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Unlocking Occupational Opportunity: The Labor Market Effects of DACA
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ABSTRACT

U.S. laws make it illegal for employers to knowingly hire undocumented migrants. This legal constraint affects which firms will employ unauthorized workers and what jobs undocumented migrants can expect to get. As a result, unauthorized migrants are more likely to end up in jobs that have a lower risk of detection of immigration status and are less desirable. The Deferred Action for Childhood Arrivals (DACA) policy, which began in August 2012, gave temporary legal authorization to work in the U.S. to a subset of undocumented migrants – those who arrived in the U.S. as children meeting certain other eligibility criteria. In this paper, we use a difference-in-differences strategy to estimate the effect of DACA on the occupational outcomes of young adults who arrived in the U.S. as children. Applying this strategy to individual-level data from the American Community Survey, we find that DACA eligibility decreases the likelihood that noncitizen childhood immigrants hold traditional immigrant jobs or jobs with a high risk of injury, and increases the likelihood of holding a government job or jobs that require occupational licensing. On the whole, DACA eligibility shifts noncitizen childhood immigrants to occupations that are higher-paying and employ more educated workers. These findings are consistent with legal barriers constraining undocumented childhood migrants from taking the jobs they are interested in and have the skills for. These workers are shunted to jobs they find less desirable and there are societal losses from the misallocation of talent.

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I. INTRODUCTION

Unauthorized immigrants in the U.S. face multiple barriers that constrain their social and economic integration. In the absence of legal residency and work authorization, they are excluded from legal employment opportunities, do not qualify for many social safety net programs, and have limited access to higher education in most states. These impediments often hamper undocumented immigrants' prospects for economic mobility and contribute to the observed occupational segregation among migrant workers (Hellerstein and Neumark 2008). As such, unauthorized workers are disproportionally represented in dangerous jobs (Orrenius and Zavodny 2009), low-wage occupations, and job environments that relegate them to the shadows (Ortega and Hsin 2022). In this paper, we examine how granting access to temporary work authorization impacts the occupational outcomes of young undocumented immigrants by leveraging the eligibility requirements for the Deferred Action for Childhood Arrivals (DACA) program.

Enacted in June 2012 via executive order, DACA grants temporary work authorization and defers removal action against unlawful migrants who arrived in the country as children and meet various age and education requirements.[1] For those who are DACA-eligible, this program offers to remove the legal constraints that limit their job opportunities, thus expanding the set of occupations over which unauthorized workers can optimize their labor market choices. Consequently, investigating the impacts of DACA on the occupational outcomes of young migrants not only contributes to the ongoing policy discussion about the impacts of this program, but it more broadly reveals the choices workers make when employment opportunities expand. In particular, observing no change in occupational outcomes would suggest that undocumented workers already hold desired jobs subject to skill and preference constraints, and that the legal work barriers are not binding. Alternatively, a change in occupational outcomes would be indicative of a positive response to the expanded job opportunities – a utility-improving outcome. Not only might there be gains in terms of the utility of the DACA-eligible young migrants, but potentially there may be efficiency gains

[1] Since its adoption, over 800,000 individuals have received temporary relief from deportation and work permit, accounting for roughly 70 percent of the estimated eligible population (Migration Policy Institute n.d.). For more details, see https://www.uscis.gov/DACA

by reducing the misallocation of talent and enabling these workers to get jobs closer to their skills and interests.

Prior research demonstrates that, among those who are eligible, the enactment of DACA was followed by improved labor market outcomes at the extensive and intensive margins, increasing labor force participation (Pope 2016), the likelihood of employment (Pope 2016; Amuedo-Dorantes and Antman 2017), weekly hours worked (Pope 2016), income among those at the bottom of the income distribution (Pope 2016), and an overall decline in the incidence of poverty for households headed by DACA-eligible individuals (Amuedo-Dorantes and Antman 2016).[2] Yet, our understanding of the implications of DACA on the occupational outcomes of young migrants is limited.[3] We contribute to this literature by examining the impact of this program on a broader set of labor market outcomes that are well-suited to capture changes in working conditions and career potential.

A closely related line of work also documents meaningful changes in educational investments, with the direction of the responses varying between secondary and postsecondary levels. DACA raised high school enrollment and graduation significantly (Kuka, Shenhav, and Shih 2020), and increased the likelihood of obtaining a GED certificate (Pope 2016). However, there is evidence that DACA incentivized short-term labor market returns at the expense of longer-term investments in higher education (Amuedo-Dorantes and Antman 2017), increasing the dropout rate among undocumented students enrolled in four-year institutions and reducing the course load among those enrolled in two-year colleges (Hsin and Ortega 2018). Our work contributes to this literature by examining occupational choices alongside educational outcomes in order to assess the extent to which educational investments mediate the impacts on occupation. Moreover, insights from prior work suggest meaningful adjustments in educational investments at the high school margin particularly among those who were of school-going age when DACA was announced (Kuka, Shenhav, and Shih 2020). As such, we conduct our empirical analyses stratified by age of

[2] Other research on the impacts of DACA documents improvements in health (Giuntella and Lonsky 2020; Hainmueller et al. 2017), teenage pregnancy (Kuka, Shenhav, and Shih 2019), and household poverty (Amuedo-Dorantes and Antman 2016).

[3] Pope (2016) and Amuedo-Dorantes and Antman (2017) examine the impact of DACA on broad occupational measures such as high-low skills and formal-informal sectors as ancillary outcomes, and find small and imprecise effects.

exposure, making a clear distinction between those who were of high school-going age when the program went into effect and individuals who were older and therefore faced higher investment costs that may stifle their educational adjustments in response to the program.

Interrogating the changes in occupational choices among unauthorized workers following the passing of DACA is of interest for several reasons. First, evidence suggests that limited occupational mobility among unauthorized migrants is among the factors contributing to the low returns to labor market experience for this subset of the workforce (Borjas and Cassidy 2019). It is also well documented that immigrant workers exhibit a high degree of job segregation and are excluded from various jobs and types of employers. For example, Ortega and Hsin (2022) estimate disproportionately low shares of immigrant employment in occupations with licensing requirements and those that expose undocumented workers to a higher risk of apprehension.[4] Similarly, noncitizen migrants are substantially underrepresented in public-sector employment at the federal, state, and local levels (Lewis, Liu, and Edwards 2014). Studies also document that immigrants, especially those who are likely undocumented, hold riskier jobs characterized by high injury and fatality rates (Orrenius and Zavodny 2009; Hall and Greenman 2015). Lastly, the DACA program faces a tenuous future, and with it, the status of hundreds of thousands of immigrants who are eligible for the program remains uncertain. In this context, therefore, it is paramount to provide evidence of DACA's impact on the economic and social outcomes of immigrants to inform the ongoing policy conversation.

We estimate the causal effect of DACA on the occupational outcomes of immigrants following a difference-in-differences (DID) approach leveraging data from three sources -- the American Community Survey, the Survey of Occupational Injuries and Illnesses, and the Current Population Survey. In short, we compare outcomes of Hispanic immigrant noncitizens to Hispanic immigrant citizens who arrived in the U.S. by age 10, before and after the passing of DACA. Following Kuka, Shenhav, and Shih (2020), we choose immigrant citizens who meet the age guidelines for DACA as the comparison group holding as the identifying assumption that this is the most appropriate group whose trend in outcomes

[4] E.g., occupations that require face-to-face interactions with government officials, or long-distance travel (Ortega and Hsin 2018).

indicate the counterfactual change in outcomes over time for the undocumented immigrants in the absence of the program. Informed by prior studies (e.g., Orrenius and Zavodny 2009; Lewis, Liu, and Edwards 2014; Ortega and Hsin 2022), we consider various occupation types, such as traditional immigrant jobs, risky occupations, public-sector employment, jobs that require occupational licensing, and general measures of occupational prestige.

Overall, DACA resulted in a systematic shift in occupation types along various dimensions. First, we find a decrease in the likelihood that noncitizen childhood immigrants hold traditional immigrant jobs, measured as occupations with the highest share of noncitizen immigrant workers. Notably, the estimated effects are large and significant among younger workers who were of high school-going age when DACA was announced, highlighting the importance of age of exposure in relation to their educational investments. In contrast, we find smaller and statistically insignificant effects among workers who were over the age of 18 when the program went into effect. That young unauthorized workers change their occupations in response to DACA reveals they were taking traditional immigrant jobs because their choices were limited, not as a reflection of their preferences or skills.

Having established that DACA resulted in a change in occupations, we proceed to characterize the occupational shifts along three dimensions – occupational risk, public sector employment, and licensing. We find that DACA eligibility reduces the likelihood of being in occupations with high risk of injury. This negative effect on holding a dangerous job indicates that undocumented migrants take undesirable jobs at a higher rate than they otherwise would due to the lack of work authorization. In addition, we find that among the subsample of women DACA increases the likelihood of holding a public-sector job or a job that requires occupational licensing. These positive effects on being in a government job or licensed occupation indicate that undocumented migrants may avoid certain occupations because of high risk of detection of their undocumented status, that skill and interest in these particular occupations may not be the limiting factor. Lastly, using occupation scores to capture all the various shifts in occupational choice, we find that DACA eligibility shifts noncitizen immigrants to higher-paying, higher-educated occupations. All these effects on occupational outcomes are for undocumented migrants who were still school-aged when

DACA was announced; older workers' occupational outcomes do not change due to DACA. The differential response to DACA by age of first exposure to the policy is consistent with undocumented migrants adjusting their schooling investments while they are young in order to position themselves to take advantage of the greater labor market opportunities under DACA.

II. DATA SOURCES

We use individual-level data from the American Community Surveys (ACS) of 2005 to 2018 accessed through the Integrated Public Use Microdata Series (Ruggles et al. 2020). The ACS is a nationally representative survey that collects rich demographic, labor, and education information at the individual and household levels. Importantly for our purposes, the ACS interviews individuals irrespective of legal status or citizenship (Torrieri 2014).[5] Our analysis sample consists of Hispanic foreign-born young adults ages 22 to 30 who are employed and arrived in the U.S. by 2007 and age 10. In all estimations, occupations are defined at the 4-digit level according to the 2010 U.S. Census classification.

The ACS does not identify individual's legal immigration status; thus, following the literature, we identify likely undocumented immigrants based on lack of U.S. citizenship and Hispanic ethnicity.[6] Specifically, the "treatment" group refers to noncitizen Hispanic immigrants who meet the age and year of arrival criteria for DACA eligibility. Following Kuka, Shenhav, and Shih (2020), the "comparison" group will be identified as Hispanic foreign-born U.S. citizens, conditioned on DACA's guidelines for age and year of arrival. In effect, this paper compares Hispanic immigrants who arrived in the country at the same age and year and thus are similar in the length of exposure to U.S. institutions and integration, but some are noncitizens (and eligible for DACA) and some are citizens (not eligible for DACA), used as the comparison group to provide counterfactual changes in outcomes over time.

Our first set of outcomes examine the impact of DACA eligibility on the likelihood of

[5] The ACS also makes surveys available in Spanish to increase participation among Hispanic respondents (Torrieri 2014).
[6] Studies that employ this approach include Pope (2016), Amuedo-Dorantes and Antman (2016), Amuedo- Dorantes and Antman (2017), Kuka, Shenhav, and Shih (2019), and Kuka, Shenhav, and Shih(2020).

working in a traditional immigrant occupation. To estimate this relationship, we first construct a variable identifying the percent of noncitizen workers by occupation code using data from the 2005-2011 ACS on the subset of prime-age workers ages 25-54. We then construct three dichotomous variables identifying occupations as "traditionally immigrant" according to their relative position along the distribution of the percent of noncitizen workers – occupations with a percent of noncitizen workers above the 75th percentile, above the 50th percentile, and above the mean.[7] These three indicators allow us to examine whether the occupational choices of those who are DACA eligible reflect changes away from occupations that are traditionally held by immigrants along varying concentration.

Next, we use data from the Bureau of Labor Statistics' Survey of Occupational Injuries and Illnesses to examine differences in occupational choices along the risk dimension. This data set contains occupation-specific rates of non-fatal injuries involving days away from work per 10,000 full time workers, which we use to construct four outcome variables. First, we take the average injury rate over pre-DACA years (2005-2011) to construct a continuous measure of occupational risk. Using this variable, we then construct three dichotomous outcomes identifying occupations as "risky" according to their relative position along the injury rate distribution – occupations with an injury rate above the 75th percentile, the 50th percentile, and above the mean.[8]

The third group of outcomes measure the likelihood that an individual holds a government job. Using data from the ACS, we first construct an indicator equal to one for survey respondents whose answer to the "class of worker" variable corresponds to one of either federal, state, or local employment, and zero otherwise. We also construct measures of federal, and state and local government employment separately to examine differences by government job types.

For our fourth set of outcomes, we construct occupation-specific licensing measures using data from the 2015-2018 Current Population Surveys (CPS) accessed through the Integrated Public Use Microdata Series (Flood et al., 2020). Since 2015, the CPS added three questions related to occupational licensing and certification: "do you have a currently active

[7] See Table A2 in the appendix for a list of the top 20 occupations ranked by the percent of noncitizen workers.
[8] See Table A3 in the appendix for a list of the top 20 occupations ranked by the average injury rate.

professional certification or a state or industry license?"; "were any of your certifications or licenses issued by the federal, state, or local government?"; and "is your certification or license required for your job?". Following Kleiner and Soltas (2019), we identify a survey respondent as licensed if they answer "yes" to the first two questions. That is, a licensed individual holds an active professional certification issued by a government body. From the CPS data we construct a continuous measure of the percent of licensed workers by occupation, averaged over the survey years. Then, we construct three dichotomous indicators identifying occupations as "licensed" according to their relative position along the distribution of the percent of licensed workers – occupations with a percent of licensed workers above the 75th percentile, above the 50th percentile, and above the mean.[9]

Lastly, we use three summary measures to capture the overall quality and prestige of occupations along their education and earnings characteristics. Specifically, we use the occupational earnings score, the occupational education score, and the occupational status score as constructed by IPUMS. The occupational earnings score is a percentile rank reporting the percentage of workers in occupations with lower standardized median earnings than the respondent's occupation. The occupational education score reports the percentage of workers in the respondent's occupational category who completed one or more years of college. Finally, the occupational status score measures the percentage of workers who are in occupations with combined levels of education and earnings below the median levels of the respondent's occupation.

Table 1 summarizes the preferred definition with our five sets of outcomes—immigrant jobs, risky jobs, government jobs, licensed jobs, and occupational scores—stratified by age of exposure to DACA and program eligibility using data from pre-DACA years (2005-2011).

III. EMPIRICAL STRATEGY

Following Kuka, Shenhav, and Shih (2020), we employ a difference-in-differences strategy that compares outcomes across Hispanic immigrant noncitizens to citizens who arrived in the U.S. by age 10, before and after the implementation of DACA. Specifically, we will

[9] See Table A4 in the appendix for a list of the top 20 occupations ranked by the average percent of licensed workers.

estimate the following specification:

$$Y_{it} = \beta_0 + \beta_1 Eligible_i + \beta_2 Eligible_i \times Post_t + \boldsymbol{X}'_{it}\gamma + \omega_{st} + \lambda_{at} + \varepsilon_{it} \quad (1)$$

where Y_{it} is the outcome variable for individual i at time t; $Eligible$ is an indicatorvariable for Hispanic noncitizen immigrants who arrived in the U.S. by 2007 and age 10; $Post$ is an indicator variable equal to 1 starting in 2012, the year that DACA was announced and implemented. We control for a host of individual-level characteristics included in the vector denoted by X, such as gender, race, and region of birth.[10] Lastly, we include state-by-year and age-by-year fixed effects denoted as ω_{st} and λ_{at} to account for state-level time-varying characteristics and cohort effects, respectively. Standard errors are clustered at the state level.

We estimate equation 1 for different sets of outcomes, and stratified by age of first exposure to DACA and gender. Specifically, we examine the impacts of DACA on the likelihood of working in occupations characterized by their share of immigrant workers, injury risk, public sector, licensing requirements, and occupational prestige.[11] We also divide our sample of 22-30 year olds between younger and older adults who differ in the age of first exposure to DACA. We anticipate differential responses by age of exposure given that an earlier age at exposure provides added time for adjustments in educational and career investments. Thus, we estimate separate models for younger adults, ages 22-24 in our sample, who were of school-age at the time DACA passed, and older adults, ages 25-30 in our sample, who were older than high school-going age by the time of the program implementation. Additionally, we estimate separate models for men and women. Prior studies provide descriptive evidence of differences in employment responses by gender resulting from changes in immigration status (Powers and Seltzer 1998; Powers, Seltzer, and Shi 1998). Moreover, women and men hold different occupations and face different constraints and opportunities in the labor market, so the impact of DACA on occupational outcomes could differ by gender.

Across specifications, the parameter of interest, β_2, is the difference-in-differences in the

[10] Specific demographic control variables may change across specifications.
[11] Variable descriptions can be found in the Data section.

outcome variable. It is the change in mean outcome between the post-policy and pre- policy periods for noncitizen immigrants (who would gain work authorization due to DACA) minus the change in mean outcome between the post-policy and pre-policy periods for citizen immigrants (who always have such authorization). Under the parallel trends assumption, i.e., the change over time would have been the same for the noncitizen immigrants and citizen immigrants in the absence of the DACA policy, the difference-in-differences estimator gives the causal effect DACA eligibility. There is no way to directly test the parallel trends assumption – it is impossible to know what outcomes would have been for immigrant noncitizens had DACA not occurred – however one way to assess the validity of this assumption is to look at the trends in outcomes for the noncitizen immigrants and citizen immigrants in the time period leading up to the policy.

A common way to test if there are pre-trends is using an event study model in which equation 1 is expanded to allow for year-specific difference-in-differences estimates relative to a reference before year. We do this in Figures 1-5 for the five main outcomes we examine: being in a high immigrant share occupation, being in a high injury rate occupation, holding a government job, being in a high licensed share occupation, and occupation score that is increasing in pay and education level of workers in the occupation. In our setting, since DACA begins May 2012, we will use 2011, the immediate time period before, as the omitted reference year. Difference-in-differences coefficients for a year before 2011 (e.g., the 2010 coefficient would be the change in outcome between 2010 and 2011 for the noncitizens minus that change for the citizens) would not reflect anything about the effect of DACA (the policy has not even been enacted), and it is zero if trends in outcomes for noncitizen immigrants and citizen immigrants are parallel. Significant non-zero difference-in-differences coefficients for years before 2011 would be indicative of differential trends, i.e., even without the policy the change in outcomes differs between noncitizens and citizens, which would make the difference-in-differences estimates for years involving after years unconvincing estimates of the true effect of the policy. Overall, the year-specific coefficients displayed in Figures 1-5 do not indicate pre-trends in these outcomes, and are supportive of the parallel trend assumption. This gives support for interpreting the difference-in-differences estimates as the causal effect of the DACA policy.

IV. RESULTS

In this section, we present the results from estimating Equation 1 using OLS. The coefficient of interest is the coefficient for the interaction term $Eligible \times Post$ -- this is the difference-in- differences estimator of the impact of DACA eligibility. We examine five sets of occupational outcomes: (1) being in an immigrant occupation; (2) being in a risky occupation; (3) holding a government job; (4) being in a licensed occupation; and (5) occupation score capturing the education or income status of a job. In supplemental analyses, we use employment and educational attainment as dependent variables in order to understand the role that changing selection into employment and education might play in the impacts on occupational outcomes.

4.1 Holding an Immigrant Occupation

Does DACA eligibility change the likelihood that an individual works in an occupation that is traditionally held by noncitizen immigrants? With work authorization, individuals are able to choose from a wider set of jobs. Some may choose traditional immigrant occupations because that is their preference, however some may choose them because they had a limited choice given their lack of work authorization. Table 2 shows the estimation results where the dependent variable relates to being in an immigrant occupation. We construct a variable which is the percent of non-citizen immigrant workers at the 4-digit occupation code level. In addition to looking at this percent immigrant workers in occupation itself as an outcome, we also analyze nonlinear functions of it to capture being in a high immigrant share occupation. In Panel A, the dependent variable is a dummy indicating working in an occupation that is in the top 25% of occupations in terms of percent non-citizen immigrants. We show point estimates for the pooled sample (ages 22-30), as well as separately for the younger (22-24) and older (25-30) age cohorts. Columns 3-4 and 5-6 show the results for the younger and older group, respectively.

As shown in Table 2, it is only the younger group who was of school-going age when DACA was announced that is responsive to DACA eligibility for this outcome. Indeed, for women ages 22-24, DACA eligibility reduces the likelihood of holding an occupation within

the top quartile of immigrant occupations by 6.4 percentage points while for men it is 2.7 percentage points. In contrast, for both men and women in the older age cohort who were older than school-going age when DACA passed (ages 25-30) there is no significant effect of DACA eligibility on being in a top 25% immigrant occupation.

In Panels B, C and D, we use alternative ways of measuring immigrant occupations: a dummy variable for being in an occupation that is above the mean percent immigrant among occupations, a dummy for being in an occupation that is in the top 50% occupations in terms of percent non-citizen immigrants (i.e., above the median), and the percent immigrant worker in occupation itself. Panel D shows there are no significant effects on the percent immigrant worker, while Panels A, B and C show that young workers are leaving high immigrant occupations. These findings indicate that fewer workers are taking traditional immigrant occupations when their employment opportunities expand to include choices not feasible given their undocumented status. This clearly shows that the lack of work authorization is constraining the occupational choice of young undocumented migrants. The observation that young undocumented migrants systematically shift out of traditional immigrant occupations once the feasible set of occupations expanded shows that some of the new choices are preferred over the previous best available choice; they could still opt for the traditional immigrant occupation if they wanted to, so the observation of a systematic shift out of occupations with high non-citizen share reveals that some are in those traditional immigrant occupations because their choices are limited.

4.2 Holding a Risky Occupation

Without work authorization, undocumented migrants may take more dangerous jobs because that is the only work available to them or that is the only work with higher pay (a compensating differential for the risk). Does DACA eligibility change the likelihood that an individual works in a risky occupation? Table 3 shows the estimation results where the dependent variable relates to being in a risky occupation. We construct a variable which is the pre-DACA average injury rate at the 4-digit occupation code level. In addition to looking at this injury rate itself as an outcome, we also analyze nonlinear functions of it to capture being in a high injury occupation.

Panel A shows the results where the dependent variable is a dummy for being in an occupation that is among the top 25% occupations in terms of injury rate. We find heterogeneity in effects by sex and age group. DACA eligibility decreases the likelihood of holding a risky occupation for workers ages 22-24 and has no effect on workers ages 25-30. Among workers ages 22-24, the point estimates indicate a larger effect on men than women. Indeed, DACA eligibility decreases the likelihood of being in a risky occupation by 3.6 percentage points for men (Column 3) and 1.9 percentage points for women (Column 4). The occupations that have high injury rates are ones that men are more likely to have than women – common ones include in construction and transportation—so it is perhaps not surprising there is a larger response for men than women.[12]

In Panels B, C and D, we use alternative ways of measuring dangerous occupations: dummy variable for being in an occupation that is above the mean injury rate among occupations, a dummy for being in an occupation that is in the top 50% occupations in terms of injury rate (i.e., above the median), and the injury rate in occupation itself. These results corroborate with the Panel A results in showing a shift out of occupations that have higher likelihood of injury. In sum, the negative impact of DACA on being in a dangerous occupation indicates that undocumented migrants take undesirable jobs. Here, we measure one aspect of undesirable jobs, the risk of bodily harm, and we find that young undocumented migrants, particularly men, take dangerous jobs at a higher rate than they otherwise would due to the lack of work authorization.

4.3 Holding a Government Occupation

Unauthorized migrants often avoid jobs with a high risk of detection and ones that may require repeated interactions with government officials (Ortega and Hsin 2018). Does DACA eligibility impact the likelihood that migrants work in government jobs? Table 4 shows the estimation results where the dependent variable indicates employment in the public sector. Panel A reports estimates using an indicator that captures employment in *any* government job (federal, state, or local). Panels B and C report alternative specifications where the

[12] See Table A3 for examples of the top 20 occupations ranked by the injury rate.

outcome variables separately denote federal government employment and state and local government jobs, respectively.

As shown in Table 4, the point estimates indicate a positive impact of DACA eligibility on the likelihood of holding a government job that is statistically significant among the subsample of young women (ages 22-24). Indeed, DACA increased the likelihood of employment in the public sector by 2.4 percentage points. We observe shifts into both federal as well as state and local government occupations. In contrast, the point estimates are small and insignificant for the male subsample and the older age cohort (25-30). These findings suggest that legal constraints prevent noncitizen immigrants from accessing employment in the public sector, a class of jobs that have historically been a pathway into the middle class and economic integration for migrants (Logan, Alba, and Stults 2003).

4.4 Holding a Licensed Occupation

A license may be required to practice in some occupations, and often obtaining a license may require work authorization. Does DACA eligibility change the likelihood that an individual works in a licensed occupation? Table 5 shows the estimation results where the dependent variable relates to being in a licensed occupation. We form a variable which is the percent of licensed workers at the 4-digit occupation code level. Based on this, we form four specific measures of licensed occupation: dummy indicating working in an occupation that is in the top 25% occupations in terms of percent licensed (Panel A), dummy variable for being in an occupation that is above the mean percent licensed among occupations (Panel B), a dummy for being in an occupation that is in the top 50% occupations in terms of percent licensed (i.e., above the median) (Panel C), and the percent licensed in occupation itself. We note that the estimation is performed dropping individuals from California from the sample because the state of California permits licenses to be issued regardless of legal status of the immigrant.

The results show no effect of DACA eligibility on the likelihood of holding a licensed occupation for men of both age groups and for older women. However, for younger women, DACA eligibility increases the likelihood of holding a licensed occupation. These shifts are not into the occupations with the highest levels of licensing (Panel A, which has being in a

top quartile occupation in terms of licensing percent, does not show significant effects), and instead reflect movements lower down in the distribution of occupations by share licensed. Panel C, Column 4 shows that DACA eligibility increases the likelihood of being in an occupation that is above the median in percent licensed by 6.5 percentage points. There are certain occupations that require both more education and licensing, such as in jobs related to teaching, nursing, and other health fields, and that may be why it is the younger women who are especially responsive for this occupational outcome. These younger women would have been exposed early enough to DACA that they can adjust their educational investments and gain the credentials to enter a licensed occupation.

Some attractive career opportunities require licensing. Due to the formal paperwork submission needed to obtain a license (e.g., from the state or federal authority), the risk of detection of undocumented status would be high. Our findings here suggest that legal restrictions kept undocumented workers with skills and interest in licensed occupations from pursuing them.

4.5 Occupation Score

We have found evidence that DACA eligibility affects occupational choice of young undocumented migrants, making them less likely to work in traditional immigrant occupations and risky occupations, and more likely to work in public-sector and licensed occupations. The observation that we find systematic changes in occupation, even though these workers could have chosen the same job as they would have without DACA, shows that workers are better off with DACA. These utility gains may not be reflected in incomes measures, for example, because some of the gains may be non-monetary (e.g., leaving a dangerous job may involve a pay cut, a higher skill job may be more rewarding) or because current pay may not adequately reflect the career path and eventual pay.

To get a measure of occupational outcome that reflects all the various shifts, we use occupation scores that index occupations by income in that occupation and/or education in that occupation. The specific three variables we use from IPUMS are: (1) education score, measuring the percentage of people in the individual's 4-digit occupation who have completed one or more years of college (higher would mean more educated/skilled job);(2)

earnings score, measuring the percentage of workers who work in occupations with lower median earnings than the individual's occupation (higher would mean more higher-paying job); and (3) earnings and education score which is higher for occupations that have higher education or higher paid workers. Table 6 shows the estimation results using these three occupational score measures as dependent variables. The results show a significant positive effect of DACA eligibility on the occupation scores of younger workers ages 22-24 and no effect for older workers ages 25-30. This difference in effect by age group accords with our earlier findings, which found significant effects (out of traditional immigrant jobs, out of dangerous jobs, into licensed occupations) for younger workers and no effects on older workers. DACA eligibility expanded the set of feasible occupations for young undocumented migrants, and we find that it is the ones who were of school-age at the time DACA passed who respond, and although the occupational shifts are varied, these shifts taken together are toward jobs that are on average higher-paying and use more educated workers.

V. SUPPLEMENTAL ANALYSES

5.1 Employment

The first row of Appendix Table A1 reports the results of estimating Equation 1 with a dummy for being employed as the dependent variable. We find that DACA-eligible individuals are 2.6 percentage points more likely to be employed than non-DACA eligibility individuals. We also find larger employment effects for younger DACA-eligible individuals than for older DACA-eligible individuals (3.4 versus 2.6 percentage points) in comparison to non-DACA eligibility individuals. Interestingly, these employment effects are mainly driven by females in the sample. For example, among young individuals ages 22-24, female DACA-eligible individuals are 6.2 percentage points more likely to be employed than non-DACA eligibility females (Column 5) while males 0.4 percentage points more likely (Column 6), with the latter coefficient not statistically significant at conventional levels. Thus, for our earlier findings on occupational outcomes, which are conditional on being employed, selection into employment would not be a factor for interpreting the impacts on young men ages 22-24. However, for women ages 22-24, we need to consider the role that the employment margin

plays. The findings are consistent with some previously unemployed or out-of-the-labor-force undocumented young women entering employment as improved job opportunities become available. However, these results are preliminary, and further analysis is needed to better understand the characteristics of the marginal women induced into employment by DACA.

5.2 Education

Rows 2-5 of Appendix Table A1 report the results of estimating Equation 1 with educational attainment measures as the dependent variable. In Row 2 with years of schooling as the dependent variable, we find that the DACA policy increased schooling for younger people but not older people. Specifically, the DACA policy increased younger individual's schooling by 0.157 years of education. In analysis at different margins of educational attainment reported in lower columns, we find the DACA policy increased high school completion by 5 percentage points, and increased getting some college by 2.6 percentage points, for younger people. To take up DACA one needs a high school degree, so it is not surprising that there is a sizable increase in high school degree completion. The point estimates suggest an increase in getting college education, consistent with some undocumented migrants adjusting their schooling investments in order to avail themselves of the expanded employment opportunities from DACA. For older DACA-eligible individuals in our sample, we find that the DACA policy negatively affected their human capital investment. The net negative impact is likely because there some undocumented migrants who would have attended college had DACA not come along and presented them with expanded employment opportunities.

In results not reported in tables but available from authors, we re-estimated the models in Tables 2-5 adding years of schooling as a control variable. This is a crude way of assessing whether education might be a mediating variable in the estimate effects of DACA eligibility on the occupational outcome: if the estimated policy effect changes materially with the addition of years of schooling, then schooling might be a material mediating variable. For both occupational outcomes (being in a risky occupation, being in a government occupation, and being in a licensed occupation), it appears that controlling for education does not change the direction of the estimated policy effect, but it does reduce the magnitude somewhat. We

intend to explore the role of educational investments and other human capital investments in the impacts of DACA on occupational outcomes in future analyses. For example, we are interested in whether college students who are eligible for DACA choose different majors. These analyses are intended to investigate the extent to which lack of work authorization distorts educational and occupational attainment for undocumented migrants, towards a quantification of how skills, income and well-being might change if these legal constraints are lifted.

VI. CONCLUDING REMARKS

U.S. laws make it illegal for employers to knowingly hire undocumented migrants. The legal constraints affect which firms will hire undocumented migrants and what jobs undocumented migrants can expect to get, and undocumented migrants are more likely to end up in jobs that have a lower risk of detection of immigration status and are less desirable. The Deferred Action for Childhood Arrivals (DACA) policy, which began in August 2012, gave temporary legal authorization to work in the U.S. for a subset of undocumented migrants: those who arrived in the U.S. as children meeting certain other eligibility criteria. In this paper, we estimate the effect of DACA on the occupational outcomes of young adults who arrived in the U.S. as children and received their schooling in the U.S.

We use a difference-in-differences strategy—taking the change in the outcome before and after DACA for noncitizen immigrants (who would gain work authorization due to DACA) and using citizen immigrants (who always have such authorization) to control for changes over time that would have occurred even in the absence of DACA—to estimate the causal impact of DACA on several occupational outcome measures. Applying this strategy to individual-level data from the American Community Survey, first, we find that DACA eligibility decreases the likelihood that noncitizen childhood immigrants hold traditional immigrant jobs. These findings indicate that fewer workers are taking traditional immigrant occupations when their employment opportunities expand to include choices not feasible given their undocumented status. Second, DACA eligibility decreases the likelihood that noncitizen childhood immigrants are in occupations with high risk of injury. This negative effect on holding a dangerous job indicates that undocumented migrants take undesirable

jobs— here, we measure one type, jobs with high risk of bodily harm — at a higher rate than they otherwise would be due to the lack of work authorization. Third, we find an increased likelihood of holding a public-sector job (both federal and state and local) among DACA eligible young adult, indicating a move toward occupations with a relatively higher risk of detection and repeated interactions with government. Fourth, we find that DACA increases the likelihood of holding a job that requires occupational licensing for women, with no effect for men. Some attractive career opportunities require licensing, including in teaching and health, but it appears that legal restrictions kept undocumented workers with skills and interest in licensed occupations from pursuing them; due to the formal paperwork submission needed, the risk of detection would be high. Overall, using occupation scores to capture all the various shifts in occupational choice, we find that DACA eligibility shifts noncitizen immigrants to higher-paying, higher-educated occupations. Lastly, we find these occupational responses among undocumented migrants who were still school-aged when DACA was announced; older workers are less responsive. The differential response to DACA by age of first exposure to DACA is consistent with undocumented migrants adjusting their schooling investments while they are young in order to position themselves to take advantage of the greater labor market opportunities under DACA.

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Tables and Figures

Table 1: Descriptive Statistics: Outcome Variables

	DACA Eligible				DACA Ineligible			
	Age 22-24		Age 25-30		Age 22-24		Age 25-30	
	Men	Women	Men	Women	Men	Women	Men	Women
Share Immigrant Jobs: Top 25%	0.60	0.39	0.54	0.35	0.37	0.22	0.37	0.20
	(0.49)	(0.49)	(0.50)	(0.48)	(0.48)	(0.41)	(0.48)	(0.40)
Share Risky Jobs: Top 25%	0.45	0.12	0.48	0.11	0.37	0.09	0.40	0.10
	(0.50)	(0.32)	(0.50)	(0.31)	(0.48)	(0.29)	(0.49)	(0.31)
Share Government Jobs	0.04	0.07	0.03	0.08	0.12	0.15	0.11	0.16
	(0.19)	(0.25)	(0.18)	(0.27)	(0.33)	(0.35)	(0.31)	(0.36)
Share Licensed Jobs: Top 25%	0.10	0.14	0.13	0.17	0.16	0.21	0.19	0.27
	(0.30)	(0.35)	(0.34)	(0.37)	(0.37)	(0.41)	(0.40)	(0.45)
Occupational Score	29.83	34.14	32.37	39.05	39.17	44.05	43.41	49.57
	(19.79)	(20.51)	(21.55)	(23.18)	(23.14)	(22.61)	(25.03)	(24.90)

Note: Immigrant jobs indicate occupations where the share of noncitizen workers falls within the 75th percentile of the distribution of noncitizen workers. The share of noncitizen workers was constructed using the 2005-2011 ACS data. Risky jobs indicate occupations where the average injury rate falls within the 75th percentile of the distribution of occupational injuries. The injury rate was obtained from the 2005-2011 Survey of Injuries, Illnesses, and Fatalities. The share of government workers is a direct measure derived from the "class of worker" variable in the ACS. Licensed jobs indicate occupations where the average share of licensed workers falls within the 75th percentile of the distribution of occupational licensing. The share of licensed workers by occupation was constructed using the 2015-2018 CPS. The occupational score measures the percentage of workers who are in occupations with combined levels of education and earnings below the median levels of the respondent's occupation. This variable was obtained from the ACS. Estimates correspond to the average over the pre-DACA years in the sample (2005-2011).

Table 2: DACA Eligibility and the Likelihood of Working in an Immigrant Occupation

Panel A: Immigrant Occupations above the 25th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.010	-0.018	-0.027*	-0.064***	-0.015	0.001
	(0.011)	(0.013)	(0.016)	(0.017)	(0.015)	(0.023)
Observations	36362	30092	12615	10161	23648	19819

Panel B: Immigrant Occupations above the Mean

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.006	-0.014	-0.022*	-0.053**	-0.007	0.004
	(0.011)	(0.015)	(0.013)	(0.022)	(0.016)	(0.033)
Observations	36362	30092	12615	10161	23648	19819

Panel C: Immigrant Occupations above the 50th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.017	-0.029**	-0.026	-0.048*	-0.022	-0.019
	(0.010)	(0.012)	(0.023)	(0.028)	(0.013)	(0.024)
Observations	36362	30092	12615	10161	23648	19819

Panel D: Percent of Immigrant Workers in Occupation

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA ELigible X Post	-0.192	-0.013	-0.339	-0.843	-0.282	0.409
	(0.140)	(0.278)	(0.374)	(0.680)	(0.323)	(0.268)
Observations	36362	30092	12615	10161	23648	19819

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and conditional on employment. Panel A shows estimates on the likelihood of working in an occupation where the share of employed non-citizens is above the 75th percentile. Panel B shows estimates on the likelihood of working in an occupation where the share of employed non-citizens is above the mean. Panel C shows estimates on the likelihood of working in an occupation where the share of employed non-citizens is above the 50th percentile. Panel D shows estimates on the percent of non-citizens by occupation. Occupations are defined at 4-digit occupation classification according to the 2010 Census. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: DACA Eligibility and the Likelihood of Working in a Risky Occupation

Panel A: Risky Occupations above the 25th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.003	0.005	-0.036*	-0.019**	0.016	0.018
	(0.013)	(0.011)	(0.019)	(0.010)	(0.016)	(0.016)
Observations	35192	29289	12189	9912	22905	19264

Panel B: Risky Occupations above the Mean

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.013	-0.002	-0.052***	-0.004	-0.004	-0.001
	(0.010)	(0.010)	(0.015)	(0.019)	(0.015)	(0.017)
Observations	35192	29289	12189	9912	22905	19264

Panel C: Risky Occupations above the 50th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.018*	-0.017	-0.048***	-0.035	-0.019	-0.005
	(0.009)	(0.015)	(0.015)	(0.027)	(0.012)	(0.025)
Observations	35192	29289	12189	9912	22905	19264

Panel D: Nonfatal Injury Rate in Occupation

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.033	0.791	-10.410**	-3.580	3.877	3.441
	(2.444)	(2.237)	(4.034)	(4.575)	(3.338)	(3.669)
Observations	35192	29289	12189	9912	22905	19264

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and conditional on employment. Panel A shows estimates on the likelihood of working in an occupation where the nonfatal injury rate is above the 75th percentile. Panel B shows estimates on the likelihood of working in an occupation where the nonfatal injury rate is above the mean. Panel C shows estimates on the likelihood of working in an occupation where the nonfatal injury rate is above the 50th percentile. Panel D shows estimates on the nonfatal injury rate by occupation. Occupations are defined at 4-digit occupation classification according to the 2010 Census. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: DACA Eligibility and the Likelihood of Working in a Government Job

Panel A: Any Government Job

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.003	0.014	-0.003	0.024***	0.002	0.007
	(0.005)	(0.009)	(0.009)	(0.008)	(0.007)	(0.013)
Observations	36362	30092	12615	10161	23648	19819

Panel B: Federal Government Jobs

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.003	0.002	-0.003	0.009*	0.006	-0.002
	(0.005)	(0.004)	(0.008)	(0.005)	(0.006)	(0.006)
Observations	36362	30092	12615	10161	23648	19819

Panel C: State and Local Government Jobs

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.005	0.011	0.000	0.015*	-0.004	0.009
	(0.005)	(0.007)	(0.009)	(0.008)	(0.008)	(0.009)
Observations	36362	30092	12615	10161	23648	19819

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and conditional on employment. Panel A shows estimates on the likelihood of working in any government job. Panel B shows estimates on the likelihood of working in a federal government job. Panel C shows estimates on the likelihood of working in a either a state or local government job. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: DACA Eligibility and the Likelihood of Working in a Licensed Occupation

Panel A: Licensed Occupations above the 25th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.001	-0.003	-0.015	0.022	0.020	-0.002
	(0.012)	(0.020)	(0.017)	(0.026)	(0.014)	(0.033)
Observations	24288	20798	8635	7157	15554	13526

Panel B: Licensed Occupations above the Mean

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.008	0.008	-0.020	0.038	0.007	0.012
	(0.011)	(0.023)	(0.021)	(0.025)	(0.013)	(0.034)
Observations	24288	20798	8635	7157	15554	13526

Panel C: Licensed Occupations above the 50th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.007	0.017	0.013	0.065***	0.016	-0.001
	(0.015)	(0.022)	(0.016)	(0.019)	(0.022)	(0.034)
Observations	24288	20798	8635	7157	15554	13526

Panel D: Percent Licensed Workers in Occupation

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.273	0.212	0.139	2.590**	0.996	-0.163
	(0.437)	(0.994)	(0.429)	(1.264)	(0.895)	(1.709)
Observations	24288	20798	8635	7157	15554	13526

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and conditional on employment. It also excludes observations from CA. Panel A shows estimates on the likelihood of working in an occupation where the percent of licensed workers rate is above the 75th percentile. Panel B shows estimates on the likelihood of working in an occupation where the percent of licensed workers is above the mean. Panel C shows estimates on the likelihood of working in an occupation where the percent of licensed workers is above the 50th percentile. Panel D shows estimates on the percent of licensed workers by occupation. Occupations are defined at 4-digit occupation classification according to the 2010 Census. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: DACA Eligibility and Occupational Standing by Education and Earnings

Panel A: Education Score

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.098	1.176*	1.924**	3.867***	-0.280	0.097
	(0.589)	(0.635)	(0.734)	(1.305)	(0.859)	(0.624)
Observations	35639	29960	12284	10104	23259	19742

Panel B: Earnings Score

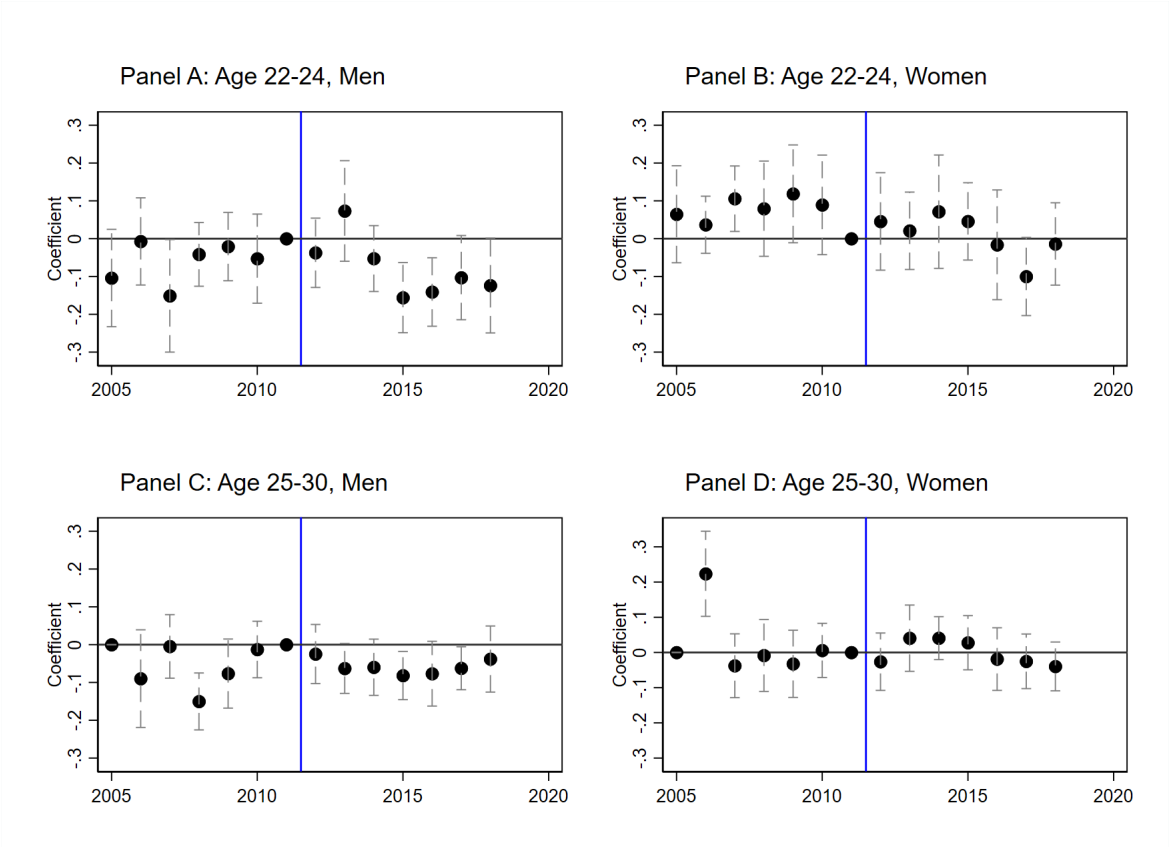
	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.545	0.546	2.302***	3.825***	0.838	-0.539
	(0.484)	(0.375)	(0.797)	(0.862)	(0.623)	(0.889)
Observations	35639	29960	12284	10104	23259	19742

Panel C: Earnings and Education Score

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.399	0.823*	2.558***	4.389***	0.401	-0.578
	(0.492)	(0.462)	(0.668)	(1.230)	(0.690)	(0.875)
Observations	35639	29960	12284	10104	23259	19742

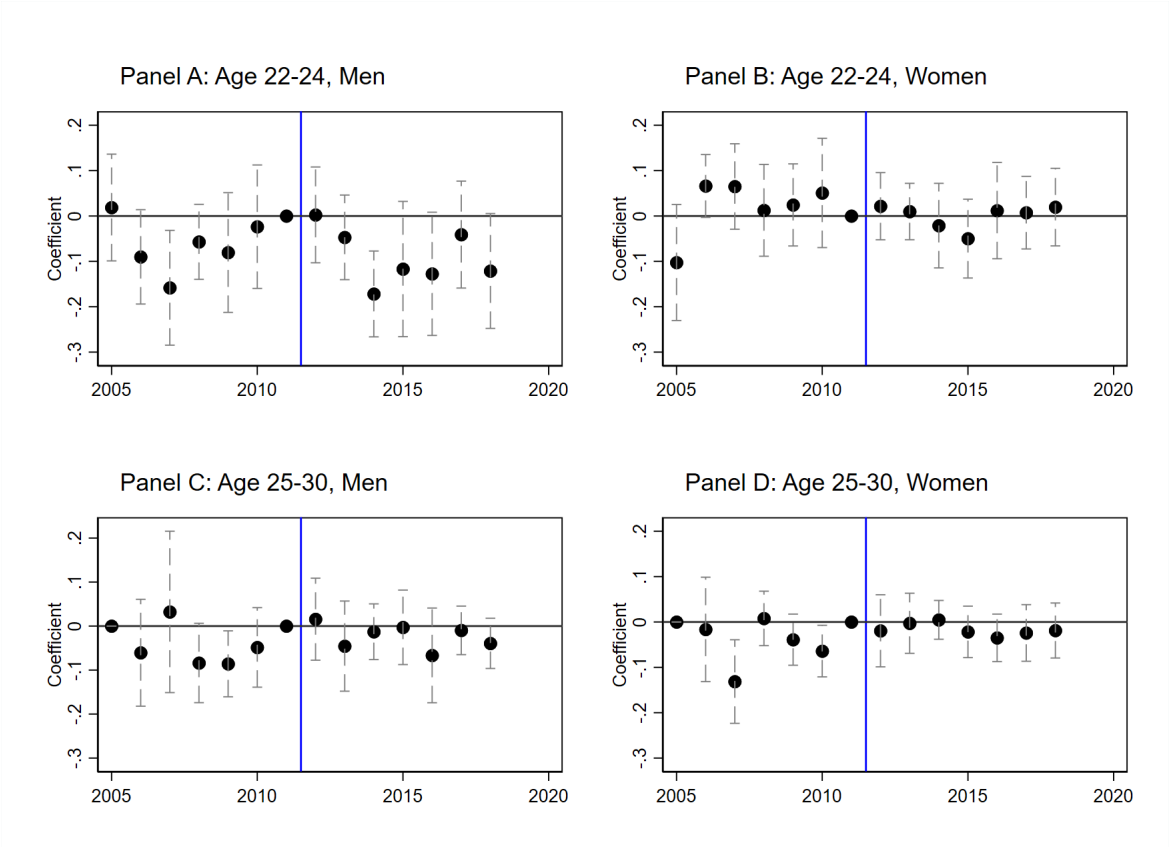
Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and conditional on employment. Panel A shows estimates on the occupational education score, which indicates the percentage of people in the respondents' occupational category who had completed one or more years of college. Panel B shows estimates on the occupational earnings score, which represents the percent of workers in occupations with lower standardized median earnings than han the respondent's occupation. Panel C shows estimates on the earnings-by-education score, which represents the percentage of persons in the civilian labor force who are in occupations having combined levels of education and earnings below each occupation. Occupations are defined at 4-digit occupation classification according to the 2010 Census. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 1: DACA Eligibility and the Likelihood of Working in an Immigrant Occupation



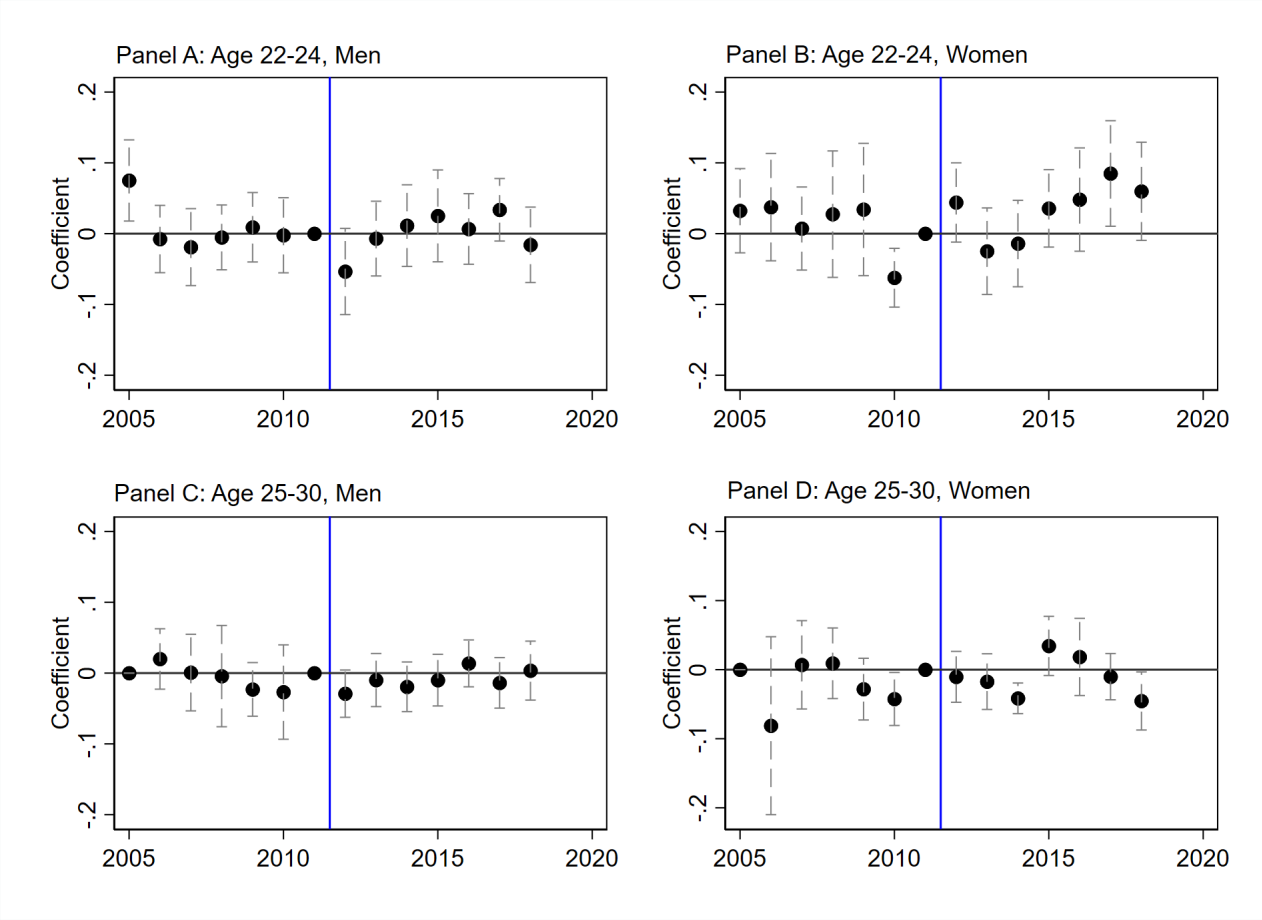
Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the percent of noncitizen workers falls above the 75th percentile. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure 2: DACA Eligibility and the Likelihood of Working in a Risky Occupation



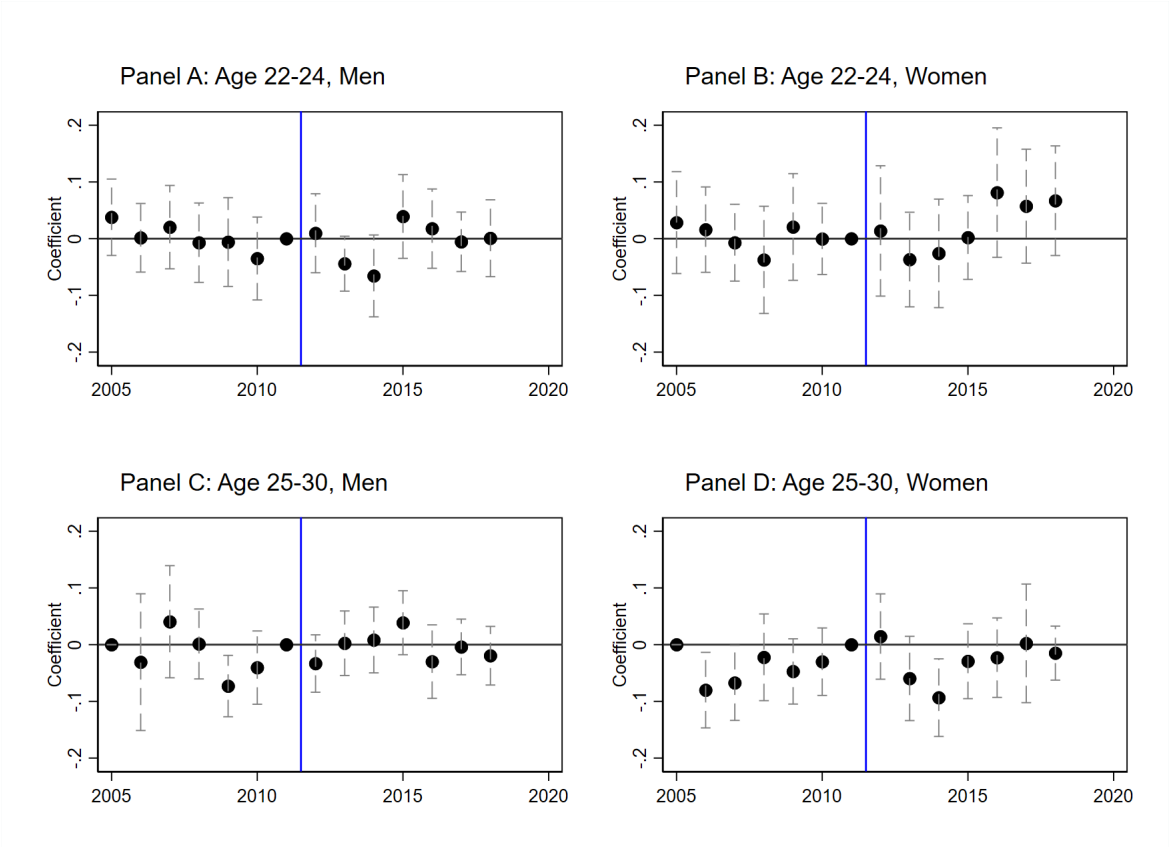
Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the average pre-DACA injury rate falls above the 75th percentile. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure 3: DACA Eligibility and the Likelihood of Working in a Government Job



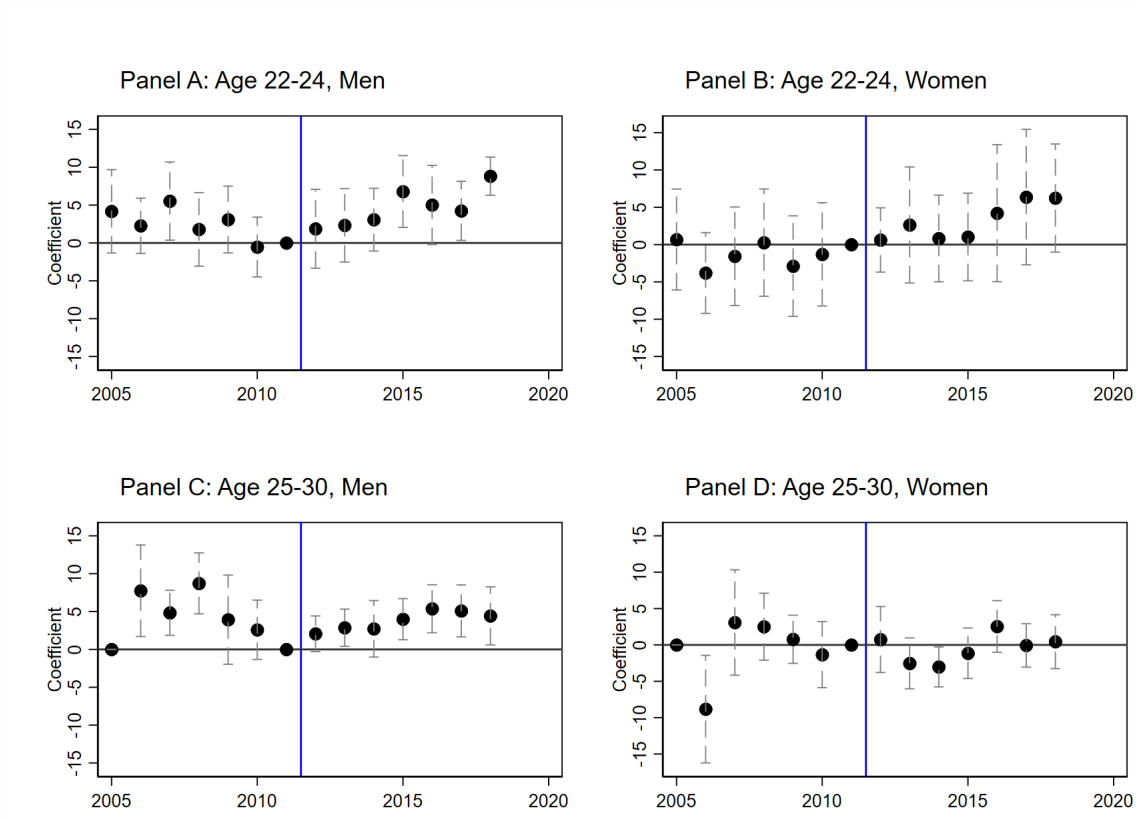
Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in a federal, state, or local government job. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure 4: DACA Eligibility and the Likelihood of Working in a Licensed Occupation



Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the percent of licensed workers falls above the 75th percentile. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure 5: DACA Eligibility and Occupational Earnings and Education Score



Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is the earnings-by-education score, which represents the percentage of workers who are in occupations with combined levels of education and earnings below the median levels of the respondent's occupation. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Appendix A: Additional Tables

Table A1: Employment and Education Outcomes

	Age 22-30			Age 22-24			Age 25-30		
	(1) All	(2) Men	(3) Women	(4) All	(5) Men	(6) Women	(7) All	(8) Men	(9) Women
Employment									
DACA Eligible X Post	0.026***	0.011	0.037***	0.034***	0.004	0.062***	0.026***	0.020*	0.026*
	(0.008)	(0.010)	(0.010)	(0.011)	(0.014)	(0.021)	(0.010)	(0.010)	(0.014)
Observations	92,596	46,799	45,751	33,377	17,087	16,214	59,162	29,633	29,471
Years of Education									
DACA Eligible X Post	-0.034	-0.113**	0.044	0.157**	0.054	0.245**	-0.016	-0.070	0.035
	(0.045)	(0.053)	(0.076)	(0.064)	(0.086)	(0.101)	(0.049)	(0.067)	(0.064)
Observations	92,596	46,799	45,751	33,377	17,087	16,214	59,162	29,633	29,471
High School Completion									
DACA Eligible X Post	0.018**	0.012	0.020	0.050***	0.037***	0.050**	0.009	0.015	-0.001
	(0.008)	(0.008)	(0.016)	(0.014)	(0.012)	(0.020)	(0.009)	(0.017)	(0.010)
Observations	92,596	46,799	45,751	33,377	17,087	16,214	59,162	29,633	29,471
Some College									
DACA Eligible X Post	-0.007	-0.015*	-0.002	0.026*	0.034**	0.012	-0.015	-0.002	-0.034***
	(0.009)	(0.008)	(0.014)	(0.014)	(0.015)	(0.017)	(0.010)	(0.017)	(0.011)
Observations	92,596	46,799	45,751	33,377	17,087	16,214	59,162	29,633	29,471
Associate's Degree Completion									
DACA Eligible X Post	-0.029***	-0.042***	-0.015	-0.008	-0.015	0.004	-0.022**	-0.038***	-0.006
	(0.006)	(0.006)	(0.011)	(0.009)	(0.012)	(0.011)	(0.008)	(0.010)	(0.013)
Observations	92,596	46,799	45,751	33,377	17,087	16,214	59,162	29,633	29,471

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race, place of birth, and sex (applicable only for columns (1), (4) and (7)). The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Examples of Immigrant Occupations

Occupation Code	**Percent Non-Citizen**	**Occupation Name**
6040	49.71	graders and sorters, agricultural products
6460	46.62	plasterers and stucco masons
6050	45.31	agricultural workers, nec
8310	38.87	pressers, textile, garment, and related materials
6330	36.92	drywall installers, ceiling tile installers, and tapers
4230	35.94	maids and housekeeping cleaners
4140	35.33	dishwashers
6600	34.63	helpers, construction trades
8320	34.32	sewing machine operators
9640	33.23	packers and packagers, hand
6515	32.48	roofers
4250	31.25	grounds maintenance workers
1650	30.36	medical scientists, and life scientists, all other
8950	30.29	helpers–production workers
7610	29.86	helpers–installation, maintenance, and repair workers
9350	29.30	parking lot attendants
6420	29.11	painters, construction, and maintenance
6250	28.80	cement masons, concrete finishers, and terrazzo workers
4130	28.78	food preparation and serving related workers, nec
8800	28.10	packaging and filling machine operators and tenders

Notes: Table shows the top 20 occupations ranked by the 2005-2011 average percent of noncitizen workers. Occupation codes are defined according to the 4-digit 2010 Census classification.

Table A3: Examples of Risky Occupations

Occupation Code	**Injury Rate**	**Occupation Name**
9260	1439.40	subway, streetcar, and other rail transportation workers
3900	793.98	animal control
2720	617.72	athletes, coaches, umpires, and related workers
8550	617.05	woodworkers including model makers and patternmakers, nec
9560	612.57	conveyor operators and tenders, and hoist and winch operators
6765	516.93	construction workers, nec
9050	464.29	flight attendants and transportation workers and attendants
9750	440.79	material moving workers, nec
9620	416.07	laborers and freight, stock, and material movers, hand
3400	403.20	emergency medical technicians and paramedics
3600	402.79	nursing, psychiatric, and home health aides
6260	362.27	construction laborers
6940	343.75	extraction workers, nec
6515	320.45	roofers
9130	312.57	driver/sales workers and truck drivers
6120	307.20	forest and conservation workers
3800	306.09	sheriffs, bailiffs, correctional officers, and jailers
4120	298.67	food servers, non-restaurant
3820	296.58	police officers and detectives
6730	293.42	highway maintenance workers

Notes: Table shows the top 20 occupations ranked by the 2005-2011 average nonfatal injury rate. Occupation codes are defined according to the 4-digit 2010 Census classification.

Table A4: Examples of Licensed Occupations

Occupation Code	**Percent Licensed**	**Occupation Name**
3000	95.46	chiropractors
3150	90.50	occupational therapists
3250	88.93	veterinarians
3110	88.91	physician assistants
3220	87.87	respiratory therapists
3230	87.04	speech language pathologists
3010	86.74	dentists
3040	86.53	optometrists
3060	85.76	physicians and surgeons
3130	85.52	registered nurses
2100	84.92	lawyers, and judges, magistrates, and other judicial workers
3050	84.71	pharmacists
3610	83.10	occupational therapy assistants and aides
3310	82.82	dental hygienists
3160	82.66	physical therapists
9030	82.57	aircraft pilots and flight engineers
1820	80.44	psychologists
3400	79.60	emergency medical technicians and paramedics
2320	79.57	secondary school teachers
3630	78.47	massage therapists

Notes: Table shows the top 20 occupations ranked by the 2015-2018 average percent of licensed workers. Occupation codes are defined according to the 4-digit 2010 Census classification.

Table A5: DACA Eligibility and the Likelihood of Working in an Immigrant Occupation, Unconditioned on Employment Selection

Panel A: Immigrant Occupations above the 25th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.010	0.002	-0.010	-0.023	0.013	0.013
	(0.010)	(0.008)	(0.013)	(0.017)	(0.014)	(0.018)
Observations	46799	45751	17087	16214	29633	29471

Panel B: Immigrant Occupations above the Mean

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.014	0.006	-0.007	-0.011	0.020	0.015
	(0.011)	(0.010)	(0.013)	(0.020)	(0.016)	(0.025)
Observations	46799	45751	17087	16214	29633	29471

Panel C: Immigrant Occupations above the 50th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.004	0.001	-0.011	-0.001	0.006	0.003
	(0.009)	(0.010)	(0.016)	(0.028)	(0.013)	(0.021)
Observations	46799	45751	17087	16214	29633	29471

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and unconditional on employment (those who are unemployed are coded as not in a traditional immigrant occupation). Panel A shows estimates on the likelihood of working in an occupation where the share of employed non-citizens is above the 75th percentile. Panel B shows estimates on the likelihood of working in an occupation where the share of employed non-citizens is above the mean. Panel C shows estimates on the likelihood of working in an occupation where the share of employed non-citizens is above the 50th percentile. Occupations are defined at 4-digit occupation classification according to the 2010 Census. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: DACA Eligibility and the Likelihood of Working in a Risky Occupation, Unconditioned on Employment Selection

Panel A: Risky Occupations above the 25th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.012	0.006	-0.022	-0.010	0.024*	0.017
	(0.012)	(0.009)	(0.017)	(0.008)	(0.014)	(0.013)
Observations	41728	37654	14915	13172	26728	24397

Panel B: Risky Occupations above the Mean

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.002	0.004	-0.031**	0.009	0.012	0.005
	(0.009)	(0.010)	(0.013)	(0.016)	(0.013)	(0.012)
Observations	41728	37654	14915	13172	26728	24397

Panel C: Risky Occupations above the 50th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.001	-0.001	-0.027*	-0.003	0.000	0.006
	(0.009)	(0.010)	(0.015)	(0.022)	(0.010)	(0.017)
Observations	41728	37654	14915	13172	26728	24397

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and unconditional on employment (those who are unemployed are coded as not in a risky occupation). Panel A shows estimates on the likelihood of working in an occupation where the nonfatal injury rate is above the 75th percentile. Panel B shows estimates on the likelihood of working in an occupation where the nonfatal injury rate is above the mean. Panel C shows estimates on the likelihood of working in an occupation where the nonfatal injury rate is above the 50th percentile. Panel D shows estimates on the nonfatal injury rate by occupation. Occupations are defined at 4-digit occupation classification according to the 2010 Census. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: DACA Eligibility and the Likelihood of Working in a Licensed Occupation, Unconditioned on Employment Selection

Panel A: Licensed Occupations above the 25th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.000	-0.000	-0.009	0.015	0.014	0.003
	(0.010)	(0.010)	(0.013)	(0.018)	(0.012)	(0.019)
Observations	31437	31157	11778	11296	19583	19795

Panel B: Licensed Occupations above the Mean

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	-0.008	0.008	-0.014	0.029*	0.004	0.011
	(0.010)	(0.012)	(0.018)	(0.016)	(0.011)	(0.017)
Observations	31437	31157	11778	11296	19583	19795

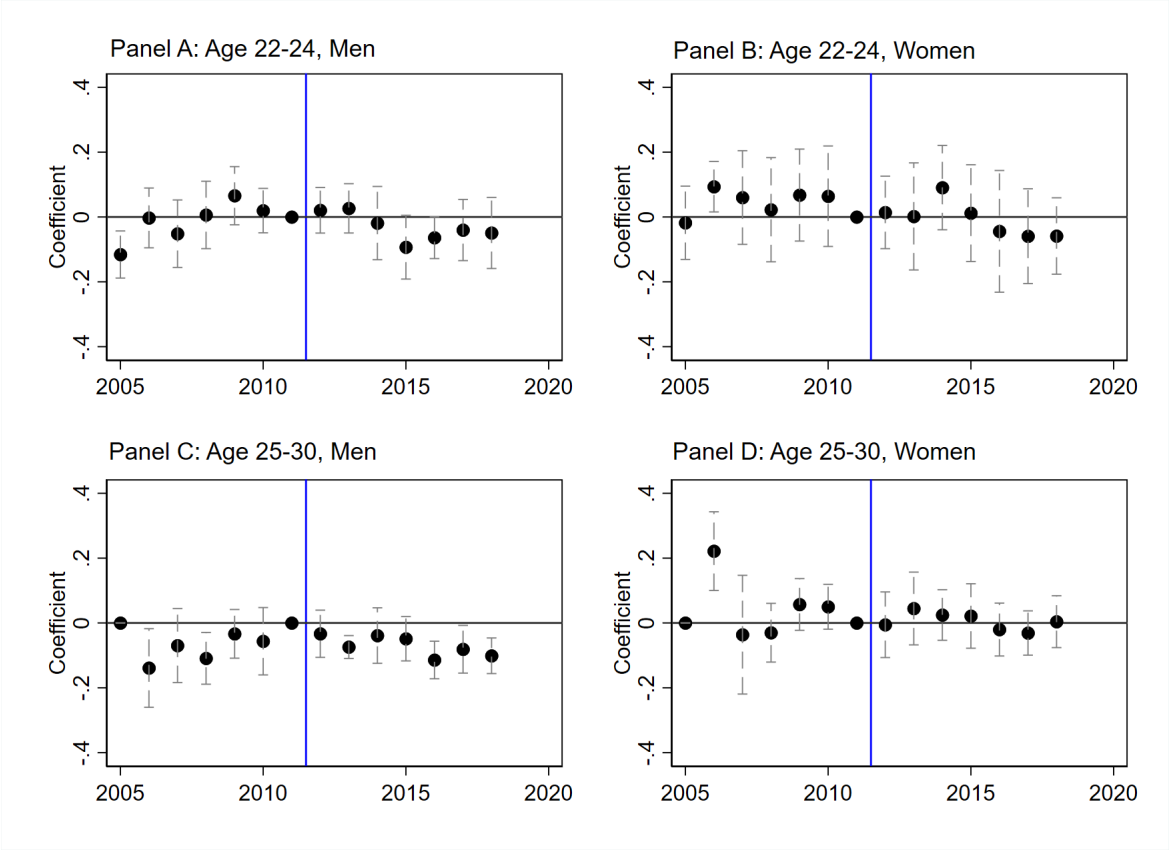
Panel C: Licensed Occupations above the 50th Percentile

	Age 22-30		Age 22-24		Age 25-30	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
DACA Eligible X Post	0.004	0.013	0.012	0.052***	0.011	-0.001
	(0.015)	(0.012)	(0.015)	(0.012)	(0.020)	(0.018)
Observations	31437	31157	11778	11296	19583	19795

Notes: Estimates are obtained from regression equations that include state-by-year fixed effects and age-by-year fixed effects and control for race and place of birth. The analysis sample is limited to foreign-born Hispanics who arrived by age 10 and before 2007, and unconditional on employment (those who are unemployed are coded as not in a licensed occupation). It also excludes observations from CA. Panel A shows estimates on the likelihood of working in an occupation where the percent of licensed workers rate is above the 75th percentile. Panel B shows estimates on the likelihood of working in an occupation where the percent of licensed workers is above the mean. Panel C shows estimates on the likelihood of working in an occupation where the percent of licensed workers is above the 50th percentile. Occupations are defined at 4-digit occupation classification according to the 2010 Census. Standard errors clustered by state are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

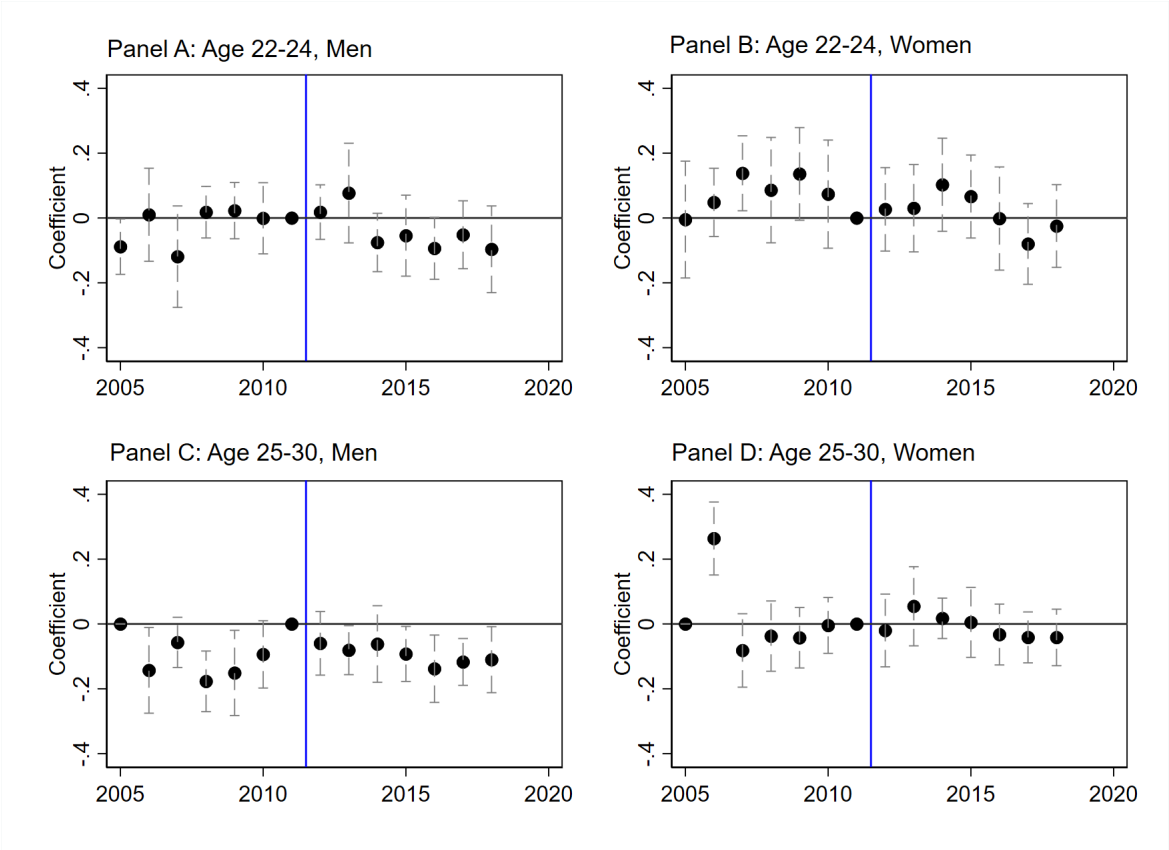
Appendix B: Additional Figures

Figure B1: DACA Eligibility and the Likelihood of Working in an Immigrant Occupation: Above Median



Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the percent of noncitizen workers falls above the 50th percentile. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure B2: DACA Eligibility and the Likelihood of Working in an Immigrant Occupation: Above Mean

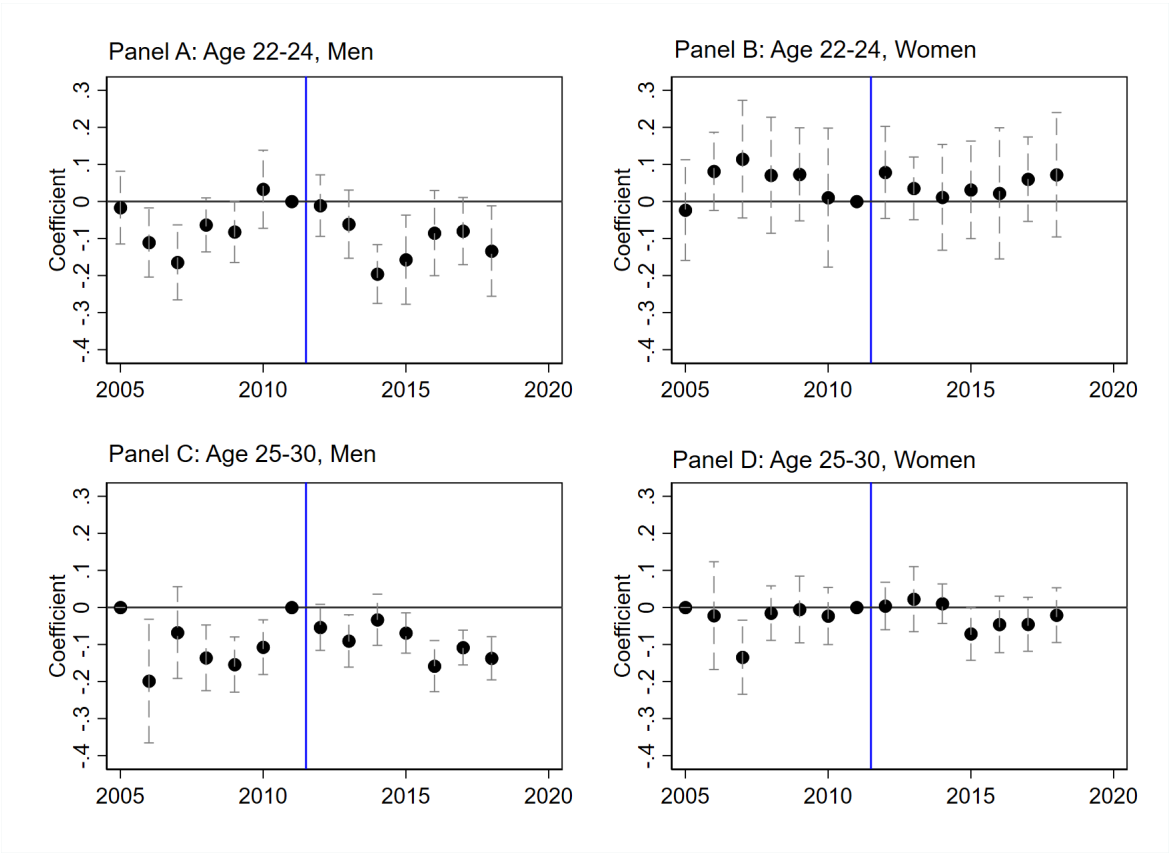


Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the percent of noncitizen workers falls above the mean. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure B3: DACA Eligibility and the Likelihood of Working in a Risky Occupation: Above Median

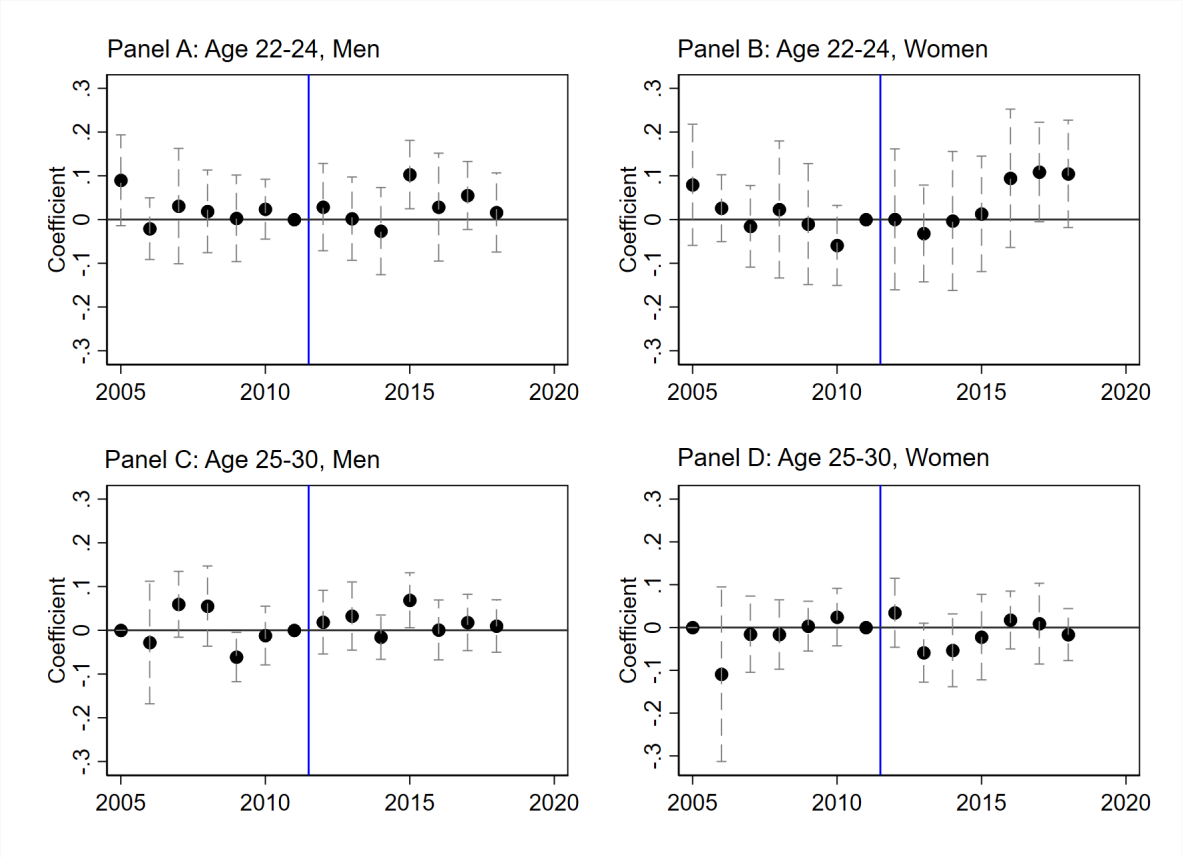
Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the average pre-DACA injury rate falls above the 50th percentile. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure B4: DACA Eligibility and the Likelihood of Working in a Risky Occupation: Above Mean



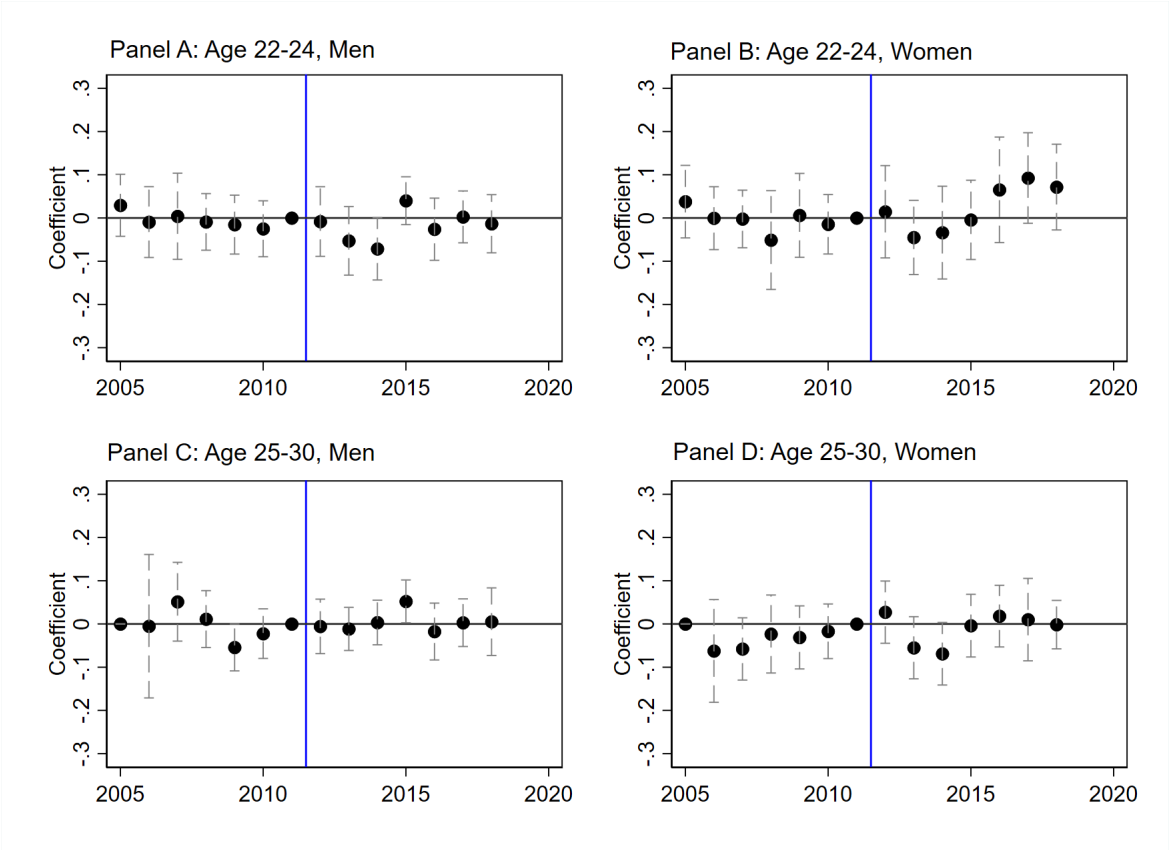
Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the average pre-DACA injury rate falls above the mean. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure B5: DACA Eligibility and the Likelihood of Working in a Licensed Occupation: Above Median



Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the percent of licensed workers falls above the 50th percentile. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.

Figure B6: DACA Eligibility and the Likelihood of Working in a Licensed Occupation: Above Mean



Note: This figure shows the coefficients and 95 percent confidence intervals from event study regressions including state-by-year fixed effects and age-by-year fixed effects and control for race, and place of birth. The outcome variable is an indicator for working in an occupation where the percent of licensed workers falls above the mean. The omitted category is the year 2011 and the blue line indicates the enactment of DACA.