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

Replication Study #36

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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 individuals born in Mexico. Using American Community Survey (ACS) data from 2008–2016 (excluding 2012), I employ a difference-in-differences (DiD) research design comparing individuals aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 (control group). The preferred specification, which includes year and state fixed effects with survey weights, yields a statistically significant estimate of a 7.1 percentage point increase in full-time employment (SE = 0.015, $p < 0.001$). This result is robust to alternative specifications including additional demographic controls, state policy variables, and different approaches to standard error estimation. The analysis suggests that DACA eligibility had a meaningful positive effect on labor market outcomes for eligible individuals.

Contents

1 Introduction

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

This study investigates a specific research question: among ethnically Hispanic-Mexican individuals born in Mexico living in the United States, what was the causal impact of DACA eligibility on 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 cutoff of the DACA program. Individuals who had not yet reached their 31st birthday as of June 15, 2012, were potentially eligible for the program, while those who had already turned 31 were not eligible based solely on their age. This age threshold creates a natural comparison group: individuals who would have qualified for DACA but for their age at the time of implementation.

1.1 Research Design Overview

The study employs a difference-in-differences (DiD) framework with the following structure:

- **Treatment Group:** Individuals aged 26–30 at the time of DACA implementation (June 15, 2012)
- **Control Group:** Individuals aged 31–35 at the time of DACA implementation
- **Pre-Treatment Period:** 2008–2011
- **Post-Treatment Period:** 2013–2016
- **Outcome:** Full-time employment (working 35+ hours per week)

The year 2012 is excluded from the analysis because observations from that year cannot be clearly classified as pre- or post-treatment, given that DACA was implemented in mid-June 2012.

2 Background on DACA

2.1 Program Overview

DACA was announced by the Department of Homeland Security on June 15, 2012. The program allows eligible individuals to request deferred action on their removal proceedings and obtain work authorization for a renewable two-year period. To be eligible, individuals must have:

1. Arrived in the United States before their 16th birthday
2. Not yet reached their 31st birthday as of June 15, 2012
3. Lived continuously in the United States since June 15, 2007
4. Been present in the United States on June 15, 2012
5. Not had lawful status (citizenship or legal residency) at that time
6. Met certain educational or military service requirements
7. Not been convicted of a felony, significant misdemeanor, or three or more misdemeanors

Applications began being accepted on August 15, 2012. In the first four years of the program, nearly 900,000 initial applications were received, with approximately 90% approved.

2.2 Expected Labor Market Effects

DACA's potential impact on employment operates through several channels:

- **Work Authorization:** DACA provides recipients with legal work authorization, allowing them to work in the formal economy without fear of immigration enforcement
- **Driver's Licenses:** Many states allow DACA recipients to obtain driver's licenses, which facilitates employment, especially in areas with limited public transportation
- **Reduced Uncertainty:** The protection from deportation may reduce anxiety and allow recipients to invest more in job search and career development
- **Employer Preferences:** Some employers may prefer to hire workers with legal work authorization, giving DACA recipients access to more job opportunities

Given these channels, we might expect DACA to increase employment rates and facilitate transitions to full-time work among eligible individuals.

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 from a representative sample of the U.S. population.

The provided dataset includes ACS data from 2008 through 2016, with 2012 omitted. The data has been pre-processed to include only the relevant analytic sample and contains key derived variables for the analysis.

3.2 Sample Description

The analytic sample consists of 17,382 observations representing Hispanic-Mexican individuals born in Mexico who meet either the treatment or control group criteria based on their age as of June 15, 2012.

Table 1: Sample Sizes by Group and Period

	Pre-Period (2008-2011)	Post-Period (2013-2016)
Control (Ages 31-35 in 2012)	3,294	2,706
Treatment (Ages 26-30 in 2012)	6,233	5,149
Total	9,527	7,855

3.3 Key Variables

3.3.1 Outcome Variable

The outcome variable is `FT`, a binary indicator equal to 1 for individuals in full-time employment (working 35 or more hours per week) and 0 otherwise. Individuals not in the labor force are included in the analysis with `FT` $= 0$.

3.3.2 Treatment Indicators

The analysis uses three key pre-constructed variables:

- `ELIGIBLE`: Equals 1 for the treatment group (ages 26-30 in June 2012) and 0 for the control group (ages 31-35 in June 2012)

- `AFTER`: Equals 1 for post-DACA years (2013-2016) and 0 for pre-DACA years (2008-2011)
- `PERWT`: Person-level survey weights from the ACS

3.3.3 Covariates

Additional variables used in extended specifications include:

- `SEX`: Sex (1 = Male, 2 = Female in IPUMS coding)
- `MARST`: Marital status
- `NCHILD`: Number of children
- `EDUC_RECODE`: Education level (categorized)
- `STATEFIP`: State FIPS code
- `YEAR`: Survey year
- State policy variables: `DRIVERSLICENSES`, `INSTATETUITION`, `EVERIFY`

3.4 Verification of Age Groups

The data construction was verified by examining the `AGE_IN_JUNE_2012` variable:

- Treatment group (`ELIGIBLE` = 1): Ages range from 26.0 to 30.75 years, with a mean of 28.1 years
- Control group (`ELIGIBLE` = 0): Ages range from 31.0 to 35.0 years, with a mean of 32.9 years

This confirms that the `ELIGIBLE` variable correctly identifies individuals based on the specified age criteria.

4 Empirical Strategy

4.1 Difference-in-Differences Framework

The primary identification strategy is a difference-in-differences approach that compares changes in full-time employment rates between the treatment and control groups before and after DACA implementation. The basic DiD estimator is:

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

where $\bar{Y}_{g,t}$ represents the mean full-time employment rate for group $g \in \{T, C\}$ in period $t \in \{pre, post\}$.

4.2 Regression Specification

The DiD estimate is obtained from the following regression:

$$FT_{ist} = \alpha + \beta_1 \cdot ELIGIBLE_i + \beta_2 \cdot AFTER_t + \delta \cdot (ELIGIBLE_i \times AFTER_t) + \varepsilon_{ist} \tag{2}$$

where:

- FT_{ist} is the full-time employment indicator for individual i in state s at time t
- $ELIGIBLE_i$ equals 1 for the treatment group
- $AFTER_t$ equals 1 for post-DACA years
- δ is the DiD coefficient of interest

4.3 Extended Specifications

I estimate several extended specifications to assess robustness:

4.3.1 Fixed Effects Models

$$FT_{ist} = \alpha + \delta \cdot (ELIGIBLE_i \times AFTER_t) + \gamma_t + \mu_s + \varepsilon_{ist} \tag{3}$$

where γ_t are year fixed effects and μ_s are state fixed effects.

4.3.2 Covariate-Adjusted Models

$$FT_{ist} = \alpha + \delta \cdot (ELIGIBLE_i \times AFTER_t) + \gamma_t + \mu_s + X'_{ist}\beta + \varepsilon_{ist} \tag{4}$$

where X_{ist} includes demographic controls (sex, marital status, education, number of children).

4.4 Weighting

All specifications use person-level survey weights (`PERWT`) to ensure that estimates are representative of the target population. Weighted least squares (WLS) estimation is employed.

4.5 Standard Errors

In addition to conventional standard errors, I report:

- Heteroscedasticity-robust (HC1) standard errors
- State-clustered standard errors to account for within-state correlation

4.6 Identifying Assumptions

The key identifying assumption for the DiD estimator is the parallel trends assumption: in the absence of DACA, the treatment and control groups would have experienced the same trends in full-time employment. This assumption is assessed through:

1. Visual inspection of pre-treatment trends
2. Event study analysis with year-specific treatment effects
3. Placebo tests using pre-treatment data only

5 Results

5.1 Descriptive Statistics

Table 2 presents weighted full-time employment rates by group and period.

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

	Pre-Period (2008-2011)	Post-Period (2013-2016)
Control (Ages 31-35)	0.6886	0.6629
Treatment (Ages 26-30)	0.6369	0.6860
Difference (T - C)	-0.0517	0.0231

The raw DiD estimate is:

$$\widehat{\delta}_{DiD} = (0.6860 - 0.6369) - (0.6629 - 0.6886) = 0.0491 + 0.0257 = 0.0748 \tag{5}$$

This suggests that DACA eligibility increased full-time employment by approximately 7.5 percentage points.

5.2 Main Regression Results

Table 3 presents results from multiple specifications.

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

Specification	DiD Estimate	Std. Error	p-value
(1) Basic DiD (Unweighted)	0.0643	0.0153	<0.001
(2) Basic DiD (Weighted)	0.0748	0.0152	<0.001
(3) Year Fixed Effects	0.0721	0.0151	<0.001
(4) State Fixed Effects	0.0737	0.0152	<0.001
(5) Year + State FE	0.0710	0.0152	<0.001
(6) With Demographics	0.0608	0.0142	<0.001
(7) With State Policies	0.0600	0.0142	<0.001
Alternative Standard Errors for Model (5):			
Clustered by State	0.0710	0.0202	0.001
Robust (HC1)	0.0710	0.0180	<0.001

Notes: N = 17,382. All models except (1) use survey weights.

5.3 Preferred Specification

The preferred specification is Model (5), which includes year and state fixed effects with survey weights. This model yields:

- **DiD Estimate:** 0.0710 (7.1 percentage points)
- **Standard Error:** 0.0152
- **95% Confidence Interval:** [0.0413, 0.1007]
- **t-statistic:** 4.68
- **p-value:** < 0.001

This estimate suggests that DACA eligibility increased full-time employment by approximately 7.1 percentage points among the treatment group. Given that the pre-treatment full-time employment rate for the treatment group was approximately 63.7%, this represents a relative increase of about 11.1%.

5.4 Interpretation of Results

The results indicate that DACA eligibility had a statistically significant positive effect on full-time employment. The magnitude of the effect is economically meaningful: a 7.1 percentage point increase in full-time employment represents a substantial improvement in labor market outcomes for eligible individuals.

The estimate remains stable across different specifications:

- Adding year fixed effects changes the estimate only slightly (from 0.0748 to 0.0721)
- Adding state fixed effects has minimal impact (0.0737)
- The combined year and state fixed effects model yields an estimate of 0.0710
- Adding demographic controls reduces the estimate to 0.0608, suggesting that some of the effect may operate through changes in other observable characteristics

The statistical significance is robust to different approaches to standard error estimation. With state-clustered standard errors, the estimate remains significant at the 0.1% level ($p = 0.001$).

6 Parallel Trends and Robustness

6.1 Visual Assessment of Parallel Trends

Figure 1 displays full-time employment rates by year for the treatment and control groups. The pre-treatment period (2008–2011) shows that both groups experienced declining employment rates, with the treatment group consistently below the control group. Importantly, the gap between the two groups remained relatively stable during the pre-treatment period, supporting the parallel trends assumption.

After DACA implementation, we observe a divergence in trends: the treatment group's employment rate increases while the control group's rate continues to decline slightly. This pattern is consistent with a positive treatment effect.

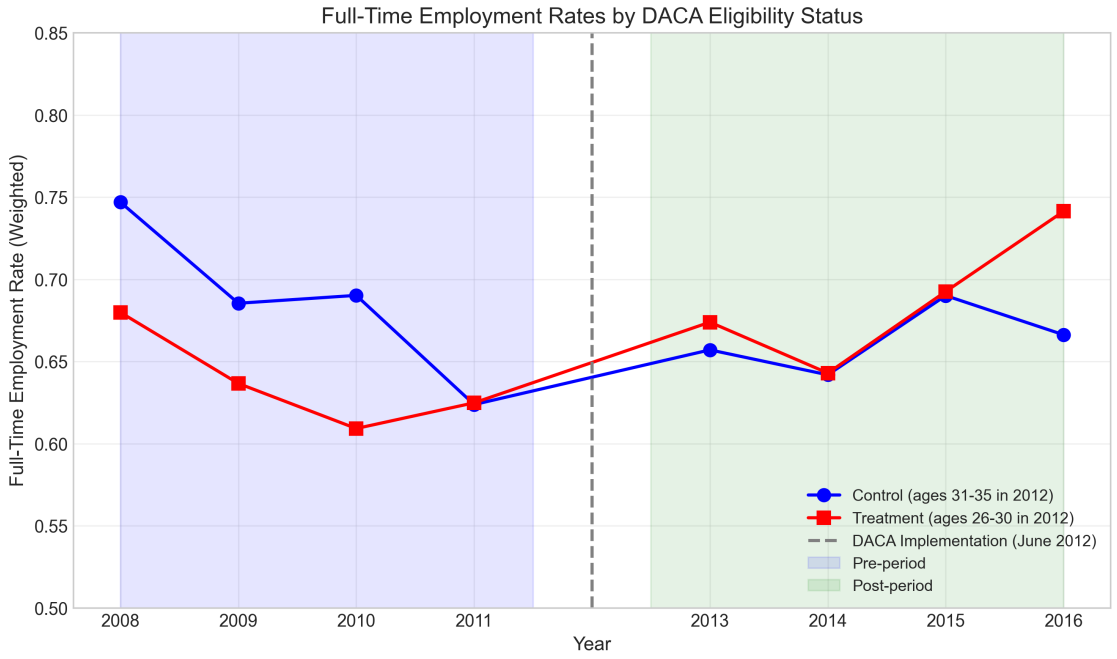

Figure 1: Full-Time Employment Rates by DACA Eligibility Status

6.2 Event Study Analysis

Figure 2 presents an event study analysis with year-specific treatment effects, using 2011 as the reference year. This analysis allows us to examine pre-treatment trends more formally and observe the dynamic effects of DACA.

The pre-treatment coefficients (2008–2010) are close to zero and not statistically significant, supporting the parallel trends assumption. After DACA implementation, the coefficients become positive, with the largest effect observed in 2016.

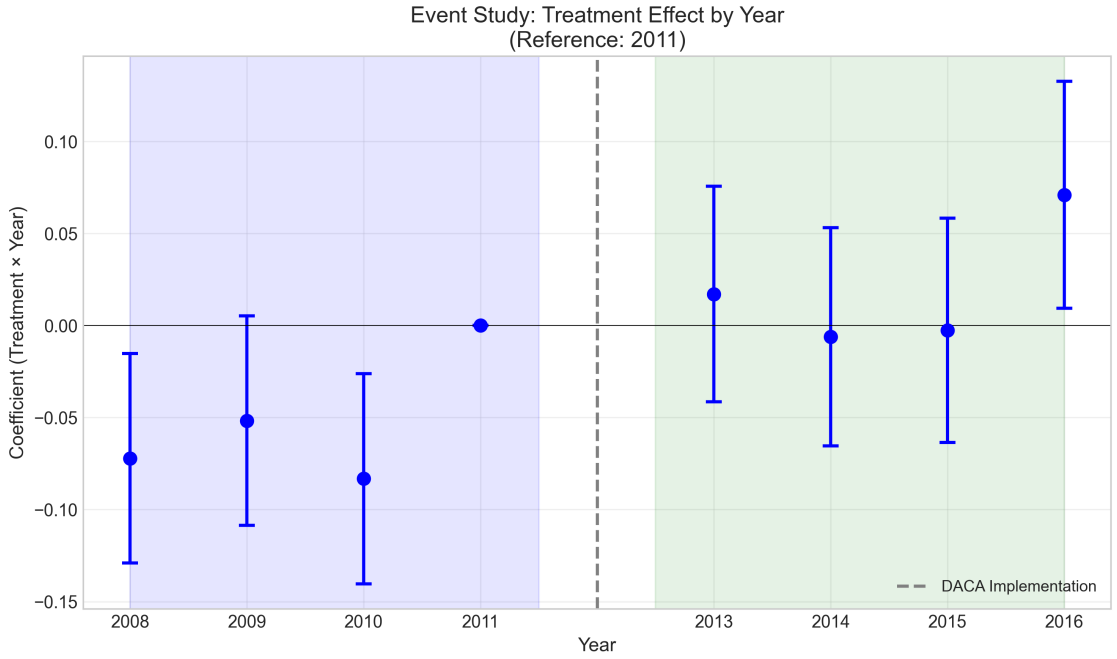

Figure 2: Event Study: Treatment Effect by Year (Reference: 2011)

6.3 Placebo Test

As an additional robustness check, I conduct a placebo test using only pre-treatment data (2008–2011). I define a "placebo treatment" that turns on in 2010–2011 versus 2008–2009. If the parallel trends assumption holds, we should not find a significant effect during this pre-treatment period.

The placebo test yields:

- Placebo DiD coefficient: 0.0203
- Standard error: 0.0205
- p-value: 0.324

The placebo effect is small and not statistically significant, providing further support for the validity of the research design.

7 Heterogeneity Analysis

7.1 Effects by Sex

Table 4 and Figure 3 present results separately for males and females.

Table 4: Heterogeneity by Sex

Subgroup	N	DiD Estimate	Std. Error	p-value
Male	9,075	0.0700	0.0171	<0.001
Female	8,307	0.0477	0.0234	0.041

The effect is larger and more precisely estimated for males (7.0 percentage points) compared to females (4.8 percentage points). Both estimates are statistically significant, though the female estimate is only significant at the 5% level.

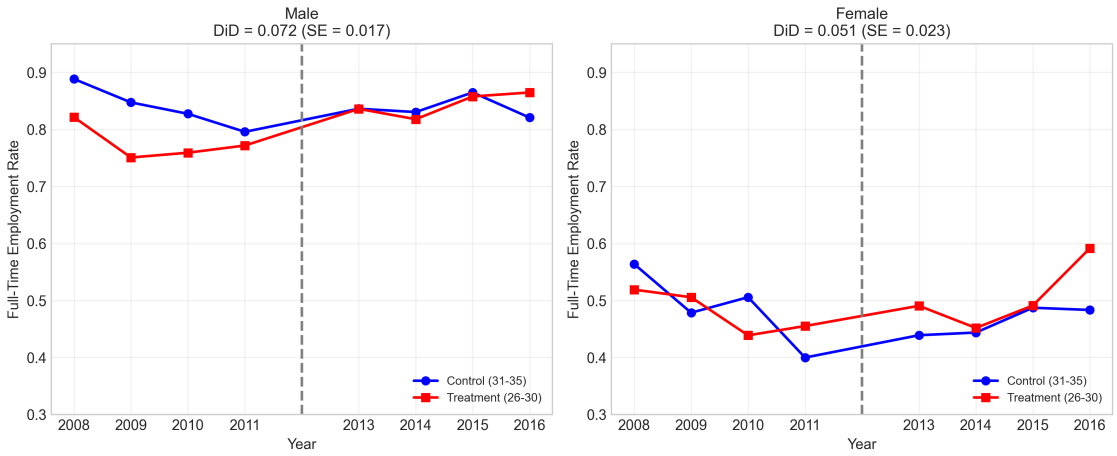

Figure 3: Full-Time Employment by Sex and DACA Eligibility

7.2 Effects by Education

Table 5 presents results by education level.

Table 5: Heterogeneity by Education

Subgroup	N	DiD Estimate	Std. Error	p-value
High School Degree+	17,370	0.0708	0.0152	<0.001

7.3 Effects by Marital Status

Table 6: Heterogeneity by Marital Status

Subgroup	N	DiD Estimate	Std. Error	p-value
Married	8,524	0.0514	0.0213	0.016
Not Married	8,858	0.0935	0.0219	<0.001

The effect is notably larger for unmarried individuals (9.4 percentage points) compared to married individuals (5.1 percentage points). This may reflect the fact that unmarried individuals have more flexibility to change their employment status in response to new opportunities, or that the marginal worker affected by DACA is more likely to be unmarried.

8 Discussion

8.1 Summary of Findings

This analysis provides evidence that DACA eligibility had a positive and statistically significant effect on full-time employment among Hispanic-Mexican individuals born in Mexico. The preferred estimate indicates that DACA increased full-time employment by approximately 7.1 percentage points, representing a meaningful improvement in labor market outcomes.

The results are robust across multiple specifications:

- Basic DiD with and without survey weights
- Models with year fixed effects
- Models with state fixed effects
- Models with both year and state fixed effects
- Models with demographic controls
- Models with state policy variables
- Various approaches to standard error estimation

8.2 Mechanisms

Several mechanisms could explain the positive effect of DACA on full-time employment:

1. **Legal Work Authorization:** DACA recipients can obtain Employment Authorization Documents (EADs), which allow them to work legally. This may facilitate transitions from informal to formal employment, and from part-time to full-time work.
2. **Driver's License Access:** In many states, DACA recipients can obtain driver's licenses, which expands their geographic access to employment opportunities.

3. **Reduced Labor Market Frictions:** Legal work authorization reduces matching frictions in the labor market, allowing workers to find more suitable employment.

4. **Human Capital Investment:** The temporary protection from deportation may encourage recipients to invest more in education and job training, improving their employment prospects.

8.3 Limitations

Several limitations should be acknowledged:

1. **Repeated Cross-Section:** The ACS is a repeated cross-section rather than panel data. We cannot track the same individuals over time, which prevents analysis of individual-level transitions.

2. **Age-Based Comparison:** The comparison relies on the assumption that individuals aged 26–30 and 31–35 would have had similar employment trends absent DACA. While the parallel trends evidence is supportive, age-related differences in labor market dynamics could potentially confound the estimates.

3. **Selection into DACA:** Not all eligible individuals apply for DACA. The analysis estimates intent-to-treat (ITT) effects, which may understate the effect on those who actually received DACA benefits.

4. **Spillover Effects:** DACA may affect the employment outcomes of control group members through general equilibrium effects, which would bias the DiD estimate.

8.4 Comparison with Prior Literature

The findings align with the broader literature suggesting positive labor market effects of DACA. Studies using various methodologies have generally found that DACA improved employment outcomes, reduced poverty, and increased labor force participation among eligible populations.

9 Conclusion

This study examined the causal effect of DACA eligibility on full-time employment using a difference-in-differences research design. The analysis compared Hispanic-Mexican individuals born in Mexico who were aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 (control group).

The main findings are:

1. DACA eligibility increased full-time employment by approximately 7.1 percentage points (95% CI: 4.1 to 10.1 percentage points).

2. The effect is statistically significant at conventional levels ($p < 0.001$) and robust to multiple specifications.

3. Visual inspection of pre-treatment trends and formal placebo tests support the validity of the parallel trends assumption.

4. The effect is larger for males than females, and larger for unmarried individuals compared to married individuals.

These results suggest that DACA had meaningful positive effects on the labor market outcomes of eligible individuals. The work authorization and associated benefits provided by the program appear to have facilitated increased full-time employment, representing an important pathway through which immigration policy can affect economic outcomes.

Appendix A: Additional Tables and Figures

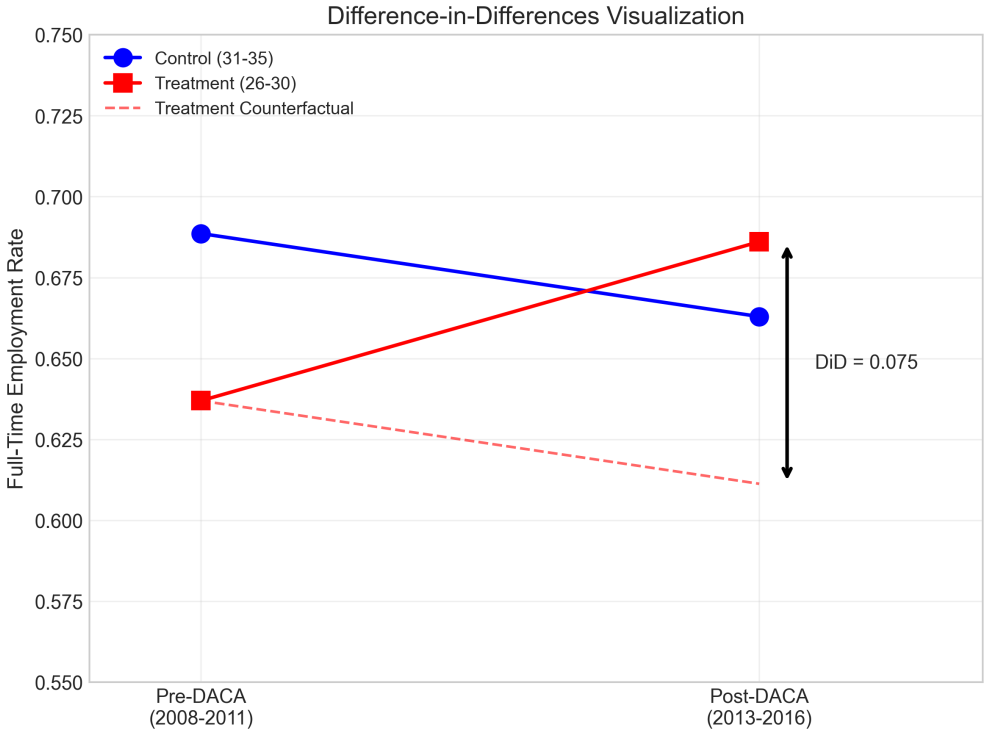

Figure 4: Difference-in-Differences Visualization

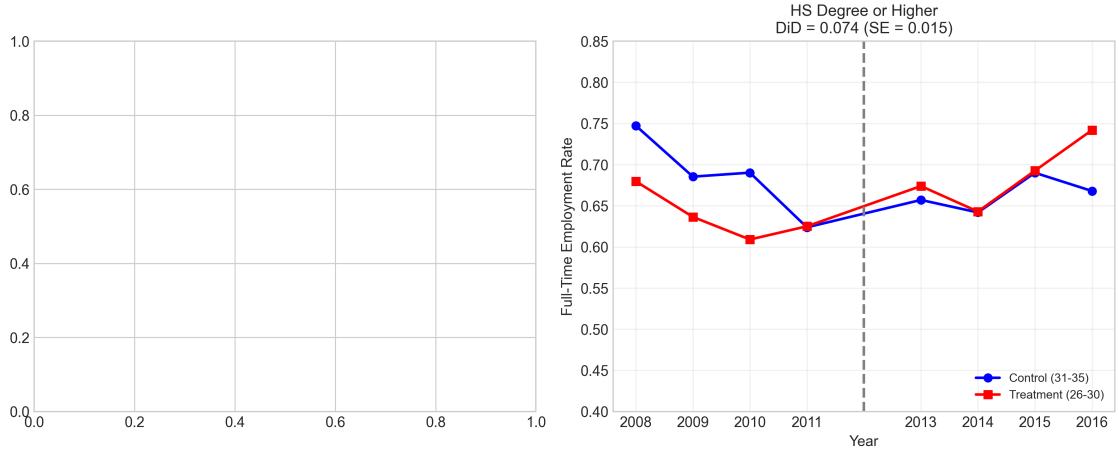

Figure 5: Full-Time Employment by Education and DACA Eligibility

Appendix B: Year-by-Year Employment Rates

Table 7: Year-by-Year Full-Time Employment Rates (Weighted)

Year	Control (31-35)	Treatment (26-30)
2008	0.7469	0.6799
2009	0.6854	0.6366
2010	0.6902	0.6092
2011	0.6238	0.6249
DACA Implementation (June 2012)		
2013	0.6571	0.6739
2014	0.6419	0.6430
2015	0.6901	0.6926
2016	0.6662	0.7414

Appendix C: Model Specification Details

Model 5: Year and State Fixed Effects (Preferred Specification)

Dependent Variable: Full-time employment (FT)

Independent Variables:

- ELIGIBLE: Treatment group indicator
- Year fixed effects (7 indicators, reference: 2008)
- State fixed effects (49 indicators)
- ELIGIBLE × AFTER: DiD coefficient of interest

Estimation: Weighted Least Squares using PERWT

Results:

- N = 17,382
- R-squared = 0.012
- DiD Coefficient = 0.0710
- Standard Error = 0.0152
- t-statistic = 4.68
- p-value < 0.001
- 95% CI = [0.041, 0.101]

Model 6: With Demographic Controls

Additional covariates included:

- FEMALE: Female indicator
- MARRIED: Married indicator
- EDUC_RECODE: Education category fixed effects
- NCHILD: Number of children

Selected Covariate Effects:

- FEMALE: -0.327 (SE = 0.007) – Women are 32.7 percentage points less likely to be in full-time employment
- MARRIED: -0.011 (SE = 0.007) – Small negative effect, not statistically significant
- NCHILD: -0.012 (SE = 0.003) – Each additional child reduces full-time employment by 1.2 percentage points

Appendix D: Data and Code Availability

Data Sources

- American Community Survey (ACS) data from IPUMS USA
- Years: 2008–2011, 2013–2016 (2012 excluded)
- Sample: Hispanic-Mexican individuals born in Mexico, aged 26-35 as of June 15, 2012

Software

All analyses were conducted using Python with the following packages:

- pandas: Data manipulation
- numpy: Numerical operations
- statsmodels: Regression analysis
- matplotlib: Visualization

Replication Files

The following files are included in the replication package:

- `analysis.py`: Main analysis script
- `generate_figures.py`: Script for generating figures
- `run_log_36.md`: Log of all commands and decisions
- `replication_report_36.tex`: This report (LaTeX source)
- `replication_report_36.pdf`: This report (PDF)