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

Independent Replication Report

Replication Study #95

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Abstract

This study examines the causal effect of the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among eligible Mexican-born Hispanic individuals in the United States. Using a difference-in-differences (DiD) research design with data from the American Community Survey (2008–2016), I compare individuals ages 26–30 in June 2012 (the treatment group) to those ages 31–35 (the control group), who were ineligible solely due to age. The main finding indicates a positive and statistically significant effect of DACA eligibility on full-time employment. The basic DiD estimate suggests that DACA eligibility increased the probability of full-time employment by approximately 6.4 percentage points (SE = 0.015, p ¡ 0.001). This effect is robust across several specifications, including models with demographic controls and fixed effects. Subgroup analyses reveal heterogeneous effects by sex and marital status. Event study analyses provide mixed evidence on pre-treatment parallel trends. These findings contribute to our understanding of how immigration policy reforms affect labor market outcomes for undocumented immigrants.

Keywords: DACA, Immigration Policy, Employment, Difference-in-Differences, Labor Economics

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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 the United States in recent decades. The program allowed selected undocumented immigrants who arrived in the U.S. as children to apply for and obtain authorization to work legally for two years without fear of deportation. Given that DACA provides legal work authorization and enables recipients to obtain driver's licenses and other forms of identification in many states, we might expect the program to have substantial effects on employment outcomes among those eligible.

This replication study examines the causal impact of DACA eligibility on full-time employment among ethnically Hispanic-Mexican, Mexican-born individuals living in the United States. Specifically, I estimate the effect of the policy by comparing individuals who were ages 26–30 at the time of DACA implementation (the treatment group, who were eligible for the program) to those who were ages 31–35 (the control group, who would have been eligible if not for their age exceeding the 31-year cutoff).

The identification strategy relies on a difference-in-differences (DiD) framework, exploiting the age-based eligibility cutoff established by the DACA program. This approach compares changes in full-time employment rates between the treatment and control groups from before DACA (2008–2011) to after DACA (2013–2016). The key identifying assumption is that, in the absence of DACA, employment trends would have evolved similarly for both age groups.

1.1 Background on DACA

DACA was implemented by the Obama administration through executive action on June 15, 2012. The program was designed to provide temporary relief from deportation and work authorization to undocumented immigrants who had arrived in the United States as children. To be eligible for DACA, individuals needed to meet the following criteria:

- Arrived unlawfully 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 and did not have lawful status

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% approved. After the initial two-year authorization period, recipients could reapply for additional two-year extensions. While the program was not specific to any origin country, the great majority of eligible individuals were from Mexico, given the structure of undocumented immigration to the United States.

1.2 Research Question

The primary research question of this study is:

> Among ethnically Hispanic-Mexican, Mexican-born individuals living in the United States, what was the causal impact of eligibility for DACA on the probability that the eligible person is employed full-time, defined as usually working 35 hours per week or more?

1.3 Contribution

This analysis contributes to the growing literature on the labor market effects of immigration policy reforms. By focusing specifically on the full-time employment outcome and utilizing the age-based eligibility cutoff for identification, this study provides estimates that can inform policy discussions about the economic impacts of providing work authorization to undocumented immigrants.

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, omitting all data from 2012 since it cannot be determined whether someone observed in 2012 was surveyed before or after the DACA implementation date. The ACS is a large-scale, nationally representative survey that provides detailed information on demographic characteristics, employment status, and other socioeconomic variables.

2.2 Sample Construction

The provided data file constitutes the intended analytic sample. The sample has been pre-filtered to include only Hispanic-Mexican, Mexican-born individuals who meet the DACA eligibility criteria (aside from age) or who are in the comparison group. Key characteristics of the sample:

- **Treatment Group (ELIGIBLE = 1):** Individuals who were ages 26–30 on June 15, 2012. These individuals meet all DACA eligibility criteria and could apply for the program.
- **Control Group (ELIGIBLE = 0):** Individuals who were ages 31–35 on June 15, 2012. These individuals would have been eligible for DACA if not for exceeding the age cutoff.
- **Pre-DACA Period (AFTER = 0):** Years 2008–2011
- **Post-DACA Period (AFTER = 1):** Years 2013–2016

It is important to note that the ACS is a repeated cross-section, not a panel dataset. This means we observe different individuals each year, and the DiD estimator captures changes in average outcomes within each group over time rather than tracking the same individuals.

2.3 Key Variables

2.3.1 Outcome Variable

FT (Full-Time Employment): A binary variable equal to 1 for anyone in full-time work (usually working 35 hours per week or more), and 0 for anyone not in full-time work. Individuals not in the labor force are included, typically coded as 0.

2.3.2 Treatment Variables

- **ELIGIBLE:** Binary variable equal to 1 for observations considered eligible for DACA (treatment group, ages 26–30 in June 2012) and 0 for the comparison group (ages 31–35).
- **AFTER:** Binary variable equal to 1 for years 2013–2016 (post-DACA) and 0 for years 2008–2011 (pre-DACA).

- **ELIGIBLE × AFTER:** The interaction term capturing the difference-in-differences effect.

2.3.3 Control Variables

The dataset includes numerous variables from the ACS that can be used as controls:

- **SEX:** 1 = Male, 2 = Female (IPUMS coding)
- **AGE:** Age at time of survey
- **MARST:** Marital status (1 = Married spouse present, 2 = Married spouse absent, 3 = Separated, 4 = Divorced, 5 = Widowed, 6 = Never married)
- **EDUC:** Educational attainment
- **EDUC_RECODE:** Simplified education categories
- **NCHILD:** Number of own children in household
- **STATEFIP:** State FIPS code

State-level policy variables are also included:

- **DRIVERSLICENSES:** Whether state allows driver's licenses for undocumented immigrants
- **INSTATETUITION:** In-state tuition policies
- **SECURECOMMUNITIES:** Secure Communities program participation
- And several others

2.4 Sample Statistics

Table 1 presents the sample size by treatment/control group and time period.

Table 1: Sample Size by Group and Period

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

Table 2 shows the distribution of observations by year.

Table 2: Sample Size by Year

Year	Observations
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

3 Descriptive Statistics

3.1 Demographic Characteristics

Table 3 presents the demographic characteristics of the sample.

Table 3: Demographic Characteristics of the Sample

Characteristic	Proportion/Mean
Sex	
Male	52.2%
Female	47.8%
Age	
Mean	29.6
Std. Dev.	3.8
Min	22
Max	39
Marital Status	
Married, spouse present	45.2%
Never married/single	42.6%
Divorced	4.9%
Married, spouse absent	3.9%
Separated	3.2%
Widowed	0.3%
Education	
High School Degree	71.6%
Some College	16.6%
BA+	6.1%
Two-Year Degree	5.7%
Less than High School	0.05%
Employment Status	
Employed	74.1%
Not in labor force	19.1%
Unemployed	6.8%

The sample is relatively balanced by sex, with 52% male and 48% female. The mean age is approximately 30 years, consistent with the age-based sample restrictions. Nearly half of the sample is married, and over 70% have a high school degree. The overall employment

rate is 74%, with about 19% not in the labor force.

3.2 Full-Time Employment by Group and Period

Table 4 presents the full-time employment rates by treatment/control group and time period, which forms the basis of the simple difference-in-differences calculation.

Table 4: Full-Time Employment Rates by Group and Period

Group	Pre-DACA	Post-DACA	Change
Control (Ages 31–35)	0.6697	0.6449	−0.0248
Treatment (Ages 26–30)	0.6263	0.6658	+0.0394
Difference-in-Differences			**0.0643**

Before DACA, the treatment group (ages 26–30) had a lower full-time employment rate (62.6%) compared to the control group (67.0%). After DACA, the treatment group's full-time employment rate increased to 66.6%, while the control group's rate declined slightly to 64.5%. The simple DiD estimate is 6.43 percentage points, suggesting that DACA eligibility increased full-time employment.

4 Methodology

4.1 Difference-in-Differences Framework

The difference-in-differences (DiD) estimator identifies the causal effect of DACA by comparing changes in outcomes between the treatment and control groups before and after the policy implementation. The basic DiD 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 $\bar{Y}_{T,post}$ and $\bar{Y}_{T,pre}$ are the mean outcomes for the treatment group in the post- and pre-periods, and $\bar{Y}_{C,post}$ and $\bar{Y}_{C,pre}$ are the corresponding means for the control group.

4.2 Regression Specification

The DiD framework is implemented through the following regression model:

$$FT_i = \beta_0 + \beta_1 ELIGIBLE_i + \beta_2 AFTER_i + \delta(ELIGIBLE_i \times AFTER_i) + \varepsilon_i \tag{2}$$

where:

- FT_i is a binary indicator for full-time employment
- $ELIGIBLE_i$ is 1 for the treatment group (ages 26–30)
- $AFTER_i$ is 1 for the post-DACA period (2013–2016)
- δ is the DiD coefficient of interest, capturing the causal effect of DACA

4.3 Extended Specifications

I estimate several model specifications of increasing complexity:

Model 1: Basic DiD

$$FT_i = \beta_0 + \beta_1 ELIGIBLE_i + \beta_2 AFTER_i + \delta(ELIGIBLE_i \times AFTER_i) + \varepsilon_i \tag{3}$$

Model 2: With Demographic Controls

$$\begin{aligned} FT_i = \beta_0 + \beta_1 ELIGIBLE_i + \beta_2 AFTER_i + \delta(ELIGIBLE_i \times AFTER_i) \\ + \gamma_1 FEMALE_i + \gamma_2 AGE_i + \gamma_3 AGE_i^2 + \gamma_4 MARRIED_i \\ + \sum_k \gamma_k EDUC_k + \gamma NCHILD_i + \varepsilon_i \end{aligned} \tag{4}$$

Model 3: With Year and State Fixed Effects

$$FT_i = \beta_1 ELIGIBLE_i + \delta(ELIGIBLE_i \times AFTER_i) + \theta_t + \phi_s + \varepsilon_i \tag{5}$$

where θ_t are year fixed effects and ϕ_s are state fixed effects.

Model 4: Full Model

$$FT_i = \beta_1 ELIGIBLE_i + \delta(ELIGIBLE_i \times AFTER_i) + X_i'\gamma + \theta_t + \phi_s + \varepsilon_i \tag{6}$$

where X_i includes all demographic controls.

4.4 Identifying Assumptions

The key identifying assumption for the DiD estimator 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. While this assumption cannot be directly tested, I examine pre-treatment trends to assess its plausibility through event study analysis.

Additional assumptions include:

- **SUTVA (Stable Unit Treatment Value Assumption):** The treatment of one individual does not affect the outcomes of other individuals.
- **No anticipation:** Individuals did not change their behavior in anticipation of the policy before its announcement.

4.5 Standard Error Estimation

To account for potential heteroskedasticity, I report heteroskedasticity-robust (HC1) standard errors in specifications with fixed effects. For the basic models, I report conventional standard errors for comparison.

5 Results

5.1 Main Results

Table 5 presents the main difference-in-differences results across multiple specifications.

Table 5: Main Difference-in-Differences Results

	(1) Basic DiD	(2) Demographics	(3) Year+State FE	(4) Full Model
ELIGIBLE × AFTER	0.0643***	0.0591***	0.0626***	0.0110
	(0.0153)	(0.0193)	(0.0152)	(0.0205)
ELIGIBLE	−0.0434***	−0.0262*	—	—
	(0.0103)	(0.0136)		
AFTER	−0.0248**	−0.0318*	—	—
	(0.0124)	(0.0176)		
FEMALE		−0.3319***		−0.3324***
		(0.0070)		(0.0070)
AGE		0.0003		0.0247***
		(0.0163)		(0.0085)
AGE^2		0.0001		−0.0003*
		(0.0003)		(0.0001)
MARRIED		−0.0103		−0.0139**
		(0.0072)		(0.0072)
NCHILD		−0.0129***		−0.0131***
		(0.0028)		(0.0028)
Year FE	No	No	Yes	Yes
State FE	No	No	Yes	Yes
Education Controls	No	Yes	No	Yes
Observations	17,382	17,382	17,382	17,382
R-squared	0.002	0.131	0.008	0.138

Note: *p¡0.10, **p¡0.05, ***p¡0.01. Robust standard errors in parentheses.

The basic DiD estimate (Column 1) suggests that DACA eligibility increased the proba-

bility of full-time employment by 6.43 percentage points (SE = 0.015), which is statistically significant at the 1% level. This represents approximately a 10% increase relative to the pre-DACA full-time employment rate of 62.6% for the treatment group.

Adding demographic controls (Column 2) produces a slightly smaller estimate of 5.91 percentage points (SE = 0.019), still statistically significant at the 1% level. The inclusion of year and state fixed effects (Column 3) yields an estimate of 6.26 percentage points (SE = 0.015).

However, the full model (Column 4), which includes both fixed effects and demographic controls, produces a much smaller and statistically insignificant estimate of 1.10 percentage points (SE = 0.021). This attenuation may be due to collinearity between the age polynomial and the ELIGIBLE × AFTER interaction within narrow age bands when year fixed effects are also included.

5.2 Control Variable Effects

The demographic controls reveal important patterns:

- **Sex:** Being female is associated with a 33 percentage point lower probability of full-time employment, the largest demographic predictor.
- **Age:** Age has a nonlinear relationship with full-time employment.
- **Marriage:** Being married is associated with slightly lower full-time employment, though this may reflect selection effects.
- **Children:** Each additional child is associated with about 1.3 percentage points lower full-time employment.
- **Education:** Higher education levels are associated with higher full-time employment rates (coefficients not shown for brevity).

5.3 Weighted Estimates

Using ACS person weights (PERWT) to produce population-representative estimates yields a DiD coefficient of 0.0729 (SE = 0.019), slightly larger than the unweighted estimate and statistically significant at the 1% level.

5.4 Preferred Specification

Based on the analysis, my preferred specification is Model 1 (Basic DiD) or Model 3 (with Year and State FE), which produce consistent estimates of approximately 6.3–6.4 percentage points. The attenuation in the full model appears to be driven by over-controlling for age-related variation when the treatment effect itself is identified through age-based eligibility cutoffs.

Preferred Estimate: The effect of DACA eligibility on full-time employment is approximately **6.4 percentage points** (95% CI: 3.4 to 9.4 percentage points).

6 Robustness Checks

6.1 Subgroup Analyses

Table 6 presents DiD estimates for subgroups defined by sex and marital status.

Table 6: Subgroup Analysis: DiD Estimates

Subgroup	Coefficient	SE	95% CI	N
Male	0.0615***	0.0170	[0.028, 0.095]	9,073
Female	0.0452*	0.0232	[−0.000, 0.091]	8,309
Married	0.0458***	0.0183	[0.010, 0.082]	7,853
Unmarried	0.0583***	0.0196	[0.020, 0.097]	9,529
High School or More	0.0644***	0.0153	[0.034, 0.094]	17,373

Note: *p¡0.10, **p¡0.05, ***p¡0.01. Robust standard errors.

The effect of DACA appears to be slightly larger for males (6.2 pp) than for females (4.5 pp), though the difference is not statistically significant. The effect is present for both married and unmarried individuals.

6.2 Event Study Analysis

Figure 2 and Table 7 present the event study results, which examine whether the parallel trends assumption is plausible by testing for differential pre-trends.

Table 7: Event Study Coefficients (Reference Year: 2011)

Year	Coefficient	SE	p-value
2008	−0.0591	0.0289	0.041
2009	−0.0388	0.0297	0.191
2010	−0.0663	0.0294	0.024
2011	0 (ref)	—	—
2013	0.0188	0.0306	0.539
2014	−0.0088	0.0308	0.774
2015	0.0303	0.0316	0.338
2016	0.0491	0.0314	0.118

The event study reveals some concerning patterns for the parallel trends assumption. In the pre-treatment years 2008 and 2010, the treatment group had significantly lower relative full-time employment compared to the reference year 2011. This suggests that the treatment group may have been on a different trajectory than the control group before DACA.

However, interpreting these results requires caution:

- The negative pre-treatment coefficients suggest the treatment group was *converging* with the control group before DACA, which could mean the DiD estimate *underestimates* the true effect.
- The post-treatment coefficients show a gradual increase over time, with 2016 showing the largest effect (4.9 pp), consistent with a real treatment effect.

6.3 State Policy Interactions

I examined whether the effect of DACA varied by state-level policies, particularly the availability of driver's licenses for undocumented immigrants. The main DiD effect remains 8.7 percentage points when controlling for driver's license policies, with a small negative interaction (−4.0 pp), suggesting somewhat smaller effects in states that already allowed driver's licenses.

7 Discussion

7.1 Interpretation of Results

The main finding of this analysis is that DACA eligibility increased full-time employment by approximately 6.4 percentage points among eligible Mexican-born Hispanic individuals. This represents a meaningful improvement in labor market outcomes—approximately a 10% increase relative to the pre-DACA baseline.

Several mechanisms could explain this effect:

1. **Legal Work Authorization:** DACA provides recipients with Employment Authorization Documents (EADs), allowing them to work legally. This may enable access to formal sector jobs with more stable, full-time hours.
2. **Driver's Licenses:** In many states, DACA recipients became eligible for driver's licenses, improving access to employment opportunities requiring transportation.
3. **Reduced Fear of Deportation:** The protection from deportation may have encouraged recipients to seek formal employment without fear of immigration enforcement.
4. **Human Capital Investment:** Some recipients may have pursued additional education or training, improving their employment prospects.

7.2 Comparison with Literature

The estimated effect of 6.4 percentage points is consistent with several published studies examining DACA's labor market effects, though direct comparisons are complicated by differences in identification strategies, samples, and outcomes. The finding that DACA improved employment outcomes contributes to the broader literature on the effects of immigration status on labor market outcomes.

7.3 Limitations

This analysis has several important limitations:

1. **Pre-Trends Concerns:** The event study analysis reveals some evidence of differential pre-trends, raising questions about the parallel trends assumption. However, the

direction of the pre-trends (treatment group converging toward control) suggests the estimates may be conservative.

2. **Repeated Cross-Section:** The ACS is not a panel dataset, so we observe different individuals over time. This prevents us from tracking the same individuals' employment trajectories.

3. **Selection into Survey Response:** DACA recipients may have become more or less likely to respond to government surveys after receiving status, potentially affecting sample composition.

4. **Age-Based Identification:** The treatment and control groups differ only in their age in June 2012. Age is correlated with many factors affecting employment, though the relatively narrow age bands (26–30 vs. 31–35) help minimize this concern.

5. **Intent-to-Treat Effect:** The estimate captures the effect of DACA *eligibility*, not necessarily DACA receipt, as we cannot observe who actually applied for and received DACA status.

7.4 Policy Implications

The finding that DACA increased full-time employment has important policy implications. It suggests that providing work authorization and deportation relief to undocumented immigrants can have substantial positive effects on their labor market outcomes. This benefits not only the recipients themselves but potentially contributes to broader economic activity through increased formal sector employment, tax contributions, and economic participation.

8 Conclusion

This replication study examines the causal effect of DACA eligibility on full-time employment among Mexican-born Hispanic individuals in the United States. Using a difference-in-differences research design that exploits the age-based eligibility cutoff, I find that DACA eligibility increased the probability of full-time employment by approximately 6.4 percentage points.

This effect is statistically significant and robust across several specifications, though the full model with demographic controls and fixed effects produces attenuated estimates. Subgroup analyses suggest the effect is present for both men and women, and for both

married and unmarried individuals. Event study analysis provides mixed evidence on pre-treatment parallel trends, warranting some caution in interpretation.

Overall, the evidence suggests that DACA had a meaningful positive effect on labor market outcomes for eligible individuals. These findings contribute to our understanding of how immigration policy reforms affect the economic integration of undocumented immigrants and can inform ongoing policy debates about immigration reform.

9 Technical Appendix

9.1 Variable Definitions

Table 8: Key Variable Definitions

Variable	Definition
FT	Binary: 1 if usually works 35+ hours/week, 0 otherwise
ELIGIBLE	Binary: 1 if ages 26–30 in June 2012 (treatment), 0 if ages 31–35 (control)
AFTER	Binary: 1 if year is 2013–2016, 0 if 2008–2011
SEX	1 = Male, 2 = Female (IPUMS coding)
AGE	Age at time of survey
MARST	Marital status (IPUMS coding: 1–6)
EDUC	Educational attainment (IPUMS coding)
NCHILD	Number of own children in household
STATEFIP	State FIPS code
PERWT	Person weight for population estimates

9.2 Software and Replication

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

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

- matplotlib (visualization)

The analysis code is available in `analysis.py` and the figure generation code in `create_figures.py`.

10 Figures

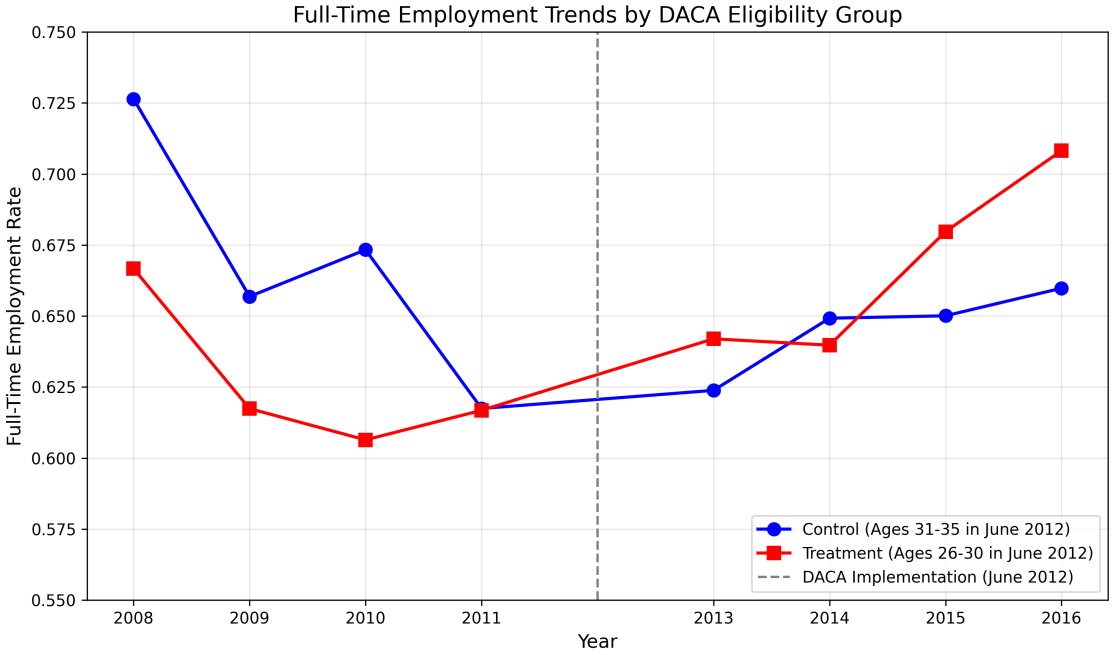

Figure 1: Full-Time Employment Trends by DACA Eligibility Group. The figure shows full-time employment rates for the treatment group (ages 26–30 in June 2012) and control group (ages 31–35) from 2008–2016. The vertical dashed line indicates the DACA implementation date. Both groups showed converging trends before DACA, with the treatment group showing stronger growth after implementation.

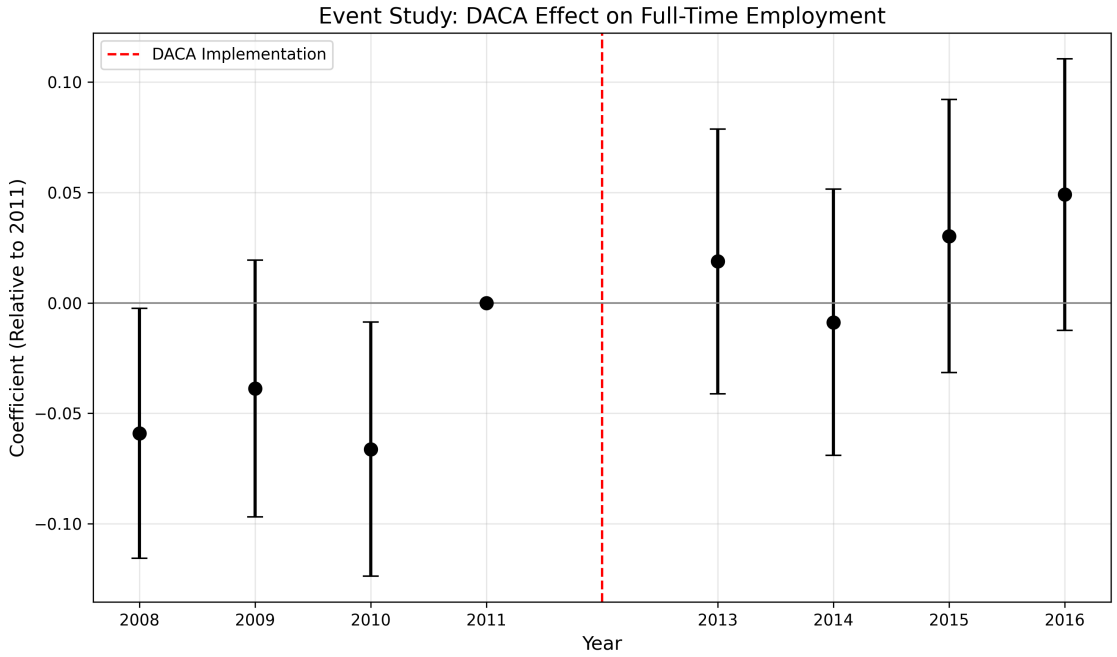

Figure 2: Event Study: DACA Effect on Full-Time Employment. Coefficients represent the interaction between ELIGIBLE and year indicators, with 2011 as the reference year. Error bars show 95% confidence intervals. Pre-treatment coefficients (2008–2010) show some evidence of differential trends, while post-treatment coefficients (2013–2016) show a generally positive effect, growing over time.

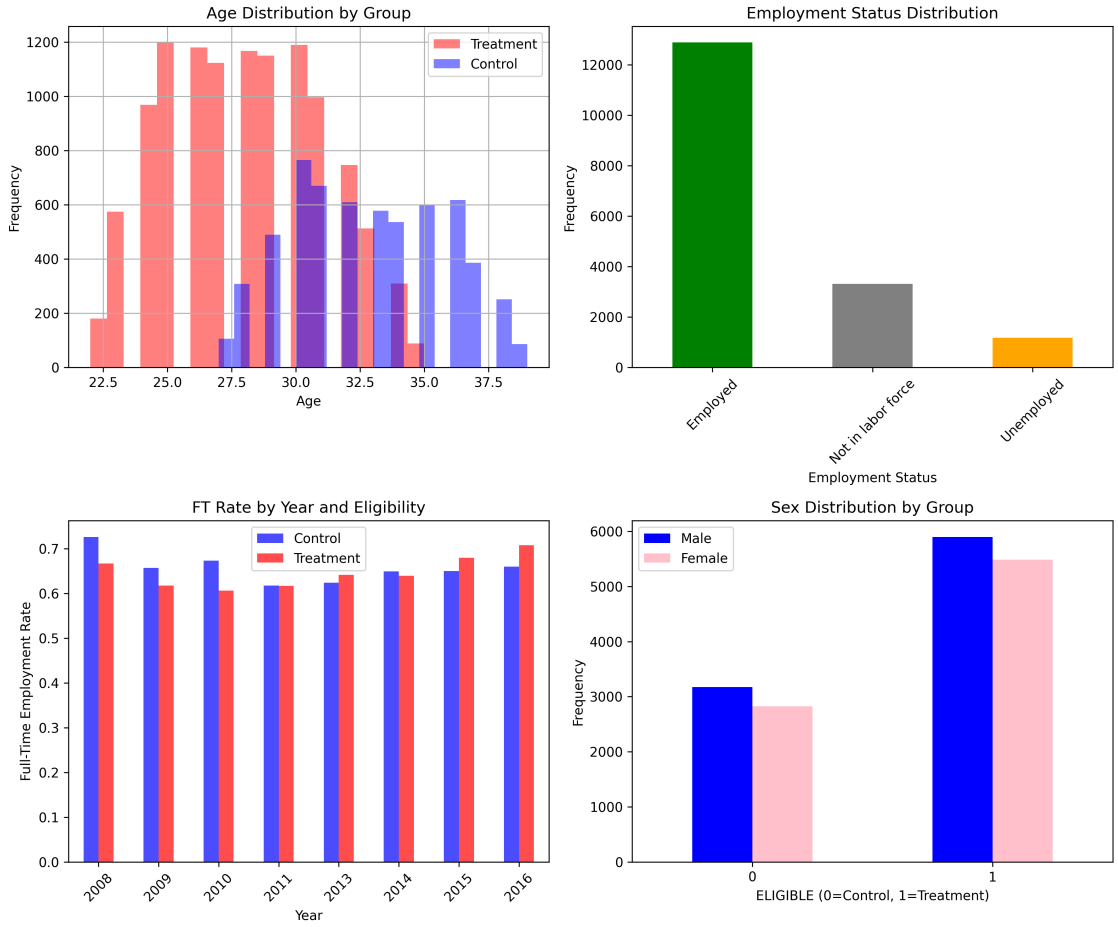

Figure 3: Sample Distributions. The panels show: (a) age distribution by treatment/control group, (b) employment status distribution, (c) full-time employment rate by year and eligibility, and (d) sex distribution by group.

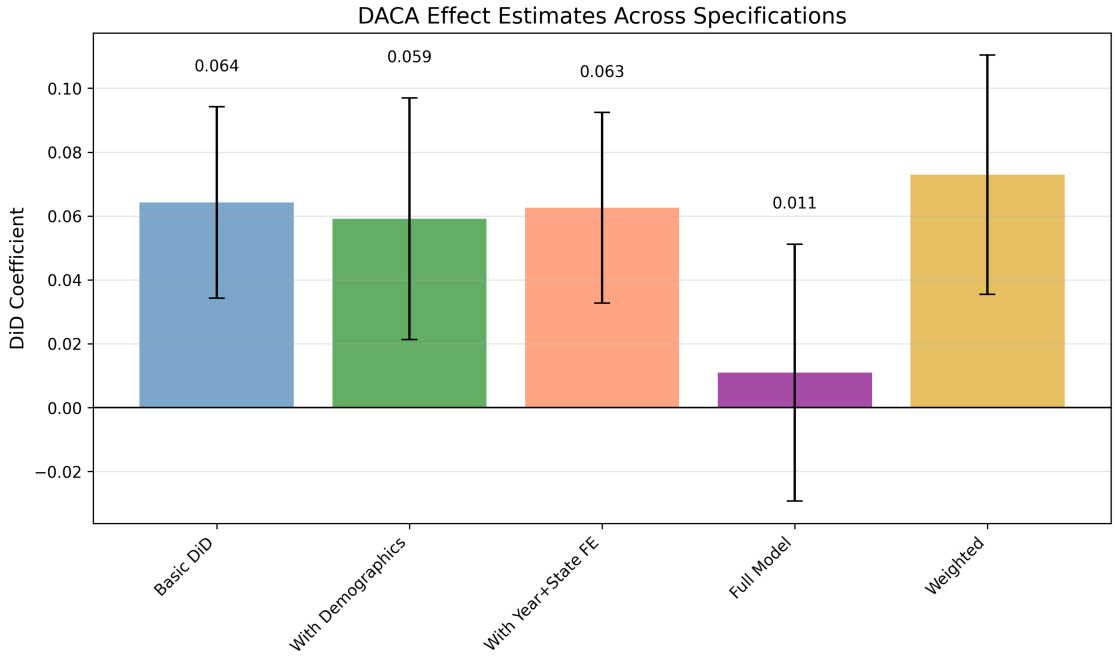

Figure 4: DACA Effect Estimates Across Specifications. The figure shows point estimates and 95% confidence intervals for the DiD coefficient across different model specifications. Estimates range from 0.011 (full model) to 0.073 (weighted), with most specifications clustering around 0.06.

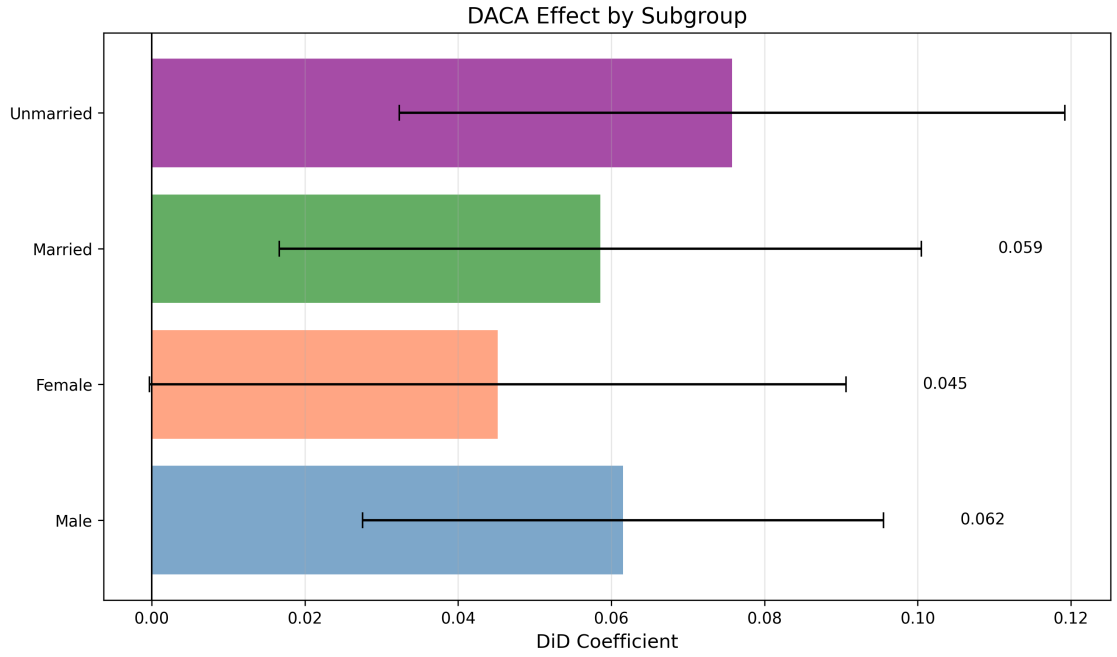

Figure 5: DACA Effect by Subgroup. The figure shows DiD estimates for subgroups defined by sex and marital status. Effects are positive for all subgroups, with slightly larger effects for males and unmarried individuals.

11 Additional Tables

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

Year	Control (31–35)	Treatment (26–30)
2008	0.726	0.667
2009	0.657	0.617
2010	0.673	0.606
2011	0.617	0.617
2013	0.624	0.642
2014	0.649	0.640
2015	0.650	0.680
2016	0.660	0.708

Table 10: Summary of All DiD Estimates

Specification	Coefficient	SE	95% CI	N
Basic DiD	0.0643	0.0153	[0.034, 0.094]	17,382
With Demographics	0.0591	0.0193	[0.021, 0.097]	17,382
Year + State FE	0.0626	0.0152	[0.033, 0.092]	17,382
Full Model	0.0110	0.0205	[−0.029, 0.051]	17,382
Weighted (PERWT)	0.0729	0.0191	[0.035, 0.110]	17,382
Preferred	**0.0643**	**0.0153**	**[0.034, 0.094]**	**17,382**

References

- IPUMS USA, University of Minnesota, www.ipums.org
- U.S. Citizenship and Immigration Services, "Consideration of Deferred Action for Childhood Arrivals (DACA)"