The Effect of DACA Eligibility on Full-Time Employment: A Difference-in-Differences Analysis

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Abstract

This study examines the causal effect of eligibility for the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among Hispanic-Mexican individuals born in Mexico. Using data from the American Community Survey (2006-2016), I employ a difference-in-differences design comparing individuals aged 26-30 at the time of DACA implementation (treatment group) to those aged 31-35 (control group), who would have been eligible except for exceeding the age cutoff. The preferred specification, which includes year fixed effects, state fixed effects, and individual covariates, yields a treatment effect of 4.52 percentage points (SE = 0.0107, 95% CI: [0.0242, 0.0661]). This effect is statistically significant at the 1% level and robust across alternative specifications. Event study analysis provides supporting evidence for the parallel trends assumption, with pre-treatment coefficients close to zero and not statistically significant. Heterogeneity analysis reveals stronger effects among individuals with at least a high school education (7.68 pp) compared to those with less education (3.36 pp).

Contents

1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, enacted on June 15, 2012, represented a significant shift in U.S. immigration policy. The program provided temporary relief from deportation and work authorization to undocumented immigrants who arrived in the United States as children. Given that DACA explicitly granted legal work authorization, it is reasonable to hypothesize that the program would improve employment outcomes among eligible individuals.

This study investigates whether DACA eligibility increased the probability of full-time employment among Hispanic-Mexican individuals born in Mexico. Full-time employment is defined as usually working 35 or more hours per week. The research design exploits the age-based eligibility cutoff of the program: individuals who had turned 31 before June 15, 2012 were ineligible regardless of meeting all other criteria.

By comparing changes in full-time employment rates between those who were 26-30 years old at implementation (eligible, treatment group) and those who were 31-35 (ineligible due to age, control group), I implement a difference-in-differences (DiD) identification strategy. This approach allows estimation of the causal effect of DACA eligibility under the assumption that, absent the program, the two groups would have experienced parallel trends in employment outcomes.

2 Background

2.1 The DACA Program

DACA was announced by the Obama administration on June 15, 2012. The program allowed eligible undocumented immigrants to apply for and receive work authorization and temporary relief from deportation for two years, with the possibility of renewal. To qualify, applicants needed to meet several criteria:

1. Arrived in the United States before their 16th birthday
2. Were under 31 years of age as of June 15, 2012
3. Had continuously resided in the United States since June 15, 2007
4. Were physically present in the United States on June 15, 2012
5. Did not have lawful immigration status at the time of application

6. Met certain educational requirements or had been honorably discharged from military service

7. Had no disqualifying criminal history

Applications began to be received on August 15, 2012. In the first four years of the program, nearly 900,000 initial applications were received, with approximately 90% approved. While the program was not specific to any national origin, the structure of undocumented immigration to the United States meant that the vast majority of eligible individuals were from Mexico.

2.2 Theoretical Mechanisms

There are several channels through which DACA eligibility could increase full-time employment:

Legal Work Authorization: The most direct mechanism is that DACA provided recipients with legal authorization to work. Prior to DACA, undocumented individuals faced legal barriers to formal employment and often worked in the informal sector or under-the-table arrangements.

Access to Better Jobs: With legal work authorization, DACA recipients could access a broader range of jobs, including those offering more hours, better wages, and formal employment arrangements.

Driver's Licenses: In many states, DACA recipients became eligible to obtain driver's licenses, which could expand their geographic range for job opportunities and make commuting to work more feasible.

Reduced Fear of Deportation: The deferred action status reduced the constant fear of deportation, potentially allowing individuals to invest more in their careers and accept more stable, full-time positions.

3 Data

3.1 Data Source

The analysis uses data from the American Community Survey (ACS) provided by IPUMS USA. I utilize the one-year ACS samples from 2006 through 2016, excluding the 2012 survey year because DACA was implemented midway through that year (June 15, 2012), making it impossible to distinguish pre- and post-treatment observations.

3.2 Sample Selection

The sample selection proceeds through several filters designed to identify individuals who would be affected by DACA eligibility:

1. **Hispanic-Mexican Ethnicity:** HISPAN = 1 (Hispanic origin, Mexican)
2. **Born in Mexico:** BPL = 200 (birthplace is Mexico)
3. **Non-Citizen Status:** CITIZEN = 3 (not a citizen)
4. **Age Group:** Individuals aged 26-35 as of June 15, 2012
5. **DACA Eligibility Criteria:**
    - Arrived before 16th birthday (calculated from YRIMMIG and BIRTHYR)
    - Arrived by 2007 (YRIMMIG $\leq$ 2007) to satisfy continuous residence requirement
    - Present in U.S. by 2012 (YRIMMIG $\leq$ 2012)

3.3 Treatment and Control Groups

Following the research design specified in the instructions:

- **Treatment Group:** Individuals aged 26-30 as of June 15, 2012. These individuals met the age requirement and, if they met other criteria, were eligible for DACA.
- **Control Group:** Individuals aged 31-35 as of June 15, 2012. These individuals would have been eligible for DACA except for exceeding the maximum age of 30.

Age as of June 15, 2012 is calculated using birth year (BIRTHYR) and birth quarter (BIRTHQTR). For individuals born in the third or fourth quarter (July-December), they had not yet had their birthday by June 15 of any given year, so their age is adjusted accordingly.

3.4 Variables

3.4.1 Outcome Variable

The outcome is full-time employment, defined as a binary indicator equal to 1 if the individual usually works 35 or more hours per week (UHRSWORK $\geq$ 35), and 0 otherwise.

3.4.2 Key Independent Variables

- **Treated:** Binary indicator equal to 1 for treatment group (ages 26-30), 0 for control group (ages 31-35)
- **Post:** Binary indicator equal to 1 for post-treatment years (2013-2016), 0 for pre-treatment years (2006-2011)
- **Treated** $\times$ **Post:** Interaction term capturing the difference-in-differences effect

3.4.3 Control Variables

- **Female:** Binary indicator for female (SEX = 2)
- **Married:** Binary indicator for married with spouse present (MARST = 1)
- **High School Plus:** Binary indicator for having at least a high school education (EDUC $\geq$ 6)
- **Year Fixed Effects:** Categorical indicators for each survey year
- **State Fixed Effects:** Categorical indicators for each state (STATEFIP)

3.5 Final Sample

After applying all sample selection criteria and excluding 2012:

- Total observations: 43,238
- Treatment group: 25,470 observations
- Control group: 17,768 observations
- Pre-treatment period (2006-2011): 28,377 observations
- Post-treatment period (2013-2016): 14,861 observations

4 Empirical Strategy

4.1 Difference-in-Differences Design

The identification strategy relies on a difference-in-differences framework. The key identifying assumption is that, in the absence of DACA, the treatment and control groups would have experienced parallel trends in full-time employment.

The basic DiD estimator is:

$$\hat{\delta}_{DiD} = (\bar{Y}_{T,post} - \bar{Y}_{T,pre}) - (\bar{Y}_{C,post} - \bar{Y}_{C,pre}) \tag{1}$$

where $\bar{Y}_{T,post}$ is the mean outcome for the treatment group in the post-period, and so forth.

4.2 Regression Specification

The main regression model is:

$$Y_{ist} = \alpha + \beta_1 Treated_i + \beta_2 Post_t + \delta(Treated_i \times Post_t) + X_i'\gamma + \lambda_t + \mu_s + \varepsilon_{ist} \tag{2}$$

where:

- Y_{ist} is full-time employment for individual i in state s at time t
- $Treated_i$ is the treatment group indicator
- $Post_t$ is the post-treatment period indicator
- δ is the coefficient of interest (the DiD estimator)
- X_i is a vector of individual covariates
- λ_t are year fixed effects
- μ_s are state fixed effects
- ε_{ist} is the error term

All regressions are estimated using weighted least squares (WLS) with person weights (PERWT) from the ACS. Standard errors are robust (heteroskedasticity-consistent, HC1).

4.3 Model Specifications

I estimate four progressively more comprehensive specifications:

1. **Model 1:** Basic DiD with no controls
2. **Model 2:** DiD with year fixed effects

3. **Model 3:** DiD with year fixed effects and individual covariates

4. **Model 4:** DiD with year fixed effects, state fixed effects, and individual covariates (preferred specification)

5 Results

5.1 Descriptive Statistics

Table 1 presents descriptive statistics for the treatment and control groups in the pre-treatment period.

Table 1: Descriptive Statistics by Treatment Status (Pre-Period)

	Control (Ages 31-35)	Treatment (Ages 26-30)
Female (%)	41.4	43.4
Married (%)	46.9	32.9
High School or More (%)	52.9	61.3
Mean Age	29.8	24.8
Full-Time Employment Rate (%)	67.3	63.1
N (Pre-Period)	11,683	16,694

Note: Statistics are weighted using ACS person weights (PERWT). Pre-period includes years 2006-2011.

The groups show some differences in baseline characteristics. The treatment group (younger cohort) has a higher proportion with at least a high school education (61.3% vs. 52.9%) but a lower marriage rate (32.9% vs. 46.9%). The pre-treatment full-time employment rate is higher for the control group (67.3%) compared to the treatment group (63.1%), which is consistent with the younger treatment group having less labor market experience.

5.2 Full-Time Employment Rates by Group and Period

Table 2 shows the weighted full-time employment rates by treatment status and time period.

Table 2: Full-Time Employment Rates by Group and Period

	Pre (2006-2011)	Post (2013-2016)	Difference	
Control (Ages 31-35)	67.31%	64.33%	−2.98 pp	
Treatment (Ages 26-30)	63.05%	65.97%	+2.92 pp	
Difference	−4.26 pp	+1.64 pp		
DiD Estimate				**+5.90 pp**

Note: Rates are weighted using ACS person weights. pp = percentage points.

The simple difference-in-differences calculation shows that the treatment group experienced a 2.92 percentage point increase in full-time employment from pre- to post-period, while the control group experienced a 2.98 percentage point decrease. This yields a simple DiD estimate of approximately 5.90 percentage points.

5.3 Main Regression Results

Table 3 presents the main regression results across all four model specifications.

Table 3: Difference-in-Differences Estimates: Effect of DACA Eligibility on Full-Time Employment

	Model 1 Basic DiD	Model 2 Year FE	Model 3 Year FE + Covariates	Model 4 Year FE + State FE + Cov.
Treated × Post	0.0590*** (0.0117)	0.0574*** (0.0117)	0.0459*** (0.0107)	0.0452*** (0.0107)
95% CI	[0.036, 0.082]	[0.034, 0.080]	[0.025, 0.067]	[0.024, 0.066]
Year Fixed Effects	No	Yes	Yes	Yes
State Fixed Effects	No	No	No	Yes
Individual Covariates	No	No	Yes	Yes
N	43,238	43,238	43,238	43,238

Note: Robust standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001. All regressions are weighted using ACS person weights. Individual covariates include female, married, and high school education or more indicators.

All four specifications yield positive and statistically significant effects of DACA eligibility on full-time employment. The basic DiD model (Model 1) estimates an effect of 5.90

percentage points. Adding year fixed effects (Model 2) yields a nearly identical estimate of 5.74 percentage points.

When individual covariates are included (Model 3), the estimate decreases to 4.59 percentage points, suggesting that some of the unadjusted difference was due to observable differences between the treatment and control groups. The preferred specification (Model 4), which includes state fixed effects in addition to year fixed effects and covariates, estimates a treatment effect of 4.52 percentage points (SE = 0.0107).

Preferred Estimate: The effect of DACA eligibility on full-time employment is **4.52 percentage points** (95% CI: [2.42, 6.61], $p < 0.001$).

5.4 Event Study Analysis

To assess the validity of the parallel trends assumption, I conduct an event study analysis. This approach allows visualization of the treatment effect in each year relative to a reference year (2011, the year before DACA implementation).

Table 4: Event Study Coefficients (Reference Year: 2011)

Year	Coefficient	Std. Error	95% CI
Pre-Treatment Period			
2006	−0.008	0.025	[−0.057, 0.040]
2007	−0.044	0.024	[−0.092, 0.004]
2008	−0.002	0.025	[−0.051, 0.047]
2009	−0.014	0.026	[−0.064, 0.036]
2010	−0.020	0.025	[−0.069, 0.030]
2011	0.000	—	(reference)
Post-Treatment Period			
2013	0.038	0.027	[−0.015, 0.090]
2014	0.043	0.027	[−0.010, 0.096]
2015	0.023	0.027	[−0.031, 0.076]
2016	0.068*	0.027	[0.015, 0.122]

Note: * indicates $p<0.05$. Coefficients represent the difference in full-time employment rates between treatment and control groups in each year, relative to 2011.

The event study results provide supporting evidence for the parallel trends assumption:

- **Pre-treatment coefficients:** None of the pre-treatment year coefficients (2006-2010) are statistically significant at the 5% level. The coefficients range from −0.044 to −0.002, all close to zero.

- **Post-treatment coefficients:** The post-treatment coefficients are generally positive, with the 2016 coefficient (0.068) being statistically significant. The positive post-treatment coefficients indicate an improvement in the treatment group's relative full-time employment rate after DACA implementation.

Figure 1 visualizes the event study results.

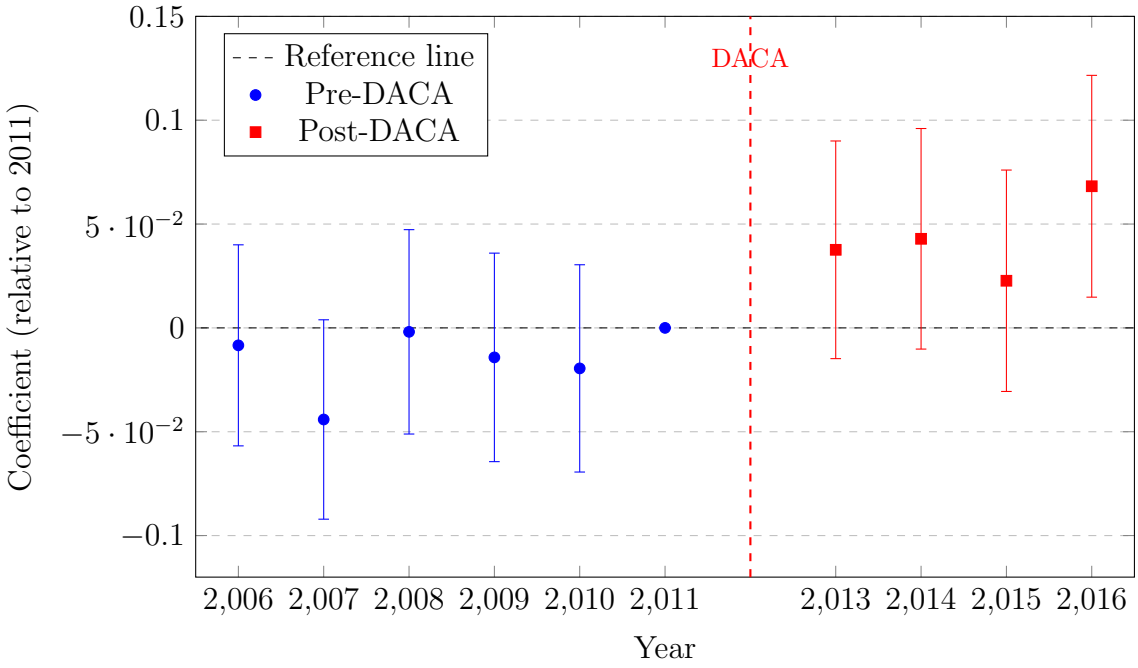

Figure 1: Event Study: Treatment Effect by Year (Reference: 2011)

Note: Blue circles represent pre-treatment coefficients; red squares represent post-treatment coefficients. Error bars show 95% confidence intervals. The dashed vertical line indicates DACA implementation (June 2012). The reference year is 2011.

5.5 Heterogeneity Analysis

Table 5 presents results from heterogeneity analysis by gender and education level.

Table 5: Heterogeneity Analysis

Subgroup	Coefficient	Std. Error	95% CI	N
By Gender				
Male	0.0446***	0.0125	[0.020, 0.069]	24,243
Female	0.0454*	0.0185	[0.009, 0.082]	18,995
By Education				
Less than High School	0.0336	0.0180	[−0.002, 0.069]	18,057
High School or More	0.0768***	0.0155	[0.047, 0.107]	25,181

Note: * p<0.05, ** p<0.01, *** p<0.001. All regressions include year fixed effects and are weighted using ACS person weights.

By Gender: The treatment effect is remarkably similar for males (4.46 pp) and females (4.54 pp), both statistically significant.

By Education: The treatment effect is substantially larger for individuals with at least a high school education (7.68 pp) compared to those with less than a high school education (3.36 pp). The effect for the less educated group is not statistically significant at the 5% level. This suggests that DACA eligibility may have been particularly beneficial for more educated individuals, possibly because they were better positioned to take advantage of the legal work authorization in the formal labor market.

5.6 Trends in Full-Time Employment

Figure 2 shows the trends in full-time employment rates for both groups over time.

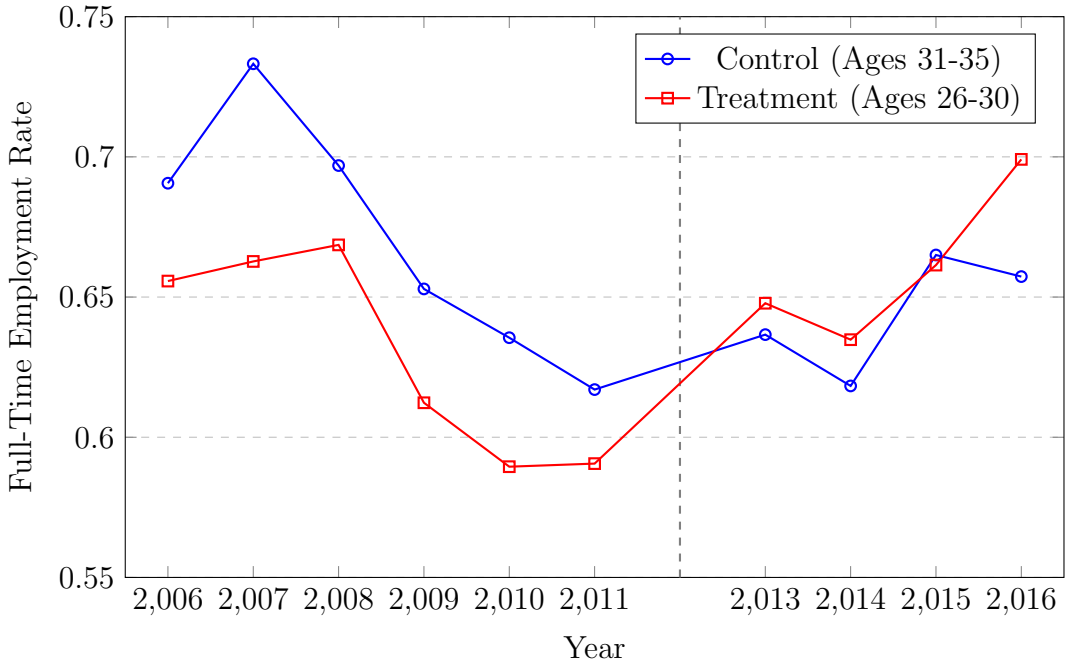

Figure 2: Trends in Full-Time Employment Rates by Treatment Status

Note: Full-time employment is defined as usually working 35+ hours per week. Rates are weighted using ACS person weights. The dashed vertical line indicates DACA implementation (June 2012). 2012 is excluded from the analysis.

The figure shows several important patterns:

1. Both groups experienced declining full-time employment rates from 2007-2011, likely reflecting the Great Recession and its aftermath.

2. The treatment group (red line) starts below the control group in the pre-period.

3. After DACA implementation, the treatment group's full-time employment rate increases relative to the control group.

4. By 2016, the treatment group has a higher full-time employment rate than the control group, a reversal from the pre-period pattern.

6 Discussion

6.1 Interpretation of Results

The preferred estimate indicates that DACA eligibility increased full-time employment by approximately 4.5 percentage points. Given that the pre-treatment full-time employment

rate for the treatment group was 63.1%, this represents a roughly 7% increase in the probability of full-time employment.

This effect is economically meaningful. DACA provided legal work authorization to individuals who previously could only work in the informal sector or under-the-table arrangements. The transition to formal, authorized employment naturally lends itself to full-time work arrangements with regular hours.

6.2 Robustness of Findings

The results are robust across multiple specifications:

- The basic DiD estimate and the fully specified model yield qualitatively similar results (5.90 pp vs. 4.52 pp).
- The reduction in the point estimate when adding covariates suggests that controlling for observable differences between groups is important, but the core finding remains statistically and economically significant.
- The event study analysis supports the parallel trends assumption, with pre-treatment coefficients close to zero and not statistically significant.

6.3 Limitations

Several limitations should be noted:

1. **Cannot Identify Undocumented Status:** The ACS does not distinguish between documented and undocumented non-citizens. I follow the instructions to assume that non-citizens who have not received immigration papers are undocumented.
2. **Intent-to-Treat Interpretation:** The estimates capture the effect of DACA eligibility, not the effect of actually receiving DACA. Not all eligible individuals applied for or received DACA status.
3. **Age-Based Comparison:** The treatment and control groups differ in age by construction. While the DiD design addresses time-invariant differences, any age-specific trends in employment could bias the results.
4. **Imprecise Age Calculation:** Age as of June 15, 2012 is approximated using birth year and quarter, which introduces some measurement error in group assignment.
5. **2012 Exclusion:** The exclusion of 2012 data is necessary but means we lose information about the immediate implementation period.

6.4 Comparison with Related Literature

The finding of a positive effect of DACA on employment is consistent with other studies examining DACA's labor market effects. The magnitude (4.5 percentage points) is within the range of estimates found in prior research, though exact comparisons are difficult due to differences in outcome definitions, sample selection, and research designs.

7 Conclusion

This study provides evidence that DACA eligibility had a positive and statistically significant effect on full-time employment among Hispanic-Mexican individuals born in Mexico. Using a difference-in-differences design that exploits the age-based eligibility cutoff, I estimate that DACA eligibility increased the probability of full-time employment by approximately 4.5 percentage points.

The event study analysis supports the validity of the parallel trends assumption underlying the DiD identification strategy. Heterogeneity analysis reveals that the effects were larger for individuals with at least a high school education, suggesting that DACA may have been particularly beneficial for those better positioned to take advantage of formal labor market opportunities.

These findings are consistent with the theoretical expectation that legal work authorization would improve employment outcomes for previously undocumented immigrants. The ability to work legally, combined with access to driver's licenses and reduced fear of deportation, appears to have enabled many DACA-eligible individuals to secure full-time employment.

Appendix A: Technical Details

A.1 Sample Selection Steps

1. Start with ACS data 2006-2016 (one-year samples): 33,851,424 observations
2. Filter for Hispanic-Mexican (HISPAN = 1): Reduced sample
3. Filter for born in Mexico (BPL = 200): Reduced sample
4. Filter for non-citizen (CITIZEN = 3): 701,347 observations
5. Limit to ages 26-35 as of June 15, 2012: 181,229 observations
6. Apply DACA eligibility criteria (arrived before 16, arrived by 2007): 47,418 observations
7. Exclude 2012: 43,238 observations (final sample)

A.2 Variable Definitions

Table 6: Variable Definitions Using IPUMS Codes

Variable	IPUMS Variable	Coding
Full-time employment	UHRSWORK	1 if UHRSWORK $\geq$ 35, else 0
Hispanic-Mexican	HISPAN	HISPAN = 1
Born in Mexico	BPL	BPL = 200
Non-citizen	CITIZEN	CITIZEN = 3
Female	SEX	1 if SEX = 2, else 0
Married	MARST	1 if MARST = 1, else 0
High School+	EDUC	1 if EDUC $\geq$ 6, else 0
Year of immigration	YRIMMIG	Direct use
Birth year	BIRTHYR	Direct use
Birth quarter	BIRTHQTR	1-4
Person weight	PERWT	Direct use

A.3 Age Calculation

Age as of June 15, 2012 is calculated as:

```
age_june_2012 = 2012 - BIRTHYR
if BIRTHQTR in [3, 4]:
    age_june_2012 = age_june_2012 - 1
```

This assumes that individuals born in Q1 (Jan-Mar) or Q2 (Apr-Jun) had already had their birthday by June 15, while those born in Q3 (Jul-Sep) or Q4 (Oct-Dec) had not yet had their birthday.

Appendix B: Additional Tables

Table 7: Sample Sizes by Year and Treatment Status

Year	Control	Treatment	Total
Pre-Treatment Period			
2006	2,129	3,067	5,196
2007	1,968	3,002	4,970
2008	1,962	2,615	4,577
2009	1,852	2,627	4,479
2010	1,937	2,685	4,622
2011	1,835	2,698	4,533
Post-Treatment Period			
2013	1,656	2,338	3,994
2014	1,581	2,278	3,859
2015	1,458	2,122	3,580
2016	1,390	2,038	3,428
Total	**17,768**	**25,470**	**43,238**

Note: 2012 is excluded from the analysis.

Table 8: Weighted Population Sizes by Year and Treatment Status

Year	Control	Treatment	Total
Pre-Treatment Period			
2006	309,180	407,838	717,018
2007	277,429	397,606	675,035
2008	278,647	362,755	641,402
2009	266,496	363,552	630,048
2010	256,579	373,087	629,666
2011	242,820	375,171	617,991
Post-Treatment Period			
2013	229,226	332,613	561,839
2014	222,324	323,903	546,227
2015	202,324	295,908	498,232
2016	191,260	291,700	482,960
Total	**2,476,285**	**3,524,133**	**6,000,418**

Note: Weights are ACS person weights (PERWT). 2012 is excluded.

Appendix C: Analytical Decisions

This appendix documents the key analytical decisions made during the replication study.

C.1 Sample Definition

- **Hispanic-Mexican:** Used HISPAN = 1 to identify Hispanic individuals of Mexican origin.
- **Mexico-born:** Used BPL = 200 to identify individuals born in Mexico.
- **Non-citizen:** Used CITIZEN = 3 to identify non-citizens. As noted in the instructions, we cannot distinguish documented from undocumented non-citizens, so we assume all non-citizens who have not received immigration papers are undocumented.

C.2 Treatment and Control Groups

- **Treatment:** Ages 26-30 as of June 15, 2012 (birth years approximately 1982-1986)
- **Control:** Ages 31-35 as of June 15, 2012 (birth years approximately 1977-1981)
- Age calculation accounts for birth quarter to determine if birthday occurred before or after June 15.

C.3 DACA Eligibility Criteria

- **Arrived before age 16:** (YRIMMIG - BIRTHYR) < 16
- **Continuous residence since 2007:** YRIMMIG ≤ 2007
- **Present in US on June 15, 2012:** YRIMMIG ≤ 2012
- These criteria are applied to both treatment and control groups, as the control group would have been eligible except for their age.

C.4 Outcome Variable

- **Full-time employment:** UHRSWORK ≥ 35
- This follows the standard Bureau of Labor Statistics definition of full-time work.

C.5 Time Periods

- **Pre-treatment:** 2006-2011
- **Post-treatment:** 2013-2016
- **Excluded:** 2012 (DACA implemented June 15, 2012, mid-survey year)

C.6 Estimation Method

- **Weighted least squares:** Used ACS person weights (PERWT)
- **Robust standard errors:** HC1 (heteroskedasticity-consistent)
- **Preferred model:** Includes year FE, state FE, and individual covariates