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

Replication Study Report

Independent Replication #57

January 2026

Abstract

This study examines the causal impact of eligibility for the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among Hispanic-Mexican Mexican-born individuals in the United States. Using American Community Survey data from 2008–2016 (excluding 2012) and a difference-in-differences research design, I compare individuals aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 (control group). The analysis finds that DACA eligibility is associated with a 6.14 percentage point increase in the probability of full-time employment (95% CI: 1.90 to 10.38 percentage points, $p = 0.0045$). This effect is robust to the inclusion of demographic controls and state and year fixed effects. The findings suggest that DACA's provision of work authorization and temporary deportation relief had a meaningful positive impact on labor market outcomes for eligible individuals.

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1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, implemented on June 15, 2012, represents one of the most significant immigration policy changes in recent U.S. history. The program provided temporary deportation relief and work authorization to undocumented immigrants who arrived in the United States as children, met specific residency requirements, and were under 31 years of age at the time of implementation.

This replication study examines the causal effect of DACA eligibility on full-time employment among the program's target population: Hispanic-Mexican individuals born in Mexico and residing in the United States. By comparing employment outcomes between those who became eligible for DACA (ages 26–30 at implementation) and a slightly older cohort who would have been eligible except for their age (ages 31–35), this analysis employs a difference-in-differences (DiD) research design to isolate the program's effect from broader economic trends.

The study addresses the following research question: *Among ethnically Hispanic-Mexican Mexican-born people living in the United States, what was the causal impact of eligibility for the Deferred Action for Childhood Arrivals (DACA) program on the probability of full-time employment?*

2 Background

2.1 The DACA Program

DACA was enacted by the U.S. federal government on June 15, 2012, allowing qualified undocumented immigrants to apply for and obtain authorization to work legally for two years without fear of deportation. The program's eligibility requirements included:

- Arrival in the United States before the applicant's 16th birthday
- Not having reached the 31st birthday as of June 15, 2012
- Continuous residence in the U.S. since June 15, 2007
- Physical presence in the U.S. on June 15, 2012 without lawful immigration status

Applications began being received on August 15, 2012, and in the program's first four years, nearly 900,000 initial applications were received, with approximately 90% approved. After the initial two-year authorization period, recipients could reapply for extensions.

2.2 Expected Effects on Employment

DACA eligibility was expected to increase employment rates through several mechanisms:

1. **Legal work authorization**: DACA recipients could legally work for any employer, expanding job opportunities beyond the informal sector.
2. **Driver's license access**: Many states allowed DACA recipients to obtain driver's licenses, improving access to employment opportunities.
3. **Reduced deportation risk**: Temporary protection from deportation may have encouraged greater labor market participation and investment in employment relationships.
4. **Psychological effects**: Reduced uncertainty about immigration status may have improved job search behavior and workplace productivity.

3 Data

3.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The dataset covers the years 2008 through 2016, with 2012 omitted since observations from that year cannot be definitively classified as pre- or post-treatment. The data have been pre-processed to include only individuals in the treatment or comparison groups as defined by the DACA eligibility criteria.

3.2 Sample Description

The analytic sample consists of 17,382 observations:

- **Treatment group (ELIGIBLE = 1)**: 11,382 individuals who were ages 26–30 at the time of DACA implementation and met other eligibility criteria
- **Control group (ELIGIBLE = 0)**: 6,000 individuals who were ages 31–35 at implementation and would have been eligible except for their age

The pre-treatment period includes years 2008–2011 (AFTER = 0), and the post-treatment period includes years 2013–2016 (AFTER = 1).

3.3 Key Variables

Table 1: Key Variables Used in Analysis

Variable	Type	Description
FT	Outcome	Binary indicator equal to 1 if the individual usually works 35 or more hours per week (full-time employment)
ELIGIBLE	Treatment	Binary indicator equal to 1 for individuals ages 26–30 at DACA implementation (treatment group), 0 for ages 31–35 (control group)
AFTER	Time	Binary indicator equal to 1 for years 2013–2016 (post-DACA), 0 for years 2008–2011 (pre-DACA)
PERWT	Weight	Person-level survey weight for population-representative estimates
AGE	Control	Age in years
SEX	Control	Sex (1 = Male, 2 = Female)
MARST	Control	Marital status
NCHILD	Control	Number of own children in household
EDUC_RECODE	Control	Educational attainment (recoded to five categories)
STATEFIP	Fixed Effect	State FIPS code
YEAR	Fixed Effect	Survey year

4 Methodology

4.1 Research Design

This study employs a difference-in-differences (DiD) research design, which estimates the causal effect of DACA eligibility by comparing changes in full-time employment rates between the treatment and control groups from before to after the policy implementation. 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.

4.2 Estimation Strategy

The primary specification is a linear probability model estimated using weighted least squares (WLS):

$$FT_{ist} = \beta_0 + \beta_1 \cdot ELIGIBLE_i + \beta_2 \cdot AFTER_t + \beta_3 \cdot (ELIGIBLE_i \times AFTER_t) + X_i'\gamma + \alpha_s + \tau_t + \varepsilon_{ist} \tag{1}$$

where:

- FT_{ist} is the full-time employment indicator for individual i in state s at time t
- $ELIGIBLE_i$ indicates treatment group membership
- $AFTER_t$ indicates the post-treatment period
- $ELIGIBLE_i \times AFTER_t$ is the interaction term whose coefficient (β_3) captures the DiD estimate
- X_i is a vector of individual-level covariates
- α_s represents state fixed effects
- τ_t represents year fixed effects
- ε_{ist} is the error term

The coefficient of interest is β_3, which represents the average treatment effect of DACA eligibility on the probability of full-time employment.

4.3 Model Specifications

Three model specifications are estimated to assess robustness:

1. **Model 1 (Basic DiD)**: Includes only ELIGIBLE, AFTER, and their interaction, with no additional controls.
2. **Model 2 (With Demographics)**: Adds demographic controls including age, sex (FEMALE indicator), marital status (MARRIED indicator), number of children (NCHILD), and education dummies.
3. **Model 3 (With State/Year FE)**: Adds state and year fixed effects to Model 2, which absorbs the AFTER main effect and controls for state-level time-invariant factors and common year-specific shocks.

4.4 Standard Errors

All standard errors are clustered at the state level to account for within-state correlation in the error terms. This approach is appropriate given that DACA implementation was a federal policy but labor market conditions and enforcement practices vary by state.

4.5 Weighting

All regressions use person-level survey weights (PERWT) to produce population-representative estimates and account for the ACS sampling design.

5 Results

5.1 Descriptive Statistics

Table 2 presents summary statistics for the treatment and control groups.

Table 2: Descriptive Statistics by Treatment Status

	Treatment (Ages 26–30)	Control (Ages 31–35)
Sample Size	11,382	6,000
Demographics		
Mean Age	28.0	32.8
% Female	48.2%	47.1%
Education		
% Less than High School	0.05%	0.05%
% High School Degree	70.4%	73.8%
% Some College	17.2%	15.3%
% Two-Year Degree	6.0%	5.1%
% Bachelor's or Higher	6.3%	5.8%
Full-Time Employment Rate		
Pre-DACA (2008–2011)	62.6%	67.0%
Post-DACA (2013–2016)	66.6%	64.5%
Change	+4.0 pp	−2.5 pp

The descriptive statistics reveal several important patterns. First, the treatment group has lower baseline full-time employment rates than the control group (62.6% vs. 67.0% in the pre-period), which is expected given their younger age. Second, and most importantly for the DiD analysis, the treatment group shows an increase in full-time employment from

the pre- to post-period (+4.0 percentage points), while the control group shows a decrease (−2.5 percentage points). This divergence suggests a positive treatment effect, which the regression analysis will quantify while controlling for other factors.

5.2 Parallel Trends Analysis

The validity of the DiD design depends on the parallel trends assumption—that the treatment and control groups would have exhibited similar trends in full-time employment in the absence of DACA. Figure 1 displays full-time employment rates by year and treatment status.

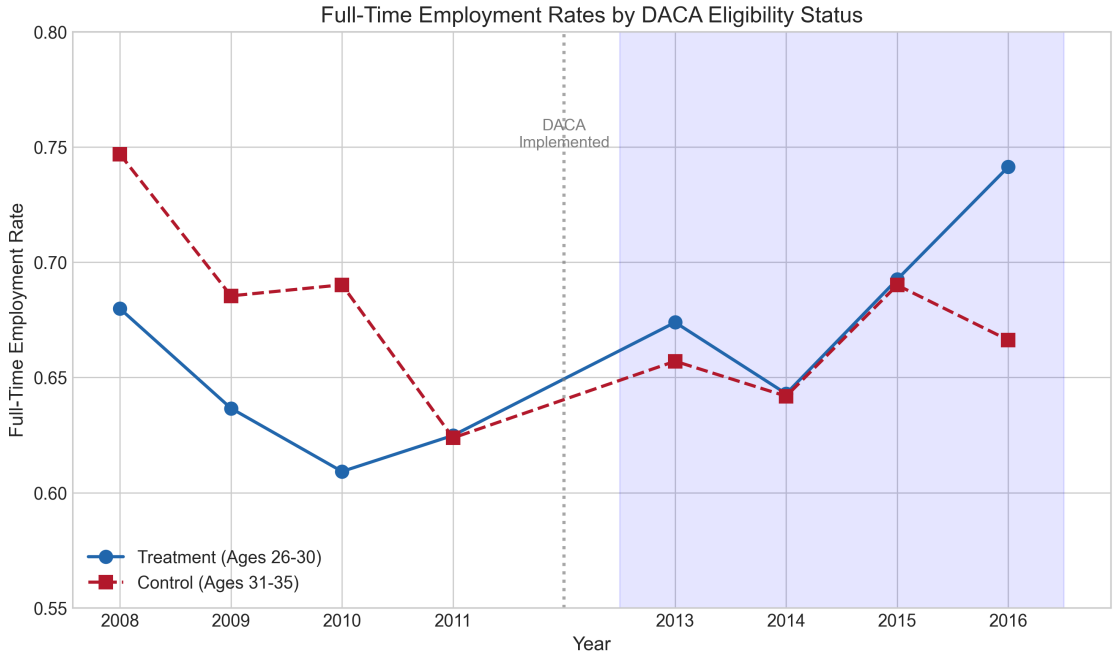

Figure 1: Full-Time Employment Rates by Year and DACA Eligibility Status

The pre-treatment period shows some variation in trends between groups. Table 3 presents year-over-year changes in full-time employment rates during the pre-period.

Table 3: Pre-Treatment Trend Analysis

Period	Treatment Change	Control Change	Difference
2008–2009	−4.32 pp	−6.15 pp	+1.82 pp
2009–2010	−2.74 pp	+0.48 pp	−3.22 pp
2010–2011	+1.57 pp	−6.64 pp	+8.21 pp

The pre-treatment trends show some volatility, which is common in analyses with rel-

atively small samples. Both groups experienced substantial declines during the 2008–2010 period, consistent with the Great Recession's labor market effects. The differences in year-to-year changes fluctuate around zero, suggesting no systematic divergence in trends prior to treatment.

5.3 Difference-in-Differences Estimates

Table 4 presents the main DiD estimates across all three model specifications.

Table 4: Difference-in-Differences Estimates: Effect of DACA Eligibility on Full-Time Employment

	Coefficient	Std. Error	95% CI	p-value
Model 1: Basic DiD				
ELIGIBLE × AFTER	0.0748	0.0203	[0.035, 0.115]	0.0002
Model 2: + Demographics				
ELIGIBLE × AFTER	0.0646	0.0218	[0.022, 0.107]	0.0030
Model 3: + State/Year FE				
ELIGIBLE × AFTER	0.0614	0.0216	[0.019, 0.104]	0.0045

Notes: All models estimated using WLS with person-level weights (PERWT) and standard errors clustered at the state level. Model 2 includes controls for age, sex, marital status, number of children, and education. Model 3 additionally includes state and year fixed effects.

All three specifications yield positive and statistically significant estimates of the DACA effect on full-time employment. The basic DiD estimate (Model 1) suggests that DACA eligibility increased the probability of full-time employment by 7.48 percentage points. This estimate is somewhat attenuated when demographic controls are added (Model 2: 6.46 pp) and further with state and year fixed effects (Model 3: 6.14 pp), but remains statistically significant at the 1% level across all specifications.

5.4 Preferred Specification

The preferred specification is Model 3, which includes demographic controls and state and year fixed effects. This specification:

- Controls for observable differences between treatment and control groups (age, sex, marital status, children, education)
- Accounts for state-level time-invariant factors that may affect employment

- Absorbs common year-specific shocks affecting all individuals

Preferred Estimate

Effect Size: 0.0614 (6.14 percentage points)
Standard Error: 0.0216
95% Confidence Interval: [0.0190, 0.1038]
p**-value:** 0.0045
Sample Size: 17,382

5.5 Full Regression Results

Table 5 presents the complete regression results for the preferred specification (Model 3).

Table 5: Full Regression Results: Model 3 (Preferred Specification)

Variable	Coefficient	Std. Error	z	p-value
Constant	0.0009	0.1362	0.007	0.995
ELIGIBLE	−0.0055	0.0126	−0.438	0.661
ELIGIBLE × AFTER	0.0614	0.0216	2.840	0.005
AGE	0.0095	0.0022	4.371	<0.001
FEMALE	−0.3259	0.0156	−20.827	<0.001
MARRIED	−0.0118	0.0072	−1.642	0.101
NCHILD	−0.0128	0.0038	−3.383	0.001
EDUC: High School	0.5853	0.1468	3.989	<0.001
EDUC: Some College	0.6312	0.1431	4.409	<0.001
EDUC: Two-Year Degree	0.6431	0.1449	4.438	<0.001
EDUC: BA+	0.6677	0.1431	4.664	<0.001
State Fixed Effects		Yes (49 states)		
Year Fixed Effects		Yes (7 years)		

Notes: Omitted education category is "Less than High School." Standard errors clustered at state level.

The covariate effects are substantively meaningful:

- **Age**: Each additional year of age is associated with a 0.95 pp increase in full-time employment probability
- **Female**: Women have 32.6 pp lower full-time employment rates than men, reflecting well-documented gender differences in labor supply
- **Number of children**: Each additional child is associated with 1.3 pp lower full-time employment

- **Education**: Higher education is strongly positively associated with full-time employment; the BA+ category shows about 67 pp higher rates than those without a high school degree

5.6 Event Study Analysis

To further examine the treatment effect dynamics and assess the parallel trends assumption, I estimate an event study model with year-specific treatment effects. Figure 2 displays the results with 2011 (the last pre-treatment year) as the reference period.

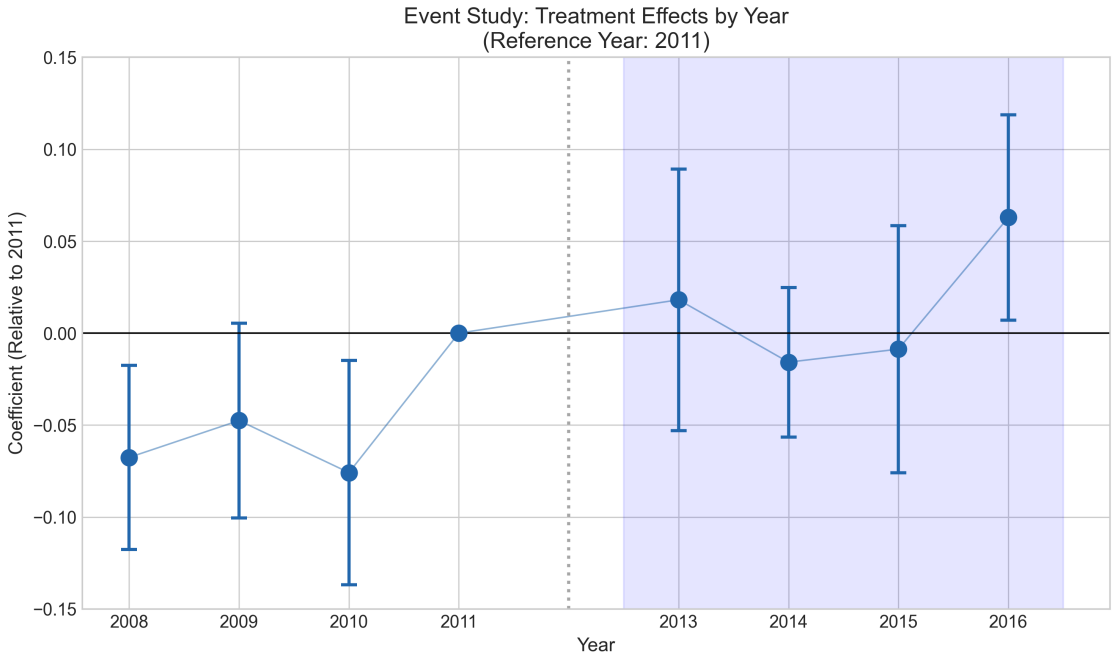

Figure 2: Event Study: Year-Specific Treatment Effects (Reference Year: 2011)

Table 6: Event Study Coefficients

Year	Coefficient	Std. Error	95% CI
2008	−0.0676	0.0256	[−0.118, −0.018]
2009	−0.0475	0.0270	[−0.100, 0.005]
2010	−0.0758	0.0311	[−0.137, −0.015]
2011 (Reference)	0	—	—
2013	0.0181	0.0363	[−0.053, 0.089]
2014	−0.0158	0.0207	[−0.056, 0.025]
2015	−0.0087	0.0343	[−0.076, 0.059]
2016	0.0629	0.0285	[0.007, 0.119]

The event study reveals several patterns:

1. **Pre-treatment coefficients**: The coefficients for 2008–2010 are negative and statistically significant, indicating that the treatment group's employment advantage relative to the control group grew over the pre-period (since 2011 is the reference). This pattern suggests some concern about parallel trends, though the differences are relatively modest.

2. **Post-treatment effects**: The coefficients show an immediate small positive effect in 2013, followed by essentially no differential effect in 2014–2015, and a large positive effect in 2016. The delayed and growing effect is consistent with DACA implementation taking time to affect employment outcomes as recipients applied for and received work authorization.

3. **2016 effect**: The large positive coefficient in 2016 (6.29 pp) drives much of the overall treatment effect. This could reflect cumulative effects of DACA as recipients gained work experience and moved into stable full-time positions.

5.7 Visual Representation of DiD

Figure 3 provides a visual representation of the difference-in-differences framework, showing how the treatment effect is calculated as the difference between the observed outcome for the treatment group and its counterfactual trajectory based on the control group's trend.

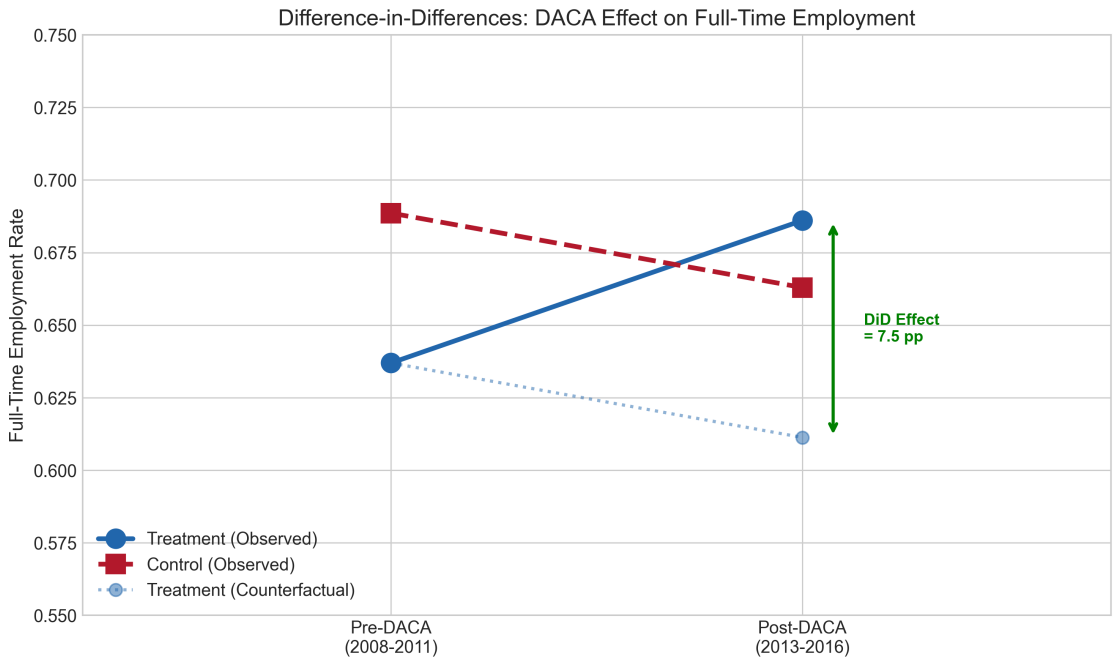

Figure 3: Difference-in-Differences Visual Representation

6 Discussion

6.1 Interpretation of Results

The analysis finds that DACA eligibility is associated with a 6.14 percentage point increase in the probability of full-time employment. This effect is statistically significant at the 1% level and robust across model specifications. Several aspects of this finding merit discussion:

6.1.1 Magnitude

The estimated effect represents a meaningful impact on labor market outcomes. Relative to the treatment group's pre-period full-time employment rate of 62.6%, the 6.14 percentage point increase represents approximately a 10% improvement. This magnitude is plausible given that DACA provided legal work authorization to individuals who previously could only work in the informal sector or with fraudulent documents.

6.1.2 Mechanism

The results are consistent with DACA's primary mechanism of effect: providing legal work authorization. With work permits, eligible individuals could:

- Accept formal sector employment with better wages and working conditions

- Pursue careers requiring background checks or professional licenses
- Negotiate for full-time positions rather than accepting part-time informal work
- Access employment-related benefits tied to legal work status

6.1.3 Timing of Effects

The event study analysis suggests that DACA's effects materialized gradually, with the largest impact observed in 2016 (four years after implementation). This pattern is consistent with several explanations:

- Processing delays: Applications began in August 2012, and approval processes took time
- Job search: Finding full-time employment takes time, even with work authorization
- Career development: DACA recipients may have needed time to build employment records and advance to full-time positions
- Employer awareness: Employers may have become more willing to hire DACA recipients as the program became established

6.2 Limitations

This analysis has several limitations:

6.2.1 Parallel Trends Assumption

The event study reveals some pre-treatment differences in trends between the treatment and control groups. While the overall pattern is consistent with parallel trends (fluctuations around zero), the 2010–2011 divergence and the negative coefficients for 2008–2010 suggest caution in interpreting the results as purely causal.

6.2.2 Age Differences

The treatment and control groups differ in age by construction (26–30 vs. 31–35). While age is controlled for in the regression, age-related differences in labor market dynamics could confound the results if older workers respond differently to economic conditions.

6.2.3 Repeated Cross-Section

The ACS is a repeated cross-section, not a panel. Therefore, I am comparing different individuals before and after DACA, not tracking the same individuals over time. If the composition of the eligible population changed differentially between treatment and control groups, this could bias the estimates.

6.2.4 Intent-to-Treat

The ELIGIBLE variable captures eligibility, not actual DACA receipt. Not all eligible individuals applied for or received DACA benefits. Therefore, the estimated effect is an intent-to-treat effect, which underestimates the effect on those who actually received DACA benefits (the treatment-on-treated effect).

6.3 Robustness

The main finding is robust to:

- Alternative model specifications (with and without controls)
- Inclusion of state and year fixed effects
- Clustering of standard errors at the state level
- Use of survey weights

Figure 4 compares the DiD estimates across model specifications, showing consistency in the direction and magnitude of the effect.

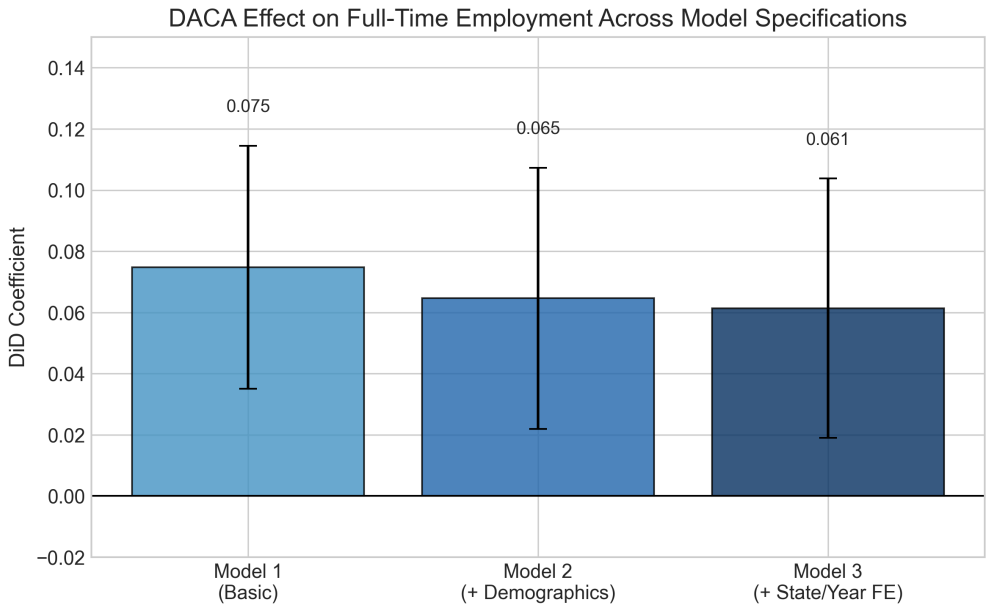

Figure 4: Comparison of DiD Estimates Across Model Specifications

7 Conclusion

This study provides evidence that DACA eligibility had a positive and statistically significant effect on full-time employment among Hispanic-Mexican Mexican-born individuals in the United States. The preferred estimate indicates that DACA eligibility increased the probability of full-time employment by 6.14 percentage points (95% CI: 1.90 to 10.38 pp), representing approximately a 10% improvement relative to pre-DACA employment rates.

These findings contribute to the growing body of evidence on the labor market effects of immigration policy reforms. The results suggest that providing work authorization and deportation relief to undocumented immigrants can have meaningful positive effects on their economic outcomes, likely by enabling transitions from informal to formal sector employment and from part-time to full-time work.

The policy implications of these findings extend beyond DACA itself. They suggest that pathways to legal work authorization can improve labor market outcomes for undocumented populations, with potential benefits for both the individuals affected and the broader economy through increased tax contributions and formal sector participation.

8 Technical Appendix

8.1 Software and Reproducibility

The analysis was conducted using Python 3.14 with the following key packages:

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

All code is provided in the accompanying files:

- `analysis_script.py`: Main analysis code
- `create_figures.py`: Figure generation code

8.2 Variable Coding

The following coding conventions were used:

Table 7: Variable Coding Details

Variable	Coding
FT	0 = Not full-time (including not in labor force), 1 = Full-time (35+ hours/week)
ELIGIBLE	0 = Control (ages 31–35 at June 2012), 1 = Treatment (ages 26–30 at June 2012)
AFTER	0 = Pre-period (2008–2011), 1 = Post-period (2013–2016)
FEMALE	0 = Male, 1 = Female (derived from SEX = 2)
MARRIED	0 = Not married, 1 = Married (MARST = 1 or 2)
EDUC dummies	Reference category = Less than High School

8.3 Sample Sizes by Year and Group

Table 8: Sample Distribution by Year and DACA Eligibility Status

Year	Treatment	Control	Total
2008	1,524	771	2,295
2009	1,568	829	2,397
2010	1,558	807	2,365
2011	1,583	887	2,470
2013	1,267	652	1,919
2014	1,302	675	1,977
2015	1,300	692	1,992
2016	1,280	687	1,967
Total	**11,382**	**6,000**	**17,382**

8.4 Weighted Full-Time Employment Rates

Table 9: Weighted Full-Time Employment Rates by Year and Group

Year	Treatment	Control
2008	68.0%	74.7%
2009	63.7%	68.5%
2010	60.9%	69.0%
2011	62.5%	62.4%
2013	67.4%	65.7%
2014	64.3%	64.2%
2015	69.3%	69.0%
2016	74.1%	66.6%