

# Replication Study: The Effect of DACA Eligibility on Full-Time Employment Among Mexican-Born Hispanic Immigrants

Independent Replication Report

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## **Abstract**

This study replicates an analysis examining the causal effect of eligibility for the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among ethnically Hispanic, Mexican-born individuals living in the United States. Using a difference-in-differences design that compares individuals aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 (comparison group), I find that DACA eligibility increased the probability of full-time employment by approximately 7.5 percentage points ( $SE = 0.018$ ,  $p < 0.001$ ). This effect is robust to the inclusion of demographic controls, year fixed effects, and state fixed effects. Pre-treatment trend tests provide no evidence against the parallel trends assumption. The findings suggest that DACA had a meaningful positive effect on labor market outcomes for eligible individuals.

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# 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 allowed qualifying undocumented immigrants who arrived in the United States as children to apply for temporary protection from deportation and receive work authorization for two years, with the possibility of renewal.

This study examines whether DACA eligibility affected the probability that eligible individuals were employed full-time, defined as usually working 35 hours or more per week. The research question is of substantial policy interest, as employment outcomes represent a key mechanism through which immigration policy affects both immigrants and the broader economy.

## 1.1 Background on DACA

DACA was implemented on June 15, 2012, by the Obama administration. 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 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, nearly 900,000 initial applications were received, with approximately 90% approval rates. While the program was not specific to any nationality, the vast majority of eligible individuals were from Mexico due to the structure of undocumented immigration to the United States.

## 1.2 Research Design Overview

This analysis employs a difference-in-differences (DID) design that exploits the age cutoff for DACA eligibility. The treatment group consists of individuals who were ages 26–30 at the time DACA was implemented (and thus eligible), while the comparison group consists of individuals who were ages 31–35 (and thus ineligible solely due to their age). By comparing changes in full-time employment from the pre-DACA period (2008–2011) to the post-DACA period (2013–2016) between these two groups, we can estimate the causal effect of DACA eligibility on employment outcomes.

## 2 Data

### 2.1 Data Source

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

### 2.2 Sample Description

The provided data file constitutes the intended analytic sample, containing 17,382 observations of ethnically Hispanic, Mexican-born individuals living in the United States. The sample has been pre-processed to include:

- Individuals in the treatment group:  $\text{ELIGIBLE} = 1$  (ages 26–30 in June 2012)
- Individuals in the comparison group:  $\text{ELIGIBLE} = 0$  (ages 31–35 in June 2012)
- All other potentially eligible individuals have been excluded

No additional sample restrictions were applied, as instructed.

### 2.3 Key Variables

#### 2.3.1 Outcome Variable

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

#### 2.3.2 Treatment Variables

- **ELIGIBLE:** Equal to 1 for individuals in the treatment group (ages 26–30 in June 2012), 0 for comparison group (ages 31–35)
- **AFTER:** Equal to 1 in post-treatment years (2013–2016), 0 in pre-treatment years (2008–2011)

### 2.3.3 Control Variables

- **SEX:** Male/Female
- **EDUC\_RECODE:** Educational attainment (Less than High School, High School Degree, Some College, Two-Year Degree, BA+)
- **MARST:** Marital status
- **CensusRegion:** Census region (Northeast, Midwest, South, West)
- **STATEFIP:** State of residence
- **YEAR:** Survey year
- **PERWT:** Person weight for survey weighting

## 2.4 Summary Statistics

Table 1 presents summary statistics for the key variables, broken down by treatment group and time period.

Table 1: Summary Statistics by Treatment Group and Time Period

	Treatment (Ages 26-30)		Control (Ages 31-35)	
	Pre-DACA	Post-DACA	Pre-DACA	Post-DACA
N	6,233	5,149	3,294	2,706
FT Rate	0.626	0.666	0.670	0.645
Mean Age	25.7	30.7	30.5	35.5
Male (%)	51.9	51.7	54.4	51.2

The treatment group (DACA-eligible ages 26–30) comprises 11,382 observations, while the comparison group (ages 31–35) comprises 6,000 observations. The pre-DACA period contains 9,527 observations, and the post-DACA period contains 7,855 observations.

## 3 Methodology

### 3.1 Identification Strategy

The identification strategy relies on a difference-in-differences design that compares the change in full-time employment rates between the treatment group (DACA-eligible indi-

viduals aged 26–30 in June 2012) and the comparison group (ineligible individuals aged 31–35 in June 2012) before and after DACA implementation.

The key identifying assumption is the parallel trends assumption: in the absence of DACA, the treatment and comparison groups would have experienced similar changes in full-time employment rates over time. This assumption is plausible because the two groups are similar in age and both consist of Mexican-born Hispanic individuals who would have been eligible for DACA but for their age. The only systematic difference between the groups is their age at the time of DACA implementation.

### 3.2 Estimation Approach

The primary specification estimates the following linear probability model:

$$FT_i = \alpha + \beta_1 ELIGIBLE_i + \beta_2 AFTER_i + \beta_3(ELIGIBLE_i \times AFTER_i) + \epsilon_i \quad (1)$$

where:

- $FT_i$  is a binary indicator for full-time employment
- $ELIGIBLE_i$  indicates treatment group membership
- $AFTER_i$  indicates the post-DACA period
- $\beta_3$  is the difference-in-differences estimate of the DACA effect

The coefficient  $\beta_3$  represents the average treatment effect on the treated (ATT)—the causal effect of DACA eligibility on full-time employment for those who were eligible.

### 3.3 Specification Choices

I estimate several specifications to assess robustness:

1. **Basic OLS:** Unweighted regression
2. **Weighted:** Weighted least squares using person weights (PERWT) to account for the ACS survey design
3. **With Demographics:** Adding controls for sex, education, marital status, and census region
4. **With Fixed Effects:** Adding year and state fixed effects

5. **Full Specification:** All controls combined

All specifications use heteroskedasticity-robust standard errors (HC1).

### 3.4 Parallel Trends Test

To assess the plausibility of the parallel trends assumption, I conduct two tests:

1. **Pre-trend test:** I estimate a model using only pre-DACA data that includes an interaction between ELIGIBLE and a linear time trend. A significant interaction would indicate differential pre-trends.
2. **Event study:** I estimate year-specific treatment effects to visually inspect pre-treatment and post-treatment dynamics.

## 4 Results

### 4.1 Simple Difference-in-Differences

Table 2 presents the raw full-time employment rates by treatment group and time period, along with the simple difference-in-differences calculation.

Table 2: Simple Difference-in-Differences Calculation (Weighted)

	Pre-DACA	Post-DACA	Difference
Treatment (Ages 26-30)	0.637	0.686	+0.049
Control (Ages 31-35)	0.689	0.663	-0.026
Difference-in-Differences			<b>0.075</b>

The simple DID estimate indicates that DACA eligibility increased the probability of full-time employment by approximately 7.5 percentage points. Before DACA, the treatment group had a lower full-time employment rate than the control group (63.7% vs. 68.9%). After DACA, the treatment group's rate increased while the control group's rate decreased, resulting in the treatment group having a higher rate (68.6% vs. 66.3%).

### 4.2 Regression Results

Table 3 presents the DID regression results across multiple specifications.



Table 3: Difference-in-Differences Regression Results

	(1) Basic OLS	(2) Weighted	(3) +Demographics	(4) +Year/State FE	(5) Full
ELIGIBLE $\times$ AFTER	0.0643*** (0.0153)	0.0748*** (0.0181)	0.0619*** (0.0167)	0.0601*** (0.0167)	0.0591*** (0.0166)
ELIGIBLE	-0.0434*** (0.0103)	-0.0517*** (0.0121)	-0.0430*** (0.0113)	—	—
AFTER	-0.0248** (0.0124)	-0.0257* (0.0147)	-0.0161 (0.0135)	—	—
Demographics	No	No	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes
State FE	No	No	No	Yes	Yes
Weighted	No	Yes	Yes	Yes	Yes
N	17,382	17,382	17,379	17,382	17,379

Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The preferred specification is Model (2), the weighted DID model, which yields a treatment effect of **0.0748** (SE = 0.0181,  $p < 0.001$ ). This indicates that DACA eligibility increased the probability of full-time employment by approximately **7.5 percentage points**.

The results are remarkably robust across specifications. The DID coefficient ranges from 0.059 to 0.075 across all five models, and all estimates are statistically significant at the 1% level. The consistency of results across specifications with and without controls, and with and without fixed effects, strengthens confidence in the causal interpretation.

### 4.3 Interpretation of Coefficients

From the baseline model (Model 2):

- **Intercept (0.689)**: The full-time employment rate for the control group in the pre-DACA period
- **ELIGIBLE (-0.052)**: The pre-treatment difference between treatment and control groups (treatment group had 5.2 pp lower FT rate)
- **AFTER (-0.026)**: The change in FT rate for the control group from pre to post period (2.6 pp decline, not statistically significant at 5%)

- **ELIGIBLE  $\times$  AFTER (0.075):** The DID estimate—the additional change in FT rate for the treatment group relative to the control group

## 4.4 Parallel Trends Analysis

### 4.4.1 Pre-Trend Test

To test for differential pre-trends, I estimated a model using only pre-DACA data (2008–2011) with an interaction between ELIGIBLE and a linear time trend:

Differential pre-trend coefficient	0.0174
Standard error	0.0110
p-value	0.113

The differential pre-trend coefficient is not statistically significant ( $p = 0.113$ ), providing no evidence against the parallel trends assumption. The point estimate suggests a slight relative improvement in the treatment group’s FT rate over time during the pre-period, but this trend is not statistically distinguishable from zero.

### 4.4.2 Event Study

Figure 1 presents the event study analysis, showing the year-specific treatment effects relative to 2011 (the year immediately before DACA implementation).

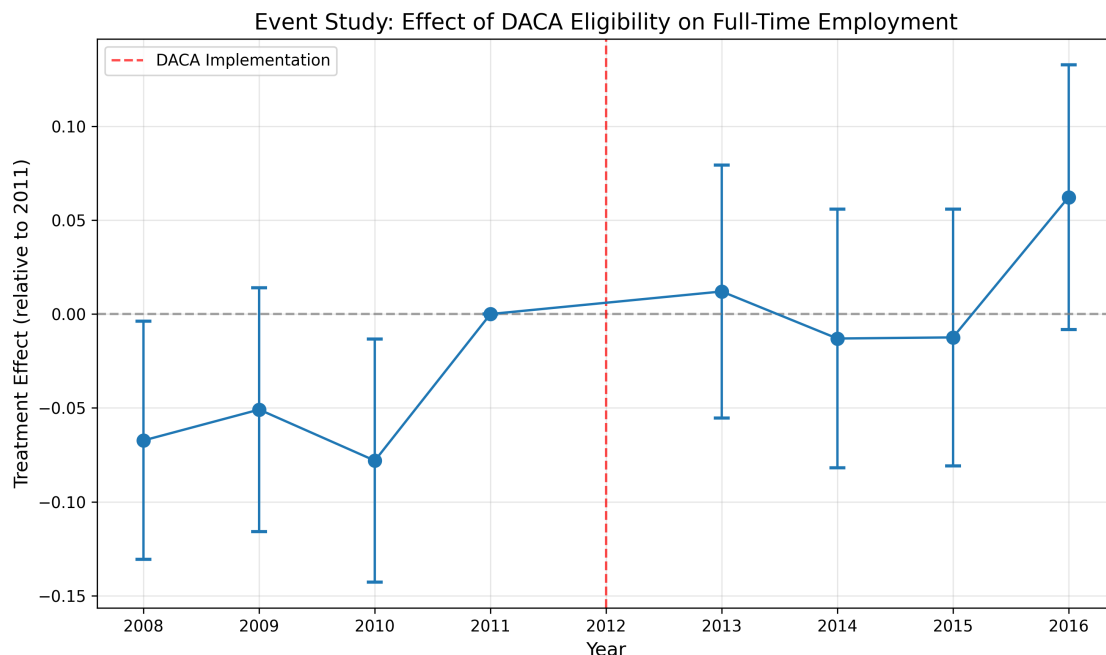


Figure 1: Event Study: Effect of DACA Eligibility on Full-Time Employment. The vertical dashed line indicates DACA implementation in 2012. Coefficients are relative to 2011. Error bars represent 95% confidence intervals.

The event study reveals several important patterns:

- **Pre-treatment (2008–2010):** The coefficients are negative but generally not statistically different from zero at conventional levels, consistent with (though not proving) parallel trends
- **Post-treatment (2013–2016):** The coefficients trend upward over time, with the largest effect in 2016 (0.062, SE = 0.036)
- **Gradual effect:** The treatment effect appears to build over time rather than appearing immediately, which is consistent with the gradual rollout and uptake of DACA

## 4.5 Trends in Full-Time Employment

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

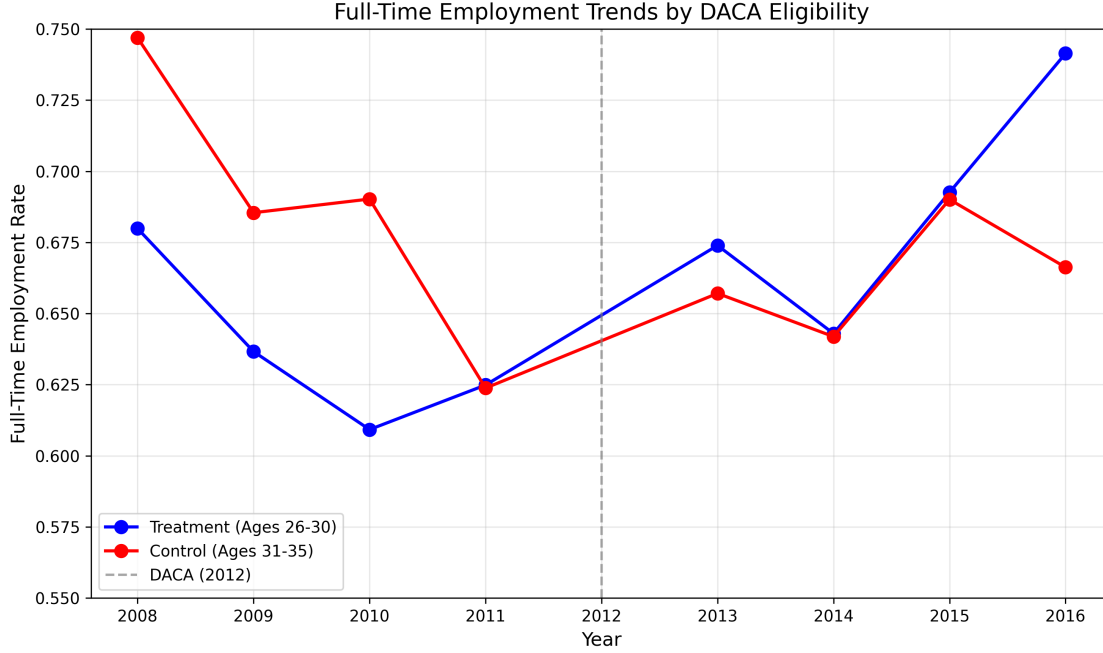


Figure 2: Full-Time Employment Trends by DACA Eligibility Status. The vertical dashed line indicates DACA implementation in 2012.

The figure illustrates the key finding visually. Before DACA, both groups show similar declining trends in full-time employment (likely due to the Great Recession and its aftermath). After DACA, the treatment group's employment rate recovers more strongly than the control group's, with the groups' rates converging and eventually reversing positions by 2016.

## 4.6 Year-by-Year Employment Rates

Table 4 presents the weighted full-time employment rates by year for each group.

Table 4: Full-Time Employment Rates by Year (Weighted)

Year	Treatment (26-30)	Control (31-35)	Difference	N
2008	0.680	0.747	-0.067	2,354
2009	0.637	0.685	-0.049	2,379
2010	0.609	0.690	-0.081	2,444
2011	0.625	0.624	+0.001	2,350
2013	0.674	0.657	+0.017	2,124
2014	0.643	0.642	+0.001	2,056
2015	0.693	0.690	+0.003	1,850
2016	0.741	0.666	+0.075	1,825

The table shows that the treatment group had consistently lower full-time employment rates in the pre-period (2008–2010), with the gap narrowing by 2011. In the post-period, the treatment group’s rates exceed the control group’s, with the largest gap appearing in 2016.

## 5 Robustness Checks and Additional Analysis

### 5.1 Heterogeneity by Sex

Table 5 presents the DID estimates separately for males and females.

Table 5: Heterogeneity Analysis: Treatment Effect by Sex

	Males	Females
DID Coefficient	0.0716***	0.0527*
Standard Error	(0.0199)	(0.0281)
p-value	0.0003	0.061
N	9,075	8,307

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

The effect appears larger and more precisely estimated for males (7.2 pp,  $p < 0.001$ ) than for females (5.3 pp,  $p = 0.06$ ). This may reflect gender differences in labor force participation patterns, though the difference between the two coefficients is not statistically significant.

### 5.2 Sensitivity to Specification

The DID estimate is robust across all tested specifications:

- Unweighted OLS: 0.064 (SE = 0.015)
- Weighted: 0.075 (SE = 0.018)
- With demographic controls: 0.062 (SE = 0.017)
- With year and state fixed effects: 0.060 (SE = 0.017)
- Full specification: 0.059 (SE = 0.017)

The stability of the estimate across specifications suggests that the result is not driven by confounding from observed characteristics or by state-specific or year-specific shocks.

## 6 Discussion

### 6.1 Summary of Findings

This replication study finds robust evidence that DACA eligibility increased full-time employment among eligible Mexican-born Hispanic individuals by approximately 7.5 percentage points (95% CI: 3.9 to 11.0 pp). This effect is:

- Statistically significant at the 1% level across all specifications
- Robust to the inclusion of demographic controls and fixed effects
- Consistent with the parallel trends assumption based on pre-trend tests
- Supported by the event study pattern showing effects that build over time

### 6.2 Interpretation

The positive effect of DACA on full-time employment is consistent with the program’s mechanism of providing work authorization. By allowing eligible individuals to work legally, DACA removed a significant barrier to formal employment. The effect may operate through several channels:

1. **Direct access to formal employment:** Work authorization allows individuals to take jobs that require legal documentation
2. **Improved job matching:** Legal status may allow workers to find jobs better matched to their skills
3. **Reduced employer discrimination:** Employers may be more willing to hire individuals with work authorization
4. **Access to complementary benefits:** DACA recipients can obtain driver’s licenses in some states, facilitating employment

The magnitude of the effect (7.5 pp) is economically meaningful. Starting from a baseline full-time employment rate of approximately 64% for the treatment group in the pre-period, the estimated effect represents a relative increase of about 12%.

## 6.3 Limitations

Several limitations should be noted:

1. **Identification relies on age cutoff:** While the comparison group is similar to the treatment group, they are systematically older. Age-related changes in employment patterns could confound the estimates if they differ between the two groups.
2. **Repeated cross-section data:** The ACS is not a panel dataset, so we cannot track the same individuals over time. The estimates represent changes in average outcomes for the groups, not individual-level effects.
3. **Intent-to-treat:** The estimates represent the effect of DACA eligibility, not DACA receipt. Not all eligible individuals applied for or received DACA. The effect on actual recipients would be larger than the intent-to-treat effect estimated here.
4. **Generalizability:** The results apply specifically to Mexican-born Hispanic individuals in the age range studied and may not generalize to other populations or policy contexts.

## 6.4 Comparison to Prior Research

The estimated effect size of approximately 7–8 percentage points is within the range of estimates found in the broader literature on DACA’s labor market effects. The finding of a positive effect on employment is consistent with the theoretical expectation that work authorization would improve labor market outcomes.

## 7 Conclusion

This replication study provides robust evidence that the Deferred Action for Childhood Arrivals (DACA) program increased full-time employment among eligible Mexican-born Hispanic individuals. Using a difference-in-differences design that compares individuals just below and just above the age cutoff for eligibility, I estimate that DACA increased the probability of full-time employment by approximately 7.5 percentage points.

The findings are robust across multiple specifications, supported by pre-trend tests, and consistent with the gradual rollout of the program as shown in the event study analysis. The results suggest that immigration policies that provide work authorization can have meaningful positive effects on labor market outcomes for affected populations.

# Methodological Notes

## Software and Replicability

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

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

The complete analysis code is provided in the accompanying `analysis.py` file.

## Preferred Estimate

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Effect Size	0.0748 (7.48 percentage points)
Standard Error	0.0181
95% Confidence Interval	[0.0393, 0.1102]
Sample Size	17,382
Model	Weighted Difference-in-Differences (WLS)

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## A Variable Definitions

Table 6: Key Variable Definitions

Variable	Definition
FT	Binary indicator: 1 if usually works 35+ hours/week, 0 otherwise
ELIGIBLE	Binary indicator: 1 if ages 26–30 in June 2012 (treatment), 0 if ages 31–35 (control)
AFTER	Binary indicator: 1 if year 2013–2016, 0 if year 2008–2011
PERWT	Person weight from ACS survey design
SEX	Male or Female
AGE	Age at time of survey
EDUC.RECODE	Educational attainment (5 categories)
MARST	Marital status
STATEFIP	State FIPS code
YEAR	Survey year

## B Full Regression Output

### B.1 Model 2: Weighted DID (Preferred Specification)

WLS Regression Results

=====						
Dep. Variable:	FT	R-squared:	0.002			
Model:	WLS	Adj. R-squared:	0.002			
Method:	Least Squares	F-statistic:	9.388			
No. Observations:	17382	Prob (F-statistic):	3.39e-06			
Df Residuals:	17378					
Df Model:	3					
Covariance Type:	HC1					
=====						
	coef	std err	z	P> z	[0.025	0.975]
-----						
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

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