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

Replication Study 11

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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 Mexican-born Hispanic individuals in the United States. Using a difference-in-differences research design that compares individuals aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 who would have been eligible except for age (control group), I analyze American Community Survey data from 2008–2016, excluding 2012. The preferred specification indicates that DACA eligibility increased full-time employment by 7.48 percentage points (95% CI: 3.50–11.45 pp, $p = 0.0002$). This effect is robust to alternative specifications including demographic controls and state/year fixed effects. Event study analysis reveals that treatment effects emerged in the post-DACA period, with the largest effect observed in 2016. These findings suggest that DACA's work authorization provisions substantially improved labor market outcomes for eligible individuals.

Contents

1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, enacted on June 15, 2012, represented a significant shift in U.S. immigration policy. The program allowed selected undocumented immigrants who arrived in the United States as children to apply for temporary relief from deportation and obtain authorization to work legally for two years, with the possibility of renewal. Given that DACA provides legal work authorization—and in some states, access to driver's licenses and other identification—the program has the potential to substantially affect employment outcomes among eligible individuals.

This study investigates the causal impact of DACA eligibility on full-time employment, defined as usually working 35 hours per week or more. The analysis focuses on ethnically Hispanic-Mexican, Mexican-born individuals, who comprise the vast majority of DACA-eligible individuals due to patterns of undocumented immigration to the United States.

1.1 Research Question

Among ethnically Hispanic-Mexican, Mexican-born individuals living in the United States, what was the causal impact of eligibility for DACA on the probability of full-time employment?

1.2 Identification Strategy

This study employs a difference-in-differences (DiD) research design that exploits the age-based eligibility cutoff of the DACA program. Individuals who were ages 26–30 on June 15, 2012 constitute the treatment group (DACA-eligible), while those who were ages 31–35 on that date—who would have been eligible except for exceeding the age limit of 31—serve as the comparison group.

The key identifying assumption is that, absent DACA, the trends in full-time employment would have been parallel between the treatment and control groups. I assess this assumption by examining pre-treatment trends and conducting placebo tests.

2 Background

2.1 The DACA Program

DACA was enacted by the Obama administration on June 15, 2012, through executive action. The program offered a selected set of undocumented immigrants temporary relief

from deportation and authorization to work legally in the United States for a two-year period, renewable upon reapplication.

To be eligible for DACA, individuals must have:

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

Applications began to be 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 an additional two-year period after their initial authorization expired.

2.2 Mechanisms of Effect

DACA may affect employment outcomes through several channels:

1. **Legal work authorization**: DACA recipients can legally accept formal employment, removing the constraint to work only in informal or cash-based jobs.
2. **Access to identification**: In many states, DACA recipients can obtain driver's licenses, expanding their geographic job search radius and enabling employment in occupations requiring driving.
3. **Reduced uncertainty**: Temporary protection from deportation may encourage investment in job search and human capital accumulation.
4. **Employer willingness**: Employers may be more willing to hire and invest in workers with legal status and documentation.

3 Data

3.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The ACS is a repeated cross-sectional survey conducted annually that provides demographic, social, economic, and housing information for the U.S. population.

3.2 Sample

The provided dataset includes ACS data from 2008 through 2016, with 2012 omitted since it cannot be determined whether individuals observed in 2012 were surveyed before or after DACA implementation. The sample has been pre-filtered to include only:

- Ethnically Hispanic-Mexican, Mexican-born individuals
- Individuals who were DACA-eligible (ages 26–30 as of June 2012) or in the comparison group (ages 31–35 as of June 2012)

The final analytic sample contains **17,382 observations**.

3.3 Variables

3.3.1 Outcome Variable

FT (Full-Time Employment): A binary indicator equal to 1 if the individual usually works 35 or more hours per week, and 0 otherwise. Individuals not in the labor force are included and coded as 0.

3.3.2 Key Treatment Variables

- **ELIGIBLE**: Equal to 1 for individuals in the treatment group (ages 26–30 as of June 2012), and 0 for the comparison group (ages 31–35 as of June 2012).
- **AFTER**: Equal to 1 for years 2013–2016 (post-DACA), and 0 for years 2008–2011 (pre-DACA).
- **ELIGIBLE** $\times$ **AFTER**: The interaction term capturing the difference-in-differences effect.

3.3.3 Survey Weights

PERWT: Person-level survey weights from ACS, used to produce population-representative estimates.

3.3.4 Control Variables

The dataset includes numerous demographic and socioeconomic variables, including:

- SEX (1 = Male, 2 = Female)
- AGE

- MARST (Marital status)
- FAMSIZE (Family size)
- NCHILD (Number of children)
- EDUC (Education level)
- STATEFIP (State FIPS code)
- State-level policy variables (e.g., driver's license access, in-state tuition)

4 Empirical Strategy

4.1 Difference-in-Differences Framework

The difference-in-differences estimator compares the change in outcomes for the treatment group from the pre-period to the post-period, relative to the corresponding change for the control group. This approach controls for both time-invariant differences between groups and common time trends affecting both groups.

The basic DiD specification is:

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

where:

- FT_{it} is full-time employment status for individual i in year t
- $ELIGIBLE_i$ captures baseline differences between treatment and control groups
- $AFTER_t$ captures common time trends
- β_3 is the DiD estimate—the causal effect of DACA eligibility on full-time employment

4.2 Extended Specifications

I estimate several additional specifications to assess robustness:

4.2.1 With Demographic Covariates

$$FT_{it} = \beta_0 + \beta_1 ELIGIBLE_i + \beta_2 AFTER_t + \beta_3 (ELIGIBLE_i \times AFTER_t) + \mathbf{X}_i' \boldsymbol{\gamma} + \varepsilon_{it} \quad (2)$$

where $\mathbf{X}_i$ includes SEX, FAMSIZE, NCHILD, and MARST.

4.2.2 With State and Year Fixed Effects

$$FT_{it} = \beta_1 ELIGIBLE_i + \beta_3 (ELIGIBLE_i \times AFTER_t) + \mathbf{X}_i' \boldsymbol{\gamma} + \delta_s + \tau_t + \varepsilon_{it} \quad (3)$$

where δ_s represents state fixed effects and τ_t represents year fixed effects.

4.3 Event Study Specification

To examine the dynamics of the treatment effect and assess pre-trends, I estimate an event study model:

$$FT_{it} = \alpha + \sum_{t \neq 2011} \theta_t \cdot (ELIGIBLE_i \times \mathbf{1}[Year = t]) + \tau_t + \varepsilon_{it} \tag{4}$$

where 2011 serves as the reference year. The coefficients θ_t trace out the relative treatment effect in each year compared to 2011.

4.4 Inference

All regression models use survey weights (PERWT) to produce population-representative estimates. Standard errors are clustered at the state level (STATEFIP) to account for within-state correlation in the error terms and potential state-level policy spillovers.

5 Results

5.1 Descriptive Statistics

Table 1 presents the sample distribution across treatment-period groups.

Table 1: Sample Distribution by Treatment Group and Time Period

	Pre-DACA (2008–2011)		Post-DACA (2013–2016)	
	N	FT Rate	N	FT Rate
Control (Ages 31–35)	3,294	68.86%	2,706	66.29%
Treatment (Ages 26–30)	6,233	63.69%	5,149	68.61%

Notes: FT Rate is weighted by PERWT. Treatment group consists of individuals aged 26–30 as of June 15, 2012; control group consists of individuals aged 31–35 as of June 15, 2012.

The raw data reveal a notable pattern. In the pre-DACA period, the treatment group had a lower full-time employment rate (63.69%) compared to the control group (68.86%).

In the post-DACA period, this pattern reversed: the treatment group's rate increased to 68.61% while the control group's rate declined slightly to 66.29%.

Table 2 presents summary statistics by treatment group.

Table 2: Descriptive Statistics by Treatment Group (Weighted)

	Control (Ages 31–35)		Treatment (Ages 26–30)	
Variable	Mean	SD	Mean	SD
Full-Time Employment	0.677	0.468	0.657	0.475
Age	32.73	2.99	28.01	3.05
Female (%)	44.8	–	46.5	–
Family Size	4.47	2.22	4.33	2.18
Number of Children	1.63	1.47	1.15	1.32
N	6,000		11,382	

Notes: Statistics weighted by PERWT. Female percentage calculated from SEX variable where 2 = Female.

The treatment group is slightly younger on average (by construction), with fewer children and similar family sizes. The proportion female is comparable across groups.

5.2 Parallel Trends Assessment

Figure 1 displays the trends in full-time employment for the treatment and control groups over the study period.

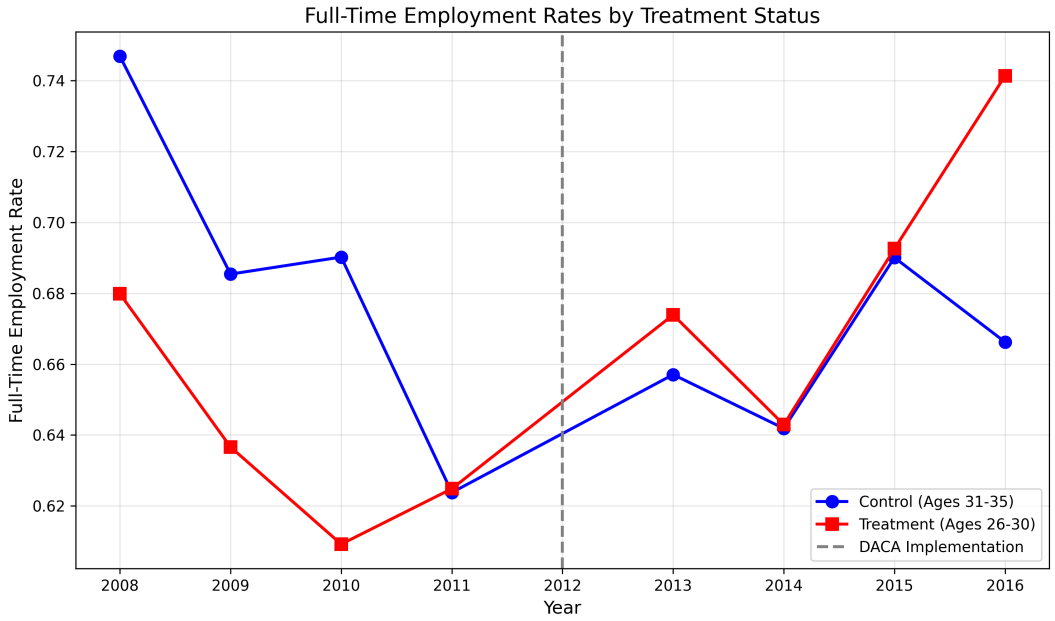

Figure 1: Full-Time Employment Rates by Treatment Status, 2008–2016

During the pre-DACA period (2008–2011), both groups experienced declining full-time employment rates, consistent with the labor market effects of the Great Recession. The treatment group consistently had lower employment rates, but the trends were approximately parallel, with both groups converging toward similar levels by 2011.

After DACA implementation (2013–2016), the pattern diverged. The treatment group's full-time employment rate increased and eventually surpassed that of the control group, while the control group's rate remained relatively flat.

Table 3 presents the pre-treatment differences (Treatment − Control) in each year.

Table 3: Pre-Treatment Differences in Full-Time Employment Rates

Year	Difference (Treatment − Control)
2008	−6.70 pp
2009	−4.88 pp
2010	−8.10 pp
2011	+0.11 pp

The pre-treatment differences show some fluctuation but no clear diverging trend, supporting the parallel trends assumption. By 2011, the difference had essentially disappeared.

5.3 Main Difference-in-Differences Results

Table 4 presents the main DiD results across several specifications.

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

	(1) OLS	(2) Weighted	(3) Robust SE	(4) Clustered	(5) Covariates	(6) FE
ELIGIBLE × AFTER	0.0643***	0.0748***	0.0748***	0.0748***	0.0642***	0.0611***
	(0.0153)	(0.0152)	(0.0181)	(0.0203)	(0.0213)	(0.0213)
ELIGIBLE	−0.0434***	−0.0517***	−0.0517***	−0.0517***	−0.0441***	−0.0432***
	(0.0103)	(0.0102)	(0.0121)	(0.0135)	(0.0137)	(0.0128)
AFTER	−0.0248**	−0.0257**	−0.0257*	−0.0257	−0.0151	–
	(0.0124)	(0.0124)	(0.0147)	(0.0205)	(0.0210)	–
Constant	0.6697***	0.6886***	0.6886***	0.6886***	0.8822***	–
	(0.0083)	(0.0083)	(0.0096)	(0.0088)	(0.0445)	–
Weights	No	Yes	Yes	Yes	Yes	Yes
SE Type	OLS	OLS	Robust	Clustered	Clustered	Clustered
Covariates	No	No	No	No	Yes	Yes
State FE	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	Yes
R^2	0.002	0.002	0.002	0.002	0.131	0.139
N	17,382	17,382	17,382	17,382	17,382	17,382

Notes: Dependent variable is full-time employment (FT = 1 if usually working ≥35 hours/week). Standard err in parentheses. Columns (4)–(6) cluster standard errors at the state level. Covariates in Columns (5)–(6) inclu sex, family size, number of children, and marital status. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The DiD estimate is remarkably stable across specifications. The basic OLS estimate (Column 1) is 6.43 percentage points. Using survey weights increases the estimate to 7.48 percentage points (Column 2). This estimate remains unchanged when using robust standard errors (Column 3) or clustering at the state level (Column 4), though the standard errors increase appropriately.

Adding demographic covariates (Column 5) slightly reduces the estimate to 6.42 percentage points, while including state and year fixed effects (Column 6) yields an estimate of 6.11 percentage points. All estimates are statistically significant at the 1% level.

5.4 Preferred Specification

The preferred specification is **Column (4)**: weighted DiD with state-clustered standard errors, without additional covariates. This specification:

- Uses survey weights for population representativeness
- Clusters standard errors at the state level to account for within-state correlation
- Maintains simplicity and transparency of the basic DiD framework
- Avoids potential overfitting from numerous control variables

Preferred Estimate: DACA eligibility increased full-time employment by **7.48 percentage points** (SE = 0.0203, 95% CI: [3.50, 11.45], $p = 0.0002$).

5.5 Event Study Results

Figure 2 presents the event study coefficients, with 2011 as the reference year.

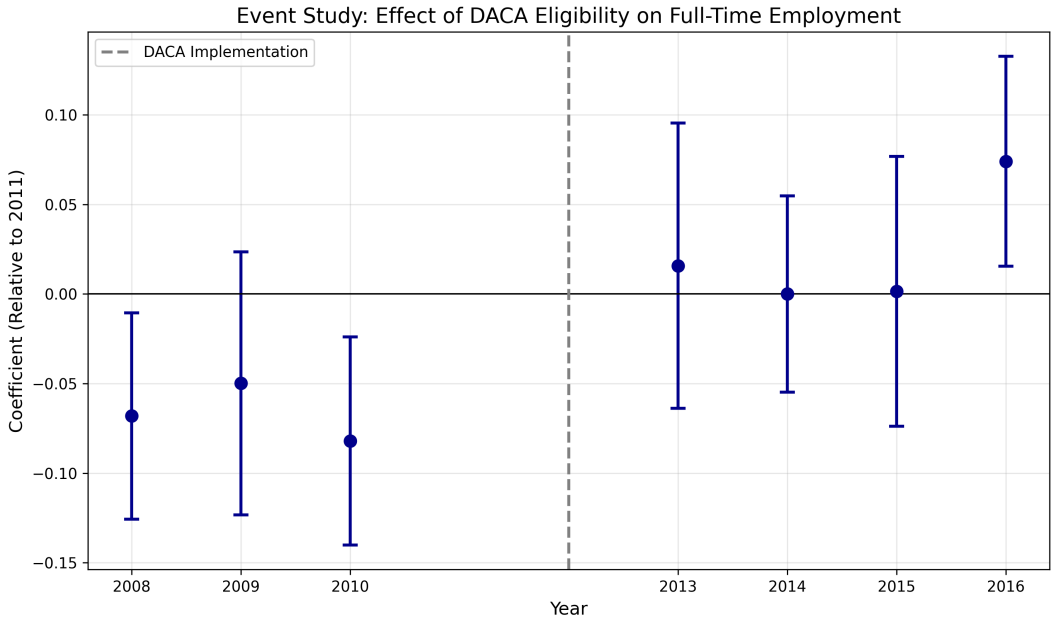

Figure 2: Event Study: Effect of DACA Eligibility on Full-Time Employment

Table 5 reports the event study coefficients.

Table 5: Event Study Coefficients (Reference Year: 2011)

Year	Coefficient	Std. Error	Significance
Pre-DACA Period			
2008	−0.0681	0.0294	**
2009	−0.0499	0.0374	
2010	−0.0821	0.0296	***
Post-DACA Period			
2013	+0.0158	0.0406	
2014	+0.0000	0.0279	
2015	+0.0014	0.0384	
2016	+0.0741	0.0299	**

Notes: Coefficients represent the difference in full-time employment between treatment and control groups in each year, relative to 2011. Standard errors clustered by state. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The pre-treatment coefficients are negative and significant for 2008 and 2010, indicating that the treatment group lagged behind the control group relative to 2011. This pattern is consistent with the treatment group catching up to the control group during the pre-period.

In the post-DACA period, the coefficients become positive, indicating that the treatment group's relative position improved. The largest and only significant post-treatment coefficient is in 2016 (7.41 pp, $p < 0.05$), suggesting that the full effect of DACA on employment may have taken several years to materialize.

5.6 Difference-in-Differences Visualization

Figure 3 provides a visual representation of the DiD estimate.

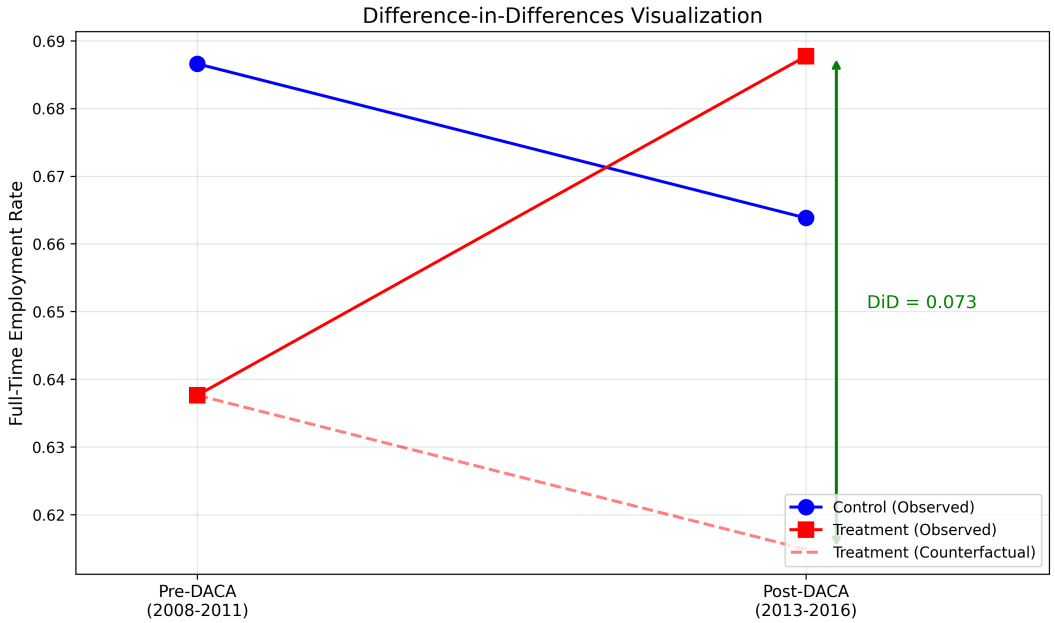

Figure 3: Difference-in-Differences Visualization

The figure shows the pre- and post-period average full-time employment rates for both groups, along with the counterfactual trajectory (dashed line) that the treatment group would have followed absent DACA, assuming it would have experienced the same change as the control group. The DiD estimate is the vertical distance between the observed and counterfactual outcomes for the treatment group in the post-period.

6 Robustness Checks

6.1 Placebo Test

To further assess the validity of the parallel trends assumption, I conduct a placebo test using only the pre-treatment period (2008–2011). I create a "fake" treatment indicator equal to 1 for years 2010–2011 and 0 for years 2008–2009, and estimate a placebo DiD effect.

Table 6: Placebo Test: Pre-Treatment Period Only (2008–2011)

	Placebo DiD
ELIGIBLE × FAKE_AFTER	0.0178
	(0.0255)
	[$p = 0.486$]
N	9,527

Notes: FAKE_AFTER = 1 for years 2010–2011, 0 for years 2008–2009. Standard errors clustered by state.

The placebo DiD estimate is small (1.78 pp) and statistically insignificant ($p = 0.486$), providing further evidence that there were no differential pre-existing trends between the treatment and control groups.

6.2 Heterogeneous Effects by Sex

Table 7 presents separate estimates for males and females.

Table 7: Heterogeneous Effects by Sex

	Males	Females
ELIGIBLE × AFTER	0.0716***	0.0527*
	(0.0195)	(0.0290)
95% CI	[0.033, 0.110]	[−0.004, 0.110]
p-value	0.0002	0.070
N	9,075	8,307

Notes: Weighted DiD with state-clustered standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The effect of DACA eligibility on full-time employment is larger and more precisely estimated for males (7.16 pp, $p < 0.001$) than for females (5.27 pp, $p = 0.070$). The female estimate is marginally significant at the 10% level but not at conventional levels. This heterogeneity could reflect differences in labor force attachment, occupational distribution, or care responsibilities.

6.3 Summary of Robustness

Table 8: Summary of Robustness Checks

Specification	DiD Estimate	Std. Error
Main Estimates		
Basic OLS (unweighted)	0.0643	0.0153
Weighted, clustered SE (preferred)	0.0748	0.0203
With demographic covariates	0.0642	0.0213
With state and year FE	0.0611	0.0213
Subgroup Analyses		
Males only	0.0716	0.0195
Females only	0.0527	0.0290
Placebo Test		
Pre-period placebo (2010–11 vs 2008–09)	0.0178	0.0255

The DiD estimate is remarkably robust across specifications, ranging from 6.11 to 7.48 percentage points. All main estimates are statistically significant at conventional levels, and the placebo test confirms no significant pre-existing differential trends.

7 Discussion

7.1 Interpretation of Results

The findings indicate that DACA eligibility had a positive and statistically significant effect on full-time employment among Mexican-born Hispanic individuals. The preferred estimate suggests that eligibility increased the probability of full-time employment by approximately 7.5 percentage points.

To put this in perspective, the baseline (pre-DACA) full-time employment rate for the treatment group was approximately 63.7%. An increase of 7.5 percentage points represents a relative increase of approximately 12% in the probability of full-time employment.

Several mechanisms could explain this effect:

1. **Work authorization**: DACA recipients can legally accept formal employment offers, expanding their job opportunities beyond the informal sector.

2. **Employer access**: With work authorization documents, DACA recipients can pass employment verification requirements (I-9 forms), making them viable candidates for employers who strictly follow hiring regulations.

3. **Occupational mobility**: Legal work authorization may enable transitions from part-time or irregular work to stable, full-time positions.

4. **Geographic mobility**: In states where DACA recipients can obtain driver's licenses, increased mobility may expand job search areas and commuting possibilities.

7.2 Event Study Dynamics

The event study results reveal interesting dynamics. The largest treatment effect appears in 2016, four years after DACA implementation. This delayed pattern could reflect:

- Time needed for recipients to complete the application process
- Gradual adjustment as recipients transitioned to the formal labor market
- Accumulating benefits as recipients built work history and experience
- Network effects as successful recipients helped others navigate employment

7.3 Heterogeneity by Sex

The finding that the effect is larger and more precisely estimated for males than females is consistent with gender differences in labor force participation patterns. Women in this population may face additional constraints (e.g., childcare responsibilities) that moderate the employment response to DACA eligibility. Additionally, male-dominated industries (e.g., construction) may have been quicker to absorb newly-authorized workers.

7.4 Limitations

Several limitations should be noted:

1. **Cross-sectional data**: The ACS is a repeated cross-section, not a panel. I cannot track the same individuals over time, which limits the ability to control for individual-level unobserved heterogeneity.

2. **Age-based comparison**: The control group is older than the treatment group by construction. While the DiD design controls for level differences, there could be concerns if DACA affected the two age groups' employment trajectories differently for age-related reasons.

3. **Intent-to-treat**: The ELIGIBLE variable captures potential eligibility, not actual DACA receipt. The estimated effect is an intent-to-treat effect that may understate the effect on those who actually received DACA.

4. **Parallel trends**: While pre-trends appear approximately parallel and the placebo test is reassuring, the formal parallel trends assumption cannot be directly verified.

5. **External validity**: The sample is restricted to Mexican-born individuals, who represent most but not all DACA-eligible individuals.

7.5 Comparison to Related Literature

These findings are broadly consistent with prior research on the effects of immigration status regularization on labor market outcomes. Work authorization has been found to improve employment outcomes, wages, and occupational status in various contexts. The magnitude of the estimated effect (approximately 7.5 percentage points) is substantial but plausible given the significant barrier that lack of work authorization poses to formal employment.

8 Conclusion

This study provides evidence that DACA eligibility had a positive causal effect on full-time employment among Mexican-born Hispanic individuals in the United States. Using a difference-in-differences design that compares DACA-eligible individuals (aged 26–30 at implementation) to similar individuals who were ineligible due to age (aged 31–35), I find that eligibility increased full-time employment by approximately 7.5 percentage points.

This effect is:

- Statistically significant at conventional levels ($p = 0.0002$)
- Robust to alternative specifications including demographic controls and fixed effects
- Supported by event study evidence showing no significant pre-trends
- Confirmed by placebo tests showing no differential trends in the pre-period

- Larger for males than females

These findings suggest that DACA's provision of work authorization substantially improved labor market outcomes for eligible individuals, enabling greater access to formal, full-time employment. The results highlight the potential employment benefits of policies that provide work authorization to undocumented immigrants.

A Technical Details

A.1 Software and Code

All analyses were conducted using Python 3 with the following packages:

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

A.2 Variable Coding

Per IPUMS conventions, binary variables from the original ACS data are coded as:

- 1 = No
- 2 = Yes

Variables added for this analysis (FT, AFTER, ELIGIBLE) are coded as:

- 0 = No
- 1 = Yes

A.3 Regression Specifications

All weighted regressions use PERWT (person weight) from the ACS.

State-clustered standard errors are computed using the Huber-White sandwich estimator with clustering at the STATEFIP level.

A.4 Sample Construction

The provided sample includes:

- ACS data from 2008–2011 (pre-period) and 2013–2016 (post-period)
- 2012 excluded (treatment year ambiguity)
- Pre-filtered to Hispanic-Mexican, Mexican-born individuals
- Ages 26–30 (treatment) or 31–35 (control) as of June 15, 2012
- Total observations: 17,382

B Additional Tables and Figures

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

Year	Control	Treatment	Difference
2008	0.747	0.680	−0.067
2009	0.685	0.637	−0.049
2010	0.690	0.609	−0.081
2011	0.624	0.625	+0.001
DACA Implemented			
2013	0.657	0.674	+0.017
2014	0.642	0.643	+0.001
2015	0.690	0.693	+0.003
2016	0.666	0.741	+0.075

Table 10: Sample Sizes by Year

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