



The Economic Benefits of Passing the DREAM Act

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Appendix: Methodology

For this analysis of the economic benefits of passing the DREAM Act, we produced a dataset of unauthorized immigrants that has the largest number of cases used in published research to date. With this foundation, we conducted a detailed analysis on the likely educational attainment of DREAMers based on methodology by economist Luis Crouch using yearly information to deduce cohort educational transition rates (how likely a group of DREAMers in the same age group are to graduate from college with a bachelor's degree) based on differences between age groups.³⁸

We then applied our educational attainment projection to a synthetic lifetime earnings model used by U.S. Census Bureau researchers to develop an estimation of the direct economic impact of the DREAM Act on potential beneficiaries.³⁹ This model takes into account factors such as education, age, sex, and race and ethnicity. Finally, we used the IMPLAN input-output matrix to study the induced economic effect that would result from the direct economic impact.⁴⁰

Much of the analysis for this report was conducted using Stata, a statistical software package. To produce our estimates, we wrote a great deal of Stata code. We have made this code available for others who wish to replicate or examine our methodology. It can be found at: <https://github.com/Guzman-Jara/DREAM-economic-impact>.

The period we looked at in our analysis was between 2010 and 2030. We chose 2010 as the starting point because the latest demographic data is available for that year. We chose 2030 as an end year both to avoid making predictions too far into the future and also because the majority of DREAM eligible people will then be old enough to have graduated from college (if they attend) and have spent some time in the labor force.

There are four main components necessary to conduct this procedure and estimate the total economic impact of passing the DREAM Act.

- A data set of unauthorized immigrants
- Educational profiles
- Conditional and permanent resident status requirements
- Profiles of earnings and the induced economic activity that results from them

We briefly describe each of these components in the sections that follow.

As with any projections, these numbers are estimates and contain a certain amount of uncertainty. We assume, for example, that economic conditions will remain roughly the same as the period between 2006 and 2010, and assume that the rates of educational attainment will stay the same in the future—meaning that attendance and graduation rates for postsecondary education will remain roughly the same as today.

While we believe our final estimate reflects best available data, there are many reasons to conclude that the estimate is conservative. Our estimate of direct impact is based heavily on American Community Survey data from between 2006 and 2010, a period of time that overlaps with the Great Recession, which began in 2007. Our estimate of induced impact is based not only on our estimate of direct impact, but also on 2010 economic data, which the Great Recession also affected. The adverse economic conditions of the period we examined almost certainly reduce our final estimate.

Additionally, our model assumes that removing the barriers to higher education that potential DREAMers face will lead to attainment rates similar to their U.S. born counterparts of the same race and ethnicity. Yet potential DREAMers actually have incentives far above those of U.S. citizens to attain a postsecondary education. Their very presence in the country could depend on achieving a degree, which in turn could lead to attendance rates significantly higher than the relatively low rates which groups like U.S. born Hispanics now face.

Finally, because our estimate of educational attainment rates is based on the entire foreign-born population, and not just the unauthorized population, it is possible that we are overestimating the educational attainment of potential DREAMers in the absence of the DREAM Act's passage.

In short, if we are overestimating the educational attainment of undocumented youth without the benefit of the DREAM Act, then we are underestimating the difference between what we would expect with the status quo, and what we would expect from the passage of the DREAM Act.

Demographics of eligible DREAMers

The first step in this economic analysis involved creating a demographic dataset based on the eligible population of DREAM Act beneficiaries. Creating such a dataset is not a trivial task, as no national survey undertaken by the Census Bureau asks for participants' immigration status. Nevertheless, researchers have developed statistical techniques for producing estimates of unauthorized population and its demographic characteristics.

The most widely known and cited data on the number of unauthorized immigrants living in the United States have been Pew Hispanic Center demographer Jeffrey Passel's annually updated estimates. In a 2009 paper Pew published demographic characteristics of the unauthorized population based on a methodology of assigning an immigration status to individual cases in the 2007-2009 March Supplements of the Current Population Survey.⁴¹ Even with three years' worth of data, the total sample size is only about 620,000 cases, with only about 23,000 cases of unauthorized immigrants. The sample size of potential DREAMers is even smaller, at less than 5,000 cases. While that sample is robust enough to draw reasonable estimates about the size and broad demographic characteristics of potential DREAMers, it is not sufficient for the more detailed analysis required for this report.

In order to construct a larger dataset, we apply Passel's procedure for estimating the unauthorized population to the U.S. Census Bureau's 2006 to 2010 American Community Survey.⁴² From the approximately 25 million cases in the 2006 to 2010 survey, we were able to produce a dataset of unauthorized immigrants that includes nearly 420,000 cases—and from those a sample of potential DREAMers with a little over 89,000 cases. To the best of our knowledge, this is the largest dataset of unauthorized immigrants produced to date.

Passel's methodology takes previously derived estimates of the unauthorized immigrant population by state and uses these numbers to determine probabilities that an individual case in survey data represents an unauthorized immigrant. It involves three major steps.

- The first is the elimination of cases that are with a very unlikely to represent an unauthorized immigrant.
- The second is assignment of initial probabilities to all remaining cases based on occupational data derived from the Legalized Population Survey.
- The third is to revise those initial probabilities to account for family units while maintaining a target population consistent with the previously derived estimates.

The elimination of cases unlikely to be unauthorized immigrants begins by eliminating any cases born in the United States or those who immigrated before 1980. Then checks are performed using date of arrival to the United States, occupation, and key demographic characteristic to determine if a person is likely to have a valid work visa. Finally, State Department data on refugees combined with American Community Survey data on country of origin is used to determine which countries of origin are likely to indicate refugee status by year. This data is then used to exclude those likely to be refugees.

Initial probabilities of unauthorized status are based on country of origin and Legalized Population Survey data, which is a survey of 6,193 previously unauthorized immigrants who were interviewed when they sought permanent legal residence, sponsored by the departments of Homeland Security, Labor, Agriculture, and Commerce. From the Legalized Population Survey, percentage distributions are calculated by broad occupational category, region of the country, and sex. These distributions are updated by rates in change of occupational category in the country as a whole. These distributions, in combination with country of origin data are used to create a target distribution for unauthorized immigrants.

Once the target distribution based on country of origin and occupation is calculated, probabilities of unauthorized status for individual cases in the ACS are calculated for the working age population (ages 18 to 65) such that the distribution of those selected as unauthorized will match the target distribution. These probabilities are then revised so that state populations are consistent with the previously derived estimates, while maintaining the target occupation/country

of origin distribution. These probabilities are revised one more time to take into account the children of those selected.

As a final check, we compared key demographic characteristics derived from our dataset against the Pew data, including educational distributions, country of origin, and broad occupational groups for the unauthorized population as a whole. We then compared data on the number of, location of, and DREAM Act criteria met to data published by the Migration Policy Institute on potential DREAM Act beneficiaries.⁴³ Although our dataset covers a broader period (2006 to 2010) than the studies we compared it to (which cover the 2007 to 2009 period), making direct comparisons difficult, we found broad agreement between our numbers and those previously published. For a more detailed explanation of Passel's methodology, please see his original paper.⁴⁴

Future educational-attainment rates

The future education profile of a population depends on several factors that are captured in graduation and transition rates for each educational level. These rates, however, are not available for the combination of: age, sex, race and ethnicity, migration status, and the different postsecondary levels needed for this study.

Instead, we calculated these rates by using a synthesized cohort analysis—which allows us to analyze different age groups of people as if they were a single age cohort passing through time—of the educational profile of the population, similarly to how demographers calculate life tables to estimate life expectancy. We used five-year cohorts of the American Community Survey by sex, race/ethnicity, and nativity to calculate transition rates in the educational profile of the population. We estimated transition rates between the following education levels:

- Less than high school
- High school diploma or GED
- Some college education
- Associate's degree
- Bachelor's degree
- Higher than bachelor's, which includes Master's, doctoral and professional degrees.

In our model we also assume that no further education occurs after the age of 40. We calculated one set of rates for the U.S.-born population and one set of rates for the foreign-born population.

Because earnings vary by work experience and because individuals do not complete their education all at the same age, it is necessary to simulate the passing of time to produce a reasonable estimate. We do this by “aging” the population in five-year increments. For each period, we applied education-transition rates, adjusted earnings based on a worker's new age and education, and summed the total earnings and induced effect for that period.

For the actual calculation, we compared the educational distribution of one five-year age group, compared it to its successor, and calculated the transition rate needed to obtain the educational percentage distribution of the successor. We used percentages distribution instead of frequency distributions to eliminate difference in cohort size. We followed this procedure for each sex, race/ethnicity, and nativity group.

In our final estimate we assumed that if the DREAM Act is enacted, the eligible population would experience the transition rates of their U.S.-born counterparts; otherwise they will experience the graduation rates of their foreign-born counterparts. We used the entire foreign-born population, including documented and undocumented people, instead of just the unauthorized population for two reasons.

The first is that using the larger population allowed us to produce more robust estimates of educational transition rates. A more important reason, however, is that DREAMers who arrived in the United States during or before their teens are not directly comparable to what is normally meant by first-generation immigrants. They comprise what is commonly termed “1.5 Generation” immigrants, those who have immigrated early enough in life to allow a more easy assimilation into their new culture than their parents. Including legal, foreign-born immigrants in our estimation of educational transition rates helps us to split the difference between unauthorized first generation immigrants and a group that faces less adversity in its quest to attain education.

The economic impact

The economic impact is divided into direct and induced impacts. The direct impact is the economic changes that we would observe directly in the DREAMers, which is basically the change in their earnings potential. The induced impact is the economic activity that the increase in earnings would generate in the overall economy.

Direct impact

The direct impact is the difference between the aggregate earnings that eligible migrants to the DREAM Act would receive if the DREAM Act were to become law, and the earnings that eligible migrants would receive were the DREAM Act not enacted.

The earnings are calculated for U.S. and foreign-born residents based on 10-year age groups, sex, education level, and race and ethnicity. We calculated the mean earnings for each age/sex/race and ethnicity/education level combination using 10 regions defined as each of the six largest states (Arizona, California, Florida, Illinois, New York, Texas) and the four Census Bureau regions (Northeast, Midwest, South, and West). The division into these six states and four regions allowed us to take into account earning and labor market differentials. We use 10-year intervals for the age groups because they allow for robust results.

After applying the transition rates of U.S.- and foreign-born individuals to the potential DREAMers, we assigned the earning corresponding to each age/sex/education level group, and calculated the difference between the two estimates by each year. This difference constituted our estimate of the direct impact.

The induced impact: the IMPLAN model

This study uses the IMPLAN input-output models for 2010—IMPLAN stands for “Impact analysis for PLANing.” IMPLAN allows researchers to calculate the impacts resulting from changes in policy and economic activity. The study estimates the impacts on economic output and employment in each industry, and the resulting impact on tax contributions, given a range of assumed changes to migration-related policies. The model allows identification of direct economic effects in affected industries and induced effects that cascade through the economy.

In the present study, we produced our own estimate of direct impact and, therefore, only used the IMPLAN to produce an estimate of the induced impact.

We divided our estimate of direct impact by state (and the District of Columbia) and five-year period in order to conduct a series of multiregion analyses over the 20-year period between 2010 and 2030. This resulted in a total of 204 multiregion analyses, each comprised of two regions: the state in question and a composite region comprised of the remaining states. As input for the analysis we use the difference in earnings generated by potential DREAMers should the DREAM Act be passed in that state and time period divided by income level. Our final total estimate of induced impact is comprised of the aggregate totals of each of these multiregion analyses.

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