. Increased tax revenues to county governments in Maryland are measured as the present value of the increase in income tax revenues because of higher lifetime earnings. Increased tax revenues to the federal government are measured as the increase in income tax and Medicare taxes brought about by more education.

Measured fiscal benefits to the state government include increased income tax revenue and increased sales tax revenue. Income tax revenues are calculated as the increase in discounted lifetime earnings multiplied by 4.75%, which is equal to the Maryland marginal tax rate for taxable income between \$3,000 and \$150,000 (2009 dollars). We estimated the effective sales

tax rate by dividing total state tax revenue for FY2010 by total earnings in 2010.²⁰ Our estimate of the effective state sales tax rate is 3.31%. The Maryland sales tax is officially 6%, but is only charged if income is spent on taxable products within Maryland (for example, this excludes real estate and food). The effective sales tax rate that we use is equivalent to assuming that workers spend about half of their earnings on taxable products within Maryland.

Increased tax revenues to county governments in Maryland are measured as the present value of the increase in income tax revenues because of higher earnings. We estimated this by multiplying the increase in lifetime earnings by 3.16%, which is the mean county tax rate weighted by the number of young undocumented immigrants.²¹

Increased tax revenues to the federal government are measured as the increase in income tax and Medicare taxes brought about by more education. The increase in Medicare taxes is estimated by multiplying the increase in lifetime discounted earnings by 2.9%, which is the total Medicare tax rate (employer plus employee portion of the Medicare tax). We assume a marginal federal income tax rate of 25%, which is the marginal tax rate for single people in the \$34,500 to \$83,600 bracket in 2011. The increase in federal income tax revenue is calculated as the increase in lifetime earnings multiplied by this marginal income tax rate.²²

The increase in the discounted value of the tax revenues (in 2011 dollars) to each level of government is presented in table 4.

b. Reduced Incarceration Spending

Several empirical studies present evidence that higher education and earnings lower the probability that an individual will commit a crime (i.e. Lochner and Moretti, 2004; Machinan and Megher, 2000; Lochner, 2004; Carroll and Erkut, 2009). Lochner and Moretti (2004) present a recent causal estimate of the impact of education on crime rates. Lochner and Moretti (2004) found that the biggest impacts of education on incarceration occur for students who receive a high school degree rather than drop out of high school. For example, their estimates suggest that obtaining a high school degree results in a fall in incarceration rates of 7 to 9 percentage points for blacks and of 0.6-0.9 percentage points for whites. This compares to the impact of getting an Associate's degree, which lowers incarceration rates for blacks by about 1 percentage point, and for whites of about 0.1 percentage points. Based on the Lochner and Moretti (2004) estimates, a

²⁰ Total sales revenue is from the Comptroller of Maryland "Spotlight on Maryland Money" (www.comp.state.md.us). Total earnings are equal to the median earnings per worker multiplied by the number of workers in Maryland in 2010, using the American Community Survey one year estimate, calculated using the American Fact Finder (factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

²¹ We do not estimate the increase in property tax revenue, which is a significant part of local tax revenue. Therefore, it is likely that we underestimate the true fiscal benefit of the Dream Act to local governments in Maryland.

²² We did not include the increase in Social Security or unemployment insurance taxes that result from higher earnings because, although these taxes increase with income, so do transfers. Further, these programs are intended be actuarially neutral; that is, on average the amount paid by the taxpayer to the government equals the amount paid back to the taxpayer from the government. Medicare transfers to taxpayers, on the other hand, do not depend on income. Therefore, higher Medicare tax revenues represent a net fiscal gain for the Federal government.

study by the Rand Corporation calculates the reduced fiscal costs of incarceration to state and local governments of increased education (Carroll and Erkut, 2009).

We use the Rand estimates for Hispanics to calculate the expected reduction in the present value of incarceration spending for state and local governments for a student who takes advantage of the Dream Act. The Rand analysis calculates the estimated reduction in costs for incarceration in state, municipal and county jails and prisons. They do not include spending on incarceration in federal prisons because such spending is a small percent of total incarceration spending in the United States (about 8%). The study assumes that spending for each prisoner is equal to the national average per prisoner spending in state and local prisons and jails. We divide the reduced incarceration spending reported by Rand into state and local components based on distribution of incarceration spending between state and local governments nationally.

The estimates of reduced incarceration spending by state and local governments are presented in table 5. The biggest reduction in spending on incarceration occurs when students who would otherwise drop out graduate from high school because of the Dream Act. Getting an Associate's degree also causes a sizeable reduction in incarceration spending. However, the additional reduction in incarceration spending from getting a Bachelor's degree (beyond an Associate's) is small.

C. Discounting Costs and Benefits

All costs and benefits are reported in 2011 discounted dollars. Some of our source data report dollar values using prices in other years; we convert these to 2011 discounted dollars. To do this, we first convert all nominal values of benefits and costs to 2011 dollars using the average U.S. Consumer Price index. In addition, to take into account that individuals and governments may value a dollar in the future by less than they value that dollar today, all future costs and benefits are discounted to the first year of college.

Costs are discounted beginning in the first year of community college, based on an assumption about the discount rate (DR), a measure of how much society discounts future dollars relative to current dollars. That is, costs are divided by 1 the first year of community college, divided by $(1+DR)$ the second year of community college, divided by $(1+DR)^2$ the third year of college (one year after community college) and $(1+DR)^3$ the last year of college.

In discounting benefits, we start by using the present value of lifetime earnings; multiplying nominal lifetime earnings by a discount factor calculated from the discount rate and assuming a working life of 45 years. Then we further discount back to the first year after high school (i.e. we divide the present value of lifetime earnings of an Associate's degree graduate by $(1+DR)^2$ and the present value of lifetime earnings of a university graduate by $(1+DR)^4$). We do this because we assume that the benefits of the Dream Act (based on earnings increases) do not start until after leaving school.

The real discount rate used in our base estimates is 3%. Assuming a discount rate of around 3% is common in studies of the costs and benefits of education, including in the studies that we cite here (i.e. Carrol and Erkut, 2009; Caravale, Rose and Cheah, 2011 and Rouse, 2005). The 3% discount rate is also consistent with current long-term interest rates, which are around 3% (i.e. the current yield on 30 year treasury bonds is slightly below 3%, while the nominal interest rate

on a 30-year mortgage is around 3%).²³ If there is inflation, a nominal real interest rate of 3% implies that real interest rates (adjusted for inflation) are actually lower than 3%. As a sensitivity analysis we explore how the costs and benefits change when we use other discount rates, including 0% (no discounting), 5% and 10%.

D. Other Potential Costs

An impact of the Maryland Dream Act which is not included in our estimates of the private or fiscal costs is the lost revenue to Maryland community colleges and universities because some undocumented students who would have paid out-of-state tuition are now paying in-state tuition. This is not included in our estimate of the government fiscal cost of the Dream Act because, while it represents lost revenue to colleges and universities, it will not directly translate into an increase in state or county government spending (subsidies).²⁴ Not all students who benefit from the Dream Act will cause a reduction in tuition revenue; tuition loss will only occur for those students who would have attended a public college or university without the Dream Act, and continue to do so with the Dream Act. The change in revenue received by community colleges or universities is the difference between out-of-state and in-state tuition and fees minus the additional subsidies from state and local governments to colleges and universities due to the Dream Act. For community college there will be no revenue loss due to the Dream Act. On the contrary, the Dream Act will result in an increase in revenue because the additional state subsidy is greater than the lost tuition revenue. For 4-year universities, the Dream Act results in lost revenue because there is a tuition loss but no additional state subsidy due to the Dream Act. For each student who would have completed a 4-year degree at a public university before the Dream Act and who now completes a 4-year degree under the Dream Act, public 4-year universities will lose \$16,372 in tuition revenue (see the last column of table 2; recall that under the Dream Act students attend universities for two years).

We estimate that, in total, state universities will experience a drop in revenue of approximately \$1.8 million each year, which represents 0.1% of total tuition and fee revenue at public universities in Maryland.²⁵ Universities may react to this fall in revenue by reducing the number of classes or other services offered to students, which could increase the amount of time it takes students to graduate. However, given that the lost tuition represents only 0.1% of total tuition revenue it is not likely that there will be a large reduction in the number of classes or other services offered to students.

An alternative reaction that universities could have to the loss in revenue would be to raise tuition on all students. If this case, the Dream Act will impose a private cost on all students at Maryland public universities. Note that there is no fiscal cost because subsidies do not increase

²³ Treasury yields from the U.S. Department of Treasury Resource Center, <http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield>, 30-year mortgage rate from <http://www.bankrate.com/mortgage.aspx>.

²⁴ Even if we count lost tuition revenue as an explicit cost in our calculations, net benefits are still positive for all categories that are affected.

²⁵ Total tuition and fee revenue at public 4-year universities in Maryland in 2011 was 1,339,643,147, which represents 48% of total expenditures by public 4-year universities in Maryland (MHEC, 2012).

(the increased cost is borne by students). If tuition is increased by the total amount of lost tuition revenue, then this will increase our estimates of the private cost of the Dream Act for each cohort of students by \$1.8 million. Another possibility is that the state may step in to make up the revenue loss to universities by increasing total subsidies to universities by \$1.8 million. Even if these alternatives occur, estimated net economic benefits will still be large and positive. If either of these alternatives occur, the estimates of the private plus public net benefits will fall from \$66.3 million to \$64.5 million (see table 6).

The fiscal costs of the Dream Act may be higher if it makes Maryland a more attractive destination for undocumented immigrants and their families. These families might impose a fiscal burden on state and local governments through increased spending on social protection programs and public services such as police, fire and K-12 education. However, there is little empirical evidence that undocumented immigrants are attracted to states and localities with more generous public benefits. For example, recent studies find no evidence that publicly-provided benefits to low-income families and individuals have an impact on the location decisions of low-income non-refugee immigrants (i.e. Kaushal, 2005; Damm, 2009).²⁶ These studies suggest that other factors overwhelm the possible advantages of in-state tuition at public community colleges and universities in the decision families make about where to locate. Further, because of the restrictions imposed by the Maryland Dream Act, moving to Maryland to take advantage of the Act would require several years of planning on the part of the parents of undocumented immigrant children. The family would need to decide at least three years before high school graduation to move to Maryland, and once in the state would need to make sure that the student spent a minimum of three years in, and graduated from, a Maryland high school (as well as paying state and federal income taxes for all years).

Our analysis does not include “crowding-out effects,” i.e., reductions in the educational attainment of citizens due to undocumented immigrants being awarded a larger fraction of a fixed number of “slots” at public community colleges and universities (i.e. Camarota, 2010). The provisions of the Maryland dream Act, the nature of admission policies at Maryland public community colleges and universities, and the relatively small number of undocumented immigrants we estimate will take advantage of the Maryland Dream Act combine to make this unlikely to occur in Maryland. Students taking advantage of the Maryland Dream Act must spend the first two years of higher education at a public community college. Maryland public community colleges have open access admission policies and admit anyone who meets minimal admissions requirements. Therefore, additional undocumented immigrant students admitted to Maryland public community colleges will have no impact on the probability that other students will or will not be admitted. Because students who take advantage of the Dream Act are required to begin higher education at community college, the Dream Act will not have a negative impact on the number of citizens admitted as freshman to 4-year public universities (if anything, it will open up additional space for citizens). It is also unlikely that Dream Act beneficiaries transferring to 4-year public universities from community colleges will have an effect on the number of citizens transferring to 4-year public universities from community colleges, as Maryland public 4-year universities have guidelines that require them to accept all community

²⁶ These studies do find that publicly provided benefits have an impact on the location decisions of those classified as refugees.

college transfers who meet minimum requirements (usually a minimum GPA in community college). Further, we estimate that the number of new students transferring from community colleges to public 4-year universities in Maryland will be 102 students per year (74 new students and 15 who would have gone to private universities, see Table 1). This is about 0.1% of the 117,187 students enrolled at Maryland public universities in 2012. Given that there are 12 public universities in Maryland, this would imply an average increase of about 10 students per year at each university. Discussions with admissions officials at Maryland public universities lead us to conclude that this number of additional students is not likely to influence the number of other students admitted. Recent empirical studies on the topic are consistent with this argument. Kaushal (2008) and Amuedo-Dorantes and Sparbe (2012) both find that existing in-state tuition policies for undocumented immigrants do not adversely affect the educational outcomes of citizens.

E. Other Social Benefits

It is important to note that in this report we do not conduct a full social cost-benefit analysis. This report underestimates the true social net benefits of the Dream Act because we do not consider many of the private and social benefits of a more educated citizenry that are difficult to measure. For example, Oreopoulos and Salvanes (2009 and 2011) show that, in addition to higher earnings, more-educated workers are also more likely to receive fringe benefits such as medical insurance, pension contributions, paid vacations, stock options, and so on. Haveman and Wolfe (1984), in an earlier review of the literature, cite studies that suggest that returns to schooling would be 10 to 40 percent higher if fringe benefits were taken into account.

Additional education reduces the probability that teens will engage in risky behavior. For example, more educated teens are less likely to have children. Black, Devereux and Salvanes (2008) present evidence that an additional year of compulsory schooling (in high school) reduces the probability of a birth before the age of 20 by 0.9 percentage points. Since the children of undocumented immigrants born in the United States are U.S. citizens, these children would be eligible for U.S. social protection benefits. A recent estimate suggests that each teen birth costs Maryland taxpayers approximately \$35,000 (Hoffman, 2006 and The National Campaign to Prevent Teen Pregnancy, 2012).

More educated individuals also report higher job satisfaction, are more likely to engage in civic engagement activities such as volunteerism and voting, and exhibit healthier behaviors (Baum, Ma and Payea, 2010; Oreopoulos and Salvanes, 2009 and 2011). In terms of health status, more-educated individuals are more likely to have access to preventive health care, less likely to smoke, more likely to exercise, less likely to have low birth weight babies, more likely to breast feed and less likely to be obese (Baum, Ma and Payea, 2010). The United Health Foundation (2009) estimates that additional health care costs attributable to obesity averaged about \$361 per adult in 2008.

The benefits of additional education do not stop with the student. There are important intergenerational effects of having a more-educated parent. For example, children of more-educated parents are more likely to be healthier, obtain more schooling, and less likely to engage

in risky behavior such as teen pregnancy and gang activity (Oreopoulos and Salvanes, 2009 and 2011; Baum, Ma and Payea, 2010).

As is shown in the next section, even without taking these additional social benefits of a more educated citizenry into account, our estimates suggest that the net economic effect of the Maryland Dream Act on the Maryland economy will be positive, and that the benefits will be large. Even if we only consider the impact on the fiscal position of state and local governments, we estimate that the impact of the Dream Act will be positive and large. This is because the initial costs of the investment in education will be more than offset by increased tax revenues and lower incarceration costs from a more educated citizenry. We conclude that repealing the Maryland Dream Act will reduce economic growth and income in Maryland, and will reduce the fiscal resources available to Maryland state and county governments. Taking these additional social benefits in to account would increase the already large and positive estimate of the net benefits of the Dream Act to the Maryland economy and to state and county governments.

IV. RESULTS

A. The Number of Students Who Will Benefit from the Dream Act

Our estimates of the number of students who will benefit from the Dream Act in each category are presented in table 1. We predict that 185 students will be induced to graduate from high school because of the Dream Act. Some, but not all, of these new high school graduates go on to college. We predict that 435 Maryland students will take advantage of the Dream Act to go to college each year. Of these, 163 are students who are induced to obtain more education because of the Dream Act and 272 are students who would have gone to college even without the Dream Act but where the Dream Act shifts costs from the student to state or local governments. These estimates suggest that that each year the Dream Act will result in an additional 117 students in Maryland community colleges (89 new students plus 28 who would have gone to private universities) and an additional 102 students in Maryland 4-year universities (59 new university students plus 15 who would have stopped with an Associate's degree without the Dream Act plus 28 who would have gone to private universities without the Dream Act).

The estimates presented in table 1 are for each annual cohort of students, rather than the total number of students in community colleges and universities at any point in time. To obtain a rough estimate of the number of Dream Act students in Maryland community colleges and universities at any point in time, we assume that students who obtain a 4-year degree under the Dream Act spend two years at community college followed by two years at a 4-year university, and that students who attend college but do not get a 4-year degree spend two years at a community college. Under these assumptions, , at any point in time, there will be approximately 1294 students in Maryland community colleges or universities who benefit from the Dream Act: 869 students in Maryland public community colleges and 425 students in Maryland public 4-year universities. These estimates imply that, at any point in time, students who benefit from the

Dream Act will make up 0.6% of the approximately 223,000 students in Maryland public colleges and universities.²⁷

Our estimates of the number of students who are likely to benefit from the Dream Act are consistent with the number of students who have taken advantage of existing in-state tuition laws in other states, after we take into account the different number of undocumented immigrants in those states compared to Maryland. For example, in 2010 undocumented immigrant students made up approximately 1% of students in Texas public higher education institutions (Texas Higher Education Coordination Board, 2012). However, the population of undocumented immigrants in Texas is larger than in Maryland. Specifically, the Pew Hispanic Research Center estimates that undocumented immigrants make up 9.0% of the population in Texas but 6.2% in Maryland (Passel and Cohn, 2011). These numbers suggest that, if the impact of the Maryland Dream Act on the number of students in colleges and universities is the same in Maryland as it has been in Texas, at any point in time undocumented immigrant students will make up 0.7% (1% multiplied by $(6.2/9.0)$) of the students in Maryland public colleges and universities. Undocumented immigrants in California also make up less than 1% of students at California state universities. Using the same methodology as we used to compare Texas and Maryland this suggests that, if the impact of the Maryland Dream Act on the number of students in colleges and universities is the same in Maryland as it has been in California, at any point in time undocumented immigrant students will make up 0.6% (1% multiplied by $(6.2/9.7)$) of the students in Maryland public colleges and universities.²⁸ The point is that the estimates in this study of the number of students who will benefit from the Maryland Dream Act are similar to the number of students who are benefitting from in-state tuition laws in other states.

B. The Fiscal Costs of Schooling

Table 2 presents our estimates of the per student fiscal costs of the Dream Act for each category. Table 2 confirms that total fiscal costs are larger for those students who receive more education. For example, the category where the total fiscal costs of the Dream Act are highest is the category where students who would not have attended college without the Dream Act but complete a 4-year university degree with the Dream Act. The state subsidy to these students is \$18,637 and county subsidy is \$8,685. At the other extreme, the lowest fiscal costs are for students who would obtain a 4-year university degree from a Maryland public university either with or without the Dream Act. For these students county government spending increases (because there are new students in community colleges) but state government spending falls (because the state subsidy to community colleges is less than the state subsidy to 4-year universities).

We estimate that the total fiscal costs of schooling for each annual cohort of students who take advantage of the Dream Act will be approximately \$3.6 million dollars for the state government,

²⁷ The total number of students at Maryland public colleges and universities in 2010 was 222,988 (MHEC Data Book 2012).

²⁸ The Pew Hispanic Research Center estimates that undocumented immigrants make up 9.7% of the population in California but 6.2% in Maryland (Passel and Cohn, 2011).

\$3.6 million dollars for the county government and \$200 thousand dollars for the federal government.

C. Net Benefits

As noted above, we combine the estimates of costs and benefits along with our estimates of how many students will benefit from the Dream Act to calculate the total private plus fiscal net benefits (benefits minus costs) of the Maryland Dream Act. Table 6 presents our estimates of net economic benefits of the Dream Act for a single annual cohort of students. Rows 1-4 and 6-8 of table 6 present the 2011 dollar value estimates of net benefits (benefits minus costs) for a student in each of the categories that could be used to take advantage of the Dream Act. The net benefits in each category are then multiplied by the number of students in each category, and summed up over all categories. The total net benefits or costs for an annual cohort of students are presented in the final row of table 6. Our estimate of the total private plus fiscal net benefits of the Dream Act is in the bottom right corner of the table (\$66,271,391). In addition to the estimates of total costs and benefits, the final row of table 6 separately presents of the net fiscal benefit to the state government, the net fiscal benefit to county governments in Maryland, the net fiscal benefit to the Federal government, and the net private benefit to students.

1. Total Net Economic Benefits (Private Plus Fiscal Net Benefits)

Broadly, students who take advantage of the Dream Act fall into two categories: (A) undocumented immigrant students who obtain more education because the Dream Act lowers the private cost of education, and (B) undocumented immigrant students who would obtain the same education with or without the Dream Act, but who pay lower tuition and fees at public universities because of the Dream Act.

For all categories of students who are induced to obtain more education because of the Dream Act (A), total measured benefits greatly outnumber the measured costs. The largest gains come from students who would not have attended college without the Dream Act, but who graduate with a 4-year university degree because of the Dream Act; the discounted net benefits for these students is approximately 366,800 in 2011 dollars each. Our estimates of positive net benefits for students who obtain more education because of the Dream Act are expected, and should not be controversial. All that this means is that education is a good investment both for the student and for the economy.

For most students who are not induced to obtain more education by the Dream Act (B), total benefits also exceed total costs, however costs shift between the student, and county, state and federal governments. For example, for students who would have received a degree from a 4-year public university without the Dream Act, the Dream Act will lead to reduced tuition and fees for students, reduced state government spending (because the state subsidy for community college students is less than 4-year university students), but increased county government spending (subsidies for the two years at a public community college). While the reduced tuition and fees plus lower state subsidies are less than the increase in county government subsidies, so that the net benefits are positive, there is an important shift in who pays for college; students and the state government pay less while local governments pay more. For students who switch from private (or out-of-state public) universities to Maryland public colleges and universities, tuition and fees

paid by the student fall, but state and local government subsidies increase. That is, students pay less and state and county governments pay more. Again, however, the lower costs to students more than offset increased government subsidies so that the Dream Act results in net benefits to Maryland for each student in this path. The one category where the net benefit is not positive is for those students who would have received less than a 4-year college degree (i.e. an Associate's degree) without the Dream Act, and still receives an Associate's degree with the Dream Act. In this case, the net benefits are negative but small (-\$383), because the lower tuition paid by students is offset by the higher state subsidy to community colleges.

Because the net total benefits of the Dream Act are positive or near zero for almost all categories of students who benefit, our estimates clearly indicate that the Dream Act will have positive and large net benefits for the economy of Maryland. This is true no matter the number of students who benefit. The specific value of the total net benefits of the Dream Act on the economy depends on the number of students induced to obtain education relative to the number of students who benefit from the Dream Act but do not obtain more education. The more students the Dream Act induces to obtain more education, the larger will be the net benefits. Using our estimates of the number of students who benefit from the Dream Act in each category, and adding all costs and benefits together, we estimate that the Dream Act will result in large net long run fiscal and private benefits to the economy in Maryland. Over the long run, total private and fiscal net benefits will be in excess of \$66 million 2011 dollars per year.

2. Fiscal Net Benefits to State, Local and Federal Governments

In table 6 we separate the net fiscal benefits for state, local and federal governments from the private benefits and costs. For all students who are induced by the Dream Act to obtain more education (the categories under A), there are fiscal gains to all levels of government: state, local and federal. That is, the present value of the fiscal benefits of a more educated citizenry (higher tax revenues and reduced incarceration costs) is greater than present value of the costs of providing this additional education. For students induced to obtain more education because of the Dream Act, the long-run effects of the Dream Act on Maryland state, county and federal budgets are positive.

On the other hand, for those who take advantage of lower tuition and fees at public community colleges and universities, but who do not obtain more education because of the Dream Act (the categories under B), the impact of the Dream Act on state and county budgets is negative. For these students, the total value of state, local and federal government subsidies increases, but there are no fiscal benefits because these students do not experience an increase in educational attainment. For students who would obtain an Associate's degree from a Maryland community college with or without the Dream Act, state government subsidies increase while county government subsidies do not change. For students who would obtain a 4-year degree from a Maryland public university without the Dream Act, but now with the Dream Act will spend two years in public community college and then graduate from a 4-year Maryland public university, county government subsidies increase because more students are going to community colleges, but state government subsidies fall because the state is not paying the full subsidy for community college students (whereas the state does pay the full subsidy for students at 4-year universities). For students who shift from private to public colleges and universities, both state government

and county government subsidies increase substantially. The largest net fiscal costs to state and local governments are from students who shift from private to public colleges and universities because of the Dream Act.

The net fiscal impact of the Dream Act therefore depends on what percent of the students who benefit from the Act are induced to obtain more education. Students who are induced to obtain more education will contribute increased revenue to state, county and federal government coffers, while students who take advantage of lower tuition and fees but do not obtain more education will have a negative impact on the revenues to state and county governments.

Adding all categories together, we estimate that the Dream Act will result in an increase in fiscal resources available to state, county and federal governments. The annual increase in net fiscal resources to all levels of government due to the Dream Act will be approximately \$24.6 million in 2011 dollars; about \$5.6 million dollars for the state government, \$600 thousand for county governments, and \$18.4 million for the federal government. That is, our estimates suggest that repealing the Dream Act will reduce the fiscal resources available to Maryland state and county governments as well as to the Federal government.

V. SENSITIVITY ANALYSIS

As with any estimate of future costs and benefits of a public program, our estimates may be sensitive to the assumptions we make about the future behavior of individuals and governments. In this section we explore how sensitive our results are to our assumptions.

A. Not Including Reductions in Spending on Incarceration in the Estimate of Fiscal Benefits

It could be argued that state and local governments will not realize the full benefit of reduced spending on incarceration that occurs when undocumented immigrants obtain more education because undocumented immigrants who commit criminal acts are likely to be deported. If this is the case, then state and local governments do not incur the full costs of incarceration for undocumented immigrants. We examine how our estimates of the costs and benefits of the Dream Act change if we do not include the estimates of reduced incarceration spending as a fiscal benefit. That is, if the only fiscal benefit we include in our calculations are increased income and sales tax revenue. Our estimates of the costs and benefits under this assumption are presented in table 7. In general, not including reduced incarceration spending reduces the estimate of the fiscal benefits of the Dream Act, especially to county governments. Our estimates suggest that increased county income tax revenue will not be enough to pay for the increased costs of educating undocumented immigrants in community colleges; the present value of costs to county governments will exceed the present value of increased tax revenue by about \$1.8 million 2011 dollars for each yearly cohort of students.²⁹ The state and federal governments still

²⁹ In all of our estimates, the net fiscal benefits to the state government are larger than the net fiscal benefits to the county governments. This is because the Dream Act shifts some of the costs of educating undocumented immigrants from the state to counties, and because county income tax rates are smaller than state income tax rates, so that the income tax revenue brought about by a more educated citizenry is lower in counties than in the state.

receive net fiscal benefits from the Dream Act; we estimate that state income and sales tax revenues from Dream Act students will exceed the additional costs of educating these students by about \$746 thousand 2011 dollars, while federal tax revenues will increase by about \$18.4 million more than federal subsidies. It is important to note that total net economic benefits are still positive and large, and that total fiscal benefits of the Dream Act to all levels of government (state plus county plus federal) are still positive. However, these results highlight the redistribution of costs that occurs with the Dream Act; county governments may have net fiscal losses because of the Dream Act even as state and federal government budgets gain. Counties governments are more likely than the state or federal governments to incur fiscal losses because of the Dream Act for two reasons: (1) county income tax rates, and therefore increased tax revenues, are lower for county governments than for the state governments and (2) the Maryland Dream Act requires students to spend the first two years of higher education in community colleges, which shifts some of the costs of educating college students from the state to the counties.

B. Different Estimates of Returns to Education

In our base estimates we use the Marcotte (2010) estimates of rates of return to education in part because these are the most recent and best estimates of specific returns to community college and 4-year university, recognizing that the rate of return to a 4-year university degree may be different from the rate of return to an Associate's degree, and that the rate of return to one year of college or university that results in an Associate's or BA degree may be different from one more year of college or university that does not result in a degree. More common in the literature are estimates of the rate of return to one more year of education that assume that each additional year of education causes the same percent increase in earnings. A literature review by Card (1999) reports that the estimates in the literature of the causal effect of an additional year of education vary between 5% and 11%. Literature reviews by Card (1999) and Rouse (2005) conclude that the consensus in the literature is that an additional year of education increases earnings by approximately 10%. To test the sensitivity of our results to our assumptions about the rate of return to education, we also estimate the net costs and benefits assuming a rate of return of 10% per year of education and a rate of return to 5% per year of education.

The net economic benefits of the Dream Act are positive using both the 10% and 5% rate of return estimates (table 8). Not surprisingly, net economic benefits are smaller if the rate of return to education is smaller (since the rate of return is one measure of the benefit of an education). For the estimate that uses a 5% rate of return to education, net economic benefits are \$34 million, about half the value of our base estimates. Further, assuming a 5% rate of return to education, we estimate that while the Dream Act will lead to an increase in total fiscal resources for the state and federal governments, fiscal resources will decrease for county governments.

C. Different Discount Rates

Because the costs of the Dream Act occur relatively early, while many of the benefits occur in the near and far future, the rate at which we discount the future will clearly affect the comparison of costs and benefits. The discount rate used in our base estimates is 3%, but as a sensitivity analysis we explore how the costs and benefits change when we use other discount rates, including 0% (no discounting), 5% and 10%.

Increasing the rate at which we discount the future reduces our estimate of the total net economic benefits due to the Dream Act (table 8). Still, even at a high discount rate of 10%, the total net economic benefits are positive and large (almost \$25 million 2011 dollars per annual cohort). However, at higher discount rates the net fiscal benefits to local (county) governments in Maryland become negative. That is, at high discount rates, we estimate that the Dream Act has negative effects on county government budgets. It is important to note that total fiscal plus private net benefits are still positive and large, and that total fiscal benefits of the Dream Act to all levels of government (state plus county plus federal) are still positive. However, these results again highlight the redistribution of costs that occurs with the Dream Act; county governments may have net fiscal losses because of the Dream Act even as state and federal government budgets gain.

D. Different Assumptions about the Impact of the Dream Act on Educational Attainment

It is possible that our basic estimates overestimate the impacts of the Dream Act on high school graduation rates and college enrollment rates because the tuition reduction for Maryland students due to the Dream Act may be less than the tuition reduction in other states that have implemented in-state tuition laws. This is because, in Maryland, students who take advantage of the Dream Act are required to spend the first two years of higher education at community colleges, where in-state tuition breaks are smaller than in 4-year universities. Our base estimates assume that the Maryland Dream Act will cause high school graduation rates to increase by five percentage points, cause college enrollment rates to increase by four percentage points, and cause the probability that an undocumented student will graduate with a Bachelor's degree by two percentage points. To explore what happens to our estimates of costs and benefits if the impact of the in-state tuition for undocumented immigrants in Maryland is lower than it has been in other states, we re-estimate net benefits assuming that the impacts in Maryland will be one-half that of other states; that is, assuming that the impact on high school graduate rates is 2.5 percentage points, the impact on college enrollments is two percentage points, and the impact on college graduation is one percentage point. As expected, when we use lower estimates of the impact of the Dream Act on high school and university graduation and enrollment, the fiscal costs of the Dream Act to the State and local governments falls substantially, but so do the benefits. Overall, a lower impact of the Dream Act on high school graduation rates and college enrollment rates reduces the estimated net benefits of the Dream Act substantially (from \$66.3 million to \$39.4 million). However, even using these smaller impact estimates, the total net benefits of the Dream Act on the Maryland economy are still positive and large. Similarly, the net fiscal benefits to the Maryland state government, and to the federal government, are still positive. However, using the smaller impact estimates, the net fiscal benefits to Maryland county governments are negative (the present value of education spending due to the Dream Act exceeds the present value of future tax revenue due to the Dream Act). These results again highlight the redistribution of costs towards county governments that occurs with the Dream Act.

We also examined how our results change if we assume that the impact of the Dream Act is larger. If we assume that more people are induced to get more education because of the Dream Act, then the net economic benefits of the Dream Act increase substantially, as do the net fiscal benefits for local, state and federal governments.

E. Different Assumptions of the Graduation and Enrollment Rates of Undocumented Immigrants in the Absence of the Dream Act

We also explore how our results change if we assume different graduation and enrollment rates of undocumented students in the absence of the Dream Act. The results in table 8 show that our estimates are not very sensitive to changing these rates. That is, changing these assumptions has very small effects on the value of the estimates of net economic benefits, or the net fiscal benefits to any level of government.

F. Different Assumptions about the Distribution of Students between Public and Private Universities

We explore how sensitive our estimates are to changing assumptions about the percent of undocumented students who obtained a Bachelor's degree from a public (vs. private) university pre-Dream Act, and about the percent of undocumented students who attend public rather than private universities because of the Dream Act. The results in table 8 show that our estimates are not very sensitive to changing these assumptions. That is, changing these assumptions has very small effects on the value of the estimates of net economic benefits, or the net fiscal benefits to any level of government.

V. CONCLUSIONS

This study presents the results of an evidence-based cost-benefit analysis of the Maryland Dream Act. It addresses the following three questions: (1) how many students will benefit from the Dream Act; (2) what will be the fiscal costs and benefits to the state, county and federal governments of the Dream Act; and (3) what will be the total net economic impacts of the Dream Act?

As the first attempt of which we are aware to estimate the economic impacts of the Maryland Dream Act, this study makes several contributions. On a conceptual level, it highlights the two broad categories of students who would take advantage of the Dream Act, namely: (A) undocumented immigrant students who obtain more education because the Dream Act lowers the cost of education to them; and (B) undocumented immigrant students who would obtain the same education with or without the Dream Act, but who pay lower tuition and fees at public universities because of the Dream Act. Furthermore, it highlights that by increasing educational attainment, the Dream Act will increase lifetime earnings of beneficiaries as well as tax revenues.

We estimate that approximately 185 students in each annual 18-year old cohort will be induced to graduate from high school in Maryland because of the Dream Act. In addition, a total of 435 students in each annual cohort will take advantage of the Dream Act to attend college. Of those who attend college, 163 are induced by the Dream Act to obtain more college education, while 272 pay less for each year of college with the Dream Act than they would have in the absence of the Dream Act, but do not increase their educational attainment.

The estimates from this analysis suggest that the net economic effect of the Maryland Dream Act will be positive, and the benefits will be substantial. The estimated total net economic benefits of

each annual cohort of students who take advantage of the Dream Act are approximately \$66 million in 2011 dollars.

Even if the only consideration is the fiscal effects on state and local governments, the impact of the Dream Act will be positive and large. The initial costs of the investment in education will be more than offset by increased tax revenues and lower incarceration costs from a more educated citizenry. We conclude that repealing the Maryland Dream Act will reduce economic growth and income in Maryland, and will reduce the fiscal resources available to Maryland state and county governments.

In general, we find that our results are not sensitive to changes in the assumptions made. Specifically, the following results hold under all sets of alternative assumptions that we consider: the total net economic benefits of the Dream Act are always positive and large; total net fiscal benefits to state government are always positive; and total net fiscal benefits to the federal government are always positive. Under some sets of alternative assumptions, the net fiscal benefits to county governments are negative. That is, the sensitivity analysis suggests that a redistribution of costs between different levels of government may occur with the Dream Act. The Dream Act may result in net fiscal losses for county governments even as state and federal government budgets gain.

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Table 1: Estimated Number of Students in Each Category for one Annual Cohort of Students		
	Estimated Number of Students in Each Category for one Annual Cohort of Students	
A. FOR EACH STUDENT INDUCED BY THE DREAM ACT TO OBTAIN MORE EDUCATION		
<i>High school drop-out without the Dream Act, at least high school graduate with the Dream Act</i>		185
<i>Does not attend college or university without the Dream Act, with the Dream Act:</i>		
<i>Completes some college but does not obtain Bachelor's degree</i>		89
<i>Obtains Bachelor's degree from a public university</i>		59
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>		15
B. FOR EACH STUDENT WHO PAYS LESS BECAUSE OF THE DREAM ACT, BUT DOES NOT OBTAIN MORE EDUCATION		
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Associate's degree from a public community college with the Dream Act</i>		133
<i>Obtains Bachelor's degree from a public university without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>		111
<i>Obtains Bachelor's degree from a private or out-of-state public university without the Dream Act, obtains Bachelor's degree from an in-state public university with the Dream Act</i>		28

Table 2: Fiscal costs of additional schooling Due to the Dream Act for a Single Cohort (2011 dollars)

	Fiscal Costs to State and Local Governments in Maryland			Fiscal Costs to Federal Government	Total Costs (all governments)	Change in college or university revenues
	Fiscal Costs to State Government	Fiscal Costs to Local Government	Total State plus Local			
A. FOR EACH STUDENT INDUCED BY THE DREAM ACT TO OBTAIN MORE EDUCATION						
<i>High school drop-out without the Dream Act, at least high school graduate with the Dream Act</i>	7652	5770	13422	1060	14482	0
<i>Does not attend college or university without the Dream Act, with the Dream Act:</i>						
<i>Completes some college but does not obtain Bachelor's degree</i>	6054	8685	14739	0	14739	0
<i>Obtains Bachelor's degree from a public university</i>	18637	8685	27322	0	27322	0
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	12583	0	12583	0	12583	383
SUBTOTAL: NET DISCOUNTED FISCAL COSTS FOR A.	3,240,291	2,350,886	5,591,176	195,854	5,787,030	
B. FOR EACH STUDENT WHO PAYS LESS BECAUSE OF THE DREAM ACT, BUT DOES NOT OBTAIN MORE EDUCATION						
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Associate's degree from a public community college with the Dream Act</i>	6054	0	6054	0	6054	383
<i>Obtains Bachelor's degree from a public university without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	-7295	8685	1390	0	1390	-16372
<i>Obtains Bachelor's degree from a private or out-of-state public university without the Dream Act, obtains Bachelor's degree from an in-state public university with the Dream Act</i>	14488	8685	23173	0	23173	0
SUBTOTAL: NET DISCOUNTED FISCAL COSTS FOR B.	398,377	1,204,068	1,602,445	0	1,602,445	
TOTAL NET DISCOUNTED FISCAL COSTS	3,638,667	3,554,954	7,193,621	195,854	7,389,476	-1,759,260

Table 3: Increased pre-tax lifetime earnings Due to the Dream Act for a Single Cohort (2011 dollars)		
A. FOR EACH STUDENT INDUCED BY THE DREAM ACT TO OBTAIN MORE EDUCATION		
<i>High school drop-out without the Dream Act, at least high school graduate with the Dream Act</i>	105,674	
<i>Does not attend college or university without the Dream Act, with the Dream Act:</i>		
<i>Completes some college but does not obtain Bachelor's degree</i>	104,667	
<i>Obtains Bachelor's degree from a public university</i>	367,138	
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	262,471	
SUBTOTAL FOR A.	54,420,498	
B. FOR EACH STUDENT WHO PAYS LESS BECAUSE OF THE DREAM ACT, BUT DOES NOT OBTAIN MORE EDUCATION		
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Associate's degree from a public community college with the Dream Act</i>	0	
<i>Obtains Bachelor's degree from a public university without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	0	
<i>Obtains Bachelor's degree from a private or out-of-state public university without the Dream Act, obtains Bachelor's degree from an in-state public university with the Dream Act</i>	0	

Table 4: Increased tax revenue Due to the Dream Act for a Single Cohort					
	Increased Tax Revenue to State and Local Governments in Maryland				
	State Government	Local Government	Total State plus Local	Increased Tax Revenue to Federal Government	Total Increased Tax Revenue (all governments)
A. FOR EACH STUDENT INDUCED BY THE DREAM ACT TO OBTAIN MORE EDUCATION					
<i>High school drop-out without the Dream Act, at least high school graduate with the Dream Act</i>	8515	3339	11854	36035	47889
<i>Does not attend college or university without the Dream Act, with the Dream Act:</i>					
<i>Completes some college but does not obtain Bachelor's degree</i>	8434	3307	11741	35691	47433
<i>Obtains Bachelor's degree from a public university</i>	29583	11602	41185	125194	166379
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	21150	8294	29444	89503	118946
SUBTOTAL: NET DISCOUNTED BENEFITS FOR A.	4,385,132	1,719,688	6,104,820	18,557,390	24,662,210
B. FOR EACH STUDENT WHO PAYS LESS BECAUSE OF THE DREAM ACT, BUT DOES NOT OBTAIN MORE EDUCATION					
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Associate's degree from a public community college with the Dream Act</i>	0	0	0	0	0
<i>Obtains Bachelor's degree from a public university without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	0	0	0	0	0
<i>Obtains Bachelor's degree from a private or out-of-state public university without the Dream Act, obtains Bachelor's degree from an in-state public university with the Dream Act</i>	0	0	0	0	0
SUBTOTAL: NET DISCOUNTED BENEFITS FOR B.	0	0	0	0	0
TOTAL NET DISCOUNTED BENEFITS	4,385,132	1,719,688	6,104,820	18,557,390	24,662,210

Table 5: Reduced incarceration spending Due to the Dream Act for a Single Cohort			
	Reduced Incarceration Spending by State and Local Governments in Maryland		
	State Government	Local Government	Total State plus Local
A. FOR EACH STUDENT INDUCED BY THE DREAM ACT TO OBTAIN MORE EDUCATION			
<i>High school drop-out without the Dream Act, at least high school graduate with the Dream Act</i>	16282	8092	24375
<i>Does not attend college or university without the Dream Act, with the Dream Act:</i>			
<i>Completes some college but does not obtain Bachelor's degree</i>	11272	5602	16875
<i>Obtains Bachelor's degree from a public university</i>	14195	7055	21250
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	2922	1452	4375
SUBTOTAL: NET DISCOUNTED BENEFITS FOR A.	4,893,016	2,431,858	7,324,874
B. FOR EACH STUDENT WHO PAYS LESS BECAUSE OF THE DREAM ACT, BUT DOES NOT OBTAIN MORE EDUCATION			
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Associate's degree from a public community college with the Dream Act</i>	0	0	0
<i>Obtains Bachelor's degree from a public university without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	0	0	0
<i>Obtains Bachelor's degree from a private or out-of-state public university without the Dream Act. obtains Bachelor's dearee from an in-state public universitv with the Dream Act</i>	0	0	0
SUBTOTAL: NET DISCOUNTED BENEFITS FOR B.	0	0	0
TOTAL NET DISCOUNTED BENEFITS	4,893,016	2,431,858	7,324,874

Table 6: Net Discounted Benefits (+) or Costs (-) Due to the Dream Act for a Single Cohort (2011 dollars)								
NET DISCOUNTED BENEFITS (+) OR COSTS (-) DUE TO THE DREAM ACT FOR A SINGLE ANNUAL COHORT (Benefits of additional educational attainment minus costs of additional schooling)								
	Fiscal Net Benefits to State and Local Governments in Maryland			Fiscal Net Benefits to Federal Government	Total Net Fiscal Benefits (all governments)	Private Net Benefits	Total Net Benefits (Fiscal plus Private)	Estimated Number of Students in Each Category
	Fiscal Net Benefits to State Government	Fiscal Net Benefits to Local Government	Total State plus Local					
A. FOR EACH STUDENT INDUCED BY THE DREAM ACT TO OBTAIN MORE EDUCATION								
<i>High school drop-out without the Dream Act, at least high school graduate with the Dream Act</i>	17,145	5,662	22,807	34,975	57,783	65,869	123,651	185
<i>Does not attend college or university without the Dream Act, with the Dream Act:</i>								
<i>Completes some college but does not obtain Bachelor's degree</i>	13,652	225	13,877	35,691	49,569	57,273	106,842	89
<i>Obtains Bachelor's degree from a public university</i>	25,142	9,972	35,113	125,194	160,307	206,492	366,800	59
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	11,489	9,747	21,236	89,503	110,739	149,219	259,958	15
SUBTOTAL: NET DISCOUNTED BENEFITS (+) OR COSTS (-) FOR A.	6,037,858	1,800,660	7,838,518	18,361,535	26,200,054	31,679,492	57,879,546	
B. FOR EACH STUDENT WHO PAYS LESS BECAUSE OF THE DREAM ACT, BUT DOES NOT OBTAIN MORE EDUCATION								
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Associate's degree from a public community college with the Dream Act</i>	-6,054	0	-6,054	0	-6,054	5,671	-383	133
<i>Obtains Bachelor's degree from a public university without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	7,295	-8,685	-1,390	0	-1,390	41,034	39,644	111
<i>Obtains Bachelor's degree from a private or out-of-state public university without the Dream Act, obtains Bachelor's degree from an in-state public university with the Dream Act</i>	-14,488	-8,685	-23,173	0	-23,173	169,078	145,905	28
SUBTOTAL: NET DISCOUNTED BENEFITS (+) OR COSTS (-) FOR B.	-398,377	-1,204,068	-1,602,445	0	-1,602,445	9,994,290	8,391,845	
TOTAL NET DISCOUNTED BENEFITS (+) OR COSTS (-)	5,639,481	596,592	6,236,073	18,361,535	24,597,608	41,673,783	66,271,391	

Table 7: Net Discounted Benefits (+) or Costs (-) Due to the Dream Act for a Single Cohort (2011 dollars)								
Not Including Reduced Incarceration Spending as a Fiscal Benefit								
NET DISCOUNTED BENEFITS (+) OR COSTS (-) DUE TO THE DREAM ACT FOR A SINGLE ANNUAL COHORT								
(Benefits of additional educational attainment minus costs of additional schooling)								
Fiscal Net Benefits to State and Local Governments in Maryland								
	Fiscal Net Benefits to State Government	Fiscal Net Benefits to Local Government	Total State plus Local	Fiscal Net Benefits to Federal Government	Total Net Fiscal Benefits (all governments)	Private Net Benefits	Total Net Benefits (Fiscal plus Private)	Number of Students in Each Category
A. FOR EACH STUDENT INDUCED BY THE DREAM ACT TO OBTAIN MORE EDUCATION								
<i>High school drop-out without the Dream Act, at least high school graduate with the Dream Act</i>	863	-2,430	-1,568	34,975	33,408	65,869	99,276	185
<i>Does not attend college or university without the Dream Act, with the Dream Act:</i>								
<i>Completes some college but does not obtain Bachelor's degree</i>	2,380	-5,377	-2,997	35,691	32,694	57,273	89,967	89
<i>Obtains Bachelor's degree from a public university</i>	10,947	2,917	13,863	125,194	139,057	206,492	345,550	59
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	8,567	8,294	16,861	89,503	106,364	149,219	255,583	15
SUBTOTAL: NET DISCOUNTED BENEFITS (+) OR COSTS (-) FOR A.	1,144,842	-631,198	513,644	18,361,535	18,875,179	31,679,492	50,554,671	
B. FOR EACH STUDENT WHO PAYS LESS BECAUSE OF THE DREAM ACT, BUT DOES NOT OBTAIN MORE EDUCATION								
<i>Obtains an Associate's degree from a public community college without the Dream Act, obtains Associate's degree from a public community college with the Dream Act</i>	-6,054	0	-6,054	0	-6,054	5,671	-383	133
<i>Obtains Bachelor's degree from a public university without the Dream Act, obtains Bachelor's degree from a public university with the Dream Act</i>	7,295	-8,685	-1,390	0	-1,390	41,034	39,644	111
<i>Obtains Bachelor's degree from a private or out-of-state public university without the Dream Act, obtains Bachelor's degree from an in-state public university with the Dream Act</i>	-14,488	-8,685	-23,173	0	-23,173	169,078	145,905	28
SUBTOTAL: NET DISCOUNTED BENEFITS (+) OR COSTS (-) FOR B.	-398,377	-1,204,068	-1,602,445	0	-1,602,445	9,994,290	8,391,845	
TOTAL NET DISCOUNTED BENEFITS (+) OR COSTS (-)	746,465	-1,835,266	-1,088,801	18,361,535	17,272,734	41,673,783	58,946,517	

Table 8: Sensitivity Analysis: Benefits and Costs of the Dream Act Under Different Assumptions (millions of 2011 dollars)									
TOTAL NET DISCOUNTED BENEFITS (+) OR COSTS (-) BECAUSE OF DREAM ACT									
(Benefits of additional educational attainment minus costs of additional schooling)									
			Fiscal Net Benefits to State and Local Governments in Maryland						
			Fiscal Net Benefits to State Government	Fiscal Net Benefits to Local Government	Total State plus Local	Fiscal Net Benefits to Federal Government	Total Net Fiscal Benefits (all governments)	Private Net Benefits	Total Net Benefits (Fiscal plus Private)
Basic Estimate			5.6	0.6	6.2	18.4	24.6	41.7	66.3
Different Estimates of Rates of Return to Education									
		10%	5.2	0.4	5.6	16.4	22.1	38.2	60.2
		5%	3.2	-0.4	2.9	8.1	11.0	23.0	34.0
Different Discount Rates									
		No discounting (0%)	13.5	4.1	17.7	35.6	53.3	73.6	126.8
		5%	3.1	-0.5	2.6	12.9	15.5	31.5	46.9
		10%	0.3	-1.8	-1.5	6.7	5.1	19.7	24.8
Different Assumptions of the Impact of the Dream Act to Induce Students to Obtain More Education									
High School Graduation Rate	College Enrollment Rate	Bachelor's Attainment Rate							
2.5%	2.0%	1.0%	2.5	-0.6	1.9	9.2	11.1	28.3	39.4
7.5%	6.0%	3.0%	8.6	1.2	9.8	27.5	37.3	60.0	97.3
10.0%	2.0%	4.0%	11.6	2.1	13.7	36.7	50.4	75.9	126.2
Different Assumptions of the pre-Dream Act Graduation and Enrollment Rates of Undocumented Immigrants									
High School Graduation Rate	College Enrollment Rate	Bachelor's Attainment Rate							
45.0%	7.5%	4.5%	5.7	0.9	6.6	18.4	25.0	39.2	64.2
60.0%	10.0%	6.0%	5.6	0.6	6.2	18.4	24.6	41.7	66.3
75.0%	12.5%	7.5%	5.5	0.3	5.8	18.4	24.2	44.2	68.4
Different Assumptions Distribution of Undocumented Students Between Public and Private Universities									
% of those who get a Bachelor's degree who attend public universities									
		25.0%	5.6	0.6	6.2	18.4	24.6	41.7	66.3
		75.0%	6.2	0.2	6.5	18.4	24.8	41.6	66.4
% of those in private universities who switch to public universities with the Dream Act									
		50.0%	5.6	0.6	6.2	18.4	24.6	41.7	66.3
		75.0%	5.2	0.4	5.6	18.4	24.0	46.4	70.3