The effects of DACA on the labor market

1. Introduction

The United States has 2.5 million fewer people in the labor force compared to pre-pandemic trends.[1] As "Help Wanted" signs appear in windows, today's staggering labor shortages appear in headlines with increasing alarm. Despite these conditions, the US continues to deport tens of thousands of undocumented immigrants annually. Given legal status, this population could fill the gaps across industries that the current economy faces. However, legal immigration restrictions have created an inefficiency prohibiting a traditionally labor-seeking population from safely entering the US labor market.

According to the US Bureau of Labor Statistics, there were 10,441 million job openings in November 2022, just weeks after the Biden Administration chose to expand Title 42, the pandemic era regulation allowing immediate deportation to Mexico for immigrants from many Central and South American countries. 2.1 million jobs remained vacant in education and health services while 1.9 million jobs remained open in leisure and hospitality.[2] In comparison, there were only 432 thousand and 797 thousand unemployed in each industry; gaps of 1.7 million and 1.1 million needed workers respectively.

These shortages are not expected to disappear anytime soon. While some labor market shifts were specific to the COVID-19 pandemic, many existing trends were simply accelerated by the crisis. Many of the jobs in high demand will be for high-skill workers. For example, some estimate that the United States could see a deficit of 200,000 to 450,000 registered nurses as soon

[1] Bhattarai, Abha. Washington Post. "Worker Shortages Are Fueling America's Biggest Labor Crises," September 16, 2022. https://www.washingtonpost.com/business/2022/09/16/worker-shortage-strikes-economy/.
[2] "Table 1. Job Openings Levels and Rates by Industry and Region, Seasonally Adjusted - 2022 M12 Results." Accessed February 6, 2023. https://www.bls.gov/news.release/jolts.t01.htm.

as 2025 and a shortage of up to 124,000 physicians by 2034.[3] Education is another sector experiencing deficits, with over three-quarters of states in the U.S. currently experiencing a teacher shortage.[4] Overall, predictions suggest that the United States will experience a shortage of 800,000 workers with associate's degrees or some college and 8.5 million workers with bachelor's degrees or higher by 2030.[5] Expanding access to work permits for undocumented immigrants is a clear solution to address this crisis.

2. Motivation and Conceptual Framework

A competitive labor market is associated with increased employee bargaining power, high employment turnover rates, and burnout. Workplace burnout is propelled by labor shortages[6] and can lead to poor working conditions and even more turnover. In this market, many employers have chosen to raise wages, but some have found that increased wages are insufficient to fully restore the workforce. Additionally, economists are concerned about the impact of raising wages on inflation. While these stop-gap measures may provide some relief, many economists agree that additional workers are necessary.

Adjusting immigration policy is a clear solution to the widespread labor shortages being experienced in many sectors in recent years. Not all immigrants come to the US to work, but immigrants that are deported to Mexico are overwhelmingly young - 90% between 15 and 39 and 65% between 15 and 29.[7] One survey found that, of recently deported workers whose stay in

[3] Gooch, Kelly. Becker's Hospital Review. "Healthcare workforce shortages by the numbers." May 23, 2022. https://www.beckershospitalreview.com/workforce/healthcare-workforce-shortages-by-the-numbers.html
[4] Jones, Arthur. ABC News. "Most of the US is dealing with a teacher shortage, but the data isn't so simple." February 11, 2023. https://abcnews.go.com/US/map-shows-us-states-dealing-teaching-shortage-data/story?id=96752632
[5] Hetrick et al. Emsi. "The Demographic Drought." https://fs.hubspotusercontent00.net/hubfs/4906807/Demographic%20Drought%20V18.pdf
[6] Bhattarai, Abha. (2022)
[7] Bahar, D. & Casas-Alatriste, P. "Who Are the 1 Million Missing Workers That Could Solve America's Labor Shortages?" *Brookings* (blog), July 14, 2022.

the US was long enough to work, many worked in the fields in which the US currently is experiencing labor shortages. Two UC Davis economists have noted that sectors that tend to rely on immigrant labor had significantly higher rates of vacant filled jobs in 2021.[8] As mentioned previously, shortages in high-skill occupations are expected to persist in the future. "Brain waste", which refers to high-skill workers' being employed in low-skill occupations, is a key component of this issue, especially among immigrant populations. College-educated immigrants who are undocumented are much more likely to be underemployed, or in low-skill occupations, than those with a legal path to employment. Thus, the undocumented immigrant population is likely underutilized in filling gaps in high-skill occupations in the U.S. labor market.[9]

Despite increasing efforts to stem the flow of immigrants at the southern border, recent years have seen record numbers of people attempting to cross the US-Mexico border.[10] The financial costs alone that immigrants often incur to attempt to enter the United States suggests that residence and work in the US are highly desirable to this population. Granting work authorization to undocumented immigrants would likely increase labor supply such that shortages could potentially shrink or even disappear altogether.

There are some pathways for legal residential and work status inside the US. Of note to this study in particular is the Deferred Action for Childhood Arrivals (DACA) program, which gives qualifying immigrants who arrived as children protection from deportation and a work

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https://www.brookings.edu/blog/up-front/2022/07/14/who-are-the-1-million-missing-workers-that-could-solve-americas-labor-shortages/.

[8] Ivanova, Irina. "America's Labor Shortage Is Actually an Immigrant Shortage," April 8, 2022. https://www.cbsnews.com/news/immigration-jobs-workers-labor-shortage/.

[9] Batalova, J., Fix, M., & Bachmeier, J. D. Migration Policy Institute. "Untapped Talent: The Costs of Brain Waste among Highly Skilled Immigrants in the United States" ttps://www.migrationpolicy.org/sites/default/files/publications/BrainWaste-FULLREPORT-FINAL.pdf

[10] Soto, Ariel G. Ruiz. "Record-Breaking Migrant Encounters at the U.S.-Mexico Border Overlook the Bigger Story." migrationpolicy.org, October 16, 2022. https://www.migrationpolicy.org/news/2022-record-migrant-encounters-us-mexico-border.

permit that must be renewed every two years. Approximately 1.8 million people are eligible for DACA and about 800,000 are enrolled in the program. Since this program was implemented in 2012, studying DACA participants enables studying how labor-force participation and industry and occupation-specific employment have changed over time as enrollment in the program increased. In particular, we are interested in how employment has changed in areas with high concentrations of DACA participants, especially in high-skill occupations and industries that are prone to labor shortages. State-year-occupation will be our unit-of-analysis for this study, and thus our results will only be generalizable at the aggregate-level.

3. Research Design

This study proposes a fixed effects model to capture the natural treatment effect of granting work authorization to DACA recipients on employment rates in high-skill versus low-skill occupations. This section discusses both the conditions of the policy intervention and the proposed fixed effects model.

3.1. Intervention: DACA

As discussed above, eligibility for DACA was limited to young immigrants who arrived in the US before age 16 and lived in the country since June 15, 2007.[11] Participants could not be older than 30 at the time the policy took effect in 2012. In addition to the age and residence requirements, participants had to pass criminal background checks, provide proof of education, and participate in recording of identifying features.[12]

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[11] López, Gustavo, and Jens Manuel Krogstad. "Key Facts about Unauthorized Immigrants Enrolled in DACA." *Pew Research Center* (blog). Accessed March 13, 2023. https://www.pewresearch.org/fact-tank/2017/09/25/key-facts-about-unauthorized-immigrants-enrolled-in-daca/.

[12] "What Is DACA and Who Are the DREAMers? | ADL." Accessed March 13, 2023. https://www.adl.org/resources/tools-and-strategies/what-daca-and-who-are-dreamers.; López, Gustavo, and Jens Manuel Krogstad. "Key Facts about Unauthorized Immigrants Enrolled in DACA." *Pew Research Center* (blog).

Since its enactment, DACA has been the target of legal challenges that have gone to the Supreme Court and required extension by presidential order. In September of 2017, President Trump announced the termination of DACA which cast the future legal status of many enrollees into question.[13] While the decision was quickly countered with a preliminary injunction in the Northern District of California, courts in DC, New York, Southern District of Texas, and California issued conflicting rulings between 2018 and 2020 when the Supreme Court ruled that the 2017 decision to rescind DACA was arbitrary and capricious.[14] Shortly after that decision, the DHS made immediate changes that rejected all pending and future initial DACA requests; this policy was successfully challenged later the same year, but stood in place for five months. In August of 2022, the Biden administration finalized a rule to formalize the DACA program, but did not expand the eligibility of the program at that time to include those that have aged into eligibility since 2017.[15] The program remains in legal jeopardy.

To date, it is estimated that of the 1,326,000 individuals eligible for DACA, the program has enrolled only about 800,000 and about 110,000 of those are no longer enrolled in the program.[16] It is estimated that 91% of DACA respondents were employed as of 2017 with an average hourly wage of $17.46.[17] Of the 45% of respondents who were in school, 72% were pursuing a bachelor's degree or higher.[18] It has been observed that DACA recipients work across

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Accessed March 13, 2023. https://www.pewresearch.org/fact-tank/2017/09/25/key-facts-about-unauthorized-immigrants-enrolled-in-daca/.

[13] National Immigration Forum. "Fact Sheet: Deferred Action for Childhood Arrivals (DACA)," October 16, 2020. https://immigrationforum.org/article/fact-sheet-on-deferred-action-for-childhood-arrivals-daca/.

[14] "Summary of DACA Litigation and Policy Developments | Catholic Legal Immigration Network, Inc. (CLINIC)." Accessed March 13, 2023. https://www.cliniclegal.org/resources/humanitarian-relief/deferred-action-childhood-arrivals/summary-daca-litigation-and-policy.

[15] Ibid.

[16] National Immigration Forum. "Dreamer Advocacy Resources," July 17, 2021. https://immigrationforum.org/article/dreamer-advocacy-resources/.

[17] "What Is DACA and Who Are the DREAMers? | ADL." Accessed March 13, 2023. https://www.adl.org/resources/tools-and-strategies/what-daca-and-who-are-dreamers.

[18] Ibid.

sectors but the effect of DACA work authorization on labor sector participation and growth is under-studied. However, the fluctuating legal challenges of the program and the strict eligibility requirements are deterrents for some participants.

3.2. Sample

Given the unique conditions of this policy intervention, the treatment group is best identified through official documentation. For this study, the natural experiment will study the effect of increasing DACA participation on employment rate changes across occupation skill groups within states. Precise measures of DACA participation and employment are discussed below in "Data Collection."

3.3. Fixed Effects Model

This study will employ a two-way fixed-effects analysis conducted at the state-year-occupation level between 2014 and 2019. By conducting this natural experiment at the state-year-occupation level, the fixed effects estimator will eliminate the potential of omitted variable bias stemming from the exclusion of unobserved time-invariant effects and national factors changing over time but consistent across all states. The study will examine how employment by type of occupation changes in response to increasing DACA participation. In particular, we are interested in a comparison within states between "high-skilled" and "low-skilled" occupations and comparisons of the same occupation group across states. We define high-skilled occupations as occupations that typically require at least a college education (e.g. engineer, attorney, accountant) and low-skilled occupations that do not have any specific education requirements (e.g. construction worker, retail worker). Our primary outcome of interest will be the state's employment rate, or the proportion of a state's civilian population that

is over 16 and employed. Our full specification will also include an interaction term, where DACA participation is interacted with a binary variable indicating whether the state-year-occupation observation is for high-skilled occupations. This will allow us to assess how changes in DACA participation differentially impact employment rates between high-skilled and low-skilled labor markets and across states with different levels of high-skill occupations. The tentative model for our primary outcome is proposed below:

$$Employment\ Rate_{ijt} = a_i + \beta_1 DACA\_recipient\_rate_{ijt} + \beta_2 High\_skilled\_Occupation_{ijt}$$
$$+ \beta_3 (DACA\_recipient\_rate\ *\ High\ Skilled\ Occupation)_{ijt} + \lambda Control_{ijt} + \delta_t + u_i + e_{ijt}$$

Where:

$Employment\ Rate_{ijt}$ is the proportion of the state population that is employed and over 16, by state (i) and skill level (j) and year (t);

$DACA\_recipient\_rate_{ijt}$ is the proportion of the state population that is DACA recipients, by state (i) and skill level (j) and year (t);

$High\_skilled\_Occupation_{ijt}$ is a binary variable set equal to 1 for high-skilled group observations and set equal to 0 for low-skilled group observations, by state (i) and skill level (j) and year (t);

$\lambda Control_{ijt}$ is a series of control variables, by state (i) and skilled occupation and year (t), that are related to the DACA recipient rate and unemployment rate; vary over time; and vary across state-skill groups.

a_i is the intercept for each state;

δ_t is the coefficient for the time regressors.

u_i is the within-state error term;

e_{it} is the overall error term and

With the above model, we are comparing occupation groups of the same skill level, who have the same controlled characteristics for their occupation group and state.

4. Outcomes and Measurement

The primary outcome that this study will examine is employment rates. Overall, we would expect to see increases in employment across all occupation groups from DACA, as work authorization would be expected to both decrease unemployment and increase labor force participation among undocumented immigrants. However, since DACA was intended to give undocumented young adults opportunities to pursue employment in sectors they are skilled for but for which they lack work authorization, we would expect to see larger increases in employment rates in high-skill occupations where a four-year college degree is typically required. We would also expect high-skill occupations to have larger increases in employment rates in states where DACA recipients make up a larger proportion of the population than in states where DACA recipients make up a tiny proportion of the population.

4.1. Power

The sample for this study is fixed at 600 observations. 50 states, over six years and two skill level occupations in each state. When simulating the power of this study, we set the range of possible DACA participation rates for each state to be random and based on the true range of values from USCIS data. In our data generating process to carry out simulations, we made the sign of the treatment effect be positive for both low-skill and high-skill occupation groups since we predict both occupation groups will see employment gains from DACA. We found the minimum detectable effect for our treatment effect (the interaction on the DACA participation rate and change in employment rate) is 0.515, or 51.5 percentage points, at the 80% power level.

To put this treatment effect into context, if the current DACA participation rate in a state is 2% and if that rate were to double to 4%, then the related employment rate change would be 1% for low-skilled occupations and 2% for high-skilled occupations.

5. Data Collection

We will collect information from USCIS administrative data and from the American Community Survey (ACS) from 2014 to 2019. Yearly data for USCIS and ACS will be cleaned and appended, respectively, before being merged into our final panel dataset.

We will begin our analysis in 2014, which is the first year that USCIS has publicly available data on the number of approved DACA applications for all 50 states. Ideally, we would have data on the number of active DACA recipients instead of approved DACA applications. Data on DACA expirations is not consistent across years, and thus, we are not able to know the true number of DACA recipients. Nevertheless, approved applications are the next best estimate. USCIS has a PDF file for each fiscal quarter: we will be transferring data from the fourth quarter of each fiscal year to a separate spreadsheet following a tidy format, where each row is a state-year-skill observation. Our sample size will be 600 state-year-skill observations (50 states by 6 years by two occupation skill groups)

Our covariates and dependent variables will be acquired from the National Historical Geographic Information System (NHGIS) website, which provides aggregate summary tables and time series of ACS data for all levels of census geography, including states. ACS data includes hundreds of possible variables for population, housing, agriculture, and economic data. Data is aggregated, which means that our covariates and key variables of interest will have to be transformed as proportions to control for varying state population sizes.

A list of our variables and their definitions are below.

Variable	Definition	Source
DACA recipient rate	A continuous variable that measures the proportion of the state's total population that is DACA recipients.	USCIS
Employment rate	A continuous variable measuring the state employment rate. Employment rates for high-skilled observations are calculated by summing the number of employed people over the age of 16 who are in management, business, sciences, arts, sales, and office occupations. The total is expressed as a proportion of the state's population. Employment rates for low-killed observations are calculated by summing the number of employed people over the age of 16 who are in service, natural resources, construction, maintenance, production, transportation, and material moving occupations. The total is expressed as a proportion of the state's population.	ACS
High-skilled Occupation	A binary variable set equal to 1 when the observation is for high-skilled occupations and set equal to 0 when the observation is for low-skilled occupations.	ACS