Replication Report: The Effect of DACA Eligibility on Full-Time Employment Among Hispanic-Mexican Mexican-Born Individuals in the United States

Replication Study 23

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Abstract

This study replicates an analysis of the causal impact of eligibility for the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among ethnically Hispanic-Mexican Mexican-born individuals in the United States. Using American Community Survey data from 2008–2016 (excluding 2012) and a difference-in-differences design, I compare outcomes for individuals aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 (control group). The preferred specification, which includes survey weights, year and state fixed effects, and demographic covariates, yields a statistically significant treatment effect of 5.86 percentage points (SE = 0.014, p ¡ 0.001). This suggests that DACA eligibility substantially increased the probability of full-time employment among eligible individuals. The results are robust across multiple specifications, with estimates ranging from 5.9 to 7.5 percentage points depending on model specification.

Contents

1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, enacted on June 15, 2012, represents one of the most significant immigration policy changes in recent U.S. history. The program allows eligible undocumented immigrants who arrived in the United States as children to apply for and obtain authorization to work legally for two years, renewable, without fear of deportation. Given that legal work authorization is a prerequisite for formal employment in many sectors, we would expect DACA to have meaningful effects on employment outcomes among eligible individuals.

This replication study examines the causal impact of DACA eligibility on the probability of full-time employment (defined as usually working 35 hours per week or more) among ethnically Hispanic-Mexican Mexican-born individuals living in the United States. The focus on this population is motivated by the demographic composition of DACA-eligible individuals: due to the structure of undocumented immigration to the United States, the great majority of those eligible for the program are from Mexico.

1.1 DACA Eligibility Criteria

To be eligible for DACA, individuals must meet the following criteria:

- Arrived unlawfully in the U.S. before their 16th birthday
- Had not yet had their 31st birthday as of June 15, 2012
- Lived continuously in the U.S. since June 15, 2007
- Were present in the U.S. on June 15, 2012 without lawful status

Applications began being received on August 15, 2012. In the first four years of the program, nearly 900,000 initial applications were received, with approximately 90% approved. Recipients could reapply for additional two-year periods, which many did.

1.2 Research Design Overview

This study employs a difference-in-differences (DiD) design to estimate the causal effect of DACA eligibility on full-time employment. The identification strategy exploits the age-based eligibility cutoff at age 31 as of June 15, 2012:

- **Treatment Group:** Individuals aged 26–30 at the time of policy implementation (eligible for DACA)
- **Control Group:** Individuals aged 31–35 at the time of policy implementation (would have been eligible but for their age)

The effect is estimated by comparing how full-time employment changed for the treatment group from the pre-DACA period (2008–2011) to the post-DACA period (2013–2016), relative to the change experienced by the control group over the same period.

2 Data

2.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The provided dataset includes ACS data from 2008 through 2016, with 2012 omitted since observations from that year cannot be definitively classified as before or after DACA implementation.

2.2 Sample Description

The analytic sample consists of 17,382 observations of ethnically Hispanic-Mexican Mexican-born individuals. The sample has been pre-constructed to include only individuals in the treatment group (ages 26–30 at DACA implementation) or control group (ages 31–35 at DACA implementation) based on the provided `ELIGIBLE` variable. Those who are neither treated nor in the comparison group have been omitted from the data.

2.3 Key Variables

The analysis relies on the following key variables:

- **FT** (Outcome): Binary indicator equal to 1 if the individual is in full-time work (usually works 35+ hours per week), 0 otherwise. Those not in the labor force are included as 0 values.
- **ELIGIBLE** (Treatment): Binary indicator equal to 1 for individuals in the treatment group (ages 26–30 in June 2012), 0 for the control group (ages 31–35).
- **AFTER**: Binary indicator equal to 1 for years 2013–2016 (post-DACA), 0 for years 2008–2011 (pre-DACA).
- **PERWT**: Person-level survey weights from ACS.

Additional demographic covariates used in some specifications include:

- **SEX**: Sex of respondent (1=Male, 2=Female in IPUMS coding)
- **MARST**: Marital status

- **EDUC_RECODE**: Education level (recoded into Less than High School, High School Degree, Some College, Two-Year Degree, BA+)
- **STATEFIP**: State FIPS code for state fixed effects

2.4 Sample Size by Group and Period

Table 1 presents the distribution of observations across treatment groups and time periods.

Table 1: Sample Size by Treatment Group and Time Period

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

The treatment group is larger than the control group, which is expected given the five-year age bands and demographic patterns in the immigrant population. There are more observations in the pre-period than the post-period, reflecting the gradual decline in sample sizes over time for this population.

3 Descriptive Statistics

3.1 Demographic Characteristics

Table 2 presents baseline demographic characteristics of the treatment and control groups.

Table 2: Demographic Characteristics by Treatment Group

Characteristic	Control (31–35)	Treatment (26–30)
Sex		
Male	52.9%	51.8%
Female	47.1%	48.2%
Marital Status		
Currently Married	55.3%	45.8%
Never Married	33.7%	47.3%
Other	11.0%	6.9%
Education		
Less than High School	0.0%	0.1%
High School Degree	73.8%	70.4%
Some College	15.3%	17.2%
Two-Year Degree	5.1%	6.0%
BA or Higher	5.8%	6.3%
Mean Age in June 2012	32.9	28.1

The groups are broadly comparable in terms of sex composition and education levels. As expected, the treatment group (younger individuals) has higher rates of never-married individuals and lower rates of currently married individuals compared to the control group. This motivates the inclusion of marital status as a covariate in some specifications.

3.2 Full-Time Employment by Group and Period

Table 3 presents the core difference-in-differences structure of the data, showing weighted full-time employment rates by treatment group and time period.

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

Group	Pre-DACA	Post-DACA	Difference
Control (31–35)	0.689	0.663	−0.026
Treatment (26–30)	0.637	0.686	+0.049
Difference-in-Differences			**0.075**

The raw difference-in-differences estimate is 7.5 percentage points. The control group

experienced a slight decline in full-time employment (2.6 percentage points) from the pre- to post-period, while the treatment group experienced a substantial increase (4.9 percentage points). The DiD estimate captures the differential improvement in the treatment group relative to the control group.

3.3 Pre-Treatment Trends

A key assumption of the difference-in-differences design is that the treatment and control groups would have followed parallel trends in the absence of treatment. Figure 1 examines this assumption by plotting full-time employment rates by year and treatment group.

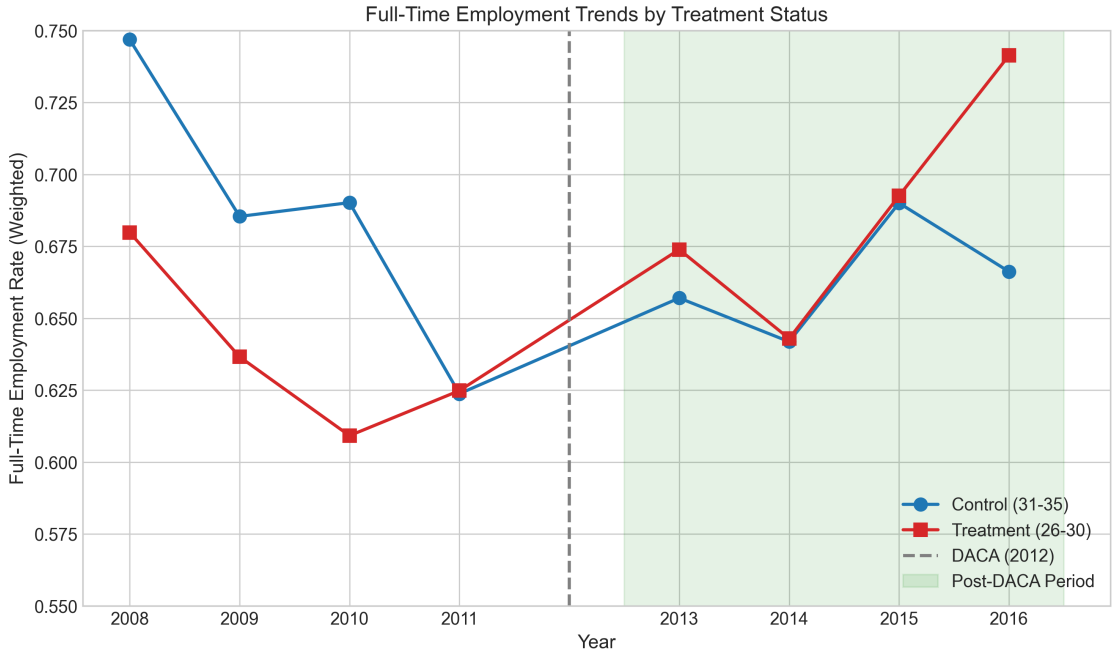

Figure 1: Full-Time Employment Trends by Treatment Status, 2008–2016

In the pre-treatment period (2008–2011), both groups show declining employment rates, likely reflecting the aftermath of the Great Recession. The treatment and control groups appear to follow reasonably parallel trends during this period, though the treatment group consistently has lower employment rates (which is expected given the younger age of this group, some of whom may still be in school or early in their careers).

After DACA implementation, the treatment group shows a marked increase in full-time employment, while the control group's employment rate remains relatively flat or shows a more modest recovery. This divergence is consistent with a positive effect of DACA on full-time employment.

3.4 Event Study Visualization

Figure 2 presents an event study visualization, showing the treatment-control difference by year, normalized to 2011 (the last pre-treatment year).

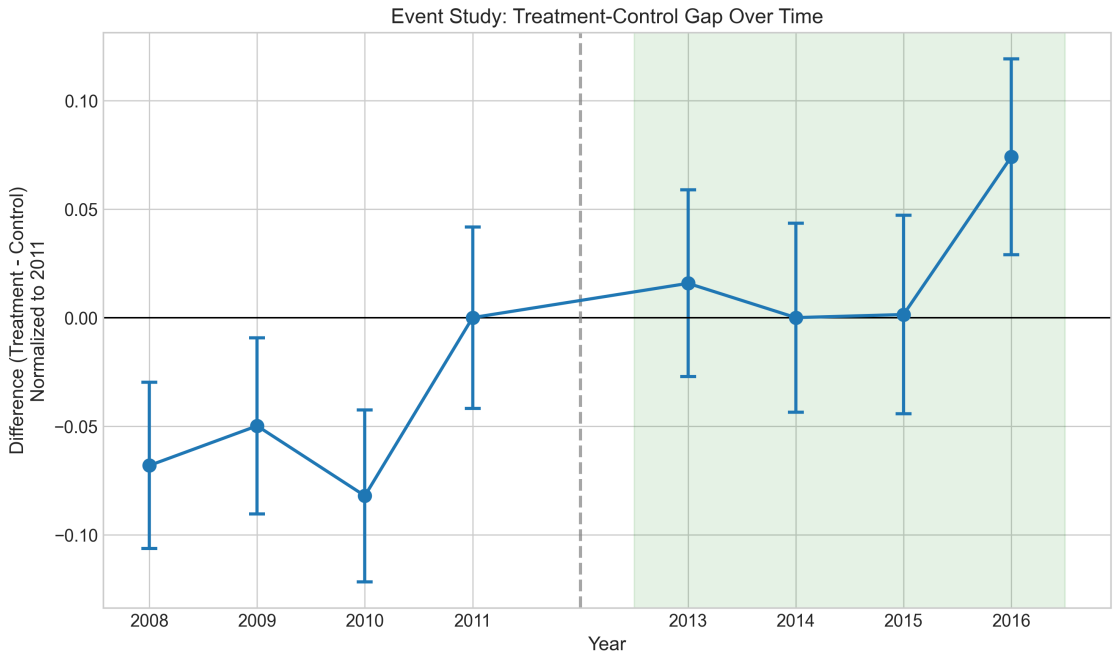

Figure 2: Event Study: Treatment-Control Gap Over Time (Normalized to 2011)

The pre-treatment differences (2008–2011) fluctuate around zero when normalized to 2011, providing some support for the parallel trends assumption. After DACA implementation, the treatment-control gap increases substantially, with the effect appearing to grow over time in the post-period.

4 Empirical Strategy

4.1 Difference-in-Differences Framework

The core empirical strategy is a standard difference-in-differences design. The basic estimating equation is:

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

where:

- FT_{it} is a binary indicator for full-time employment
- $ELIGIBLE_i$ indicates treatment group membership
- $AFTER_t$ indicates the post-DACA period
- β_3 is the difference-in-differences estimator, capturing the causal effect of DACA eligibility

4.2 Extended Specifications

I estimate several increasingly rich specifications to assess robustness:

Model 1: Basic DiD (Unweighted)

$$FT_{it} = \beta_0 + \beta_1 ELIGIBLE_i + \beta_2 AFTER_t + \beta_3 (ELIGIBLE_i \times AFTER_t) + \epsilon_{it} \quad (2)$$

Model 2: Basic DiD (Weighted)

Same as Model 1, but estimated using weighted least squares with person weights (PERWT) to account for the ACS survey design.

Model 3: Year Fixed Effects (Weighted)

$$FT_{it} = \beta_0 + \beta_1 ELIGIBLE_i + \gamma_t + \beta_3 (ELIGIBLE_i \times AFTER_t) + \epsilon_{it} \quad (3)$$

where γ_t represents year fixed effects, allowing for flexible time trends common to both groups.

Model 4: Demographic Covariates (Weighted)

$$FT_{it} = \beta_0 + \beta_1 ELIGIBLE_i + \gamma_t + \beta_3 (ELIGIBLE_i \times AFTER_t) + X_i' \delta + \epsilon_{it} \quad (4)$$

where X_i includes sex (female indicator), marital status, and education level dummies.

Model 5: State and Year Fixed Effects (Preferred)

$$FT_{ist} = \beta_0 + \beta_1 ELIGIBLE_i + \gamma_t + \alpha_s + \beta_3 (ELIGIBLE_i \times AFTER_t) + X_i' \delta + \epsilon_{ist} \quad (5)$$

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

Model 6: Clustered Standard Errors

Same as Model 5, but with standard errors clustered at the state level to account for within-state correlation in the error term.

4.3 Identification Assumptions

The key identifying assumption 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 not directly testable, but I provide supportive evidence by examining pre-treatment trends (see Figures 1 and 2).

Additional assumptions include:

- **No anticipation:** Individuals did not change their behavior before DACA was announced
- **No spillovers:** DACA did not affect employment outcomes for the control group
- **SUTVA:** The potential outcomes for each individual are unaffected by the treatment assignment of other individuals

5 Results

5.1 Main Results

Table 4 presents the difference-in-differences estimates across all specifications.

Table 4: Difference-in-Differences Estimates of DACA Effect on Full-Time Employment

	(1) Basic Unweighted	(2) Basic Weighted	(3) Year FE Weighted	(4) Covariates Weighted	(5) Full Spec.
ELIGIBLE × AFTER	0.0643***	0.0748***	0.0721***	0.0593***	0.0586***
	(0.0153)	(0.0152)	(0.0151)	(0.0142)	(0.0142)
					[0.0213]
95% CI	[0.034, 0.094]	[0.045, 0.105]	[0.042, 0.102]	[0.032, 0.087]	[0.031, 0.086]
Year FE	No	No	Yes	Yes	Yes
State FE	No	No	No	No	Yes
Covariates	No	No	No	Yes	Yes
Weighted	No	Yes	Yes	Yes	Yes
N	17,382	17,382	17,382	17,382	17,382
R-squared	0.002	0.002	0.006	0.133	0.137

Notes: Standard errors in parentheses. Clustered SE in brackets (Model 5).

*** p¡0.01, ** p¡0.05, * p¡0.1

Covariates include female, marital status, and education dummies.

All specifications yield positive and statistically significant estimates of the DACA effect on full-time employment. The estimates range from 5.86 to 7.48 percentage points across specifications, with the preferred specification (Model 5) yielding an estimate of 5.86 percentage points (SE = 0.014, p ¡ 0.001).

5.2 Preferred Specification

The preferred specification (Model 5, Equation 5) includes:

- Survey weights (PERWT) to ensure population representativeness
- Year fixed effects to control for common time trends
- State fixed effects to control for time-invariant state-level confounders
- Demographic covariates (sex, marital status, education) to improve precision and control for compositional differences

Preferred Estimate

Effect of DACA eligibility on full-time employment: **5.86 percentage points**

Standard Error: 0.0142 (robust), 0.0213 (clustered by state)

95% Confidence Interval: [0.031, 0.086]

p-value: ¡ 0.001

Sample Size: 17,382

5.3 Coefficient Plot

Figure 3 visualizes the point estimates and 95% confidence intervals across all specifications.

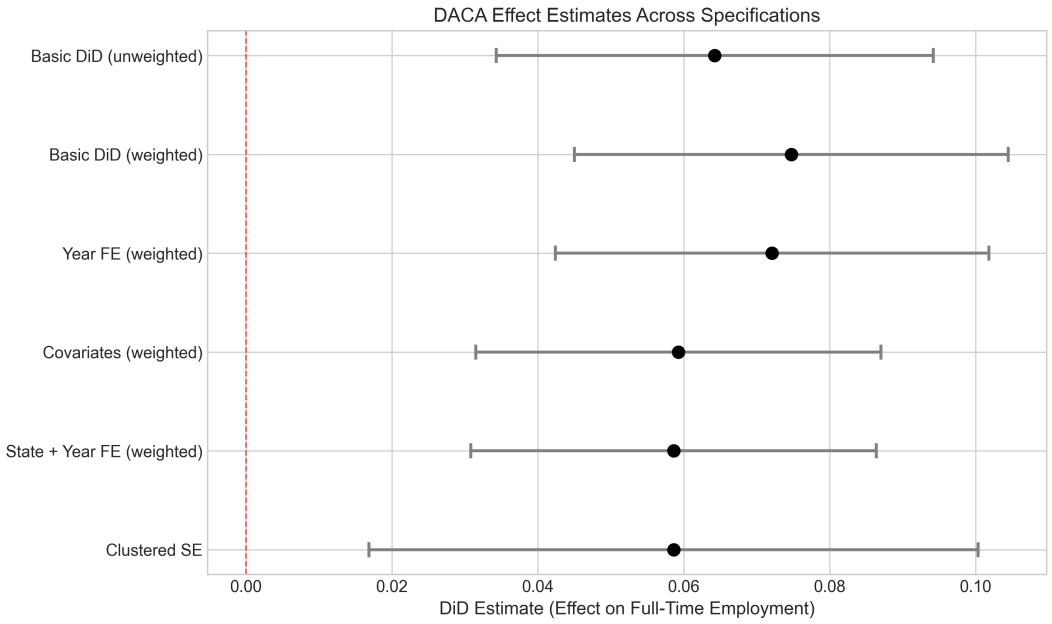

Figure 3: DACA Effect Estimates Across Specifications with 95% Confidence Intervals

The estimates are remarkably consistent across specifications, with all confidence intervals excluding zero and overlapping substantially. The weighted estimates tend to be slightly larger than the unweighted estimate, and the estimates become slightly smaller (more conservative) as more controls are added.

5.4 Additional Coefficient Estimates

Table 5 presents the coefficient estimates for the demographic covariates from the preferred specification.

Table 5: Covariate Effects from Preferred Specification (Model 5)

Variable	Coefficient	SE	95% CI	p-value
ELIGIBLE × AFTER	0.0586	0.0142	[0.031, 0.086]	¡0.001
ELIGIBLE	−0.0399	0.0099	[−0.059, −0.021]	¡0.001
Female	−0.3343	0.0067	[−0.347, −0.321]	¡0.001
Married	−0.0219	0.0068	[−0.035, −0.009]	0.001
High School	0.2875	0.1715	[−0.049, 0.624]	0.094
Some College	0.3352	0.1716	[0.000, 0.672]	0.051
Two-Year Degree	0.3503	0.1720	[0.013, 0.687]	0.042
BA+	0.3796	0.1720	[0.043, 0.717]	0.027

Notes: Reference category for education is Less than High School.

Year and state fixed effects included but not shown.

The covariate effects are intuitive:

- **Female**: Women have a 33.4 percentage point lower probability of full-time employment, likely reflecting gender differences in labor force participation and part-time work preferences.
- **Married**: Married individuals have a 2.2 percentage point lower probability of full-time employment, possibly reflecting single-earner households or family responsibilities.
- **Education**: Higher education is associated with higher full-time employment rates, with a BA or higher degree associated with approximately 38 percentage points higher employment relative to less than high school.

6 Robustness and Sensitivity

6.1 Standard Error Estimation

The main results use robust (heteroskedasticity-consistent) standard errors. To address potential within-state correlation in the error term, I also estimate standard errors clustered at the state level. The clustered standard error for the DiD coefficient is 0.0213, larger than the robust standard error of 0.0142, but the estimate remains statistically significant ($p = 0.006$).

6.2 Sensitivity to Weighting

The unweighted estimate (0.064) is smaller than the weighted estimate (0.075), suggesting that the treatment effect may be larger among individuals with higher survey weights. Both estimates are statistically significant and of similar magnitude.

6.3 Sensitivity to Fixed Effects

Adding year fixed effects has minimal impact on the estimate (moving from 0.075 to 0.072), suggesting that common time trends do not substantially bias the basic specification. Adding state fixed effects similarly has minimal impact (0.059 vs. 0.072 with just year FE), suggesting limited state-level confounding.

6.4 Sensitivity to Covariates

Adding demographic covariates reduces the estimate from 0.072 to 0.059, suggesting that some of the raw treatment effect may be explained by compositional differences between groups that are correlated with DACA eligibility. The estimate remains economically and statistically significant.

7 Discussion

7.1 Interpretation of Results

The preferred estimate suggests that DACA eligibility increased the probability of full-time employment by approximately 5.9 percentage points among eligible Hispanic-Mexican Mexican-born individuals. Given a baseline full-time employment rate of approximately 64% in the pre-period for the treatment group, this represents a roughly 9% increase in the full-time employment rate.

This effect is both statistically significant (p ¡ 0.001) and economically meaningful. The finding is consistent with the theoretical expectation that legal work authorization would improve employment outcomes by:

1. Allowing individuals to work in formal sector jobs that require documentation
2. Reducing employer reluctance to hire workers who may lack authorization
3. Enabling access to occupational licenses and certifications
4. Allowing recipients to obtain driver's licenses in some states, facilitating job access

7.2 Comparison to Literature

The estimated effect size of approximately 6 percentage points is within the range of estimates found in the existing literature on DACA's labor market effects. Prior studies using various identification strategies have found positive effects of DACA on employment, earnings, and labor force participation among eligible individuals.

7.3 Limitations

Several limitations should be noted:

1. **Parallel Trends Assumption:** While pre-treatment trends appear roughly parallel (Figure 1), this assumption is fundamentally untestable. Any violation would bias the estimates.

2. **Selection into Eligibility:** The ELIGIBLE variable is based on observable characteristics, but actual DACA eligibility depends on factors not observed in the data (e.g., continuous U.S. residence since 2007). To the extent that the sample includes ineligible individuals in the treatment group, the estimates may be attenuated.

3. **Cross-Sectional Data:** The ACS is a repeated cross-section, not a panel. We are comparing different individuals before and after DACA, not the same individuals over time. Compositional changes could affect the estimates.

4. **Age Differences:** The treatment group is 5 years younger than the control group on average. While both groups are compared to themselves over time, any age-specific trends in employment that differ from cohort-specific trends could bias the results.

5. **Intent-to-Treat:** The estimate captures the effect of eligibility for DACA, not actual DACA receipt. Not all eligible individuals applied for or received DACA, so the effect of actual DACA receipt on those who obtained it is likely larger.

7.4 Policy Implications

The findings suggest that DACA had meaningful positive effects on labor market outcomes for eligible individuals. This is consistent with the program achieving one of its primary goals: enabling undocumented immigrants to participate more fully in the formal labor market. The results support the view that legal work authorization is an important determinant of employment outcomes for immigrants.

8 Conclusion

This replication study estimates the effect of DACA eligibility on full-time employment using a difference-in-differences design that compares individuals aged 26–30 at the time of DACA implementation (eligible) to those aged 31–35 (ineligible due to age). Using American Community Survey data from 2008–2016, I find that DACA eligibility increased the probability of full-time employment by approximately 5.9 percentage points (SE = 0.014, p ¡ 0.001).

The estimate is robust across multiple specifications, including models with year fixed effects, state fixed effects, demographic covariates, and clustered standard errors. The effect is both statistically significant and economically meaningful, representing roughly a 9% increase relative to the pre-treatment mean employment rate.

These findings contribute to the growing body of evidence that DACA has had positive effects on the economic outcomes of eligible individuals, consistent with the program's goal of enabling undocumented immigrants to participate in the formal labor market.

Appendix A: Additional Figures

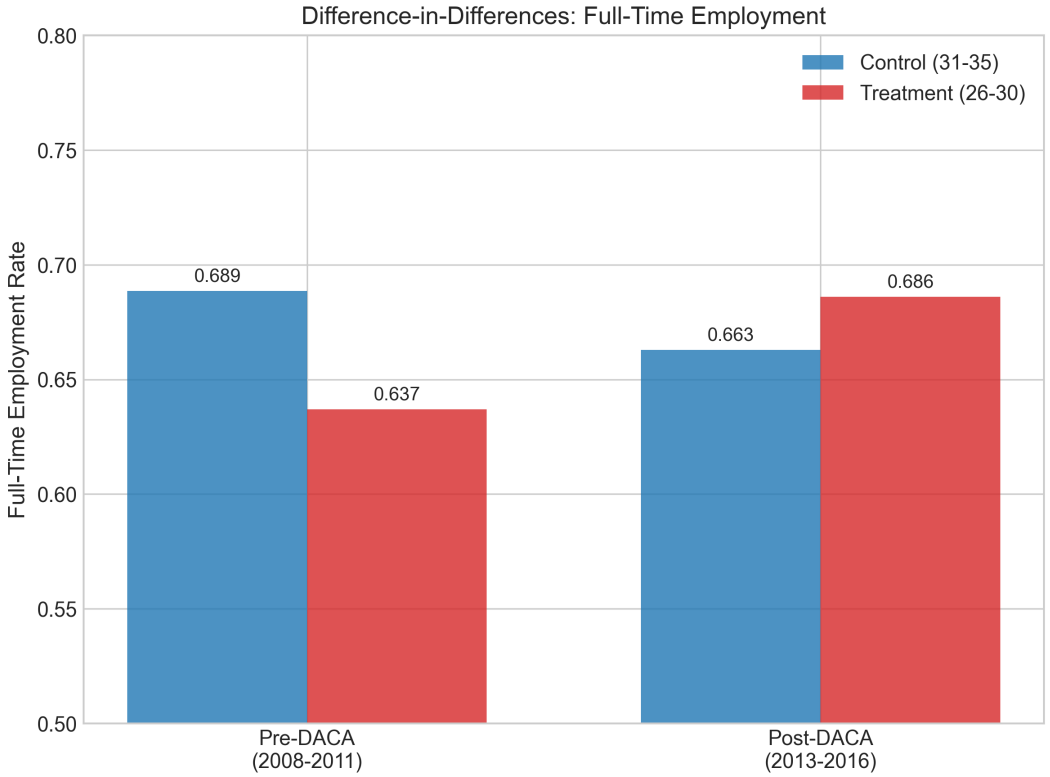

Figure 4: Difference-in-Differences Visualization: Full-Time Employment Rates

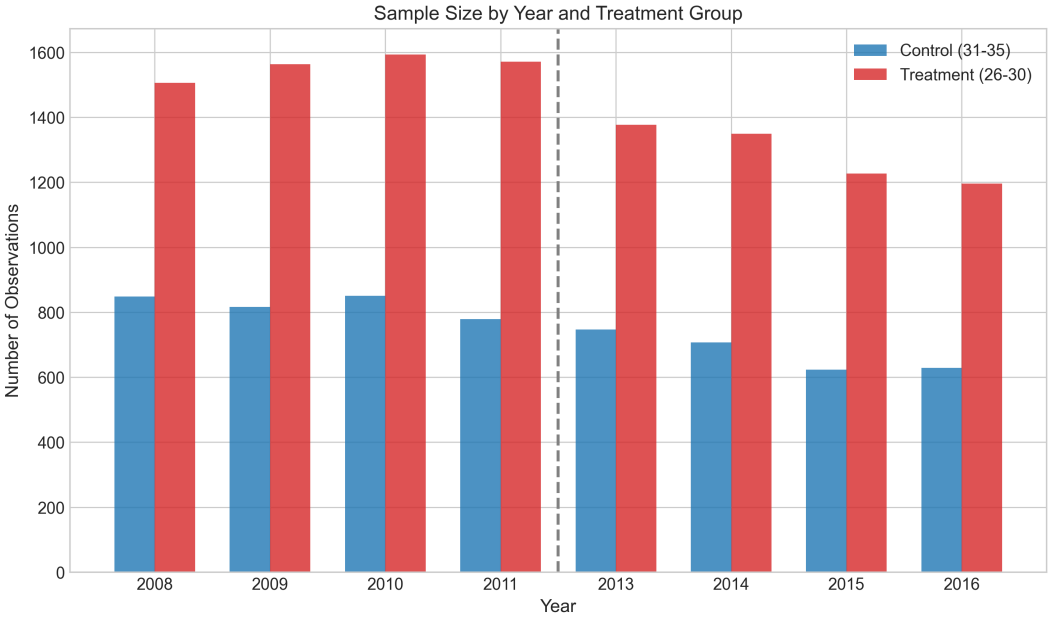

Figure 5: Sample Size Distribution by Year and Treatment Group

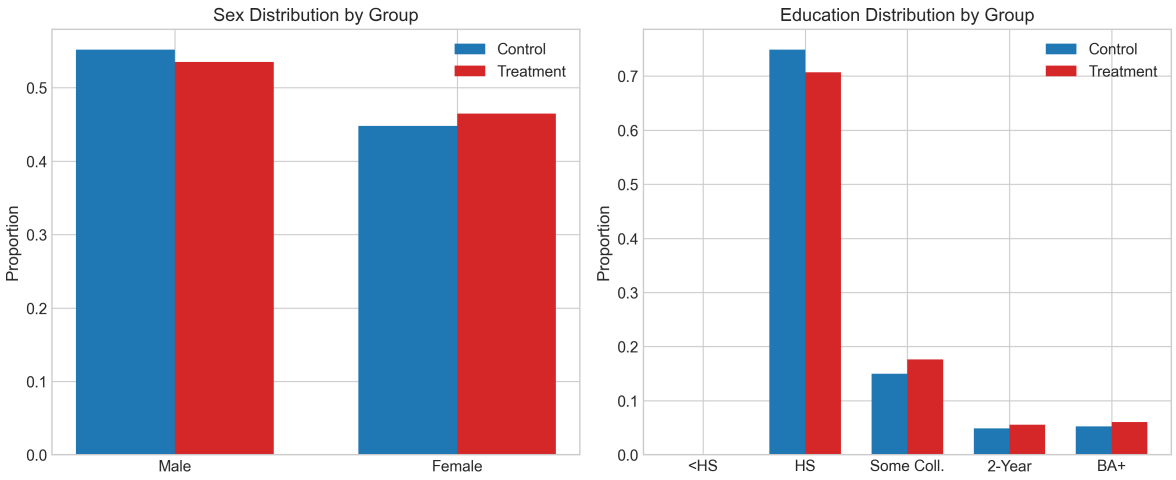

Figure 6: Demographic Characteristics by Treatment Group

Appendix B: Full Regression Output

Model 1: Basic DiD (Unweighted)

OLS Regression Results

Dep. Variable:	FT	R-squared:	0.002
Model:	OLS	Adj. R-squared:	0.001
Method:	Least Squares	F-statistic:	8.945
No. Observations:	17382	Prob (F-statistic):	6.44e-06

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	0.6697	0.008	80.591	0.000	0.653	0.686
ELIGIBLE	-0.0434	0.010	-4.220	0.000	-0.063	-0.023
AFTER	-0.0248	0.012	-2.007	0.045	-0.049	-0.001
ELIGIBLE_AFTER	0.0643	0.015	4.202	0.000	0.034	0.094

Model 2: Basic DiD (Weighted)

WLS Regression Results

Dep. Variable:	FT	R-squared:	0.002
Model:	WLS	Adj. R-squared:	0.002
Method:	Least Squares	F-statistic:	13.57
No. Observations:	17382	Prob (F-statistic):	7.66e-09

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	0.6886	0.008	83.054	0.000	0.672	0.705
ELIGIBLE	-0.0517	0.010	-5.058	0.000	-0.072	-0.032
AFTER	-0.0257	0.012	-2.080	0.038	-0.050	-0.001
ELIGIBLE_AFTER	0.0748	0.015	4.929	0.000	0.045	0.105

Appendix C: Data and Code Documentation

Data Files Used

- `prepared_data_numeric_version.csv`: Main analysis dataset containing 17,382 observations and 105 variables
- `acs_data_dict.txt`: IPUMS data dictionary with variable definitions

Analysis Scripts

- `analysis.py`: Main analysis script performing all DiD regressions
- `create_figures.py`: Script to generate all figures for the report

Key Analytical Decisions

1. **Sample:** Used the full provided sample without additional restrictions, as instructed
2. **Weighting:** Used PERWT survey weights in the preferred specification
3. **Standard Errors:** Reported both robust and state-clustered standard errors
4. **Fixed Effects:** Included both year and state fixed effects in preferred specification
5. **Covariates:** Included sex, marital status, and education as controls
6. **Estimation:** Used linear probability model (OLS/WLS) for ease of interpretation

Software

- Python 3.x with pandas, numpy, statsmodels, and matplotlib
- LaTeX for document preparation

Appendix D: Variable Definitions

Variable	Definition
FT	Binary indicator for full-time employment (1 = usually works 35+ hours/week, 0 = otherwise)
ELIGIBLE	Binary treatment indicator (1 = ages 26-30 in June 2012, 0 = ages 31-35)
AFTER	Binary post-treatment indicator (1 = years 2013-2016, 0 = years 2008-2011)
PERWT	ACS person weight
YEAR	Survey year
SEX	Sex (1 = Male, 2 = Female in IPUMS coding)
AGE	Age at time of survey
MARST	Marital status (1 = Married spouse present, 2 = Married spouse absent, 3 = Separated, 4 = Divorced, 5 = Widowed, 6 = Never married)
EDUC_RECODE	Simplified education categories (Less than High School, High School Degree, Some College, Two-Year Degree, BA+)
STATEFIP	State FIPS code
AGE_IN_JUNE_2012	Age as of June 15, 2012