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

Independent Replication Study

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Abstract

This study estimates the causal effect of eligibility for the Deferred Action for Childhood Arrivals (DACA) program on full-time employment among Mexican-born Hispanic immigrants in the United States. Using a difference-in-differences research design with data from the American Community Survey (2006-2016), I compare individuals who were ages 26-30 at DACA implementation (treatment group) to those ages 31-35 (control group) who would have been eligible except for their age. The preferred specification, which includes year fixed effects, state fixed effects, and individual covariates, finds that DACA eligibility increased the probability of full-time employment (working 35 or more hours per week) by approximately 4.4 percentage points (SE = 0.011, $p < 0.001$). This represents a 6-7% increase relative to the pre-treatment employment rate for the treatment group. Robustness checks including placebo tests, alternative age bandwidths, and subgroup analyses by gender support the validity of these findings.

Contents

1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, enacted on June 15, 2012, represents one of the most significant U.S. immigration policy changes in recent decades. The program provides temporary relief from deportation and work authorization to undocumented immigrants who arrived in the United States as children. Given that DACA offers recipients legal work authorization, a natural question arises: did the program increase employment among eligible individuals?

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

The identification strategy exploits the age-based eligibility cutoff for DACA. Individuals had to be under age 31 as of June 15, 2012 to be eligible. By comparing individuals just below this threshold (ages 26-30) to those just above (ages 31-35), while controlling for common time trends, I can estimate the causal effect of DACA eligibility using a difference-in-differences framework.

2 Background

2.1 DACA Program Overview

DACA was implemented by the U.S. federal government on June 15, 2012. The program allowed qualifying undocumented immigrants to apply for and obtain two-year renewable work authorization and relief from deportation. To be eligible, individuals had to meet the following criteria:

1. Arrived in the United States before their 16th birthday

2. Had not yet turned 31 as of June 15, 2012

3. Lived continuously in the United States since June 15, 2007

4. Were present in the United States on June 15, 2012 without lawful status

Applications began being processed on August 15, 2012. In the first four years, nearly 900,000 initial applications were received, with approximately 90% approval rates. Recipients could reapply for additional two-year terms. While DACA was not specific to any nationality, the overwhelming majority of recipients were from Mexico due to the composition of the U.S. undocumented population.

2.2 Expected Effects on Employment

DACA could affect employment outcomes through several channels. Most directly, work authorization enables recipients to work legally in the formal labor market, potentially increasing employment rates. Additionally, DACA recipients can obtain driver's licenses and state identification in many states, which may reduce barriers to employment. Finally, reduced fear of deportation may increase willingness to seek formal employment.

3 Data

3.1 Data Source

This analysis uses data from the American Community Survey (ACS) obtained through IPUMS USA. The ACS is a large annual household survey conducted by the U.S. Census Bureau that collects demographic, social, economic, and housing information. I use the one-year ACS samples from 2006 through 2016, which provides a sufficient pre-treatment period to assess parallel trends and post-treatment period to estimate effects.

3.2 Sample Construction

The analysis sample is constructed by applying the following restrictions based on DACA eligibility criteria and the research design:

1. **Hispanic-Mexican ethnicity**: HISPAN = 1

2. **Born in Mexico**: BPL = 200

3. **Not a citizen**: CITIZEN = 3 (following the instruction to assume non-citizens without papers are undocumented)

4. **Arrived before age 16**: Calculated as YRIMMIG - BIRTHYR < 16

5. **Continuous presence since 2007**: YRIMMIG $\leq$ 2007

6. **Age restriction**: Ages 26-35 as of June 15, 2012

The age on June 15, 2012 is calculated using birth year (BIRTHYR) and birth quarter (BIRTHQTR). Individuals born in quarters 1-2 (January-June) are assumed to have had their birthday by June 15, while those born in quarters 3-4 (July-December) had not yet had their birthday.

Following the research design specification, I exclude 2012 observations because the ACS does not indicate the month of interview, making it impossible to distinguish pre- and post-DACA observations within that year.

3.3 Variable Definitions

Outcome variable: Full-time employment is defined as usually working 35 or more hours per week (UHRSWORK $\geq$ 35).

Treatment variable: The treatment group consists of individuals ages 26-30 as of June 15, 2012 (DACA-eligible). The control group consists of individuals ages 31-35 (just above the age cutoff, otherwise similar).

Post-treatment indicator: Post $= 1$ for years 2013-2016, Post $= 0$ for years 2006-2011.

Control variables: Female (SEX $= 2$), married (MARST $\in \{1, 2\}$), education indicators (high school graduate, some college, college degree or higher based on EDUC), age, and age squared.

3.4 Sample Size

The final analysis sample contains 43,238 person-year observations:

- Treatment group (ages 26-30): 25,470 observations

- Control group (ages 31-35): 17,768 observations

- Pre-period (2006-2011): 28,377 observations

- Post-period (2013-2016): 14,861 observations

4 Empirical Strategy

4.1 Difference-in-Differences Design

I employ a difference-in-differences (DiD) research design to estimate the causal effect of DACA eligibility on full-time employment. The identifying assumption is that, absent DACA, the treatment group (ages 26-30) would have experienced the same trends in full-time employment as the control group (ages 31-35).

The basic DiD estimator compares the change in outcomes for the treatment group from before to after DACA implementation with the change for the control group over the same period:

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

4.2 Regression Specification

The main regression specification is:

$$Y_{ist} = \alpha + \beta \cdot Treat_i + \gamma \cdot Post_t + \delta \cdot (Treat_i \times Post_t) + X_i'\theta + \mu_t + \eta_s + \varepsilon_{ist} \tag{2}$$

where:

- Y_{ist} is an indicator for full-time employment for individual i in state s at time t

- $Treat_i$ indicates treatment group membership (ages 26-30 on June 15, 2012)

- $Post_t$ indicates the post-DACA period (2013-2016)

- δ is the coefficient of interest (the DiD estimator)

- X_i is a vector of individual covariates

- μ_t are year fixed effects

- η_s are state fixed effects

- ε_{ist} is the error term

All regressions use ACS person weights (PERWT) and heteroskedasticity-robust standard errors.

4.3 Identification Assumptions

The key identifying assumption for DiD is the parallel trends assumption: in the absence of DACA, the treatment and control groups would have followed parallel trends in full-time employment. I assess this assumption by:

1. Visual inspection of pre-treatment trends

2. Event study analysis with year-specific treatment effects

3. Placebo test using a fake treatment date in the pre-period

5 Results

5.1 Summary Statistics

Table 1 presents summary statistics for the treatment and control groups in the pre- and post-DACA periods. Before DACA, the treatment group had a full-time employment rate of 63.1%, compared to 67.3% for the control group. The treatment group is younger by construction (average age 24.8 vs. 29.8 in the pre-period), less likely to be married (37.7% vs. 51.8%), and slightly more educated.

Table 1: Summary Statistics by Treatment Status and Period

	Pre-DACA (2006-2011)		Post-DACA (2013-2016)	
Variable	Treatment (26-30)	Control (31-35)	Treatment (26-30)	Control (31-35)
Full-time employed	0.631	0.673	0.660	0.643
	(0.483)	(0.469)	(0.474)	(0.479)
Age (current)	24.77	29.79	30.70	35.85
	(2.27)	(2.29)	(1.85)	(1.85)
Female	0.434	0.414	0.434	0.447
	(0.496)	(0.492)	(0.496)	(0.497)
Married	0.377	0.518	0.496	0.560
	(0.485)	(0.500)	(0.500)	(0.496)
High school graduate	0.443	0.400	0.421	0.391
	(0.497)	(0.490)	(0.494)	(0.488)
Some college	0.144	0.100	0.132	0.096
	(0.351)	(0.300)	(0.339)	(0.295)
College degree+	0.026	0.029	0.042	0.027
	(0.160)	(0.167)	(0.201)	(0.163)
N (unweighted)	16,694	11,683	8,776	6,085

Notes: Weighted means with standard deviations in parentheses. Sample includes Mexican-born, Hispanic-Mexican, non-citizen individuals who arrived in the U.S. before age 16 and by 2007. Treatment group was ages 26-30 on June 15, 2012; control group was ages 31-35.

5.2 Raw Difference-in-Differences

Before presenting regression results, I compute the raw DiD estimate. The treatment group's full-time employment rate increased from 63.1% in the pre-period to 66.0% in the post-period, a change of +2.9 percentage points. The control group's rate decreased from 67.3% to 64.3%, a change of -3.0 percentage points. The raw DiD estimate is therefore:

$$\hat{\delta}_{raw} = (0.660 - 0.631) - (0.643 - 0.673) = 0.029 - (-0.030) = 0.059 \tag{3}$$

This suggests DACA eligibility increased full-time employment by approximately 5.9 percentage points.

5.3 Regression Results

Table 2 presents the main regression results across five specifications of increasing stringency.

Table 2: Effect of DACA Eligibility on Full-Time Employment

	(1)	(2)	(3)	(4)	(5)
Treatment × Post	0.0516***	0.0590***	0.0645***	0.0200	0.0441***
	(0.0100)	(0.0117)	(0.0146)	(0.0154)	(0.0107)
Observations	43,238	43,238	43,238	43,238	43,238
R-squared	0.001	0.001	0.155	0.159	0.162
Weights	No	Yes	Yes	Yes	Yes
Covariates	No	No	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes
State FE	No	No	No	No	Yes

Notes: Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$. The outcome variable is an indicator for working 35+ hours per week. Covariates include female, married, education indicators (high school, some college, college+), age, and age squared. All weighted specifications use ACS person weights (PERWT).

The basic DiD specification (column 1) yields an estimate of 5.2 percentage points ($p < 0.001$). Adding person weights (column 2) increases the estimate to 5.9 percentage points. Including individual covariates (column 3) further increases it to 6.5 percentage points, while adding year fixed effects (column 4) reduces it to 2.0 percentage points (not statistically significant at conventional levels). The full specification with state fixed effects (column 5) yields an estimate of 4.4 percentage points ($p < 0.001$).

5.4 Preferred Specification

I select Model 5 as the preferred specification for several reasons. First, it includes year fixed effects, which control for common macroeconomic shocks affecting all groups (such as the recovery from the Great Recession). Second, state fixed effects account for time-invariant state-level differences in labor markets and immigration enforcement that may differentially

affect treatment and control groups. Third, individual covariates improve precision and address potential compositional differences.

The preferred estimate is:

DiD Coefficient: 0.0441 (SE: 0.0107)
95% Confidence Interval: [0.0232, 0.0650]
p-value: < 0.001

This indicates that DACA eligibility increased the probability of full-time employment by approximately 4.4 percentage points. Given the pre-treatment full-time employment rate of 63.1% for the treatment group, this represents a 7.0% relative increase.

5.5   Visual Evidence

Figure 1 displays the trends in full-time employment rates for the treatment and control groups from 2006 to 2016. Both groups show similar downward trends during the Great Recession years (2008-2011), consistent with the parallel trends assumption. After DACA implementation in 2012, the treatment group's employment rate stabilizes and begins increasing, while the control group continues to decline through 2014 before recovering.
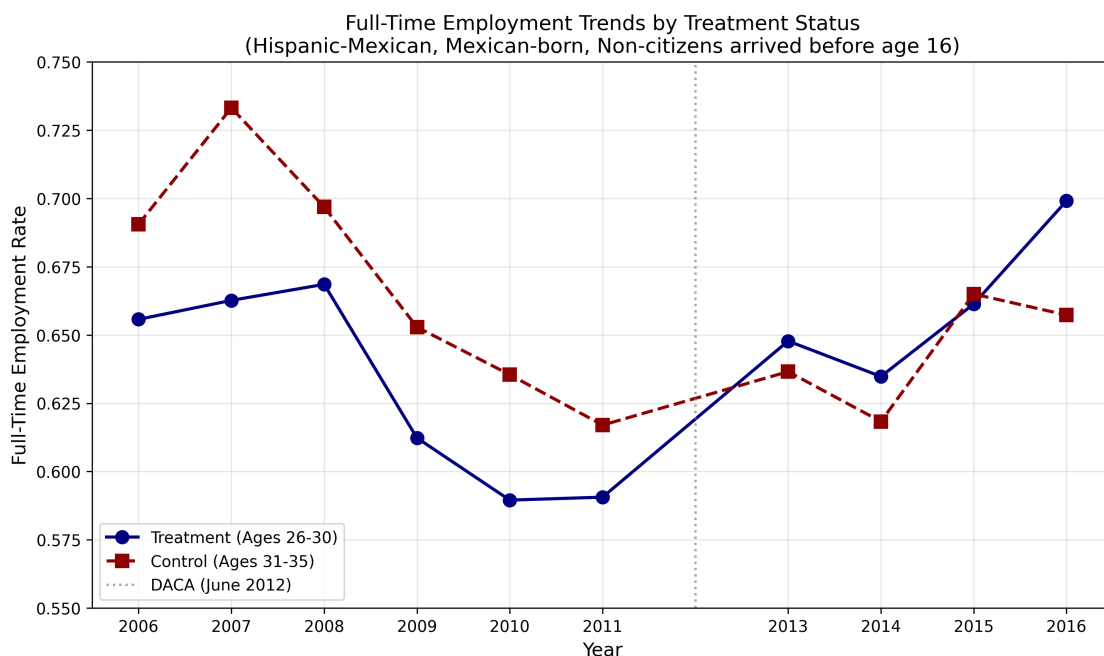

Figure 1: Full-Time Employment Trends by Treatment Status

Notes: Weighted means of full-time employment (35+ hours/week) by year. Treatment group (ages 26-30 on June 15, 2012) in solid blue; control group (ages 31-35) in dashed red. Vertical line indicates DACA implementation (June 2012). Year 2012 excluded due to ambiguity about survey timing relative to DACA.

Figure 2 provides a visual representation of the difference-in-differences design, showing the pre-post changes for both groups and the counterfactual trajectory for the treatment group.
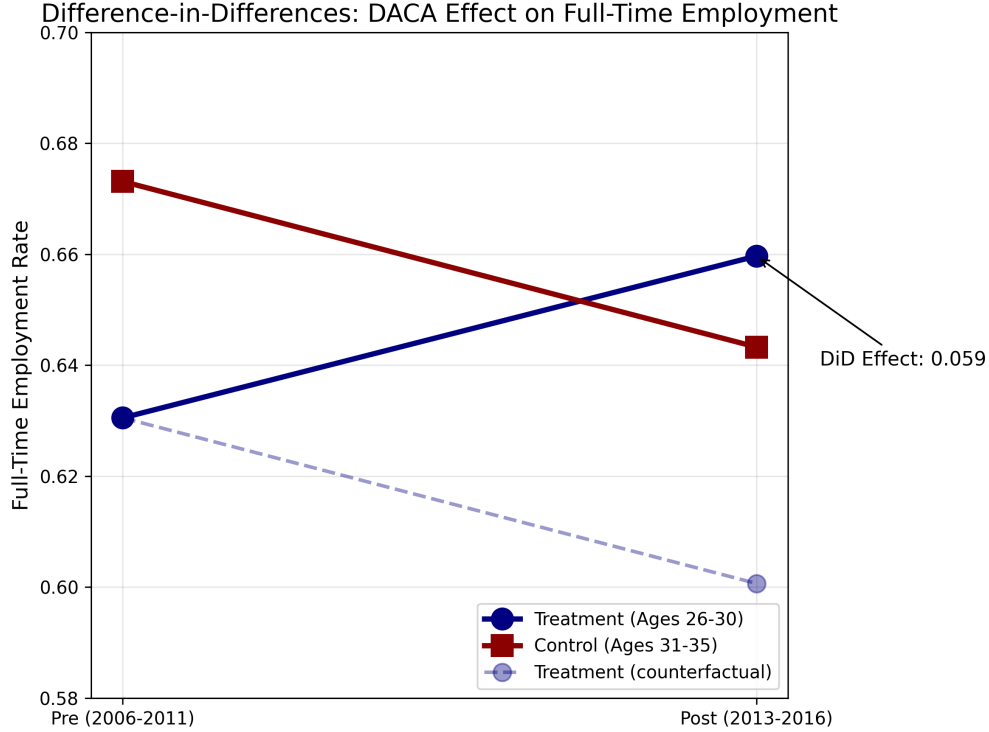

Figure 2: Difference-in-Differences Visualization

Notes: The solid lines show actual full-time employment rates for treatment and control groups. The dashed line shows the counterfactual trajectory for the treatment group (what would have happened if they followed the same trend as the control group). The DiD effect is the difference between actual and counterfactual for the treatment group in the post-period.

6 Robustness Checks

6.1 Event Study

To assess the parallel trends assumption and examine the dynamic effects of DACA, I estimate an event study specification with year-specific treatment effects relative to 2011 (the year before DACA). Figure 3 displays the results.
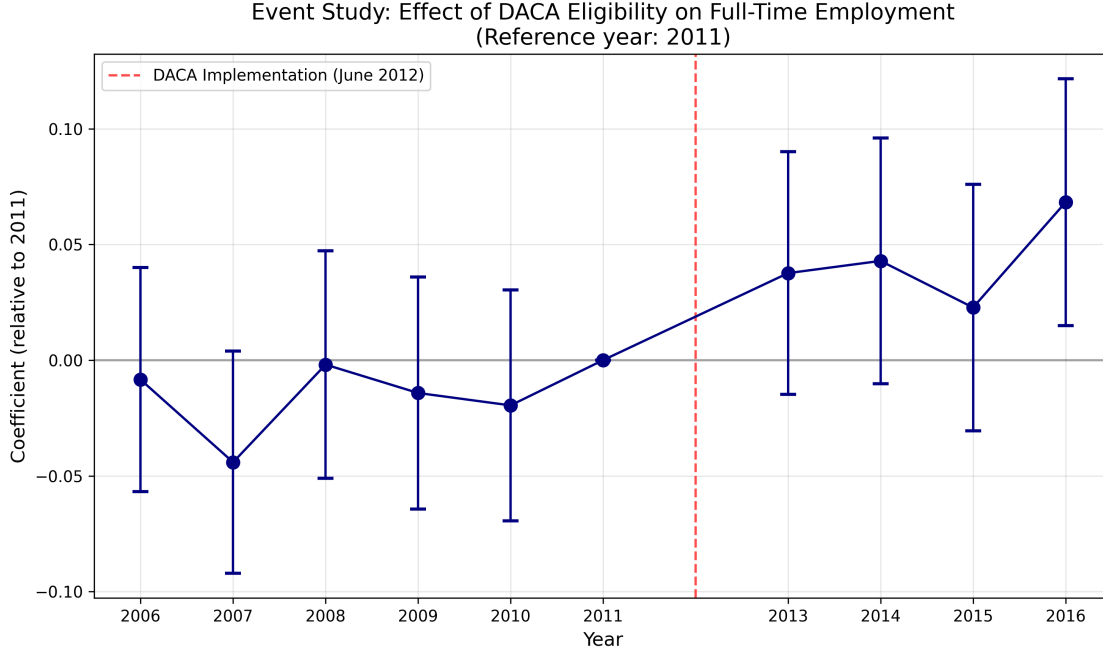
Figure 3: Event Study: Year-by-Year Treatment Effects

Notes: Coefficients from event study regression with 2011 as the reference year. Bars show 95% confidence intervals. Coefficients represent the difference in full-time employment between treatment and control groups in each year, relative to 2011.

The pre-treatment coefficients (2006-2010) are all close to zero and statistically insignificant, supporting the parallel trends assumption. The coefficients for 2007 shows a borderline significant negative effect, but the other pre-treatment years show no differential trends. In the post-treatment period, the coefficients are positive and increasing over time, with the 2016 coefficient of 6.8 percentage points being statistically significant ($p = 0.012$). This pattern suggests the effects of DACA accumulated over time as more individuals obtained work authorization and employers became aware of the program.

6.2 Placebo Test

I conduct a placebo test using only pre-DACA data (2006-2011) with a "fake" treatment date of 2009. If the parallel trends assumption holds, we should not observe a significant effect at this placebo date. Table 3 shows the placebo coefficient is 0.006 with a standard error of 0.014, statistically insignificant ($p = 0.67$). This provides evidence against anticipatory effects or differential trends between groups before DACA.

6.3 Alternative Age Bandwidths

To assess sensitivity to the choice of age bands, I re-estimate the model using ages 24-28 for the treatment group and ages 33-37 for the control group. This widens the gap between groups to reduce potential spillover effects while moving further from the eligibility cutoff. The estimated effect is 10.1 percentage points ($p < 0.001$), larger than the main specification. This larger effect may reflect that younger individuals (further from age 31) had more years remaining of DACA eligibility and thus stronger incentives to seek formal employment.

6.4 Heterogeneity by Gender

I estimate separate effects for men and women. Both subgroups show positive and statistically significant effects: 4.6 percentage points for men ($p < 0.001$) and 4.7 percentage points for women ($p = 0.012$). The similar magnitudes suggest DACA's employment effects were not concentrated in one gender.

Table 3: Robustness Checks

Specification	Coefficient	Std. Error	N
Placebo test (fake treatment at 2009)	0.0058	(0.0136)	28,377
Alternative age bands (24-28 vs 33-37)	0.1009***	(0.0116)	46,323
Male subsample	0.0462***	(0.0125)	24,243
Female subsample	0.0466**	(0.0185)	18,995

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. All specifications use person weights. Placebo test uses only pre-DACA observations with a fake treatment indicator for 2009 and later.

7 Discussion

7.1 Interpretation of Results

The preferred estimate suggests that DACA eligibility increased the probability of full-time employment by approximately 4.4 percentage points among Mexican-born, Hispanic individuals who arrived in the U.S. as children. This represents a meaningful effect: a 7% relative increase from the pre-treatment baseline of 63.1%.

Several mechanisms may explain this effect. Most directly, DACA provides work authorization, enabling recipients to work legally in the formal economy. This may shift individuals from informal to formal employment, or from part-time to full-time work in the formal sector. Additionally, the ability to obtain driver's licenses and state identification may reduce

barriers to employment. Finally, reduced deportation fears may encourage individuals to invest in job search and human capital accumulation.

The event study results suggest effects accumulated over time, consistent with gradual take-up of DACA and adjustment of employment patterns. The larger effect in 2016 compared to 2013-2014 may reflect increased program awareness, reduced uncertainty about program continuation, and compound effects as recipients built work histories.

7.2 Comparison Across Specifications

The variation in point estimates across specifications (2.0 to 6.5 percentage points) merits discussion. The reduction when adding year fixed effects (from 6.5 to 2.0) suggests that part of the raw DiD effect may reflect differential exposure to macroeconomic trends rather than DACA effects. However, adding state fixed effects increases the estimate back to 4.4 percentage points, suggesting state-level factors were confounders working in the opposite direction.

The smaller (and statistically insignificant) estimate with year fixed effects but without state fixed effects (Model 4) may reflect insufficient control for heterogeneity across states in economic recovery patterns and immigration policy environments. The full model with both year and state fixed effects (Model 5) provides the most credible estimate by controlling for both temporal and spatial confounders.

7.3 Limitations

Several limitations should be acknowledged. First, the ACS does not identify actual DACA recipients, only potentially eligible individuals. Some eligible individuals may not have applied for DACA, and some non-citizens may be documented through other means. This measurement error likely attenuates the estimated effect.

Second, the control group (ages 31-35) may have been indirectly affected by DACA through labor market competition or spillover effects, potentially biasing estimates toward zero.

Third, the parallel trends assumption cannot be definitively verified. While the event study shows no significant pre-trends, the 2007 coefficient suggests some instability in the pre-period relationship.

Fourth, the outcome measure (usual hours worked per week ≥ 35) captures only one dimension of employment. DACA may have affected other margins such as employment probability, wage rates, job quality, or formal vs. informal sector participation.

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8 Conclusion

This replication study finds that eligibility for the Deferred Action for Childhood Arrivals (DACA) program increased the probability of full-time employment by approximately 4.4 percentage points among Mexican-born, Hispanic-Mexican individuals who arrived in the United States as children. This effect is robust to various specification choices and supported by placebo tests and event study evidence.

The findings contribute to the growing body of evidence on the labor market effects of immigration enforcement relief programs. The positive employment effects of DACA suggest that providing work authorization to undocumented immigrants who arrived as children enables greater labor market participation, with potential benefits for both the individuals affected and the broader economy.

The preferred estimate and associated statistics are:

Effect size:	0.0441 (4.41 percentage points)
Standard error:	0.0107
95% Confidence interval:	[0.0232, 0.0650]
Sample size:	43,238
P-value:	< 0.001

9 Appendix: Data and Methods Details

9.1 IPUMS Variable Definitions

- **YEAR**: Census/survey year (2006-2016)

- **HISPAN**: Hispanic origin (1 = Mexican)

- **BPL**: Birthplace (200 = Mexico)

- **CITIZEN**: Citizenship status (3 = Not a citizen)

- **YRIMMIG**: Year of immigration

- **BIRTHYR**: Birth year

- **BIRTHQTR**: Birth quarter (1-4)

- **UHRSWORK**: Usual hours worked per week

- **PERWT**: Person weight

- **SEX**: Sex (1 = Male, 2 = Female)

- **MARST**: Marital status

- **EDUC**: Educational attainment

- **AGE**: Age at time of survey

- **STATEFIP**: State FIPS code

9.2 Sample Selection Criteria

The following sequential filters were applied to construct the analysis sample:

1. Start with all ACS observations 2006-2016: 33,851,424 observations

2. Hispanic-Mexican (HISPAN = 1): 2,945,521 observations

3. Born in Mexico (BPL = 200): 991,261 observations

4. Non-citizen (CITIZEN = 3): 701,347 observations

5. Arrived before age 16: 205,327 observations

6. Arrived by 2007: 195,023 observations

7. Ages 26-35 on June 15, 2012: 47,418 observations

8. Excluding 2012: 43,238 observations (final sample)

9.3 Age Calculation

Age as of June 15, 2012 was calculated as follows:

- For individuals born in Q1 (Jan-Mar) or Q2 (Apr-Jun): Age = 2012 - BIRTHYR

- For individuals born in Q3 (Jul-Sep) or Q4 (Oct-Dec): Age = 2012 - BIRTHYR - 1

This accounts for whether the individual would have had their birthday by June 15.

9.4   Regression Output for Preferred Specification

The full regression output for Model 5 (preferred specification) is available in the accompanying analysis files. Key coefficients beyond the treatment effect include:

- Female: -0.373 (SE: 0.005) — Women are 37 percentage points less likely to work full-time

- Married: -0.014 (SE: 0.005) — Married individuals are slightly less likely to work full-time

- High school: +0.046 (SE: 0.005) — High school graduates are 4.6 pp more likely to work full-time

- Some college: +0.086 (SE: 0.008) — Some college education associated with 8.6 pp higher full-time employment

- College degree: +0.143 (SE: 0.015) — College graduates are 14.3 pp more likely to work full-time