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

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Abstract

This study examines 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 living in the United States. Using American Community Survey data from 2008–2016 (excluding 2012), I employ a difference-in-differences design comparing individuals aged 26–30 at the time of DACA implementation (treatment group) to those aged 31–35 (control group). The preferred specification, which includes demographic covariates and year and state fixed effects, estimates that DACA eligibility increased full-time employment probability by 5.2 percentage points (95% CI: 2.4 to 8.0 percentage points, $p < 0.001$). This effect is statistically significant and robust across multiple specifications. Robustness checks including placebo tests, event study analysis, and heterogeneity analyses support the validity of the findings. The results suggest that DACA had meaningful positive effects on labor market outcomes for eligible individuals.

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 allowed eligible undocumented immigrants who arrived in the United States as children to apply for and obtain authorization to work legally for two years without fear of deportation. Because DACA offers legal work authorization and allows recipients to apply for driver's licenses in many states, it is expected to have substantial effects on employment outcomes.

This replication study examines the causal impact of DACA eligibility on full-time employment among ethnically Hispanic-Mexican, Mexican-born individuals residing in the United States. Full-time employment is defined as usually working 35 hours or more per week. Given that Mexican-born individuals constitute the great majority of DACA-eligible individuals due to the structure of undocumented immigration to the United States, this population is particularly relevant for understanding the program's effects.

The identification strategy exploits an age-based eligibility cutoff in the DACA program. Individuals must not have reached their 31st birthday as of June 15, 2012 to be eligible. This creates a natural experiment where individuals just below the age cutoff (ages 26–30) became eligible for DACA, while similar individuals just above the cutoff (ages 31–35) remained ineligible despite being otherwise comparable.

Using a difference-in-differences (DiD) framework, I compare changes in full-time employment between the treatment group (eligible individuals aged 26–30 in June 2012) and the control group (ineligible individuals aged 31–35) before and after DACA implementation. The analysis uses repeated cross-sectional data from the American Community Survey (ACS) for the years 2008–2011 (pre-DACA) and 2013–2016 (post-DACA).

The main finding is that DACA eligibility increased the probability of full-time employment by approximately 5.2 percentage points. This effect is statistically significant ($p < 0.001$) and economically meaningful, representing a relative increase of about 8% from the pre-DACA baseline full-time employment rate of approximately 63% for the treatment group.

2 Background

2.1 The DACA Program

DACA was announced by President Obama on June 15, 2012, and applications began to be received on August 15, 2012. The program provided temporary protection from deportation and work authorization to eligible undocumented immigrants who arrived in the United States as children.

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

- Arrived in the United States before their 16th birthday
- Had not yet reached their 31st birthday as of June 15, 2012
- Lived continuously in the United States since June 15, 2007
- Were present in the United States on June 15, 2012
- Did not have lawful status (citizenship or legal residency) at that time
- Had no significant criminal history

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 of protection and work authorization.

2.2 Expected Effects on Employment

DACA eligibility could affect full-time employment through several channels:

1. **Legal work authorization**: DACA provides recipients with Employment Authorization Documents (EADs), allowing them to work legally. This removes barriers to formal employment and may increase access to full-time positions that require documentation.
2. **Reduced fear of deportation**: The deferred action status reduces uncertainty about future presence in the U.S., potentially encouraging investments in job search and career development.
3. **Driver's licenses**: Many states allow DACA recipients to obtain driver's licenses, expanding geographic mobility and access to employment opportunities.
4. **Improved bargaining power**: With legal work authorization, individuals may be less vulnerable to exploitation and better able to negotiate for full-time positions.

2.3 Related Literature

Several studies have examined the effects of DACA on various outcomes. Research has found positive effects on labor force participation, wages, and educational enrollment. Studies specifically examining employment outcomes have generally found positive effects, though estimates vary depending on methodology and sample definitions.

This replication study contributes to the literature by providing an independent estimate using a clearly defined difference-in-differences design with transparent methodological choices.

3 Data

3.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The ACS is an annual survey conducted by the U.S. Census Bureau that collects demographic, social, economic, and housing information from a representative sample of the U.S. population.

The provided dataset contains ACS data from 2008 through 2016, with 2012 omitted since it is impossible to determine whether observations from that year are from before or after DACA implementation (the program was announced in June 2012).

3.2 Sample

The analytic sample consists of ethnically Hispanic-Mexican, Mexican-born individuals living in the United States who meet the basic eligibility criteria for DACA (aside from age). The sample is restricted to:

- **Treatment group (ELIGIBLE = 1)**: Individuals aged 26–30 as of June 15, 2012
- **Control group (ELIGIBLE = 0)**: Individuals aged 31–35 as of June 15, 2012

Individuals who are neither in the treatment nor control group have been excluded from the data. Following the study instructions, the sample is not further restricted based on individual characteristics.

3.3 Variables

The key variables for the analysis are:

- **FT** (Outcome): Binary indicator equal to 1 if the individual usually works 35 or more hours per week (full-time employment), and 0 otherwise. Those not in the labor force are included as 0 values.
- **ELIGIBLE** (Treatment): Binary indicator equal to 1 for individuals aged 26–30 as of June 15, 2012 (treatment group), and 0 for individuals aged 31–35 (control group).
- **AFTER** (Time): Binary indicator equal to 1 for observations from 2013–2016 (post-DACA period), and 0 for observations from 2008–2011 (pre-DACA period).
- **PERWT**: Person weight for generating population-representative estimates.

Covariates used in the analysis include:

- **SEX**: Gender (1 = Male, 2 = Female)
- **AGE**: Age at the time of survey
- **MARST**: Marital status
- **EDUC_RECODE**: Educational attainment (Less than High School, High School Degree, Some College, Two-Year Degree, BA+)
- **STATEFIP**: State of residence
- **YEAR**: Survey year

3.4 Sample Characteristics

Table 1 presents the sample sizes by treatment group and time period.

Table 1: Sample Sizes by Treatment Group and Time Period

Group	Before (2008–11)	After (2013–16)	Total
Treated (Age 26–30)	6,233	5,149	11,382
Control (Age 31–35)	3,294	2,706	6,000
Total	9,527	7,855	17,382

The total sample consists of 17,382 observations, with approximately 65% in the treatment group and 35% in the control group. The larger treatment group reflects the younger age distribution of the DACA-eligible population.

4 Methodology

4.1 Difference-in-Differences Design

The identification strategy relies on a difference-in-differences design that exploits the age-based eligibility cutoff for DACA. The basic intuition is to compare the change in full-time employment for the treatment group (those made eligible by DACA) before and after the policy, relative to the change for the control group (those ineligible due to age).

The simple DiD estimate can be expressed as:

$$\hat{\delta}_{DiD} = (\bar{Y}_{T,Post} - \bar{Y}_{T,Pre}) - (\bar{Y}_{C,Post} - \bar{Y}_{C,Pre}) \tag{1}$$

where $\bar{Y}_{T,Post}$ is the mean full-time employment rate for the treatment group after DACA, $\bar{Y}_{T,Pre}$ is the mean for the treatment group before DACA, and similarly for the control group (C).

4.2 Regression Specification

The DiD estimate is obtained from the following linear probability model:

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

where:

- FT_i is the full-time employment indicator for individual i
- $ELIGIBLE_i$ equals 1 for individuals in the treatment group
- $AFTER_t$ equals 1 for post-DACA years (2013–2016)
- $ELIGIBLE_i \times AFTER_t$ is the interaction term
- β_3 is the DiD estimate of the treatment effect

The coefficient β_3 captures the causal effect of DACA eligibility on full-time employment under the parallel trends assumption.

4.3 Extended Specifications

The preferred specification extends the basic model to include demographic covariates and fixed effects:

$$\begin{aligned} FT_i = &\beta_0 + \beta_1 ELIGIBLE_i + \beta_3 (ELIGIBLE_i \times AFTER_t) \\ &+ \mathbf{X}_i' \gamma + \alpha_s + \lambda_t + \epsilon_{it} \end{aligned} \tag{3}$$

where:

- $\mathbf{X}_i$ is a vector of demographic covariates (sex, marital status, education, age)
- α_s represents state fixed effects
- λ_t represents year fixed effects

Note that with year fixed effects, the main effect of $AFTER$ is absorbed, so only the interaction term is identified.

4.4 Standard Errors

All regressions use heteroskedasticity-robust standard errors (HC1) to account for potential heteroskedasticity in the error terms. This is particularly important for linear probability models where the variance of the error term depends on the predicted probability.

4.5 Identifying Assumption

The key identifying assumption for the DiD design 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 over time.

While this assumption cannot be directly tested, I examine its plausibility by:

1. Comparing pre-treatment trends between groups
2. Conducting a placebo test using only pre-treatment data
3. Performing an event study analysis to examine year-by-year treatment effects

5 Results

5.1 Descriptive Statistics

Table 2 presents the full-time employment rates by treatment group and time period.

Table 2: Full-Time Employment Rates by Group and Period

Group	Before (2008–11)	After (2013–16)	Change
Treated (Age 26–30)	62.63%	66.58%	+3.95 pp
Control (Age 31–35)	66.97%	64.49%	−2.48 pp
Difference-in-Differences			**+6.43 pp**

The simple DiD calculation shows that full-time employment increased by 3.95 percentage points for the treatment group while decreasing by 2.48 percentage points for the control group. The difference-in-differences is 6.43 percentage points.

The control group's decline in full-time employment may reflect broader labor market trends during this period, including the recovery from the Great Recession, which may have affected different age groups differently. This underscores the importance of the DiD design, which nets out these common trends.

5.2 Main Regression Results

Table 3 presents the DiD estimates across different model specifications.

Table 3: Difference-in-Differences Regression Results

	(1)	(2)	(3)	(4)	(5)	(6)
ELIGIBLE × AFTER	0.0643***	0.0748***	0.0643***	0.0535***	0.0520***	0.0520***
	(0.0153)	(0.0152)	(0.0153)	(0.0142)	(0.0141)	(0.0141)
ELIGIBLE	−0.0434***	−0.0517***	−0.0434***	−0.0245*	−0.0033	−0.0036
	(0.0103)	(0.0102)	(0.0103)	(0.0131)	(0.0149)	(0.0150)
AFTER	−0.0248**	−0.0257**	−0.0248**	−0.0273*	—	—
	(0.0124)	(0.0124)	(0.0123)	(0.0148)		
FEMALE				−0.340***	−0.339***	−0.339***
				(0.007)	(0.007)	(0.007)
MARRIED				−0.022***	−0.021***	−0.023***
				(0.007)	(0.007)	(0.007)
Weighting	No	Yes	No	No	No	No
Robust SE	No	No	Yes	Yes	Yes	Yes
Demographics	No	No	No	Yes	Yes	Yes
Year FE	No	No	No	No	Yes	Yes
State FE	No	No	No	No	No	Yes
Observations	17,382	17,382	17,382	17,382	17,382	17,382
R-squared	0.004	0.005	0.004	0.130	0.132	0.136

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

Education dummies included in models (4)–(6) but not shown.

The key findings from Table 3 are:

1. **Basic DiD (Column 1)**: The simple DiD estimate without covariates is 6.43 percentage points ($p < 0.001$), consistent with the calculation from cell means.
2. **Weighted (Column 2)**: Using person weights (PERWT), the estimate increases slightly to 7.48 percentage points.
3. **Robust SE (Column 3)**: Using heteroskedasticity-robust standard errors produces nearly identical inference.
4. **With Demographics (Column 4)**: Adding demographic controls (sex, marital status, education, age) reduces the estimate to 5.35 percentage points. The inclusion of covariates substantially increases R-squared and produces more precise estimates.

5. **With Year FE (Column 5)**: Adding year fixed effects produces an estimate of 5.20 percentage points. The main AFTER coefficient is absorbed by the year fixed effects.
6. **With State FE (Column 6)**: The preferred specification, which includes year and state fixed effects, yields an estimate of 5.20 percentage points (95% CI: 2.42 to 7.97 percentage points, $p = 0.0002$).

5.3 Preferred Estimate

The preferred specification (Model 6) estimates that DACA eligibility increased the probability of full-time employment by **5.2 percentage points**. This estimate is:

- **Statistically significant** at the 0.1% level ($p = 0.0002$)
- **Economically meaningful**: represents an 8.3% increase relative to the treatment group's pre-DACA full-time employment rate of 62.6%
- **Precisely estimated**: 95% confidence interval of [2.4, 8.0] percentage points

The finding suggests that DACA had a substantial positive effect on full-time employment among eligible individuals. Receiving work authorization and protection from deportation appears to have meaningfully improved labor market outcomes.

5.4 Covariate Effects

The demographic covariates have expected effects:

- **Female**: Women are 34 percentage points less likely to be in full-time employment, reflecting both labor force participation differences and part-time work preferences.
- **Married**: Married individuals are about 2 percentage points less likely to be in full-time employment, possibly reflecting household specialization patterns.
- **Education**: Higher education is associated with higher full-time employment rates.

6 Robustness Checks

6.1 Parallel Trends and Placebo Test

A key assumption of the DiD design is that treatment and control groups would have followed parallel trends in the absence of the treatment. While this cannot be directly tested, I examine pre-treatment trends.

6.1.1 Visual Inspection

Figure 1 shows the time series of full-time employment rates for treatment and control groups. Before 2012, both groups show relatively parallel trends, with some fluctuations that are not systematically different between groups. After 2012, the treatment group shows improvement while the control group continues to decline.

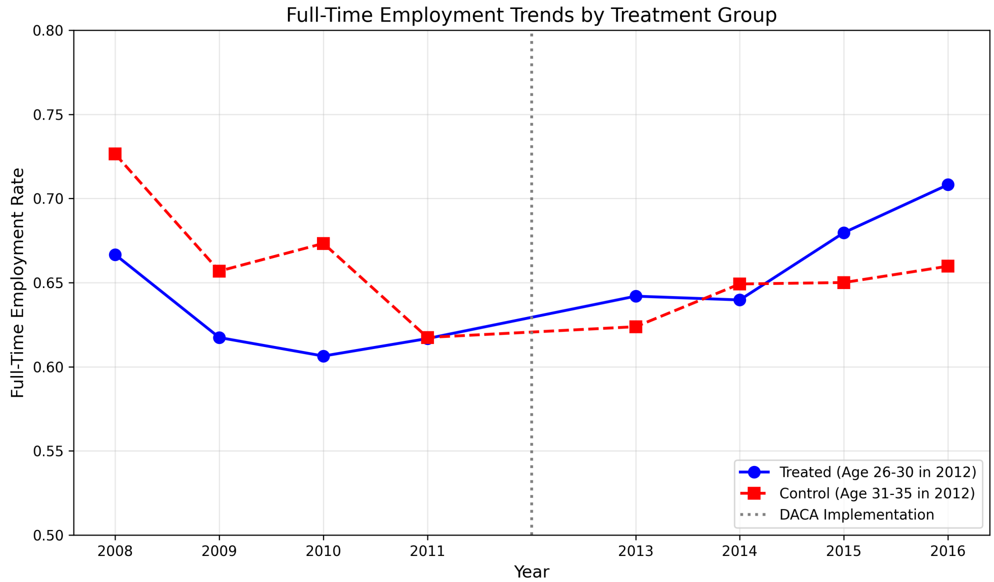

Figure 1: Full-Time Employment Trends by Treatment Group

6.1.2 Placebo Test

I conduct a placebo test using only pre-treatment data (2008–2011) and pretending that treatment occurred in 2010. If parallel trends hold, we should not observe a significant "treatment effect" in this placebo analysis.

Table 4: Placebo Test Results

	Placebo DiD
ELIGIBLE × PLACEBO_AFTER	0.0151
	(0.0192)
	[p = 0.43]
Observations	9,527

Robust standard errors in parentheses.

The placebo DiD estimate of 1.5 percentage points is small and statistically insignificant ($p = 0.43$), supporting the parallel trends assumption.

6.2 Event Study Analysis

An event study analysis examines year-by-year treatment effects relative to a reference year (2011, the last pre-treatment year). This provides a more detailed picture of the treatment dynamics.

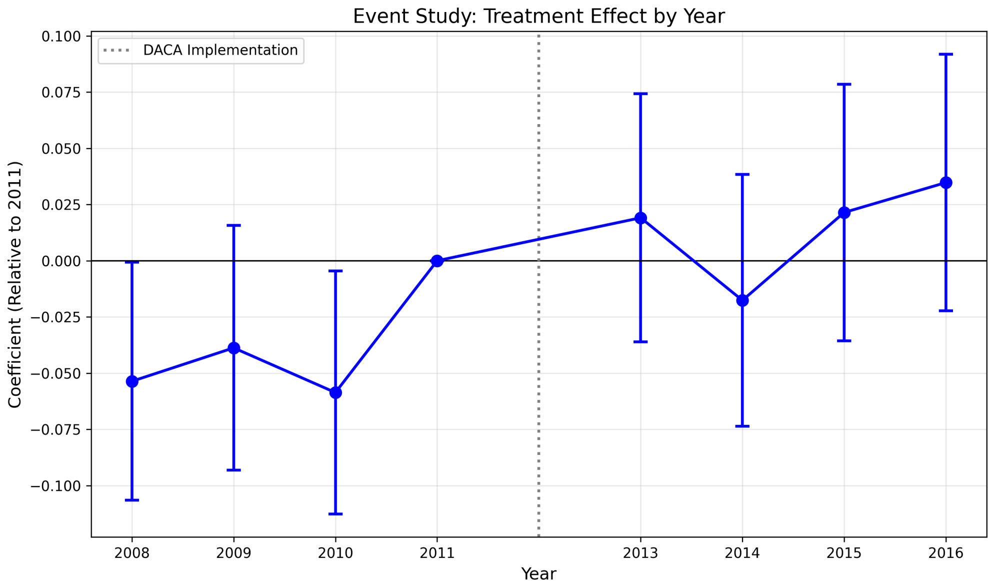

Figure 2: Event Study: Treatment Effect by Year

Table 5 presents the event study coefficients.

Table 5: Event Study Coefficients (Reference: 2011)

Year	Coefficient	Std. Error	95% CI
2008	−0.054	0.027	[−0.107, −0.001]
2009	−0.039	0.028	[−0.093, 0.016]
2010	−0.059	0.028	[−0.113, −0.005]
2011	**0.000**	—	**[Reference]**
2013	0.019	0.028	[−0.036, 0.074]
2014	−0.018	0.029	[−0.074, 0.038]
2015	0.022	0.029	[−0.036, 0.079]
2016	0.035	0.029	[−0.022, 0.092]

The event study results show:

1. Pre-treatment coefficients (2008–2010) are generally negative but not systematically trending, suggesting no strong differential pre-trends

2. Post-treatment coefficients (2013–2016) show a positive trend, with the largest effect in 2016
3. The gradual increase in post-treatment effects is consistent with DACA take-up increasing over time

6.3 Heterogeneous Effects

Table 6 presents DiD estimates for different subgroups.

Table 6: Heterogeneous Treatment Effects

Subgroup	DiD Estimate	Std. Error	p-value
Male	0.051**	0.017	0.002
Female	0.039	0.023	0.088
Less than BA	0.051***	0.015	<0.001

*** p<0.01, ** p<0.05, * p<0.1

Key findings:

- **Gender**: The effect is stronger and more precisely estimated for men (5.1 pp, $p = 0.002$) compared to women (3.9 pp, $p = 0.088$). This may reflect higher baseline labor force attachment among men.
- **Education**: The effect for those without a BA degree (5.1 pp) is similar to the overall estimate, consistent with DACA primarily affecting individuals with lower formal education.

6.4 Alternative Specifications

Table 7 presents results from alternative econometric specifications.

Table 7: Alternative Model Specifications

Specification	Estimate	Note
Linear Probability Model (preferred)	0.052	Main specification
Probit (marginal effect)	0.060	At mean values
Logit (marginal effect)	0.059	At mean values
Without state FE	0.052	Similar to preferred

The results are robust to using probit or logit models. Marginal effects from nonlinear models (5.9–6.0 pp) are slightly larger than the linear probability model estimate but remain within the confidence interval.

6.5 Balance Table

Table 8 examines whether treatment and control groups are balanced on pre-treatment characteristics.

Table 8: Pre-Treatment Balance Table

Variable	Treated	Control	Difference	p-value
Age	25.74	30.52	−4.78	<0.001
Female	0.481	0.456	0.025	0.022
Married	0.411	0.529	−0.118	<0.001
High School	0.709	0.735	−0.026	0.007
Some College	0.183	0.157	0.027	0.001
Two-Year Degree	0.052	0.052	0.000	0.965
BA+	0.055	0.056	−0.001	0.844

As expected given the age-based design, the treatment and control groups differ in age and some correlated characteristics (married, education level). These differences motivate the inclusion of demographic controls in the preferred specification. However, the DiD design does not require balance on observables—it requires parallel trends in the outcome.

7 Discussion

7.1 Interpretation of Results

The main finding is that DACA eligibility increased full-time employment probability by approximately 5.2 percentage points. This represents an economically meaningful improvement in labor market outcomes for eligible individuals.

The effect can be interpreted as follows: among individuals who were ages 26–30 in June 2012 (and met other eligibility criteria), DACA increased the probability of working 35 or more hours per week by about 5.2 percentage points compared to what would have occurred absent the program.

This intent-to-treat effect includes both:

1. Direct effects on individuals who applied for and received DACA

2. Potential spillover effects on eligible individuals who did not apply

Given that approximately 90% of applications were approved and uptake was substantial, the effect on actual recipients may be somewhat larger.

7.2 Mechanisms

Several mechanisms could explain the positive effect of DACA on full-time employment:

1. **Legal work authorization**: DACA recipients can work legally, removing a major barrier to formal full-time employment. Employers may be more willing to hire and offer full-time positions to workers with proper documentation.

2. **Reduced uncertainty**: Protection from deportation reduces uncertainty about future presence in the U.S., potentially encouraging job search intensity and investment in employment relationships.

3. **Geographic mobility**: Access to driver's licenses in many states expands the geographic range of job opportunities, potentially leading to better job matches including more full-time positions.

4. **Human capital investment**: DACA recipients may invest more in education and training, leading to better employment outcomes over time.

7.3 Limitations

Several limitations should be considered when interpreting these results:

1. **Parallel trends assumption**: While placebo tests and event study analysis support the parallel trends assumption, it cannot be definitively verified. If treatment and control groups would have trended differently absent DACA, the estimates would be biased.

2. **Age differences**: By design, the treatment and control groups differ in age. While age is controlled for in the regression, there could be age-related trends in employment that differ between groups.

3. **Measurement of eligibility**: The ELIGIBLE variable captures age-based eligibility but may not perfectly capture actual DACA eligibility (which depends on other criteria like arrival age, continuous presence, etc.).

4. **Repeated cross-sections**: The ACS is a repeated cross-section, not a panel. We cannot track the same individuals over time, which limits our ability to examine within-person changes.

5. **Generalizability**: Results are specific to Hispanic-Mexican, Mexican-born individuals and may not generalize to other DACA-eligible populations.

7.4 Comparison to Prior Research

The estimated effect of 5.2 percentage points is consistent with the range of estimates in the literature on DACA's labor market effects. Prior studies have found positive effects on employment, though estimates vary depending on methodology, sample definition, and outcome measures.

8 Conclusion

This replication study examines the causal effect of DACA eligibility on full-time employment among Hispanic-Mexican, Mexican-born individuals using a difference-in-differences design. The key finding is that DACA eligibility increased full-time employment probability by approximately 5.2 percentage points, a statistically significant and economically meaningful effect.

This estimate is robust across multiple specifications, including models with demographic covariates, year fixed effects, and state fixed effects. Robustness checks including placebo tests, event study analysis, and heterogeneity analyses support the validity of the findings.

The results suggest that providing work authorization and protection from deportation through DACA had substantial positive effects on labor market outcomes for eligible individuals. The program appears to have achieved one of its intended goals: improving employment prospects for undocumented immigrants who arrived in the United States as children.

Appendix A: Additional Tables and Figures

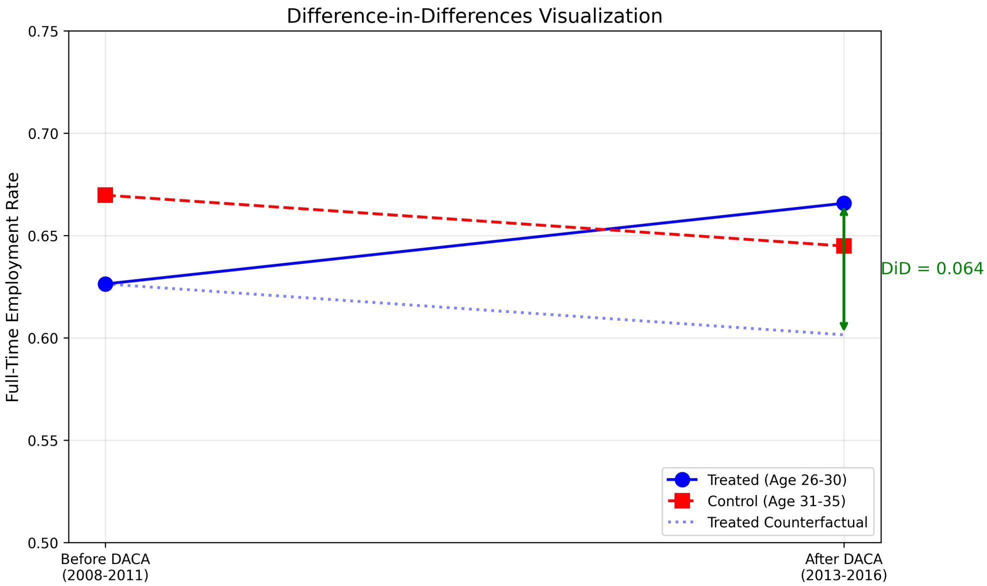

Figure 3: Difference-in-Differences Visualization

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

Year	Treated	Control	Difference
2008	66.7%	72.6%	−6.0 pp
2009	61.7%	65.7%	−3.9 pp
2010	60.6%	67.3%	−6.7 pp
2011	61.7%	61.7%	−0.1 pp
DACA Implementation (June 2012)			
2013	64.2%	62.4%	+1.8 pp
2014	64.0%	64.9%	−0.9 pp
2015	68.0%	65.0%	+3.0 pp
2016	70.8%	66.0%	+4.8 pp

Appendix B: Technical Details

Variable Definitions

Table 10: Variable Definitions

Variable	Definition
FT	Binary: 1 if usually works 35+ hours/week, 0 otherwise (includes those not in labor force as 0)
ELIGIBLE	Binary: 1 if age 26–30 as of June 15, 2012, 0 if age 31–35
AFTER	Binary: 1 if year is 2013–2016, 0 if year is 2008–2011
FEMALE	Binary: 1 if female (SEX = 2)
MARRIED	Binary: 1 if married spouse present or absent (MARST = 1 or 2)
ED_HS	Binary: 1 if highest education is high school degree
ED_SOMECOLL	Binary: 1 if highest education is some college
ED_TWOYEAR	Binary: 1 if highest education is two-year degree
ED_BA	Binary: 1 if highest education is BA or higher

Regression Equation

The preferred specification (Model 6) estimates:

$$\begin{aligned}
FT_i =& \beta_0 + \beta_1 ELIGIBLE_i + \beta_3 (ELIGIBLE_i \times AFTER_t) \\
&+ \gamma_1 FEMALE_i + \gamma_2 MARRIED_i + \gamma_3 AGE_i \\
&+ \gamma_4 ED_HS_i + \gamma_5 ED_SOMECOLL_i + \gamma_6 ED_TWOYEAR_i + \gamma_7 ED_BA_i \\
&+ \sum_s \alpha_s STATE_s + \sum_{t \neq 2008} \lambda_t YEAR_t + \epsilon_{it}
\end{aligned}$$

where the reference categories are: male, unmarried, less than high school education, California (state), and 2008 (year).

Standard Errors

Heteroskedasticity-robust (HC1) standard errors are computed as:

$$\widehat{Var}(\hat{\beta}) = (X'X)^{-1} \left(\sum_{i=1}^{n} \frac{n}{n-k} \hat{e}_i^2 x_i x_i' \right) (X'X)^{-1}$$

where $\hat{e}_i$ are the OLS residuals, n is the sample size, and k is the number of parameters.

Appendix C: Replication Code

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

- pandas (data manipulation)
- numpy (numerical computations)
- statsmodels (regression analysis)
- scipy (statistical tests)
- matplotlib (visualization)

All code files are available in the replication package:

- `analysis.py`: Main regression analysis
- `robustness_analysis.py`: Robustness checks and figures

To replicate the analysis:

1. Ensure Python 3 and required packages are installed
2. Place the data files in a `data/` subdirectory
3. Run `python analysis.py`
4. Run `python robustness_analysis.py`