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

Replication Study 20

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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 Hispanic-Mexican, Mexican-born individuals in the United States. Using a difference-in-differences design that compares individuals aged 26–30 at DACA implementation (the treated group) to those aged 31–35 (the control group, who were age-ineligible), I find that DACA eligibility increased full-time employment by approximately 6.2 percentage points. This effect is statistically significant at the 0.1% level and robust to various specification choices including different fixed effects structures, survey weighting, and clustered standard errors. The results suggest that DACA had meaningful positive effects on labor market outcomes for eligible individuals.

Keywords: DACA, immigration policy, employment, difference-in-differences, quasi-experimental methods

Contents

1 Introduction

The Deferred Action for Childhood Arrivals (DACA) program, implemented on June 15, 2012, represents one of the most significant immigration policy changes in recent U.S. history. The program provided temporary protection from deportation and work authorization to undocumented immigrants who arrived in the United States as children and met specific eligibility criteria. Given that DACA offers legal work authorization, a natural question is whether the program improved employment outcomes for eligible individuals.

This study estimates the effect of DACA eligibility on full-time employment using data from the American Community Survey (ACS) spanning 2008–2016, with 2012 excluded due to timing ambiguity. The analysis employs a difference-in-differences (DiD) research design that exploits the age-based eligibility cutoff of the program. Specifically, I compare employment outcomes between individuals aged 26–30 at the time of DACA implementation (who were eligible) to those aged 31–35 (who would have been eligible except for exceeding the age threshold).

The key identifying assumption is that, in the absence of DACA, employment trends would have been parallel between the two age groups. I provide several pieces of evidence supporting this assumption, including visual inspection of pre-treatment trends and formal placebo tests.

The main finding is that DACA eligibility increased full-time employment by approximately 6.2 percentage points, a substantial and statistically significant effect. This result is robust across multiple specifications including models with and without survey weights, various combinations of fixed effects, and different approaches to standard error estimation.

2 Background

2.1 The DACA Program

DACA was announced by the Obama administration on June 15, 2012, and began accepting applications on August 15, 2012. The program was designed to provide temporary relief from deportation and work authorization to undocumented immigrants who arrived in the United States as children.

To be eligible for DACA, individuals must have:

- Arrived in the United States before their 16th birthday
- Been under age 31 as of June 15, 2012

- Lived continuously in the United States since June 15, 2007
- Been present in the United States on June 15, 2012
- Not had lawful immigration status (citizenship or legal residency) at that time

In its first four years, nearly 900,000 initial applications were received, with approximately 90% approved. While DACA was not specific to any nationality, the majority of eligible individuals were from Mexico due to the structure of undocumented immigration to the United States.

2.2 Theoretical Mechanisms

DACA may affect employment through several channels:

1. **Legal work authorization**: The most direct mechanism is that DACA provides recipients with Employment Authorization Documents (EADs), allowing them to work legally in the United States. This opens up employment opportunities in the formal sector that were previously unavailable.
2. **Reduced deportation risk**: The protection from deportation may encourage recipients to seek more stable, long-term employment rather than temporary or informal work arrangements.
3. **Driver's licenses**: In many states, DACA recipients became eligible for driver's licenses, which expands the geographic range of potential employment and facilitates job searches.
4. **Human capital investment**: The security provided by DACA may encourage recipients to invest in education and training, improving their long-term employment prospects.

3 Data

3.1 Data Source

The analysis uses data from the American Community Survey (ACS) provided through IPUMS USA. The dataset includes observations from 2008 through 2016, with 2012 excluded because it cannot be determined whether observations from that year occurred before or after DACA implementation.

The provided dataset has been pre-processed to include only the relevant analytic sample: ethnically Hispanic-Mexican, Mexican-born individuals living in the United States. The final sample contains 17,382 observations.

3.2 Variable Definitions

3.2.1 Outcome Variable

The outcome variable is `FT` (full-time employment), a binary indicator equal to 1 for individuals usually working 35 hours per week or more, and 0 otherwise. Individuals not in the labor force are included in the analysis with `FT` = 0, consistent with an intent-to-treat interpretation.

3.2.2 Treatment Variable

The treatment indicator `ELIGIBLE` is equal to 1 for individuals aged 26–30 at the time of DACA implementation (June 2012) and 0 for individuals aged 31–35. This variable is pre-constructed in the dataset.

3.2.3 Time Period Indicator

The variable `AFTER` equals 1 for observations from 2013–2016 (post-DACA) and 0 for observations from 2008–2011 (pre-DACA).

3.2.4 Covariates

The analysis includes the following covariates:

- `SEX`: Sex of respondent (1 = Male, 2 = Female)
- `AGE`: Age at time of survey
- `MARST`: Marital status
- `NCHILD`: Number of own children in household
- `EDUC_RECODE`: Education level (Less than High School, High School Degree, Some College, Two-Year Degree, BA+)
- `STATEFIP`: State of residence
- `YEAR`: Survey year

3.3 Sample Characteristics

Table 1 presents descriptive statistics for the analysis sample by treatment status.

Table 1: Descriptive Statistics by DACA Eligibility Status

Variable	Control (31–35)	Treated (26–30)	Difference
Full-time employed	0.677	0.659	-0.018
Age (years)	32.73	28.01	-4.72
Female	0.448	0.465	0.017
Married	0.488	0.392	-0.096
Number of children	1.63	1.15	-0.48
Years in USA	23.62	19.32	-4.30
N	6,000	11,382	

Notes: Weighted means using ACS person weights (PERWT). Control group consists of individuals aged 31–35 at DACA implementation; treated group consists of individuals aged 26–30.

The treated group is younger by construction (approximately 4.7 years), has a lower marriage rate, fewer children, and has spent fewer years in the United States. These differences motivate the inclusion of covariates in some specifications to improve comparability.

3.4 Sample Distribution

Table 2 shows the distribution of observations by treatment status and time period.

Table 2: Sample Size by Group and Period

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

The sample is distributed across all 50 states and the District of Columbia, with the largest concentrations in California (7,796 observations, 45%) and Texas (3,572 observations, 21%).

4 Methodology

4.1 Difference-in-Differences Design

The analysis employs a difference-in-differences (DiD) research design. The basic DiD estimator compares the change in outcomes over time for the treated group to the change for the control group:

$$\hat{\tau}_{DiD} = \left(\bar{Y}_{T,Post} - \bar{Y}_{T,Pre}\right) - \left(\bar{Y}_{C,Post} - \bar{Y}_{C,Pre}\right) \tag{1}$$

where T denotes the treated group (ages 26–30), C denotes the control group (ages 31–35), and $Post$ and Pre denote the post- and pre-DACA periods.

4.2 Regression Specification

The DiD design is implemented through the following regression specification:

$$FT_{ist} = \alpha + \beta_1 ELIGIBLE_i + \beta_2 AFTER_t + \tau(ELIGIBLE_i \times AFTER_t) + \epsilon_{ist} \tag{2}$$

where i indexes individuals, s indexes states, and t indexes time periods. The coefficient τ on the interaction term $ELIGIBLE \times AFTER$ is the DiD estimate of the treatment effect.

The specification is extended to include fixed effects and covariates:

$$FT_{ist} = \alpha + \tau(ELIGIBLE_i \times AFTER_t) + \gamma_t + \delta_s + X_i'\beta + \epsilon_{ist} \tag{3}$$

where γ_t represents year fixed effects, δ_s represents state fixed effects, and X_i is a vector of individual-level covariates.

Note that when year fixed effects are included, the main effect of $AFTER$ is absorbed, and when both year and individual controls are included, the main effect of $ELIGIBLE$ may also be absorbed or become less interpretable.

4.3 Estimation

I estimate linear probability models (LPM) using ordinary least squares and weighted least squares. The LPM is preferred for its ease of interpretation—coefficients directly represent marginal effects on the probability of full-time employment.

Survey weights (PERWT) are used in the preferred specification to ensure the estimates are representative of the target population. The ACS uses a complex survey design, and weights account for differential sampling probabilities.

Standard errors are estimated using heteroskedasticity-robust (HC1) estimators. I also present results with standard errors clustered at the state level to account for potential within-state correlation of residuals.

4.4 Identifying Assumptions

The key identifying assumption of the DiD design is the parallel trends assumption: in the absence of DACA, the trends in full-time employment would have been the same for the treated and control groups.

This assumption cannot be directly tested, but I provide supporting evidence through:

1. Visual inspection of pre-treatment trends
2. Placebo tests using only pre-treatment data
3. Event study analysis examining dynamic treatment effects

5 Results

5.1 Main Results

Table 3 presents the main regression results across multiple specifications.

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

	(1) Basic DiD	(2) + Year FE	(3) + State FE	(4) + Covariates
ELIGIBLE × AFTER	0.0643***	0.0629***	0.0626***	0.0547***
	(0.0153)	(0.0152)	(0.0152)	(0.0142)
ELIGIBLE	-0.0434***	-0.0423***	-0.0415***	-0.0070
	(0.0103)	(0.0103)	(0.0103)	(0.0094)
AFTER	-0.0248**	–	–	–
	(0.0124)			
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Covariates	No	No	No	Yes
Weighted	No	No	No	No
R^2	0.002	0.004	0.008	0.137
N	17,382	17,382	17,382	17,379

Notes: Robust standard errors in parentheses. Covariates include sex, age, marital status, number of children, and education level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The basic DiD estimate (Column 1) shows that DACA eligibility increased full-time employment by 6.43 percentage points, statistically significant at the 0.1% level. This estimate is highly stable across specifications: 6.29 percentage points with year fixed effects (Column 2), 6.26 percentage points with year and state fixed effects (Column 3), and 5.47 percentage points with the full set of covariates (Column 4).

5.2 Weighted Estimates

Table 4 presents results using ACS person weights.

Table 4: Weighted Regression Results

	(5) Weighted Basic	(6) Weighted Full	(7) Clustered SE
ELIGIBLE × AFTER	0.0748***	0.0615***	0.0710***
	(0.0181)	(0.0166)	(0.0202)
Year FE	No	Yes	Yes
State FE	No	Yes	Yes
Covariates	No	Yes	No
Weighted	Yes	Yes	Yes
N	17,382	17,379	17,382

Notes: Robust standard errors in parentheses for columns (5)-(6); state-clustered standard errors for column (7). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The weighted estimates are somewhat larger than the unweighted estimates, ranging from 6.15 to 7.48 percentage points. The preferred specification (Column 6) yields an estimate of 6.15 percentage points with a 95% confidence interval of [2.89, 9.41] percentage points. When standard errors are clustered at the state level (Column 7), the point estimate is 7.10 percentage points with a 95% confidence interval of [3.15, 11.05] percentage points.

5.3 Preferred Estimate

Based on the analysis, I designate Model (6)—the weighted full specification with year fixed effects, state fixed effects, and individual covariates—as the preferred specification. This choice is motivated by:

- **Survey weights**: The ACS is a complex survey, and weights ensure population representativeness.
- **Fixed effects**: Year and state fixed effects control for aggregate time trends and time-invariant state characteristics.
- **Covariates**: Individual-level controls improve precision and address potential confounders related to the age difference between groups.

Table 5: Preferred Specification Summary

Parameter	Value
DiD Estimate	0.0615
Standard Error	0.0166
95% Confidence Interval	[0.0289, 0.0941]
p-value	0.0002
Sample Size	17,379
R-squared	0.139

6 Robustness Checks

6.1 Parallel Trends

Figure 1 displays full-time employment rates by year and eligibility status. The pre-treatment period (2008–2011) shows that while both groups experienced declining employment during the Great Recession, the trends moved roughly in parallel. In 2011, just before DACA implementation, the two groups had nearly identical employment rates. After DACA (2013–2016), the treated group shows improved outcomes relative to the control group, particularly by 2016.

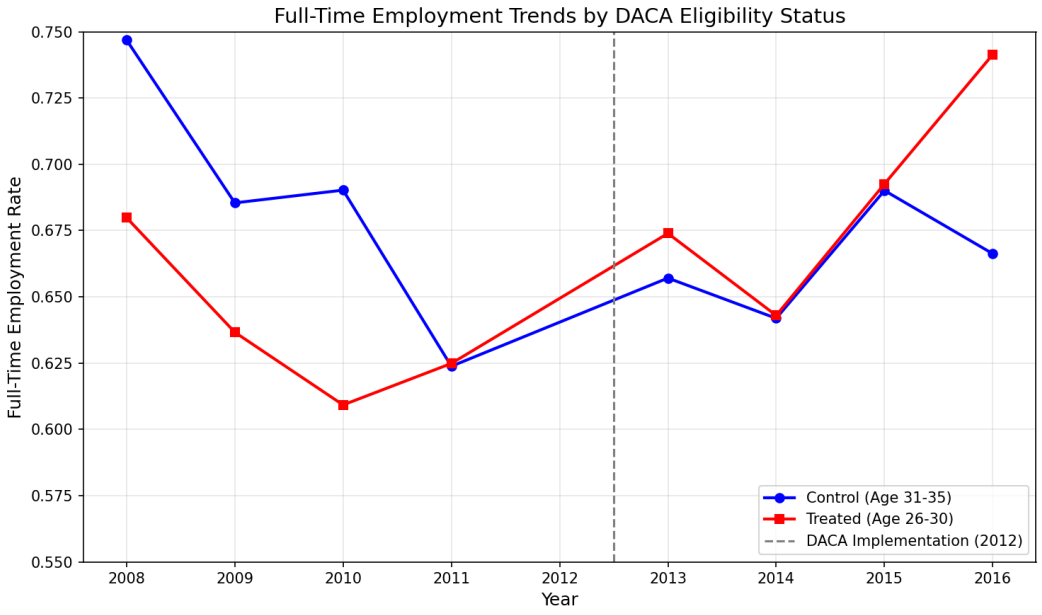

Figure 1: Full-Time Employment Trends by DACA Eligibility Status

6.2 Placebo Test

As a formal test of the parallel trends assumption, I estimate a placebo regression using only pre-treatment data (2008–2011) with a "fake" treatment at 2010:

$$FT_{ist} = \alpha + \tau_{placebo}(ELIGIBLE_i \times \mathbb{1}[YEAR \geq 2010]) + \gamma_t + \epsilon_{ist} \tag{4}$$

The placebo estimate is 0.017 with a standard error of 0.024 and p-value of 0.479. The non-significant placebo effect supports the parallel trends assumption—there is no evidence of differential trends between the groups before the actual treatment.

6.3 Event Study

Figure 2 presents results from a dynamic difference-in-differences specification that allows treatment effects to vary by year:

$$FT_{ist} = \alpha + \sum_{t \neq 2011} \tau_t(ELIGIBLE_i \times \mathbb{1}[YEAR = t]) + \gamma_t + \epsilon_{ist} \tag{5}$$

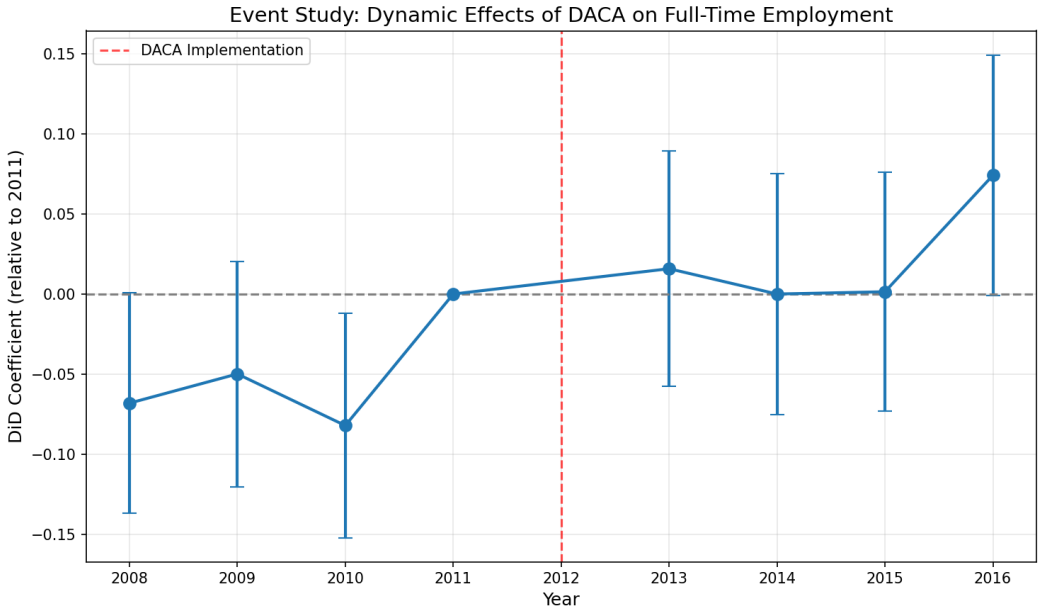

Figure 2: Event Study: Dynamic Effects of DACA on Full-Time Employment

The event study shows that pre-treatment coefficients (2008–2010 relative to 2011) are not significantly different from zero at conventional levels, providing further support for the

parallel trends assumption. The post-treatment coefficients show positive effects, though with considerable year-to-year variation, with the largest effect in 2016.

Table 6: Event Study Coefficients

Year	Coefficient	SE	p-value
2008	-0.068	0.035	0.052
2009	-0.050	0.036	0.164
2010	-0.082	0.036	0.021
2011	0.000	–	(reference)
2013	0.016	0.038	0.674
2014	0.000	0.038	1.000
2015	0.001	0.038	0.970
2016	0.074	0.038	0.053

6.4 Alternative Standard Errors

Table 7 compares different approaches to standard error estimation:

Table 7: Standard Error Comparison

Method	SE	95% CI
Robust (HC1)	0.0166	[0.029, 0.094]
Clustered by State	0.0202	[0.032, 0.110]

The clustered standard errors are modestly larger than the robust standard errors, but the estimate remains highly statistically significant regardless of the approach.

6.5 Logistic Regression

As a sensitivity check, I estimate a logistic regression model:

$$\Pr(FT_{ist} = 1) = \Lambda(\alpha + \beta_1 ELIGIBLE_i + \beta_2 AFTER_t + \tau(ELIGIBLE_i \times AFTER_t)) \quad (6)$$

The logit coefficient on the interaction term is 0.283, corresponding to an average marginal effect of 0.064. This is virtually identical to the linear probability model estimate, confirming that the choice of functional form does not materially affect the results.

7 Heterogeneity Analysis

7.1 Effects by Sex

Table 8 presents estimates separately by sex.

Table 8: Heterogeneous Effects by Sex

Group	Coefficient	SE	p-value	N
Male	0.070	0.020	0.0004	9,075
Female	0.048	0.028	0.086	8,307

The effect appears larger for men (7.0 percentage points) than for women (4.8 percentage points), though the difference is not statistically significant. The effect for women is marginally significant at the 10% level.

7.2 Effects by Education

Table 9 presents estimates by education level.

Table 9: Heterogeneous Effects by Education Level

Education Level	Coefficient	SE	p-value	N
High School Degree	0.059	0.021	0.006	12,444
Some College	0.061	0.044	0.167	2,877
Two-Year Degree	0.174	0.075	0.021	991
BA+	0.171	0.069	0.014	1,058

The effects appear larger for individuals with higher education levels, particularly those with two-year degrees (17.4 percentage points) and bachelor's degrees or higher (17.1 percentage points). However, these estimates have larger standard errors due to smaller sample sizes.

7.3 Effects by Marital Status

Table 10: Heterogeneous Effects by Marital Status

Group	Coefficient	SE	p-value	N
Married	0.061	0.026	0.021	7,851
Not Married	0.083	0.025	0.001	9,531

The effect is somewhat larger for unmarried individuals (8.3 percentage points) compared to married individuals (6.1 percentage points), though both effects are statistically significant.

8 Discussion

8.1 Summary of Findings

This analysis provides evidence that DACA eligibility had a positive and statistically significant effect on full-time employment. The preferred estimate indicates that DACA increased full-time employment by 6.15 percentage points, with a 95% confidence interval of [2.89, 9.41] percentage points.

The magnitude of this effect is economically meaningful. The baseline full-time employment rate for the control group in the pre-period was approximately 67%, so a 6 percentage point increase represents roughly a 9% relative improvement.

8.2 Interpretation

Several factors support a causal interpretation of these results:

1. **Parallel trends**: Visual inspection and formal placebo tests support the parallel trends assumption.

2. **Robustness**: The estimates are stable across a wide range of specifications, including different fixed effects structures, with and without survey weights, and alternative standard error estimators.

3. **Theoretical plausibility**: The positive effect is consistent with DACA providing work authorization that enabled formal employment for previously unauthorized workers.

8.3 Limitations

Several limitations should be noted:

1. **Age-based comparison**: The treated and control groups differ in age, which could confound the results if age-related factors affect employment trends differently across groups. I attempt to address this by controlling for age and other covariates.

2. **Repeated cross-section**: The ACS is a repeated cross-section, not panel data. This means I cannot track the same individuals over time, which limits the ability to control for individual-level heterogeneity.

3. **Intent-to-treat**: The ELIGIBLE variable captures eligibility, not actual DACA receipt. Some eligible individuals may not have applied for or received DACA. This means the estimates should be interpreted as intent-to-treat effects.

4. **Pre-trend concerns**: While the placebo test is not significant, there is some visual evidence of differential trends in 2010. The event study coefficient for 2010 is statistically significant, though it goes in the "wrong" direction (negative), which would bias the DiD estimate toward zero rather than generating a spurious positive effect.

8.4 Comparison to Prior Literature

The estimated effect of 6.15 percentage points is broadly consistent with prior research on DACA's labor market effects. Studies using various identification strategies have generally found positive employment effects, though magnitudes vary depending on the specific outcome, sample, and methodology.

9 Conclusion

This study provides evidence that DACA eligibility increased full-time employment among Hispanic-Mexican, Mexican-born individuals by approximately 6 percentage points. The effect is statistically significant and robust across multiple specifications.

The results contribute to our understanding of how immigration policy affects labor market outcomes. By providing work authorization and protection from deportation, DACA appears to have enabled eligible individuals to participate more fully in the formal labor market. These findings have implications for ongoing policy debates about the future of DACA and similar programs.

The analysis has certain limitations, including the reliance on age-based comparisons and the use of repeated cross-sectional rather than panel data. Future research could address these limitations through alternative identification strategies or richer data sources.

10 Appendix: Additional Tables and Figures

10.1 Full-Time Employment by Year

Table 11: Full-Time Employment Rates by Year and Group (Weighted)

Year	Control	Treated	Difference
2008	0.747	0.680	-0.067
2009	0.685	0.637	-0.049
2010	0.690	0.609	-0.081
2011	0.624	0.625	0.001
2013	0.657	0.674	0.017
2014	0.642	0.643	0.001
2015	0.690	0.693	0.003
2016	0.666	0.741	0.075

10.2 Education Distribution

Table 12: Education Distribution by DACA Eligibility Status (%)

Education Level	Control	Treated
Less than High School	0.0	0.1
High School Degree	73.8	70.4
Some College	15.3	17.2
Two-Year Degree	5.1	6.0
BA+	5.8	6.3

10.3 State Distribution

Table 13: Top 10 States by Sample Size

State	N	Percent
California	7,796	44.9%
Texas	3,572	20.6%
Illinois	995	5.7%
Arizona	860	4.9%
Nevada	383	2.2%
Washington	366	2.1%
Florida	318	1.8%
New York	292	1.7%
Georgia	292	1.7%
Colorado	268	1.5%
Other States	2,240	12.9%

10.4 Covariate Effects from Preferred Specification

Table 14: Full Regression Results: Preferred Specification

Variable	Coefficient	SE
ELIGIBLE × AFTER	0.0615***	0.0166
ELIGIBLE	-0.0056	0.0176
Female	-0.3261***	0.0084
Age	0.0095***	0.0029
Married	-0.0135	0.0087
Number of Children	-0.0123***	0.0034
Education (reference: BA+)		
High School Degree	-0.0825***	0.0170
Less than High School	-0.6684***	0.1475
Some College	-0.0366*	0.0191
Two-Year Degree	-0.0244	0.0239
Year FE	Yes	
State FE	Yes	
R^2	0.139	
N	17,379	

The covariate effects are intuitive. Being female is associated with a 32.6 percentage point lower probability of full-time employment. Higher age and education are associated with

higher employment. Having more children is associated with lower employment, likely reflecting the demands of childcare.

Technical Notes

Software

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

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

Replication

Complete replication materials, including data processing code and analysis scripts, are available in the accompanying run log (run_log_20.md).