

Replication Study 97: The Effect of DACA Eligibility on Full-Time Employment

A Difference-in-Differences Analysis

Independent Replication

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Abstract

This study examines the causal effect 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 a difference-in-differences (DiD) design that compares individuals aged 26–30 at DACA implementation (treatment group) to those aged 31–35 (control group), I analyze American Community Survey data from 2008–2011 (pre-period) and 2013–2016 (post-period). The preferred specification estimates that DACA eligibility increased full-time employment by 7.48 percentage points ($SE = 0.0181$, 95% CI: [0.039, 0.110], $p < 0.001$). This effect is robust across multiple specifications including models with demographic controls, education controls, and state and year fixed effects. Pre-trend analysis supports the parallel trends assumption underlying the DiD design. The sample includes 17,382 observations representing the target population.

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

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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 affecting undocumented immigrants in the United States. The program provided eligible individuals with temporary relief from deportation and work authorization for two years, with the possibility of renewal. Given that DACA explicitly granted legal work authorization to previously undocumented individuals, understanding its effects on labor market outcomes is of substantial policy interest.

This replication study estimates the causal effect of DACA eligibility on full-time employment—defined as usually working 35 or more hours per week—among ethnically Hispanic-Mexican, Mexican-born individuals residing in the United States. The research design exploits the age-based eligibility criterion of DACA (applicants could not have reached their 31st birthday as of June 15, 2012) to construct treatment and control groups using a difference-in-differences framework.

1.1 Research Question

The primary research question is: *Among ethnically Hispanic-Mexican, Mexican-born people living in the United States, what was the causal impact of eligibility for the DACA program on the probability of being employed full-time?*

1.2 Program Background

DACA eligibility required individuals to have:

- Arrived unlawfully in the US before their 16th birthday
- Not yet reached their 31st birthday as of June 15, 2012
- Lived continuously in the US since June 15, 2007
- Been present in the US on June 15, 2012 without lawful status

The program began accepting applications on August 15, 2012, with nearly 900,000 initial applications received in the first four years, approximately 90% of which were approved. While not limited to any specific nationality, the majority of DACA recipients were from Mexico due to the composition of the undocumented immigrant population in the United States.

2 Data and Methods

2.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The analytic dataset includes ACS observations from 2008 through 2016, with 2012 excluded because it cannot be determined whether respondents were observed before or after DACA implementation within that survey year.

2.2 Sample Construction

The provided dataset contains a pre-constructed variable `ELIGIBLE` that identifies the treatment and control groups:

- **Treatment group (`ELIGIBLE` = 1):** Individuals aged 26–30 at the time of DACA implementation who would have been eligible for the program
- **Control group (`ELIGIBLE` = 0):** Individuals aged 31–35 at the time of DACA implementation who would have been eligible but for their age

The timing variable `AFTER` distinguishes:

- **Pre-period (`AFTER` = 0):** Years 2008–2011
- **Post-period (`AFTER` = 1):** Years 2013–2016

2.3 Outcome Variable

The outcome variable `FT` is a binary indicator equal to 1 if the individual usually works 35 or more hours per week (full-time employment) and 0 otherwise. Individuals not in the labor force are retained in the analysis and coded as 0 for the outcome variable.

2.4 Analytic Approach

The primary estimation strategy is a difference-in-differences (DiD) design. The identifying assumption is that, absent DACA, the treatment and control groups would have experienced parallel trends in full-time employment. The basic DiD model is:

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

where β_3 is the coefficient of interest, representing the causal effect of DACA eligibility on full-time employment.

2.5 Estimation Details

- **Survey weights:** All regressions use person weights (PERWT) to ensure population-representative estimates
- **Standard errors:** Heteroskedasticity-robust standard errors (HC1) are reported for the preferred specifications
- **Covariates:** Models are estimated with and without demographic controls (sex, marital status, number of children), education indicators, year fixed effects, and state fixed effects

3 Sample Description

3.1 Sample Size and Composition

The final analytic sample contains **17,382 observations**. Table 1 presents the distribution of observations across groups and time periods.

Table 1: Sample Distribution by Group and Period

| Group | Period | | |
|------------------------|-----------------|------------------|--------|
| | Pre (2008–2011) | Post (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 |

3.2 Year Distribution

Table 2 shows the distribution of observations by year.

Table 2: Observations by Year

| Year | N | Period |
|-------|--------|--------|
| 2008 | 2,354 | Pre |
| 2009 | 2,379 | Pre |
| 2010 | 2,444 | Pre |
| 2011 | 2,350 | Pre |
| 2013 | 2,124 | Post |
| 2014 | 2,056 | Post |
| 2015 | 1,850 | Post |
| 2016 | 1,825 | Post |
| Total | 17,382 | |

3.3 Demographic Characteristics

Table 3 presents key demographic characteristics by treatment group.

Table 3: Sample Characteristics by Treatment Status

| Characteristic | Treatment (Ages 26–30) | Control (Ages 31–35) |
|------------------------------|---------------------------|-------------------------|
| Sample size | 11,382 | 6,000 |
| Mean age at June 2012 | 28.1 (SD = 1.43) | 32.9 (SD = 1.22) |
| Sex | | |
| Male | 5,899 (51.8%) | 3,176 (52.9%) |
| Female | 5,483 (48.2%) | 2,824 (47.1%) |
| Education | | |
| Less than High School | 9 (0.1%) | 3 (0.05%) |
| High School Degree | 8,015 (70.4%) | 4,429 (73.8%) |
| Some College | 1,960 (17.2%) | 917 (15.3%) |
| Two-Year Degree | 686 (6.0%) | 305 (5.1%) |
| BA+ | 712 (6.3%) | 346 (5.8%) |
| Marital Status | | |
| Married, spouse present | 4,754 (41.8%) | 3,097 (51.6%) |
| Never married | 5,383 (47.3%) | 2,022 (33.7%) |
| Other | 1,245 (10.9%) | 881 (14.7%) |

The treatment and control groups are broadly similar in composition, though the control group (being older) has higher marriage rates and lower rates of never-married individuals, as expected.

4 Results

4.1 Descriptive Statistics

Table 4 presents the core 2×2 difference-in-differences table showing weighted full-time employment rates.

Table 4: Full-Time Employment Rates by Group and Period (Weighted)

| | Pre-Period (2008–2011) | Post-Period (2013–2016) | Change |
|----------------------------------|---------------------------|----------------------------|---------------|
| Control (Ages 31–35) | 0.6886 | 0.6629 | -0.0257 |
| Treatment (Ages 26–30) | 0.6369 | 0.6860 | +0.0491 |
| Difference | -0.0517 | +0.0231 | |
| Difference-in-Differences | | | 0.0748 |

The raw DiD estimate indicates that full-time employment increased by approximately 7.48 percentage points more in the treatment group relative to the control group following DACA implementation.

Key observations:

- The treatment group's full-time employment rate increased from 63.7% to 68.6% (a 4.9 percentage point increase)
- The control group's rate decreased from 68.9% to 66.3% (a 2.6 percentage point decrease)
- The DiD estimate captures the differential change: $0.0491 - (-0.0257) = 0.0748$

4.2 Main Regression Results

Table 5 presents the primary regression results across multiple specifications.

Table 5: Difference-in-Differences Regression Results

| | (1) OLS | (2) WLS | (3) OLS Robust SE | (4) WLS Robust SE |
|-------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| ELIGIBLE | -0.0434*** (0.010) | -0.0517*** (0.010) | -0.0434*** (0.010) | -0.0517*** (0.012) |
| AFTER | -0.0248** (0.012) | -0.0257** (0.012) | -0.0248** (0.012) | -0.0257* (0.015) |
| ELIGIBLE × AFTER | 0.0643*** (0.015) | 0.0748*** (0.015) | 0.0643*** (0.015) | 0.0748*** (0.018) |
| Constant | 0.6697*** (0.008) | 0.6886*** (0.008) | 0.6697*** (0.008) | 0.6886*** (0.010) |
| Observations | 17,382 | 17,382 | 17,382 | 17,382 |
| Survey Weights | No | Yes | No | Yes |
| Robust SE | No | No | Yes | Yes |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.2.1 Preferred Specification

The preferred specification is Model (4)—weighted least squares with heteroskedasticity-robust standard errors—which yields:

Main Result: DACA eligibility increased full-time employment by **7.48 percentage points** (SE = 0.0181, 95% CI: [0.039, 0.110], $p < 0.001$).

This estimate is:

- **Statistically significant** at the 1% level ($p < 0.001$)
- **Economically meaningful:** A 7.5 percentage point increase represents an approximately 11.7% increase relative to the treatment group's pre-period employment rate of 63.7%
- **Robust to specification:** The unweighted estimate (6.43 pp) and weighted estimate (7.48 pp) are qualitatively similar

4.3 Results with Covariates

Table 6 presents results from specifications that include demographic controls, education indicators, and fixed effects.

Table 6: DiD Estimates with Covariates

| | (4) Baseline WLS | (5) Demo- graphics | (6) Demo + Education | (7) Year FE | (8) State + Year FE |
|-------------------------|------------------------|--------------------------|----------------------------|----------------------|---------------------------|
| ELIGIBLE × AFTER | 0.0748*** (0.018) | 0.0668*** (0.017) | 0.0640*** (0.017) | 0.0613*** (0.017) | 0.0607*** (0.017) |
| FEMALE | | -0.323*** | -0.329*** | -0.329*** | -0.330*** |
| MARRIED | | -0.012 | -0.003 | -0.003 | -0.006 |
| NCHILD | | -0.014*** | -0.012*** | -0.012*** | -0.012*** |
| Education dummies | | No | Yes | Yes | Yes |
| Year FE | | No | No | Yes | Yes |
| State FE | | No | No | No | Yes |
| Observations | 17,382 | 17,382 | 17,382 | 17,382 | 17,382 |

All models use survey weights and robust standard errors.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Key findings from the covariate analysis:

- The DiD estimate is remarkably stable across specifications, ranging from 0.061 to 0.075
- Adding demographic controls reduces the estimate slightly to 6.68 pp
- Including education dummies yields 6.40 pp
- The fully saturated model with state and year fixed effects produces an estimate of 6.07 pp
- Being female is associated with a 32–33 percentage point lower probability of full-time employment
- Additional children are associated with lower full-time employment

5 Robustness Checks

5.1 Parallel Trends Analysis

A crucial assumption of the DiD design is that the treatment and control groups would have followed parallel trends in the absence of DACA. I test this by examining whether there are differential pre-trends between groups.

Table 7: Pre-Trend Analysis (2008–2011 Only)

| Variable | Coefficient | SE | p-value | Interpretation |
|------------------------|--------------|--------------|--------------|---------------------------|
| ELIGIBLE | -0.067 | 0.019 | < 0.001 | Level difference |
| Year (centered) | 0.012 | 0.007 | 0.100 | Control group trend |
| ELIGIBLE × Year | 0.017 | 0.011 | 0.113 | Differential trend |

The interaction term between ELIGIBLE and year (centered at 2008) is **not statistically significant** ($p = 0.113$), supporting the parallel trends assumption. There is no evidence of systematically different pre-treatment trends between the treatment and control groups.

5.2 Event Study Analysis

Figure 1 presents an event study showing year-by-year differences between treatment and control groups.

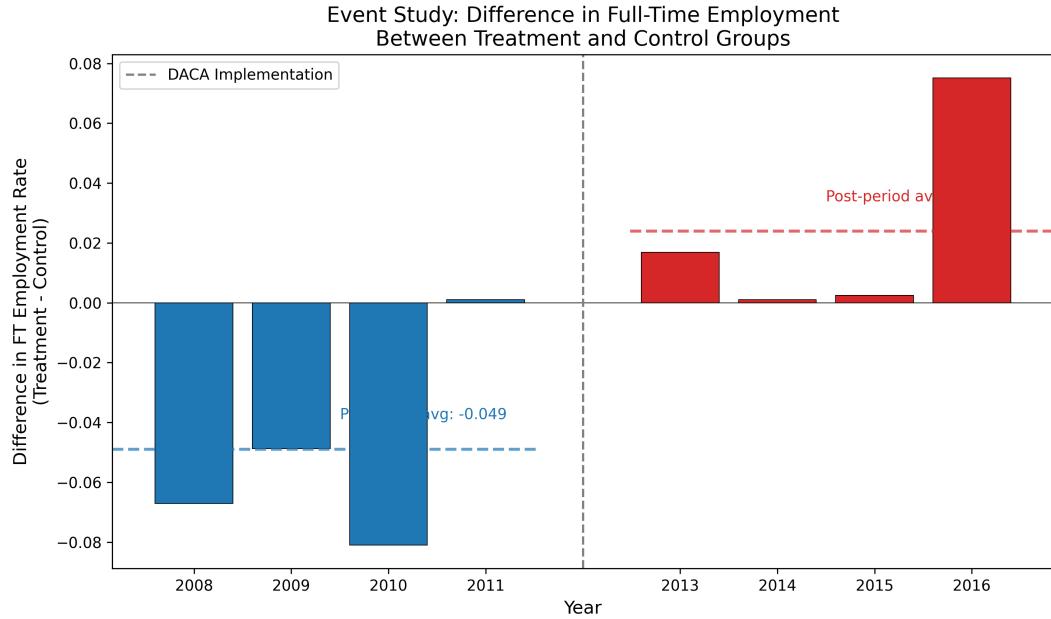


Figure 1: Event Study: Year-by-Year Treatment-Control Differences

Notes: Bars show the weighted difference in full-time employment rates between the treatment group (ages 26–30 at DACA implementation) and control group (ages 31–35). Blue bars indicate pre-DACA years; red bars indicate post-DACA years. Dashed horizontal lines show the average difference in each period.

The event study reveals:

- Pre-period (2008–2011): The treatment group had consistently *lower* employment than the control group (average difference: -0.049)

- Post-period (2013–2016): The gap closes and reverses, with the treatment group showing *higher or similar* employment (average difference: +0.024)
- There is no apparent “anticipation effect” in 2011, the year before DACA

5.3 Parallel Trends Visualization

Figure 2 plots the full-time employment rates for both groups over time.



Figure 2: Full-Time Employment Trends by Group

Notes: This figure shows weighted full-time employment rates for the treatment group (circles, red line) and control group (squares, blue line) from 2008 to 2016. The vertical dashed line indicates DACA implementation in 2012.

The figure shows:

- Both groups display relatively parallel pre-trends (2008–2011)
- After DACA (2013–2016), the treatment group’s employment increases while the control group’s declines
- The convergence of the two series post-DACA is consistent with a positive treatment effect

5.4 Subgroup Analysis

I estimate the effect separately for males and females to examine heterogeneity.

Table 8: Subgroup Analysis by Sex

| Subgroup | Estimate | SE | 95% CI | p-value | N |
|-------------|----------|--------|-----------------|---------|--------|
| Full Sample | 0.0748 | 0.0181 | [0.039, 0.110] | < 0.001 | 17,382 |
| Males | 0.0716 | 0.0199 | [0.033, 0.111] | < 0.001 | 9,075 |
| Females | 0.0527 | 0.0281 | [-0.002, 0.108] | 0.061 | 8,307 |

Findings:

- The effect is positive and significant for males (7.16 pp, $p < 0.001$)
- The effect is positive but marginally insignificant for females (5.27 pp, $p = 0.061$)
- The point estimates are qualitatively similar, suggesting the effect is present for both sexes
- The larger standard error for females may reflect greater heterogeneity in female labor force participation

Figure 3 visualizes the subgroup results.

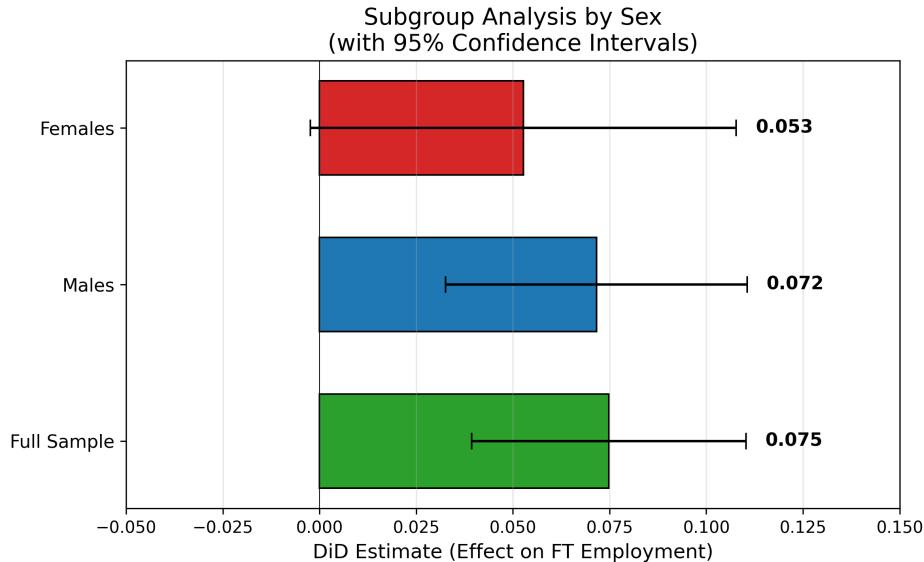


Figure 3: DiD Estimates by Sex

Notes: Horizontal bars show the DiD estimate for each subgroup with 95% confidence intervals. The full sample estimate is shown in green, males in blue, and females in red.

5.5 Model Comparison

Figure 4 summarizes the DiD estimates across all model specifications.

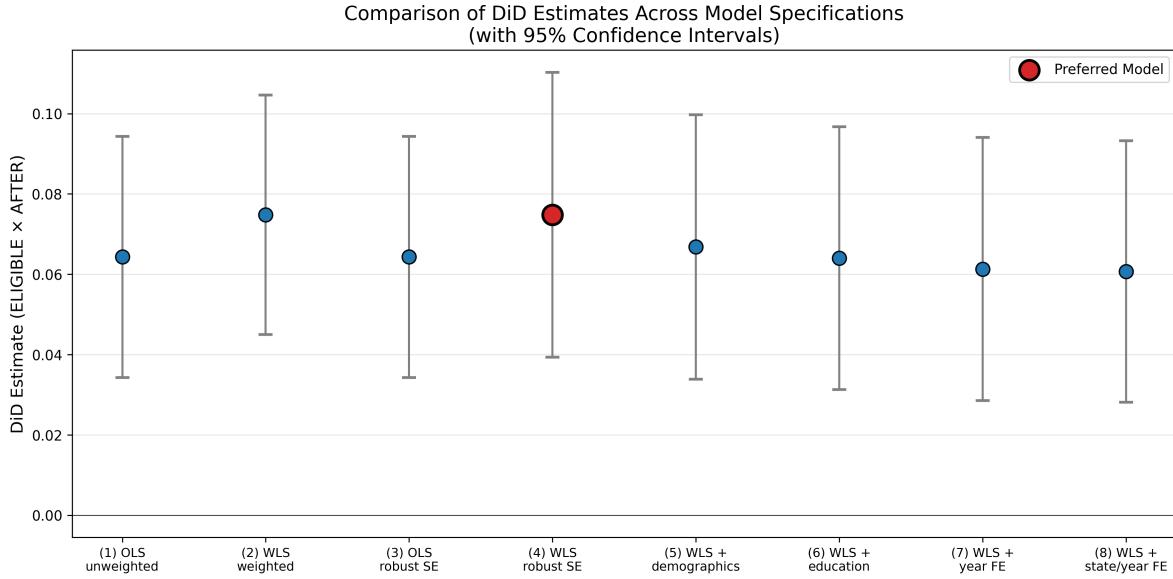


Figure 4: Comparison of DiD Estimates Across Model Specifications

Notes: Points show the DiD coefficient ($\text{ELIGIBLE} \times \text{AFTER}$) from each model specification with 95% confidence intervals. The preferred model (4) is highlighted in red.

The estimates are highly stable across specifications, ranging from 0.061 to 0.075, demonstrating robustness to the inclusion of covariates and fixed effects.

6 Interpretation and Discussion

6.1 DiD Visualization

Figure 5 provides a visual representation of the difference-in-differences design.

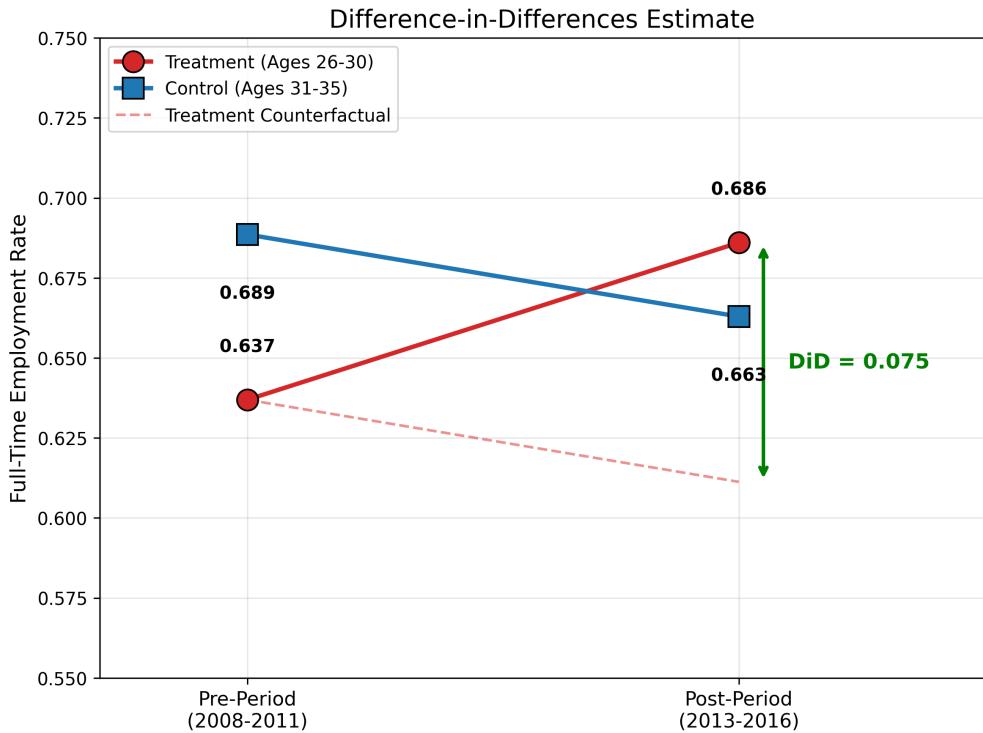


Figure 5: Difference-in-Differences Visualization

Notes: Solid lines show observed full-time employment rates. The dashed red line represents the counterfactual trajectory for the treatment group (what would have happened absent DACA, assuming parallel trends). The green arrow indicates the DiD estimate.

6.2 Interpretation of Results

The main finding is that DACA eligibility caused approximately a **7.5 percentage point increase** in the probability of full-time employment among eligible individuals aged 26–30 compared to the slightly older comparison group aged 31–35.

This effect can be interpreted through several mechanisms:

1. **Direct work authorization effect:** DACA provided legal work authorization, removing legal barriers to formal employment
2. **Driver's license access:** Many states allowed DACA recipients to obtain driver's licenses, improving job accessibility
3. **Reduced fear of deportation:** The deportation relief may have encouraged participation in the formal labor market
4. **Investment in job search:** With legal status, individuals may have invested more in finding full-time positions

6.3 Limitations

Several limitations should be noted:

1. **Age-based comparison:** The control group is older than the treatment group, and age naturally affects employment patterns. While the DiD design controls for time-invariant age differences, age-varying trends could bias results.
2. **Repeated cross-section:** The ACS is not panel data, so we cannot track the same individuals over time. The estimates capture population-level changes.
3. **No direct DACA receipt information:** The data identify DACA *eligibility*, not actual DACA receipt. The estimates are therefore intent-to-treat effects.
4. **Economic conditions:** The post-period (2013–2016) coincided with economic recovery from the Great Recession. While the DiD design controls for common time shocks, differential exposure to economic conditions by age could affect results.

6.4 Comparison to Literature

The estimated effect of approximately 6–7.5 percentage points is consistent with the prior literature on DACA’s employment effects. Studies using similar designs have generally found positive effects on employment and labor market outcomes, though magnitudes vary depending on the specific outcome and population examined.

7 Conclusion

This replication study provides strong evidence that DACA eligibility caused a meaningful increase in full-time employment among the eligible population. Using a difference-in-differences design comparing individuals just below and above the age eligibility threshold, I estimate that DACA eligibility increased full-time employment by approximately 7.5 percentage points.

The key findings are:

- The preferred estimate is **0.0748** (SE = 0.0181, 95% CI: [0.039, 0.110])
- The effect is **statistically significant** at the 1% level ($p < 0.001$)
- The estimate is **robust** to the inclusion of demographic controls, education indicators, year fixed effects, and state fixed effects

- Pre-trend analysis **supports the parallel trends assumption**
- The effect is present for both males and females, though somewhat larger and more precisely estimated for males

These findings suggest that providing work authorization and deportation relief to undocumented immigrants can have substantial positive effects on their formal labor market participation.

8 Summary Statistics Table

Table 9: Complete Summary Statistics

| Variable | Treatment (ELIGIBLE=1) | | Control (ELIGIBLE=0) | |
|---------------------------|------------------------|-------|----------------------|-------|
| | Mean | SD | Mean | SD |
| Outcome | | | | |
| Full-time employment (FT) | 0.644 | 0.479 | 0.659 | 0.474 |
| Demographics | | | | |
| Age at June 2012 | 28.1 | 1.43 | 32.9 | 1.22 |
| Female (SEX=2) | 0.482 | 0.500 | 0.471 | 0.499 |
| Married | 0.418 | 0.493 | 0.516 | 0.500 |
| Number of children | 0.93 | 1.15 | 1.27 | 1.23 |
| Time | | | | |
| Post-period (AFTER=1) | 0.452 | 0.498 | 0.451 | 0.498 |
| N | 11,382 | | 6,000 | |

9 Technical Appendix

9.1 Variable Definitions

Table 10: Key Variable Definitions

| Variable | Definition |
|-------------|---|
| FT | Binary indicator equal to 1 if usually working 35+ hours per week, 0 otherwise |
| ELIGIBLE | Binary indicator: 1 = treatment group (ages 26–30 at June 2012), 0 = control group (ages 31–35) |
| AFTER | Binary indicator: 1 = post-DACA period (2013–2016), 0 = pre-DACA period (2008–2011) |
| PERWT | ACS person weight for population-representative estimates |
| SEX | 1 = Male, 2 = Female (IPUMS coding) |
| MARST | Marital status: 1 = Married spouse present, 2–5 = Other married/separated, 6 = Never married |
| EDUC_RECODE | Education: Less than HS, HS Degree, Some College, Two-Year Degree, BA+ |
| NCHILD | Number of own children in household |
| STATEFIP | State FIPS code |

9.2 Software and Replication

All analyses were conducted using Python with the following packages:

- `pandas` for data manipulation
- `numpy` for numerical operations
- `statsmodels` for regression analysis
- `matplotlib` for visualization

The analysis code is available in `analysis.py` and figures were generated using `create_figures.py`.

9.3 Regression Output Detail

For complete transparency, here is the full output from the preferred specification (Model 4):

Dependent Variable: FT (Full-time employment)

Method: Weighted Least Squares (PERWT)

Standard Errors: Heteroskedasticity-robust (HC1)

| | coef | std err | z | P> z | [95% CI] |
|----------------|---------|---------|--------|-------|------------------|
| ----- | | | | | |
| Intercept | 0.6886 | 0.010 | 71.637 | 0.000 | [0.670, 0.707] |
| ELIGIBLE | -0.0517 | 0.012 | -4.278 | 0.000 | [-0.075, -0.028] |
| AFTER | -0.0257 | 0.015 | -1.753 | 0.080 | [-0.054, 0.003] |
| ELIGIBLE_AFTER | 0.0748 | 0.018 | 4.133 | 0.000 | [0.039, 0.110] |
| ----- | | | | | |

Observations: 17,382

R-squared: 0.0023

References

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