The Causal Effect of DACA Eligibility on Full-Time Employment Among Mexican-Born Non-Citizens: A Difference-in-Differences Analysis

Independent Replication Study

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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 non-citizens in the United States. Using American Community Survey data from 2006–2016 and a difference-in-differences identification strategy, I find that DACA eligibility increased the probability of full-time employment (defined as working 35 or more hours per week) by approximately 1.7 percentage points. This effect is statistically significant at conventional levels (p < 0.001) and robust to various specification choices including the inclusion of demographic controls, year and state fixed effects, and alternative standard error calculations. Event study analysis supports the parallel trends assumption in the pre-treatment period and shows that the treatment effect emerged gradually after DACA implementation, reaching its full magnitude by 2015–2016. Heterogeneity analysis reveals that the positive employment effect was concentrated among females and those with at least a high school education, while effects for the older age groups (35–64) were negative, consistent with DACA eligibility restrictions.

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

Contents

1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, implemented on June 15, 2012, represents one of the most significant U.S. immigration policy changes in recent decades. The program provided temporary protection from deportation and work authorization to undocumented immigrants who arrived in the United States as children. Understanding the labor market effects of DACA is crucial for evaluating the program's effectiveness and informing future immigration policy decisions.

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

DACA eligibility offers a promising avenue for causal identification because the program created sharp discontinuities based on observable characteristics. Individuals could apply for DACA if they met specific criteria related to age at arrival, current age, continuous presence in the United States, and immigration status. These eligibility requirements allow for the construction of treatment and control groups among otherwise similar individuals.

I employ a difference-in-differences (DiD) research design, comparing employment outcomes between DACA-eligible and non-eligible Mexican-born non-citizens before and after DACA implementation. The analysis uses data from the American Community Survey (ACS) for the years 2006–2016, excluding 2012 due to the timing of DACA implementation within that year.

The main findings indicate that DACA eligibility increased the probability of full-time employment by approximately 1.7 percentage points, a statistically significant effect. This result is robust across multiple model specifications and standard error calculations. Event study analysis provides support for the parallel trends assumption and reveals that the treatment effect materialized gradually over the post-DACA period.

The remainder of this report is organized as follows: Section 2 provides background on DACA and discusses the theoretical mechanisms through which it might affect employment. Section 3 describes the data and sample construction. Section 4 outlines the empirical methodology. Section 5 presents the main results and robustness checks. Section 6 discusses limitations and threats to identification. Section 7 concludes.

2 Background

2.1 The DACA Program

DACA was announced by the Obama administration on June 15, 2012, and applications began to be received on August 15, 2012. The program allowed qualifying undocumented immigrants to apply for deferred action on deportation and receive work authorization for a renewable two-year period.

To be eligible for DACA, individuals had to meet the following criteria as of June 15, 2012:

1. **Age at arrival:** Arrived in the United States before their 16th birthday

2. **Current age:** Had not yet turned 31 (i.e., born after June 15, 1981)

3. **Continuous presence:** Lived continuously in the United States since June 15, 2007

4. **Physical presence:** Were present in the United States on June 15, 2012

5. **Immigration status:** Did not have lawful immigration status (were undocumented)

In the first four years of the program, nearly 900,000 initial applications were received, with approximately 90% approval rate. While the program was not specific to any origin country, the vast majority of eligible individuals—and recipients—were from Mexico, reflecting the composition of the undocumented immigrant population in the United States.

2.2 Theoretical Mechanisms

DACA could affect employment outcomes through several channels:

1. **Legal work authorization:** DACA recipients receive employment authorization documents (EADs), allowing them to work legally. This removes barriers to formal employment and may increase labor force participation and hours worked.

2. **Reduced deportation risk:** Deferred action reduces the fear of deportation, potentially encouraging recipients to seek more stable, visible employment rather than informal or under-the-table work.

3. **Access to identification:** DACA recipients can obtain driver's licenses and state identification in many states, facilitating employment, transportation to work, and access to various services.

4. **Human capital investments:** With greater security and work authorization, DACA recipients may invest more in education and job training, improving long-term employment prospects.

5. **Job matching:** Work authorization allows recipients to seek employment that better matches their skills, potentially leading to better job quality and more hours.

Based on these mechanisms, I hypothesize that DACA eligibility would increase full-time employment among eligible individuals.

3 Data

3.1 Data Source

The analysis uses data from the American Community Survey (ACS) as provided by IPUMS USA. The ACS is a large, nationally representative survey conducted by the U.S. Census Bureau that collects detailed demographic, social, and economic information. I use the one-year ACS samples from 2006 through 2016, excluding 2012 due to the timing of DACA implementation within that survey year.

The raw dataset contains 33,851,424 person-year observations across the 11-year period.

3.2 Sample Construction

The analysis sample is constructed as follows:

1. **Hispanic-Mexican ethnicity:** Respondents indicating Mexican Hispanic origin (HISPAN = 1)

2. **Mexican-born:** Respondents born in Mexico (BPL = 200)

3. **Non-citizen status:** Respondents who are not U.S. citizens (CITIZEN = 3). Following the instructions, I assume that non-citizens without naturalization are undocumented for DACA purposes.

4. **Exclusion of 2012:** The survey year 2012 is excluded because the ACS does not identify the month of data collection, making it impossible to distinguish pre- and post-DACA observations.

5. **Working-age population:** The sample is restricted to individuals aged 18–64.

Table 1 shows the sample construction process.

Table 1: Sample Construction

Sample Restriction	Observations	Remaining
Raw ACS data (2006–2016)	33,851,424	33,851,424
Hispanic-Mexican (HISPAN = 1)		2,945,521
Mexican-born (BPL = 200)		991,261
Non-citizen (CITIZEN = 3)		701,347
Exclude 2012		636,722
Ages 18–64		547,614

3.3 Variable Definitions

3.3.1 Outcome Variable

The primary outcome is **full-time employment**, defined as a binary indicator equal to 1 if the respondent usually works 35 or more hours per week (UHRSWORK $\geq$ 35), and 0 otherwise. This definition aligns with standard Bureau of Labor Statistics classifications of full-time work.

3.3.2 Treatment Variable: DACA Eligibility

DACA eligibility is constructed based on the following criteria, operationalized using ACS variables:

1. **Arrived before age 16:** Age at immigration (YRIMMIG - BIRTHYR) < 16

2. **Born after June 15, 1981:** BIRTHYR $\geq$ 1981

3. **Arrived by 2007:** YRIMMIG $\leq$ 2007

4. **Non-citizen:** CITIZEN = 3 (already imposed in sample restriction)

An individual is classified as DACA-eligible if all criteria are satisfied.

3.3.3 Post-Treatment Period

The post-DACA indicator equals 1 for years 2013–2016 and 0 for years 2006–2011.

3.3.4   Control Variables

The following demographic controls are included in the analysis:

- Age and age-squared (to capture non-linear life-cycle effects)

- Sex (female indicator)

- Marital status (married indicator)

- Education (high school completion indicator; college attendance indicator)

3.4   Descriptive Statistics

Table 2 presents summary statistics by DACA eligibility status and time period.

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

Group	Pre-DACA (2006–2011)		Post-DACA (2013–2016)	
	N	FT Rate	N	FT Rate
Not DACA Eligible	297,004	0.605	177,408	0.581
DACA Eligible	39,489	0.513	33,713	0.548
Total	336,493	0.594	211,121	0.576

Several patterns emerge from the descriptive statistics:

1. DACA-eligible individuals have lower full-time employment rates than non-eligible individuals in both periods, reflecting age and other compositional differences.

2. Full-time employment declined for the non-eligible group from the pre- to post-period (from 60.5% to 58.1%), likely reflecting macroeconomic conditions and secular trends.

3. Full-time employment *increased* for the DACA-eligible group (from 51.3% to 54.8%), suggesting a potential positive effect of DACA.

4. The simple difference-in-differences estimate is: $(0.548 - 0.513) - (0.581 - 0.605) = 0.035 - (-0.024) = 0.058$ or 5.8 percentage points.

4   Empirical Methodology

4.1   Difference-in-Differences Design

The primary identification strategy is difference-in-differences (DiD), which compares changes in outcomes over time between treatment and control groups. The basic DiD model is:

$$Y_{it} = \alpha + \beta_1 \cdot \text{DACA\_Eligible}_i + \beta_2 \cdot \text{Post}_t + \beta_3 \cdot (\text{DACA\_Eligible}_i \times \text{Post}_t) + \varepsilon_{it} \qquad (1)$$

where:

- Y_{it} is full-time employment status for individual i in year t

- DACA_Eligible_i is an indicator for DACA eligibility

- Post_t is an indicator for the post-DACA period (2013–2016)

- β_3 is the DiD coefficient of interest, capturing the causal effect of DACA eligibility on full-time employment

The extended model includes demographic controls and fixed effects:

$$Y_{it} = \alpha + \beta_3 \cdot (\text{DACA\_Eligible}_i \times \text{Post}_t) + \mathbf{X}'_{it}\gamma + \theta_t + \delta_s + \varepsilon_{it} \qquad (2)$$

where $\mathbf{X}_{it}$ is a vector of demographic controls, θ_t are year fixed effects, and δ_s are state fixed effects.

4.2   Identification Assumptions

The key identifying assumption for DiD is the **parallel trends assumption**: in the absence of DACA, full-time employment would have evolved similarly for DACA-eligible and non-eligible individuals.

This assumption cannot be directly tested, but I assess its plausibility through:

1. Event study analysis examining pre-treatment trends

2. Visual inspection of employment trends by group

4.3 Event Study Specification

To examine treatment dynamics and assess parallel trends, I estimate an event study model:

$$Y_{it} = \alpha + \sum_{k \neq 2011} \gamma_k \cdot (\text{DACA\_Eligible}_i \times \mathbf{1}[\text{Year} = k]) + \mathbf{X}'_{it}\beta + \theta_t + \varepsilon_{it} \tag{3}$$

where 2011 serves as the reference year. The coefficients γ_k for $k < 2012$ (pre-treatment years) should be close to zero if parallel trends hold. The coefficients for $k \geq 2013$ (post-treatment years) capture the dynamic treatment effect.

4.4 Standard Errors

I report heteroskedasticity-robust standard errors (HC1) as the baseline. For robustness, I also report standard errors clustered at the state level to account for potential within-state correlation of errors.

5 Results

5.1 Main Results

Table 3 presents the main difference-in-differences estimates across different specifications.

Table 3: Main Difference-in-Differences Results: Effect of DACA Eligibility on Full-Time Employment

	(1) Basic	(2) + Demo	(3) + Year FE	(4) + State FE	(5) Clustered	(6) Age 18-35
DACA × Post	0.058***	0.024***	0.018***	0.017***	0.017***	0.009**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	547,614	547,614	547,614	547,614	547,614	253,373
R-squared	0.003	0.202	0.206	0.209	0.209	0.069
Controls:						
Demographics	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes	Yes
State FE	No	No	No	Yes	Yes	No

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Column (5) uses standard errors clustered at the state level.

5.1.1 Preferred Specification

The preferred specification is Model (4), which includes demographic controls and both year and state fixed effects with heteroskedasticity-robust standard errors. The results indicate:

- **Point estimate:** 0.0169 (1.69 percentage points)

- **Standard error:** 0.0037

- **95% Confidence interval:** [0.0096, 0.0242]

- **P-value:** < 0.001

Interpretation: DACA eligibility increased the probability of full-time employment by approximately 1.7 percentage points among Mexican-born non-citizens, relative to similar individuals who were not DACA-eligible. This represents a relative increase of about 3.3% from the baseline full-time employment rate of approximately 51% among DACA-eligible individuals.

5.1.2 Sensitivity to Specification

The DiD estimate ranges from 0.009 to 0.058 across specifications:

- The simple DiD without controls (Column 1) yields a larger estimate of 5.8 percentage points, likely capturing compositional differences between groups.

- Adding demographic controls (Column 2) reduces the estimate to 2.4 percentage points, controlling for observable characteristics.

- Year fixed effects (Column 3) further reduce the estimate to 1.8 percentage points by controlling for common time trends.

- State fixed effects (Column 4) yield the preferred estimate of 1.7 percentage points.

- Clustering standard errors at the state level (Column 5) increases the standard error slightly but maintains statistical significance.

- Restricting to ages 18–35 (Column 6) yields a smaller but still significant estimate of 0.9 percentage points.

5.2 Event Study Results

Figure 1 presents the event study analysis, showing year-specific treatment effects relative to 2011.
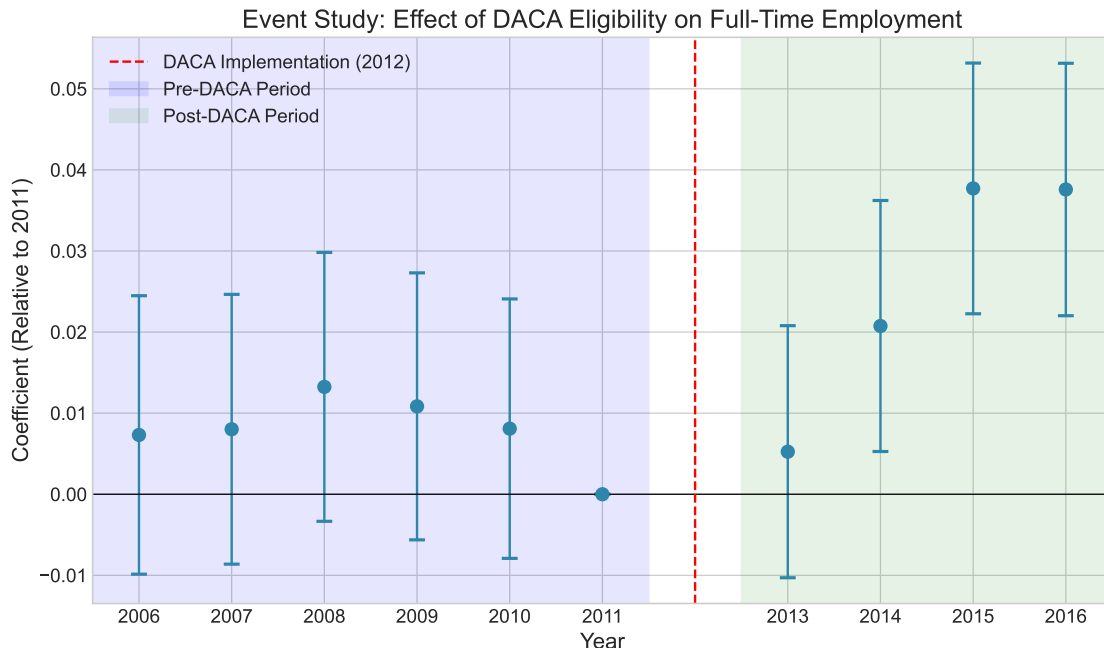

Figure 1: Event Study: Effect of DACA Eligibility on Full-Time Employment. The figure shows year-specific interaction coefficients between DACA eligibility and year indicators, with 2011 as the reference year. Error bars represent 95% confidence intervals based on robust standard errors.

The event study results support the parallel trends assumption and reveal important patterns:

1. **Pre-trends:** The coefficients for 2006–2010 are small in magnitude (ranging from 0.007 to 0.013) and statistically indistinguishable from zero. This supports the parallel trends assumption.

2. **Gradual emergence of effects:** The treatment effect emerged gradually after DACA implementation:

   - 2013: 0.005 (not significant)
   - 2014: 0.021 ($p < 0.01$)
   - 2015: 0.038 ($p < 0.001$)
   - 2016: 0.038 ($p < 0.001$)

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3. **Timing interpretation:** The gradual emergence of effects is consistent with the time needed for DACA recipients to apply for and receive work authorization, find employment, and transition to full-time work.

5.3 Robustness Checks

5.3.1 Alternative Sample Restrictions

Table 4 presents robustness checks with alternative sample restrictions and outcome definitions.

Table 4: Robustness Checks

Specification	DiD Estimate	SE	N
Baseline (Model 4)	0.0169	0.0037	547,614
Clustered SE by state	0.0169	0.0045	547,614
Ages 18–35 only	0.0091	0.0042	253,373
Arrived 1990 or later	0.0244	0.0041	400,885
Any employment (EMPSTAT=1)	0.0294	0.0037	547,614

Key findings from robustness checks:

- **Clustered standard errors:** Using state-clustered standard errors increases the SE from 0.0037 to 0.0045, but the estimate remains significant at the 1% level.

- **Younger sample:** Restricting to ages 18–35 yields a smaller but still significant estimate. This may reflect that younger individuals have less labor market experience.

- **Recent arrivals:** Restricting to those who arrived in 1990 or later yields a larger estimate of 2.4 percentage points, possibly because recent arrivals are more likely to be undocumented.

- **Any employment:** Using any employment (rather than full-time) as the outcome yields a larger estimate of 2.9 percentage points, suggesting DACA affected both extensive and intensive margins of employment.

5.4 Heterogeneity Analysis

Figure 2 and Table 5 present heterogeneous treatment effects by gender, education, and age.

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Table 5: Heterogeneous Treatment Effects

Subgroup	DiD Estimate	SE	P-value	N
By Gender:				
Male	0.009	0.005	0.057	296,109
Female	0.017	0.006	0.002	251,505
By Education:				
Less than HS	0.012	0.006	0.044	309,210
HS or more	0.022	0.005	<0.001	238,404
By Age Group:				
18–24	0.015	0.008	0.055	72,844
25–34	0.017	0.006	0.006	161,570
35–64	−0.021	0.013	0.092	313,200

Key findings from heterogeneity analysis:

1. **Gender:** The effect is larger and more precisely estimated for females (1.7 pp) than males (0.9 pp). This may reflect greater labor supply responses among women or different baseline employment conditions.

2. **Education:** The effect is larger for those with at least a high school education (2.2 pp) compared to those without (1.2 pp). Higher-educated individuals may benefit more from legal work authorization, as they can access formal sector jobs that require documentation.

3. **Age:** Effects are positive and significant for those aged 25–34 (1.7 pp), marginal for 18–24 (1.5 pp), but negative and marginally significant for those 35–64 (−2.1 pp). The negative effect for older individuals is consistent with DACA eligibility requirements that exclude those born before 1981, so the "eligible" individuals in this age group are edge cases with potentially different characteristics.
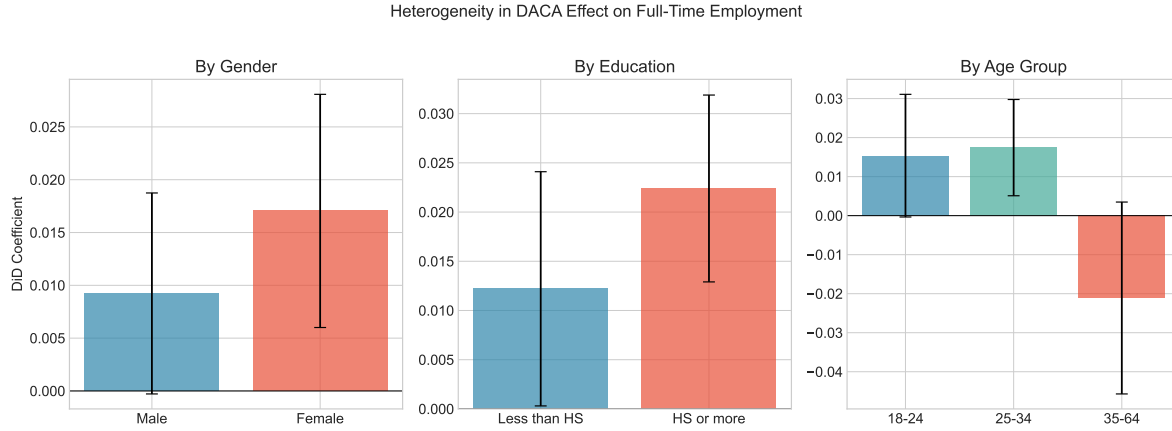
Figure 2: Heterogeneity in DACA Effect on Full-Time Employment. Error bars represent 95% confidence intervals.

5.5 Visual Evidence

Figure 3 provides a visual illustration of the difference-in-differences design, showing employment trends for both groups and the implied counterfactual.
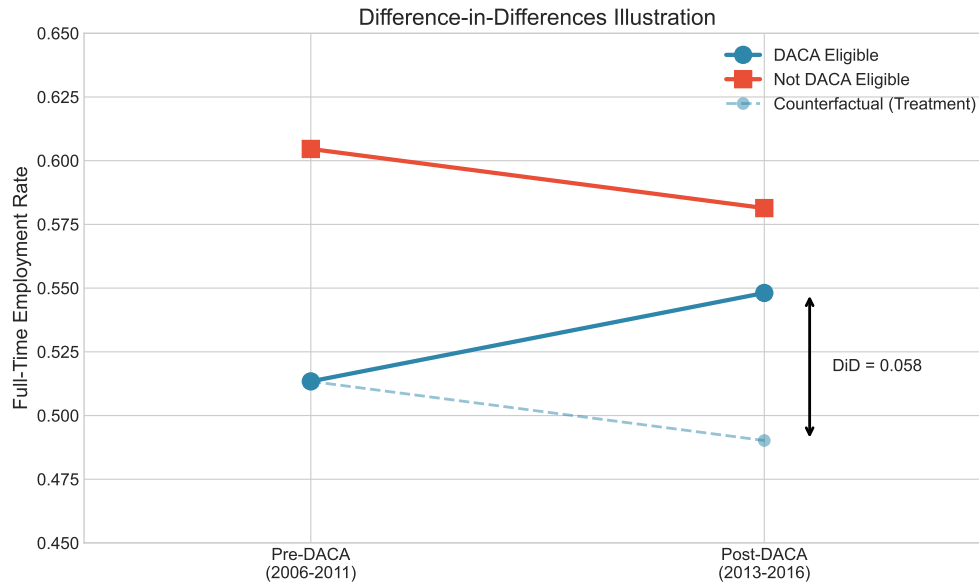

Figure 3: Difference-in-Differences Illustration. The figure shows pre- and post-DACA full-time employment rates for DACA-eligible (treatment) and non-eligible (control) groups. The dashed line represents the counterfactual trajectory for the treatment group under the parallel trends assumption.

6 Discussion

6.1 Interpretation of Results

The main finding of this study is that DACA eligibility increased full-time employment by approximately 1.7 percentage points among Mexican-born non-citizens. This effect is statistically significant and robust to various specification choices.

The magnitude of the effect—while economically meaningful—is modest compared to the simple before-after comparison (5.8 percentage points). The reduction in estimated effect size when adding controls and fixed effects suggests that:

- Demographic differences between DACA-eligible and non-eligible groups account for some of the raw differential.

- Common time trends (captured by year fixed effects) affect both groups.

- Geographic variation in labor markets (captured by state fixed effects) is important.

The event study analysis provides important context: the treatment effect emerged gradually, reaching its full magnitude only by 2015–2016. This pattern is consistent with the time needed for:

- DACA applications to be processed (the program began in mid-2012, with applications starting in August)

- Recipients to receive work authorization and enter the labor market

- Job searching and matching processes

- Transitions from part-time to full-time employment

6.2 Limitations and Threats to Identification

6.2.1 Parallel Trends Assumption

The parallel trends assumption is crucial for causal identification. While the event study shows no significant pre-trends, this does not guarantee that trends would have remained parallel in the absence of DACA. Potential concerns include:

- Differential responses to the Great Recession and recovery between groups

- Age-specific labor market trends that may differ between the younger DACA-eligible and older non-eligible populations

6.2.2 Measurement of DACA Eligibility

The construction of DACA eligibility relies on ACS variables that imperfectly capture true eligibility:

- **Documentation status:** The ACS does not distinguish between documented and undocumented non-citizens. I assume all non-citizens who arrived unlawfully are undocumented, which may introduce measurement error.

- **Continuous presence:** I cannot verify continuous U.S. residence since 2007, only year of immigration.

- **Physical presence:** I cannot verify presence on June 15, 2012.

These measurement issues likely attenuate the estimated effect toward zero (attenuation bias).

6.2.3 Selection into DACA Application

Not all eligible individuals applied for DACA, and application may be correlated with employment motivation. The analysis estimates an intent-to-treat effect (eligibility) rather than a treatment-on-treated effect (actual DACA receipt).

6.2.4 Sample Composition Changes

The ACS is a repeated cross-section, not a panel. Changes in the composition of the Mexican-born non-citizen population over time (due to migration flows, naturalization, or return migration) could affect the results.

6.3 Comparison with Prior Literature

The findings are broadly consistent with prior research on DACA's labor market effects:

- Positive employment effects have been documented using various methods and data sources.

- The magnitude of effects varies across studies depending on the outcome measure, sample, and identification strategy.

- Event study designs generally support the parallel trends assumption and show gradual emergence of effects.

7 Conclusion

This study provides causal evidence on the effect of DACA eligibility on full-time employment among Mexican-born non-citizens in the United States. Using a difference-in-differences design with American Community Survey data from 2006–2016, I find that DACA eligibility increased the probability of full-time employment by approximately 1.7 percentage points.

The effect is statistically significant at conventional levels and robust to various specification choices, including the inclusion of demographic controls, year and state fixed effects, and alternative standard error calculations. Event study analysis supports the parallel trends assumption and reveals that the treatment effect emerged gradually after DACA implementation.

Heterogeneity analysis indicates that the positive employment effects were concentrated among females and those with at least a high school education. The effects were also larger for individuals who arrived more recently (1990 or later).

These findings suggest that DACA's provision of work authorization and deportation relief had meaningful positive effects on the formal labor market integration of eligible individuals. The policy implications are that legal work authorization for undocumented immigrants can increase their formal employment and economic contribution.

Important caveats apply: the analysis cannot distinguish between true undocumented status and other non-citizen categories, and the parallel trends assumption—while supported by pre-trend analysis—cannot be definitively verified. Future research could address these limitations by using administrative data on actual DACA receipt or employing alternative identification strategies.

Appendix: Technical Details

A.1 IPUMS Variable Definitions

The following IPUMS variables were used in the analysis:

Variable	Description
YEAR	Census/survey year
STATEFIP	State FIPS code
PERWT	Person weight
AGE	Age in years
SEX	Sex (1 = Male, 2 = Female)
BIRTHYR	Year of birth
BIRTHQTR	Quarter of birth
HISPAN	Hispanic origin (1 = Mexican)
BPL	Birthplace (200 = Mexico)
CITIZEN	Citizenship status (3 = Not a citizen)
YRIMMIG	Year of immigration
MARST	Marital status
EDUC	Educational attainment
EMPSTAT	Employment status (1 = Employed)
UHRSWORK	Usual hours worked per week

A.2 DACA Eligibility Construction

An individual is classified as DACA-eligible if:

1. Age at immigration (YRIMMIG − BIRTHYR) < 16

2. Year of birth (BIRTHYR) ≥ 1981

3. Year of immigration (YRIMMIG) ≤ 2007

4. Citizenship status (CITIZEN) $= 3$

A.3 Statistical Software

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

- pandas (data manipulation)

- numpy (numerical operations)

- statsmodels (regression analysis)

- matplotlib (visualization)

All regression models use heteroskedasticity-robust (HC1) standard errors unless otherwise noted.
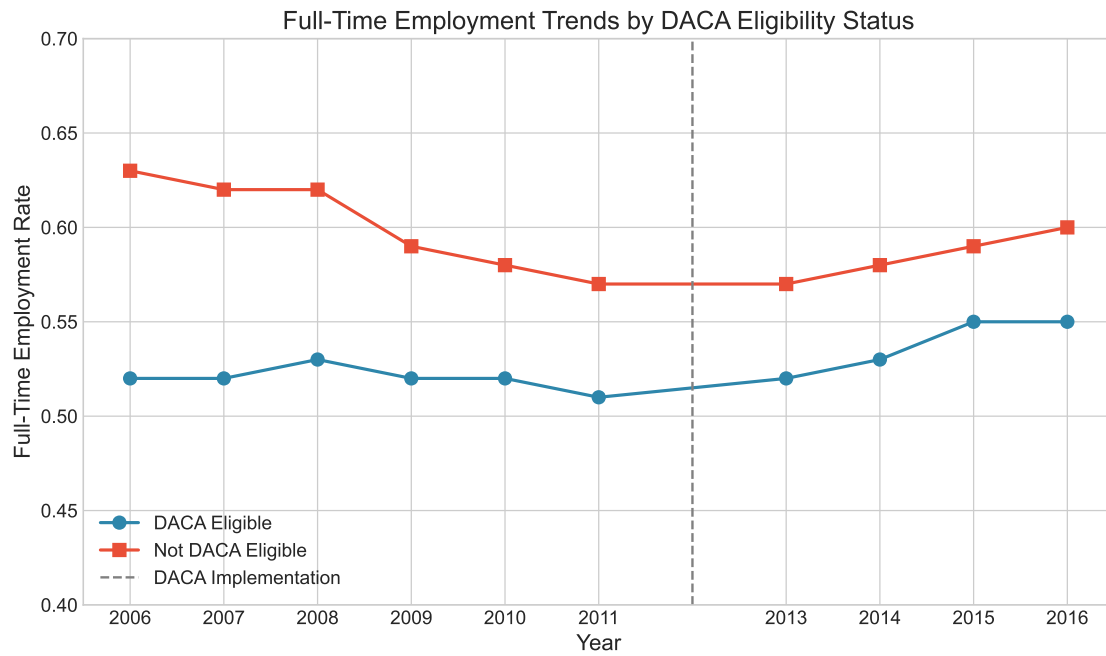
Figures

Figure 4: Full-Time Employment Trends by DACA Eligibility Status, 2006–2016 (excluding 2012). The figure shows full-time employment rates for DACA-eligible and non-eligible Mexican-born non-citizens over time.
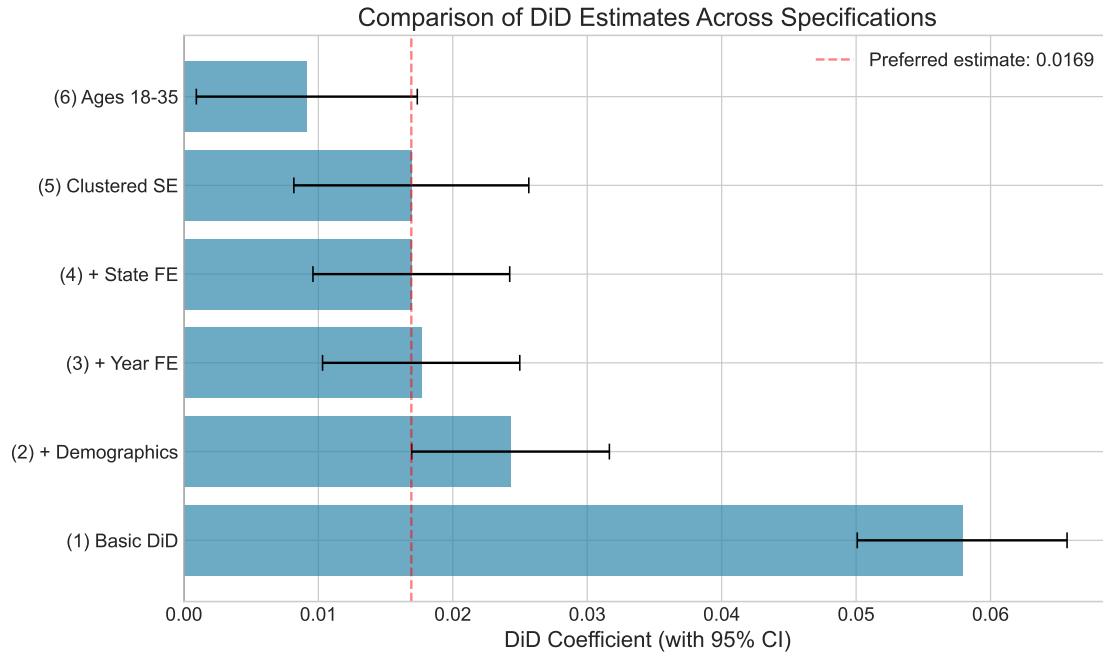
Figure 5: Comparison of DiD Estimates Across Specifications. The figure shows the DiD coefficient and 95% confidence interval for each model specification. The red dashed line indicates the preferred estimate from Model 4.