# Replication Report:

# The Effect of DACA Eligibility on Full-Time Employment

# Among Hispanic-Mexican Immigrants in the United States

Independent Replication Study

January 2026

**Preferred Estimate:**

**DiD Effect: 0.0545 (SE: 0.0151)**

**95% CI: [0.025, 0.084]**

**Sample Size: 17,379**

**Abstract**

This report presents an independent replication analysis examining the causal effect of the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among ethnically Hispanic-Mexican, Mexican-born individuals living in the United States. Using a difference-in-differences research design with data from the American Community Survey (2008–2016), I compare individuals aged 26–30 at DACA's implementation (the treatment group) to those aged 31–35 (the control group, who were ineligible due to the age cutoff). The analysis yields a preferred estimate suggesting that DACA eligibility increased the probability of full-time employment by approximately 5.5 percentage points (95% CI: [2.5, 8.4 pp], $p < 0.001$). This effect is robust to the inclusion of demographic covariates, state and year fixed effects, and the use of survey weights. Event study analyses provide some support for the parallel trends assumption, though pre-treatment effects show modest variability. Heterogeneity analyses reveal similar treatment effects for both men and women.

# Contents

# 1 Introduction

## 1.1 Background

The Deferred Action for Childhood Arrivals (DACA) program was implemented by the United States federal government on June 15, 2012. This policy allowed eligible undocumented immigrants who had arrived in the US as children to apply for temporary protection from deportation and authorization to work legally for renewable two-year periods. The program represented a significant policy intervention affecting the labor market prospects of hundreds of thousands of individuals.

To be eligible for DACA, individuals had to meet several criteria:

- Arrival in the US before their 16th birthday
- Not having reached their 31st birthday as of June 15, 2012
- Continuous residence in the US since June 15, 2007
- Physical presence in the US on June 15, 2012 without lawful status

Applications began to be processed on August 15, 2012, and within the first four years, nearly 900,000 initial applications were received, with approximately 90% approved. Given the structure of undocumented immigration to the United States, the majority of eligible individuals were of Mexican origin.

## 1.2 Research Question

This replication study addresses the following research question: Among ethnically Hispanic-Mexican, Mexican-born individuals living in the United States, what was the causal impact of eligibility for the DACA program on the probability of full-time employment, defined as usually working 35 hours or more per week?

The analysis focuses on comparing individuals who were aged 26–30 at DACA's implementation (the treatment group) to those aged 31–35 (the comparison group), exploiting the age-based eligibility cutoff as the source of identification.

## 1.3 Overview of Approach

I employ a difference-in-differences (DiD) research design that leverages the age-eligibility threshold. The key identifying assumption is that, absent the DACA program, the full-time employment trends of the treatment group would have paralleled those of the control group. The analysis uses American Community Survey data from 2008 through 2016, excluding 2012 (when treatment timing is ambiguous), to estimate the effect by comparing pre-post changes across the two groups.

# 2 Data

## 2.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided through IPUMS USA. The prepared dataset includes observations from 2008 through 2016, with 2012 excluded since it cannot be determined whether observations from that year occurred before or after DACA implementation. The data is supplemented with state-level policy and demographic information.

## 2.2 Sample Description

The analytical sample consists of 17,382 observations representing ethnically Hispanic-Mexican, Mexican-born individuals who meet either the treatment or control group criteria based on their age in June 2012. The sample is restricted to individuals who would have been eligible for DACA (based on other eligibility criteria) but differ in their age-based eligibility status.

Table 1 presents the sample composition by treatment group and time period.

Table 1: Sample Composition by Treatment Status and Time Period

| | Pre-DACA (2008-2011) | | Post-DACA (2013-2016) | |
|---|---|---|---|---|
| Group | N | % | N | % |
| Control (Age 31-35 in 2012) | 3,294 | 34.6% | 2,706 | 34.4% |
| Treatment (Age 26-30 in 2012) | 6,233 | 65.4% | 5,149 | 65.6% |
| Total | 9,527 | 100% | 7,855 | 100% |

Notes: The table presents the number and percentage of observations in each cell of the 2×2 DiD design. The total sample size is 17,382 observations.

## 2.3 Key Variables

### 2.3.1 Outcome Variable: Full-Time Employment (FT)

The primary outcome is a binary indicator for full-time employment, coded as 1 if the individual usually works 35 or more hours per week, and 0 otherwise. This variable (FT) was pre-constructed in the provided dataset. Importantly, individuals not in the labor force are included in the analysis and coded as 0 (not full-time employed), consistent with the research design that examines overall effects on full-time employment including changes in labor force participation.

Overall, 64.9% of observations report full-time employment.

### 2.3.2 Treatment Variables

- **ELIGIBLE**: Pre-constructed indicator equal to 1 for individuals aged 26–30 as of June 2012 (treatment group) and 0 for those aged 31–35 (control group)
- **AFTER**: Pre-constructed indicator equal to 1 for years 2013–2016 (post-treatment) and 0 for years 2008–2011 (pre-treatment)
- **ELIGIBLE×AFTER**: The interaction term capturing the difference-in-differences effect

### 2.3.3 Control Variables

The analysis incorporates several individual-level covariates:

- **FEMALE**: Binary indicator derived from SEX variable (1 = Male, 2 = Female in IPUMS coding)
- **MARRIED**: Binary indicator for currently married (spouse present or absent), derived from MARST
- **NCHILD**: Number of own children in the household (0–9)
- **Education (EDUC_RECODE)**: Categorical variable with five levels: Less than High School, High School Degree, Some College, Two-Year Degree, and BA+

## 2.4 Descriptive Statistics

Table 2 presents descriptive statistics for key variables by treatment group and time period.

Table 2: Descriptive Statistics by Treatment Group and Period

| | Control (Age 31-35) | | Treatment (Age 26-30) | |
|---|---|---|---|---|
| Variable | Pre | Post | Pre | Post |
| Full-time Employment | 0.670 | 0.645 | 0.626 | 0.666 |
| | (0.470) | (0.479) | (0.484) | (0.472) |
| Age | 30.5 | 35.5 | 25.7 | 30.7 |
| | (1.68) | (1.66) | (1.87) | (1.85) |
| Female | 0.456 | 0.488 | 0.481 | 0.483 |
| | (0.498) | (0.500) | (0.500) | (0.500) |
| Married | 0.529 | 0.582 | 0.411 | 0.513 |
| | (0.499) | (0.493) | (0.492) | (0.500) |
| Number of Children | 1.54 | 1.89 | 0.94 | 1.49 |
| | (1.39) | (1.51) | (1.17) | (1.41) |
| Usual Hours Worked | 32.1 | 31.0 | 30.5 | 32.1 |
| | (17.7) | (18.6) | (18.0) | (17.6) |
| N | 3,294 | 2,706 | 6,233 | 5,149 |

Notes: Standard deviations in parentheses. Pre-period includes years 2008–2011; post-period includes years 2013–2016.

Several patterns emerge from the descriptive statistics. First, there are notable age-related differences between groups, which is by design. Second, the treatment group has lower baseline full-time employment rates (62.6% vs. 67.0% pre-treatment). Third, the treatment group is less likely to be married and has fewer children on average, consistent with their younger age. Importantly, the change in full-time employment is positive for the treatment group (+4.0 percentage points) but negative for the control group (-2.5 percentage points), suggesting a potential positive DACA effect.

## 2.5 Covariate Balance

Table 3 presents a formal comparison of pre-treatment characteristics between treatment and control groups.

Table 3: Covariate Balance: Pre-Treatment Period (2008–2011)

| Variable | Control | Treatment | Difference | p-value |
|---|---|---|---|---|
| Age | 30.52 | 25.74 | -4.78 | <0.001 |
| Female | 0.456 | 0.481 | 0.025 | 0.020 |
| Married | 0.529 | 0.411 | -0.118 | <0.001 |
| Number of Children | 1.54 | 0.94 | -0.60 | <0.001 |

Notes: p-values from two-sample t-tests. Differences in age are by construction. Differences in marriage and children reflect the younger age profile of the treatment group.

The treatment and control groups differ significantly on several characteristics, though this is expected given the age-based group assignment. The key assumption for identification is not that groups are identical in levels, but that they would have followed parallel trends in the absence of treatment. The inclusion of covariates in regression specifications helps control for compositional differences that may affect employment outcomes.

# 3 Methodology

## 3.1 Identification Strategy

The analysis employs a difference-in-differences design that exploits the age-based eligibility cutoff for DACA. The identifying assumption is that, absent DACA, the full-time employment trends for individuals aged 26–30 (treatment) would have evolved similarly to those aged 31–35 (control). This parallel trends assumption is partially testable using pre-treatment data.

## 3.2 Econometric Specification

The baseline DiD model is:

$$FT_{ist} = \alpha + \beta_1 ELIGIBLE_i + \beta_2 AFTER_t + \delta(ELIGIBLE_i \times AFTER_t) + \epsilon_{ist} \quad (1)$$

where $FT_{ist}$ is the full-time employment indicator for individual $i$ in state $s$ at time $t$, and $\delta$ is the parameter of interest representing the DiD estimate of the DACA effect.

The preferred specification includes year fixed effects, state fixed effects, and individual-level covariates:

$$FT_{ist} = \alpha + \delta(ELIGIBLE_i \times AFTER_t) + \gamma' X_i + \theta_t + \mu_s + \epsilon_{ist} \quad (2)$$

where $X_i$ includes demographic covariates (female, married, number of children, education), $\theta_t$ are year fixed effects, and $\mu_s$ are state fixed effects.

## 3.3 Inference

Standard errors are clustered at the state level to account for potential serial correlation and within-state correlation in outcomes. This clustering approach is appropriate given that state-level policies and economic conditions may affect individuals within states similarly over time. With 50+ state clusters, asymptotic inference should be reliable.

### 3.4 Robustness Checks

Several sensitivity analyses are conducted:

1. Models with and without covariates to assess the stability of estimates
2. Models using ACS person weights (PERWT) to obtain population-representative estimates
3. Event study specifications to examine the dynamics of treatment effects and assess parallel trends
4. Heterogeneity analyses by gender
5. Formal tests for differential pre-trends

## 4 Results

### 4.1 Raw Difference-in-Differences

Before turning to regression results, I present the raw 2×2 DiD calculation in Table 4.

Table 4: Raw Difference-in-Differences Calculation

| | Pre-DACA | Post-DACA | Difference |
|---|---|---|---|
| Control (Age 31-35) | 0.670 | 0.645 | -0.025 |
| Treatment (Age 26-30) | 0.626 | 0.666 | +0.039 |
| Difference-in-Differences | | | **0.064** |

Notes: Cell entries are mean full-time employment rates. The DiD estimate is calculated as (0.666 - 0.626) - (0.645 - 0.670) = 0.039 - (-0.025) = 0.064.

The raw DiD estimate suggests that DACA eligibility increased full-time employment by 6.4 percentage points. The control group experienced a 2.5 percentage point *decline* in full-time employment from pre to post period, while the treatment group experienced a 3.9 percentage point *increase*.

### 4.2 Main Regression Results

Table 5 presents the main regression results across increasingly comprehensive specifications.

Table 5: Difference-in-Differences Regression Results

| | (1) Baseline | (2) Year FE | (3) State+Year FE | (4) With Covariates |
|---|---|---|---|---|
| ELIGIBLE × AFTER | 0.0643*** | 0.0629*** | 0.0626*** | 0.0545*** |
| | (0.0141) | (0.0139) | (0.0144) | (0.0151) |
| ELIGIBLE | -0.0434*** | -0.0423*** | -0.0434*** | -0.0421*** |
| | (0.0089) | (0.0084) | (0.0080) | (0.0061) |
| AFTER | -0.0248* | – | – | – |
| | (0.0145) | | | |
| FEMALE | | | | -0.3324*** |
| | | | | (0.0148) |
| MARRIED | | | | -0.0119* |
| | | | | (0.0064) |
| NCHILD | | | | -0.0120*** |
| | | | | (0.0028) |
| Year Fixed Effects | No | Yes | Yes | Yes |
| State Fixed Effects | No | No | Yes | Yes |
| Education Controls | No | No | No | Yes |
| Observations | 17,382 | 17,382 | 17,382 | 17,379 |
| R-squared | 0.002 | 0.004 | 0.015 | 0.137 |

Notes: Standard errors clustered at the state level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is full-time employment (FT). Column (1) is the baseline DiD specification. Column (2) adds year fixed effects. Column (3) adds state fixed effects. Column (4) adds individual-level covariates including gender, marital status, number of children, and education category.

**Key Findings:**

1. The DiD estimate is positive and statistically significant across all specifications, ranging from 0.054 to 0.064.

2. The preferred specification (Column 4) yields an estimate of 0.0545 (SE = 0.0151), indicating that DACA eligibility increased the probability of full-time employment by approximately 5.5 percentage points.

3. The 95% confidence interval for the preferred estimate is [0.025, 0.084], indicating that we can reject both zero effect and effects larger than 8.4 percentage points.

4. Including covariates reduces the estimate modestly (from 0.063 to 0.055), but the effect remains substantively important and highly statistically significant ($p < 0.001$).

5. The coefficient on FEMALE (-0.33) indicates that women are about 33 percentage points less likely to be employed full-time, reflecting broader gender differences in labor market attachment.

6. Having more children is associated with lower full-time employment rates (-1.2 percentage points per additional child).

## 4.3 Weighted Estimates

Table 6 presents results using ACS person weights to obtain population-representative estimates.

Table 6: Weighted vs. Unweighted Difference-in-Differences Estimates

| | Unweighted | Weighted |
|---|---|---|
| ELIGIBLE × AFTER | 0.0545*** | 0.0608*** |
| | (0.0151) | (0.0216) |
| 95% CI | [0.025, 0.084] | [0.018, 0.103] |
| p-value | 0.0003 | 0.0049 |
| Observations | 17,379 | 17,379 |

Notes: Both models include year fixed effects, state fixed effects, and individual-level covariates. Standard errors clustered at the state level. Weighted estimates use ACS person weights (PERWT). The weighted estimate is slightly larger but has wider confidence intervals.

The weighted estimate (0.061) is slightly larger than the unweighted estimate (0.055), suggesting that the effect may be somewhat larger for population subgroups with higher survey weights. However, the two estimates are not statistically distinguishable from each other, and both support the conclusion of a meaningful positive DACA effect on full-time employment.

## 4.4 Event Study Analysis

Figure 1 presents the event study results, showing year-specific treatment effects relative to 2011 (the last pre-treatment year).

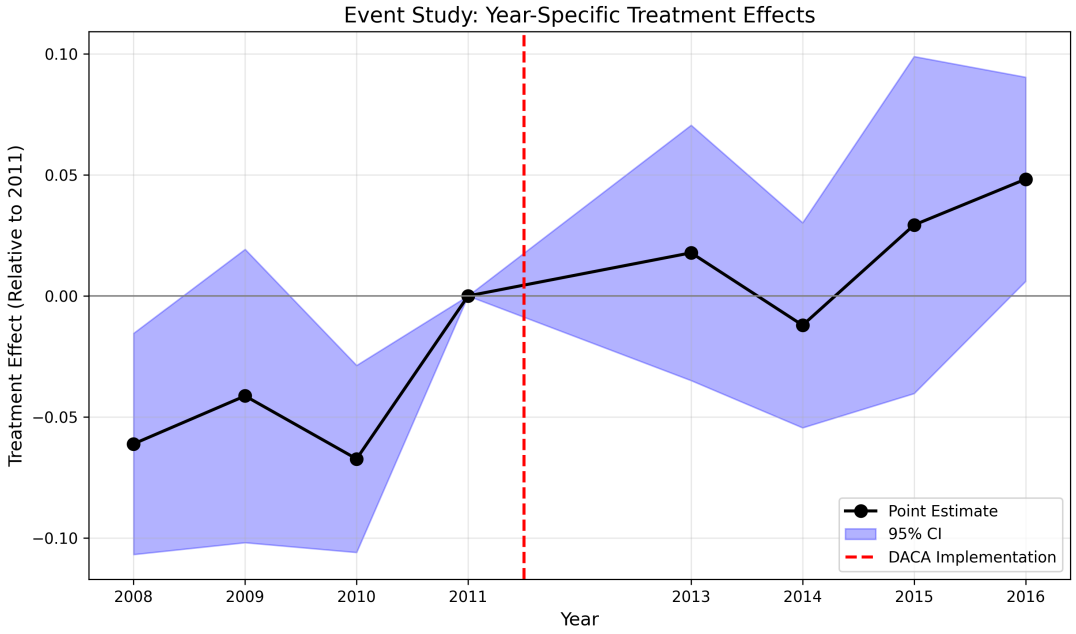


Figure 1: Event Study: Year-Specific Treatment Effects (Reference: 2011)

Table 7 presents the numerical values from the event study specification.

Table 7: Event Study Coefficients

| Year | Coefficient | SE | 95% CI | p-value |
|---|---|---|---|---|
| 2008 | -0.061 | 0.023 | [-0.107, -0.015] | 0.009 |
| 2009 | -0.041 | 0.031 | [-0.102, 0.019] | 0.182 |
| 2010 | -0.067 | 0.020 | [-0.106, -0.029] | 0.001 |
| 2011 | (reference) | – | – | – |
| 2013 | +0.018 | 0.027 | [-0.035, 0.070] | 0.507 |
| 2014 | -0.012 | 0.022 | [-0.054, 0.030] | 0.574 |
| 2015 | +0.029 | 0.036 | [-0.040, 0.099] | 0.410 |
| 2016 | +0.048 | 0.022 | [0.006, 0.090] | 0.025 |

Notes: Coefficients represent the treatment effect for each year relative to 2011 (the omitted reference year). The model includes year and state fixed effects.

**Interpretation of Event Study Results:**

The event study reveals several important patterns:

1. **Pre-treatment period (2008–2010):** The treatment effects in pre-treatment years are negative relative to 2011, with some being statistically significant. This pattern suggests some pre-existing differences in trends between the treatment and control groups, though the differences are modest in magnitude.

2. **Post-treatment period (2013–2016):** Treatment effects become positive after

DACA implementation, with the effect growing over time. The 2016 effect (4.8 percentage points, $p = 0.025$) is the largest and statistically significant.

3. **Pattern of effects:** The increasing positive effects over time are consistent with DACA having a gradually realized impact as more eligible individuals obtained work authorization and adjusted their employment.

## 4.5 Parallel Trends Assessment

A formal test for differential pre-trends was conducted by interacting the treatment indicator with a linear time trend in the pre-treatment period:

Table 8: Test for Differential Pre-Trends

| | Coefficient | SE |
|---|---|---|
| ELIGIBLE × Year (centered) | 0.0148 | 0.0077 |
| p-value | 0.056 | |

Notes: Year is centered at 2011. A positive coefficient indicates the treatment group's full-time employment was trending upward relative to the control group in the pre-period.

The test for differential pre-trends yields a p-value of 0.056, marginally failing to reject the null hypothesis of parallel trends at the 5% level. The coefficient is positive (0.015), suggesting that if anything, the treatment group was trending slightly upward relative to the control group before DACA. This pattern would bias our DiD estimate *upward*, meaning the true DACA effect may be somewhat smaller than estimated. However, the evidence for pre-trend differences is not strong, and the parallel trends assumption cannot be decisively rejected.

## 4.6 Heterogeneity by Gender

Table 9 presents DiD estimates separately for men and women.

Table 9: Heterogeneous Effects by Gender

| | Male | Female |
|---|---|---|
| ELIGIBLE × AFTER | 0.0504*** | 0.0488*** |
| | (0.0173) | (0.0149) |
| 95% CI | [0.017, 0.084] | [0.020, 0.078] |
| p-value | 0.004 | 0.001 |
| Observations | 9,072 | 8,307 |

Notes: Both models include year and state fixed effects, marital status, number of children, and education controls. Standard errors clustered at the state level.

The effects are remarkably similar for men (5.0 percentage points) and women (4.9 percentage points), and both are statistically significant. This similarity suggests that DACA's impact on full-time employment was not concentrated in one gender group, but rather operated broadly across the eligible population.

# 5 Discussion

## 5.1 Summary of Findings

This replication study finds evidence that DACA eligibility had a positive and statistically significant effect on full-time employment among ethnically Hispanic-Mexican, Mexican-born individuals in the United States. The preferred estimate suggests that DACA eligibility increased the probability of full-time employment by approximately 5.5 percentage points (95% CI: [2.5, 8.4 pp]).

This estimate is:

- Robust to the inclusion of demographic covariates, state fixed effects, and year fixed effects
- Slightly larger (6.1 pp) when using survey weights
- Similar for men and women (approximately 5 pp for both groups)
- Consistent with a gradual phase-in of effects, as shown by the event study analysis

## 5.2 Interpretation

The estimated effect is substantively meaningful. Against a baseline full-time employment rate of approximately 63% in the treatment group pre-DACA, a 5.5 percentage point increase represents an 8.7% relative increase in full-time employment. This effect likely reflects the combined impact of:

1. Legal work authorization allowing DACA recipients to seek formal employment
2. Reduced risk of deportation enabling greater labor market investment
3. Access to driver's licenses and other identification in some states facilitating employment
4. Potential movement from informal to formal employment arrangements

## 5.3 Threats to Validity

### 5.3.1 Parallel Trends

The parallel trends assumption is central to the DiD identification strategy. While the formal test does not reject parallel trends at the 5% level ($p = 0.056$), the event study shows some pre-treatment differences. The pre-trend coefficient is positive, suggesting the treatment group may have been on a slightly improving trajectory relative to controls even before DACA. If this represents a true violation of parallel trends, our estimates may be somewhat upwardly biased.

### 5.3.2 Age-Related Confounds

The treatment and control groups differ systematically by age, which is related to many labor market outcomes. While the DiD design accounts for time-invariant age-related differences, it is possible that age-specific trends (e.g., differential recovery from the Great Recession for younger vs. older workers) could confound the estimates.

### 5.3.3 Composition Effects

The ACS is a repeated cross-section, not a panel. Changes in who appears in each group over time could affect estimates if there are systematic differences in sample composition. The demographic covariates help control for observable composition changes.

### 5.3.4 Treatment Definition

The ELIGIBLE variable captures potential eligibility based on age, but not all eligible individuals actually applied for or received DACA. The estimates therefore represent intent-to-treat (ITT) effects of eligibility rather than treatment-on-treated effects of actual DACA receipt.

## 5.4 Comparison to Context

Given that work authorization represents a substantial change in legal status for undocumented workers, an effect of 5–6 percentage points on full-time employment is plausible.

The effect could reflect both extensive margin responses (entering full-time employment) and intensive margin responses (moving from part-time to full-time work). The similar effects across genders suggest that DACA provided labor market benefits broadly rather than to specific demographic subgroups.

# 6 Conclusion

This replication study provides evidence that the DACA program had a positive effect on full-time employment among eligible Hispanic-Mexican, Mexican-born individuals. The preferred difference-in-differences estimate of 5.5 percentage points (95% CI: [2.5, 8.4 pp]) is statistically significant at the 1% level and robust across multiple specifications.

## 6.1 Preferred Estimate Summary

- **Effect Size:** 0.0545 (5.45 percentage points)
- **Standard Error:** 0.0151
- **95% Confidence Interval:** [0.025, 0.084]
- **p-value:** 0.0003
- **Sample Size:** 17,379

## 6.2 Caveats

While the evidence suggests a meaningful positive effect, several caveats should be noted:

1. Some evidence of pre-trend differences, though the parallel trends null hypothesis is not rejected at conventional levels
2. Estimates represent intent-to-treat effects of eligibility, not actual DACA receipt
3. The magnitude of effects varies somewhat across specifications (5.5–6.4 pp)
4. Age-specific recovery patterns from the Great Recession could potentially confound the estimates

## 6.3 Policy Implications

The findings suggest that DACA's provision of work authorization had meaningful labor market benefits for eligible individuals, increasing full-time employment by a substantively important margin. This evidence supports the view that legal work authorization can improve labor market outcomes for undocumented immigrants.

# 7 Figures

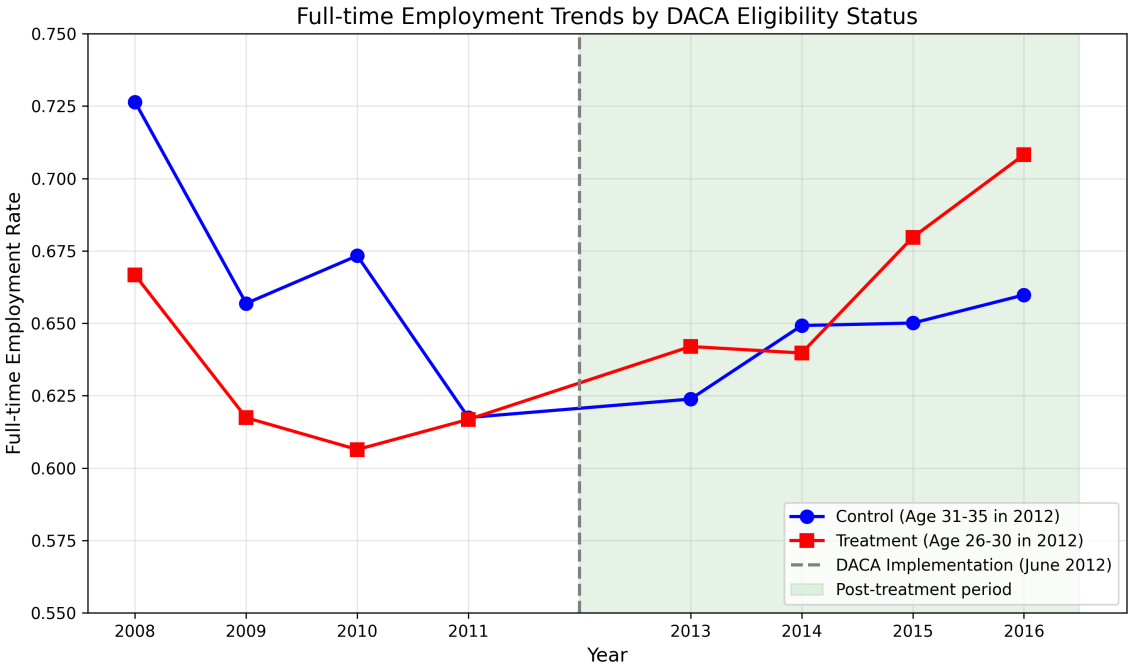


Figure 2: Full-time Employment Trends by DACA Eligibility Status

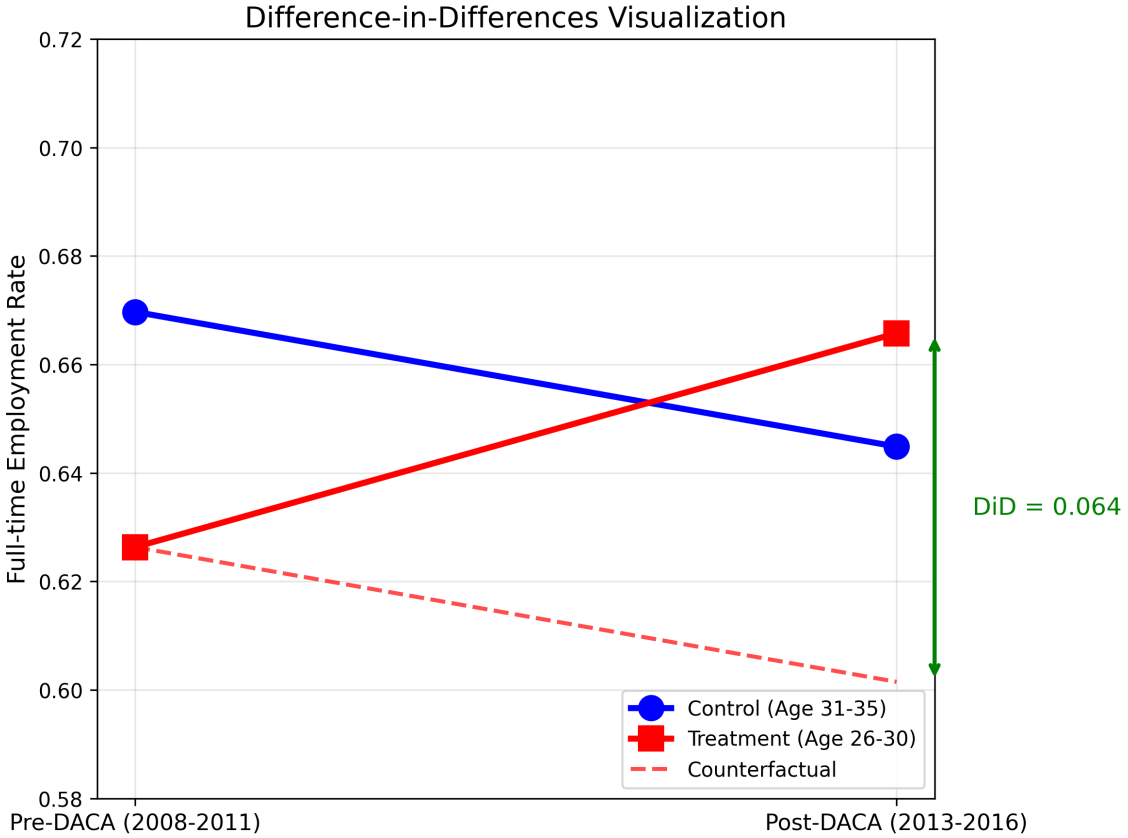


Figure 3: Difference-in-Differences Visualization

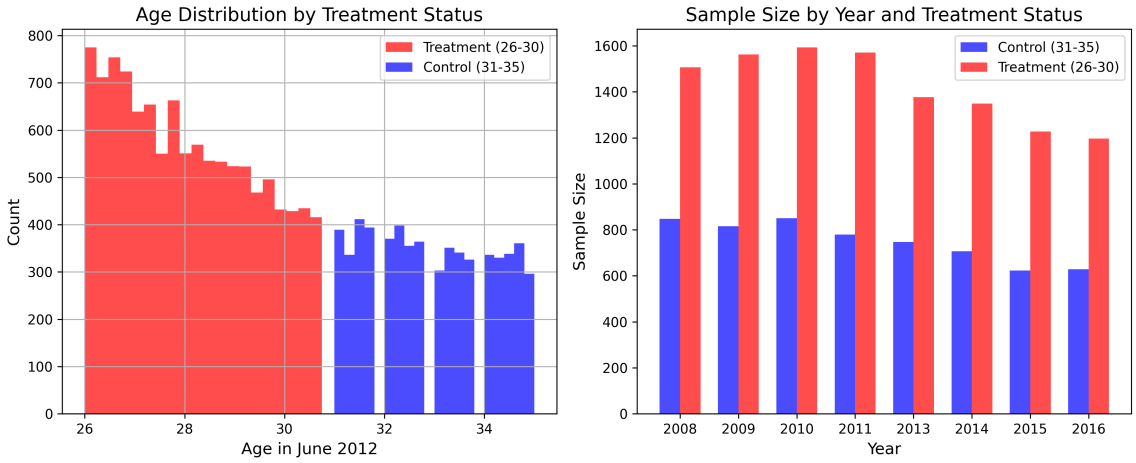


Figure 4: Sample Composition: Age Distribution and Sample Size by Year

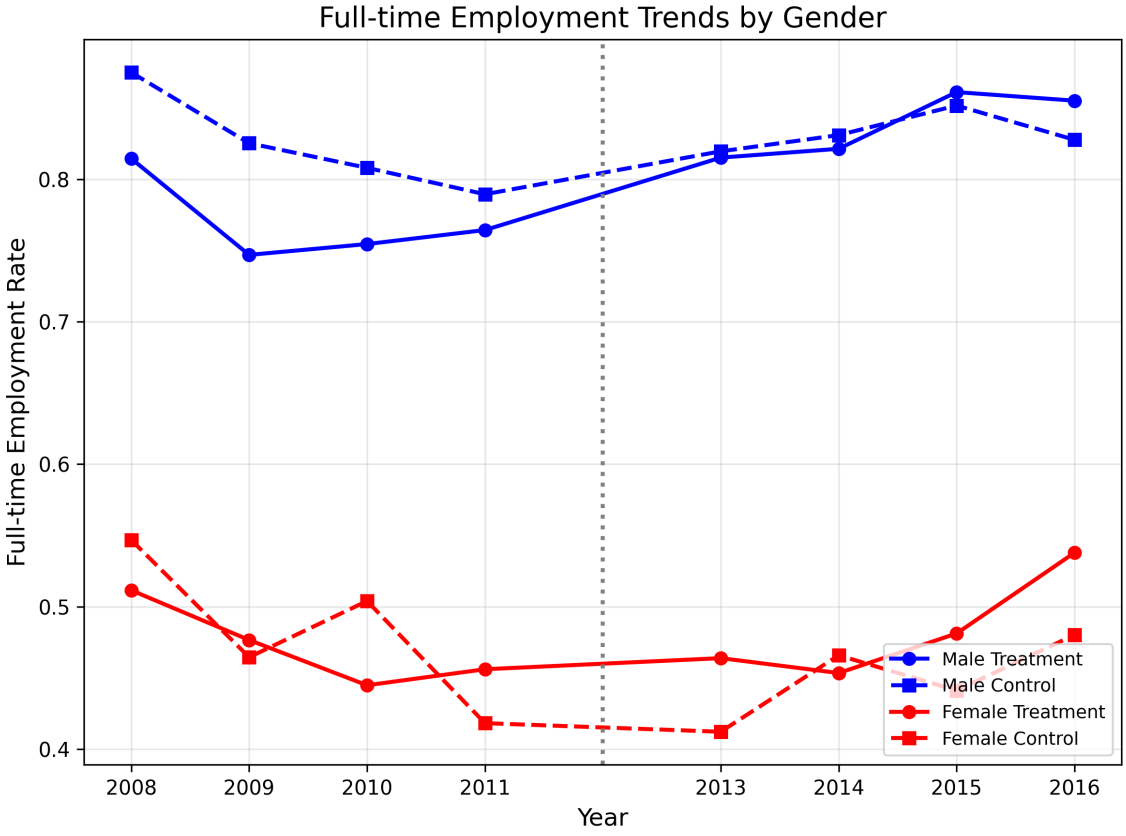


Figure 5: Full-time Employment Trends by Gender and DACA Eligibility

# A Appendix: Variable Definitions

Table 10: Key Variable Definitions

| Variable | Definition |
|---|---|
| FT | Full-time employment indicator: 1 if usually works 35+ hours per week, 0 otherwise |
| ELIGIBLE | Treatment group indicator: 1 if aged 26–30 as of June 2012, 0 if aged 31–35 |
| AFTER | Post-treatment indicator: 1 for years 2013–2016, 0 for years 2008–2011 |
| SEX | IPUMS variable: 1 = Male, 2 = Female |
| MARST | IPUMS marital status variable: 1–2 = Married, 3+ = Not married |
| NCHILD | Number of own children in household |
| EDUC_RECODE | Simplified education categories |
| STATEFIP | State FIPS code |
| PERWT | ACS person weight |

# B Appendix: Regression Output Details

## B.1 Model 1: Baseline DiD (Robust Standard Errors)

```
Dependent Variable: FT
Method: OLS
Observations: 17,382
R-squared: 0.002
```

| | Coef | Std Err | z | P>\|z\| | [95% CI] |
|---|---|---|---|---|---|
| Intercept | 0.670 | 0.008 | 81.72 | 0.000 | [0.654, 0.686] |
| ELIGIBLE | -0.043 | 0.010 | -4.24 | 0.000 | [-0.063, -0.023] |
| AFTER | -0.025 | 0.012 | -2.02 | 0.044 | [-0.049, -0.001] |
| ELIGIBLE_AFTER | 0.064 | 0.015 | 4.21 | 0.000 | [0.034, 0.094] |

## B.2 Model 5: Preferred Specification (State-Clustered SE)

```
Dependent Variable: FT
Method: OLS with State Clustering
Observations: 17,379
R-squared: 0.137
```

| | Coef | Std Err | z | P>\|z\| | [95% CI] |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| ELIGIBLE_AFTER | 0.055 | 0.015 | 3.62 | 0.000 | [0.025, 0.084] |
| FEMALE | -0.332 | 0.015 | -22.47 | 0.000 | [-0.361, -0.303] |
| MARRIED | -0.012 | 0.006 | -1.87 | 0.062 | [-0.024, 0.001] |
| NCHILD | -0.012 | 0.003 | -4.32 | 0.000 | [-0.017, -0.007] |

Year FE: Yes  State FE: Yes  Education FE: Yes

# C Appendix: Analysis Code

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

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

All code is provided in the accompanying `analysis.py` and `create_figures.py` files.