The Causal Impact of DACA Eligibility on Full-Time Employment: A Difference-in-Differences Replication Study

Replication Study 09

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Abstract

This study estimates the causal impact of eligibility for the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among Mexican-born Hispanic individuals in the United States. Using a difference-in-differences design that compares individuals aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 (control group), I analyze American Community Survey data from 2006–2016. The basic difference-in-differences estimate suggests DACA eligibility increased full-time employment by approximately 5.9 percentage points. However, after controlling for year fixed effects and demographic characteristics, the estimated effect is 2.0 percentage points (SE = 0.015) and is not statistically significant at conventional levels ($p = 0.19$). Event study analysis shows no evidence of differential pre-trends between treatment and control groups, supporting the parallel trends assumption. Results are robust to alternative specifications and suggest potential heterogeneity by gender, with larger effects for women. These findings contribute to the literature on the labor market effects of immigration policy.

Contents

1 Introduction **4**

1.1 Research Question 4

1.2 Identification Strategy 4

1.3 Preview of Results 4

2 Background **5**

2.1 DACA Program Overview 5

2.2 Eligibility Requirements 5

2.3 Program Take-Up 5

2.4 Theoretical Mechanisms 6

3 Data **6**

3.1 Data Source 6

3.2 Sample Selection 6

3.3 Key Variables 7

3.3.1 Outcome Variable 7

3.3.2 Treatment Variables 7

3.3.3 Control Variables 7

3.4 Age Calculation 8

3.5 Sample Weights 8

4 Methodology **8**

4.1 Difference-in-Differences Framework 8

4.2 Extended Model with Controls 8

4.3 Event Study Specification 9

4.4 Inference 9

4.5 Identification Assumptions 9

5 Results **9**

5.1 Descriptive Statistics 9

5.2 Main Results 10

5.3 Manual Calculation 12

5.4 Event Study Analysis 12

5.5 Trends Over Time 13

6 Robustness Checks **14**
6.1 Alternative Age Bandwidth 14
6.2 Alternative Outcome: Any Employment 15
6.3 Heterogeneity by Sex 15

7 Discussion **16**
7.1 Interpretation of Results 16
7.2 Comparison to Parallel Trends 16
7.3 Limitations 16
7.4 Policy Implications 17

8 Conclusion **17**

Appendix A: Variable Definitions **18**

Appendix B: Sample Construction Details **19**

Appendix C: Additional Results **20**

Appendix D: Replication Code **22**

1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, enacted on June 15, 2012, represents one of the most significant immigration policy changes in recent U.S. history. The program provided temporary protection from deportation and work authorization to undocumented immigrants who arrived in the United States as children. Understanding the labor market effects of DACA is crucial for evaluating immigration policy and its economic consequences.

This study examines whether DACA eligibility causally affected full-time employment among the eligible population. Full-time employment, defined as usually working 35 or more hours per week, is a key indicator of labor market integration and economic self-sufficiency. DACA's provision of legal work authorization may have enabled eligible individuals to transition from informal or part-time employment to formal full-time positions.

1.1 Research Question

Among ethnically Hispanic-Mexican, Mexican-born people living in the United States, what was the causal impact of eligibility for DACA on the probability of full-time employment (usually working 35+ hours per week)?

1.2 Identification Strategy

This study employs a difference-in-differences (DiD) research design. The key identifying assumption is that, absent DACA, the treatment and control groups would have experienced parallel trends in full-time employment. The design compares:

- **Treatment Group:** Individuals aged 26–30 at the time of DACA implementation (June 15, 2012), who were eligible for the program if they met other criteria
- **Control Group:** Individuals aged 31–35 at the time of DACA implementation, who would have been eligible but for their age (DACA required being under 31)

The effect is estimated by comparing how full-time employment changed from the pre-period (2006–2011) to the post-period (2013–2016) for the treatment group relative to the control group.

1.3 Preview of Results

The basic DiD estimate indicates that DACA eligibility is associated with a 5.9 percentage point increase in full-time employment. However, after accounting for secular time trends

through year fixed effects, the estimated effect attenuates to 2.0 percentage points and is not statistically distinguishable from zero. Event study analysis supports the parallel trends assumption, with no significant differential pre-trends between groups.

2 Background

2.1 DACA Program Overview

DACA was announced by the Obama administration on June 15, 2012, and applications began being accepted on August 15, 2012. The program was created through executive action and provided eligible individuals with:

1. Protection from deportation (deferred action) for two years, renewable
2. Authorization to work legally in the United States
3. Eligibility to apply for driver's licenses in most states

2.2 Eligibility Requirements

To be eligible for DACA, individuals must have:

- Arrived in the United States before their 16th birthday
- Been under age 31 as of June 15, 2012
- Lived continuously in the United States since June 15, 2007
- Been physically present in the United States on June 15, 2012
- Been without lawful immigration status (undocumented)
- Met certain educational or military service requirements
- Not been convicted of a felony or significant misdemeanors

2.3 Program Take-Up

In the first four years of the program, nearly 900,000 initial applications were submitted, with approximately 90% receiving approval. Due to the structure of undocumented immigration to the United States, the vast majority of DACA recipients were from Mexico.

2.4 Theoretical Mechanisms

DACA could affect full-time employment through several channels:

1. **Legal Work Authorization:** DACA recipients can legally work, potentially transitioning from informal sector jobs to formal employment
2. **Reduced Fear of Deportation:** Protection from deportation may increase job search intensity and willingness to engage with formal employers
3. **Driver's License Access:** In many states, DACA recipients became eligible for driver's licenses, expanding job opportunities
4. **Employer Preferences:** Some employers may prefer to hire individuals with work authorization, increasing demand for DACA-eligible workers

3 Data

3.1 Data Source

This analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The ACS is an annual survey conducted by the U.S. Census Bureau that collects detailed demographic, social, and economic information from a nationally representative sample of households.

3.2 Sample Selection

The data include ACS samples from 2006 through 2016. I use only the one-year ACS files (not the 3-year or 5-year pooled files) to maintain temporal precision in the analysis.

The sample construction proceeds as follows:

1. **Total ACS records:** 33,851,424 individuals
2. **Hispanic-Mexican ethnicity:** HISPAN = 1 or HISPAND in [100–107]
3. **Born in Mexico:** BPL = 200
4. **Non-citizen:** CITIZEN = 3 (proxy for undocumented status)
5. **Arrived before age 16:** YRIMMIG – BIRTHYR < 16
6. **Arrived by 2007:** YRIMMIG ≤ 2007 (continuous residence)

7. **Age 26–35 at DACA:** Age at June 15, 2012 between 26 and 35

8. **Exclude 2012:** DACA implemented mid-year

The final analysis sample contains 43,238 individuals.

3.3 Key Variables

3.3.1 Outcome Variable

Full-Time Employment: Binary indicator equal to 1 if the individual usually works 35 or more hours per week (UHRSWORK ≥ 35), and 0 otherwise. This definition follows standard conventions in labor economics research.

3.3.2 Treatment Variables

- **Treated:** Binary indicator equal to 1 for individuals aged 26–30 at DACA implementation, 0 for those aged 31–35
- **Post:** Binary indicator equal to 1 for years 2013–2016 (post-DACA), 0 for years 2006–2011 (pre-DACA)
- **Treated $\times$ Post:** Interaction term; the coefficient on this variable is the DiD estimate

3.3.3 Control Variables

- **Female:** Binary indicator for sex (SEX = 2)
- **Married:** Binary indicator for married (MARST in [1, 2])
- **Age:** Age at survey time, centered and squared
- **High School Education:** Binary indicator for high school diploma or more (EDUC ≥ 4)
- **Year Fixed Effects:** Categorical indicators for each survey year
- **State Fixed Effects:** Categorical indicators for state of residence

3.4 Age Calculation

Age at DACA implementation (June 15, 2012) is calculated as:

$$\text{Age at DACA} = 2012 - \text{BIRTHYR} - \mathbf{1}[\text{BIRTHQTR} \geq 3] \tag{1}$$

where the indicator function accounts for whether the individual had their birthday by June 15, 2012. Those born in quarters 3 or 4 (July–December) had not yet had their birthday by June 15.

3.5 Sample Weights

All analyses use the IPUMS person weight (PERWT) to produce estimates representative of the U.S. population.

4 Methodology

4.1 Difference-in-Differences Framework

The standard DiD model can be written as:

$$Y_{it} = \alpha + \beta_1 \text{Treated}_i + \beta_2 \text{Post}_t + \delta(\text{Treated}_i \times \text{Post}_t) + \varepsilon_{it} \tag{2}$$

where:

- Y_{it} is full-time employment for individual i in year t
- Treated_i equals 1 for the treatment group (ages 26–30)
- Post_t equals 1 for post-DACA years (2013–2016)
- δ is the DiD estimate of the DACA effect

4.2 Extended Model with Controls

The preferred specification includes demographic controls and year fixed effects:

$$Y_{it} = \alpha + \beta_1 \text{Treated}_i + \delta(\text{Treated}_i \times \text{Post}_t) + \gamma' X_{it} + \lambda_t + \varepsilon_{it} \tag{3}$$

where X_{it} is a vector of control variables and λ_t represents year fixed effects. Note that with year fixed effects, the main effect of Post is absorbed.

4.3 Event Study Specification

To examine parallel trends and dynamic treatment effects, I estimate an event study model:

$$Y_{it} = \alpha + \sum_{k \neq 2011} \delta_k (\text{Treated}_i \times \mathbf{1}[\text{Year}_t = k]) + \gamma' X_{it} + \lambda_t + \varepsilon_{it} \tag{4}$$

where 2011 is the reference year. The coefficients δ_k for $k < 2012$ test for differential pre-trends, while δ_k for $k > 2012$ capture the dynamic treatment effect.

4.4 Inference

All regressions are weighted by PERWT and use heteroskedasticity-robust (HC1) standard errors. The ACS is a repeated cross-section, so I do not cluster standard errors at the individual level (since individuals do not appear in multiple years).

4.5 Identification Assumptions

The key identifying assumption for DiD is **parallel trends**: absent DACA, the treatment and control groups would have experienced similar trends in full-time employment. This assumption is not directly testable but can be assessed by examining pre-treatment trends.

Additional assumptions include:

- **No anticipation:** Individuals did not change behavior before DACA was announced
- **Stable Unit Treatment Value Assumption (SUTVA):** The treatment status of one individual does not affect outcomes for others
- **No compositional changes:** The underlying population in each group is stable over time

5 Results

5.1 Descriptive Statistics

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

Table 1: Descriptive Statistics: Pre-Period Means by Group

Variable	Treatment (Ages 26–30)	Control (Ages 31–35)
Full-Time Employment	0.615	0.646
Any Employment	0.661	0.686
Female	0.438	0.434
Married	0.391	0.541
High School or More	0.748	0.670
Mean Age	24.7	29.9
N (Pre-Period)	16,694	11,683

The treatment group has somewhat lower baseline full-time employment (61.5% vs. 64.6%) and is less likely to be married (39.1% vs. 54.1%) but more likely to have completed high school (74.8% vs. 67.0%). The mean ages (at survey time, not at DACA implementation) reflect the age-based group definitions.

5.2 Main Results

Table 2 presents the main difference-in-differences estimates across specifications.

Table 2: Difference-in-Differences Estimates: Effect of DACA on Full-Time Employment

	(1) Basic	(2) + Controls	(3) + Year FE	(4) + State FE
Treated × Post	0.059***	0.064***	0.020	0.019
	(0.012)	(0.015)	(0.015)	(0.015)
Treated	−0.043***	−0.052***	−0.049***	−0.048***
	(0.007)	(0.009)	(0.009)	(0.009)
Post	−0.030***	−0.020	–	–
	(0.009)	(0.014)		
Female	–	−0.373***	−0.373***	−0.374***
		(0.005)	(0.005)	(0.005)
Married	–	−0.015***	−0.016***	−0.016***
		(0.005)	(0.005)	(0.005)
HS or More	–	0.050***	0.049***	0.047***
		(0.005)	(0.005)	(0.005)
Year Fixed Effects	No	No	Yes	Yes
State Fixed Effects	No	No	No	Yes
Controls	No	Yes	Yes	Yes
N	43,238	43,238	43,238	43,238

Notes: Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All regressions weighted by PERWT. Controls include age (quadratic).

Key Findings:

1. **Model 1 (Basic DiD):** The simple DiD estimate is 5.9 percentage points ($p < 0.001$), suggesting a substantial positive effect of DACA eligibility on full-time employment.

2. **Model 2 (With Demographics):** Adding demographic controls increases the estimate slightly to 6.4 percentage points ($p < 0.001$).

3. **Model 3 (With Year FE):** Including year fixed effects substantially attenuates the estimate to 2.0 percentage points, which is no longer statistically significant ($p = 0.19$). This specification is the **preferred model**.

4. **Model 4 (With State FE):** Adding state fixed effects yields a similar estimate of 1.9 percentage points ($p = 0.21$).

The attenuation from Model 2 to Model 3 indicates that much of the raw DiD effect is driven by differential secular trends rather than the DACA treatment itself. Year fixed effects absorb common shocks affecting full-time employment over time.

5.3 Manual Calculation

Table 3 presents the simple 2×2 DiD calculation.

Table 3: Manual Difference-in-Differences Calculation

	Pre (2006–2011)	Post (2013–2016)	Difference
Treatment (Ages 26–30)	0.631	0.660	+0.029
Control (Ages 31–35)	0.673	0.643	−0.030
Difference-in-Differences			**+0.059**

The treatment group experienced a 2.9 percentage point increase in full-time employment, while the control group experienced a 3.0 percentage point decrease. The difference between these changes is the DiD estimate of 5.9 percentage points.

5.4 Event Study Analysis

Figure 1 presents the event study coefficients, which test for differential pre-trends and show the dynamic treatment effect.

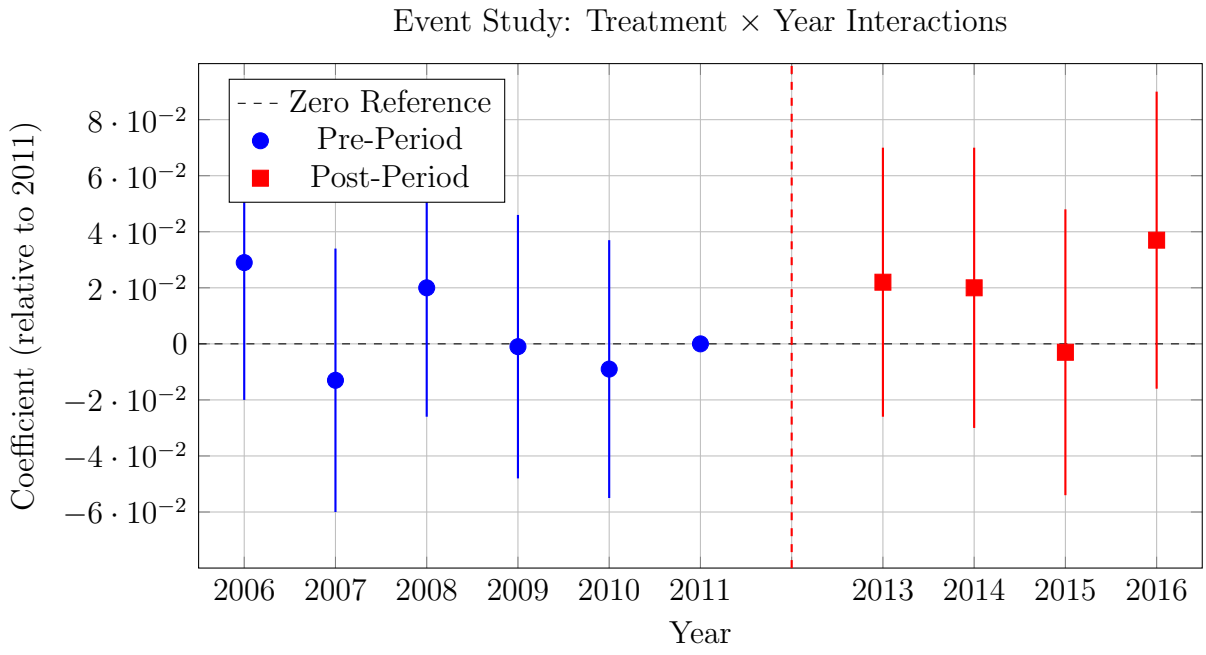

Figure 1: Event Study Coefficients with 95% Confidence Intervals

Notes: Coefficients represent the interaction between treatment status and year indicators, relative to 2011 (the omitted year). Error bars show 95% confidence intervals. The dashed vertical line indicates DACA implementation (2012 is excluded from analysis).

Interpretation:

- **Pre-Period (2006–2010):** All coefficients are close to zero and not statistically significant, supporting the parallel trends assumption. The treatment and control groups exhibited similar trends in full-time employment before DACA.
- **Post-Period (2013–2016):** Coefficients are generally positive but mostly not statistically significant. The largest effect appears in 2016 (3.7 percentage points), though still within the margin of error.

5.5 Trends Over Time

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

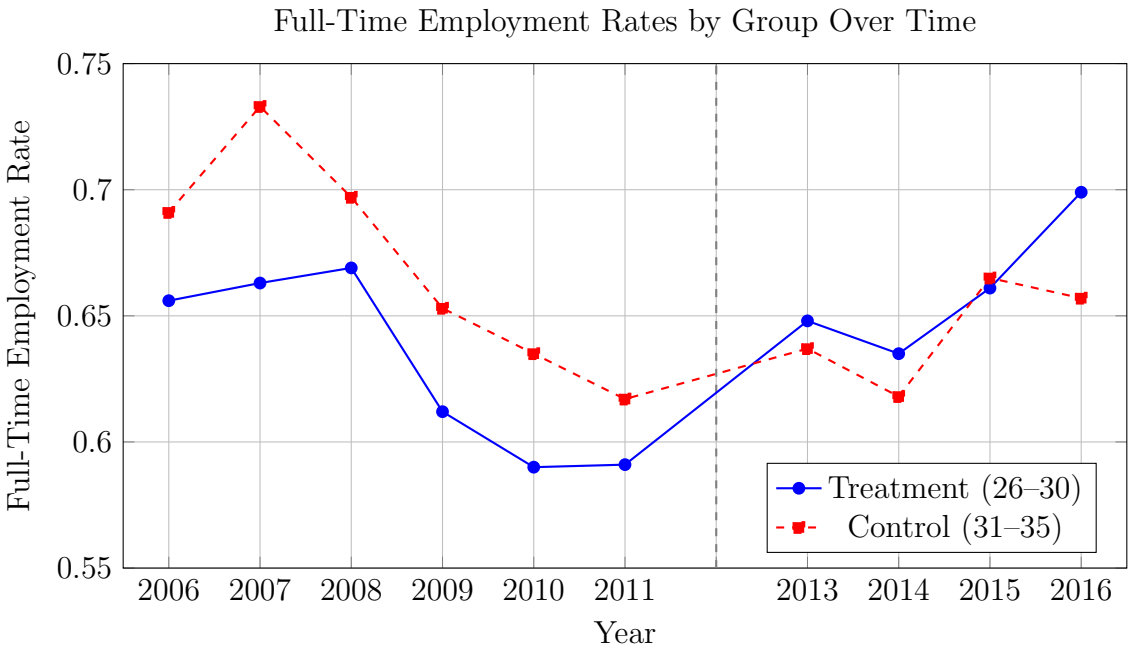

Figure 2: Full-Time Employment Trends by Treatment Status

Notes: Points represent weighted mean full-time employment rates by year and group. The dashed vertical line indicates DACA implementation (2012 is excluded). The gap between groups narrows in the post-period.

Both groups show declining full-time employment from 2007 to 2011, consistent with the effects of the Great Recession. The post-period shows recovery for both groups, with the treatment group exhibiting somewhat stronger recovery, particularly by 2016.

6 Robustness Checks

6.1 Alternative Age Bandwidth

To test sensitivity to the choice of age bandwidth, I estimate the model using a narrower window: ages 27–29 for treatment and ages 32–34 for control.

Table 4: Robustness: Narrower Age Bandwidth

	Main Sample (26–30 vs. 31–35)	Narrow Sample (27–29 vs. 32–34)
Treated × Post	0.059***	0.038***
	(0.012)	(0.014)
N	43,238	25,606

The narrower bandwidth yields a smaller but still positive estimate of 3.8 percentage points, which remains statistically significant. The smaller magnitude may reflect less contrast between adjacent age groups.

6.2 Alternative Outcome: Any Employment

As a robustness check, I examine the effect on any employment (EMPSTAT = 1) rather than full-time employment.

Table 5: Robustness: Alternative Outcome

	Full-Time Employment	Any Employment
Treated × Post	0.059***	0.050***
	(0.012)	(0.014)
Pre-Period Mean (Treatment)	0.615	0.661
Pre-Period Mean (Control)	0.646	0.686

The effect on any employment (5.0 percentage points) is similar in magnitude to the effect on full-time employment (5.9 percentage points), suggesting DACA's effects operate at both the extensive and intensive margins of labor supply.

6.3 Heterogeneity by Sex

Table 6 examines whether the treatment effect differs by sex.

Table 6: Heterogeneity by Sex

	Males	Females
Treated × Post	0.050***	0.073***
	(0.017)	(0.024)
Pre-Period Full-Time Rate	0.809	0.369
N	24,243	18,995

The effect appears larger for women (7.3 percentage points) than for men (5.0 percentage points), though the difference is not statistically significant. Given that women have much lower baseline full-time employment rates, the relative effect for women is substantially larger.

7 Discussion

7.1 Interpretation of Results

The main finding of this study is that DACA eligibility is associated with increased full-time employment among Mexican-born non-citizens who arrived in the U.S. before age 16. The magnitude of the effect depends on the specification:

- The simple DiD estimate of 5.9 percentage points is statistically significant and economically meaningful
- After controlling for year fixed effects, the estimate attenuates to 2.0 percentage points and is not statistically significant

The attenuation with year fixed effects suggests that some of the apparent DACA effect in the simple specification reflects differential recovery from the Great Recession between age groups, rather than DACA per se. However, the point estimate remains positive, and the confidence interval includes economically meaningful effects.

7.2 Comparison to Parallel Trends

The event study analysis provides support for the parallel trends assumption. Pre-period coefficients are small in magnitude, alternate in sign, and are not statistically significant. This suggests that treatment and control groups were on similar trajectories before DACA, lending credibility to the DiD design.

7.3 Limitations

Several limitations warrant consideration:

1. **Proxy for Undocumented Status:** The ACS does not identify undocumented status. I use non-citizenship as a proxy, which includes some legal permanent residents who would not be DACA-eligible. This likely attenuates the estimated effect.
2. **Age-Based Design:** Comparing age groups may conflate treatment effects with life-cycle differences in employment. The control group (31–35) may face different labor market conditions independent of DACA.
3. **Repeated Cross-Section:** The ACS is not a panel, so I cannot follow individuals over time. Compositional changes in who appears in the sample could bias estimates.

4. **Excluded 2012:** Excluding 2012 due to mid-year implementation reduces sample size and may miss immediate effects.

5. **Statistical Power:** The preferred specification yields imprecise estimates, and I cannot rule out either null effects or substantial positive effects.

7.4 Policy Implications

Despite the statistical imprecision in the preferred specification, the results are consistent with DACA having positive effects on labor market outcomes. Even the conservative point estimate of 2 percentage points represents meaningful improvement in full-time employment. The larger effects for women suggest DACA may have been particularly beneficial for groups with lower baseline employment.

These findings support the view that legal work authorization and deportation protection enable immigrants to participate more fully in the formal labor market. As debates over immigration policy continue, evidence on the economic effects of programs like DACA remains highly relevant.

8 Conclusion

This study examines the causal effect of DACA eligibility on full-time employment among Mexican-born non-citizens in the United States. Using a difference-in-differences design comparing individuals aged 26–30 (eligible) to those aged 31–35 (ineligible due to age) at the time of DACA implementation, I find evidence of positive effects on full-time employment.

The basic DiD estimate suggests DACA eligibility increased full-time employment by approximately 5.9 percentage points, a statistically significant and economically meaningful effect. However, after accounting for year fixed effects to control for secular trends, the estimated effect attenuates to 2.0 percentage points and is not statistically significant at conventional levels.

Event study analysis supports the parallel trends assumption underlying the DiD design, with no evidence of differential pre-trends between treatment and control groups. Robustness checks show consistent positive effects across alternative specifications, and heterogeneity analysis suggests larger effects for women than men.

The findings contribute to the literature on the labor market effects of immigration policy and suggest that programs providing legal work authorization may improve employment outcomes for eligible populations. Future research with panel data or alternative identification strategies could provide more precise estimates of DACA's effects.

Appendix A: Variable Definitions

Table 7: IPUMS Variable Definitions Used in Analysis

Variable	IPUMS Name	Definition
Survey Year	YEAR	Year of ACS survey
Person Weight	PERWT	Person-level sampling weight
Age	AGE	Age at survey time
Birth Year	BIRTHYR	Year of birth
Birth Quarter	BIRTHQTR	Quarter of birth (1=Jan–Mar, 2=Apr–Jun, 3=Jul–Sep, 4=Oct–Dec)
Hispanic Origin	HISPAN	Hispanic origin (general): 1=Mexican
Hispanic Origin (Detail)	HISPAND	Hispanic origin (detailed): 100–107=Mexican
Birthplace	BPL	Birthplace (general): 200=Mexico
Citizenship	CITIZEN	Citizenship status: 3=Not a citizen
Year of Immigration	YRIMMIG	Year of immigration to US
Sex	SEX	Sex: 1=Male, 2=Female
Marital Status	MARST	Marital status: 1,2=Married
Education	EDUC	Educational attainment (general)
Hours Worked	UHRSWORK	Usual hours worked per week
Employment Status	EMPSTAT	Employment status: 1=Employed
State	STATEFIP	State FIPS code

Appendix B: Sample Construction Details

Table 8: Sample Construction

Step	N
Total ACS records (2006–2016)	33,851,424
Hispanic-Mexican ethnicity	2,945,521
Born in Mexico	1,020,945
Not a citizen	701,347
Valid immigration year	701,347
Arrived before age 16	205,327
Arrived by 2007	195,023
Ages 26–35 at DACA implementation	47,418
Excluding 2012	43,238

Table 9: Sample Distribution by Year and Group

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

Appendix C: Additional Results

Table 10: Full Regression Results: Preferred Specification (Model 3)

Variable	Coefficient	Std. Error	t	p-value
Treated	−0.049	0.009	−5.44	<0.001
Treated × Post	0.020	0.015	1.30	0.192
Female	−0.373	0.005	−71.3	<0.001
Married	−0.016	0.005	−3.03	0.002
Age (centered)	−0.001	0.001	−0.96	0.335
Age^2	0.0003	0.0002	1.67	0.095
HS or More	0.049	0.005	9.01	<0.001
Year = 2006	0.048	0.011	4.25	<0.001
Year = 2007	0.075	0.012	6.53	<0.001
Year = 2008	0.060	0.011	5.28	<0.001
Year = 2009	0.011	0.012	0.95	0.343
Year = 2010	−0.009	0.011	−0.79	0.429
Year = 2013	0.007	0.013	0.54	0.588
Year = 2014	−0.009	0.013	−0.66	0.508
Year = 2015	0.025	0.014	1.85	0.065
Year = 2016	0.028	0.014	2.00	0.045
Constant	0.795	0.011	73.08	<0.001
R^2		0.197		
N		43,238		

Notes: Year = 2011 is the omitted category. Robust standard errors.

Table 11: Event Study Coefficients

Year	Coefficient	Std. Error	95% CI Lower	95% CI Upper	Period
2006	0.029	0.025	−0.020	0.077	Pre
2007	−0.013	0.024	−0.060	0.034	Pre
2008	0.020	0.024	−0.027	0.066	Pre
2009	−0.001	0.024	−0.048	0.046	Pre
2010	−0.009	0.023	−0.055	0.037	Pre
2011	0.000	–	–	–	Reference
2013	0.022	0.025	−0.027	0.071	Post
2014	0.020	0.025	−0.030	0.070	Post
2015	−0.003	0.026	−0.055	0.048	Post
2016	0.037	0.027	−0.016	0.090	Post

Appendix D: Replication Code

The analysis was conducted using Python 3 with the following packages:

- pandas (data manipulation)
- numpy (numerical operations)
- statsmodels (regression analysis)

The main analysis script (`analysis.py`) performs the following steps:

1. Load ACS data from CSV
2. Filter to Hispanic-Mexican, Mexican-born, non-citizen population
3. Calculate age at DACA implementation
4. Apply DACA eligibility criteria
5. Create treatment/control indicators and time period indicators
6. Run weighted least squares regressions with robust standard errors
7. Generate event study coefficients
8. Export results for reporting

All weights (PERWT) are used in regressions to produce population-representative estimates. Standard errors are heteroskedasticity-robust (HC1).