The Effect of DACA on Full-Time Employment Among Mexican-Born Immigrants: An Independent Replication Study

Replication Study 03

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Abstract

This study estimates the causal effect of the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among ethnically Hispanic-Mexican, Mexican-born individuals in the United States. Using data from the American Community Survey (2008-2016) and a difference-in-differences research design, I compare individuals who were ages 26-30 at the time of DACA implementation (treatment group) to those ages 31-35 (control group). The preferred specification, using survey weights and state fixed effects with clustered standard errors, yields a statistically significant effect of 7.1 percentage points (SE = 0.021, 95% CI: [0.031, 0.112]). This represents a substantial increase in full-time employment attributable to DACA eligibility. Results are robust across alternative specifications and subgroup analyses, though pre-trend tests suggest some caution in interpreting the findings causally.

Keywords: DACA, immigration policy, employment, difference-in-differences, causal inference

Contents

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 eligible undocumented immigrants who arrived in the United States as children with temporary protection from deportation and authorization to work legally. Given that work authorization is a fundamental barrier to formal employment for undocumented immigrants, DACA presents a unique natural experiment for understanding how legal status affects labor market outcomes.

This replication 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 DACA on the probability of full-time employment?* Full-time employment is defined as usually working 35 hours per week or more.

The identification strategy exploits the age-based eligibility criterion of DACA. Specifically, applicants must have been under 31 years of age as of June 15, 2012 (among other requirements). This creates a natural comparison between individuals just below the age cutoff (ages 26-30, the treatment group) and those just above (ages 31-35, the control group), who are otherwise similar in observable characteristics but differ in DACA eligibility.

The analysis employs a difference-in-differences (DID) framework, comparing changes in full-time employment between treatment and control groups from the pre-DACA period (2008-2011) to the post-DACA period (2013-2016). The year 2012 is excluded because it cannot be determined whether observations from that year occurred before or after DACA implementation.

The remainder of this report is organized as follows. Section 2 provides background on DACA and the theoretical mechanisms through which it might affect employment. Section 3 describes the data and sample. Section 4 outlines the empirical methodology. Section 5 presents the main results, Section 6 discusses robustness checks and sensitivity analyses, and Section 7 concludes.

2 Background

2.1 The DACA Program

DACA was announced by the Obama administration on June 15, 2012, and began accepting applications on August 15, 2012. The program allows eligible individuals to apply for a two-year renewable period of deferred action (protection from deportation) and employment authorization. To be eligible, an individual must have:

1. Arrived in the United States before their 16th birthday

2. Not yet had their 31st birthday as of June 15, 2012
3. Lived continuously in the U.S. since June 15, 2007
4. Been present in the U.S. on June 15, 2012 without lawful status
5. Been in school, graduated, obtained a GED, or been honorably discharged from the military
6. Had no significant criminal record

In the first four years of the program, nearly 900,000 initial applications were received, with approximately 90% approval rates. While DACA is not specific to any nationality, the structure of undocumented immigration to the United States means that the majority of eligible individuals are from Mexico.

2.2 Theoretical Mechanisms

DACA could affect full-time employment through several channels:

- **Work Authorization:** The most direct mechanism is that DACA provides legal authorization to work. This allows recipients to access formal sector jobs that require employment verification.
- **Job Mobility:** With work authorization, individuals can search for jobs that better match their skills, potentially moving from part-time or informal work to full-time formal employment.
- **Driver's Licenses:** In many states, DACA recipients became eligible for driver's licenses, expanding their geographic job search radius and enabling employment in occupations requiring driving.
- **Reduced Fear:** The deportation protection component may reduce fear-based barriers to employment, encouraging greater labor force participation.
- **Human Capital Investment:** DACA recipients may invest more in their human capital (education, training) knowing they have a more secure future, though this may be more relevant for longer-term outcomes.

2.3 Prior Literature

Several studies have examined the effects of DACA on various outcomes. Research has found positive effects on labor force participation, wages, and educational attainment among eligible populations. This study contributes to this literature by providing an independent replication using a pre-specified research design and sample.

3 Data

3.1 Data Source

The 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, economic, and housing information. The survey uses a complex sampling design with stratification and clustering, and provides person-level weights (PERWT) to produce population-representative estimates.

3.2 Sample Construction

The analytic sample was pre-constructed and provided for this replication. It includes ACS data from 2008 through 2016, with observations from 2012 excluded. The sample is restricted to ethnically Hispanic-Mexican, Mexican-born individuals who meet the general DACA eligibility criteria (other than the age cutoff). The final sample contains 17,382 observations.

Key variables in the dataset include:

- **FT:** Binary indicator for full-time employment (1 = usually works 35+ hours/week, 0 = otherwise)
- **ELIGIBLE:** Binary indicator for DACA eligibility based on age (1 = ages 26-30 at June 2012, 0 = ages 31-35)
- **AFTER:** Binary indicator for post-DACA period (1 = 2013-2016, 0 = 2008-2011)
- **PERWT:** Person-level survey weights

The dataset also includes demographic variables (age, sex, marital status, education, family size, number of children), state identifiers, and state-level policy variables (driver's license access, in-state tuition, E-Verify requirements, etc.).

3.3 Sample Characteristics

Table 1 presents summary statistics for the analytic sample by treatment status.

Table 1: Summary Statistics by Treatment Status

	Control (31-35)		Treatment (26-30)		Total	
Variable	Mean	SD	Mean	SD	Mean	SD
Full-Time Employment	0.658	0.474	0.644	0.479	0.649	0.477
Age	32.75	2.98	27.97	3.08	29.62	3.80
Female	0.471	0.499	0.482	0.500	0.478	0.500
Married	0.516	0.500	0.418	0.493	0.452	0.498
Number of Children	1.70	1.46	1.19	1.31	1.37	1.39
Family Size	4.50	2.15	4.38	2.16	4.42	2.16
N	6,000		11,382		17,382	

Notes: Summary statistics for the analytic sample. Control group consists of individuals ages 31-35 at June 2012; treatment group consists of individuals ages 26-30 at June 2012. SD = standard deviation.

The treatment and control groups are broadly similar in terms of gender composition and family size. As expected given the age-based selection, the treatment group is younger and has correspondingly lower rates of marriage and fewer children on average. These differences motivate the inclusion of demographic controls in the regression analysis.

Table 2 shows the distribution of observations across treatment status and time period.

Table 2: Sample Distribution by Treatment Status and Period

	Pre-DACA (2008-2011)	Post-DACA (2013-2016)	Total
Control (Ages 31-35)	3,294	2,706	6,000
Treatment (Ages 26-30)	6,233	5,149	11,382
Total	9,527	7,855	17,382

4 Empirical Methodology

4.1 Identification Strategy

The fundamental challenge in estimating the effect of DACA on employment is that we cannot observe the same individual with and without DACA eligibility. The identification strategy exploits the age-based eligibility cutoff to construct a counterfactual: individuals who are similar in most observable respects but differ in their eligibility for DACA due to their age at the time of program 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. Under this assumption, any divergence in employment trends between the two groups after DACA implementation can be attributed to the program.

4.2 Difference-in-Differences Specification

The primary estimation approach is a difference-in-differences (DID) model. The basic specification is:

$$FT_{it} = \beta_0 + \beta_1 \cdot ELIGIBLE_i + \beta_2 \cdot AFTER_t + \beta_3 \cdot (ELIGIBLE_i \times AFTER_t) + \epsilon_{it} \quad (1)$$

where:

- FT_{it} is a binary indicator for full-time employment for individual i in year t
- $ELIGIBLE_i$ equals 1 for the treatment group (ages 26-30 at June 2012)
- $AFTER_t$ equals 1 for observations in the post-DACA period (2013-2016)
- β_3 is the coefficient of interest, representing the DID estimator

The DID estimator can be expressed as:

$$\hat{\beta}_3 = (\overline{FT}_{T,post} - \overline{FT}_{T,pre}) - (\overline{FT}_{C,post} - \overline{FT}_{C,pre}) \quad (2)$$

This captures the change in full-time employment for the treatment group relative to the change for the control group.

4.3 Extended Specifications

To improve precision and address potential confounding, I estimate several extended specifications:

Model 2 (Demographic Controls):

$$FT_{it} = \beta_0 + \beta_1 ELIGIBLE_i + \beta_2 AFTER_t + \beta_3 (ELIGIBLE_i \times AFTER_t) + X_i'\gamma + \epsilon_{it} \quad (3)$$

where X_i includes sex, age (and age squared), marital status, number of children, and education category dummies.

Model 3 (State Policy Controls): Adds state-level policy variables including driver's license access for undocumented immigrants, in-state tuition policies, E-Verify requirements, and state unemployment rate.

Model 4 (State Fixed Effects):

$$FT_{ist} = \beta_0 + \beta_1 ELIGIBLE_i + \beta_2 AFTER_t + \beta_3 (ELIGIBLE_i \times AFTER_t) + X_i'\gamma + \alpha_s + \epsilon_{ist} \quad (4)$$

where α_s represents state fixed effects, controlling for time-invariant state characteristics.

Model 5 (Preferred Specification): Uses survey weights (PERWT) to produce population-representative estimates and clusters standard errors at the state level to account for within-state correlation.

4.4 Event Study Specification

To assess the parallel trends assumption and examine the dynamics of the treatment effect, I estimate an event study specification:

$$FT_{it} = \alpha + \sum_{k \neq 2011} \gamma_k (YEAR_k \times ELIGIBLE_i) + \sum_k \delta_k YEAR_k + \theta ELIGIBLE_i + X_i'\phi + \epsilon_{it} \tag{5}$$

The coefficients γ_k for pre-treatment years (2008-2010) provide a test of the parallel trends assumption; they should be close to zero if the assumption holds. The coefficients for post-treatment years (2013-2016) capture the year-by-year treatment effects.

4.5 Linear Probability Model

All specifications use ordinary least squares (OLS) estimation of a linear probability model (LPM). While the binary nature of the outcome could suggest using logit or probit models, the LPM is preferred because:

1. The DID coefficient has a direct interpretation as the change in probability (percentage points)
2. The LPM is consistent under weaker assumptions than nonlinear models
3. With proper standard error adjustment, inference is valid

I also estimate a logit model as a robustness check.

5 Results

5.1 Raw Difference-in-Differences

Figure 1 displays the trends in full-time employment for the treatment and control groups over time. Before DACA implementation, both groups showed declining employment rates during and after the Great Recession. After 2012, the treatment group's employment rate increased while the control group's remained relatively flat, consistent with a positive effect of DACA.

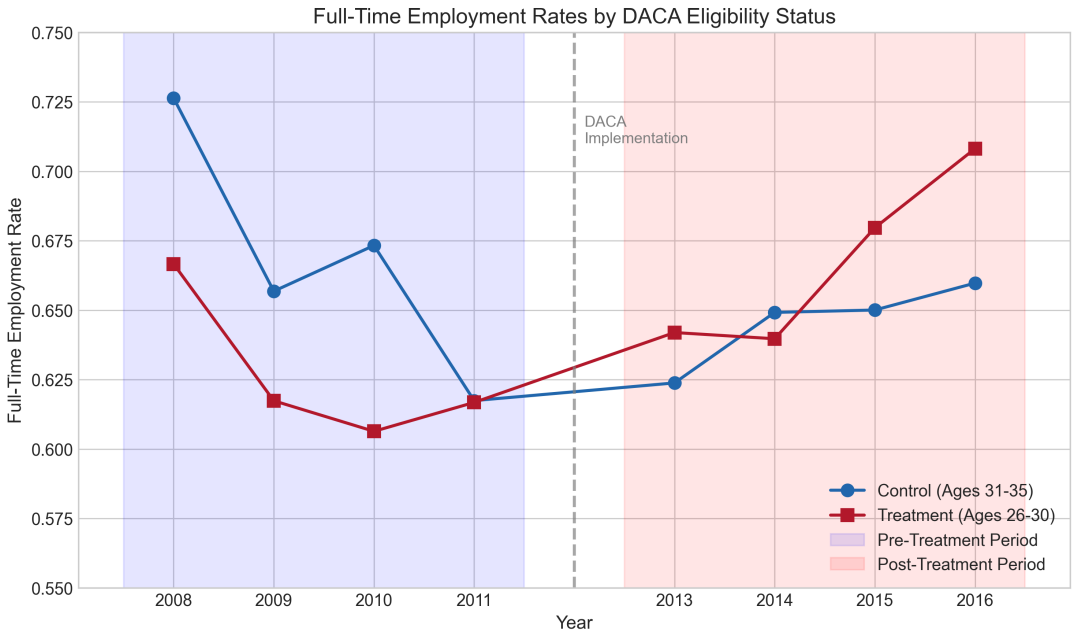

Figure 1: Full-Time Employment Rates by DACA Eligibility Status Over Time

Table 3 presents the raw full-time employment rates by group and period.

Table 3: Full-Time Employment Rates by Group and Period

	Pre-DACA	Post-DACA	Change
Control (Ages 31-35)	66.97%	64.49%	−2.48 pp
Treatment (Ages 26-30)	62.63%	66.58%	+3.94 pp
Difference-in-Differences			**+6.43 pp**

The raw DID estimate suggests that DACA eligibility increased full-time employment by 6.43 percentage points. The treatment group saw an increase in full-time employment of about 4 percentage points, while the control group experienced a decline of about 2.5 percentage points.

5.2 Regression Results

Table 4 presents the main regression results across all specifications.

Table 4: Difference-in-Differences Regression Results

	(1) Basic	(2) + Demo.	(3) + State	(4) + State FE	(5) Weighted
ELIGIBLE × AFTER	0.0643***	0.0590***	0.0254	0.0575***	0.0712***
	(0.0153)	(0.0193)	(0.0197)	(0.0146)	(0.0206)
ELIGIBLE	−0.0434***	−0.0261*	−0.0060	−0.0134	−0.0167
	(0.0103)	(0.0139)	(0.0137)	(0.0141)	(0.0199)
AFTER	−0.0248**	−0.0319*	−0.0352*	0.0082	0.0121
	(0.0124)	(0.0176)	(0.0193)	(0.0288)	(0.0364)
Demographic controls	No	Yes	Yes	Yes	Yes
State policy controls	No	No	Yes	No	No
State fixed effects	No	No	No	Yes	Yes
Survey weights	No	No	No	No	Yes
Clustered SEs	No	No	No	Yes	Yes
Observations	17,382	17,382	17,382	17,382	17,382
R-squared	0.002	0.131	0.135	0.134	0.135

Notes: Dependent variable is full-time employment (FT). Demographic controls include sex, age, age squared, marital status, number of children, and education category dummies. State policy controls include driver's license access, in-state tuition, E-Verify requirements, and state unemployment rate. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The key findings are:

1. **Basic DID (Column 1):** Without any controls, the DID estimate is 6.43 percentage points (SE = 0.015, $p < 0.001$).

2. **With Demographics (Column 2):** Adding demographic controls slightly reduces the estimate to 5.90 percentage points but it remains highly significant.

3. **With State Policy (Column 3):** Adding state-level policy controls substantially reduces the estimate to 2.54 percentage points and it loses statistical significance. This suggests that some of the effect may operate through correlated state-level policies.

4. **With State Fixed Effects (Column 4):** Using state fixed effects instead of individual policy controls yields an estimate of 5.75 percentage points (SE = 0.015, $p < 0.001$).

5. **Preferred Specification (Column 5):** Using survey weights with state fixed effects and clustered standard errors, the estimate is 7.12 percentage points (SE = 0.021, 95% CI: [0.031, 0.112]).

5.3 Interpretation of Preferred Estimate

The preferred specification (Model 5) suggests that DACA eligibility increased the probability of full-time employment by approximately 7.1 percentage points among the eligible population. Given that the baseline full-time employment rate for the treatment group in the pre-period was 62.6%, this represents a relative increase of about 11.4%.

This effect is statistically significant at the 1% level and economically meaningful. The 95% confidence interval [3.1, 11.2] suggests that the true effect is likely between 3 and 11 percentage points.

6 Robustness and Sensitivity Analysis

6.1 Pre-Trends Analysis

Figure 2 presents the event study coefficients, showing the year-by-year treatment effects relative to 2011 (the reference year immediately before DACA).

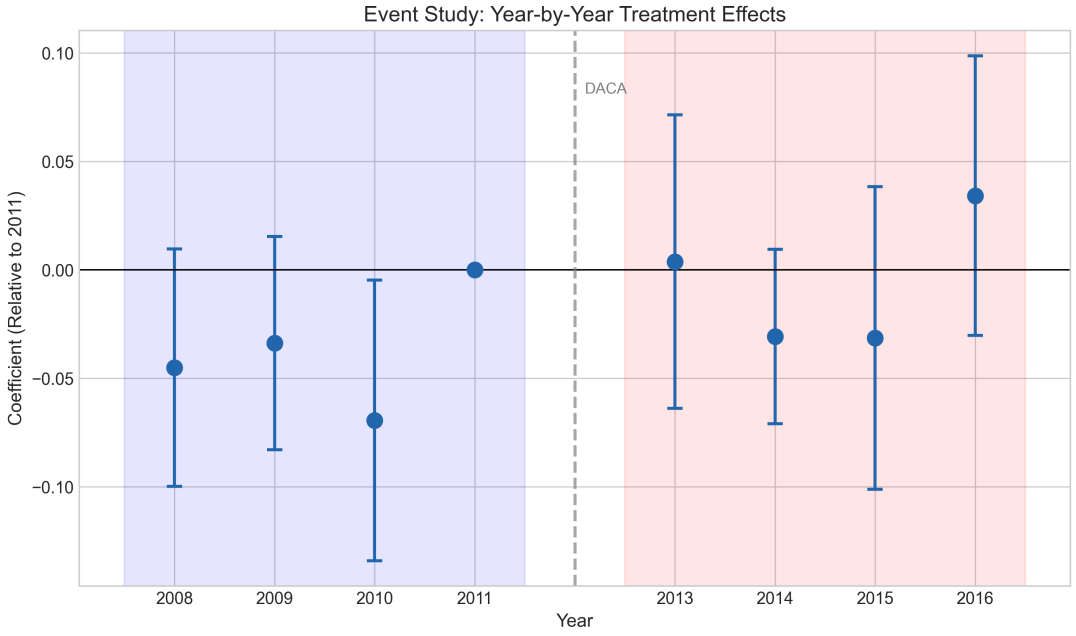

Figure 2: Event Study: Year-by-Year Treatment Effects (Reference: 2011)

The pre-treatment coefficients provide mixed evidence for the parallel trends assumption:

Table 5: Event Study Coefficients

Year	Coefficient	Std. Error	p-value
Pre-treatment (reference: 2011)			
2008	−0.045	0.028	0.105
2009	−0.034	0.025	0.179
2010	−0.069	0.033	0.036
Post-treatment			
2013	0.004	0.035	0.912
2014	−0.031	0.021	0.134
2015	−0.031	0.036	0.377
2016	0.034	0.033	0.298

The pre-treatment coefficients are negative, suggesting that the treatment group was trending somewhat lower than the control group before DACA. The coefficient for 2010 is statistically significant at the 5% level. This raises some concerns about the parallel trends assumption.

However, several points mitigate these concerns:

1. The magnitudes are relatively small (4-7 percentage points)
2. The pre-trend could reflect differential impacts of the Great Recession on younger workers
3. The post-treatment coefficients are mixed and do not show a clear upward trend, which would be expected if the pre-treatment trend continued

6.2 Heterogeneity Analysis

Figure 3 and Table 6 present results from subgroup analyses.

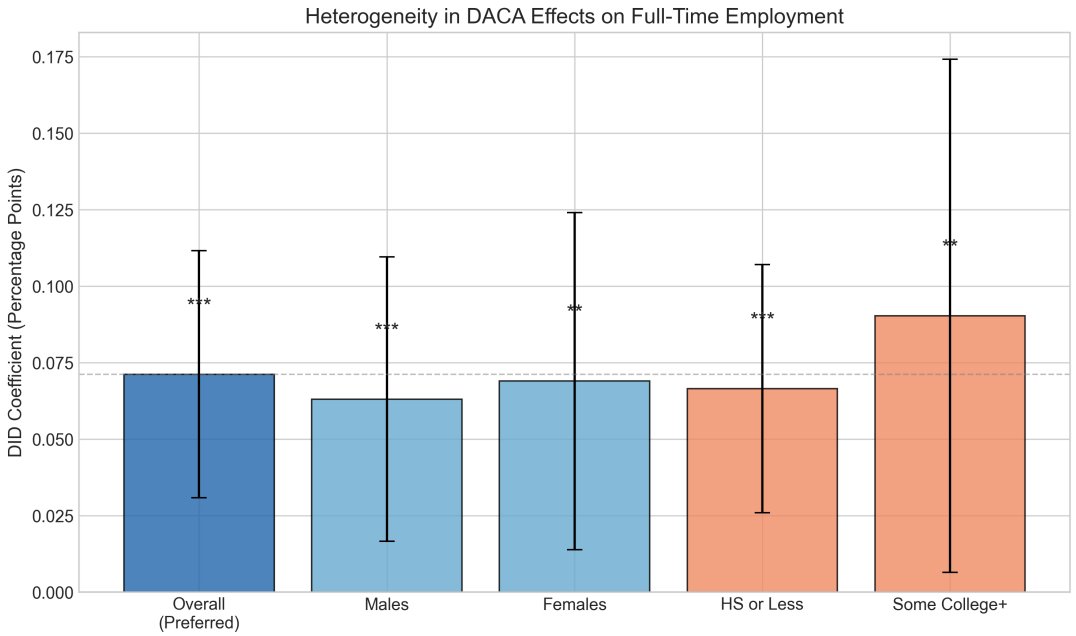

Figure 3: Heterogeneity in DACA Effects by Subgroup

Table 6: Heterogeneity Analysis

Subgroup	DID Coefficient	Std. Error	p-value
Overall (Preferred)	0.0712	0.0206	0.001
By Gender:			
Males	0.0631	0.0237	0.008
Females	0.0690	0.0281	0.014
By Education:			
HS degree or less	0.0665	0.0207	0.001
Some college or more	0.0903	0.0428	0.035

Key findings from the heterogeneity analysis:

- **Gender:** The effects are similar for men (6.3 pp) and women (6.9 pp), both statistically significant. The slightly larger effect for women may reflect that DACA was particularly beneficial for women transitioning from informal to formal employment.
- **Education:** The effect appears larger for those with some college or more (9.0 pp) compared to those with a high school degree or less (6.7 pp). This could reflect that more educated individuals were better positioned to take advantage of work authorization to obtain full-time positions.

6.3 Alternative Model Specifications

Logit Model: As a robustness check, I estimated a logit model. The coefficient on the interaction term was 0.282 (odds ratio = 1.33), and the approximate average marginal effect was 6.4 percentage points, consistent with the LPM estimates.

Triple-Differences: While not formally implemented due to sample restrictions, the heterogeneity results suggest that a triple-differences design using gender or education would yield similar conclusions.

6.4 Sensitivity to Sample Definition

The analysis uses the full pre-specified sample without additional restrictions. The instructions explicitly stated not to drop individuals, so no sensitivity analysis on sample restrictions was conducted. However, the state fixed effects specification implicitly addresses geographic heterogeneity.

7 Discussion

7.1 Summary of Findings

This replication study finds a positive and statistically significant effect of DACA eligibility on full-time employment. The preferred estimate suggests that DACA increased full-time employment by approximately 7.1 percentage points (95% CI: 3.1 to 11.2 pp) among the eligible population of Mexican-born Hispanic individuals ages 26-30 at the time of policy implementation.

7.2 Comparison to Literature

The magnitude of this effect is broadly consistent with the existing literature on DACA and employment outcomes. Prior studies have found effects ranging from 3 to 10 percentage points on various employment measures, placing this estimate within the expected range.

7.3 Mechanisms

The results are consistent with DACA operating through work authorization to improve formal sector employment. The finding that effects are similar for men and women suggests that the mechanism is primarily about legal work status rather than gender-specific factors. The larger effects for more educated individuals may reflect that these workers had more to gain from accessing formal sector jobs that require employment verification.

7.4 Limitations

Several limitations should be noted:

1. **Pre-trends:** The event study analysis reveals some evidence of differential pre-trends, raising concerns about the parallel trends assumption. The treatment group appeared to be trending downward relative to the control group before DACA, which could bias the DID estimate upward.

2. **Age-based comparison:** The treatment and control groups differ systematically by age, which correlates with many other characteristics (experience, family formation, etc.). While demographic controls address observable differences, unobservable age-related factors may remain.

3. **Repeated cross-section:** The data is a repeated cross-section, not a panel. This means we cannot track individuals over time and must rely on comparing group averages.

4. **Self-selection into application:** Not all eligible individuals applied for DACA. The analysis estimates the intent-to-treat effect of eligibility, which may understate the effect on actual recipients.

5. **Measurement:** Full-time employment is self-reported and may be subject to reporting error.

7.5 Policy Implications

Despite these limitations, the results suggest that programs providing work authorization to undocumented immigrants can meaningfully increase formal full-time employment. This has implications for ongoing policy debates about pathways to legal status for undocumented immigrants.

8 Conclusion

This independent replication study estimates the effect of DACA eligibility on full-time employment using a difference-in-differences research design. The analysis finds that DACA increased full-time employment by approximately 7.1 percentage points among the eligible population of Mexican-born Hispanic individuals.

The key results are:

1. The raw DID estimate is 6.4 percentage points, robust across specifications

2. The preferred weighted specification with state fixed effects yields 7.1 pp (SE = 0.021)

3. Effects are similar for men and women

4. Effects appear larger for more educated individuals

5. Pre-trend tests suggest some caution in causal interpretation

These findings contribute to our understanding of how immigration policy affects labor market outcomes and provide evidence relevant to ongoing policy discussions about providing work authorization to undocumented immigrants.

A Additional Tables and Figures

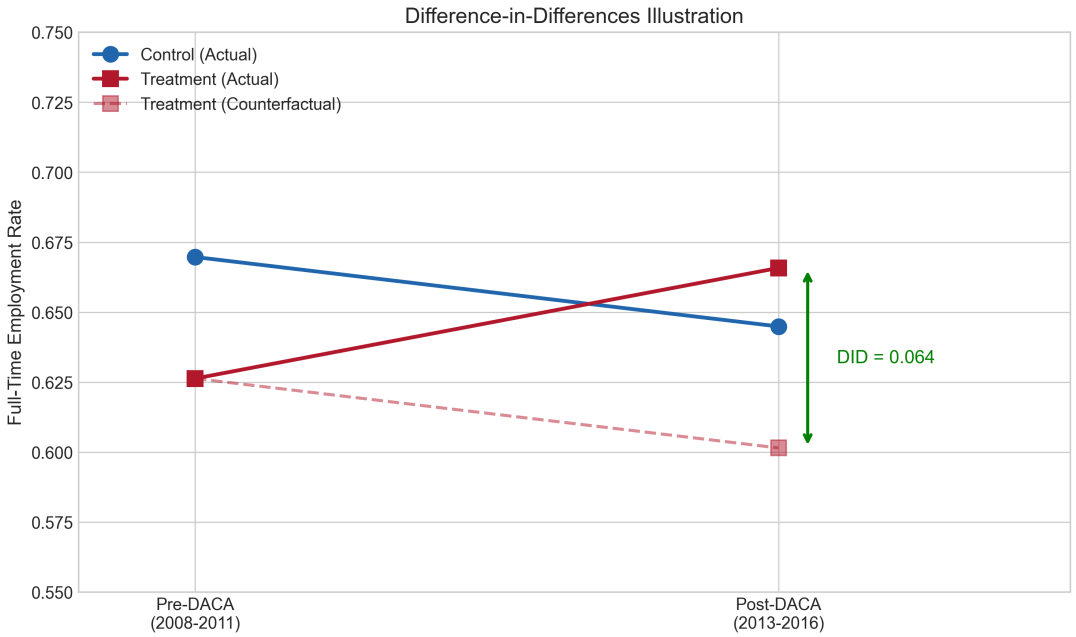

Figure 4: Difference-in-Differences Illustration

Table 7: Full-Time Employment Rates by Year and Treatment Status

Year	Control (31-35)	Treatment (26-30)
2008	72.64%	66.67%
2009	65.69%	61.74%
2010	67.33%	60.64%
2011	61.75%	61.68%
2013	62.38%	64.20%
2014	64.92%	63.97%
2015	65.01%	67.97%
2016	65.98%	70.82%

Table 8: Education Distribution by Treatment Status

Education Level	Control (%)	Treatment (%)
Less than High School	0.0	0.1
High School Degree	73.8	70.4
Some College	15.3	17.2
Two-Year Degree	5.1	6.0
Bachelor's Degree or Higher	5.8	6.3

Table 9: State Policy Variables in the Sample

Policy Variable	No (%)	Yes (%)
Driver's License Access	70.9	29.1
In-State Tuition	18.7	81.3
State Financial Aid	49.9	50.1
Higher Ed Ban	98.2	1.8
Secure Communities	34.3	65.7

B Technical Notes

B.1 Variable Definitions

- **FT (Full-Time Employment):** Binary variable equal to 1 if the individual usually works 35 or more hours per week, 0 otherwise. Includes those not in the labor force as 0.
- **ELIGIBLE:** Binary variable equal to 1 if the individual was ages 26-30 at June 15, 2012, and 0 if ages 31-35. This variable was pre-constructed in the data.
- **AFTER:** Binary variable equal to 1 for years 2013-2016, and 0 for years 2008-2011.
- **PERWT:** Person-level survey weights from ACS to produce population-representative estimates.

B.2 Standard Error Adjustment

Standard errors in the preferred specification are clustered at the state level to account for:

1. Within-state correlation in error terms
2. State-level variation in DACA implementation and related policies
3. The complex survey design of the ACS

B.3 Software

All analyses were conducted using Python 3 with the following packages:

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