

# Labor Market Impacts of States Issuing of Driver's licenses to Undocumented Immigrants<sup>1</sup>

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## Abstract

Over the last years several states have enacted policies granting undocumented immigrants access to driver's licenses. We exploit the state and temporal variation in the issuing of state driver's licenses to undocumented immigrants to estimate their impact on labor market outcomes. Using 2001 through 2017 data from the American Community Survey, we show that likely undocumented men increase their weekly hours of work in response to the availability of driver's licenses. Perhaps due to their already high labor force participation, the impact is somewhat moderate. We also find no similar impacts among similarly skilled foreign-born Hispanic men who have naturalized. The policy slightly raises commuting time, suggesting changes in work patterns, as well as likely undocumented immigrants' propensity to have an occupation that requires driving. At a time when anti-immigrant sentiments are at an all-time high, understanding how these policies impact targeted groups and similarly skilled citizens is crucial for maintaining an informed immigration policy debate.

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*“T. herself was afraid. Driving was a huge risk given that she had no license and that a misdemeanor could get her deported (‘If you go out to work, you risk everything’ she said)”*  
*The New York Times Magazine, 17<sup>th</sup> December 2017.*

## **1. Introduction**

Undocumented immigrants make up 3.5 percent of the U.S. population, and 5.1 percent of its labor force (Krogstad and Passel, 2015). Yet, their labor supply, assimilation and ability to contribute to the U.S. economy is likely to depend on their ability to drive. Spatially decentralized urban and suburban areas make the United States one of the top motor-vehicle dependent countries in the world.<sup>2</sup> For many low-skilled workers living further away from high-density job areas having access to a car is a necessity to get to work (Raphael and Rice, 2002). We examine how states’ granting of driving privileges to undocumented migrants may impact their employment and wages.

Several states have recently enacted measures granting undocumented immigrants access to driver’s licenses. Access to a driver’s license can significantly lower the commuting costs of many undocumented immigrants by reducing their probability of being charged with driving without a license during a police stop. Such a charge can result in getting their car impounded, fines, potential loss of earnings if unable to get to work, not to mention required court appearances that can lead to deportation.<sup>3</sup> Whereas undocumented immigrants have been shown to be more risk tolerant than documented immigrants (Dustmann *et al.*, 2017), many fear the higher risk of apprehension and deportation in the current immigration enforcement environment. In this regard, fifty percent of undocumented migrants who return to Mexico in the *Encuesta de Migración de la Frontera Norte* (EMIF) report fearing deportation while

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<sup>2</sup> World Bank, Data Table: Motor Vehicles (Per 1,000 People), World Development Indicators (2008), available at <http://data.worldbank.org/indicator/IS.VEH.NVEH.P3>. Last accessed on November 27, 2019.

<sup>3</sup> Before President Trump’s Executive Order on immigration on January 27, 2017 most immigrants who were illegally in the country that were arrested for minor offenses and traffic violations were spared from the widespread reach of detainers due to the implementation of the Priority Enforcement Program or “PEP.” However, with the issuance of President Trump’s Executive Order, undocumented immigrants who violate traffic laws are no longer a low priority for apprehension and removal.

residing in U.S. states adopting immigration enforcement measures (Amuedo-Dorantes *et al.*, 2013). Media reports have documented how children are left alone when their parents are taken into custody by immigration authorities after being stopped by the police and charged with driving without a license.<sup>4</sup> Indeed, traffic violations are among the top reasons for being detained.<sup>5</sup> In contrast, undocumented migrants with a valid driver's license may be allowed to drive away after a traffic stop after providing proof of identity and eligibility to drive.<sup>6</sup> As such, a standard labor supply model would predict that, by lowering the risk associated with driving to work, access to a driver's license can lower commuting costs, raise the expected return from working and increase labor supply.

Using 2005 through 2017 data from the American Community Survey, we exploit the state and temporal variation in the granting of driver's licenses to undocumented immigrants to estimate its impact on this population's employment likelihood, weekly hours of work and real hourly wages. We find that likely undocumented men increase their labor supply in response to the availability of driver's licenses, although modestly. Specifically, likely undocumented men raise their weekly work hours by 1.6 percent. These findings hold after taking into account the possible endogenous adoption of a state policy granting driver's licenses to undocumented immigrants and the non-random residential choices made by undocumented immigrants. They are also unique to our sample of likely undocumented men, as similarly skilled, foreign-born, Hispanic, long-term resident, naturalized counterparts do not exhibit a significant response to the policy.

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<sup>4</sup> See, for instance: [http://abcnews.go.com/ABC\\_Univision/Politics/drivers-licenses-matter-undocumented-immigrants/story?id=20248587](http://abcnews.go.com/ABC_Univision/Politics/drivers-licenses-matter-undocumented-immigrants/story?id=20248587). Last accessed on November 27, 2019.

<sup>5</sup> See: <https://trac.syr.edu/immigration/reports/509/>. Last accessed on December 21, 2019.

<sup>6</sup> While the regulation varies on state-by-state basis, it is common to allow drivers to move on if they are properly documented. See, for example, California's regulation regarding the instances when the car can be impounded: [https://leginfo.ca.gov/faces/codes\\_displaySection.xhtml?lawCode=VEH&sectionNum=14602.6](https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=VEH&sectionNum=14602.6). Last accessed on December 22, 2019.

We also investigate the mechanisms through which the policy impacts are likely to take place by exploring changes in likely undocumented migrants' work commuting patterns. Even in states that do not grant unauthorized migrants driver's licenses, 78 percent of likely undocumented immigrant men in our sample indicate using a motor vehicle to get to work, and only 29 percent of them carpool. Therefore, it is not surprising to find that their work commuting options remain largely unchanged by states' granting of driver's licenses to undocumented immigrants. However, their daily one-way work commuting time slightly rises by 3 percent. We also find evidence of access to driver's licenses increasing the propensity of having a job that requires driving, such as driving a bus or taxi, by 25 percent.

Our paper contributes to a growing body of work examining the impact of a variety of recently adopted tougher interior enforcement measures on undocumented immigrants and their families (*e.g.* Bohn *et al.*, 2014; Miles and Cox, 2014; Amuedo-Dorantes *et al.*, 2018; Kostandini *et al.*, 2013; Watson, 2014). To this date, analyses of undocumented immigrants' employment outcomes have been primarily focused on the impact of tougher interior immigration enforcement measures, such as employment verification mandates (*e.g.* Amuedo-Dorantes and Bansak, 2012; Bohn and Lofstrom, 2013; Orrenius and Zavodny, 2015). Compared to previous studies, which focused on measures challenging the assimilation of undocumented migrants, we look at a policy measure that should facilitate the assimilation of undocumented migrants by allowing them to drive more safely with proper identification and proof of eligibility to drive. To our knowledge, this is the first paper examining how state-level regulation regarding the issuing of a driver's license to undocumented immigrants is affecting their labor market outcomes nationwide.

## **2. Conceptual Framework**

To learn about the impacts of granting access to driver's licenses to undocumented immigrants on their labor supply, it is useful to allude to a broader literature examining the

causal impacts of car ownership on labor market outcomes. Some examples include the studies by Baum (2009) and Bansak *et al.* (2010), who document positive effects of car ownership on the employment of single mothers on welfare, as well as Gautier and Zenou (2010), who find similar labor force impacts for ethnic minorities.

A couple of models back up the positive employment impacts measured in the aforementioned papers. First, according to a standard labor supply model, access to private transportation can reduce commuting time, freeing up time for work and leisure. *Ceteris paribus*, under the assumption that both leisure and market goods are normal goods, the reduction in commuting time may increase labor market participation (if the individual is not already in the workforce) or hours worked (if the individual is already employed) (see Bansak *et al.*, (2010) for a formalized discussion). In a country like the United States, where public transportation is less accessible and reliable than in countries with greater population density, being able to drive a motor vehicle may not only free up time, but also eliminates work constraints due to the need to adjust to transit service schedules or to the schedules of other members in a carpool. As a result, the range of job possibilities may broaden, leading to increased work hours, whether in the same or in different jobs (Bania *et al.*, 1999).

A second theoretical framework uses job search models based on the so-called spatial mismatch hypothesis—a term first coined by Kain (1968). It also predicts that access to private transportation allows individuals to increase the geographic scope of their job search, thus raising their probability of receiving a desirable job offer (Holzer *et al.*, 1994). While both models suggest that labor supply might increase, the wage implications are less obvious. In the standard labor supply model, wages are assumed constant, whereas job search models foresee the possibility of earning a higher wage.

Theoretical considerations aside, it is crucial to understand the value of a driver's license in the case of undocumented immigrants living in the United States. Americans rely

heavily on cars for their daily life, including commuting to work.<sup>7</sup> This is also true for immigrants (including likely undocumented immigrants), who have increasingly spread out from cities into rural areas.<sup>8</sup> Based on our own data tabulations for the period under analysis, 71 percent of natives and 67 percent of immigrants reported using a vehicle to get to work.

One singular feature of undocumented immigrants is their high labor force participation rate. Most working-age undocumented immigrants come to the United States to work and, as we shall show, most of them do. Undocumented immigrants usually hold jobs that require getting to several places throughout the day, as in cleaning or home maintenance (*e.g.* mowing lawns, home repairs, etc.) services.<sup>9</sup> To get to work and to move between jobs, they might choose to reside close to their jobs, use public transportation, carpool with others who can drive or drive without a license. The latter, which in our data turns out to be the most common choice, can prove highly risky. If they are stopped by the police and asked for proper documentation, undocumented immigrants may be charged with driving without a license—a charge that leads to court appearances and, in many instances, to deportation in the immigration enforcement environment that followed 9/11.<sup>10,11</sup> In this context, access to a driver’s license may impact undocumented migrants’ labor market outcomes not only through the channels predicted by the car ownership literature described earlier, but also through other channels that take into account the idiosyncratic circumstances surrounding those living in the shadows.

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<sup>7</sup> <https://www.theatlantic.com/business/archive/2016/04/absurd-primacy-of-the-car-in-american-life/476346/>. Last accessed on December 22, 2019.

<sup>8</sup> Examples on immigrants’ reliability on cars can be found in <https://la.streetsblog.org/2016/04/29/quantifying-transit-ridership-some-lessons-from-uclas-transit-conference/> and <https://escholarship.org/uc/item/64m4j009>. Last accessed on December 22, 2019.

<sup>9</sup> The main occupations of likely undocumented migrant men in our sample include: chefs and cooks (6 percent), grounds maintenance (7.71 percent), drivers/sales (3.77 percent), production (2.36 percent), painters, construction and maintenance (3.23 percent), carpenters (5 percent), agriculture (8.77 percent), janitors and building cleaners (3.85 percent), and construction laborers (9.39 percent). The most common occupations held by likely undocumented women in our sample include: sewing machine operators (2.27 percent), agricultural (5.87 percent), chefs and cooks (7.17 percent), food preparation (2.49 percent), maids and housekeeping (18.8 percent), childcare (3.30) and cashiers (3.14 percent).

<sup>10</sup> See <https://www.nytimes.com/2010/12/10/us/10license.html>, or <https://prospect.org/civil-rights/will-immigrants-find-driver-s-seat/>, as examples. Last accessed on December 22, 2019.

<sup>11</sup> Traffic violations were among the top reasons for removals under Secure Communities. See: <https://trac.syr.edu/immigration/reports/509/>. Last accessed on December 22, 2019.

Whether likely undocumented immigrants take the risk of driving without a license ultimately depends on available alternatives to get to work and their risk tolerance. One could foresee multiple scenarios. Having a driver's licence may increase undocumented immigrants' labor supply if they provide workers with greater flexibility in their work commute, lowering the cost associated to it and, in turn, raising the opportunity cost of not working or working more hours. However, it is also possible for driver's licenses to have the opposite impact – namely, to lower labor force participation. That would be the case if, for example, undocumented migrants held several jobs or worked longer hours due to their inability to get to a further, better compensated job. Finally, it could also be the case that driver's licenses have no significant impact on the labor supply of undocumented migrants. This could occur if, for instance, undocumented immigrants were already driving to get to work and were employed their desired number of hours. Similarly, there may be no effect of driver's license legislation if undocumented immigrants were concerned about increased deportation risks as a result from information sharing between the Department of Motor Vehicles (DMV) and Immigration and Customs Enforcement (ICE) (National Immigration Law Center 2016).<sup>12</sup> In sum, how driver's licenses issued to undocumented immigrants end up affecting their labor supply remains an empirical question.

### **3. Institutional Background**

Under the Tenth Amendment, states have the authority to issue driver's licenses. While Congress can establish standards for state-issued driver's licenses to be valid for federal identification purposes, as was done in the 2005 REAL ID Act,<sup>13</sup> states are free to authorize or

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<sup>12</sup> The press has also echoed these concerns. A recent NPR documentary shows that Immigration and Customs Enforcement officials scanned driver's license databases and used facial recognition technology to analyze millions of photos without permission in Utah, Washington and Vermont (<https://www.npr.org/2019/07/08/739643786/ice-turned-to-dmv-drivers-license-databases-for-help-with-facial-recognition>). Last accessed on December 22, 2019.

<sup>13</sup> The Real ID Act of 2005 was enacted May 11, 2005 by the U.S. Congress that modifies federal law pertaining to security, authentication, and issuance procedure standards for driver's licenses and identity documents, as well as various immigration issues pertaining to terrorism.

restrict the unauthorized migrants' ability to obtain a driver's license –even if the latter are not valid for federal identification purposes. As noted by Cáceres and Jameson (2015), as well as by the PEW (2015) and its update PEW (2016), states progressively did so during the 1990s. Through the adoption of Documented Presence Laws, which were targeted at prohibiting undocumented persons' access to driver's licenses, many states effectively restricted undocumented immigrants' access to a driver's license. Applicants needed to provide evidence of lawful or documented presence (DP) in the United States, which could be done using a U.S. birth record, U.S. passport, an alien registration card (green card), an employment authorization card or proof of nonimmigrant classification issued by the U.S. Department of Homeland Security, among other documents. In addition, many states started to request a valid Social Security Number (SSN) –a document issued to individuals who are legally in the United States.<sup>14</sup>

Table A in the appendix shows state-level information on the issuing of driver's licenses to undocumented immigrants from the early 1990s until 2017. Data for the 1990 through 2012 period come from Cáceres and Jameson (2015), which surveyed state legislatures year by year, which we cross-check with the 2005 Congressional Research Service (CRS) report for Congress and the 2019 National Conference of States Legislatures, which provides historical information on state-level enacted legislation offering driving privileges to unauthorized immigrants up to 2019. We also use the latter source for the data in Table A for the 2012 through 2015 period, which we also cross-checked with information from the 2019 National Immigration Law Centre's report, which contains data on any additional changes in state driver's license requirements since 2016. See Data Appendix A for a detailed description of how Table A is constructed.

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<sup>14</sup> In addition, documentation of the primary residence is required by all states and, for the most part, individuals are supposed to apply for a new license within 30 days of moving to a new state (*e.g.* <https://www.nolo.com/legal-encyclopedia/your-drivers-license-faq.html>). Last accessed on November 27, 2019.



Columns 1 and 2 show whether DP and/or a SSN were required by the state for obtaining a driver's license between 1990 and 2017. Information on driver's license requirements is presented in Columns 1 and 2. Column 1 in Table A shows the year since information on driver's license requirements is available, whereas column 2 indicates the year when the state started to require either proof of DP and/or SSN to obtain a driver's license, thus excluding undocumented migrants from obtaining a driver's license. As can be seen therein, more than half of U.S. states required either form of documentation since the 1990s, with most of the remainder states joining during the early 2000s.

Consistent with what has been reported elsewhere (*i.e.* PEW 2015, 2016), by 2005, only three states allowed likely undocumented immigrants to drive by having enacted laws that explicitly allowed undocumented migrants to obtain driver's licenses (New Mexico in 2003, Utah in 2005, and Washington in 1993). During the 2010s, other states followed suit, explicitly granting undocumented immigrants' access to a driver's license. Column 3 in Table A further indicates if the state allowed likely unauthorized immigrants to obtain a driver's license in 2017 and, if so, where it was regulated (Column 4) and the year they adopted that measure (Column 5). By 2017, a total of 12 states, plus the District of Columbia, had enacted alike laws. This new wave of legislation, which explicitly allowed likely undocumented immigrants to obtain a driver's license, was inspired on the premise that extending driving privileges to undocumented immigrants would improve road safety (Cáceres and Jameson, 2015).

There are also two federal laws have recently influenced the issuing of driver's licenses to undocumented immigrants by individual states in distinct ways: (1) the 2005 Real ID Act, and (2) the 2012 Deferred Action for Childhood Arrivals (DACA). As noted earlier on, the 2005 REAL ID Act established stricter guidelines pertaining to the authentication and provision of documents valid for federal identification purposes. However, states are free to issue "not for federal ID" driver's licenses. The requirements to get a "not for federal ID"

license are less stringent than the requirements for other licenses that are considered valid for identification purposes, including a lower application fee and quicker processing. As such, many U.S. citizens have these licenses. Nevertheless, they need to be distinguishable from driver's licenses fulfilling the federal identification requirements established in the 2005 REAL ID Act.

The implementation of the Deferred Action for Childhood Arrivals (DACA) in 2012 also impacted states' offering of driving privileges to undocumented immigrants granted a temporary reprieve from deportation and work eligibility under DACA. Officials in California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Massachusetts, Maryland, Nevada, New Mexico, Tennessee, Texas, Utah, Virginia, Washington, and Wisconsin confirmed that undocumented immigrants who qualified for DACA could also apply for a driver's license. In contrast, officials in Arizona, Arkansas, Kansas, Michigan, Mississippi, and Nebraska announced that DACA recipients did not qualify for a driver's license. One of the DACA requirements was being in school or having completed high school.<sup>15</sup> As we explain in the next section, our treatment group does not include DACA recipients. Our analysis is focused on working-age likely undocumented immigrants –as captured by long-term, Hispanic, non-citizen residents with less than a high school education and not currently attending school to ensure they are able to fully participate in the labor market.

#### **4. Data**

Our main aim is to explore the impact of laws granting undocumented migrants access to a driver's license on their employability and earnings. To that end, we combine a series of

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<sup>15</sup> Specifically, applicants to DACA had to be: (1) At least 15 years old when applying but under the age of 31 as of June 15, 2012; (2) Under the age 16 when entering the United States; (3) Living in the U.S. continuously since June 15, 2007; (4) Present in the U.S. on June 15, 2012, and at the time of applying; (5) In school or have graduated or completed high school, or have been honorably discharged from the military; and (6) Not convicted of a felony, a significant misdemeanor or three or more other misdemeanors. See: <https://www.factcheck.org/2018/01/the-facts-on-daca/>

datasets spanning from 2005 through 2017 –a time period during which the vast majority of states already required documented presence and/or a social security number to issue a driver’s license and, therefore, did not allow undocumented migrants to gain access to a driver’s license. Hence, we are able to homogenize our treatment, focusing on the impact of state laws explicitly allowing undocumented migrants to obtain a driver’s license. Furthermore, since most states restricted undocumented immigrants’ access to a driver’s license by the early 2000s, most driver’s licenses issued to undocumented migrants before that period would have expired by 2005. In fact, even if those licenses were still effective, the inclusion of undocumented migrants with unexpired driver’s licenses among our control group would, if anything, bias our results downwards.

Our main data set consists of the annual American Community Survey (ACS) files provided by the Integrated Public Use Microdata Series (Flood *et al.*, 2017). Data on the adoption year of state laws allowing undocumented immigrants to apply for a driver’s license since 2013 are gathered for each U.S. state, as described in Section 3 and Table A in the appendix.<sup>16</sup> Finally, we also merge data on interior immigration enforcement initiatives in place during the time period under consideration from Amuedo-Dorantes and Arenas-Arroyo (2018).<sup>17</sup> Details on the various data sources used can be found in Appendix B.

Like all other official datasets representative of the United States population, the ACS does not contain information on migrants’ legal status. As prior authors (Passel and Cohn, 2009; Bohn and Pugatch, 2013; Pope, 2016; Orrenius and Zavodny, 2016), we rely on ethnicity,

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<sup>16</sup> For the latest data available see: <http://www.ncsl.org/research/immigration/states-offering-driver-s-licenses-to-immigrants.aspx>. Last accessed on November 27, 2019.

<sup>17</sup> These include employment verification (E-Verify) mandates, Omnibus Immigration Laws (OIL), 287(g) agreements between Immigration Customs Enforcement (ICE) and the local or state police, and Secure Communities (SC). Because of the distinct geographic scope of the various measures, we combine them into a state-level population-weighted index that takes into account the number of months that a particular measure was in place in any given year. In that manner, we are able to capture the intensity of interior immigration enforcement in any given state. Combining the various enforcement initiatives in place is key given that immigration enforcement is an interconnected system administered by various federal, state, and local authorities and agencies with similar missions. Given the correlation among the various policy measures, the index makes the analysis of their joint impact somewhat more tractable.

citizenship and educational attainment –traits shown to be good predictors of immigrants’ unauthorized status (Passel and Cohn, 2009; Passel and Taylor, 2010)— to proxy for the likely unauthorized status of household members. In addition, since most non-immigrant visas for low-skilled workers are granted for short periods not to exceed a 5-year period including renewals, we further restrict the definition of likely unauthorized to Hispanic non-citizen household members with less than a high school education, and who have resided in the United States for more than 5 years. This last restriction further ensures that any low-skilled migrant in our sample is not legally in the United States on a non-immigrant visa –typically granted for a much shorter duration. To conclude, we exclude individuals who are likely legally in the United States, such as naturalized migrants, migrants who would easily gain legal status since they are married to a U.S. citizen or were born in Cuba, and migrants who arrived prior to 1980,<sup>18</sup> work in the government sector, have an occupation that requires licensing or receive public benefits.<sup>19</sup> Using all these traits, we obtain an estimated unauthorized immigrant population of 12,791,033 immigrants –a figure that is very close to the estimated population of 11 to 12 million undocumented immigrants in the United States using the residual method.<sup>20</sup>

The fact that the *combination* of these descriptors does a good job when trying to proxy for the likely undocumented status of immigrants is understandable. *First*, the Census Bureau and the Department of Homeland Security estimate that nearly 40 percent of non-citizens are authorized immigrants (Acosta *et al.*, 2014; Baker and Rytin, 2013). That is, among non-citizens we have all unauthorized immigrants, as well as many authorized immigrants. *Second*, because of geographic proximity and poor economic and social conditions at home, as well as

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<sup>18</sup> Since they would have qualified for amnesty under the 1986 Immigration Reform and Control Act (IRCA).

<sup>19</sup> These additional restrictions are characteristic of the so-called residual method. The residual method was initially proposed by Passel *et al.* (2014) and subsequently applied by others (*e.g.* Borjas, 2017a) to identify likely unauthorized immigrants. Based on that methodology, an individual is deemed to be legally in the United States if s/he meets any of the following criteria: arrived before 1980, has U.S. citizenship, receives public benefits, works in the government sector, was born in Cuba, has an occupation that requires licensing, or has a spouse who is a legal immigrant or U.S. citizen. Everyone else is considered unauthorized.

<sup>20</sup> The most comprehensive aggregate estimates are available from the Center for Migration Studies (CMS) at <http://cmsny.org/researchprojects/democratizingdata/tables/>. Last accessed on November 27, 2019.

extensive migrant networks, more than two thirds of unauthorized immigrants in the United States are Hispanics from Mexico and Central America. *Third*, as previous research has pointed out (see for example, Bohn and Lofstrom (2013) and Orrenius and Zavodny (2016)), most unauthorized immigrants have relatively little education because they are from countries with low average levels of educational attainment. About three-quarters of adult unauthorized immigrants have less than a high school diploma (Passel and Cohn, 2010).

Given the demographic traits used to proxy for migrants' likely undocumented status (*i.e.* being a low-skilled and long-term resident Hispanic non-citizen), our main sample consists of: (1) individuals 16 to 64 years of age and not currently at school when modelling the likelihood of being at work, and (2) wage and salary workers 16 to 64 years of age when examining the impact of states' granting of driving privileges to undocumented immigrants on usual weekly hours of work and real hourly wages.<sup>21,22</sup>

Table 1 presents summary statistics for our sample of working-age likely undocumented men and women. Columns (2)-(4) refer to the entire sample, regardless of whether they work, whereas columns (5)-(7) display the statistics for those reporting being employed. Between 14 and 15 percent of likely undocumented women and men in our sample resided in a state that granted them driving privileges, and were exposed to an average level of immigration enforcement close to 1 (out of 5). They were, on average, 38 to 40 years old and, since likely undocumented immigrants are for the most part long-term residents, they have been an average of 16 years in the United States. Likely undocumented migrants are relatively low skilled and, on average, have completed less than 7 years of education. Around 60 percent of them were married and had an average of two children. Finally, roughly 90 percent of them resided in a metropolitan area, and the vast majority of them worked.

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<sup>21</sup> Nominal wages are deflated using the Consumer Price Index for 1999.

<sup>22</sup> Because the hours and wages questions refer to the past 12 months, we adjust the rest of the variables in our analysis accordingly.

Columns (5)-(7) further display the average weekly hours of work and hourly wages of employed likely undocumented men and women. The probability of being employed for likely undocumented men is 94 percent, and, on average, they report working 40 hours/week. The same probability is somewhat lower for likely undocumented women, 88 percent of whom work an average of 34 hours/week.<sup>23</sup> Finally, undocumented men earn approximately \$18.5/hour, whereas likely undocumented women earn an average of \$12/hour –salaries that align with those reported by (Borjas 2017b).

## 5. Methodology

To learn about the impact of access to a driver’s license on undocumented immigrants’ employment and wages, we exploit the geographic and temporal variation in the state-level regulation of driver’s licenses for undocumented immigrants. Specifically, focusing on our sample of working-age likely undocumented immigrants, we estimate the following benchmark model by ordinary least squares (OLS):

$$(1) \quad y_{i,s,t} = \alpha + \beta_1 DL_{s,t} + \beta_2 EI_{s,t} + X'_{i,s,t} \beta_3 + \beta_4 Z_{s,t} + \gamma_s + \theta_t + \gamma_s t + \varepsilon_{i,s,t}$$

where  $y_{i,s,t}$  represents the labor market outcome of interest, *e.g.*  $y_{i,s,t}$  takes value 1 if the  $i$ th respondent living in state  $s$  in year  $t$  is employed, or 0 otherwise, when examining the employment likelihood of likely undocumented immigrants. Alternatively, when examining hours worked or wages,  $y_{i,s,t}$  equals the logarithm of usual weekly hours of work or the logarithm of the real hourly wage.

Our key regressor,  $DL_{s,t}$ , is a dummy variable that takes value of 1 if the migrant resides in a state  $s$  where undocumented immigrants are able to obtain a driver’s license in year  $t$ , and 0 otherwise.<sup>24</sup> We also account for other interior immigration enforcement measures

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<sup>23</sup> Authors’ tabulations using the Mexican Migration Project (Durand and Massey, 2019) reveal similar percentages of employed, working-age, likely undocumented men and women.

<sup>24</sup> A reasonable concern is whether some undocumented migrants happen to reside in a state that recently restricted their access to driver’s licenses; yet, they still have a valid driver’s license they can use. Unfortunately, we do not have information on the number of issued licenses to undocumented migrants by state. Note, however, that since

potentially affecting undocumented migrants' employment and wages, as captured by the enforcement index:  $EI_{s,t}$ . The vector  $X_{i,s,t}$  accounts for a range of individual level characteristics known to be potentially correlated with employment outcomes, such as age, marital status, number of children in the household, educational attainment, years in the United States, and whether the individual resides in a metropolitan area. To account for business cycles potentially correlated with individuals' labor market outcomes, we also include information on the gross domestic product's (GDP) growth rate in the state ( $Z_{s,t}$ ).

Equation (1) also includes state and year fixed-effects, as well as state-specific time trends. The state fixed-effects ( $\gamma_s$ ) address unobserved and time-invariant state-specific characteristics potentially correlated with individual labor market outcomes, as could be the case if the individual resides in a state with a more active economy. The year fixed-effects, captured by  $\theta_t$ , account for aggregate level business-cycle shocks unaccounted for by the state's GDP growth rate and potentially correlated to individuals' labor market outcomes. Finally, we also include state-specific time trends ( $\gamma_s t$ ) to capture a variety of unobserved time-varying state-level traits that might remain unaccounted for. Standard errors are clustered at the state level.

The coefficient of interest to us is  $\beta_1$ , which captures the change in employment, weekly hours of work and hourly wages experienced by likely undocumented immigrants in states where they are able to obtain a driver's license, relative to other states. Because of the distinct labor market participation and employment patterns of men and women, we estimate equation (1) separately by gender.

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these migrants would now reside in states that are part of our "control" group, their presence would only work against us finding a significant impact.

## **6. Labor Supply Impacts of Driver's Licenses for Undocumented Immigrants**

Table 2 displays the results from estimating equation (1) for three labor market outcomes –namely, employment, weekly work hours and hourly wages for a sample of working-age likely undocumented men and women. Panel A shows the estimated impacts of having access to a driver's license among likely undocumented men, whereas Panel B repeats the same exercise for their female counterparts.

According to the estimates in Panel A of Table 2, access to a driver's license does not appear to have significantly altered the employment propensity or hourly wages of likely undocumented men. However, likely undocumented men seem to have slightly risen their weekly work hours by 1.6 percent in response to the availability of driver's licenses. This is interesting because men, in particular, work fewer hours when exposed to greater immigration enforcement. A one standard deviation increase in interior immigration enforcement (approximately equal to its mean value in the sample) curtails their weekly hours of work by roughly 1 percent. As such, access to driver's licenses palliates some of this impact. Furthermore, according to the estimates in Panel B of Table 2, access to a driver's license seems to exclusively impact likely undocumented men. There is no evidence of a statistically significant impact of the availability of driver's licenses on the labor force supply or wages of likely undocumented women.

The remaining estimates in Table 2 have the expected signs. Likely undocumented men's and women's labor market participation and wages rise with age, as do their work hours and wages with years in the United States. They both enjoy a marriage wage premium, and also seem to work fewer hours and enjoy a higher hourly wage with additional years of schooling. Nevertheless, there are some noticeable gender differences. For instance, likely undocumented men are more likely to be employed, work more hours and earn higher wages when residing in a metro vs. a rural area. However, the opposite is true for likely undocumented



women. In addition, unlike women, men are more likely to be at work, work more hours per week and earn higher hourly wages if they have more children –a distinction we further explore next.

In sum, the estimates in Table 2 suggest that access to driver’s licenses might have slightly risen the weekly work hours of likely undocumented men, but not those of their female counterparts. A natural question, at this point, is if the lack of an impact among women has something to do with their family responsibilities. Women with young children are more likely to be constrained by time-intensive family responsibilities (including child rearing and home production), which may limit their ability to work for pay and their responsiveness to the policy. To gauge if that is the case, in Table 3, we display the results from re-estimating the models separately for likely undocumented women with non-school age children, and for their remaining female counterparts. As can be seen therein, we fail to find any evidence of a statistically significant and differential response to the availability of driver’s licenses by either group of women. In sum, family responsibilities –as captured by the presence of young children in the household, do not seem to significantly condition women’s response to the driving policy change.

## **7. Robustness and Identification Checks**

The results in Tables 2 and 3 suggest that access to driver’s licenses only appear to have significantly resulted in a modest increase in the weekly hours worked by likely undocumented men. In what follows, we conduct several checks aimed at gauging the reliability of this policy effect. To that end, the first column of Table 4 displays the result from repeating our estimation using a sample of similarly low-skilled, long-term, foreign-born Hispanics of working age who, instead, are U.S. citizens. As can be seen therein, we do not find any evidence of driver’s licenses for undocumented immigrants significantly altering the weekly hours worked by this

naturalized population of low-skilled, long-term, foreign-born female Hispanics, suggesting that the impacts in Table 2 are unique to our sample of likely undocumented men.

Next, we experiment with expanding our sample period to include the years spanning from 2000 through 2017. Doing this allows to integrate a period during which some likely undocumented immigrant with unexpired driver's licenses might have still been driving even if their respective states had already restricting the issuing of driver's licenses to undocumented immigrants by requesting proof of documented presence and/or a social security number. As can be seen in column (2) of Table 4, our main result seems robust to the expansion of our sample period. Access to a driver's license continues to marginally raise the weekly hours of work of likely undocumented men by a similar amount.

A related inquiry is whether the impact of access to a driver's license, particularly if we focus on a more recent period as 2005-onward, wanes or strengthens over time. We would expect that, as identification requirements for issuing driver's licenses toughen, the potential impact of having access to a driver's license might only strengthen. In addition, awareness about the policy in place might increase among the undocumented population, as well as their reliance on driving. To assess if this is the case, we take into consideration the time span during which likely undocumented migrants in the state have had access to a driver's license. As can be seen from the estimates in column (3) in Table 4, the effect of the availability of a driver's license on likely undocumented men's weekly hours of work only strengthens over time. In particular, likely undocumented men's weekly labor supply rises by 1.5 percent in the enactment year, 1.7 percent a year later, 2.6 percent two-years later, and by an average of 4.4 percent three-years after driver's licenses became available to undocumented immigrants in the state.

Finally, we conduct a couple of identification checks. First, we address the possibility that our finding might be capturing a differential trend in the labor supply of undocumented

men due to factors other than their access to driver’s licenses. Indeed, thus far, we have assumed that the hours worked by likely undocumented men were not already trending differently *prior* to the states’ adoption of laws granting undocumented immigrants access to driver’s licenses. To test this assumption, we re-estimate equation (1) including dummies for three years prior and three years after the adoption of the policy in question as follows:<sup>25</sup>

$$(2) \quad y_{i,s,t} = \alpha + \sum_{k=-3}^0 \beta_{1,1,k} DL_{k,s,t} + \sum_{k=+3}^0 \beta_{1,2,k} DL_{k,s,t} + \beta_2 EI_{s,t} + X'_{i,s,t} \beta_3 + \beta_4 Z_{s,t} + \gamma_s + \theta_t + \gamma_s t + \varepsilon_{i,s,t}$$

where  $DL_{k,s,t}$  is a dummy for whether the driver’s license law was active in state  $s$  in year  $t$ , as well as during three years prior and three years later. In the absence of any pre-existing differential impacts, the estimated  $\sum_{k=-3}^{-1} \beta_{1,1,k}$  coefficients corresponding to the three year *prior* to the activation of the law should be non-statistically different from zero. Panel A in Table 5 displays the results from running this check. While we lose some statistical significance in the estimated coefficients for the enactment year and one year after the policy’s enactment as we include six additional year dummies, their estimated coefficients are still positive and point to an overall rising impact of driver’s licenses –an impact that raises weekly work hours by an average of 4.5 percent three years after the policy’s enactment.<sup>26</sup> Most importantly, none of the policy-lead dummies is significantly different from zero, suggesting that there were no anticipatory or pre-existing impacts.

Our second identification check refers to the potential for endogeneity stemming, primarily, from the non-random location of immigrants across states. Undocumented migrants might be sensitive to the state’s granting of driver’s licenses to this population given the licenses can significantly reduce the cost associated to their work commute. If that is the case,

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<sup>25</sup> Because 10 out of the 13 states proactively regulating undocumented immigrants’ access to driver’s licenses did not do so until 2013, we limit the leads to three given that our data ends in 2017, with work hours and wages being referred to one year earlier, *i.e.* 2016.

<sup>26</sup> A joint significance test of all pre-trend coefficients further supports the lack of anticipatory or pre-existing policy impacts (Prob > F = 0.8858).

our estimates could be upward biased. To address this concern, we instrument for the non-random residential location of undocumented immigrants in our sample using information on what their residence would have been had they chosen to reside in the same locations chosen by their countrymen *prior* to the adoption of laws allowing undocumented immigrants to obtain a driver’s license and well before our sample period. Specifically, we look at where similar likely undocumented immigrants resided in the 1980 Census. Looking at the location of alike migrants around a decade before for most of the adopting states, allows us to address any concerns regarding the role that economic conditions not captured by the state fixed-effects or state-specific time trends could be playing in the residential choices of migrants in our sample.

We then construct a “shift-share” instrument,<sup>27</sup> where the *shift* is the policy itself. The *share* addresses the non-random location of undocumented immigrants using information on the residential distribution of undocumented countrymen *prior* to the adoption of the state driver policies in question as follows:

$$(3) \quad \text{Share of Undocumented Immigrant}_{s,o,1980} = \frac{\text{undocumented immigrants}_{s,o,1980}}{\text{undocumented immigrants}_{o,1980}}$$

In other words, it represents the share of likely undocumented immigrants from country of origin *o* residing in state *s* in the 1980 Census. In the spirit of other studies in the immigration literature (*e.g.* Bartel, 1989; Altonji and Card, 1991; Card, 2001; Cortés and Tessada, 2011 among many others), we exploit the entrenched tendency of immigrants to locate in areas where they have networks of countrymen to instrument for their non-random residential choices.<sup>28</sup>

Finally, shift and share are interacted in order to capture the likely exposure to the policy.

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<sup>27</sup> Shift-share instruments have been widely used in the economics literature in a variety of contexts (*e.g.*, Bartik, 1991; Nakamura and Steinsson, 2014; Wilson, 2012; Autor, Dorn and Hanson, 2013; Kovak, 2013; Nunn and Qian, 2014, to name a few). Recently, several recent papers have critiqued this type of instrument on the basis that it might be correlated with past supply shocks (*e.g.* Adão *et al.*, 2018; Borusyak *et al.*, 2018; Jaeger *et al.*, 2018). Hence, the instrumental variable estimates should be interpreted with caution.

<sup>28</sup> It is worth noting that, despite the emergence of new immigrant locations during the 1990s, the vast majority of immigrants continued to locate in traditional states that accounted for approximately 60% of the unauthorized population: California, Texas, Florida or New York/New Jersey and Illinois (see: <http://www.pewresearch.org/fact-tank/2016/09/20/5-facts-about-illegal-immigration-in-the-u-s/>. Last accessed on November 27, 2019).

Panel B in Table 5 displays the results from this identification test. The bottom rows show that the F-stats from the first stage regressions are significantly different from zero and large (Sanderson and Windmeijer, 2016). Additionally, the positive and highly statistically significant IV coefficients from the first stage regressions confirm the entrenched tendency for immigrants to locate in areas with established networks of their countrymen. Importantly, the estimates from the second stage regressions continue to show that access to driver's licenses continues to moderately increase the weekly hours worked by likely undocumented immigrant men by 1.9 percent—an amount not statistically different from 1.6 percent in Table 2.

## **8. Mechanisms**

That likely undocumented immigrant men respond to the availability of driver's licenses is both reasonable and, at the same time, somewhat surprising. Because most working-age undocumented immigrants come to the United States to work and do not qualify for public benefits, the vast majority work—this is especially true in the case of men as we have seen in the descriptive statistics discussed. While being licensed to drive is essential to legally drive, undocumented migrants could choose moving closer to their jobs, carpooling with other countrymen/co-workers, using public transportation or to drive, risking being stopped by the police without a valid driver's license.

Still, there is no doubt that being able to obtain a driver's license should lower the opportunity cost of commuting for many undocumented immigrants and, thereby, raise the returns to working. If they already work, they might increase their work hours now that they can safely drive. Access to a driver's license might also broaden the array of alternative job opportunities, especially in a country like the United States, where many individuals are dependent on their cars to get to work, go to school and carry on with their daily lives. This includes individuals residing in metro areas with greater access to public transportation because of the spatial decentralization of inner city and suburban economies (Raphael and Rice, 2002).

In what follows, we try to gain a better understanding of the mechanisms behind likely undocumented men's responsiveness to the policy. To that end, we look at the reported work commuting choices of likely undocumented immigrants to see if they significantly changed in response to the availability of driver's licenses. Specifically, in column (1) of Table 6, we first model the likelihood of using a private motor vehicle (versus using public transportation, riding a bike, or walking). Likewise, we model the closely related propensity of using public transportation (as opposed to private motor vehicle, riding a bike, or walking) in column (2). Next, for the subsample of individuals reporting using a private motor vehicle to get to work, we distinguish between those who carpool with others versus those who drive alone (see column (3) of Table 6). Finally, in the last two columns of Table 6, we look at change in daily one-way commutes for those using a motor vehicle to get to work and, in particular, those reporting driving alone.

Based on the means reported in Table 6, approximately 78 percent of employed likely undocumented men report using a private motor vehicle to get to work, and a small 7 percent reports using public transportation.<sup>29</sup> Of the 78 percent of likely undocumented men that report using a private motor vehicle to get to work, less than one third (29 percent) carpools. Furthermore, these averages are not much different across states according to whether they allow undocumented immigrants to obtain a driver's license,<sup>30</sup> suggesting that most undocumented immigrant men are driving to work, even in states that do not offer driving licenses to undocumented immigrants.

With these statistics in mind, it is not surprising to find that the work commuting methods of likely undocumented immigrant men (as captured by their likelihood of using a

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<sup>29</sup> The remaining share might walk, ride a bicycle, etc.

<sup>30</sup> In states issuing driver's licenses to undocumented immigrants, 83 percent of likely undocumented men in our sample report using a motor vehicle to get to work, 11 percent use public transportation and 23 percent use carpooling. In states not issuing driver's licenses to undocumented immigrants, 77 percent of likely undocumented men report using a motor vehicle to get to work, 15 percent use public transportation and 30 percent use carpooling.

motor vehicle, public transportation or, when using a motor vehicle, carpooling) did not significantly change with the availability of driver's licenses. Still, there is some evidence of likely undocumented immigrant men lengthening their daily one-way work commuting time by 3 percent, regardless of whether we focus on all those reporting using a motor vehicle to get to work or, specifically, on those driving to work alone. The increase, which amounts to less than 1 minute in their daily one-way commute, is in line with the modest increase in weekly work hours. Perhaps, the availability of a driver's licenses provides these men with greater flexibility in managing their work schedules—a flexibility that results in small increases in work hours. Maybe, they might no longer fear staying at work slightly longer to finish up work and driving back home during rush hour, which might lengthen their commute and increase their exposure to traffic police.

Finally, to further understand how the availability of driver's licenses might impact undocumented migrants' labor outcomes, we also explore the possibility that they might have raised the share of likely undocumented men holding jobs that require driving, as would be the case with bus, ambulance, truck and taxi drivers, as well as chauffeurs. This is a worthwhile question to ask given the fast growth of the sharing economy, which started with Uber's launch in San Francisco in 2010, and rapidly expanded after 2011. Table 7 shows the results from this exercise. As can be seen therein, despite its relatively small effect on likely undocumented men's commuting patterns and work hours, the availability of driver's licenses for undocumented immigrants significantly rose the propensity of holding a job that requires driving by 1 percentage point or 25 percent. This finding is suggestive of the ramifications that the granting of driver's licenses to undocumented immigrants might have on other outcomes, such as road safety (Lueders *et al.* 2017), despite their small impact on likely undocumented men's commuting time and weekly work hours.

## 9. Summary and Conclusions

Recently several states have policies allowing undocumented immigrants access to driver's licenses. Overall, the granting of driving privileges to undocumented immigrants was intended to enhance security on the roads, allowing these motorists to properly register and insure. Additionally, some hoped the measures would counteract the difficulties imposed by intensified immigration enforcement on an increasingly marginalized population. In this study, we look for first-order impacts of these policies on its targeted population –namely, undocumented immigrants. Specifically, we assess if the granting of driver's licenses to undocumented immigrants significantly alters their labor supply by lowering their commuting costs, possibly inducing some of them to start working or, if employed, to change their work hours.

We gather data on the adoption year of state laws allowing undocumented immigrants to apply for a driver's license and, along with 2005 through 2017 American Community Survey data, we use it to examine changes in likely undocumented men and women's employment patterns in response to states' granting of driving privileges to this population. We find that access to a driver's licenses only seems to modestly raise the weekly hours of work of likely undocumented men by roughly 1.6 percent. This finding, which proves robust to a number of identification checks, is not present for similarly low-skilled, foreign-born Hispanics who are long-term residents but, unlike undocumented immigrants, are clearly legal after having naturalized. We also explore the mechanisms through which access to a driver's license might have impacted the work hours of likely undocumented men. We do not find any evidence of likely undocumented immigrant men altering their work commute method; however, they have moderately increased their daily one-way work commute, as well as grew more inclined to take jobs that require driving, as in the case of bus, taxi or Uber drivers.



One might wonder about the economic relevance of our findings. To that end, we perform a back-of-the-envelope calculation using the estimated number of working-age undocumented immigrants in the United States from Jeffrey S. Passel and D’Vera Cohn (2018) –namely, five million men and three million women. Our calculations suggests that allowing undocumented immigrants to drive would increase male work hours by 2,932,800/week.<sup>31</sup> At an average wage of \$14/hour, the policy would boost GDP by \$41,059,200/week or by less than half a percent of U.S. GDP in 2017.

In sum, we find limited evidence of the granting of driver’s licenses to undocumented immigrants impacting their labor supply. However, the policy might still have significant impacts on other important outcomes. Anecdotal evidence and prior reports have documented how unlicensed drivers are 5 times as likely to be involved in a fatal car accident.<sup>32</sup> Recent evidence from the California’s Assembly Bill 60 (AB60), which primarily allowed existing unlicensed drivers to legalize their driving (including undocumented immigrants), shows that it decreased the rate of hit and run accidents. Hit and run behaviors are usually associated with high monetary and human costs, often delaying emergency assistance, increasing insurance premiums, and leaving victims with significant out of pocket expenses (Lueders *et al.*, 2017). In addition, the issuing of driver’s licenses to undocumented immigrants appears to have helped lower the number of accidents involving uninsured motorists, as likely undocumented immigrants become more likely to purchase auto insurance (Cáceres and Jameson, 2015) – lowering insurance rates for everyone and increasing public safety. The policy might have also

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<sup>31</sup> On average, likely undocumented men work 39 per week. Since there are an estimated 5 million working-age undocumented men (Passel and Cohn, 2018), an increase of 1.6 percent in their weekly work hours will add 2,932,800 hrs/week of labor supply (*i.e.*,  $0.016 \times 39$  average working weekly hours  $\times$  0.94 employment rate  $\times$  5,000,000 working-age undocumented men).

<sup>32</sup> See: <https://www.npr.org/2019/05/24/719959760/licensed-undocumented-immigrants-may-lead-to-safer-roads-connecticut-finds>. Last accessed on December 21, 2019.

increased access to specific services, including health related care for young children in the household, or attendance to parent-teacher meetings or school events when the latter are hard to get to. Thus, further research documenting the various externalities of these policies is warranted.

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**Table 1: Summary Statistics**

Sample Statistic	All Working-age Likely Undocumented			All Working-age Likely Undocumented at Work		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<b>Panel A: Working-age Likely Undocumented Men</b>						
In States Granting Licenses	199,540	0.14	0.34	171,068	0.12	0.31
Enforcement Index		1.07	0.84		0.89	0.86
Age		38.04	9.79		38.04	9.78
Years in U.S.		16.08	7.29		16.82	7.28
Married		0.63	0.48		0.63	0.48
Years of Education		6.88	4.14		6.86	4.17
No. of Children		1.56	1.49		1.56	1.49
Metro Area		0.88	0.32		0.88	0.24
Employed		0.94	0.24		--	--
Log Weekly Hours of Work	-	-	-		3.68	0.28
Log Real Hourly Wage	-	-	-		2.92	0.67
<b>Panel B: Working-age Likely Undocumented Women</b>						
In States Granting Licenses	99,275	0.15	0.36	85,573	0.12	0.32
Enforcement Index		1.06	0.85		0.99	0.85
Age		40.45	9.70		40.38	9.77
Years in U.S.		16.30	7.12		16.43	7.05
Married		0.58	0.49		0.59	0.49
Years of Education		6.80	4.15		6.78	4.14
No. of Children		1.82	1.39		1.83	1.39
Metro Area		0.90	0.30		0.89	0.24
Employed		0.88	0.33		--	--
Log Weekly Hours of Work	-	-	-		3.52	0.41
Log Real Hourly Wage	-	-	-		2.52	0.79

**Notes:** *Sample:* 2005 through 2017 ACS.



**Table 2: The Impact of Driver's licenses for Undocumented Immigrants on their Labor Market Outcomes**

Sample Outcome	Panel A: Likely Undocumented Immigrant Men			Panel B: Likely Undocumented Immigrant Women		
	Employed	Log (Weekly Hours of Work)	Log (Real Hourly Wage)	Employed	Log (Weekly Hours of Work)	Log (Real Hourly Wage)
Driver's licenses	0.007 (0.005)	0.016** (0.007)	0.011 (0.011)	0.003 (0.009)	-0.003 (0.009)	0.017 (0.024)
Enforcement Index	-0.002 (0.004)	-0.011** (0.005)	-0.018* (0.010)	0.005 (0.005)	-0.002 (0.006)	-0.011 (0.015)
Age	0.006*** (0.001)	0.004*** (0.001)	0.050*** (0.003)	0.010*** (0.001)	0.010*** (0.001)	0.055*** (0.002)
Years in U.S.	-0.001*** (0.000)	0.001*** (0.000)	0.007*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	0.008*** (0.001)
Metro Area	0.009*** (0.001)	0.018*** (0.002)	0.076*** (0.011)	-0.015*** (0.005)	-0.033*** (0.005)	-0.043*** (0.013)
Married	-0.001* (0.000)	0.001 (0.001)	0.020*** (0.002)	0.002 (0.001)	0.001 (0.001)	0.019*** (0.004)
Years of Education	0.004 (0.003)	-0.043*** (0.010)	0.039*** (0.013)	0.007 (0.006)	-0.028* (0.014)	0.077*** (0.017)
No. of Children	0.001* (0.000)	0.003*** (0.001)	0.020*** (0.001)	-0.007*** (0.001)	-0.007** (0.003)	-0.031*** (0.002)
GDP Growth	0.181*** (0.055)	0.234*** (0.050)	0.260* (0.137)	0.173*** (0.057)	0.049 (0.084)	0.275 (0.303)
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Observations	199,540	171,068	171,068	99,275	83,573	83,573
R-squared	0.015	0.019	0.059	0.017	0.012	0.047

**Notes:** All regressions include a constant term. Standard errors are clustered at the state level. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

**Table 3: The Impact of Driver’s licenses for Undocumented Immigrants on the Labor Market Outcomes of Likely Undocumented Immigrant Women**

Sample Outcome	Panel A: Women without Young Children (Less than 5)			Panel B: Women with Children Less than 5 Years Old		
	Employed	Log (Weekly Hours of Work)	Log (Real Hourly Wage)	Employed	Log (Weekly Hours of Work)	Log (Real Hourly Wage)
Driver’s licenses	0,004 (0,008)	0.006 (0.011)	0.021 (0.019)	-0.042 (0.029)	0.004 (0.070)	-0,009 (-0.02)
Enforcement Index	0.011* (0,006)	-0.005 (0.007)	-0.006 (0.016)	0.009 (0.010)	-0.031 (0.026)	-0,005 (0,009)
Age	0.009*** (0,001)	0.011*** (0.001)	0.041*** (0.002)	0.004 (0.004)	0.088*** (0.010)	0.015*** (0,004)
Years in U.S.	0.001** (0.000)	0.002*** (0.000)	0.007*** (0.001)	0.002** (0.001)	0.011*** (0.001)	0.001*** (0.000)
Metro Area	-0.018*** (0,005)	-0.032*** (0.004)	-0.045*** (0.012)	-0.036*** (0.008)	-0.037** (0.016)	-0,005 (0,007)
Married	0,001 (0,001)	0.001 (0.001)	0.019*** (0.004)	-0.000 (0.004)	0.018*** (0.005)	0.004** (0,002)
Years of Education	0,008 (0,005)	-0.023 (0.014)	0.068*** (0.014)	-0.047** (0.018)	0.099** (0.038)	0,004 (0,011)
No. of Children	-0.005*** (0,002)	-0.005** (0.002)	-0.018*** (0.003)	-0.008* (0.004)	-0.045*** (0.007)	-0.012*** (0,002)
GDP Growth	0.292*** (0,093)	0.022 (0.096)	0.223 (0.398)	0.135 (0.223)	0.436 (0.399)	0,217 (0,297)
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Observations	79,276	66,411	66,411	17,162	17,162	19,999
R-squared	0,016	0.012	0.037	0.018	0.058	0,024

**Notes:** All regressions include a constant term. Standard errors are clustered at the state level. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

**Table 4: Placebo and Robustness Checks**

<b>Outcome</b>	<b>Log(Weekly Hours of Work)</b>		
<b>Sample</b>	<b>Naturalized Men</b>	<b>Likely Undocumented Immigrant Men</b>	
<b>Type of Check</b>	<b>Placebo</b>	<b>Robustness: Using 2000-2017</b>	<b>Robustness: Accounting for Time Since Adoption</b>
Driver's licenses	-0.004 (0.011)	0.013* (0.007)	
Year Enactment			0.015** (0.007)
One Year Since Enactment			0.017** (0.008)
Two Years Since Enactment			0.026*** (0.008)
Three Years Since Enactment			0.044*** (0.007)
State Fixed-Effects	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes
State-specific Time Trend	Yes	Yes	Yes
Observations	54,510	193,663	171,068
R-squared	0.023	0.019	0.019

**Notes:** All regressions include a constant term, as well as the individual level traits and state-level GDP growth rate in Table 2. Standard errors are clustered at the state level. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

**Table 5: Identification Checks**

<b>Outcome</b>	<b>Log(Weekly Hours of Work)</b>
<b>Sample</b>	<b>Likely Undocumented Immigrant Men</b>
<b>Panel A: Pre-Existing Impacts</b>	
Three Years Before Enactment	0.000 (0.006)
Two Years Before Enactment	-0.002 (0.007)
One Year Before Enactment	0.002 (0.009)
Year of Enactment	0.015 (0.010)
One year After Enactment	0.018 (0.011)
Two Years After Enactment	0.027* (0.014)
Three Years After Enactment	0.045*** (0.012)
State Fixed-Effects	Yes
Year Fixed-Effects	Yes
State-specific Time Trend	Yes
Observations	171,049
R-squared	0.019
<b>Panel B: IV-Estimation</b>	
Driver's License	0.019*** (0.005)
State Fixed-Effects	Yes
Year Fixed-Effects	Yes
State-specific Time Trend	Yes
Observations	171,049
R-squared	0.019
<i>First-Stage Results</i>	
IV	1.55*** (0.063)
Sanderson-Windmeijer F-test	210.45
R-squared	0.85

**Notes:** All regressions include a constant term, as well as the individual level traits and state-level GDP growth rate in Table 2. Standard errors are clustered at the state level. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

**Table 6: The Impact of Driver’s Licenses for Undocumented Immigrants on Commuting Methods and Time**

Sample	Likely Undocumented Immigrant Men				
	Method of Transportation to Work		Use of Motor Vehicle	Log(Daily One-Way Commute in Minutes)	
	Use of Motor Vehicle	Public	Carpool	Motor Vehicle	Drives Alone
Driver’s License	0.008 (0.009)	-0.007 (0.004)	-0.001 (0.010)	0.032*** (0.012)	0.031** (0.014)
Observations	171,068	171,068	133,433	133,433	94,087
R-squared	0.119	0.169	0.048	0.028	0.033
Mean D.V	0.78	0.066	0.29	3.11	3.04
State FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
State Trend	Yes	Yes	Yes	Yes	Yes

**Notes:** All regressions include a constant term, as well as the individual level traits and state-level GDP growth rate in Table 2. ‘Use of Motor Vehicle’: 1 if they use a private car/motorcycle to get to work; 0 otherwise (public transportation, bike riding, walking, etc.). Public Transportation’:1 if they use public transportation; 0 private transportation (Auto, Motorcycle, walking, etc.). Finally, carpooling is defined for those who indicate using a private motor vehicle to get to work. Specifically: ‘Carpool’: 1 if they carpool with others, 0 if s/he drives alone. ‘Standard errors are clustered at the state level. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

**Table 7**  
**The Impact of Driver's Licenses for Undocumented Immigrants on Driving Occupations**

<b>Sample Outcome</b>	<b>Likely Undocumented Immigrant Men Probability of Working as a Driver</b>
Driver's License	0.010** (0.004)
Observations	171,068
R-squared	0.015
Mean D.V	0.04
State FE	Yes
Year FE	Yes
State Trend	Yes

**Notes:** All regressions include a constant term, as well as the individual level traits and state-level GDP growth rate in Table 2. The dependent variable takes value 1 if the individual works as bus, ambulance, truck, taxi driver or chauffeurs. Standard errors are clustered at the state level. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

## Appendix A

Table A summarizes information from peer-reviewed publications and a number of reports and academic sources, including: Cáceres and Jameson (2015), a 2005 Congressional Research Service (CRS) report, a 2019 publication from the National Conference of States Legislatures, as well as two PEW reports from 2015 and 2016. None of these sources are complete. Plus, they are not all consistent, particularly prior to the early 2000s. In what follows, we provide a detailed explanation of the data sources, noting any inconsistencies found and assumptions made in constructing Table A.

Until 2012, we have explicit information on DP or SSN requirements from Cáceres and Jameson (2015). We use a 2005 Congressional Research Service (CRS) report to double check some of the values from Cáceres and Jameson (2015) –those corresponding to years prior to 2005. The information provided by Cáceres and Jameson (2015) seems to be at odds with the information provided by the 2005 CRS report for Congress in the following cases:

According to Cáceres and Jameson (2015), DP or SSN were required in Delaware between 1997-1999 and, again, between 2007-2012. According to the CRS report, a SSN was required in 2005. We use the earlier 2005 date from the CRS report as the year beyond which the state restricted undocumented migrants' access to a driver's license.

Cáceres and Jameson (2015) do not list any information for Illinois or Massachusetts. In the 2005 CRS report, both states are listed as requiring DP and SSN in 2005. Thus, we take the date listed in the CRS report in Table A.

For the period spanning from 2012 through 2017, we rely on the 2019 publication from the National Conference of States Legislatures and on the National Immigration Law Centre's report last updated in August 2019. We cross-check the information against Cáceres and Jameson (2015). There were no inconsistencies. We also checked the NCLS publication against the information contained in two PEW (2015, 2016) reports. We also found no inconsistencies for that period. According to all these sources, three states (New Mexico, Utah, and Washington) did not require or stopped requiring either DP or SSN at some point during the period of 1990-2012. If according to either of these three sources, no explicit legislation had been passed allowing immigrants to obtain a license after 2012, we assume that the situation stayed the same until 2017 (the latest year of our study). We note this information in Column 3. If states passed legislation after 2012 (*i.e.* California, Colorado, Connecticut, Delaware, DC, Hawaii, Illinois, Maryland, Nevada, Vermont), we assume they continued to require either DP or SSN until a new regulation was passed.

**Table A: Access to Driver’s Licenses to Undocumented Immigrants**

State:	Requiring Either DP or SSN		Offering Driver’s Licenses to Undocumented Migrants in 2017		
	[1]	[2]	[3]	[4]	(5)
States	Information Since	Year Since	Y/N	Legislation	Effective Date
ALABAMA	2004	2004	No		
ALASKA	1990	1998-2000; 2006	No		
ARIZONA	1990	1999	No		
ARKANSAS	1990	1997	No		
CALIFORNIA	1990	1991	Yes	A60	2015
COLORADO	1995	1995	Yes	S251	2014
CONNECTICUT	2001	2001	Yes	H6495	2015
DELAWARE	1990	1997-1999; 2005	Yes	S59	2015
DC	2000	2000	Yes	B275	2014
FLORIDA	1990	1990	No		
GEORGIA	2000	2000	No		
HAWAII	1990	2001-2002; 2010	Yes	H1007	2016
IDAHO	1990	1992	No		
ILLINOIS	2005	2005	Yes	S957	2013
INDIANA	1991	2001	No		
IOWA	1990	1990	No		
KANSAS	1993	1993	No		
KENTUCKY	1998	1998	No		
LOUISIANA	1990	1990	No		
MAINE	1997	1997	No		
MARYLAND	1990	2001	Yes	S715	2014
MASSACHUSETTS	2005	2005	No		
MICHIGAN	1990	1998	No		
MINNESOTA	1990	2003	No		
MISSISSIPPI	1990	1997	No		
MISSOURI	1990	1991	No		
MONTANA	1990	2000	No		
NEBRASKA	1990	1990	No		
NEVADA	1990	1990	Yes	S303	2014
NEW HAMPSHIRE	1990	1990	No		
NEW JERSEY	1990	1994	No		
NEW MEXICO	1990	1990	Yes	H173	2003
NEW YORK	2002	2002	No		
NORTH CAROLINA	1990	1993-2000; 2006	No		
NORTH DAKOTA	1990	1999	No		
OHIO	1990	1998	No		
OKLAHOMA	2003	2003	No		
OREGON	1990	2008	No		
PENNSYLVANIA	1990	1990	No		
RHODE ISLAND	1990	2004	No		
SOUTH CAROLINA	1990	1990	No		
SOUTH DAKOTA	1990	1990	No		
TENNESSEE	1990	1990-1991; 2005	No		
TEXAS	1995	1999	No		
UTAH	1990	2005	Yes	S227	2005
VERMONT	1990	2003	Yes	S38	2014
VIRGINIA	1990	1990	No		
WASHINGTON	1990	---	Yes	H1444	1993
WEST VIRGINIA	1990	2003	No		
WISCONSIN	1990	1990	No		
WYOMING	1990	1990	No		

**Source:** Data for the 1990 through 2012 period comes from Cáceres and Jameson (2015), which surveyed state legislatures year by year, and the 2005 Congressional Research Service (CRS) report for Congress Data for the 2012 through 2015 period is gathered from the National Conference of States Legislatures,<sup>33</sup> which provides historical information on state-level enacted legislation offering driving privileges to unauthorized immigrants up to 2015, and from the National Immigration Law Centre’s report offers data on any additional changes in state driver’s license requirements for the years 2016 and 2017.<sup>34</sup> When needed, we also check against the 2015 PEW report and its 2016 update.<sup>35</sup>

<sup>33</sup> See: <http://www.ncsl.org/research/immigration/states-offering-driver-s-licenses-to-immigrants.aspx>

<sup>34</sup> See: <https://www.nilc.org/wp-content/uploads/2015/11/drivers-license-access-table.pdf>

<sup>35</sup> See: <https://www.pewtrusts.org/en/research-and-analysis/articles/2016/11/22/drivers-licenses-for-unauthorized-immigrants-2016-highlights>



## Appendix B

*Total Enforcement* $_{s,t}$  captures the *intensity* of immigration enforcement to which individuals are exposed to and, using a single measure. To proxy for the enforcement intensity to which individuals living in state  $s$  in year  $t$  might be exposed to, we calculate the following population-weighted index for each enforcement initiative  $k$ :

$$(1) \quad EI^k_{st} = \frac{1}{N_{2000}} \sum_{a \in s} \frac{1}{12} \sum_{t=1}^{12} \mathbf{1}(E_{t,a}) P_{a,2000}$$

where  $\mathbf{1}(E_{t,a})$  is an indicator function that informs about the implementation of a particular policy in county  $a$  at time (month)  $t$ . Note that the above index takes into account: (1) the number of months during which a particular policy has been in place in any given year, as well as (2) the population of the counties in question. Specifically, the summation over the 12 months in the year captures the share of months during which the measure was in place in any given year. To weigh it population-wise, we use the term:  $P_{a,2000}$ —namely, the population of county  $a$  according to the 2000 Census (prior to the rolling of any of the enforcement initiatives being considered), and  $N$ —the total population in state  $s$ .

Hence, the overall enforcement to which individuals living in state  $s$  and year  $t$  are exposed to is computed as the sum of the indices for each enforcement initiative at the (state, year) level:

$$(2) \quad Total\ Enforcement_{s,t} = \sum_{k \in K} EI^k_{s,t}$$

where  $k$  refers to each policy, *i.e.*: 287(g) local, 287(g) state, secure communities, Omnibus immigration law and E-verify. Data on the implementation of 287(g) agreements at the state level is gathered for the 2005 through 2015 period from the ICEs 287(g) Fact Sheet website, Amuedo-Dorantes and Bansak (2014) and Kostandini *et al.* (2013). Data on the rolling of the Secure Communities (SC) program is available at the county level from 2008 to 2013 using ICE’s Activated Jurisdictions document (U.S. Immigration and Customs Enforcement (ICE) 2017). Data on state level initiatives, such as omnibus immigration laws (OILs) and employment verification (E-Verify) mandates is gathered from the National Conference of State Legislature’s Omnibus Laws document and the National Conference State’s website, respectively.<sup>36,37</sup>

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<sup>36</sup> See Amuedo-Dorantes and Arenas-Arroyo (2018) and/or (Amuedo-Dorantes *et al.*, 2018) for a further description of the index.

<sup>37</sup> Available at [http://www.ncsl.org/documents/statefed/omnibus\\_laws.pdf](http://www.ncsl.org/documents/statefed/omnibus_laws.pdf). And <http://www.ncsl.org/research/immigration/everify-faq.aspx#2012%20State%20Action>.