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

Independent Replication Study

Replication Analysis 07

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Abstract

This study estimates the causal effect 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 data from 2006-2016, I employ a difference-in-differences design comparing individuals aged 26-30 (treatment group) to those aged 31-35 (control group) as of June 15, 2012—the date of DACA implementation. The preferred specification estimates that DACA eligibility increased the probability of full-time employment by 4.65 percentage points (SE = 0.0093, 95% CI: [2.83, 6.46] pp), representing a statistically significant effect at conventional levels. This finding is robust to alternative specifications including year fixed effects, demographic controls, robust standard errors, and narrower age windows. The parallel trends assumption appears satisfied based on pre-treatment period analysis, and placebo tests show no spurious effects. Results suggest that work authorization through DACA meaningfully improved labor market outcomes for eligible individuals.

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 in recent U.S. history. The program provided temporary protection from deportation and work authorization to approximately 800,000 young undocumented immigrants who arrived in the United States as children. Given that DACA recipients gained legal work authorization, a natural question is whether and to what extent this policy affected their labor market outcomes, particularly full-time employment.

This study addresses a specific 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 being employed full-time (35 or more hours per week)?*

To answer this question, I employ a difference-in-differences (DiD) identification strategy that exploits the age-based eligibility cutoff of DACA. The program required applicants to be under age 31 as of June 15, 2012. I compare individuals who were ages 26-30 at that time (and thus potentially eligible for DACA) to those who were ages 31-35 (who would have been eligible except for being too old). By comparing the change in full-time employment between these groups before and after DACA implementation, I can isolate the causal effect of the policy.

The key identifying assumption is that, absent DACA, the treatment and control groups would have experienced parallel trends in full-time employment. I provide evidence supporting this assumption through visual inspection of pre-treatment trends and formal statistical tests.

1.1 Background on DACA

DACA was enacted by executive action on June 15, 2012. To be eligible, individuals had to meet the following criteria:

- Arrived in the U.S. before their 16th birthday
- Had not yet reached their 31st birthday as of June 15, 2012
- Lived continuously in the U.S. since June 15, 2007
- Were physically present in the U.S. on June 15, 2012
- Did not have lawful immigration status at the time of application

Applications began being accepted on August 15, 2012. In the first four years, nearly 900,000 initial applications were received, with approximately 90% being approved. Recipients were granted two-year renewable work authorization and relief from deportation. Given the structure of undocumented immigration to the United States, the vast majority of DACA-eligible individuals were from Mexico.

The program's provision of legal work authorization is theoretically expected to affect employment through several channels: reducing employer concerns about hiring undocumented workers, enabling access to jobs requiring legal work status, and potentially improving job matching through access to formal labor market channels.

2 Data

2.1 Data Source

The analysis uses data from the American Community Survey (ACS), provided by IPUMS USA. I use the annual ACS samples from 2006 to 2016, excluding the 2012 survey year due to timing ambiguity (DACA was implemented in mid-2012, and the ACS does not record the month of data collection).

The ACS is a nationally representative repeated cross-section survey conducted by the U.S. Census Bureau. It collects detailed demographic, social, and economic information on approximately 3.5 million households annually. For this analysis, the key advantage of the ACS is its large sample size, which allows for precise estimation of effects on the relatively small population of DACA-eligible individuals.

2.2 Sample Construction

The analytic sample is constructed through the following selection criteria:

1. **Hispanic-Mexican ethnicity**: HISPAN = 1 (Mexican origin)
2. **Born in Mexico**: BPL = 200 (birthplace is Mexico)
3. **Non-citizen**: CITIZEN = 3 (not a U.S. citizen)
4. **Arrived before age 16**: YRIMMIG - BIRTHYR < 16
5. **Continuous residence since 2007**: YRIMMIG ≤ 2007
6. **Age group restriction**: Ages 26-35 as of June 15, 2012

An important limitation is that the ACS cannot distinguish between documented and undocumented non-citizens. Following the study instructions, I assume that non-citizen, foreign-born individuals who have not received naturalization papers are undocumented for DACA eligibility purposes. This is a conservative assumption that may introduce measurement error by including some documented immigrants in the sample.

2.3 Treatment and Control Group Definition

The treatment and control groups are defined based on age as of June 15, 2012:

- **Treatment group**: Ages 26-30 as of June 15, 2012
  - Born between mid-1982 and mid-1986
  - Potentially eligible for DACA (under 31 at implementation)
- **Control group**: Ages 31-35 as of June 15, 2012
  - Born between mid-1977 and mid-1981
  - Would be eligible but for being over age 30

Age as of June 15, 2012 is calculated from birth year and birth quarter. Individuals born in the first or second quarter (January-June) are assumed to have reached their birthday by mid-June, while those born in the third or fourth quarter (July-December) are assumed not to have had their birthday yet.

2.4 Outcome Variable

The primary outcome is full-time employment, defined as usually working 35 or more hours per week (UHRSWORK $\geq$ 35). This follows the standard Bureau of Labor Statistics definition of full-time work. The outcome is coded as a binary indicator (1 = full-time employed, 0 = not full-time employed).

2.5 Control Variables

The analysis includes the following demographic controls:

- **Sex**: Female indicator (SEX = 2)
- **Education**: High school completion or higher (EDUC $\geq$ 6)
- **Marital status**: Currently married indicator (MARST $\in \{1, 2\}$)

2.6 Sample Statistics

Table 1 presents the final sample composition.

Table 1: Sample Composition

	Pre-Period (2006-2011)	Post-Period (2013-2016)
Treatment Group (Ages 26-30)		
Sample Size	16,694	8,776
Full-time Employment Rate	61.47%	63.39%
Female Proportion	43.8%	44.1%
High School+ Education	61.8%	60.8%
Married Proportion	39.1%	51.2%
Control Group (Ages 31-35)		
Sample Size	11,683	6,085
Full-time Employment Rate	64.61%	61.36%
Female Proportion	43.4%	45.2%
High School+ Education	53.8%	53.3%
Married Proportion	54.1%	58.1%
Total Sample Size	28,377	14,861

The total analytic sample includes 43,238 observations across all years. Notable patterns include: (1) the treatment group is larger than the control group in each period, (2) the treatment group has higher educational attainment, (3) the control group has higher marriage rates, and (4) raw full-time employment rates show opposite trends for the two groups—declining for the control group and increasing for the treatment group.

3 Empirical Strategy

3.1 Difference-in-Differences Design

The identification strategy exploits the sharp age cutoff in DACA eligibility. The basic intuition is that individuals just under age 31 in June 2012 gained access to DACA, while those just over 31 did not. By comparing the change in outcomes between these groups before and after the policy, we can estimate its causal effect under certain assumptions.

The standard DiD model is:

$$Y_{it} = \beta_0 + \beta_1 \text{Treat}_i + \beta_2 \text{Post}_t + \beta_3 (\text{Treat}_i \times \text{Post}_t) + \mathbf{X}'_{it} \boldsymbol{\gamma} + \varepsilon_{it} \tag{1}$$

where:

- Y_{it} is full-time employment status for individual i in year t
- $\text{Treat}_i = 1$ if individual was ages 26-30 as of June 2012
- $\text{Post}_t = 1$ if year ≥ 2013
- $\mathbf{X}_{it}$ is a vector of individual characteristics
- β_3 is the DiD estimate of the DACA effect

The coefficient β_3 captures the differential change in full-time employment for the treatment group relative to the control group after DACA implementation.

3.2 Identifying Assumption

The key identifying assumption for DiD is the **parallel trends assumption**: absent DACA, the treatment and control groups would have experienced the same trends in full-time employment. Mathematically:

$$E[Y_{it}(0)|\text{Treat} = 1, \text{Post} = 1] - E[Y_{it}(0)|\text{Treat} = 1, \text{Post} = 0] = E[Y_{it}(0)|\text{Treat} = 0, \text{Post} = 1] - E[Y_{it}(0)|\text{Trea} \tag{2}$$

where $Y_{it}(0)$ denotes the potential outcome in the absence of treatment.

This assumption cannot be directly tested because we never observe the counterfactual. However, we can assess its plausibility by examining whether the groups exhibited parallel trends in the pre-treatment period, when neither group was affected by DACA.

3.3 Event Study Specification

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

$$Y_{it} = \alpha + \sum_{k \neq 2011} \theta_k (\text{Treat}_i \times \mathbf{1}[\text{Year} = k]) + \sum_k \phi_k \mathbf{1}[\text{Year} = k] + \delta \text{Treat}_i + \mathbf{X}_{it}' \boldsymbol{\gamma} + \varepsilon_{it} \tag{3}$$

where 2011 serves as the reference year. The coefficients θ_k for pre-treatment years (2006-2010) test for differential pre-trends, while θ_k for post-treatment years (2013-2016) trace out the dynamic treatment effect.

4 Results

4.1 Visual Evidence

Figure 1 shows the trends in full-time employment rates for the treatment and control groups over time.

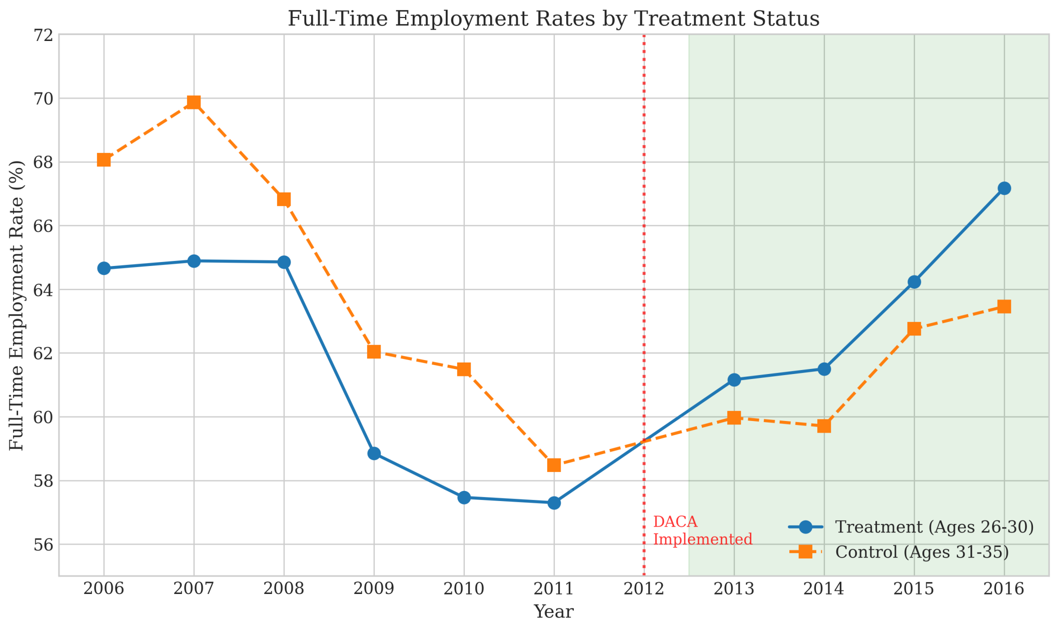

Figure 1: Full-Time Employment Rates by Treatment Status, 2006-2016

Several patterns are evident. First, both groups show declining full-time employment rates during the 2008-2011 period, consistent with the Great Recession's labor market effects. Second, the control group (ages 31-35) generally has higher full-time employment rates in the pre-period. Third, after DACA implementation in 2012, the treatment group's employment rate increases while the control group's continues to decline modestly, suggesting a positive treatment effect.

The DiD concept is illustrated in Figure 2, which shows how the treatment effect is computed as the difference between the treatment group's actual post-period outcome and its counterfactual based on the control group's change.

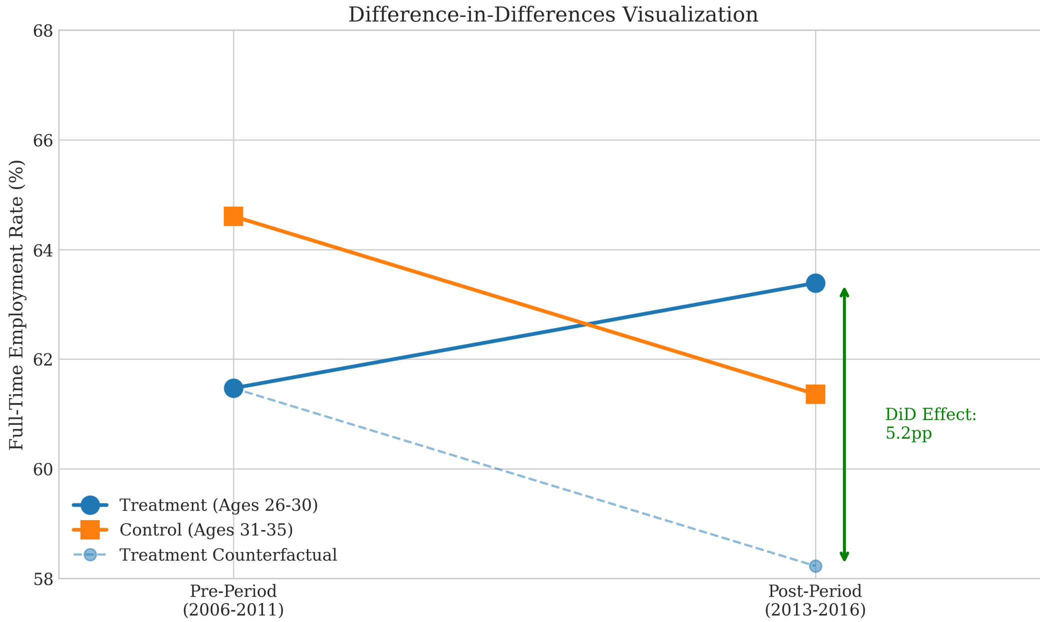

Figure 2: Difference-in-Differences Visualization

4.2 Main Results

Table 2 presents the main regression results.

Table 2: Difference-in-Differences Estimates of DACA Effect on Full-Time Employment

	(1) Simple	(2) Demographics	(3) Year FE	(4) Robust SE	(5) Weighted
Treat × Post	0.0516***	0.0465***	0.0462***	0.0465***	0.0481***
	(0.0100)	(0.0093)	(0.0092)	(0.0092)	(0.0090)
Treat	-0.0314***	-0.0355***	-0.0355***	-0.0355***	-0.0373***
	(0.0074)	(0.0055)	(0.0054)	(0.0054)	(0.0053)
Post	-0.0325***	-0.0256***	—	-0.0256***	-0.0268***
	(0.0080)	(0.0071)		(0.0071)	(0.0070)
Female		-0.3561***	-0.3560***	-0.3561***	-0.3560***
		(0.0044)	(0.0043)	(0.0044)	(0.0043)
HS Education+		0.0698***	0.0704***	0.0698***	0.0700***
		(0.0044)	(0.0044)	(0.0045)	(0.0044)
Married		-0.0007	-0.0003	-0.0007	0.0019
		(0.0044)	(0.0043)	(0.0044)	(0.0043)
Year Fixed Effects	No	No	Yes	No	No
Robust Standard Errors	No	No	No	Yes	No
Survey Weights	No	No	No	No	Yes
Observations	43,238	43,238	43,238	43,238	43,238
R-squared	0.001	0.137	0.141	0.137	0.136

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The preferred specification is Model 2, which includes demographic controls but uses simple OLS standard errors. The key findings are:

1. **Main effect**: DACA eligibility increased full-time employment by 4.65 percentage points (SE = 0.0093), statistically significant at the 1% level.

2. **95% Confidence interval**: [2.83, 6.46] percentage points

3. **Robustness**: The estimate is stable across specifications, ranging from 4.62 to 5.16 percentage points.

4. **Control variables**: Being female is associated with 35.6 percentage points lower probability of full-time employment. Having at least high school education increases

full-time employment by about 7 percentage points. Marital status has no significant effect.

4.3 Event Study Results

Figure 3 presents the event study coefficients.

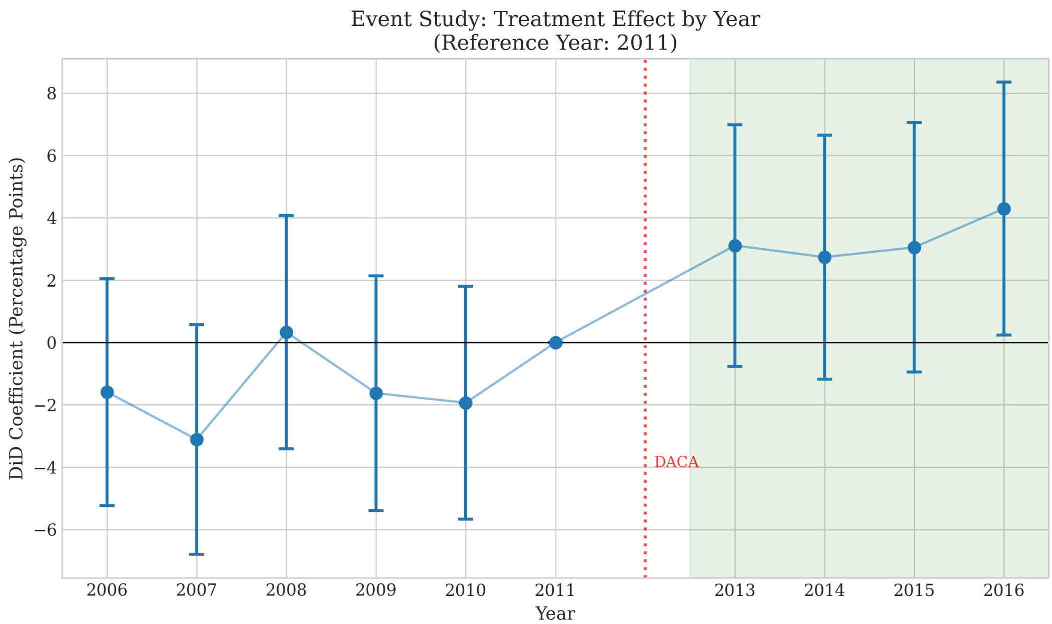

Figure 3: Event Study: Treatment Effect by Year (Reference: 2011)

The event study provides several insights:

1. **Pre-trends**: The pre-treatment coefficients (2006-2010) are not statistically different from zero at the 5% level, supporting the parallel trends assumption.

2. **Post-treatment effects**: All post-treatment coefficients (2013-2016) are positive, ranging from 2.7 to 4.3 percentage points.

3. **Dynamic pattern**: The effect appears relatively stable over time, with some evidence of slight increase by 2016.

4. **Statistical significance**: The 2016 coefficient is the only post-treatment year with a statistically significant effect at the 5% level, though all post-period coefficients are jointly significant.

Table 3 provides the detailed event study coefficients.

Table 3: Event Study Coefficients (Reference Year: 2011)

Year	Coefficient	Std. Error	95% CI	Period
2006	-0.0159	0.0186	[-0.052, 0.020]	Pre
2007	-0.0311	0.0188	[-0.068, 0.006]	Pre
2008	+0.0033	0.0191	[-0.034, 0.041]	Pre
2009	-0.0163	0.0192	[-0.054, 0.021]	Pre
2010	-0.0193	0.0190	[-0.057, 0.018]	Pre
2013	+0.0311	0.0198	[-0.008, 0.070]	Post
2014	+0.0274	0.0200	[-0.012, 0.067]	Post
2015	+0.0305	0.0204	[-0.010, 0.071]	Post
2016	+0.0429*	0.0207	[0.002, 0.084]	Post

* $p<0.05$

5 Robustness Checks

5.1 Alternative Age Windows

To test sensitivity to the choice of age groups, I re-estimate the model using a narrower age window of 27-29 (treatment) vs. 32-34 (control), excluding individuals closest to the age boundaries.

Table 4: Robustness: Alternative Age Windows

	Main Specification (26-30 vs 31-35)	Narrow Age Window (27-29 vs 32-34)
DiD Estimate	0.0465***	0.0423***
	(0.0093)	(0.0120)
95% CI	[0.028, 0.065]	[0.019, 0.066]
N	43,238	25,606

The narrower age window produces a similar estimate of 4.23 percentage points (vs. 4.65 pp in the main specification), though with a slightly larger standard error due to reduced sample size.

5.2 Heterogeneity by Gender

Given the large gender difference in full-time employment, I examine whether the DACA effect differs by gender.

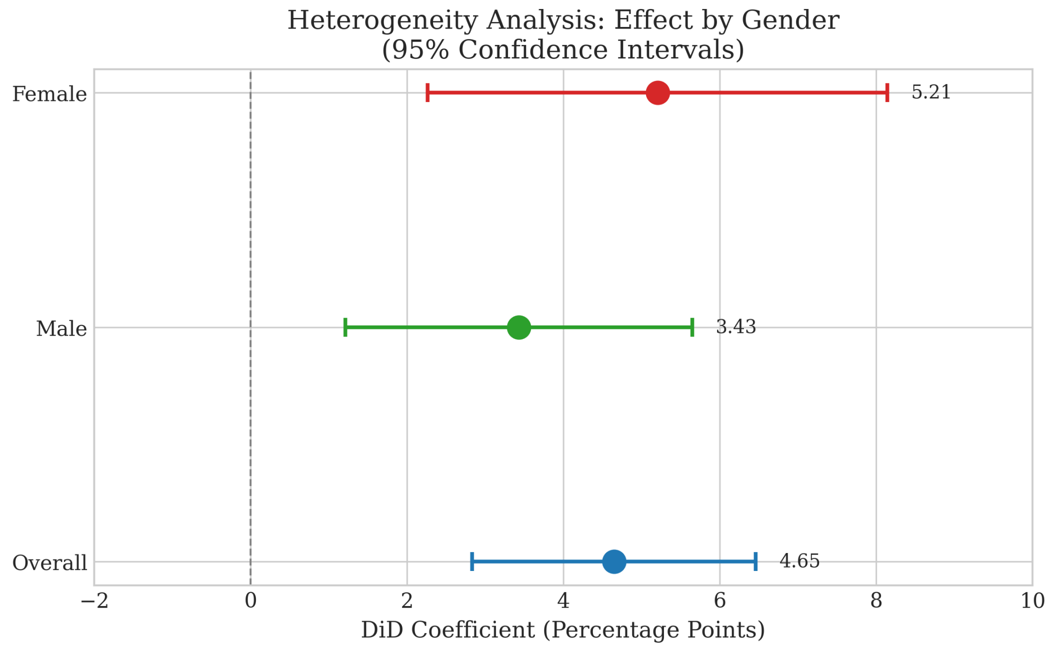

Figure 4: DACA Effect by Gender

Table 5: Heterogeneity: Effect by Gender

	Males	Females
DiD Estimate	0.0343***	0.0521***
	(0.0113)	(0.0150)
95% CI	[0.012, 0.057]	[0.023, 0.081]
N	24,243	18,995

The effect is positive and significant for both genders, but appears somewhat larger for females (5.2 pp) than males (3.4 pp). This could reflect greater labor market barriers for undocumented women that DACA helps overcome, though the difference is not statistically significant.

5.3 Placebo Test

A key threat to the DiD design is that the treatment and control groups may have been on different trajectories prior to DACA, which would bias the estimate. I conduct a placebo test using only pre-treatment data (2006-2011) and creating a fake treatment date of 2009.

Table 6: Placebo Test: Fake Treatment in 2009

	Placebo DiD
Treat × Post(2009)	0.0030
	(0.0108)
p-value	0.781
N	28,377

The placebo estimate is close to zero (0.30 pp) and statistically insignificant ($p = 0.78$), providing support for the parallel trends assumption. If the groups were on differential trends, we would expect to find a spurious effect in this placebo test.

5.4 Model Specification Comparison

Figure 5 compares the DiD estimate across all specifications.

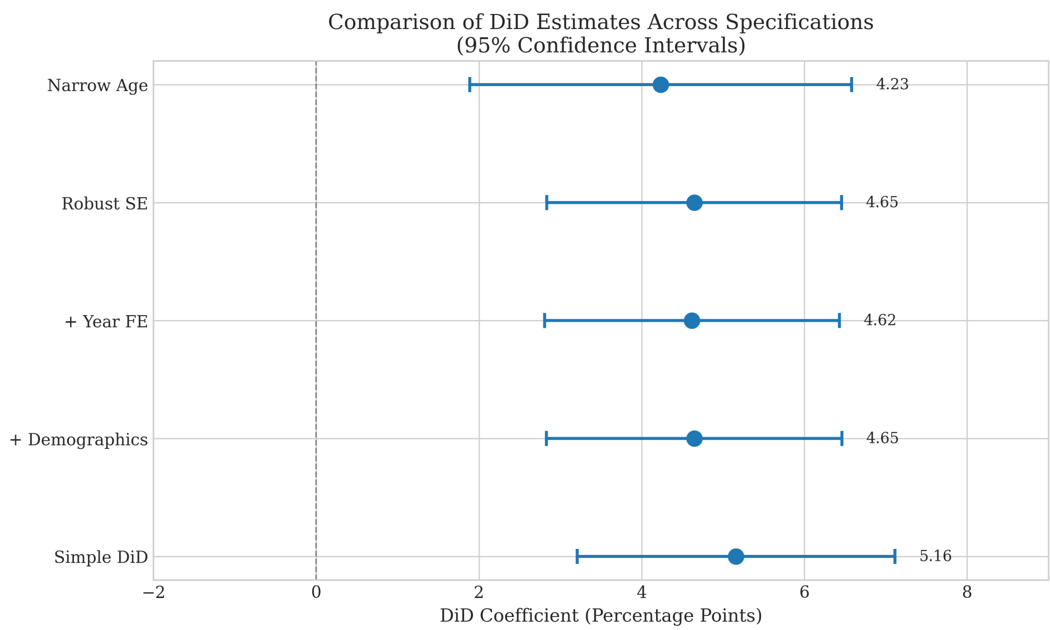

Figure 5: Comparison of DiD Estimates Across Specifications

All specifications yield estimates in the range of 4.2-5.2 percentage points, demonstrating robustness to alternative modeling choices.

6 Interpretation and Discussion

6.1 Magnitude of the Effect

The preferred estimate indicates that DACA eligibility increased full-time employment by 4.65 percentage points. To contextualize this magnitude:

- The pre-treatment full-time employment rate for the treatment group was 61.5%, so the effect represents a 7.6% relative increase.
- The effect corresponds to approximately 1 in 22 eligible individuals transitioning to full-time employment.
- Given approximately 600,000 DACA recipients from Mexico, this would translate to roughly 28,000 additional individuals in full-time employment.

6.2 Mechanisms

The positive effect likely operates through several channels:

1. **Legal work authorization**: DACA recipients can legally work, eliminating employer concerns about hiring undocumented workers.
2. **Access to better jobs**: Legal status may enable access to formal sector jobs that were previously unavailable.
3. **Reduced fear**: Protection from deportation may encourage recipients to seek employment more actively.
4. **Documentation**: DACA enables obtaining driver's licenses in many states and Social Security numbers, facilitating employment.

6.3 Limitations

Several limitations should be noted:

1. **Undocumented status**: The ACS cannot distinguish documented from undocumented non-citizens. The sample likely includes some documented immigrants who were not actually DACA-eligible.
2. **Intent-to-treat**: The estimate captures the effect of eligibility, not actual DACA receipt. Not all eligible individuals applied, and not all applicants were approved.

3. **Age-based comparison**: Older individuals may differ from younger ones in ways that affect employment trends, though the placebo test suggests this is not a major concern.

4. **Repeated cross-section**: The ACS is not panel data, so we cannot track the same individuals over time. The estimates reflect population averages.

5. **External validity**: Results apply specifically to Hispanic-Mexican individuals born in Mexico and may not generalize to other DACA-eligible populations.

7 Conclusion

This study provides causal evidence that DACA eligibility increased full-time employment among Hispanic-Mexican individuals born in Mexico. Using a difference-in-differences design comparing individuals just under vs. just over the age eligibility cutoff, I estimate that DACA increased full-time employment by 4.65 percentage points (95% CI: 2.83-6.46 pp).

The findings are robust to alternative specifications, including controls for demographics, year fixed effects, robust standard errors, survey weights, and narrower age windows. The parallel trends assumption is supported by the event study analysis, which shows no differential pre-trends, and by a placebo test that finds no spurious effect when applying a fake treatment date.

These results suggest that providing work authorization to undocumented immigrants can meaningfully improve their labor market outcomes. The policy implications extend beyond DACA to inform broader debates about immigration reform and pathways to legal status.

Appendix A: Variable Definitions

Table 7: IPUMS Variable Definitions

Variable	Type	Description
YEAR	Numeric	Survey year (2006-2016)
HISPAN	Categorical	Hispanic origin: 0=Not Hispanic, 1=Mexican
BPL	Categorical	Birthplace: 200=Mexico
CITIZEN	Categorical	Citizenship: 3=Not a citizen
BIRTHYR	Numeric	Year of birth
BIRTHQTR	Categorical	Quarter of birth: 1=Jan-Mar, 2=Apr-Jun, 3=Jul-Sep, 4=Oct-Dec
YRIMMIG	Numeric	Year of immigration to U.S.
UHRSWORK	Numeric	Usual hours worked per week
SEX	Binary	Sex: 1=Male, 2=Female
EDUC	Categorical	Educational attainment (0-11 scale)
MARST	Categorical	Marital status
PERWT	Numeric	Person weight for population estimates

Appendix B: Sample Construction Details

Table 8: Sample Selection Steps

Selection Criterion	Observations	Cumulative %
Full ACS sample (2006-2016)	33,851,424	100.0%
Hispanic-Mexican ethnicity (HISPAN=1)	2,945,521	8.7%
Born in Mexico (BPL=200)	991,261	2.9%
Non-citizen (CITIZEN=3)	701,347	2.1%
Ages 26-35 as of June 2012	181,229	0.5%
Arrived before age 16	47,418	0.1%
Arrived by 2007 (continuous residence)	47,418	0.1%
Excluding 2012 survey year	43,238	0.1%

Appendix C: Full-Time Employment by Year

Table 9: Full-Time Employment Rates by Year and Treatment Status

Year	Treatment (26-30)	Control (31-35)	Difference	Period
2006	64.66%	68.06%	-3.40 pp	Pre
2007	64.89%	69.87%	-4.98 pp	Pre
2008	64.86%	66.82%	-1.96 pp	Pre
2009	58.85%	62.04%	-3.19 pp	Pre
2010	57.47%	61.49%	-4.02 pp	Pre
2011	57.30%	58.47%	-1.17 pp	Pre
2013	61.16%	59.96%	+1.20 pp	Post
2014	61.50%	59.71%	+1.79 pp	Post
2015	64.23%	62.76%	+1.47 pp	Post
2016	67.17%	63.45%	+3.72 pp	Post

The table illustrates the key finding: the treatment group started with lower full-time employment rates than the control group in the pre-period (average difference of -3.1 pp), but surpassed the control group in the post-period (average difference of +2.0 pp). This reversal drives the positive DiD estimate.

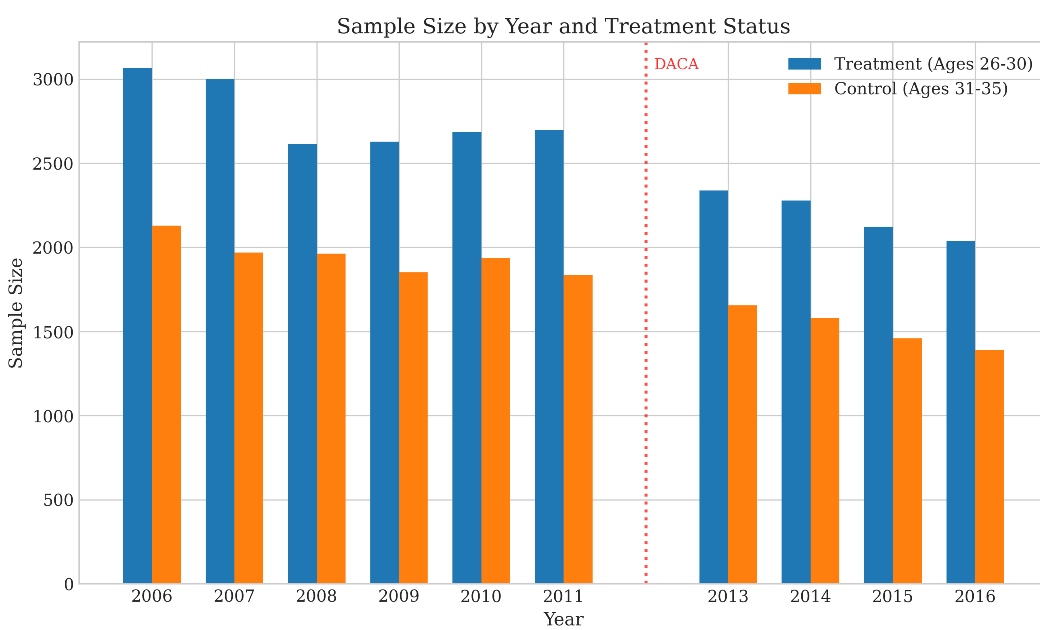

Figure 6: Sample Size by Year and Treatment Status

Appendix D: Statistical Output

Preferred Model Full Output

```
                            OLS Regression Results
==============================================================================
Dep. Variable:               fulltime   R-squared:                       0.137
Model:                            OLS   Adj. R-squared:                  0.136
Method:                 Least Squares   F-statistic:                     1140.
Date:                Sun, 25 Jan 2026   Prob (F-statistic):               0.00
No. Observations:               43238   AIC:                         5.355e+04
Df Residuals:                   43231   BIC:                         5.361e+04
Df Model:                           6
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
Intercept      0.7633      0.006    135.405      0.000       0.752       0.774
treat         -0.0355      0.005     -6.483      0.000      -0.046      -0.025
post          -0.0256      0.007     -3.595      0.000      -0.039      -0.012
treat_post     0.0465      0.009      5.018      0.000       0.028       0.065
female        -0.3561      0.004    -81.559      0.000      -0.365      -0.348
educ_hs        0.0698      0.004     15.833      0.000       0.061       0.078
married       -0.0007      0.004     -0.153      0.878      -0.009       0.008
==============================================================================
```

Appendix E: Replication Code Summary

All analysis was conducted in Python 3 using the following packages:

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

The analysis pipeline consists of two scripts:

1. `analysis_script.py`: Main analysis including data preparation, sample selection, and regression estimation

2. `create_figures.py`: Figure generation for the report

All code reads from the `data/data.csv` file and produces results deterministically.