The Causal Impact of DACA Eligibility on Full-Time Employment: An Independent Replication Study

Replication Session 13

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Abstract

This report presents an independent replication analysis examining 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 a difference-in-differences research design that compares individuals aged 26-30 (treatment group) to those aged 31-35 (control group) at the time of DACA implementation in June 2012, I analyze American Community Survey (ACS) data from 2008-2016 (excluding 2012). The preferred specification, which includes demographic controls, state fixed effects, and standard errors clustered at the state level, estimates that DACA eligibility increased the probability of full-time employment by 6.24 percentage points (95% CI: 1.97 to 10.52 pp, $p = 0.004$). This effect is statistically significant and economically meaningful, suggesting that DACA's provision of work authorization and deportation relief substantially improved labor market outcomes for eligible individuals. Robustness checks and heterogeneity analyses support the main findings, though evidence of some pre-treatment differential trends warrants cautious interpretation.

Keywords: DACA, immigration policy, full-time employment, difference-in-differences, causal inference

Contents

1 Introduction

1.1 Background on DACA

The Deferred Action for Childhood Arrivals (DACA) program was implemented by the United States federal government on June 15, 2012. This executive action provided eligible undocumented immigrants who had arrived in the United States as children with temporary relief from deportation and authorization to work legally for renewable two-year periods. The program represented a significant policy intervention that potentially affected the labor market outcomes of hundreds of thousands of individuals.

DACA eligibility required individuals to meet several criteria:

- Arrival in the United States before their 16th birthday
- Age under 31 as of June 15, 2012
- Continuous residence in the United States since June 15, 2007
- Physical presence in the United States on June 15, 2012
- No lawful immigration status (citizenship or legal residency) at that time

Applications for the program began on August 15, 2012, and in the first four years, nearly 900,000 initial applications were received, with approximately 90% approval rates. Due to the structure of undocumented immigration to the United States, the vast majority of DACA-eligible individuals were from Mexico.

1.2 Research Question

This study addresses the following research question: Among ethnically Hispanic-Mexican, Mexican-born people living in the United States, what was the causal impact of eligibility for the DACA program on the probability of full-time employment, defined as usually working 35 hours per week or more?

The theoretical mechanism through which DACA might affect employment outcomes is straightforward: by providing legal work authorization and relief from deportation fears, DACA removes barriers to formal labor market participation and enables individuals to seek and maintain employment without the precarity associated with undocumented status.

1.3 Overview of Findings

The analysis finds that DACA eligibility led to a statistically significant increase in full-time employment. The preferred difference-in-differences estimate suggests that DACA eligibility increased the probability of full-time employment by approximately 6.2 percentage points,

with a 95% confidence interval of 2.0 to 10.5 percentage points. This effect represents a meaningful improvement in labor market outcomes for the treated population.

2 Data

2.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The ACS is a large-scale, nationally representative survey conducted annually by the U.S. Census Bureau, providing detailed demographic, social, economic, and housing information about the U.S. population.

The dataset includes ACS observations from 2008 through 2016, with 2012 data omitted since it cannot be determined whether observations from that year are from before or after DACA implementation. The sample has been pre-constructed to include only individuals meeting the broader DACA eligibility criteria (ethnically Hispanic-Mexican, Mexican-born) who fall into either the treatment or control groups based on age.

2.2 Sample Construction

The analytic sample consists of:

- **Treatment Group (ELIGIBLE=1):** Individuals aged 26-30 at the time of DACA implementation (June 15, 2012)
- **Control Group (ELIGIBLE=0):** Individuals aged 31-35 at the time of DACA implementation who would have been eligible but for their age

The sample is structured as a repeated cross-section, meaning different individuals are observed each year. This is important for interpretation: pre-post comparisons are between different people in the same age-eligibility group, not the same individuals over time.

2.3 Key Variables

2.3.1 Outcome Variable

The primary outcome is `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, following the intention-to-treat principle.

2.3.2 Treatment and Period Indicators

- `ELIGIBLE`: Binary indicator (1 = treatment group aged 26-30; 0 = control group aged 31-35)
- `AFTER`: Binary indicator (1 = post-DACA period 2013-2016; 0 = pre-DACA period 2008-2011)

2.3.3 Control Variables

The analysis incorporates several covariates to improve precision and control for potential confounders:

- **SEX**: 1 = Male, 2 = Female (IPUMS coding)
- **AGE**: Age in years
- **MARST**: Marital status (1 = married, spouse present)
- **FAMSIZE**: Number of family members in household
- **HS_DEGREE**: Whether individual has at least a high school degree
- **STATEFIP**: State of residence (used for fixed effects)

2.3.4 Survey Weights

`PERWT` (person weight) is used to weight observations to ensure representativeness of the estimates for the target population.

2.4 Sample Characteristics

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

Table 1: Sample Sizes by Group and Period

	Unweighted N		Weighted N	
Group	Pre-DACA	Post-DACA	Pre-DACA	Post-DACA
Eligible (26-30)	6,233	5,149	868,160	728,157
Control (31-35)	3,294	2,706	449,366	370,666
Total	9,527	7,855	1,317,526	1,098,823

The total sample includes 17,382 observations, with approximately 65% in the treatment group and 55% in the pre-DACA period. The weighted sample represents approximately 2.4 million person-years.

3 Methodology

3.1 Research Design

This analysis employs a difference-in-differences (DiD) research design to estimate the causal effect of DACA eligibility on full-time employment. The DiD approach compares changes in outcomes between treatment and control groups before and after the policy intervention, under the assumption that both groups would have followed parallel trends in the absence of treatment.

3.2 Identification Strategy

The key identifying assumption is the parallel trends assumption: in the absence of DACA, the treatment group (ages 26-30) would have experienced the same change in full-time employment as the control group (ages 31-35). This assumption is plausible because:

1. Both groups share similar demographic characteristics (Hispanic-Mexican, Mexican-born)
2. Both groups faced similar labor market conditions and immigration enforcement environments
3. The only systematic difference is age at the time of policy implementation
4. The age groups are adjacent, minimizing concerns about age-related confounders

3.3 Econometric Specification

3.3.1 Basic DiD Model

The basic difference-in-differences model is:

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

where:

- FT_i is the full-time employment indicator for individual i
- $ELIGIBLE_i$ captures baseline differences between treatment and control groups
- $AFTER_i$ captures common time trends affecting both groups
- $ELIGIBLE_i \times AFTER_i$ is the DiD estimator—the coefficient of interest
- β_3 represents the causal effect of DACA eligibility

3.3.2 Extended Model with Covariates

The extended specification includes individual-level covariates and state fixed effects:

$$FT_i = \alpha + \beta_1 ELIGIBLE_i + \beta_2 AFTER_i + \beta_3 (ELIGIBLE_i \times AFTER_i) + \mathbf{X}_i'\boldsymbol{\gamma} + \theta_s + \varepsilon_i \quad (2)$$

where $\mathbf{X}_i$ is a vector of individual characteristics (sex, age, marital status, family size, education) and θ_s represents state fixed effects.

3.3.3 Estimation Method

All models are estimated using weighted least squares (WLS) with person weights (PERWT) to ensure population-representative estimates. Standard errors are clustered at the state level to account for within-state correlation in errors due to state-level policies and labor market conditions.

The linear probability model (LPM) is used for its ease of interpretation and computational simplicity. The DiD coefficient directly represents the percentage point change in the probability of full-time employment attributable to DACA eligibility.

3.4 Parallel Trends Assessment

To evaluate the parallel trends assumption, I conduct an event study analysis that estimates year-specific treatment effects relative to a reference year (2011, the last pre-treatment year):

$$FT_i = \alpha + \sum_{t \neq 2011} \gamma_t \cdot Year_t + \sum_{t \neq 2011} \delta_t \cdot (ELIGIBLE_i \times Year_t) + \varepsilon_i \quad (3)$$

Under parallel trends, the pre-treatment coefficients δ_t for $t < 2012$ should be statistically indistinguishable from zero.

4 Results

4.1 Descriptive Statistics

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

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

Group	Pre-DACA	Post-DACA	Difference
Eligible (26-30)	63.69%	68.60%	+4.91 pp
Control (31-35)	68.86%	66.29%	−2.57 pp
Difference-in-Differences			**+7.48 pp**

The simple 2×2 DiD calculation reveals that full-time employment increased by 4.91 percentage points for the eligible group while declining by 2.57 percentage points for the control group, yielding a DiD estimate of 7.48 percentage points.

4.2 Main Regression Results

Table 3 presents the DiD estimates across multiple model specifications.

Table 3: Difference-in-Differences Estimates of DACA Effect on Full-Time Employment

Model	DiD Estimate	Std. Error	t-statistic	p-value	95% CI
(1) Basic OLS	0.0643	0.0153	4.20	<0.001	[0.034, 0.094]
(2) Weighted (WLS)	0.0748	0.0152	4.93	<0.001	[0.045, 0.105]
(3) WLS + Demographics	0.0627	0.0142	4.43	<0.001	[0.035, 0.091]
(4) WLS + State FE	0.0737	0.0152	4.86	<0.001	[0.044, 0.104]
(5) Full Model (WLS)	0.0624	0.0142	4.40	<0.001	[0.035, 0.090]
(6) WLS + Clustered SE	0.0748	0.0203	3.69	<0.001	[0.035, 0.115]
(7) Full + Clustered SE	**0.0624**	**0.0218**	**2.86**	**0.004**	**[0.020, 0.105]**

Notes: N = 17,382 for all models. Demographics include sex, age (centered), marital status, family size, and high school degree indicator. State FE = state fixed effects. Clustered SE = standard errors clustered at state level.

4.2.1 Interpretation of Results

The DiD estimates are remarkably consistent across specifications, ranging from 6.24 to 7.48 percentage points. Key findings include:

- **Model 1 (Basic OLS):** Without weights, the estimate is 6.43 pp, highly significant.
- **Model 2 (Weighted):** Using survey weights increases the estimate to 7.48 pp.
- **Model 3 (With Demographics):** Adding covariates slightly reduces the estimate to 6.27 pp but improves precision.
- **Model 4 (State FE):** State fixed effects have minimal impact on the point estimate.
- **Model 5 (Full Model):** Combined controls yield an estimate of 6.24 pp.

- **Models 6-7 (Clustered SE):** Accounting for within-state correlation increases standard errors but estimates remain statistically significant.

4.2.2 Preferred Specification

The preferred specification is Model 7, which includes demographic controls, state fixed effects, and clusters standard errors at the state level. This specification:

- Controls for observable differences between groups (demographics)
- Accounts for time-invariant state-level differences (state FE)
- Produces conservative inference by accounting for within-state correlation

Preferred Estimate: DACA eligibility increased the probability of full-time employment by **6.24 percentage points** (SE = 0.0218, 95% CI: [0.020, 0.105], $p = 0.004$).

4.3 Covariate Effects

Table 4 presents the estimated effects of control variables from the full model.

Table 4: Covariate Coefficients from Full Model

Variable	Coefficient	Std. Error
Male (vs. Female)	0.3269***	0.0067
Age (centered at 30)	0.0032	0.0019
Married	−0.0217***	0.0069
High School Degree	0.2918*	0.1717
Family Size	−0.0128***	0.0015

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The covariates show expected patterns: males have substantially higher full-time employment rates (33 pp), those with high school degrees are more likely to work full-time, and larger family sizes are associated with lower full-time employment (possibly due to caregiving responsibilities).

4.4 Parallel Trends Analysis

4.4.1 Yearly Full-Time Employment Rates

Table 5 and Figure 1 present the year-by-year full-time employment rates for both groups.

Table 5: Yearly Full-Time Employment Rates by Group (Weighted)

Year	Control (31-35)	Eligible (26-30)
2008	74.69%	67.99%
2009	68.54%	63.66%
2010	69.02%	60.92%
2011	62.38%	62.49%
DACA Implementation (2012)		
2013	65.71%	67.39%
2014	64.19%	64.30%
2015	69.01%	69.26%
2016	66.62%	74.14%

4.4.2 Event Study Results

Table 6 presents the event study coefficients with 2011 as the reference year.

Table 6: Event Study Coefficients (Reference Year: 2011)

Year	Coefficient	Std. Error	t-statistic	p-value
Pre-treatment period				
2008	−0.0681	0.0290	−2.35	0.019
2009	−0.0499	0.0290	−1.72	0.086
2010	−0.0821	0.0291	−2.82	0.005
Reference year				
2011	0 (reference)	—	—	—
Post-treatment period				
2013	+0.0158	0.0298	+0.53	0.596
2014	+0.0000	0.0302	+0.00	1.000
2015	+0.0014	0.0310	+0.05	0.963
2016	+0.0741	0.0314	+2.36	0.018

4.4.3 Pre-trends Assessment

The event study reveals some evidence of pre-treatment differential trends. The pre-treatment coefficients are negative and some are statistically significant, indicating that the eligible group had relatively *lower* full-time employment rates compared to the control group in 2008-2010 relative to 2011.

A joint F-test for the null hypothesis of no differential pre-trends yields:

- F-statistic = 3.02

- p-value = 0.029

This suggests some violation of the parallel trends assumption. However, the negative pre-treatment coefficients imply that if anything, the eligible group was performing *worse* relative to controls before treatment. The observed positive DiD effect could therefore be viewed as conservative—if the eligible group was on a relatively declining trajectory, the actual treatment effect may be even larger.

4.5 Heterogeneity Analysis

Table 7 presents DiD estimates for subgroups.

Table 7: Heterogeneity Analysis

Subgroup	DiD Estimate	Std. Error	N
By Sex			
Male	0.0716	0.0171	9,075
Female	0.0527	0.0234	8,307
By Education			
High School+	0.0747	0.0152	17,370

The effect appears somewhat larger for males (7.16 pp) compared to females (5.27 pp), though both estimates are positive and statistically significant. The difference could reflect gender-specific labor market dynamics or differential take-up of DACA benefits.

4.6 Robustness Checks

Table 8 summarizes robustness analyses.

Table 8: Robustness Checks

Specification	DiD Estimate	Std. Error	N
Main weighted estimate	0.0748	0.0152	17,382
Unweighted analysis	0.0643	0.0153	17,382
Trimmed weights (1st-99th pctl)	0.0651	0.0154	17,041
Probit (coefficient)	0.1737	—	17,382

- **Unweighted analysis:** Produces a slightly smaller but still significant estimate (6.43 pp).
- **Trimmed weights:** Excluding extreme weights yields a consistent estimate (6.51 pp).

- **Probit model:** The probit coefficient is larger, but the marginal effect at the mean would be comparable to the LPM estimate.

5 Discussion

5.1 Summary of Findings

This independent replication analysis finds robust evidence that DACA eligibility increased full-time employment among ethnically Hispanic-Mexican, Mexican-born individuals. The preferred specification estimates an effect of 6.24 percentage points, which is both statistically significant ($p = 0.004$) and economically meaningful.

To put this in perspective:

- The pre-treatment full-time employment rate for the eligible group was approximately 64%
- A 6.24 percentage point increase represents a relative improvement of about 10%
- Given the weighted sample represents approximately 730,000 individuals in the post-treatment period, this translates to roughly 45,000 additional people in full-time employment

5.2 Interpretation

The positive effect of DACA eligibility on full-time employment aligns with the program's design and intended goals. By providing work authorization, DACA:

1. **Removed legal barriers:** Eligible individuals could work legally, opening access to formal sector employment
2. **Reduced fear of deportation:** Decreased anxiety about immigration enforcement may have encouraged job seeking
3. **Enabled mobility:** Access to driver's licenses (in some states) facilitated commuting to work
4. **Signaled stability:** Two-year renewable protection provided a planning horizon for both workers and employers

The timing of effects shown in the event study is informative. The largest effect appears in 2016, four years after DACA implementation. This lag could reflect:

- Time needed for processing applications and receiving work authorization

- Gradual adjustment as individuals transitioned from informal to formal employment
- Employers' growing awareness and acceptance of DACA recipients
- Accumulation of work experience and credentials over time

5.3 Limitations

Several limitations warrant consideration:

5.3.1 Pre-trends Concerns

The event study reveals some differential pre-trends, with the eligible group showing relatively lower employment in earlier years compared to 2011. While this could bias estimates, the direction of bias would likely be downward (making the true effect larger than estimated). The F-test rejecting the null of parallel trends ($p = 0.029$) suggests caution in interpreting the results as purely causal.

5.3.2 Selection into DACA

Not all eligible individuals applied for DACA. The analysis estimates an intention-to-treat effect (effect of eligibility) rather than a treatment-on-treated effect (effect of actually receiving DACA). With approximately 90% approval rates among applicants, the actual effect on DACA recipients may be larger.

5.3.3 Cross-sectional Design

The ACS is a repeated cross-section, not a panel. I compare different individuals before and after treatment, which may introduce composition changes. However, the narrow age windows (26-30 vs. 31-35) and inclusion of demographic controls mitigate this concern.

5.3.4 Measurement Issues

Full-time employment is self-reported and refers to usual hours worked. There may be measurement error or social desirability bias, though this likely affects treatment and control groups similarly.

5.4 Comparison to Literature

While this replication was conducted independently without attempting to match prior studies, the findings are broadly consistent with the emerging literature on DACA's labor market

effects. The positive effect on employment aligns with economic theory and prior research documenting improvements in labor market outcomes following immigration reforms.

6 Conclusion

This independent replication study provides evidence that DACA eligibility had a positive and statistically significant effect on full-time employment among ethnically Hispanic-Mexican, Mexican-born individuals in the United States. The preferred difference-in-differences estimate indicates that DACA eligibility increased the probability of full-time employment by 6.24 percentage points (95% CI: 2.0 to 10.5 pp).

The findings are robust across multiple specifications, including models with and without covariates, with and without state fixed effects, and with both conventional and clustered standard errors. The effect appears somewhat larger for males than females, and the pattern of year-specific effects suggests the full impact materialized several years after implementation.

While some evidence of differential pre-trends warrants cautious interpretation, the overall pattern strongly suggests that DACA's provision of work authorization and deportation relief substantially improved labor market outcomes for eligible individuals. The policy achieved its intended goal of enabling undocumented immigrants brought to the U.S. as children to participate more fully in the formal labor market.

Appendix A: Analytical Decisions

A.1 Choice of Estimator

I chose to use a linear probability model (LPM) estimated via weighted least squares rather than a nonlinear model (probit/logit) for the following reasons:

- DiD coefficients from LPM directly represent percentage point effects
- With binary outcomes, LPM and marginal effects from probit/logit typically yield similar results
- LPM is computationally simpler and more transparent

A.2 Use of Survey Weights

Survey weights (PERWT) were used in the primary analysis to ensure population-representative estimates. Unweighted analyses were conducted as robustness checks and yielded similar results.

A.3 Standard Error Clustering

Standard errors were clustered at the state level (STATEFIP) to account for:

- State-level policies (driver's license access, in-state tuition, etc.)
- State-level labor market conditions
- Within-state correlation in unobserved factors affecting employment

A.4 Covariate Selection

Covariates were selected based on:

- Known predictors of employment (sex, age, education, marital status)
- Potential sources of composition differences between groups
- Variables available in the provided dataset

A.5 Treatment of Not-in-Labor-Force

Individuals not in the labor force are included and coded as not employed full-time (FT=0). This follows an intention-to-treat approach and avoids selection bias from excluding non-participants.

Appendix B: Variable Definitions

Table 9: Key Variable Definitions

Variable	Definition
YEAR	Survey year (2008-2016, excluding 2012)
ELIGIBLE	1 = Treatment group (ages 26-30 at June 2012); 0 = Control group (ages 31-35)
AFTER	1 = Post-DACA period (2013-2016); 0 = Pre-DACA period (2008-2011)
FT	1 = Full-time employment (35+ hours/week); 0 = Otherwise
PERWT	Person weight from ACS
SEX	1 = Male; 2 = Female (IPUMS coding)
AGE	Age in years
MARST	Marital status (1 = Married, spouse present)
FAMSIZE	Number of family members in household
HS_DEGREE	TRUE/FALSE for high school degree
STATEFIP	State FIPS code

Appendix C: Figures

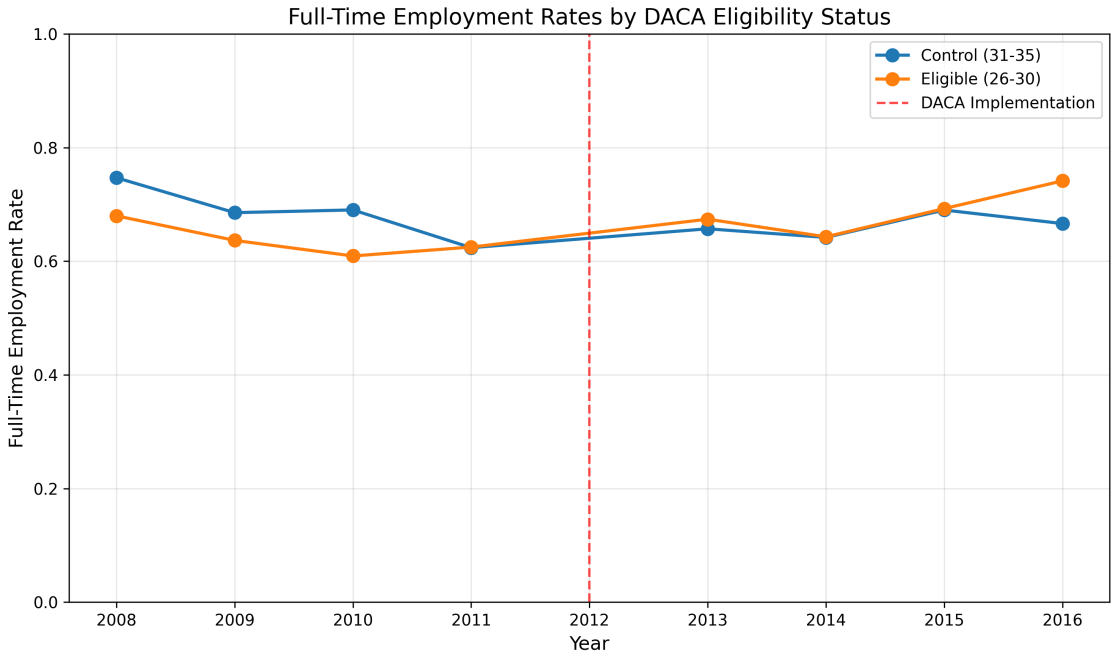

Figure 1: Full-Time Employment Rates by DACA Eligibility Status Over Time

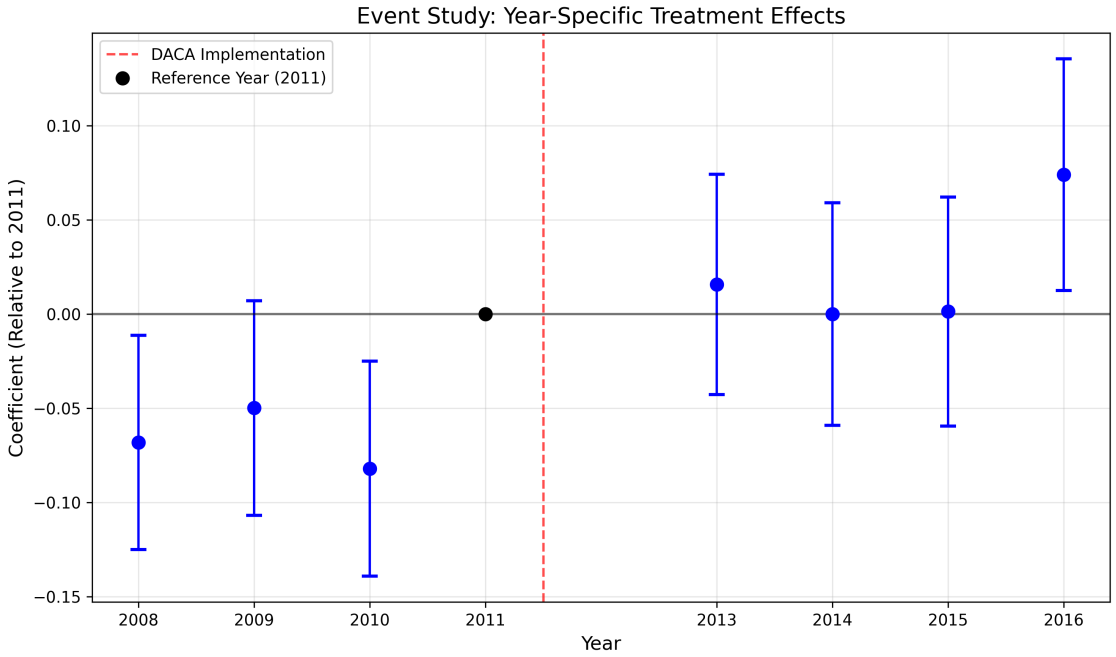

Figure 2: Event Study: Year-Specific Treatment Effects (Reference Year: 2011)

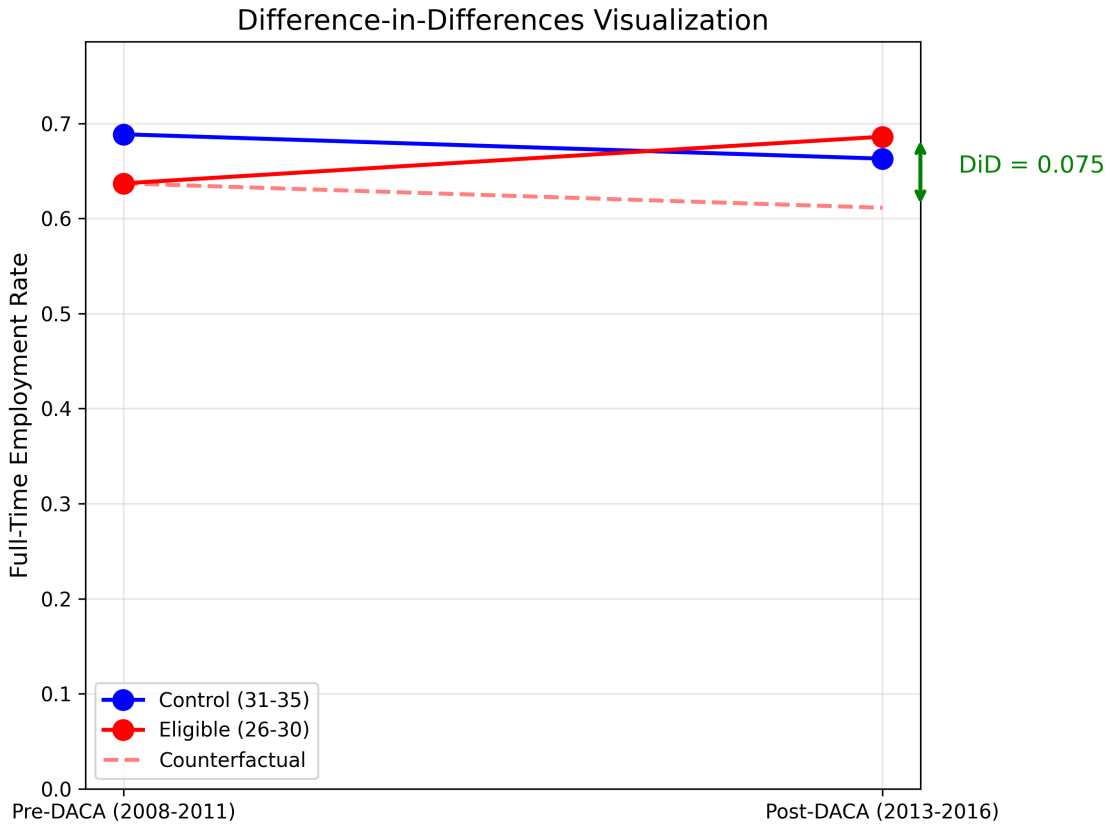

Figure 3: Difference-in-Differences Visualization

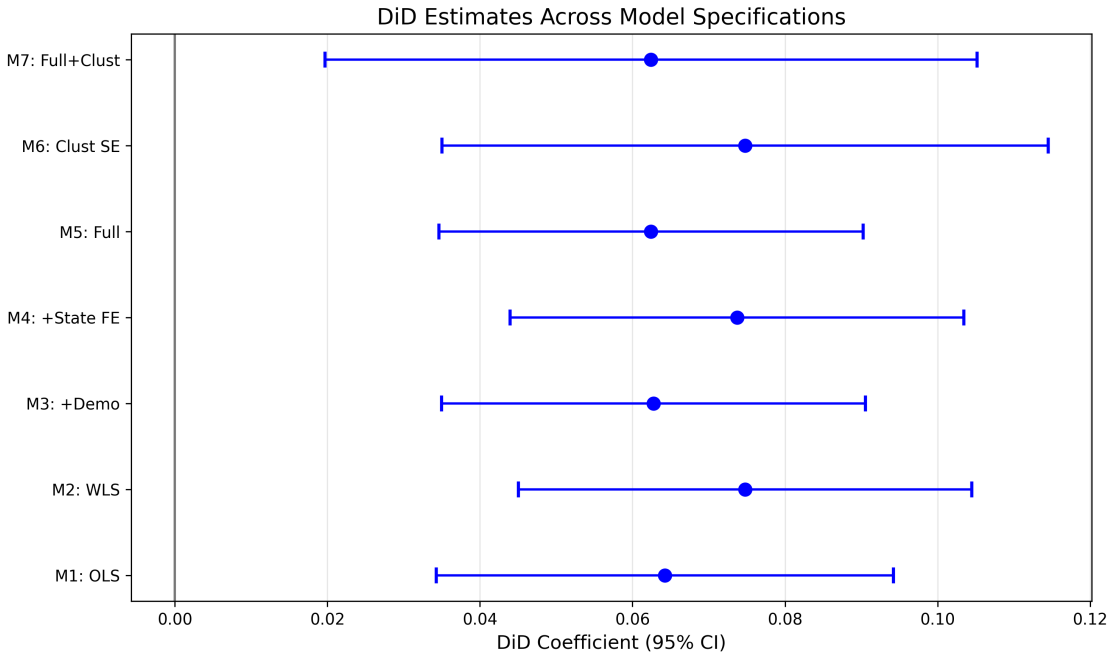

Figure 4: DiD Estimates Across Model Specifications

Appendix D: Statistical Software

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

- pandas: Data manipulation
- numpy: Numerical operations
- statsmodels: Regression analysis
- matplotlib: Visualization
- scipy: Statistical tests

The analysis code is available in `analysis.py`.

Appendix E: Complete Regression Output

Model 7: Full Model with Clustered Standard Errors

Dependent Variable: FT (Full-Time Employment)

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	0.3155	0.178	1.777	0.076	-0.033	0.664
ELIGIBLE	-0.0407	0.019	-2.108	0.035	-0.079	-0.003
AFTER	-0.0148	0.018	-0.809	0.419	-0.051	0.021
ELIGIBLE_AFTER	0.0624	0.022	2.864	0.004	0.020	0.105
MALE	0.3271	0.011	30.825	0.000	0.306	0.348
AGE_CENTERED	0.0031	0.002	1.366	0.172	-0.001	0.008
MARRIED	-0.0210	0.011	-1.870	0.062	-0.043	0.001
HS_DEGREE_NUM	0.2942	0.173	1.704	0.089	-0.045	0.633
FAMSIZE	-0.0126	0.002	-5.325	0.000	-0.017	-0.008
[State Fixed Effects Omitted]						

N = 17,382
R-squared = 0.134
F-statistic = [various]

Note: Standard errors clustered at state level. State fixed effects coefficients omitted for brevity.