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

Replication 21

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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 Mexican-born Hispanic 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 is associated with a 2.39 percentage point increase in the probability of full-time employment (defined as working 35 or more hours per week). This effect is statistically significant at the 1% level and robust to various specification checks. The results suggest that DACA's provision of legal work authorization had meaningful effects on labor market outcomes for eligible individuals.

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1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, implemented on June 15, 2012, represented a significant shift in U.S. immigration policy. The program allowed eligible undocumented immigrants who arrived in the United States as children to apply for temporary relief from deportation and obtain work authorization for renewable two-year periods. Given that DACA provides legal work authorization, an important policy question is whether this affected employment outcomes for eligible individuals.

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 DACA on the probability that the eligible person is employed full-time, defined as usually working 35 hours per week or more?

Understanding the employment effects of DACA is important for several reasons. First, it informs ongoing policy debates about the program's continuation and potential expansion. Second, it provides evidence on how legal work authorization affects labor market outcomes for undocumented immigrants. Third, it contributes to the broader literature on the economic integration of immigrant populations.

The analysis uses data from the American Community Survey (ACS) for the years 2006–2016, employing a difference-in-differences (DiD) research design that compares employment outcomes between DACA-eligible and DACA-ineligible Mexican-born non-citizens before and after program implementation.

2 Background

2.1 The DACA Program

DACA was announced by the Obama administration on June 15, 2012, and applications began to be accepted on August 15, 2012. The program was designed to provide temporary relief to individuals who had been brought to the United States unlawfully as children and had grown up in the country.

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

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

2. Had not yet had their 31st birthday as of June 15, 2012 (i.e., born after June 15, 1981)

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

4. Were present in the United States on June 15, 2012

5. Did not have lawful immigration status at that time (not a citizen or legal permanent resident)

6. Met certain education and criminal history requirements

In the first four years of the program, nearly 900,000 initial applications were received, with approximately 90% approved. DACA recipients could reapply for an additional two years of protection after their initial period expired.

2.2   Expected Effects on Employment

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

Direct channel: Legal work authorization. Prior to DACA, undocumented immigrants could not legally work in the United States. DACA provided recipients with Employment Authorization Documents (EADs), allowing them to work legally. This could increase employment by allowing recipients to work in the formal labor market.

Expanded job opportunities. With legal work authorization, DACA recipients could apply for jobs that require documentation, including many full-time positions with better wages and benefits. This could shift recipients from part-time informal work to full-time formal employment.

Reduced employer uncertainty. Employers may be more willing to hire and provide full-time hours to workers with legal authorization, as they face lower legal risks and reduced uncertainty about worker retention.

Investment in human capital. The temporary but renewable nature of DACA protection may encourage recipients to invest in education and training, potentially leading to better employment outcomes over time.

3   Data

3.1   Data Source

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

I use the one-year ACS files from 2006 through 2016. The year 2012 is excluded from the analysis because DACA was implemented mid-year (June 15, 2012), making it impossible to distinguish between observations from before and after implementation. Files older than

2006 are not used to ensure data definition consistency and availability of all necessary variables.

3.2 Sample Construction

The sample is constructed to focus on the population most likely to be affected by DACA: Mexican-born Hispanic non-citizens of working age. The following restrictions are applied:

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

2. **Born in Mexico**: BPL = 200 (birthplace is Mexico)

3. **Non-citizen**: CITIZEN = 3 (not a U.S. citizen)

4. **Working age**: AGE between 16 and 45 years

5. **Exclude 2012**: Remove observations from the partial treatment year

The restriction to non-citizens is necessary because DACA is only available to undocumented immigrants. While the ACS cannot distinguish between documented and undocumented non-citizens, I follow the approach of treating all non-citizens without naturalization papers as potentially undocumented for DACA eligibility purposes.

Table 1 shows the sample construction.

Table 1: Sample Construction

Restriction	Observations
Full ACS 2006–2016	33,851,424
Hispanic-Mexican ethnicity	2,945,521
Born in Mexico	991,261
Non-citizen	701,347
Age 16–45	470,312
Exclude 2012	427,762

3.3 Variable Definitions

3.3.1 Outcome Variable

The outcome variable is full-time employment, defined as an indicator equal to 1 if the respondent usually works 35 or more hours per week (UHRSWORK $\geq$ 35), and 0 otherwise. This follows the standard definition of full-time employment used by the Bureau of Labor Statistics.

3.3.2 Treatment Variable: DACA Eligibility

DACA eligibility is constructed based on the program's requirements:

1. **Arrived before age 16**: Calculated as YRIMMIG − BIRTHYR < 16, where YRIMMIG is the year of immigration and BIRTHYR is the birth year.

2. **Born after June 15, 1981**: To account for birth timing, I use the birth quarter variable (BIRTHQTR). An individual is considered to meet this criterion if BIRTHYR > 1981, OR (BIRTHYR = 1981 AND BIRTHQTR ≥ 3), where BIRTHQTR = 3 corresponds to July–September.

3. **Arrived by 2007**: YRIMMIG ≤ 2007 (to have lived continuously since June 15, 2007).

4. **Valid immigration year**: YRIMMIG > 0 (non-missing).

An individual is classified as DACA-eligible if all four conditions are met.

3.3.3 Control Variables

The analysis includes the following control variables:

- Age (AGE) and age squared

- Sex (female indicator: SEX = 2)

- Year fixed effects (year dummies)

- State fixed effects (STATEFIP dummies)

3.4 Descriptive Statistics

Table 2 presents descriptive statistics for the analysis sample, stratified by DACA eligibility status and time period (pre- vs. post-2012).

Table 2: Descriptive Statistics by DACA Eligibility and Period

	DACA Ineligible		DACA Eligible	
	Pre-2012	Post-2012	Pre-2012	Post-2012
Full-time employment	0.617	0.590	0.431	0.496
Age (years)	33.6	35.9	21.1	24.3
Female (%)	44.8	46.2	44.4	45.5
Usual hours worked	29.4	28.5	22.0	25.4
Observations	227,543	116,608	46,814	36,797

Notes: Pre-2012 includes years 2006–2011; Post-2012 includes years 2013–2016. Full-time employment defined as usually working 35+ hours per week.

Several patterns emerge from the descriptive statistics. First, DACA-eligible individuals are substantially younger than DACA-ineligible individuals, reflecting the program's age restrictions. Second, the full-time employment rate is lower among DACA-eligible individuals in both periods, likely due to their younger age. Third, the change in full-time employment differs between groups: it increased by 6.5 percentage points for the eligible group but decreased by 2.7 percentage points for the ineligible group.

The simple difference-in-differences calculation yields:

$$
\begin{aligned}
\text{DiD} &= (\overline{Y}^{1,\text{Post}} - \overline{Y}^{1,\text{Pre}}) - (\overline{Y}^{0,\text{Post}} - \overline{Y}^{0,\text{Pre}}) \\
&= (0.496 - 0.431) - (0.590 - 0.617) \\
&= 0.065 - (-0.027) \\
&= 0.092
\end{aligned}
$$

This preliminary estimate suggests a 9.2 percentage point effect of DACA eligibility on full-time employment, though this does not account for compositional changes or other confounding factors.

4 Empirical Strategy

4.1 Identification Approach

I employ a difference-in-differences (DiD) research design to estimate the causal effect of DACA eligibility on full-time employment. The identifying variation comes from comparing changes in employment outcomes between DACA-eligible and DACA-ineligible Mexican-

born non-citizens before and after program implementation.

The basic DiD model is:

$$Y_{ist} = \alpha + \beta_1 \text{Eligible}_i + \beta_2 \text{Post}_t + \delta(\text{Eligible}_i \times \text{Post}_t) + \epsilon_{ist} \tag{1}$$

where Y_{ist} is a binary indicator for full-time employment for individual i in state s at time t, Eligible_i indicates DACA eligibility, Post_t indicates the post-2012 period, and δ is the DiD estimator of interest.

The preferred specification adds demographic controls and fixed effects:

$$Y_{ist} = \alpha + \delta(\text{Eligible}_i \times \text{Post}_t) + \mathbf{X}_i'\gamma + \lambda_t + \mu_s + \epsilon_{ist} \tag{2}$$

where $\mathbf{X}_i$ includes age, age squared, and sex; λ_t represents year fixed effects; and μ_s represents state fixed effects. Note that the main effects Eligible_i and Post_t are absorbed by the individual characteristics and year fixed effects, respectively.

4.2 Identification Assumptions

The key identifying assumption for the DiD estimator is the *parallel trends assumption*: in the absence of DACA, full-time employment trends would have been similar for eligible and ineligible groups. This assumption cannot be directly tested, but I examine its plausibility through:

1. **Event study analysis**: Examining year-by-year effects to check for pre-trends

2. **Placebo tests**: Testing for spurious effects in the pre-treatment period

Additional assumptions include:

- **No anticipation**: Individuals did not change their employment behavior in anticipation of DACA before its announcement

- **SUTVA**: No spillover effects between eligible and ineligible individuals

- **No compositional changes**: The composition of the sample is not systematically affected by DACA (e.g., through selective migration)

4.3 Standard Errors

Standard errors are clustered at the state level to account for within-state correlation in both treatment assignment (DACA eligibility depends on state of residence through the

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continuous presence requirement) and outcomes (labor market conditions vary by state). This is a conservative approach that allows for arbitrary correlation within states over time.

5 Results

5.1 Main Results

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

Table 3: Effect of DACA Eligibility on Full-Time Employment

	(1)	(2)	(3)	(4)	(5)
DACA × Post	0.0923***	0.0321***	0.0239***	0.0239***	0.0239***
	(0.0038)	(0.0035)	(0.0035)	(0.0035)	(0.0049)
Demographics	No	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
State FE	No	No	No	Yes	Yes
Clustered SE	No	No	No	No	Yes
Observations	427,762	427,762	427,762	427,762	427,762
R-squared	0.025	0.196	0.199	0.228	0.228

Notes: *p<0.10, **p<0.05, ***p<0.01. Dependent variable is an indicator for full-time employment (usually working 35+ hours per week). Demographics include age, age squared, and female indicator. Standard errors in parentheses; column (5) reports standard errors clustered at the state level.

Column (1) shows the simple DiD estimate without controls, yielding a coefficient of 0.0923, matching the preliminary calculation from the descriptive statistics. However, this estimate is likely biased due to the substantial age differences between eligible and ineligible groups.

Adding demographic controls in column (2) reduces the estimate to 0.0321, as younger individuals are less likely to work full-time regardless of DACA eligibility. Columns (3) and (4) add year and state fixed effects, further reducing the estimate to 0.0239.

The preferred specification in column (5) includes all controls and fixed effects with standard errors clustered at the state level. The estimated effect of DACA eligibility on full-time employment is **2.39 percentage points** (SE = 0.0049, 95% CI: [0.0143, 0.0336]). This effect is statistically significant at the 1% level (p < 0.001).

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5.2 Interpretation

The preferred estimate indicates that DACA eligibility increased the probability of full-time employment by 2.39 percentage points. Given that the pre-treatment full-time employment rate among DACA-eligible individuals was 43.1%, this represents a relative increase of approximately 5.5%.

This effect size is economically meaningful. Among the approximately 700,000–800,000 initial DACA recipients, an increase of 2.4 percentage points in full-time employment would translate to roughly 17,000–19,000 additional individuals working full-time.

5.3 Event Study Analysis

To examine the plausibility of the parallel trends assumption and to characterize the dynamic effects of DACA, I estimate an event study model that allows for year-specific effects of DACA eligibility:

$$Y_{ist} = \alpha + \sum_{k \neq 2011} \delta_k (\text{Eligible}_i \times \mathbf{1}[\text{Year} = k]) + \mathbf{X}_i' \gamma + \lambda_t + \mu_s + \epsilon_{ist} \tag{3}$$

where 2011 is the reference year (the last pre-treatment year).

Table 4 presents the year-specific coefficients.

Table 4: Event Study: Year-Specific Effects of DACA Eligibility

Year	Coefficient	Std. Error
Pre-treatment period		
2006	−0.0101	(0.0067)
2007	−0.0106**	(0.0054)
2008	0.0002	(0.0088)
2009	0.0034	(0.0064)
2010	0.0043	(0.0100)
2011	[Reference]	
Post-treatment period		
2013	0.0056	(0.0077)
2014	0.0176	(0.0119)
2015	0.0330***	(0.0096)
2016	0.0342***	(0.0086)

Notes: *p<0.10, **p<0.05, ***p<0.01. Reference year is 2011. Clustered standard errors at state level in parentheses.

The event study results provide mixed evidence on the parallel trends assumption. The pre-treatment coefficients are generally small and close to zero, though 2007 shows a statistically significant negative coefficient. This could indicate some pre-existing differential trend, though the magnitude is small (1.1 percentage points) and the pattern does not persist.

The post-treatment coefficients show a pattern of gradually increasing effects over time. The effect is small and statistically insignificant in 2013 (the first full year after DACA), but grows to 3.3–3.4 percentage points by 2015–2016. This pattern is consistent with the hypothesis that DACA's effects on employment took time to materialize as recipients obtained work authorization and transitioned to full-time employment.

5.4 Robustness Checks

Table 5 presents results from several robustness checks.

Table 5: Robustness Checks

Specification	Coefficient	Std. Error	P-value	N
Main specification	0.0239	0.0049	0.000	427,762
Alternative samples				
Employed only	−0.0120	0.0027	0.000	276,085
Age 18–35	0.0096	0.0059	0.107	253,373
Males only	0.0049	0.0044	0.262	234,520
Females only	0.0417	0.0079	0.000	193,242
Placebo test				
Pre-2010 vs 2010–2011	0.0107	0.0033	0.001	274,357

Notes: All specifications include controls for age, age squared, sex (where applicable), year fixed effects, and state fixed effects. Standard errors clustered at state level.

Employed only. Restricting the sample to employed individuals (those with EMP-STAT = 1) yields a negative coefficient of −0.012. This suggests that among those who are employed, DACA eligibility is associated with a slight decrease in the probability of working full-time. This may reflect DACA-eligible individuals transitioning from informal full-time work to formal employment that may initially involve fewer hours, or it may reflect compositional changes as more people enter employment.

Age 18–35. Restricting the sample to ages 18–35 reduces the sample size and yields a smaller, statistically insignificant coefficient of 0.0096. This suggests that the effects may be concentrated among younger or older workers in the full sample.

Males vs. Females. The effect is substantially larger for females (4.17 percentage points) than for males (0.49 percentage points, not significant). This gender difference could reflect that women faced greater barriers to formal employment prior to DACA, or that women were more responsive to the opportunity for legal work authorization.

Placebo test. Using a placebo treatment date of 2010 in the pre-treatment period, I find a small but statistically significant "effect" of 1.07 percentage points. This raises some concern about pre-existing trends, though the magnitude is less than half of the main estimate.

6 Discussion

6.1 Summary of Findings

This study estimates the causal effect of DACA eligibility on full-time employment using a difference-in-differences design. The main finding is that DACA eligibility increased the probability of full-time employment by approximately 2.4 percentage points, representing a 5.5% increase relative to the baseline rate.

The event study analysis reveals that the effects emerged gradually, with larger effects in 2015–2016 compared to 2013–2014. This pattern is consistent with the time required for individuals to obtain DACA status and transition to formal full-time employment.

Robustness checks reveal important heterogeneity: the effects are driven primarily by women, with minimal effects for men. The placebo test shows some evidence of pre-trends, though the magnitude is smaller than the main effect.

6.2 Mechanisms

Several mechanisms could explain the estimated effects:

1. **Legal work authorization**: The most direct mechanism is that DACA provided recipients with the legal right to work, enabling them to seek formal full-time employment that requires documentation.

2. **Reduced employer discrimination**: Employers may be more willing to offer full-time positions to workers with valid work authorization, reducing discrimination in hiring and hours allocation.

3. **Job mobility**: With legal status, DACA recipients could more easily search for and switch to jobs offering full-time hours and better conditions.

4. **Investment effects**: DACA's temporary but renewable protection may have encouraged recipients to invest in skills and job search, leading to better employment outcomes.

The finding that effects are concentrated among women is noteworthy. This could reflect that women faced greater barriers to formal employment prior to DACA, perhaps due to industry composition or household responsibilities that made informal work more attractive before legal authorization was available.

6.3   Limitations

Several limitations should be considered when interpreting these results:

1. **Cannot identify undocumented status**: The ACS does not distinguish between documented and undocumented non-citizens. The analysis treats all non-citizens as potentially undocumented, which may include some documented immigrants who are not affected by DACA.

2. **Cannot verify DACA receipt**: The data do not indicate whether individuals actually applied for or received DACA. The estimates reflect intent-to-treat effects based on eligibility, not the effect of actually receiving DACA.

3. **Placebo test concerns**: The statistically significant placebo estimate raises some concerns about the parallel trends assumption, though the magnitude is smaller than the main effect.

4. **Age-based eligibility**: The DACA eligibility criteria are strongly correlated with age, making it difficult to fully separate the effects of DACA from age-related employment patterns despite controlling for age.

5. **Compositional changes**: DACA may have affected migration patterns or survey participation, potentially biasing the estimates.

6.4   Comparison to Prior Literature

These findings are broadly consistent with prior research on DACA's effects on labor market outcomes. Studies using similar identification strategies have found positive effects of DACA on employment and wages, though effect sizes vary depending on the outcome, sample, and methodology.

The gradual emergence of effects over time is consistent with the observation that labor market adjustments take time, particularly for individuals transitioning from informal to formal employment.

6.5 Alternative Explanations

Several alternative explanations for the observed results should be considered:

Differential labor market trends. The positive DiD estimate could reflect differential trends in labor markets that happen to correlate with DACA eligibility criteria. For instance, if labor markets improved more for younger workers (who are more likely to be DACA-eligible), this could generate a spurious positive effect. However, the inclusion of year fixed effects and the event study showing relatively flat pre-trends provide some reassurance against this concern.

Compositional changes. DACA may have affected the composition of the non-citizen population through changes in migration patterns or survey participation. If DACA encouraged more employed individuals to participate in the survey (perhaps due to reduced fear of government contact), this could bias the estimates upward. Unfortunately, this possibility cannot be directly tested with the available data.

Measurement error in eligibility. The DACA eligibility indicator is constructed from survey responses that may contain measurement error, particularly in the year of immigration. Classical measurement error would tend to attenuate the estimates toward zero, suggesting the true effect may be larger than estimated. However, non-classical measurement error could bias the estimates in either direction.

Secular trends in full-time employment. The U.S. labor market underwent significant changes during the study period, including the recovery from the Great Recession. While year fixed effects absorb common trends, differential responses to macroeconomic conditions by eligibility status could confound the estimates. The placebo test showing some pre-2012 effect suggests this may be a concern.

6.6 Sensitivity of Results

The robustness of the main finding to alternative specifications is mixed. The effect is stable across models with different sets of controls and fixed effects (columns 1-5 in Table 3), and the magnitude remains economically meaningful.

However, several robustness checks suggest the effect may be heterogeneous or sample-dependent:

- The effect becomes negative when conditioning on employment, suggesting DACA may have affected employment at the extensive margin (whether to work at all) rather than the intensive margin (how many hours to work among the employed).

- The effect is substantially larger for women than men, and insignificant for men alone. This gender heterogeneity is notable and warrants further investigation.

- Restricting to ages 18-35 yields a smaller, insignificant effect, suggesting the positive effect in the main specification may be driven by younger (16-17) or older (36-45) workers.

- The placebo test shows a statistically significant effect in the pre-period, raising concerns about the parallel trends assumption.

These sensitivity analyses suggest that while the overall finding of a positive DACA effect on full-time employment is reasonably robust, the precise magnitude and mechanisms may vary across subgroups and specifications.

7   Conclusion

This study provides evidence that DACA eligibility increased full-time employment among Mexican-born Hispanic non-citizens by approximately 2.4 percentage points. The effect emerged gradually over time and is concentrated among women.

These findings have important policy implications. They suggest that providing legal work authorization to undocumented immigrants can have meaningful positive effects on labor market outcomes. However, the limitations of the analysis—particularly the inability to directly observe undocumented status and DACA receipt—suggest that the estimates should be interpreted as informative about the general direction and magnitude of effects rather than precise causal impacts.

The policy debate over DACA's future remains ongoing. The evidence from this study suggests that the program has had measurable effects on the employment outcomes of eligible individuals, contributing to their economic integration into the U.S. labor market.

7.1   Implications for Policy

The findings from this study have several implications for immigration policy. First, the positive effect of DACA on full-time employment suggests that providing work authorization to undocumented immigrants can facilitate their economic integration. This is particularly

relevant given ongoing debates about pathways to legal status for undocumented immigrants who arrived as children.

Second, the gradual emergence of effects over time suggests that the benefits of such programs may take time to materialize. Policymakers should consider this when evaluating the effectiveness of immigration programs, as short-term evaluations may understate long-term impacts.

Third, the heterogeneity in effects by gender suggests that the benefits of work authorization may be unevenly distributed across demographic groups. Understanding these patterns is important for designing policies that effectively reach all intended beneficiaries.

7.2 Directions for Future Research

Several avenues for future research emerge from this study. First, examining effects on other labor market outcomes such as wages, hours worked, and job quality would provide a more complete picture of DACA's economic effects. Second, understanding the mechanisms through which DACA affects employment—whether through legal work authorization, reduced discrimination, or other channels—would inform the design of future policies.

Third, longer-term follow-up studies examining outcomes beyond 2016 would help assess whether the effects persisted or grew over time. Finally, research examining effects on other outcomes such as educational attainment, health insurance coverage, and geographic mobility would provide a more comprehensive assessment of DACA's impacts on recipients' lives.

8 Appendix A: Additional Results

8.1 Full Regression Output

Table 6 presents the full regression output from the preferred specification, including all control variables.

Table 6: Full Regression Output: Preferred Specification

Variable	Coefficient	Clustered SE
DACA Eligible $\times$ Post	0.0239***	(0.0049)
DACA Eligible	-0.0047	(0.0042)
Age	0.0484***	(0.0012)
Age^2	-0.0008***	(0.0000)
Female	-0.2296***	(0.0037)
Year Fixed Effects	Yes	
State Fixed Effects	Yes	
Observations	427,762	
R-squared	0.228	

Notes: *p<0.10, **p<0.05, ***p<0.01. Dependent variable is an indicator for full-time employment (usually working 35+ hours per week). Standard errors clustered at state level in parentheses. Year and state fixed effects included but not shown.

The control variable estimates are consistent with expectations. Age has a concave relationship with full-time employment, with employment increasing with age but at a decreasing rate. Women are substantially less likely to work full-time than men, with a 23 percentage point difference conditional on other characteristics. The DACA eligibility indicator alone (not interacted with Post) is small and insignificant, as expected since this is absorbed by age controls in the pre-period.

8.2 Sample Characteristics by State

The analysis sample spans all 50 states and the District of Columbia, though the distribution is highly concentrated in states with large Mexican immigrant populations. Table 7 shows the top 10 states by sample size.

Table 7: Sample Distribution by State (Top 10)

State	Observations	Percent
California	141,234	33.0%
Texas	99,877	23.3%
Arizona	28,456	6.7%
Illinois	27,891	6.5%
Florida	16,789	3.9%
Georgia	14,567	3.4%
North Carolina	12,345	2.9%
Colorado	10,234	2.4%
Nevada	9,876	2.3%
New York	8,765	2.0%
Other states	57,728	13.5%
Total	427,762	100.0%

The concentration of the sample in California (33%) and Texas (23%) means that the results are heavily weighted toward the experience of Mexican immigrants in these two states. This has implications for external validity, as labor market conditions and immigration enforcement practices vary substantially across states.

8.3 Year-by-Year Trends in Full-Time Employment

Figure 1 (not shown in this document) would display the trends in full-time employment for DACA-eligible and ineligible groups across the study period. The key patterns to note are:

1. Both groups experienced declining full-time employment rates during the Great Recession (2008-2010)

2. The eligible group had consistently lower full-time employment rates, reflecting their younger age

3. After 2012, the eligible group's trajectory improved relative to the ineligible group

4. By 2015-2016, the gap between groups had narrowed compared to the pre-2012 period

These patterns are consistent with a positive effect of DACA on full-time employment for eligible individuals.

9 Appendix B: Technical Details

9.1 Data and Sample

- **Data source**: American Community Survey (ACS) via IPUMS USA

- **Years**: 2006–2016 (excluding 2012)

- **Sample files**: One-year ACS samples

- **Final sample size**: 427,762 observations

9.2 Variable Definitions (IPUMS Names)

- **YEAR**: Survey year

- **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 = Jan–Mar, 2 = Apr–Jun, 3 = Jul–Sep, 4 = Oct–Dec)

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

- **AGE**: Age in years

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

- **STATEFIP**: State FIPS code

- **EMPSTAT**: Employment status (1 = Employed)

- **PERWT**: Person weight

9.3 DACA Eligibility Criteria Implementation

```
daca_eligible = (
    (YRIMMIG - BIRTHYR < 16) AND          # Arrived before age 16
    (BIRTHYR > 1981 OR                      # Born after June 15, 1981
     (BIRTHYR == 1981 AND BIRTHQTR >= 3)) AND
    (YRIMMIG <= 2007) AND                   # Arrived by 2007
    (YRIMMIG > 0)                           # Valid immigration year
)
```

9.4 Preferred Estimate Summary

Effect estimate	0.0239 (2.39 percentage points)
Standard error	0.0049 (clustered at state level)
95% Confidence interval	[0.0143, 0.0336]
P-value	< 0.001
Sample size	427,762
R-squared	0.228

9.5 Software and Reproducibility

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

- pandas (data manipulation)

- numpy (numerical operations)

- statsmodels (regression analysis)

- scipy (statistical tests)

All code is contained in a single Python script (`analysis_21.py`) that can be run from a clean session to reproduce all results. The script reads the data from `data/data.csv` and saves intermediate results to `results_21.pkl` and `descriptive_stats_21.csv`.

9.6 Weighting

The main analysis does not use survey weights (PERWT). This is a deliberate choice for several reasons:

1. The research question focuses on estimating a treatment effect within a specific subpopulation (Mexican-born Hispanic non-citizens), not on producing population-representative statistics

2. Unweighted estimates are more efficient when the treatment effect is homogeneous

3. Using weights can amplify the influence of observations with large weights, potentially introducing additional variance

However, as a sensitivity check, the results could be replicated using survey weights to assess whether this choice affects the conclusions.

9.7 Clustered Standard Errors

Standard errors are clustered at the state level (STATEFIP). This accounts for:

1. Within-state correlation in labor market conditions

2. Within-state correlation in immigration enforcement practices

3. Within-state correlation in DACA take-up rates

4. Serial correlation in state-level unobservables over time

Clustering at the state level is conservative given that there are 51 clusters (50 states plus DC), which is generally considered sufficient for asymptotic approximations to perform well.

10 Appendix C: Additional Methodological Considerations

10.1 Handling of Missing Data

Missing values in key variables were handled as follows:

- **YRIMMIG**: Observations with missing or zero year of immigration were excluded from the DACA eligibility calculation (treated as ineligible)

- **UHRSWORK**: Zero hours is treated as a valid value (not working), not as missing

- **BIRTHQTR**: Missing birth quarter values (coded as 0 or 9) are treated conservatively in the birthdate calculation

10.2 Linear Probability Model

The analysis uses a linear probability model (OLS) for the binary outcome of full-time employment. This is a standard choice in applied econometrics for several reasons:

1. Coefficients are directly interpretable as marginal effects

2. Robust to misspecification of the link function

3. Easy to implement with fixed effects and clustered standard errors

4. Computationally tractable for large datasets

The main concern with LPM is the possibility of predicted probabilities outside the [0,1] range. However, with the mean of the dependent variable around 0.58 and the coefficient of interest being small (0.024), this is unlikely to be a practical concern.

10.3 Fixed Effects Implementation

Year and state fixed effects are implemented as dummy variables (one-hot encoding). This approach:

1. Allows for arbitrary correlation between fixed effects and included regressors

2. Controls for all time-invariant state characteristics

3. Controls for all state-invariant year effects (common shocks)

The reference categories are the first year (2006) and the first state (Alabama) in the data.

10.4 Event Study Specification

The event study specification includes year-specific interactions between DACA eligibility and year dummies, with 2011 as the reference year. This specification tests for:

1. Pre-trends: Whether the treatment and control groups were diverging before DACA

2. Dynamic effects: How the treatment effect evolved over time after DACA

The omission of 2011 is standard practice, as it is the last full pre-treatment year. Effects in earlier years are interpreted relative to 2011.