Does Immigrant Legalization Affect Crime? Evidence from Deferred Action for Childhood Arrivals in the United States

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October 17, 2019

Abstract

The implementation of Deferred Action for Childhood Arrivals (DACA) in 2012 grants undocumented immigrants who were brought to the United States as children a temporary reprieve from deportation and authorization to work legally, potentially increasing their opportunity costs of committing crimes. In this article, I examine the impact of DACA on crime. The analysis yields a few main results. First, at the individual level, comparing the difference in the likelihood of being incarcerated between DACA-eligible population with its counterpart before and after the implementation of DACA, I fail to find evidence that DACA statistically significantly affected the incarceration rate of undocumented youth. This result is robust to controlling for the differences in characteristics associated with DACA eligibility, such as age and age at arrival. Second, using the variation in the number of DACA applications approved across the U.S. states, the evidence suggests that DACA is associated with a reduction in property crime rates. An increase of one DACA application approved per 1,000 population is associated with a 1.6% decline in overall property crime rate. Further analysis shows that this reduction is driven by the decline in burglary and larceny rates. This finding suggests that policies that limit the employment opportunities of immigrants may lead to a higher rate of crimes committed for financial gains that often do not lead to incarceration.

JEL Classification: K37, K42

Keywords: Immigration, DACA, Crime

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1 Introduction

It is estimated that 11 million undocumented immigrants live in the United States (Krogstad et al., 2018). At the same time, the public is divided on the course of action pertaining to undocumented population. Proponents of legalization argue that such a policy would allow undocumented immigrants to contribute more to U.S. society, while those against it argue that legalization would increase competition in the labor market and encourage further unauthorized immigration to the United States. There is a need, therefore, to evaluate the potential benefits and costs of a legalization policy.

In this paper, I examine the impact of a temporary legalization policy, Deferred Action for Childhood Arrivals (DACA), on crime. Announced by President Obama in 2012, DACA provides temporary relief from deportation and authorization to work legally in the United States for eligible undocumented individuals being brought to the United States as children. Conceptually, the effects of DACA on crime rates are ambiguous. On the one hand, an improvement in the labor market opportunities would increase the opportunity costs of committing a crime among undocumented youth. Indeed, a few recent studies have found that DACA increases labor force participation and employment among eligible individuals (Pope, 2016; Amuedo-Dorantes and Antman, 2017). There is also evidence that the poverty rate among undocumented youth was reduced after DACA (Amuedo-Dorantes and Antman, 2016). Therefore, DACA has the potential to reduce crime, especially in places with a higher share of DACA-eligible population.

On the other hand, DACA induced increases in labor force participation and employment among undocumented youth may increase competition in the labor market, affecting other U.S. residents' propensity to commit crimes. For example, Borjas et al. (2010) found strong positive correlation between immigration and black incarceration rates. The author argues

that an increase of low-skilled labor supply due to immigration worsens the labor market opportunities of blacks, resulting in their observed higher incarceration rate.[1] The question of whether DACA affected crime rates is, therefore, an empirical question.

I begin my analysis by examining whether the likelihood of being incarcerated among DACA-eligible population changed after DACA compared to undocumented individuals who were not eligible for it.[2] A decrease in incarceration rate among undocumented youth due to DACA would indicate that DACA reduced the likelihood of committing a crime among eligible individuals. The results of this analysis show no evidence that DACA statistically significantly affected the incarceration rate of undocumented youth. This finding is robust to controlling for the differences in characteristics associated with DACA eligibility such as age and age at arrival.

Although incarceration might be a good proxy for violent crimes that often lead to jail sentences, it may not capture the type of crimes that is unlikely to lead to incarceration, such as petty theft and other low-level property crimes. Furthermore, DACA induced increases in labor supply among undocumented youth may increase the competition in the labor market and affect the propensity to commit crime among other U.S. residents. To see if this is the case, I investigate whether overall crime rates were affected by DACA. The results of the analysis suggest that the implementation of DACA is not associated with a statistically significant change in violent crime rate. However, there is evidence that the enactment of DACA is associated with lower property crime rates. An increase of one DACA application approved per 1,000 population ($\sim$1 S.D. increase) is associated with 1.6% decline in overall

[1] In a more general setting, Gould et al. (2002) found that crime rates are sensitive to changes in labor market conditions. It is also worth noting that the literature is still inconclusive on whether immigration adversely affects the labor market outcomes of U.S. natives (Card, 1990; Ottaviano and Peri, 2012; Peri and Yasenov, 2018).

[2] It should be noted that being incarcerated would disqualify an undocumented person from being eligible for DACA. The focus of this analysis is, therefore, to examine whether undocumented youth, who were eligible for DACA and not incarcerated post-DACA, were more likely to be incarcerated in the absence of DACA.

property crime rate. Further analysis shows that this reduction is driven by the decline in burglary and larceny rates. This finding suggests that policies that limit the employment opportunities of immigrants may lead to a higher rate of crimes committed for financial gains that often do not lead to incarceration.

This paper is related to a few recent studies that attempt to examine the impacts of DACA on the labor market and education outcomes of undocumented youth. DACA has been documented to improve labor market opportunities of eligible individuals (Pope, 2016; Amuedo-Dorantes and Antman, 2016, 2017), while the evidence of its effect on schooling is mixed (Pope, 2016; Amuedo-Dorantes and Antman, 2017; Kuka et al., 2018). There is also evidence that DACA increased health insurance take-up among DACA-eligible population (Giuntella and Lonsky, 2018). Yet, to my knowledge, no study has examined whether DACA affected crime.

This paper also contributes to studies that examine the nexus of immigration and crime. The literature generally finds that immigrants are no more or even less likely to be involved in crimes compared to natives (Butcher and Piehl, 1998, 2007; Moehling and Piehl, 2009). At the aggregate level, studies have found that immigration has a null to a small positive impact on crime rates (Bianchi et al., 2012; Chalfin, 2013; Spenkuch, 2013). Recent research focusing on refugees' inflow found similar results (Amuedo-Dorantes et al., 2018b; Masterson and Yasenov, 2018). Not much is known, however, on the effect of legalization policy on crime. A few studies in Europe found that legalization lowers the likelihood of committing crimes among unauthorized immigrants by about 50% (Mastrobuoni and Pinotti, 2015; Pinotti, 2017). A closely related study to this paper is the work by Baker (2015), who found that the legalization policy in the United States during Reagan administration, Immigration Reform and Control Act (IRCA), is associated with a reduction in crime rates in places where there were more undocumented individuals being legalized. The results of this paper complement

the finding by Baker (2015) in two ways. First, unlike IRCA, DACA only provided temporary legal status to undocumented immigrants who were eligible for it. There might be differences in the effects of granting temporary legal status on crime, as opposed to granting permanent legal status.[3] Furthermore, while almost all of unauthorized population was eligible for legalization by IRCA, DACA focused on undocumented youth who were brought to the United States as children. It is likely that propensity to commit crimes among undocumented population who were legalized by IRCA is different from those who were temporarily granted legal status by DACA.[4]

The rest of the paper is constructed as follows. Section 2 briefly describes the background of DACA. Section 3 describes a simple framework to illustrate how DACA may affect crime rates. Section 4 describes the data used in the analysis. Section 5 and 6 documents the results of the analysis. Section 7 concludes.

2 Background

DACA's origin can be traced back to the DREAM Act of 2001, which if passed, would give eligible undocumented immigrants who were being brought to the United States as children a legal status to stay permanently in the United States. This legislative proposal, although it has been reintroduced several times since then, failed to obtain the sixty-votes required to avoid a filibuster in the U.S. Senate. Dissatisfied with inaction in Congress, DACA was announced by President Obama on June 15, 2012. Its aim is to provide eligible undocu-

[3]For example, since DACA recipients need to reapply every two years, there is more incentive not to commit crime among undocumented immigrants who were legalized through DACA compared to those who gained legal status through IRCA. This is because committing crime may void the eligibility for DACA renewal.

[4]Butcher and Piehl (1998, 2007) found that immigrants are less likely to be incarcerated compared to U.S. natives, suggesting that foreign-born individuals have lower propensity to commit crime compared to their U.S.-born counterparts. If this is the case, for every percentage of population being legalized, the effect of DACA on lowering crime rate would be larger than IRCA since unauthorized immigrants legalized by DACA are more similar to U.S. natives compared to those gained legal status through IRCA.

mented youth a temporary reprieve from deportation and to allow them to contribute more to society.[5] Eligible applicants receive a two-year renewable deferment from deportation and permission to be legally employed in the United States. To be eligible for DACA, an applicant must fulfill the following requirements:

a. had no lawful status as of June 15, 2012;
b. arrived in the United States before the age of 16;
c. be under the age 31 years old as of June 30, 2012;
d. has continuously resided in the United States since June, 2007;
e. be physically present in the United States on June 15, 2012;
f. be currently in school, has graduated from high school or obtained a GED, or has been honorably discharged from the Coast Guard or Armed Forces of the United States;
g. has no criminal records nor pose a threat to national security or public safety.

Shortly after the announcement, USCIS began accepting DACA applications on August 15, 2012. To apply for DACA, applicants must pay 465 dollars processing fee and submit documents showing their eligibility for DACA. A large share of DACA recipients had their applications approved in the following year (Figure 1). Between October 2012 and September 2013, approximately 470,000 applications were approved by USCIS. In September 2017, the new administration rescinded DACA, although it has since been blocked by the preliminary injunction issued by the U.S. District Court for the Northern District of California.[6] In response to this, USCIS currently only accepts a request for renewal of status, but not new applications.[7] As of February of 2019, there are approximately 673,340 active DACA recipients, in which the majority came from Latin America (USCIS, 2019a).

[5]https://obamawhitehouse.archives.gov/the-press-office/2012/06/15/remarks-president-immigration
[6]https://www.nilc.org/issues/daca/status-current-daca-litigation/
[7]https://www.uscis.gov/humanitarian/deferred-action-childhood-arrivals-response-january-2018%2Dpreliminary-injunction

3 Theoretical Framework

In this section, I outline a simple framework that illustrates how crime rates can be affected by DACA. Let D, I, and N be the share of DACA-eligible individuals, other immigrants, and natives in the population, respectively.[8] Let also ϕ be the corresponding offending rate associated with each group. The overall crime rate C can, therefore, be written as:

$$C = \phi_D D + \phi_I I + \phi_N N \tag{1}$$

The work authorization associated with DACA improves the labor market outcomes of DACA-eligible population, lowering their propensity to commit crimes. Indeed, recent studies have found that DACA increases labor force participation and employment among eligible individuals (Pope, 2016; Amuedo-Dorantes and Antman, 2017). At the same time, a rise in the labor supply of DACA-eligible population may increase the competition in the labor market, affecting other U.S. residents' propensity to commit a crime. To capture these effects, let the offending rate for each group be a function of the employment rate of DACA-eligible population (E_D):

$$\phi_s = \phi_s(E_D) \quad \forall \quad S \in \{D, I, N\} \tag{2}$$

Since one of DACA's eligibility criteria is to be physically present in the U.S. on June 15, 2012, DACA should not lead to an increase of unauthorized immigration into the United States as undocumented immigrants arrived after that date are ineligible for it. Furthermore, since DACA was implemented nationally, and there is a high cost associated with moving to other

[8] Other immigrants are defined as immigrants who are ineligible for DACA and those who legally reside in the United States.

countries, the share of DACA-eligible individuals, other immigrants, and U.S. natives in the population should be relatively unaffected by DACA. Assuming that the improvement in the labor market outcomes of DACA-eligible population due to DACA can be represented by an increase in their employment rate, the impact of DACA on crime rate can, therefore, be written as:

$$\frac{\partial C}{\partial E_D} = D\frac{\partial \phi_D}{\partial E_D} + I\frac{\partial \phi_I}{\partial E_D} + N\frac{\partial \phi_N}{\partial E_D} \tag{3}$$

Thus, the change in overall crime rate due to DACA depends on how it affected the offending rate of each group, weighted by their share in the population. If an improvement in the labor market outcomes of DACA-eligible population lowers their propensity to commit crimes, $\frac{\partial \phi_D}{\partial E_D}$ will be negative.[9] At the same time, if DACA worsens the labor market outcomes of other U.S. residents and increases their propensity to commit a crime, $\frac{\partial \phi_I}{\partial E_D}$ and $\frac{\partial \phi_N}{\partial E_D}$ will be positive.[10] Recent studies have also argued that immigrants and natives workers are imperfect substitutes in production, implying that the adverse effect of an increase in the labor supply of immigrants would be largely felt among immigrant workers themselves (Ottaviano and Peri, 2012; Manacorda et al., 2012).[11] If this is the case, the impact of DACA on the offending

[9] As DACA recipients need to renew their status every two years, it is likely that DACA affects the offending rate of DACA-eligible population through non-labor market channels such as discouraging crime-related activities. Nonetheless, the intuition of equation (3) still holds; that is, the impact of DACA on crime rate came through its effect on the offending rate of each group.

[10] Chassamboulli and Peri (2015) argue that an inflow of unauthorized immigrants can improve the labor market outcomes of natives because immigrants, especially undocumented immigrants, have lower value of outside option compared to natives, increasing the value of posting a job by a firm and spurring job creations. A legalization policy can have positive impacts on native labor market outcomes by encouraging further immigration into the country (Chassamboulli and Peri, 2015). The empirical evidence, however, offers a different perspective. Using border apprehensions as a proxy for the flow of unauthorized immigrants from Mexico, Orrenius and Zavodny (2003) concluded that IRCA did not affect the long-term patterns of unauthorized immigration into the United States. In the short-run, there is evidence of a decline in undocumented immigration into the United States after IRCA (Bean, 1990; Orrenius and Zavodny, 2003), partly because of an amnesty program, such as IRCA, is usually tied with border enforcement measures. Examining the number of job vacancies in Miami after Mariel refugees inflow in the 1980s, Anastasopoulos et al. (2018) found a decline in the Help-Wanted Index in Miami in the short-run due to Mariel supply shock. Nonetheless, if DACA improves the labor market outcomes of other U.S. residents, it follows that $\frac{\partial \phi_I}{\partial E_D}$ and $\frac{\partial \phi_N}{\partial E_D}$ will be negative.

[11] In the case of IRCA, Freedman et al. (2018) found that the introduction of mandatory requirement for employers to verify the legal status of their employees is associated with more crimes committed by

rate of other immigrants would be higher compared to that of U.S. natives ($\frac{\partial \phi_I}{\partial E_D} > \frac{\partial \phi_N}{\partial E_D}$).

4 Data and Descriptive Statistics

Recent Census microdata does not directly identify if an individual is incarcerated. However, it is possible to know if a respondent is living in an institution (i.e., correctional facilities, mental hospitals, elderly homes). Following previous studies (Butcher and Piehl, 1998, 2007; Borjas et al., 2010), I use institutionalization as a proxy for incarceration. To address the concern that individuals living in institutions include those who are not in correctional facilities, I limit the sample only to men of age 18 to 35.[12] As noted by Butcher and Piehl (1998), the vast majority of institutionalized men in this age group are indeed in correctional facilities (∼70%), and their results are not substantially affected when institutionalization is used as a proxy for incarceration.[13]

I use the American Community Survey (ACS) data to examine the effect of DACA on the incarceration rate of DACA-eligible population. Since ACS only allows me to identify if an individual is living in an institution since 2006, I focus on the period of 2006 to 2015 in the analysis. One important limitation of ACS is that the legal status of foreign-born population is not available in the data. Previous studies have used non-citizen or Hispanic non-citizen indicator as proxies for undocumented status (Pope, 2016; Amuedo-Dorantes and Antman, 2017; Giuntella and Lonsky, 2018). An alternative method is to impute undocumented status in ACS using the residual method proposed by Borjas (2017b,a). According to this method,

unauthorized immigrants who were not able to obtain legal status from IRCA, possibly due to worsening labor market opportunities among this group caused by the mandate.

[12]This age range is similar to the age range chosen by Pope (2016) and Giuntella and Lonsky (2018), who use the sample of individuals of age 18 to 35 years old to examine the impact of DACA on labor market outcomes and health insurance take-up of DACA-eligible population.

[13]A potential concern is that unauthorized immigrants may be deported prior to serving their sentence. However, U.S. Code Title 8 Chapter 12 Section 1231 does not allow foreign-born individuals, regardless of legal status, to be removed/deported from the country until they serve their sentences. An exception can be made only in the case in which a foreign-born person was convicted of a non-violent crime and the appropriate official (the attorney general or the chief of the state prison system) requests early removal because doing so is appropriate and in the best interest of the United States.

a foreign-born is classified as a legal immigrant if any of the following conditions holds:

a. the person arrived in the U.S. before 1980;
b. the person is a U.S. citizen;
c. the person receives welfare benefits such as Social Security, SSI, Medicaid, Medicare, or military insurance;
d. the person is a veteran or is currently in the Armed Forces;
e. the person works in the government sector;
f. the person resides in public housing or receive rental subsidies, or that person is a spouse of someone who resides in public housing or receive rental subsidies[14];
g. the person was born in Cuba;
h. the person's occupation requires some form of licensing;
i. the person's spouse is a legal immigrant or U.S. citizen.

Other foreign-born persons who are not classified as legal immigrants are assumed to be undocumented immigrants. Since it is possible that the results may be sensitive to the choice of proxy used to classify legal status, I check the robustness of the results when different proxies for legal status are used.

For DACA eligibility, following the literature, I classify an undocumented immigrant as "DACA-eligible" if he/she met the following conditions: 1) under the age of 31 years old as of 2012; 2) immigrated to the United States before 2007; 3) arrived in the United States before the age of 16; 4) has at least a high school diploma or equivalent. Other undocumented immigrants are classified as "DACA-ineligible." It follows that the classification of DACA-eligible population includes those who are incarcerated, even though by definition being incarcerated would disqualify an undocumented person from being eligible for DACA. The focus of the analysis is, therefore, to examine whether undocumented youth, who were eligible for DACA and not incarcerated post-DACA, were more likely to be incarcerated in the

[14]Similar to Borjas (2017a), I did not apply this condition to impute undocumented status because ACS does not have information on whether someone resides in public housing or receives rental subsidies.

absence of DACA.

The summary statistics of undocumented men age 18 to 35 in the pre-DACA period are reported in Table 1. As expected, DACA-eligible undocumented men are younger, arrived in the United States at a younger age, and have higher educational attainment compared to undocumented men who are not eligible for DACA. DACA-eligible undocumented men are also slightly less likely to be institutionalized compared to their counterparts. To make sure that the estimates are not biased because of characteristics' differences between undocumented men who are eligible for DACA and those who are not, I control flexibly for these differences by including age and age at arrival fixed effects as well as indicators for educational attainment in the regressions analysis.

In subsequent analysis, I will also examine the effects of DACA on crime rates across the U.S. states. The crime data for this analysis are obtained from the FBI Uniform Crime Report, and the summary statistics of pre-DACA States' characteristics are reported in Table 2. Approximately 200 persons per 100,000 population are DACA-eligible across the U.S. states. In general, states with a high share of DACA-eligible population (above median) have higher violent and property crime rates. These states also have a slightly higher unemployment rate, although its employment-to-population ratio is similar to states with a low share of DACA-eligible population. I control for these differences in economic conditions in the analysis. The cumulative number of approved DACA applications information at the state level used in the analysis is obtained from USCIS Deferred Action for Childhood Arrivals Quarterly Report.

5 DACA and Incarceration

I begin my analysis by examining whether DACA affected the likelihood of incarceration among undocumented youth. In this analysis, I include only undocumented immigrants in the sample. This is because the closest comparison group for DACA-eligible population would be undocumented immigrants who were not eligible for DACA. Therefore, the analysis will examine how the institutionalization rate of DACA-eligible population changed after DACA compared to those who were classified as ineligible for it. Specifically, I consider the following empirical specifications:

$$y_{ist} = \delta_{st} + \gamma DACA_{ist} + \beta(DACA_{ist} \times Post) + X'_{ist}\alpha + \varepsilon_{ist} \tag{4}$$

where y_{ist} is an indicator on whether individual i in state s at time t is institutionalized. $DACA_{ist}$ takes the value of one if an individual is classified as eligible for DACA and zero otherwise. $Post$ is an indicator if it is the year of 2012 onward. X_{ist} is a vector of individual-level characteristics, which include race, educational attainment, and dummies for age and age at arrival. γ is the pre-DACA difference in the institutionalization rate between DACA-eligible and DACA-ineligible undocumented immigrants after the differences in individuals' characteristics (and other controls) are taken into account. δ_{st} is state-by-year fixed effects to take into account differences in immigration enforcement that vary by states over time. The coefficient of interest is β, which shows how the institutionalization rate of DACA-eligible population changes after DACA compared to those who were classified as ineligible for it.

Before moving to the main results, I first replicate the analysis of Pope (2016) who found that DACA improved the labor market outcomes of DACA-eligible population to see if this finding holds among the sample considered in this study. The results of this exercise are

reported in Appendix Table 1. The implementation of DACA is associated with 1.5 to 2.2 percentage points increase in labor force participation among eligible undocumented men age 18 to 35. This finding is similar to Pope (2016), who found that DACA increased the labor force participation of the eligible population by 1.7 to 3.7 percentage points.

In Table 3, I report the effect of DACA on the incarceration rate of DACA-eligible population. The results of the analysis show no evidence that DACA statistically significantly reduced the likelihood of being incarcerated among the eligible population.[15] The magnitude of the estimates is small, and the results are robust to the addition of more stringent control as well as to different proxies used to impute undocumented status in the ACS data.[16]

As a check for parallel trends assumption in the difference-in-difference empirical strategy, I estimate an event study model as follows:

$$y_{ist} = \delta_{st} + \gamma DACA_{ist} + \sum_{t=2006}^{2010} \beta_t DACA_{ist} + \sum_{t=2012}^{2015} \beta_t DACA_{ist} + X'_{ist}\alpha + \varepsilon_{ist} \tag{5}$$

The definition of the variables are the same as before. The reference year is 2011. As DACA was signed in 2012, finding that the coefficient of $DACA_{ist}$ to be statistically significantly different from zero in the pre-DACA years would suggest that the results observed in the previous analysis were driven by the differential trends in the institutionalization rate between DACA-eligible and DACA-ineligible population prior to DACA. The results of this exercise are reported in Figure 2, and it suggests that the results are not mainly driven by the

[15] If the labor market outcomes of undocumented immigrants who are ineligible for DACA are adversely affected by DACA, the estimates will be biased in the direction that shows DACA reduced the institutionalization rate of DACA-eligible population.

[16] A potential concern is that DACA changed the survey response behavior among the eligible population after it was implemented in 2012. However, the findings by Pope (2016) suggest that this is not the case. Additionally, there is a concern that deportation may bias the estimates. It is worth noting that U.S. Code Title 8 Chapter 12 Section 1231 does not allow foreign-born individuals, regardless of legal status, to be removed/deported from the country until they serve their sentences. Moreover, deportation affects only a small share of undocumented population. A recent Cato Institute statistics estimated that interior removals as percentage of all undocumented immigrants range from 0.65% to 1.64% per year in the period of analysis (see https://www.cato.org/blog/interpreting-new-deportation-statistics). Therefore, it seems unlikely that deportation would play a substantial role in explaining the results.

difference in the trends prior to DACA.

As a further robustness check, I limit the analysis to only undocumented men who fulfill other requirements for DACA eligibility except for age at arrival. I then further restrict the sample to only those who arrived in the U.S. between ages 12 and 19. By restricting the sample this way, I effectively compare the change in institutionalization rate before and after DACA of two very similar groups, in which one group is eligible for DACA simply because they arrived at a slightly younger age. The results of this analysis are reported in Appendix Table 2. Although the number of observations becomes much smaller, the findings are qualitatively similar to before.

Overall, the evidence from the analysis suggests that the incarceration rate of DACA-eligible population was not affected by DACA. However, it is possible that DACA reduced low-level property crimes committed for financial gains, which often does not carry a prison sentence penalty. Additionally, since DACA increased the labor force participation of undocumented youth (Pope, 2016; Amuedo-Dorantes and Antman, 2017), DACA may increase the labor market competition among other U.S. residents, affecting their propensity to commit a crime. To see if this is the case, I examine whether DACA had a discernible impact on crime rates across the U.S. states in the following analysis.

6 DACA and Crime Rates

6.1 Primary Specifications

Using the cumulative number of approved DACA applications information at the state level obtained from the USCIS DACA Quarterly Report, my primary empirical specifications to

examine the effects of DACA on crime rates are as follows:

$$y_{srt} = \delta_s + \delta_{rt} + \gamma Approved_{srt} + X'_{srt}\alpha + \varepsilon_{srt} \tag{6}$$

where y_{srt} is the natural log of crime rate (crimes per 100,000) in state s that is located in region (Census Division) r at time t. X_{srt} is a vector of state-level economic and demographic controls such as unemployment rate, employment-to-population ratio, the share of married individuals in the population, the share of whites in the population, the share of blacks in population, and the share of college-educated individuals in population. δ_s and δ_t are state and year fixed effects, respectively. The main variable of interest is $Approved_{srt}$, which is defined as the cumulative number of approved DACA applications per 1,000 population in state s by the end of year t. This variable takes the value of zero prior to DACA announcement, and it increases for states in which there were DACA applications approved after 2012.[17]

A potential concern is that there were interior immigration enforcement measures implemented in the period of the analysis. In particular, several states such as Arizona adopted Universal E-verify program between 2007 and 2011.[18] Furthermore, the federal government rolled out Secure Communities program county by county starting from 2008, which covered virtually all counties by 2012.[19] To address the concern arises from Universal E-verify adoption, I include an indicator variable for states that implemented Universal E-verify program

[17]USCIS did not report the state-level information on approved applications in the last quarter of 2012. This data limitation forced me to assign a value of zero for all states in 2012. However, since most of DACA applications were approved after 2012, it is unlikely that this limitation would severely affect the results.

[18]Universal E-verify program requires every employer in the state to verify whether the new hire is legally authorized to work in the United States.

[19]Under Secure Communities, the fingerprints of a person arrested by a local law enforcement agency are sent to the Department of Homeland Security, which then compares this biometric information against its database. If the information matches those of naturalized or non-U.S. citizens, a DHS official evaluates the case and decides whether to place a "detainer" based on the arrestee's criminal history and immigration status. When a detainer is issued, Immigration and Customs Enforcement (ICE) requests the local law enforcement agency to hold the arrestee for 48 hours beyond the scheduled release date to take custody of the arrestee and initiate deportation proceeding. Participation in Secure Communities is not voluntary, and the federal government decides when Secure Communities program is activated in a U.S. county.

as control.[20] Taking into account the bias that may arise due to Secure Communities is much harder since it was activated on a county-by-county basis because of resource and technological constraints (Cox and Miles, 2013). However, as shown by Cox and Miles (2013) and Miles and Cox (2014), a county's location on the southern border is strongly correlated with early activation; more than 90% of the population in counties on the southern border was covered by Secure Communities within its first year.[21] Noting this, I address the concern due to Secure Communities implementation as follows. First, I include region-by-year fixed effects δ_{rt} to take into account Secure Communities roll-out pattern and other unobserved factors affecting crime rates that vary across the region over time. Additionally, I include control for the fraction of counties in the state with Secure Communities activated. This control variable takes a value of zero if a state has no county with activated Secure Communities and one if all counties within the state have activated Secure Communities.[22]

In addition to Universal E-Verify and Secure Communities, I add control for omnibus state laws that are related to issues affecting immigrants such as public program benefits, education, human trafficking, driver's license policies, and document-carrying policies. One such law is the controversial S.B.1070 enacted in Arizona in 2010 which gave local law enforcement agencies more power in enforcing immigration laws.[23] Furthermore, I also add control for state laws that govern undocumented immigrants' eligibility for driver licenses (e.g., California A.B.60) and in-state college tuition. The information on these state laws are obtained from Good (2013), Amuedo-Dorantes and Sparber (2014), and Amuedo-Dorantes

[20]The information on states implementing the Universal E-verify program is obtained from Orrenius and Zavodny (2016).

[21]It is also worth noting Miles and Cox (2014) found no meaningful reduction in the FBI index crime rate due to Secure Communities.

[22]Prior to Secure Communities, local enforcement agencies can enter a "287(g)" agreement with ICE to allow local law enforcement officers to perform immigration enforcement functions by conducting interviews in local jails and prisons. Since this enforcement measure is labor-intensive, there were only about two percent of the nation's counties in which the local officials were authorized to do the enforcement in local jails and prisons (Cox and Miles, 2013). Therefore, the impact of 287(g) can be expected to be small. Nevertheless, I include control for the presence of state-level 287(g) agreement in the analysis. The information for state-level 287(g) agreement is obtained from Kostandini et al. (2013).

[23]In 2012, the Supreme Court struck down many of the controversial provisions contained in S.B. 1070.

et al. (2018a).

The results of the analysis are reported in Table 4. There is no strong evidence that DACA has a substantial effect on violent crime rates. An increase of one DACA application approved per 1,000 (∼1 S.D. increase) is associated with a 0.7% decline in the overall violent crime rate (Panel A). This estimate is small in magnitude and not statistically significantly different from zero. Disaggregating violent crime into its components, I found that DACA has a negative effect on the murder rate (-4%), while it has a positive effect on the rape crime rate (2.5%). The estimates for robbery and aggravated assault are much more muted and statistically indistinguishable from zero, further suggesting that violent crime rates are not substantially affected by the implementation of DACA.

Although overall violent crime rate is not statistically significantly affected by DACA, the results of the analysis do suggest that DACA has an effect on property crime rates. An increase of one DACA application approved per 1,000 population is associated with a 2.7% decline in the overall property crime rate (Panel B of Table 4). Disaggregating property crime into its components, the results suggest that the decline in overall property crime rate is mainly driven by the reduction in burglary and larceny rates.[24] An increase of one DACA application approved per 1,000 population is associated with 2.7% and 2.4% reduction in burglary and larceny rates, respectively.

An important concern is that the OLS estimates presented above may be biased, especially since the number of approved DACA applications is strongly correlated with the presence of undocumented immigrants. For example, my estimates would be biased downward if unauthorized immigrants are more likely to reside in a state with low crime rates. To address this, I use two instrumental variable approaches. First, following the immigration literature (e.g., Altonji and Card, 1991; Card, 2001; Cortes, 2008; Peri and Sparber, 2009; Cattaneo

[24]Note that motor vehicle theft only represents a small share of property crime per 100,000 (Table 2).

et al., 2015), I exploit the tendency of new immigrants to settle in a place with a large share of immigrants from the same country, mainly because of lower information costs associated with ethnic networks. This instrument is usually known as "network" instrument, and it is constructed as follows:

$$\frac{\widehat{Undocumented}_{st}}{Population_{st}} \quad \text{where} \quad \widehat{Undocumented}_{st} = \sum_{c=1}^{9} U_{ct} \times \frac{U_{cs,1990}}{U_{c,1990}} \tag{7}$$

where $Undocumented_{st}$ is the predicted number of undocumented immigrants in state s at time t, and $Population_{st}$ is the size of population in the state. U_{ct} is the total number of unauthorized immigrants from country of origin c at time t.[25] $\frac{U_{cs,1990}}{U_{c,1990}}$ is the share of unauthorized immigrants from country c who were living in state s in 1990. Since there were no approved applications before DACA was implemented, I assigned a value of zero for the instrument in the pre-DACA period.

Although network instrument above is widely used in the literature, it may not necessarily be a valid instrument since factors that pull migrants into a destination in the past might be correlated with the crime rate today (Chalfin, 2013).[26] Therefore, in the spirit of Angrist and Kugler (2003) and Llull (2017) who used push factors such as wars/conflicts in the source country to identify the wage effects of immigration, I construct a similar instrument based on the active conflict events in Mexico that become prevalent after 2000.[27] The justification

[25] I use Borjas (2017b) residual method to impute legal status in the construction of the instrument. Similar to Spenkuch (2013), countries are aggregated into nine groups: Northwestern Europe, Eastern Europe, Southern Europe, Asia, Mexico, South and Central America, Africa, Canada, and all other countries.

[26] A recent work by Goldsmith-Pinkham et al. (2018) argues that the sufficient condition for the exclusion restriction of network instrument to be met is the exogeneity of the immigrant shares. In the case that this condition does not hold, the requirement could be met if there are many independent random shocks affecting the flows of migration from the countries of origins to the United States (Borusyak et al., 2018). Ultimately, the exclusion restriction assumption of an IV cannot be tested.

[27] An active conflict event is defined as an incident of lethal violence occurring at a given time and place that resulted in at least 25 deaths. The data for active conflicts event is obtained from the UCDP/PRIO Armed Conflict Georeferenced Event Dataset. In my previous work (Gunadi, 2019), using this instrument, I fail to find evidence that undocumented immigration statistically significantly increased overall violent and property crime rates across the U.S. states. It is important to note that the findings in Gunadi (2019) may not necessarily contradict the results of this paper. For example, the propensity to commit crime among DACA-eligible population is likely to be different from the average undocumented immigrant. Since they

for the instrument comes from the fact that the majority of unauthorized immigrants come from Mexico (Rosenblum and Ruiz Soto, 2015), so that factors that push people to migrate away from Mexico, such as conflicts, are expected to increase the presence of undocumented immigrants in U.S. states that are close to the place of conflict.[28] Specifically, I formulate the push instrument as an index that assigns a higher value to the state that is predicted to receive a larger inflow of unauthorized immigrants due to active conflicts in Mexico:

$$p_t^s = \sum_{m=1}^{32} \frac{conflict_{t-10,t}^m}{Max.conflict_{t-10,t}} \times \frac{Min.Dist.}{Dist_{sm}} \tag{8}$$

where p_t^s is the index value for state s at time t. $conflict_{t-10,t}^m$ is the casualties from all active conflict events between time t and a decade prior in Mexican state m. $Max.conflict_{t-10,t}$ is the maximum number of casualties from all active conflicts between time t and a decade prior. As such, $\frac{conflict_{t-10,t}^m}{Max.conflict_{t-10,t}}$ is a normalized conflict measure between time t and a decade prior in Mexican state m with a value between zero and one. $Dist_{sm}$ is the distance of Mexican state m with U.S. state s.[29] Therefore, $\frac{Min.Dist.}{Dist_{sm}}$ can be interpreted as an inverse distance weight, but its value is normalized to be between zero and one by multiplying it with the closest distance between a U.S. state and a Mexican state.[30] It follows that the variation in push instrument p_t^s across U.S. states comes from the differences in distance from the place of conflict in Mexico. The source of the variation can be seen in Appendix Figure 1.

entered the U.S. at a relatively young age, their propensity to commit crime is likely to be similar to U.S. natives, which has been found to be higher than foreign-born population in general (Butcher and Piehl, 1998, 2007). Therefore, it is possible that legalizing DACA-eligible population would result in lower crime rates. Additionally, DACA status can be revoked if an individual is convicted of crime, incentivizing DACA population to not commit crimes.

[28]Due to larger moving costs and an individual's dislike of living far away from home, distance has been known as a factor that mitigates the migration of people from their home country into the United States. A study by Llull (2016) estimated that the stock of Mexican immigrants in the U.S. would increase by a percentage three times larger than the percentage increase in the stock of Chinese immigrants following a $1,000 increase in U.S. income per capita.

[29]This is measured as the distance between the most populated city in Mexican state m and the most populated city in U.S. state s.

[30]The closest distance between a U.S. state and a Mexican state in the analysis is the distance between California and Baja California.

There were only two active conflicts in the Mexican state of Chiapas between 1990 and 1999, which took place as a protest to the NAFTA agreement in 1994 and 1997. In the following decades, the conflicts spread to more Mexican states after the government took a stronger stance against drug cartels starting in the 2000s. For ease of interpretation, I standardized the push instrument to have a mean of zero and a standard deviation of one. Similar to before, I assigned a value of zero for the instrument in the pre-DACA period since there were no approved applications before DACA was implemented.

Appendix Table 3 reports the first stage results of the two IV approaches. Both network and push instruments are sufficiently strong with the robust first-stage F-statistics of 61.60 and 15.84 respectively, well above Staiger and Stock (1994) rule of thumb of 10 for a weak instrument. For the network instrument, the interpretation of the estimate is that for every percentage point increase in the predicted share of undocumented immigration in the population, there are 0.26 more approved DACA applications per 1,000. For the push instrument, a one standard deviation increase in the push index is associated with 1.29 more approved DACA applications per 1,000 population.

The results of the instrumental variable analysis are reported in the second and third row of Panel A and B in Table 4. Consistent with the previous analysis, there is no strong evidence that the overall violent crime rate is affected by DACA. An increase of one approved DACA application per 1,000 is associated with 0.5% to 1.2% decline in overall violent crime rate. However, these estimates are not statistically different from zero. There is evidence that murder and robbery rates are reduced by DACA, but this is offset by the rise in rape and aggravated assault.

On property crimes, the estimates obtained using instrumental variable analysis show that DACA is statistically significantly associated with a reduction in these crime rates. An increase of one approved DACA application is associated with 2.4%-3% and 0.4%-1% reduc-

tion in burglary and larceny rates, respectively. Overall, the property crime rate is reduced by about 1.6% for every approved DACA application per 1,000. Since approximately 0.2% of the U.S. population is DACA-eligible (Table 2), this estimate suggests that legalizing all DACA-eligible individuals in the population is associated with 3.2% decline in overall property crime rate. This result is larger compared to the findings by Baker (2015), who found that IRCA reduced the property crime rate by 0.4% for each one IRCA applicant per 1,000 population. There are a few potential explanations of why DACA had a larger effect on reducing crime. First, since DACA recipients need to reapply every two years in which the eligibility of renewal depends on whether the individual is convicted of crime, there is more incentive not to commit crime among undocumented immigrants who were legalized through DACA compared to those who gained legal status through IRCA.[31] Additionally, undocumented immigrants who were legalized by DACA are more similar to U.S. natives than those gained legal status due to IRCA since they entered the United States at a relatively young age. If foreign-born individuals have lower propensity to commit crime compared to U.S. natives as suggested by Butcher and Piehl (1998, 2007), the effect of DACA on lowering crime rate would be larger than IRCA for every percentage of population being legalized because unauthorized immigrants legalized by DACA are more similar to U.S. natives compared to those gained legal status through IRCA.

6.2 Alternative Specifications

The analysis in the previous subsection used the cumulative number of approved DACA applications to measure the effects of DACA on crime. An alternative way to examine whether crime rates were affected by DACA is by using the variation in the share of DACA-

[31] It is worth noting that those who were legalized by IRCA also has a probationary period in which being convicted of a felony or three misdemeanors may lead to revocation of legal status. However, this probationary period only lasts for 18 months. Therefore, the effects of DACA in reducing crime should still be larger than IRCA.

eligible population across U.S. states. Put differently, a reduction in crime rates due to DACA should be larger in a state that has a higher share of DACA-eligible population (Figure 3). As a sensitivity check to the primary specifications, I estimate the following empirical strategy that takes advantage in the variation of the share of DACA-eligible population across the U.S. states:

$$y_{srt} = \delta_s + \delta_{rt} + \gamma HighDACA_{sr,2009-2011} + \beta(HighDACA_{sr,2009-2011} \times Post) + X'_{srt}\alpha + \varepsilon_{srt} \tag{9}$$

where $HighDACA_{sr,2009-2011}$ is an indicator on whether state s is a state with an above-median share of DACA-eligible population averaged over the 2009-2011 period to minimize measurement error. $Post$ is an indicator if it is the year 2012 onwards. Similar to before, X_{srt} is a vector of state-level control variables, while δ_s and δ_t are state and year fixed effects, respectively.

A crucial assumption for the specifications above is that states with an above median share of DACA-eligible population would experience the same change in crime rates as the states at or below the median in the absence of DACA. To provide supporting evidence that this assumption holds, I also estimate an event study model to check the parallel trends assumption as follows:

$$y_{srt} = \delta_s + \delta_{rt} + \gamma HighDACA_{sr,2009-2011} + \sum_{\phi=2006}^{2010} \beta_\phi HighDACA_{sr,2009-2011} \times 1(t=\phi) + \sum_{\phi=2012}^{2015} \beta_\phi HighDACA_{sr,2009-2011} \times 1(t=\phi) + X'_{srt}\alpha + \varepsilon_{srt} \tag{10}$$

The reference year is 2011, and the definition of the variables is the same as before. The results of these exercises are reported in Tables 5-6 and Figures 4-12.

Consistent with the results from the previous subsection, the estimates suggest that the overall violent crime rate is not largely affected by DACA. States with a high share of DACA-eligible population experienced approximately 1.1% to 1.6% decline in overall violent crime rate relative to states with a low share of DACA-eligible population (Panel A of Table 5 and Figure 4). These estimates, however, are not statistically significant. Separating violent crime into its components, the results are mixed (Table 5 and Figures 5-8). States with a high share of DACA-eligible population experienced a reduction of approximately 10% in murder rate relative to states with a low share of DACA-eligible population after DACA was announced in 2012. On the rape crime rate, the estimates are positive ($\sim$4%), although it is not statistically significant. None of the other estimates are large in magnitude and significantly distinguishable from zero. The event study graphs in Figures 4 to 8 suggest that these results are not driven by the differential trends between the states with a high share of DACA-eligible population and those with a low share of eligible population prior to DACA.

The results for property crimes are reported in Table 6. States with a high share of DACA-eligible population experienced approximately 3.4% to 4.7% decline in overall property crime rate relative to states with a low share of DACA-eligible population. Since the difference in the share of DACA-eligible population between low and high DACA eligibles states is 0.002 on average (Table 2), these estimates suggest that an increase of one DACA-eligible individual per 1000 population is associated with 1.7% to 2.35% reduction in overall property crime rate, in line with the results from the previous subsection. Further analysis suggests that the reduction in overall property crime rate is mainly driven by the decline in burglary and larceny rates (Columns 2 to 4). Relative to states with a low share of DACA-eligible population, states with a high share of DACA-eligible population experienced 5.1%-6.8% and 3.3%-4.4% reduction in burglary and larceny crime rates, respectively. The event study graphs in Figures 9 to 12 suggest that the estimates obtained using Hispanic non-citizens as a

proxy for undocumented population are a better approximation of the effects of DACA. This is because the differential trends between high and low DACA eligibles states prior to DACA are the smallest when Hispanic non-citizens are used as a proxy for unauthorized population.

One potential concern is that there might be an out-migration response by other U.S. residents because of DACA. As the analysis is conducted at the state level rather than a more disaggregated level, the bias arises from this concern should be small. However, as a further check, I examine whether states with a high share of DACA-eligible population exhibited higher natives and other immigrants out-migration rates (to other states) after DACA relative to states with a low share of DACA-eligible population (Table 7 and Figures 13-14). The results of the analysis suggest that DACA had no statistically significant impact on the out-migration rate of other immigrants and U.S. natives to other states, alleviating the concern that out-migration by natives and other immigrants lead to bias in the estimates.

In sum, the evidence suggests that DACA has no substantial effect on the overall violent crime rate. However, there is evidence that the implementation of DACA is associated with a reduction in property crimes committed for financial gains which often do not carry prison sentence penalty, such as petty theft.

7 Conclusion

There are approximately 11 million undocumented individuals in the United States (Krogstad et al., 2018). At the same time, the public is divided on the course of action pertaining to undocumented population. Proponents for legalization argue that such a policy would allow undocumented individuals to contribute more to society, while others are concerned that doing so would be detrimental to the interest of the United States. There is a need, therefore, to examine the potential benefits and costs of legalization policy.

In this paper, I evaluate the impact of a temporary legalization policy, Deferred Action for Childhood Arrivals (DACA), on crime. DACA provides a temporary reprieve from deportation and permission to work legally in the United States. As such, recent studies have documented that the labor market outcomes of undocumented youth were improved after DACA, potentially increasing the opportunity costs of committing crimes (Pope, 2016; Amuedo-Dorantes and Antman, 2017). The analysis yields a few main results. First, the findings from the individual-level analysis show no evidence that DACA statistically significantly affected the incarceration rate of undocumented youth. This result is robust to controlling for the differences in characteristics associated with DACA eligibility, such as age and age at arrival. Second, at the state level, the evidence suggests that the implementation of DACA is associated with a reduction in property crime rates. An increase of one DACA application approved per 1,000 population is associated with a 1.6% decline in overall property crime rate. This finding suggests that policies that limit the employment opportunities of immigrants may lead to a higher rate of crimes committed for financial gains that often do not lead to incarceration.

8 Tables and Figures

Table 1: Pre-DACA Descriptive Statistics for Institutionalization Analysis

	Non-citizens		Hispanic non-citizens		Borjas (2017) Residual Method	
	DACA Eligible	DACA Ineligible	DACA Eligible	DACA Ineligible	DACA Eligible	DACA Ineligible
Institutionalized	0.012	0.019	0.014	0.024	0.014	0.021
Age	22.03	28.20	22.16	28.12	21.94	27.90
Age at Arrival	8.91	19.96	8.52	18.99	9.14	20.22
Race:						
White	0.48	0.48	0.57	0.56	0.49	0.48
Black	0.09	0.06	0.01	0.01	0.07	0.05
Other	0.43	0.46	0.42	0.43	0.44	0.47
Education:						
High School Dropout	0.00	0.45	0.00	0.60	0.00	0.49
High School Graduates	0.54	0.24	0.63	0.26	0.56	0.24
College	0.46	0.32	0.37	0.14	0.44	0.28
Labor Force Participation	0.76	0.87	0.82	0.91	0.76	0.88
Observations	24814	188218	15430	120642	16278	133583

Notes: Estimates are based on sample of men of age 18 to 35 from American Community Survey 2006-2011.

Table 2: Pre-DACA States' Characteristics

	All States	Low DACA Eligibles States			High DACA Eligibles States		
		Non-citizens	Hispanic non-citizens	Borjas (2017) Residual Method	Non-citizens	Hispanic non-citizens	Borjas (2017) Residual Method
Violent Crime per 100,000							
Overall	412	383	407	417	442	417	407
Murder	5	5	5	5	5	5	5
Rape	33	36	34	35	30	31	31
Robbery	113	87	110	111	141	117	116
Aggravated Assault	261	256	257	266	265	264	255
Property Crime per 100,000							
Overall	3071	2963	3009	3014	3184	3136	3131
Burglary	683	688	657	675	677	710	690
Larceny	2112	2063	2105	2099	2163	2119	2125
Motor Vehicle Theft	277	212	247	239	344	307	316
Economic and Demographic Variables							
Unemployment Rate	0.072	0.070	0.071	0.071	0.074	0.074	0.073
Employment-to-Population Ratio	0.729	0.727	0.730	0.727	0.731	0.728	0.731
Share of Married Individuals in Population	0.40	0.41	0.40	0.40	0.39	0.40	0.40
Share of Black in Population	0.111	0.106	0.118	0.123	0.115	0.102	0.097
Share of White in Population	0.776	0.823	0.789	0.809	0.727	0.763	0.742
Share of College-educated in Population	0.427	0.411	0.420	0.416	0.444	0.434	0.438
Share of DACA Eligible Population in 2009-2011							
Non-citizens	0.002	0.001			0.004		
Hispanic non-citizens	0.001		0.000			0.003	
Borjas (2017) Residual Method	0.002			0.001			0.002

Notes: American Community Survey 2006-2011. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. "High DACA Eligible States" are states with the share of DACA eligible population above median in 2009-2011 period. "Low DACA Eligible States" are states with the share of DACA eligible population at or below median in 2009-2011 period.

Table 3: DACA and Institutionalization Rate

	Non-citizens		Hispanic non-citizens		Borjas (2017) Residual Method	
DACA Eligible	-0.016***	-0.016***	-0.019***	-0.019***	-0.020***	-0.020***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DACA Eligible x Post	0.000	-0.000	-0.001	-0.002	-0.001	-0.002
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Controls:						
Individual's Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No	Yes	No
State-by-Year Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	341711		208971		234670	

Notes: *DACA Eligible x Post* estimates show the effects of DACA on the institutionalization rate of DACA eligible population compared to non-eligible undocumented population. The sample is composed of undocumented men of age 18 to 35 years old from American Community Survey 2006-2015. "Non-citizens" column shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" column shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" column shows the estimates when undocumented population is imputed using Borjas (2017) method. Controls for individuals' characteristics include race, age, age at arrival, and educational attainment. Survey sampling weights are used in the regressions. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 4: Approved DACA Application and Natural Log of Crime Rates

	(1) Overall	(2) Murder	(3) Rape	(4) Robbery	(5) Aggravated Assault
Panel A: Violent Crime					
DACA Application Approved per 1000 (OLS)	-0.007	-0.040***	0.025	-0.018	0.003
	(0.011)	(0.014)	(0.021)	(0.012)	(0.012)
DACA Application Approved per 1000 (Network IV)	-0.005	-0.068***	0.070***	-0.030***	0.015
	(0.013)	(0.014)	(0.026)	(0.011)	(0.015)
DACA Application Approved per 1000 (Push IV)	-0.012	-0.087***	0.047***	-0.020	0.006
	(0.010)	(0.024)	(0.018)	(0.022)	(0.010)
Observations	510	510	510	510	510

	(1) Overall	(2) Burglary	(3) Larceny	(4) Vehicle Theft
Panel B: Property Crime				
DACA Application Approved per 1000	-0.027***	-0.027***	-0.024***	-0.038**
	(0.006)	(0.008)	(0.007)	(0.015)
DACA Application Approved per 1000 (Network IV)	-0.018***	-0.030***	-0.010**	-0.038***
	(0.005)	(0.008)	(0.005)	(0.014)
DACA Application Approved per 1000 (Push IV)	-0.016*	-0.024**	-0.004	-0.058**
	(0.010)	(0.011)	(0.011)	(0.027)
Observations	510	510	510	510

Notes: The estimates show the effects of an increase of one approved DACA application per 1,000 population on crime rates. Panel A shows the estimates for violent crimes. Panel B shows the estimates for property crimes. All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. The regressions are weighted by state population. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 5: DACA and Natural Log of Violent Crime Rate

	(1) Violent Crimes	(2) Murder	(3) Rape	(4) Robbery	(5) Aggravated Assault
Panel A: Non-citizens					
High DACA Eligibles States x Post	-0.011	-0.108***	0.046	-0.012	-0.003
	(0.043)	(0.035)	(0.055)	(0.034)	(0.052)
Panel B: Hispanic non-citizens					
High DACA Eligibles States x Post	-0.014	-0.096***	0.042	-0.029	-0.007
	(0.043)	(0.036)	(0.055)	(0.036)	(0.053)
Panel C: Borjas (2017) Residual Method					
High DACA Eligibles States x Post	-0.016	-0.102***	0.043	-0.018	-0.012
	(0.044)	(0.035)	(0.055)	(0.035)	(0.054)
Observations	510	510	510	510	510

Notes: *High DACA Eligible States x Post* estimates show the effects of DACA on natural log of violent crime rates in states with a high share (above median) of DACA eligible population relative to states with a low share (at or below median) of DACA eligible population. Panel A shows the estimates when undocumented population is proxied by non-citizens in the population. Panel B shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. Panel C shows the estimates when undocumented population is imputed using Borjas (2017) method. All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. The regressions are weighted by state population. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 6: DACA and Natural Log of Property Crime Rate

	(1) Property Crimes	(2) Burglary	(3) Larceny	(4) Motor Vehicle Theft
Panel A: Non-citizens				
High DACA Eligibles States x Post	-0.047***	-0.068***	-0.044**	-0.046
	(0.018)	(0.017)	(0.020)	(0.029)
Panel B: Hispanic non-citizens				
High DACA Eligibles States x Post	-0.034**	-0.051***	-0.033*	-0.006
	(0.016)	(0.017)	(0.019)	(0.030)
Panel C: Borjas (2017) Residual Method				
High DACA Eligibles States x Post	-0.044**	-0.061***	-0.043**	-0.024
	(0.017)	(0.016)	(0.021)	(0.030)
Observations	510	510	510	510

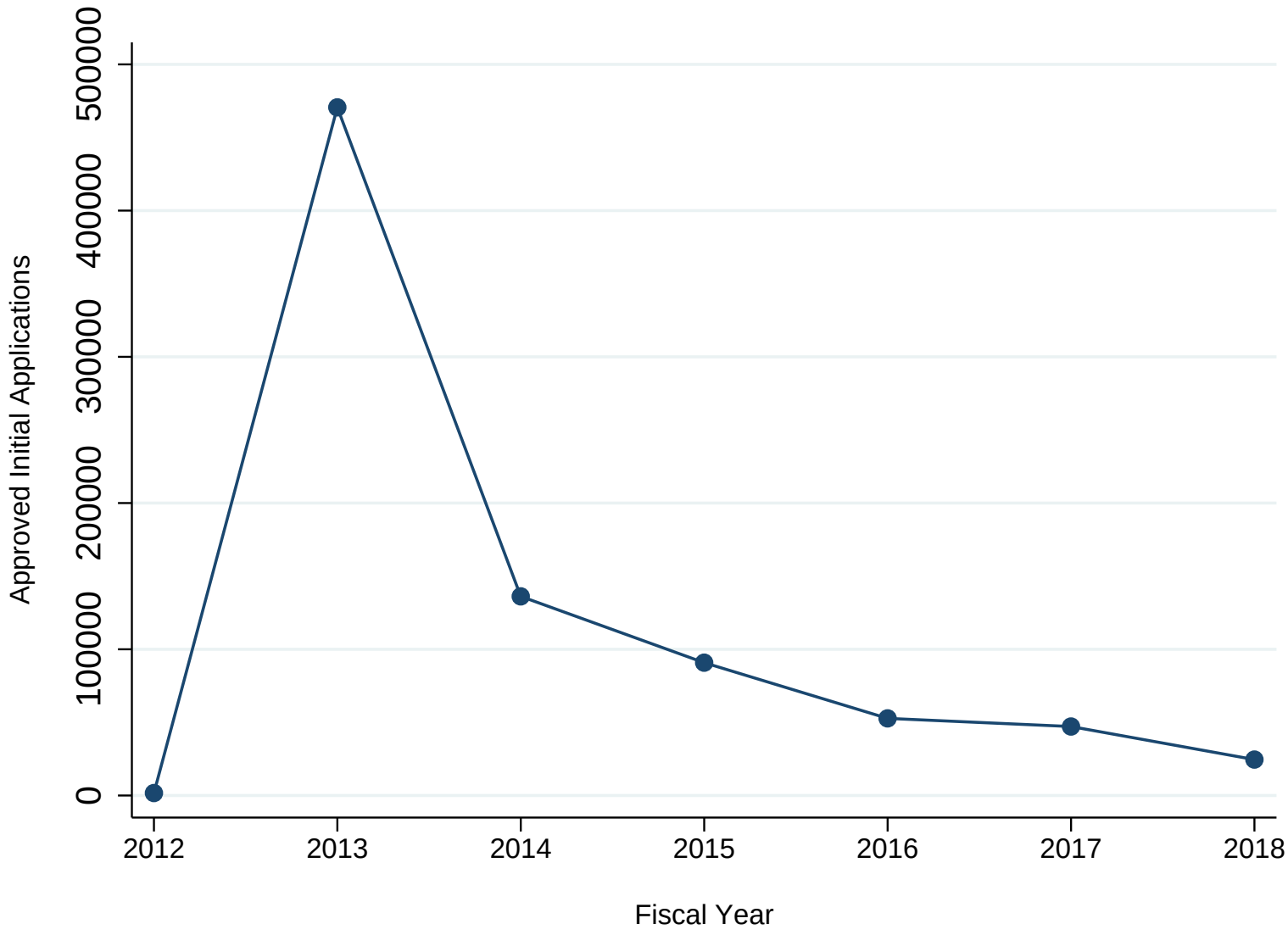
Notes: *High DACA Eligibles States x Post* estimates show the effects of DACA on natural log of property crime rates in states with a high share (above median) of DACA eligible population relative to states with a low share (at or below median) of DACA eligible population. Panel A shows the estimates when undocumented population is proxied by non-citizens in the population. Panel B shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. Panel C shows the estimates when undocumented population is imputed using Borjas (2017) method. All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. The regressions are weighted by state population. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 7: DACA and Natural Log of Out-migration Rate to Other States

	(1) Other Immigrants	(2) U.S. Natives
Panel A: Non-citizens as Proxy for Legal Status		
High DACA Eligibles States x Post	-0.022	-0.037
	(0.044)	(0.032)
Panel B: Hispanic non-citizens as Proxy for Legal Status		
High DACA Eligibles States x Post	-0.037	-0.020
	(0.042)	(0.037)
Panel C: Borjas (2017) Residual Method to Impute Legal Status		
High DACA Eligibles States x Post	-0.040	-0.018
	(0.043)	(0.037)
Observations	510	510

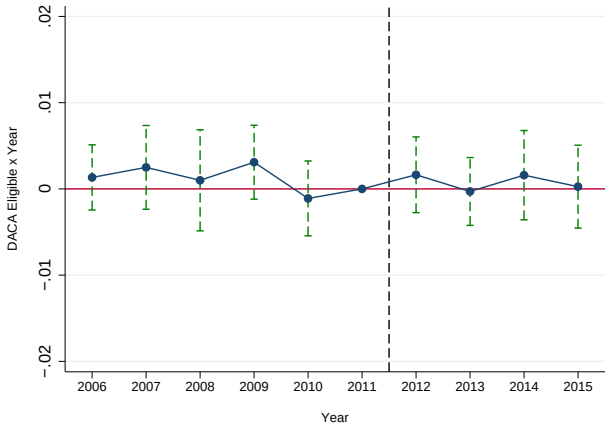
Notes: *High DACA Eligibles States x Post* estimates show the effects of DACA on natural log of out-migration rate (to other states) in states with a high share (above median) of DACA eligible population relative to states with a low share (at or below median) of DACA eligible population. Panel A shows the estimates when undocumented population is proxied by non-citizens in the population. Panel B shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. Panel C shows the estimates when undocumented population is imputed using Borjas (2017) method. All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. The regressions are weighted by state population. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Figure 1: Approved Initial Applications by Fiscal Year

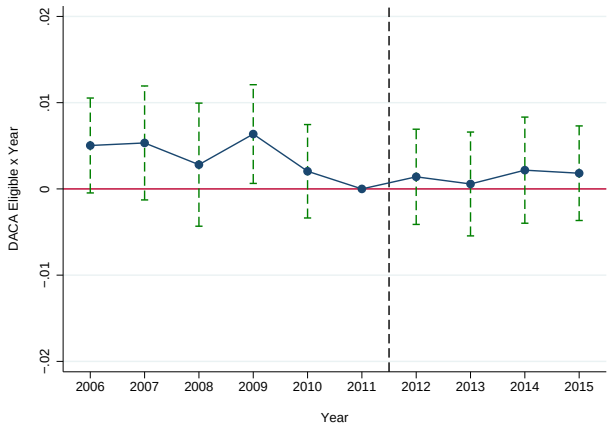


Notes: USCIS (2019b). Fiscal year covers the period of October in the previous year through September in the current year.

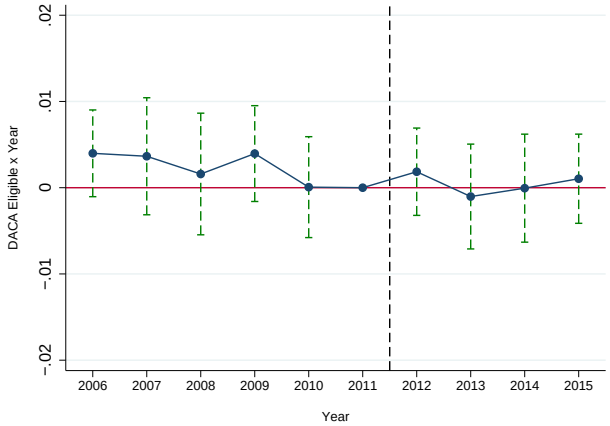
Figure 2: Effect of DACA on Institutionalization Rate



(a) Non-citizens



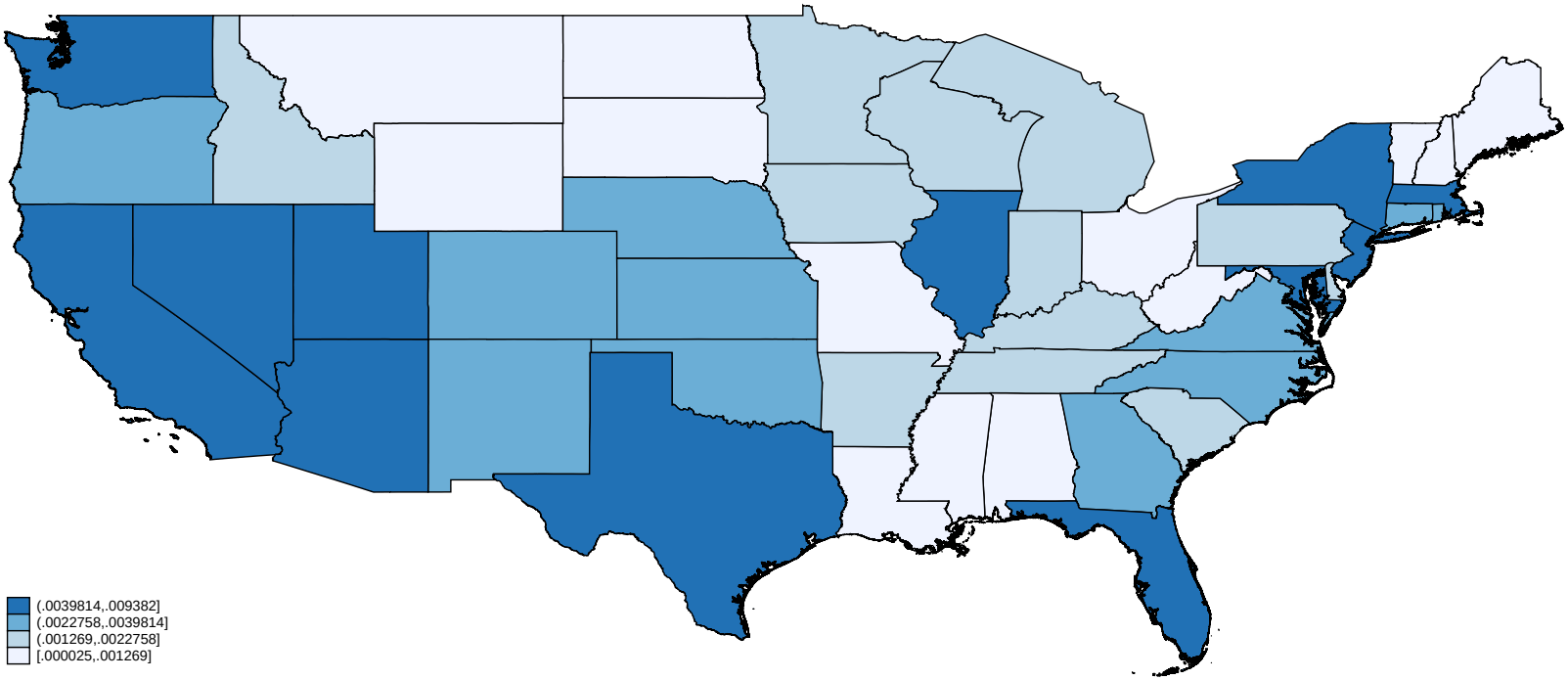
(b) Hispanic non-citizens



(c) Borjas (2017) Residual Method

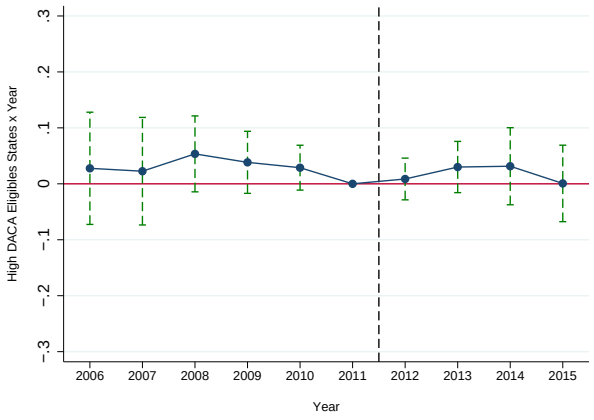
Notes: Data are from American Community Survey 2006-2015. Each point shows the coefficient of the interaction between DACA eligibility and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for race, age, age at arrival, educational attainment, and state-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. Survey sampling weights are used in the regressions.

Figure 3: Share of DACA-Eligible Population Across U.S. States

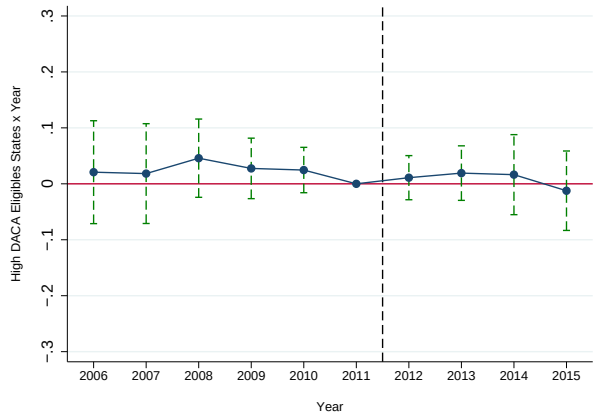


Notes: Data are from American Community Survey 2011. Undocumented status is proxied using non-citizen indicator.

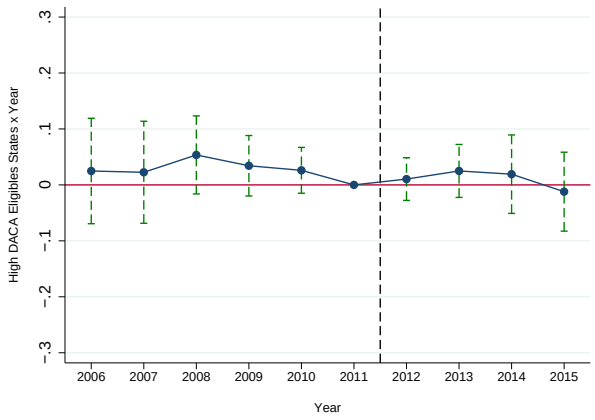
Figure 4: Effect of DACA on Natural Log of Violent Crime Rate



(a) Non-citizens



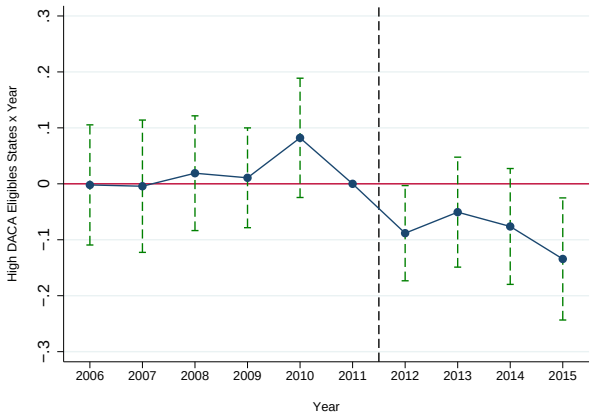
(b) Hispanic non-citizens



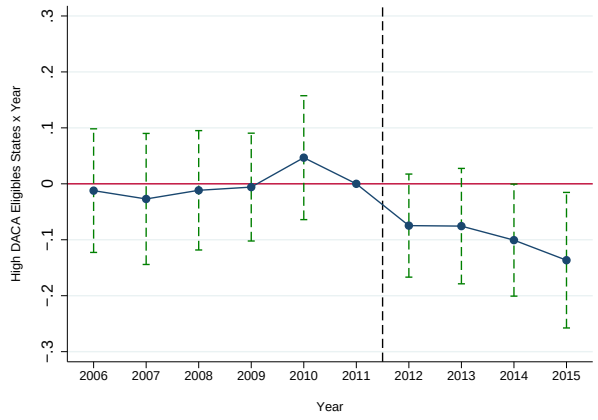
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

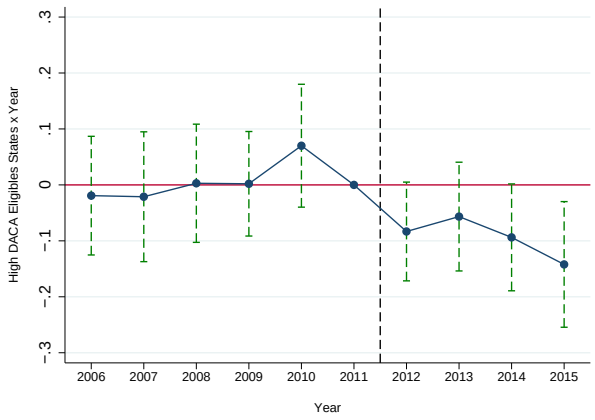
Figure 5: Effect of DACA on Natural Log of Murder Rate



(a) Non-citizens



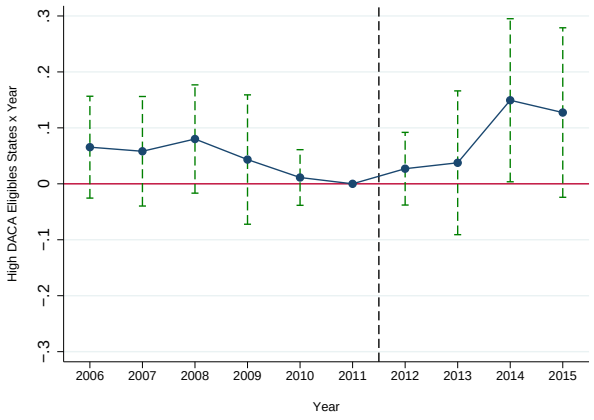
(b) Hispanic non-citizens



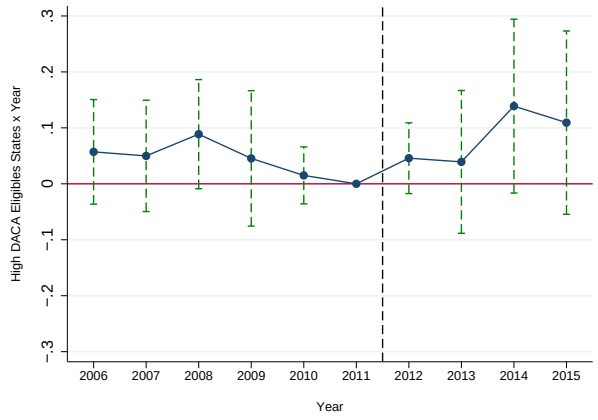
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

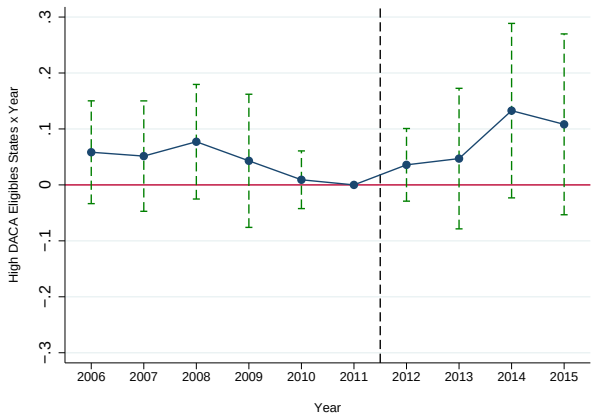
Figure 6: Effect of DACA on Natural Log of Rape Crime Rate



(a) Non-citizens



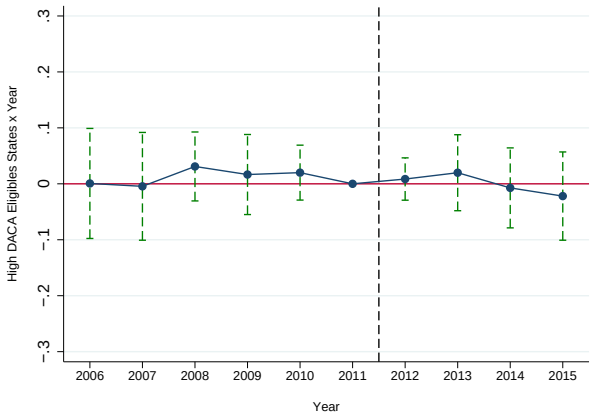
(b) Hispanic non-citizens



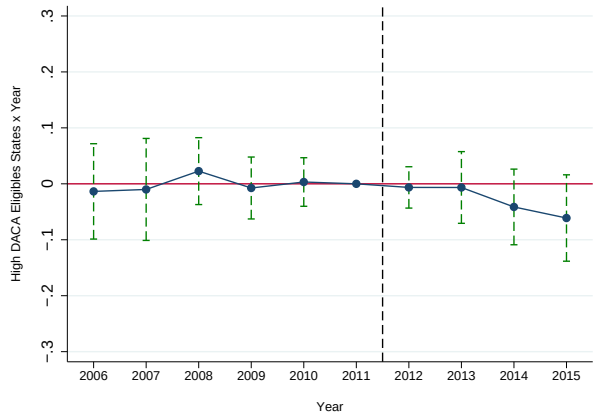
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

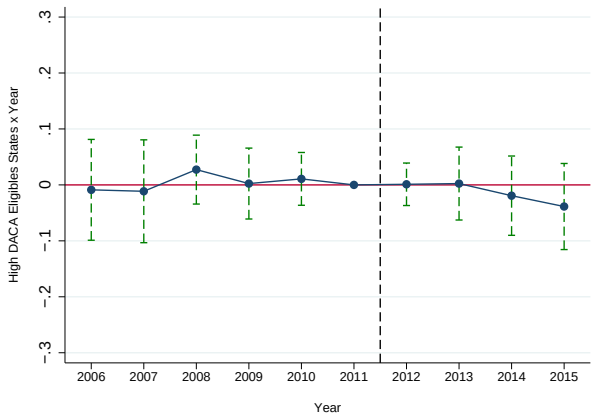
Figure 7: Effect of DACA on Natural Log of Robbery Rate



(a) Non-citizens



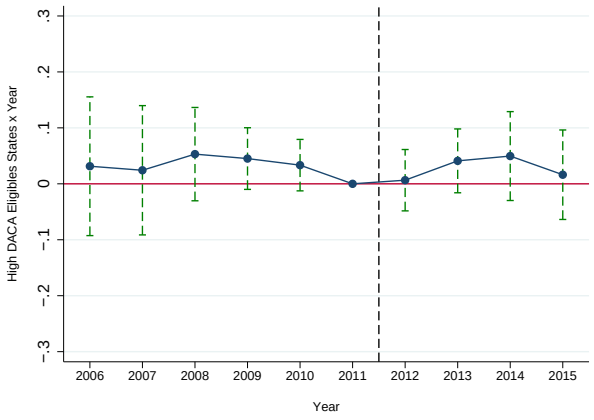
(b) Hispanic non-citizens



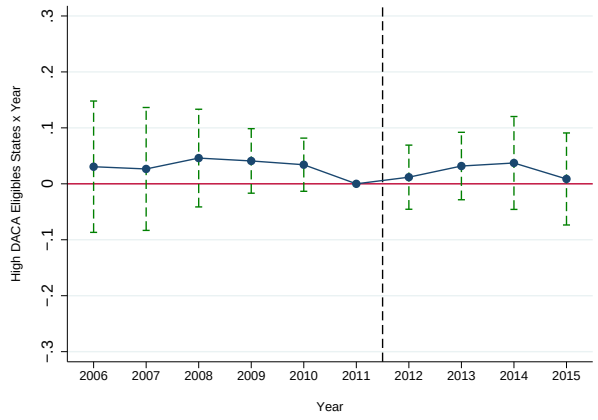
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

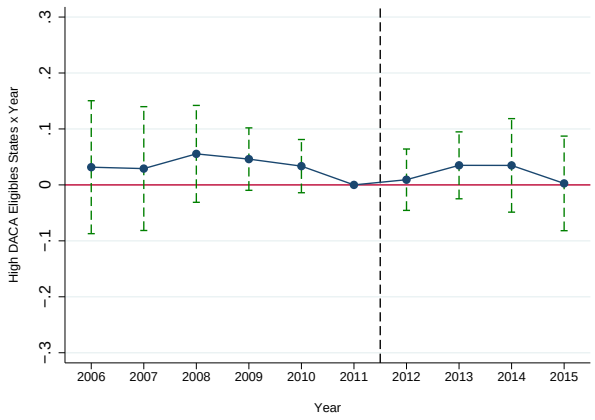
Figure 8: Effect of DACA on Natural Log of Aggravated Assault Rate



(a) Non-citizens



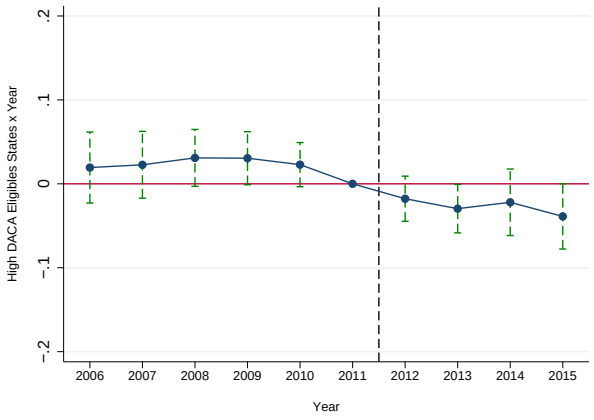
(b) Hispanic non-citizens



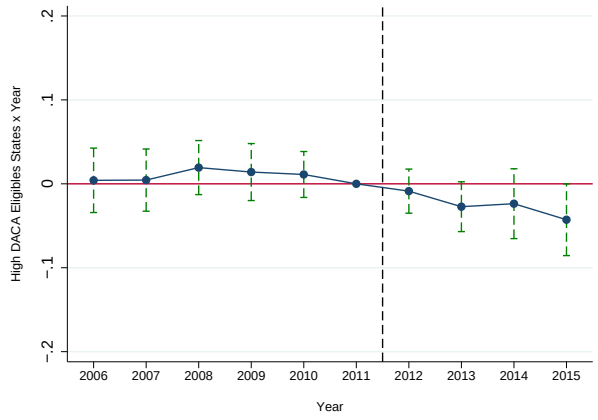
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

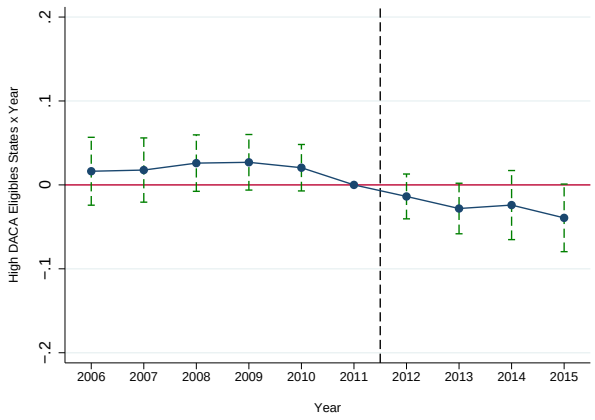
Figure 9: Effect of DACA on Natural Log of Property Crime Rate



(a) Non-citizens



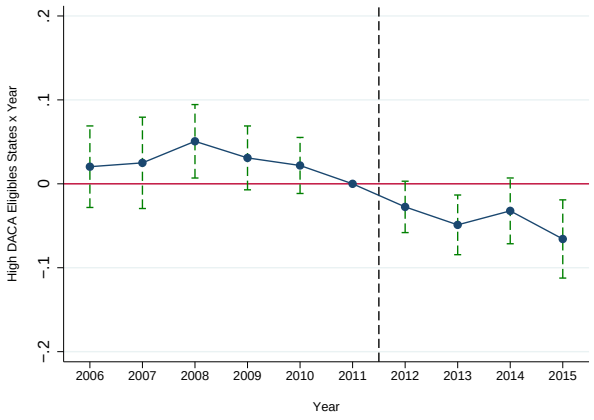
(b) Hispanic non-citizens



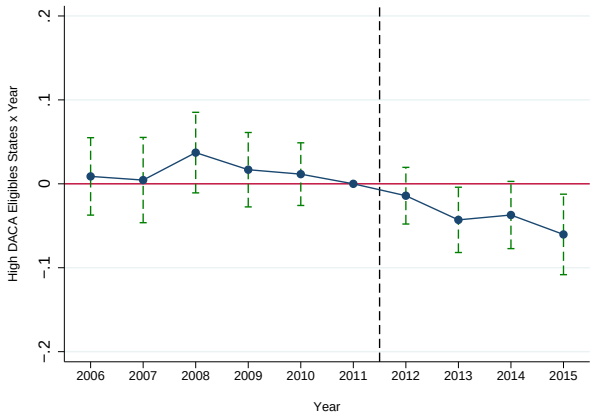
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

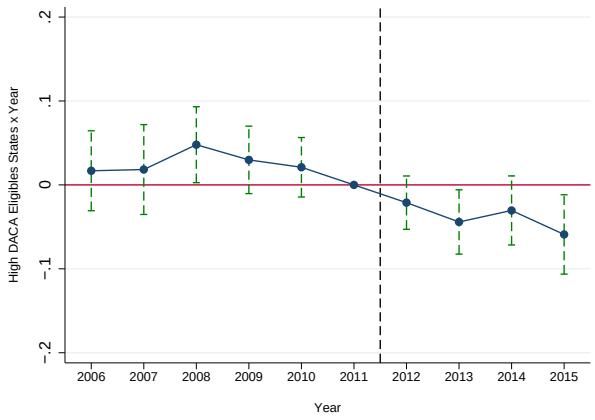
Figure 10: Effect of DACA on Natural Log of Burglary Rate



(a) Non-citizens



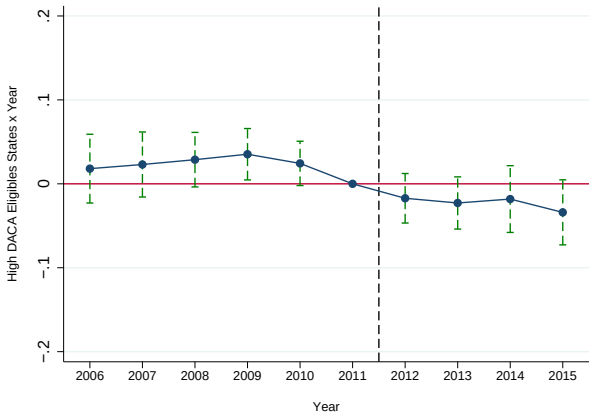
(b) Hispanic non-citizens



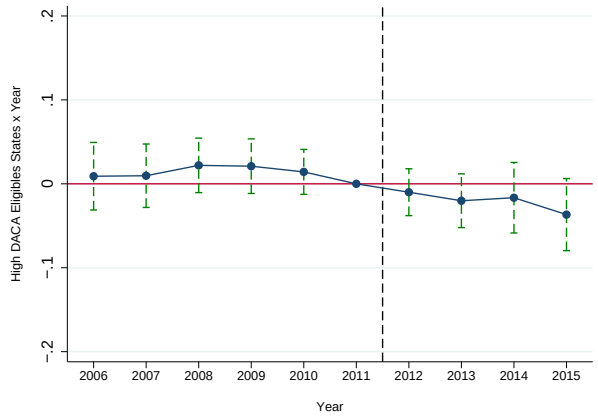
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

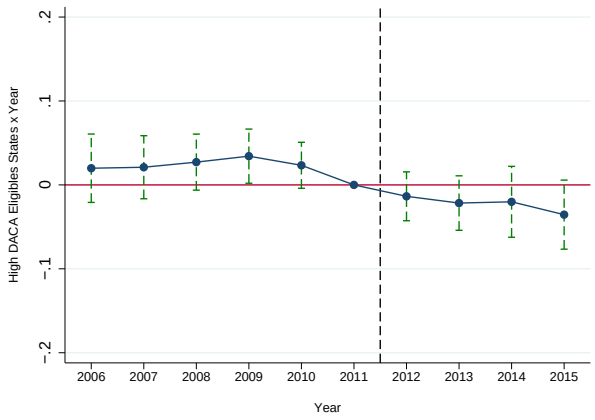
Figure 11: Effect of DACA on Natural Log of Larceny Rate



(a) Non-citizens



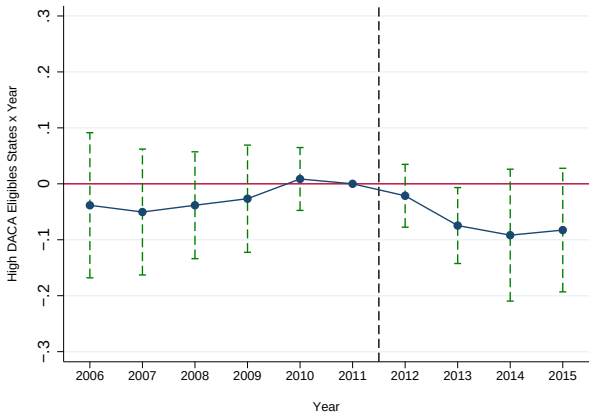
(b) Hispanic non-citizens



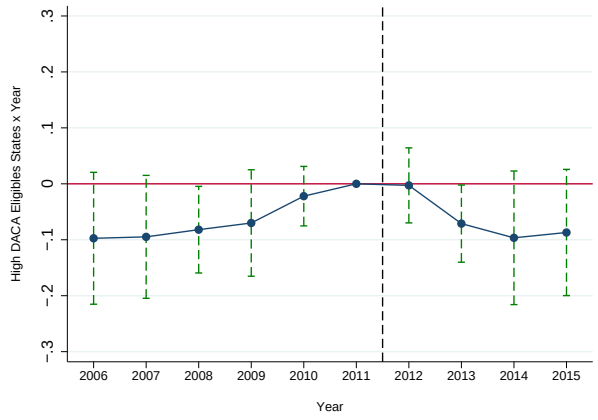
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

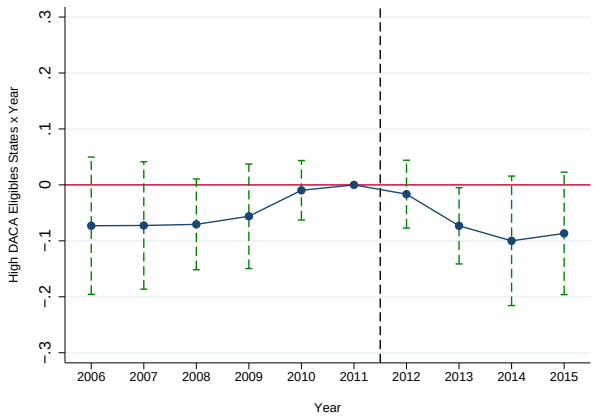
Figure 12: Effect of DACA on Natural Log of Motor Vehicle Theft Rate



(a) Non-citizens



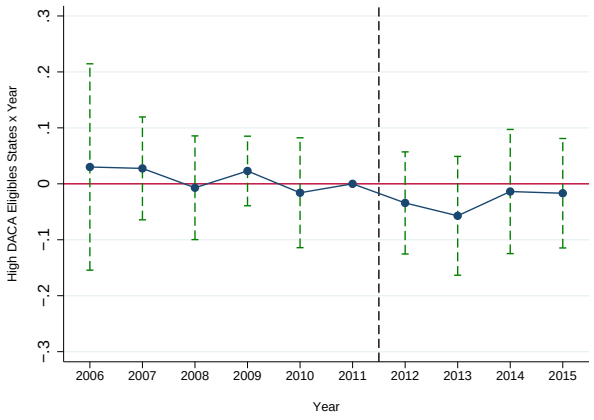
(b) Hispanic non-citizens



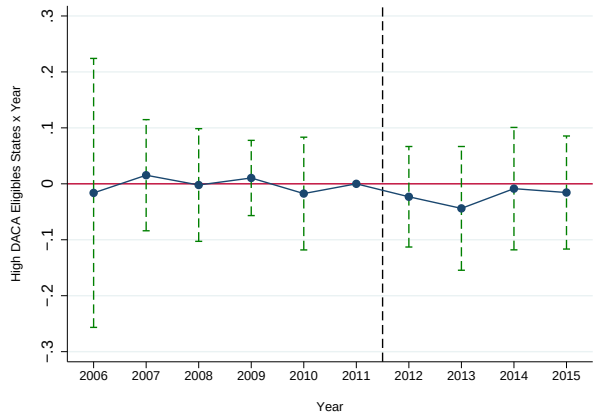
(c) Borjas (2017) Residual Method

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

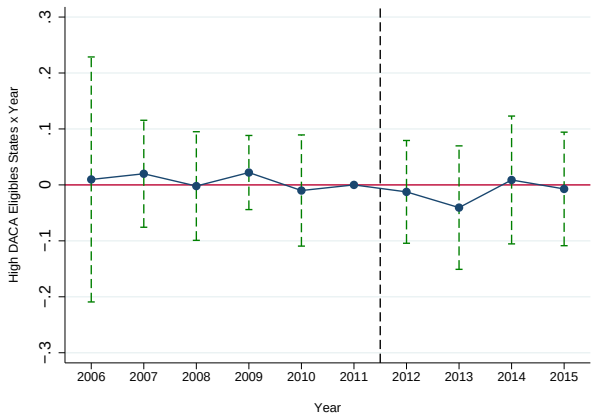
Figure 13: Effect of DACA on Natural Log of U.S. Natives Out-migration to Other States



(a) Non-citizen for Undocumented Status



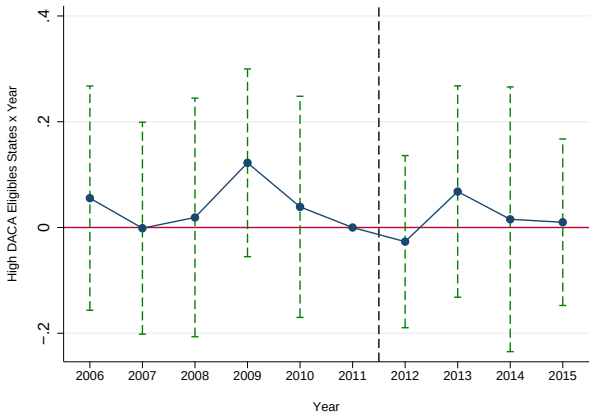
(b) Hispanic non-citizen for Undocumented Status



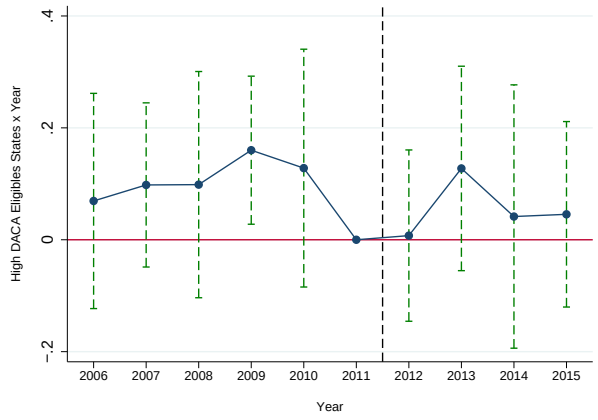
(c) Residual Method for Undocumented Status

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

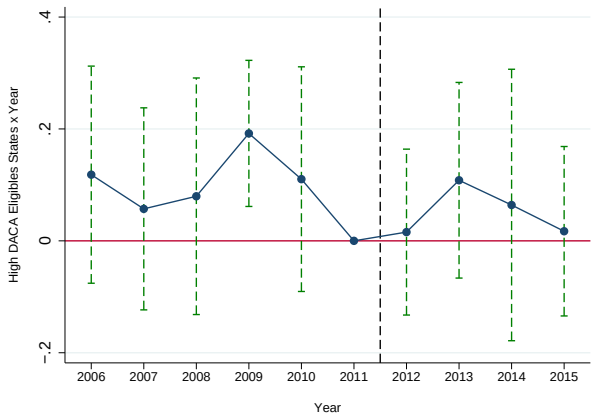
Figure 14: Effect of DACA on Natural Log of Other Immigrants Out-migration to Other States



(a) Non-citizen for Undocumented Status



(b) Hispanic non-citizen for Undocumented Status



(c) Residual Method for Undocumented Status

Notes: Each point shows the coefficient of the interaction between High DACA Eligibles States and year indicators in the event study regression (2011 is the omitted interaction). All regressions include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. "Non-citizens" shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" shows the estimates when undocumented population is imputed using Borjas (2017) method. 95% confidence intervals constructed with standard errors clustered at the state level are provided in the figure. The regressions are weighted by state population.

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Appendix

Appendix Table 1: DACA and Labor Force Participation

	Non-citizens		Hispanic non-citizens		Borjas (2017) Residual Method	
DACA Eligible	0.051***	0.051***	0.012***	0.011***	0.050***	0.049***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.006)	(0.006)
DACA Eligible x Post	0.016***	0.015***	0.021***	0.020***	0.022***	0.022***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
Controls:						
Individual's Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No	Yes	No
State-by-Year Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	341711		208971		234670	

Notes: *DACA Eligible x Post* estimates show the effects of DACA on the labor force participation of DACA eligible population compared to non-eligible undocumented population. The sample is composed of undocumented men of age 18 to 35 years old from American Community Survey 2006-2015. "Non-citizens" column shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" column shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" column shows the estimates when undocumented population is imputed using Borjas (2017) method. Controls for individuals' characteristics include race, age, age at arrival, and educational attainment. Survey sampling weights are used in the regressions. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Appendix Table 2: DACA and Institutionalization Rate
(Arriving Between Ages 12 and 19 Only)

	Non-citizens		Hispanic non-citizens		Borjas (2017) Residual Method	
DACA Eligible	0.004	0.005	0.002	0.005	0.006	0.007*
	(0.003)	(0.003)	(0.005)	(0.006)	(0.004)	(0.004)
DACA Eligible x Post	0.000	0.001	-0.002	-0.001	0.001	-0.000
	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.003)
Controls:						
Individual's Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No	Yes	No
State-by-Year Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	35157		21297		24192	

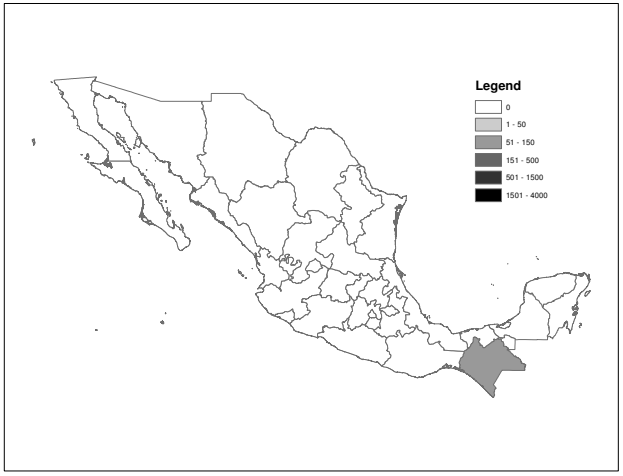
Notes: *DACA Eligible x Post* estimates show the effects of DACA on the institutionalization rate of DACA eligible population compared to non-eligible undocumented population. The sample is composed of undocumented men of age 18 to 35 years old entering the U.S. between ages 12 and 19 from American Community Survey 2006-2015. "Non-citizens" column shows the estimates when undocumented population is proxied by non-citizens in the population. "Hispanic non-citizens" column shows the estimates when undocumented population is proxied by Hispanic non-citizens in the population. "Residual method" column shows the estimates when undocumented population is imputed using Borjas (2017) method. Controls for individuals' characteristics include race, age, age at arrival, and educational attainment. Survey sampling weights are used in the regressions. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Appendix Table 3: Network/Push Instrument and Approved DACA Applications per 1,000

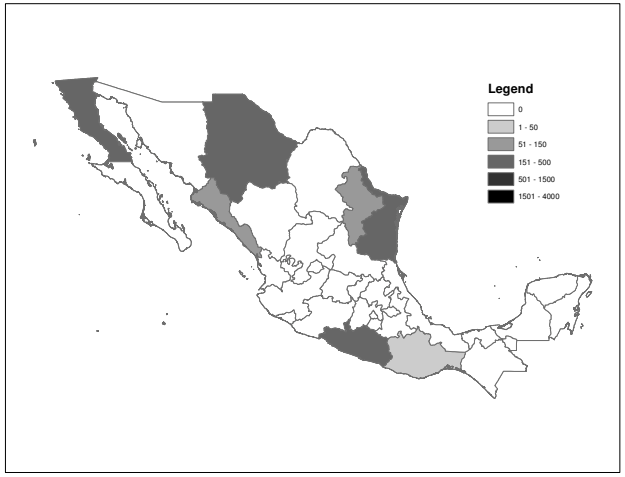
	(1)
Network Instrument	26.227***
	(3.342)
Robust First-stage F-stats	61.60
Push Instrument	1.287***
	(0.323)
Robust First-stage F-stats	15.84
Observations	510

Notes: The estimate shows the association between the instrument and the Approved DACA Applications per 1,000. The regression include controls for unemployment rate, employment-to-population ratio, share of married individuals in the population, share of whites in the population, share of blacks in population, share of college-educated individuals in population, E-verify indicators, omnibus immigration laws, state laws related to undocumented immigrants eligibility for driver license and in-state college tuition, state-level 287(g) agreement, fraction of counties with activated Secure Communities, state fixed effects, year fixed effects, and region-by-year fixed effects. Regressions are weighted by state population. Heteroskedastic- and clustered-robust standard errors at state level in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

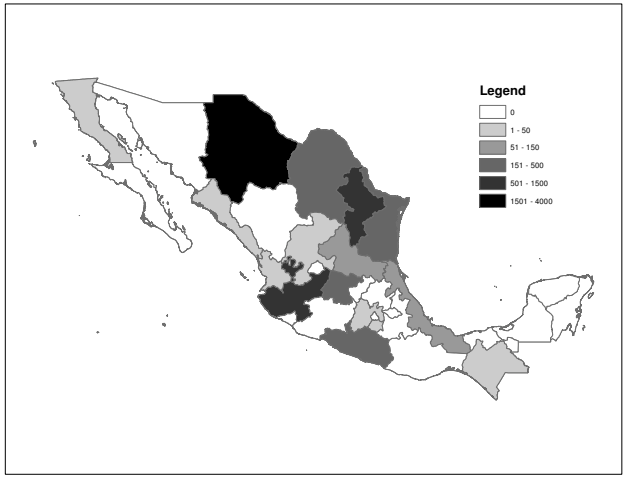
Figure .1: Casualties from Active Conflict Events in Mexico 1990 - 2014



(a) 1990-1999



(b) 2000-2009



(c) 2010-2014