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Effects of Occupational License Access on Undocumented Immigrants: Evidence from the California Reform

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Evidence from the California Reform [*]

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Abstract

In 2014, California lifted legal work status requirement for dozens of occupational licenses - a major obstacle for undocumented immigrants in the US to access professional jobs. This paper assesses its effects on the employment outcome of undocumented immigrants in California. Analysing likely undocumented immigrants in the American Community Survey, I find that the law increased their employment, particularly in lower-skill or blue-collar licensed occupations, and older or Hispanic workers. I also find the law did not crowd out documented or domestic workers.

Keywords: Occupational licensing, Undocumented immigrants, Employment
JEL Classification: J15, J44, K37

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1   Introduction

Undocumented immigrants are non-resident aliens who do not have the right to work and receive income in the United States. According to the estimation by Warren (2020), the total US undocumented population was about 10.6 million in 2018, which are bigger than most of the state populations.[1] They contribute significantly to the US economy, but have yet been integrated into the US society.

For job access, occupational licensing has been a huge barrier to undocumented immigrants in the US. Occupational licensing has affected more than one-fourth of the US workers and limits job opportunities (Blair and Chung, 2019; Kleiner, 2000; Kleiner and Krueger, 2013; Plemmons, 2023). A license regulation requires individuals to obtain certain qualifications (through formal education, pre-license training, or examinations) for them to be a licensed practitioner and work legally in an occupation. Because many professional licenses require a legal work status, this labor market restriction is a particular detriment to undocumented immigrants. Licensing restrictions, from this perspective, limit our economy to fully utilize the already-existing human resources.

This paper documents the benefits of lifting occupational license restrictions on undocumented immigrants, leveraging a policy change in California in 2014. The legislation required that the licensing boards under the California Department of Consumer Affairs (DCA) cannot deny a license application based on the citizenship or immigration status for dozens of licensed professions. Among earliest efforts in other states that grant license access to immigrants, the California policy potentially impacted a far bigger undocumented community.

Using a generalized difference-in-differences (DID) approach that analyzes 'likely undocumented immigrants' in the American Community Survey, I compare the employment status of the undocumented population in California with that in other states before and after the policy.[2] I find that the policy increases the employment of undocumented workers by about

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[1]According to the 2020 Census, only ten states have a population that exceeds 10 million.

[2]As an alternative data, I also find similar patterns using the Current Population Survey.

1 percentage point on average. The result is robust when apply entropy balancing – a recent variant of matching – to correct imbalance in observables (Hainmueller, 2012). I also find a significantly stronger impact on the 'covered' licensed professions and find no impacts on transportation-related occupations. These offer evidence that the DID estimate captures a different effect than the driver's license reform, which has an overlapping implementation schedule (Amuedo-Dorantes et al., 2020).

I also find stronger impacts on lower-skilled and blue-collar licensed professions, and older and Hispanic workers. To the extent that unnecessary licensing requirements – that residency status does not predict skill levels – created excessive barriers against the undocumented workers, the policy successfully helped a subset of the population. At the same time, the silence in higher-skill licensed professions remains an impediment for the US economy to fully utilize the already-existing human capital.

Besides the focus on undocumented immigrants, I also investigate the general equilibrium effect and find suggestive evidence that the CA law is not a zero-sum policy. While the increased employment of undocumented workers did not crowd out documented immigrants or domestic workers, the law drew individuals who were not employed to work in the licensed professions. Taken together, while the legal work status restricted supply and created shortage, lifting it fulfilled the unmet demands instead of displacing existing job opportunities.

Our discussion is among the first to quantify the benefits of lifting license restrictions on undocumented immigrants in the US. The closest attempt is by Grelewicz (2020), who also investigates the same legislation. He finds that the California bill increased the license attainment and earning of undocumented immigrants.[3] We offer complementary findings by looking into the employment status, and uncovering subgroup differences. Since hostile environments in various aspects of life have adversely impacted immigrants, overturning the restrictionary policies greatly improves their welfare (Areans Arroyo and Schmidpeter, 2022; Churchill et al., 2023; Rubalcaba et al., 2023). Our results support the initiatives in a number

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[3]Lara (2014) also provides an executive summary of this policy.

of states that grant license access to immigrants. However, the impacts of many of them were limited by the scope of the policy.[4] The regulators could better utilize the readily available labor supply and human capital by removing unnecessary requirements that barely predicts skill levels.

Overall, the current findings continue to speak to the distributional effects of occupational licensing. Studies have found that licensing disproportionately affects minority and female workers (Blair and Chung, 2021, 2022; Chung and Zou, 2021; Law and Marks, 2009; Sheehan and Thomas, 2023; Xia, 2021). A few have looked at the licensing impacts on immigrants, including wage premium (Cassidy and Dacass, 2021; Gomez et al., 2015; Tani, 2020) and employment (Federman et al., 2006; Peterson et al., 2014; Brücker et al., 2021). Our results continue to highlight the importance of removing labor market barriers on the job access of marginalized populations.

2   Policy Background

In late 80s and early 90s, the sentiment against undocumented immigrants of local Americans accumulated, that gave rise to a number of restrictionary policies (Alvarez and Butterfield, 2000; Citrin et al., 1997). At the federal level, the 1986 Immigration Reform and Control Act (IRCA) limited illegal immigrants access to jobs. At the state level, a notable initiative was Proposition 187 in 1994 in California, which created a hostile environment against illegal immigrants, including the restrictions on their access to basic health care and public education.

Despite being aware that undocumented immigrants have no legal rights to work, some US employers likely exploit the weakened bargaining power of the undocumented to save labor costs, including salary and fringe benefits (Massey and Gentsch, 2014). Also, because of the demographic changes after the baby burst in 70s, undocumented workers become a popular source to fill the demand for entry-level and low-skilled positions (Passel, 1986).

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[4]In Table A1 of appendix, we summarize similar policies in other states.

Therefore, the undocumented population in the US had been facing a difficult environment in the labor market.

With a century-long debate, states including California endeavored to integrate undocumented immigrants into the US society (Olivas, 2017).[5] Coupled with a number of initiatives, granting undocumented immigrants the access to occupational licenses is one big step forward to create a more welcoming labor market.[6] In addition to California, other states also increased occupational license access to undocumented immigrants in 2010s. We provide a summary in the technical appendix to review the covered professions and immigrant population of each legislation. Among the earlier attempts, the initiative by the State of California stands out for two reasons. The Senate Bill No. 1159 was passed on September 2014 to prohibit the licensing boards under the California Department of Consumer Affairs (DCA) from denying licensure to an applicant based on the citizenship or immigration status ('CA law' thereafter). The boards were required to implement the changes in 2015. The first prominent feature is that the bill targeted individuals beyond DACA receipts and individuals with work authorization. The bill permitted Individual Taxpayer Identification Numbers (ITINs) as an option to prove identity that opens the grate to undocumented immigrants.[7] Second, the bill applied to dozens of license broads under the DCA that potentially benefited a bigger undocumented population than similar concurrent initiatives in other states.

Table A2 of appendix lists 39 license boards that are supervised by the DCA. Except for a few with an asterisk (such as barbering and cosmology), most of the covered professions require an undergraduate degree. I will utilize the different education requirements to explore heterogeneous effects by the CA law.

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[5]Examples of earlier federal reforms that offer access to work and higher education for immigrants include the DREAM Act, and Deferred Action for Childhood Arrivals (DACA).

[6]An important symbolic legislation is SB 396 that removed most of the restrictions mandated by Prop. 187.

[7]Undocumented immigrants are not eligible for Social Security Numbers, which are used to prove identity for most occupational licenses. Immigrants under the DACA or with temporary protected status in principle were eligible for a license as long as they have gotten an SSN.

3 Methodology

We analyze the American Community Survey (ACS) from 2009 to 2019, which contains rich information about demographic and employment information of a nationally representative sample of U.S. workers each year.[8] In our context, the main difficulty is to identify undocumented immigrants since no particular questions collect related information in the survey. Our analysis follows the approach suggested by Borjas (2017) to define 'likely undocumented immigrants'. The criteria include arriving to the U.S. after 1980; having no U.S. citizenship; has not served in the military; not being a government worker; not being born in Cuba; does not receive Social Security Income. An individual who meets all criteria is then classified as a 'likely undocumented immigrant'.

Borjas (2017) also utilizes "not working in universally licensed professions" to define the undocumented population.[9] Because some granted professions under the CA law overlap with the universally licensed professions, I do not apply this criterion to classify 'likely undocumented immigrants' since 'becoming licensed' is the main channel through which the employment effect of the CA law operates.

Our sample consists of the working-age population (18-64) who are in the labor force. Table 1 shows the summary statistics of individual characteristics of 'likely undocumented immigrants' in our 10-year repeated cross-sectional sample. Among the characteristics, California has fewer blacks and Hispanics than other states. Our sample also has fewer females in general since we focus on workers who are in the labor force.

In the regression analysis, we employ the generalized difference-in-difference (DID) approach that compares the individual outcome of undocumented immigrants in California with their counterparts in other states before and after 2014. Formally, we estimate:

$$employed_{ist} = \alpha_0 + \alpha_1 CABill_{California, t>2014} + X_{ist}\Gamma + Z_{st}\delta + \theta_t + \theta_s + \epsilon_{ist}. \qquad (1)$$

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[8] The data is pooled from IPUMS USA (Ruggles et al., 2022).

[9] The list of universally licensed professions can be find in Gittleman et al. (2018).

Table 1: Demographic Statistics of Likely Undocumented Immigrants

	(1) California		(2) Other states	
	mean	sd	mean	sd
employed	0.91	0.28	0.93	0.26
female	0.38	0.49	0.38	0.49
age	38.13	10.43	37.50	10.62
college	0.33	0.47	0.37	0.48
Hispanic	0.13	0.34	0.24	0.43
black	0.01	0.11	0.09	0.29
Asian	0.21	0.41	0.18	0.39
Observations	257244		735884	

Data: American Community Survey (2009-2019)

Note: The sample consists of 'likely undocumented immigrants' following the criteria (except universal licensure) by Borjas (2017) with ages between 18 and 65 who are in the labor force. Sample weights apply.

The outcome of interest equals 1 if worker i is employed in state s in year t. $CABill$ is the treatment indicator for California after 2014. X_{ist} is vector of individual characteristics listed in Table 1. Z_{st} is a vector of time-varying state control variables tabulated using the March Supplement with sample weights. The variables include the share of minority, share of workers in manufacturing jobs, share of workers in service sector, and the college attainment rate of the state population. The tabulation sample is restricted to the 18-64 population. θ_t and θ_s are year and state fixed effects, respectively. Standard errors are clustered at the state level to allow for serial correlation and avoid underestimating confidence intervals. All regressions are weighted by the sample weight.

Although the model in Equation 1 controls for time-varying state-level changes, a number of states including California also granted undocumented immigrants the access to driver's licenses that can be a competing concurrent policy since 2014. To address this confounding factor, we also control for the driver license policy in the regression.[10]

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[10]The states are DC, Illinois, Maryland, Nevada, and Vermont in 2014; California, Colorado, and Connecticut in 2015; Delaware and Hawaii in 2016. Details in Table A3 of appendix.

4 Results

4.1 Main Patterns

In Figure 1, we first plot the raw pattern of the policy treatment by running a two-way fixed-effect event study model with no control variables. While the pre-treatment trend is slightly bumpy, the deviation is not statistically significant. To check the sensitivity of our DID estimate, I will run an alternative model that applies matching to observables in Section 4.2. For the post-treatment years, there is a one-time jump in the employment likelihood of the 'likely undocumented immigrants' in CA. The heterogeneity by occupations later will offers possible explanations for this discrete jump.

Figure 1: Event Study Dummies Conditional on Fixed Effects
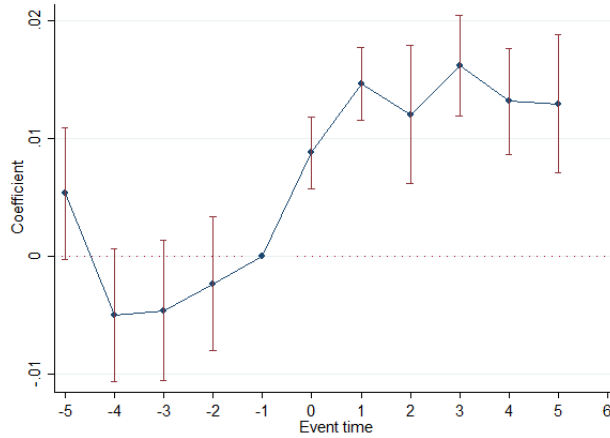
Data: CPS March Supplement (2009-2019)

Note: The figure shows the dynamic effects of the CA law, with 2014 being the omitted year. The regression only includes the year and state fixed effect. The point plots the estimate and the error bar represents the corresponding 95% confidence interval.

Table 2 presents the DID results. Column 1 reports the treatment effect conditional on fixed effects and controlling for the implementation of the driver's license reform. Although the relaxation of driver license applications for undocumented immigrants overlapped with the occupational licensing reform in CA, the treatment effect in our model remains significant at the 5% level. A way to interpret the coefficient is the effect of granting occupational licensing access conditional on the influence of the driver license reform. Section 5.1 will

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further differentiate the two competing policies.

In Column 2 and 3 of Table 2, the treatment effect remains salient at the 5% level when the model further controls for state and individual characteristics specified in Equation 1. In the fully saturated model in Column 3, lifting the occupational license restrictions increases the employment of 'likely undocumented immigrants' by about 1 percentage point. While the magnitude is small constrained by the limited scope of the law, the effect size is still statistically significant.

Table 2: Lifting License Restrictions Raises Employment of Undocumented Immigrants

	(1)	(2)	(3)
treat	0.00881**	0.0102**	0.00944**
	(0.00438)	(0.00447)	(0.00449)
Observations	993,128	993,128	993,128
R-squared	0.011	0.011	0.022
Driver license reform	X	X	X
State controls		X	X
Individual controls			X

Data: American Community Survey (2009-2019)

Note: The dependent variable equals 1 if the individual is employed. The sample is restricted to 'likely undocumented immigrants' following the criteria (except universal licensure) by Borjas (2017) with ages between 18 and 65 who are in the labor force. All regressions control for the year and state-fixed effect. Standard errors are clustered at the state level. ***, ** and, * represent 1%, 5% and 10% significance level, respectively.

4.2 Sensitivity Check

In this subsection, we check the validity of the DID estimate. Column 1 of Table 3 first reports the DID estimate in the fully saturated model as the baseline comparison. In the following exercises, the regressions follow the same specification as in Column 3 of Table 2.

The first check is the validity of the comparison states. As shown in Table A1 of the appendix, several liberal states also lift license restrictions for undocumented immigrants to some extents. In other words, putting these liberal states in the comparison group is analogous to the 'bad comparison' problem induced by heterogeneous 'treatment' timing (Baker et al., 2022). In Table A4 of the appendix, I first track the change in the DID estimate if the liberal states are gradually added to the treatment group. While the pooled estimate from all the liberal states is not the focus of this paper, the larger aggregated effect in Table A4 indeed reveals the potential bias since the employment pattern in the liberal states do not serve as a stable comparison. In Column 2 of Table 3, the DID estimate is larger by about a standard deviation if I drop the liberal states. This implies that the changing employment trend in the liberal states nullified the true treatment effect of the CA law if they are put in the comparison group.

Table 3: Sensitivity Checks: Sample Selection and Matching

VARIABLES	(1) Baseline	(2) Drop liberal states	(3) Entropy balance
treat	0.00944**	0.0156***	0.0108***
	(0.00449)	(0.00484)	(0.00301)
Observations	993,128	694,521	993,128
R-squared	0.022	0.022	0.024

Data: American Community Survey (2009-2019)

Note: The dependent variable equals 1 if the individual is employed. The sample is restricted to 'likely undocumented immigrants' following the criteria (except universal licensure) by Borjas (2017) with ages between 18 and 65 who are in the labor force. All regressions control for individual and state characteristics, the timing of driver's license reform, and the year and state-fixed effect. Standard errors are clustered at the state level. ***, ** and, * represent 1%, 5% and 10% significance level, respectively.

The second check is to apply matching to our DID regression. I match 'likely undocu-

mented workers' in CA with those in the comparison states using entropy balancing (EB) (Hainmueller, 2012). It is a recent variety of matching techniques to obtain more comparable treatment and control groups based on observables. Comparing to other common matching methods such as coarsened exact matching, EB method allows smoother weighting across units and avoids dropping observations. As shown in Figure A1 of the appendix, covariate imbalance in both individual and state characteristics is drastically reduced under the weighting scheme. The notable changes occur to the size of the service sector and the minority population. When applying EB to the regression analysis in Column 3 of Table 3, the estimate remains salient and the effect size is similar to the baseline in Column 1.

5 Further Analysis

5.1 Differentiate from Driver's License Reform

The driver's license reform in California, which was effective in January 2015, has an overlapping window with the occupational license reform this paper studies. In the main regression, when the model control for the timing of the driver's license reform in different states, I still observe a treatment effect from the occupational license law in CA. From a statistical standpoint, the treatment dummy is an interaction term that captures additional influences of the CA law conditional on the average effect of the driver's license reform. In this subsection, I provide more evidence to differentiate the CA law from the driver's license reform.

Since the CA law only applies to the forty license bureaus, a useful exercise is to differentiate the effect on the 'covered' professions from that on other occupations. The idea is if the employment effect identified in the main analysis is driven by the CA law and not other confounding progressive policies, we should observe a stronger effect on the 'covered' professions. To do so, I match the professional licenses administered by the covered license bureaus in Table A2 with the 4-digit occupation code in the CPS using the O*NET-SOC AutoCoder (Blair and Chung, 2022). The AutoCoder software is an online application offered by the US Department of Labor for researchers to relate occupational information to the occupation classification system in national household surveys. In the current paper, I first utilize the license titles to obtain the best-match 6-digit SOC codes in the AutoCoder. I then transform the 6-digit SOC codes to the 4-digit codes in the CPS using the crosswalk provided by the Census Bureau.[11] For example, a 'Thermal Insulation' license under the Bureau of Household Goods and Services is coded as '47-4099' and '47-2131' in AutoCoder, which refer to '6765 (Miscellaneous Construction and Related Workers)' and '6400 (Insulation Workers)' in the CPS using the crosswalk. In the regression, the treatment dummy further interacts with an indicator of these 'covered' professions, which is analogous to a triple-difference

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[11]The crosswalk is publicly available at https://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html.

model.

Column 1 of Table 4 reports the result of the triple-difference regression. The advantage of this model is to differentiate the impacts on the 'covered' licensed occupations from other professions. The base treatment indicator may capture the residual influences on 'uncovered' professions impacted by the driver's license reform. Our focus is the third-difference term (treat*cover), which captures the intended policy impact. The coefficient indicates that the CA law has a significantly differential impact on the employment of the undocumented in the 'covered' professions. Combining terms, the CA law increases the employment of undocumented immigrants in the 'covered' professions by about 1.5 percentage points.

Another exercise to differentiate the CA law from the driver's license reform is a falsification test. In Amuedo-Dorantes et al. (2020), they identify a particular impact on transportation-related professions by driver's license reforms. The availability of a driver's license significantly raises the propensity of working as a driver, including bus, ambulance, truck and taxi drivers, and chauffeurs. Therefore, if the estimate of the CA law captures only the residual impact of the driver's license reform, we should observe the same particular effect on the 'transportation' occupations but not in the other 'covered' professions. In Column 2 of Table 4, I run a placebo test by interacting the CA law indicator with a 'transportation' dummy. The third-difference term is insignificant and the overall placebo effect (treat+treat*transportation) is also economically small compared to the combined effect on the covered professions in Column 1. The result in Column 2 falsifies the potential issue over the residual influence of the driver's license reform.

Table 4: Differences with Driver License Reform - Heterogeneity by Occupations

	(1)	(2)
treat	0.00855*	0.00961**
	(0.00465)	(0.00454)
covered	0.0134***	
	(0.00307)	
treat*covered	0.00627**	
	(0.00262)	
transportation		0.0181***
		(0.00345)
treat*transportation		-0.00487
		(0.00332)
Observations	993,128	993,128
R-squared	0.023	0.022

Data: American Community Survey (2009-2019)

Note: The dependent variable equals 1 if the individual is employed. The sample is restricted to 'likely undocumented immigrants' following the criteria (except universal licensure) by Borjas (2017) with ages between 18 and 65 who are in the labor force. All regressions control for individual and state characteristics, the timing of driver's license reform, and the year and state-fixed effect. Standard errors are clustered at the state level. ***, ** and, * represent 1%, 5% and 10% significance level, respectively.

5.2 Heterogeneity

The distributional effect offers useful insights to policymakers to evaluate the effectiveness of the CA law. This subsection explores heterogeneity by occupational and individual characteristics to identify different impacts experienced by sub-population.

I first look at the interaction effect on whether the licensed professions require a college degree. As in Table A2 denoted with an asterisk, ten of the license boards do not require a college qualification for their licenses. The professions include barbers and cosmetologists, pest control workers, practical/vocational nurses, psychiatric technicians, security guards, different types of contractors, automotive repairs, home service workers and repairs, funeral workers and directors, locksmiths, and court clerks. The interaction term in Column 1 of Table 5 reveals that the CA law has a significantly larger effect on licensed professions that do not require a college degree with a combined effect of 1.9%, which is larger in effect size than the baseline estimate. Licenses that do not have a college requirement usually take a shorter time to obtain, potentially explaining the immediate effect in the event study graph in Figure 1. Aligning with the differential effects by college requirements, I also observe a stronger impact on blue-collar laborers in Column 2 of Table A2. The occupations belong to the 'Construction and Extraction' category in the CPS code system. The heterogeneity here highlights that the policy elasticity is stronger among lower-skilled professions. The CA law does not seem effective to influence the labor supply of higher-skilled undocumented population.

In the next panel, I evaluate the heterogeneity by demographic characteristics. By interacting the treatment effect by age and ethnicity, Column 3 and 4 of Table A2 show that the CA law has a larger impact on older workers (age above 40) and Hispanics. The policy impact on Hisanpic is even strong enough to close the employment gap with their non-Hispanic counterparts as indicated by the base term.

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Table 5: Heterogeneity by Occupational and Individual Characteristics

	(1)	(2)	(3)	(4)
		Heterogeneity by:		
	Occupational characteristics		Individual characteristics	
treat	0.00813*	0.00752	0.00804*	0.00776*
	(0.00465)	(0.00461)	(0.00471)	(0.00450)
treat*(no college req.)	0.0110***			
	(0.00326)			
no college req.	0.00491			
	(0.00384)			
treat*blue-collar		0.0185***		
		(0.00340)		
blue-collar		-0.00755**		
		(0.00365)		
treat*(age> 40)			0.00334**	
			(0.00138)	
age> 40			-0.0226***	
			(0.00122)	
treat*Hispanic				0.0128***
				(0.00243)
Hispanic				-0.00782***
				(0.00264)
Observations	993,128	993,128	993,128	993,128
R-squared	0.022	0.022	0.023	0.022

Data: American Community Survey (2009-2019)

Note: The dependent variable equals 1 if the individual is employed. The sample is restricted to 'likely undocumented immigrants' following the criteria (except universal licensure) by Borjas (2017) with ages between 18 and 65 who are in the labor force. All regressions control for individual and state characteristics, the timing of driver's license reform, and the year and state-fixed effect. Standard errors are clustered at the state level. ***, ** and, * represent 1%, 5% and 10% significance level, respectively.

5.3 General Equilibrium Effect

In this last section, I document the general equilibrium effect by evaluating the spillover on documented immigrants, the overall labor supply of the covered professions, and occupation switching of the undocumented.

In Column 1 of Table 6, I replicate the triple-difference model using the sample of documented immigrants in the CPS.[12] The base treatment indicator is significant and positive, which may imply a different state-trend in the employment pattern of documented immigrants compared to other states after 2014. The coefficient of the key interaction term, by contrast, is both economically and statistical small. This null effect offers two interpretations. First, one might worry the main result on undocumented immigrants simply reflects the demand-side expansion in CA, either due to a positive economic shock in general or a more-friendly environment towards immigrants. The null effect on documented immigrants can serve as a placebo test against demand-side changes in covered professions. Second, the increase in employment of undocumented immigrants could mean a competition of job opportunities against the documented. The non-negative effect here implies that the CA law fills up unmet consumer demands caused by the entry barrier before, instead of a zero-sum outcome of existing market transactions.

In Column 2 of Table 6, I evaluate the overall contribution to the labor supply of the covered professions in CA. Following the specification by Law and Marks (2009), I run a linear probability two-way fixed-effect model that regresses whether the worker works in the covered professions on the CA policy treatment dummy, individual and state control variables, and the timing of driver license reforms. I do not find the CA law significantly affects the overall labor supply in the covered professions. This could be due to the heterogeneity we find that the CA law only impacted lower-skilled/blue-collar jobs, in which the impact size is relatively small to the aggregate-level.

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[12]I define documented immigrants as workers who report their year of immigration to the U.S and they do not full into the undocumented criteria by Borjas (2017).

Table 6: Effects on Documented Immigrants and Overall Labor Supply

	(1)	(2)
		Dependent variable =
	Employed	Employed in covered professions
treat	0.00931***	0.000361
	(0.00339)	(0.000764)
treat*covered	0.00136	
	(0.00176)	
covered	0.0167***	
	(0.00169)	
Observations	1,580,067	15,835,573
R-squared	0.015	0.002
Sample	Documented immigrants	All workers

Data: American Community Survey (2009-2019)

Note: All regressions control for individual and state characteristics, the timing of driver's license reform, and the year and state-fixed effect. Standard errors are clustered at the state level. ***, ** and, * represent 1%, 5% and 10% significance level, respectively.

In the last exercise, I evaluate whether undocumented immigrants switch occupations. To assess the action of switching, I require the work history of a worker in which ACS lacks this information. I, therefore. analyze the March Supplement of the Current Population Survey (CPS March Supplement thereafter), which is another household survey that contains a national sample of US workers. In defining the likely undocumented immigrants, I adopt the same criteria as used in the main analysis. While CPS contains work history in the previous year, the sample size is ten times smaller than the ACS has. Therefore, this paper uses CPS March Supplement only in this sub-analysis. Nonetheless, in Table A5 of the appendix, I also observe the main patterns identified, namely, the CA law significantly increases the employment of likely undocumented immigrants in 'covered' licensed professions; has no impacts on the transportation sector; has a stronger effect in lower-skill/blue-collar occupations.

I first evaluate whether the CA law caused the already-employed workers in other fields to switch into the covered professions. Focusing on undocumented workers who report working in the previous year, I regress whether a worker switches into the covered professions in the current year on the policy indicator and the covariates in the main analysis. In Column 1

of Table7, I do not find significant effect on occupation switching, both economically and statistically.

I then assess if the CA law drew more undocumented individuals into employment. In Column 2 of Table7, I run the triple-difference model on undocumented immigrants who report not working in the previous year (either unemployed or not in the labor force). As indicated by the third-difference term, the CA law significantly increases their likelihood to work in the covered licensed professions.

Table 7: Assessing Occupation Switching Using CPS

	(1)	(2)
	Dependent variable =	
	Switch to covered licenses	Employed
treat	0.000963	-0.0128
	(0.000764)	(0.0102)
covered		0.440***
		(0.0322)
treat*covered		0.162***
		(0.0343)
Observations	82,897	33,054
R-squared	0.002	0.098
Sample	Employed last year	Not working last year

Data: CPS March Supplement (2009-2019)

Note: The sample is restricted to 'likely undocumented immigrants' following the criteria (except universal licensure) by Borjas (2017) with ages between 18 and 65. All regressions control for individual and state characteristics, the timing of driver's license reform, and the year and state-fixed effect. Standard errors are clustered at the state level. ***, ** and, * represent 1%, 5% and 10% significance level, respectively.

6 Conclusion

Exploiting the policy change in California, this paper finds that granting access of occupational licensing to undocumented immigrants increased their employment in the covered licensed professions. The effect does not occur to every covered occupations, however. I find stronger influences in lower-skilled and blue-collar professions. This potentially explains the immediate impact of the policy since these licenses have fewer requirements than the higher-skilled/white-collar ones. As a contrast, the CA law does not increase the employment in the transportation sector, which elucidates its difference with the driver's license reforms. These patterns replicate in both the ACS and CPS March Supplement.

While states have gradually been establishing a more welcoming environment for hard-working immigrants, an area to work with as shown in this paper is that higher-wage jobs are still unreachable for some who have limited access to higher education or vocational training programs. One solution is to expand the access to apprenticeship programs, providing low-cost training options that help lower-skilled individuals accumulate human capital and climb the social ladder.

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Appendix I - Additional Background Information

Table A1: Summary of Lifting License Restrictions for Immigrants

State	Legislation	Profession(s)	Requirement(s)
Arkansas	H1552 (2019)	Nursing	DACA recipients
California	SB1159 (2014)	license boards under DCA	allowing ITIN
Florida	HB775 (2014)	Law	Child arrival; 10 years of presence; SSN; legal work status
Illinois	SB0023 (2015)	Law	allowing ITIN
Mississippi	HB708 (2018)	Counselors	legal work status
Nebraska	LB947 (2016)	Professional licenses	legal work status
Nevada	AB275 (2019)	Professional licenses	allowing ITIN
New Jersey	SB843 (2020)	Professional licenses	legal work status
New York	Board of Regents and Court decision	Law; Teachers	DACA recipients
New Mexico	SB219 (2021)	Professions covered by Chapter 59A	allowing ITIN
Oregon	SB854 (2019)	Professional licenses	allowing ITIN
South Dakota	SB1045 (2015)	Dentist	recognize foreign training
Utah	SB131 (2015)	occupational therapist	recognize foreign training

Source: Williams (2019); Grelewicz (2020)

Table A2: License Boards under the California Department of Consumer Affairs

Board of Accountancy	Acupuncture Board
Arbitration Certification Program	Architects Board
Athletic Commission of California	Bureau of Automotive Repair*
Board of Barbering and Cosmetology*	Board of Behavioral Sciences
Bureau of Cannabis Control*	Cemetery and Funeral Bureau*
Board of Chiropractic Examiners	Contractors State License Board*
Court Reporters Board*	Dental Board of California
Dental Hygiene Board of California	Board of Professional Engineers, Land Surveyors, and Geologists
Bureau of Household Goods and Services*	Landscape Architects Technical Committee
Medical Board of California	Naturopathic Medicine Committee
Board of Occupational Therapy	Board of Optometry
Osteopathic Medical Board of California	Board of Pharmacy
Physical Therapy Board of California	Physician Assistant Board
Podiatric Medical Board of California	Bureau of Private Postsecondary Education
Bureau for Private Postsecondary Education	Professional Fiduciaries Bureau
Board of Psychology	Bureau of Real Estate Appraisers
Board of Registered Nursing	Respiratory Care Board
Bureau of Security and Investigative Services*	Speech-Language Pathology and Audiology and Hearing Aid Dispensers Board
Structural Pest Control Board*	Board of Vocational Nursing and Psychiatric Technicians*
Veterinary Medical Board	

Source: Official Website of DCA (`https://www.dca.ca.gov/about_us/entities.shtml`)
* Not requiring a college degree

Table A3: States Granted Driver License Access to Undocumented Immigrants

State	Year of Granting Access
DC	2014
Illinois	2014
Maryland	2014
Nevada	2014
Vermont	2014
California	2015
Colorado	2015
Connecticut	2015
Delaware	2016
Hawaii	2016

Source: National Conference of State Legislatures (`https://www.ncsl.org/immigration/states-offering-drivers-licenses-to-immigrants`); **?**.

Note: The policy control in the regression is based on the effective date in the above website.

Appendix II - Additional Results

Table A4: Add Other Liberal States to the Treatment

VARIABLES	(1) Baseline	(2) Add 2014 cohort	(3) Add 2015 cohort	(4) Add 2016 cohort
treat	0.00944**	0.0151***	0.0148***	0.0145***
	(0.00449)	(0.00382)	(0.00382)	(0.00386)
Constant	0.736***	0.753***	0.757***	0.756***
	(0.0936)	(0.0863)	(0.0862)	(0.0862)
Observations	993,128	993,128	993,128	993,128
R-squared	0.022	0.022	0.022	0.022

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

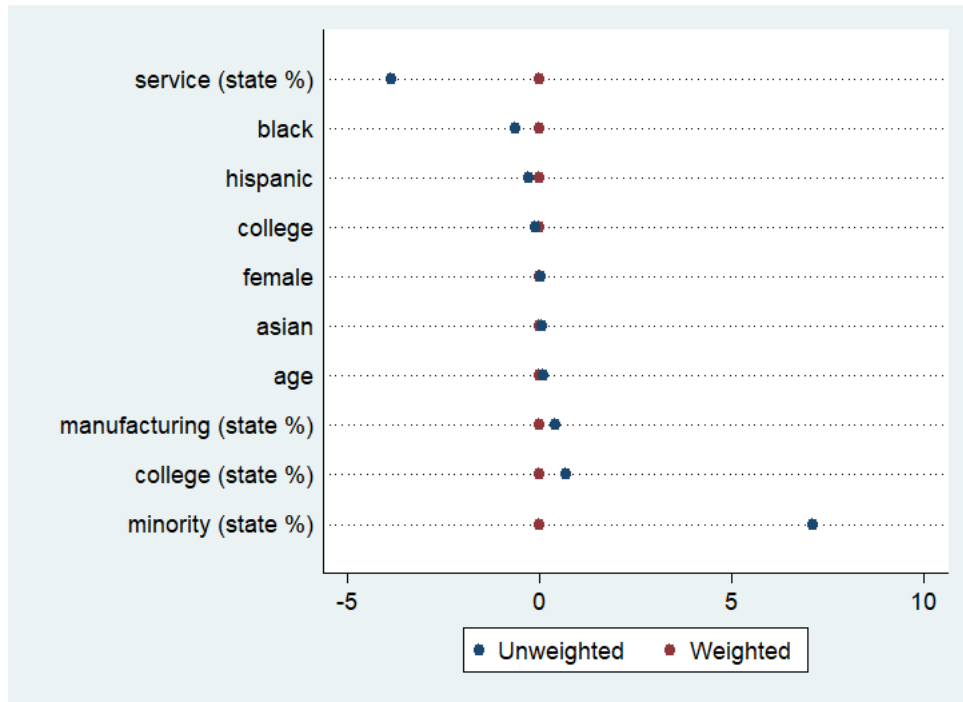Figure A1: More Balanced Covariates with Entropy Balancing

Table A5: Replicate Main Patterns Using CPS

	(1)	(2)	(3)	(4)	(5)
treatment	0.0265***	0.0221***	0.0269***	0.0212***	0.0167**
	(0.00778)	(0.00771)	(0.00784)	(0.00772)	(0.00832)
covered		-0.00751*			
		(0.00381)			
treat*covered		0.0280***			
		(0.00416)			
transportation			0.0118		
			(0.00783)		
treat*transportation			-0.0113		
			(0.00713)		
no college req.				-0.0191***	
				(0.00596)	
treat*(no college req.)				0.0398***	
				(0.00662)	
manual					-0.0329***
					(0.00941)
treat*manual					0.0489***
					(0.0100)
Observations	83,614	83,614	83,614	83,614	83,614
R-squared	0.021	0.021	0.021	0.022	0.023

Data: CPS March Supplement (2009-2019)

Note: All regressions control for individual and state characteristics, the timing of driver's license reform, and the year and state-fixed effect. Standard errors are clustered at the state level. ***, ** and, * represent 1%, 5% and 10% significance level, respectively.