

DO STATE EMPLOYMENT ELIGIBILITY VERIFICATION LAWS AFFECT JOB TURNOVER?

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State laws requiring employers to verify workers' employment eligibility may reduce employment and earnings among unauthorized workers and make it difficult for them to switch jobs. Using data from the 2005–2014 Quarterly Workforce Indicators, we find evidence of a reduction in employment and job turnover among Hispanics as a whole in states that require all employers to verify employment eligibility. These adverse effects become larger as the share of likely unauthorized Hispanic workers falls. The drop in job turnover may be due to the laws trapping some Hispanic workers in their jobs. There is little effect on employment or job turnover among non-Hispanic whites or blacks. There is no effect on average pay for all groups of workers. (JEL J15, J61, J68)

I. INTRODUCTION

Since 2006, at least 20 states have adopted laws requiring employers to use a federal database, E-Verify, to check some or all employees' eligibility to work legally in the United States. In most of those states, the laws apply only to the public sector or government contractors, but eight states have passed laws that require all employers to use E-Verify to check newly hired workers' eligibility. These laws aimed primarily to reduce the number of unauthorized immigrants living in a state by making it more difficult for them to work there. Previous research finds that the laws appear to have succeeded in this goal, with the population of likely unauthorized immigrants falling in states that implemented universal E-Verify mandates (Bohn, Lofstrom, and Raphael 2014; Orrenius and Zavodny 2016).

A potential unintended consequence of the laws is reduced job turnover among unauthorized immigrants who remain in those states. State laws that require all employers to use E-Verify apply only to new hires, not to current employees. Since switching jobs would require passing E-Verify, unauthorized immigrants may become trapped in their current jobs. A decrease in job mobility may reduce economic efficiency by preventing workers from moving to jobs where their skills are in higher demand. It may also give employers some monopsony power over unauthorized workers who are unable to move jobs, putting downward pressure on wages (Hotchkiss and Quispe-Agnoli 2013). Reduced turnover has both benefits and costs. Employers may gain via lower hiring and training costs, fewer vacancies, and lower wages; lower wages are, of course, a loss for workers. Worker mismatch and reduced turnover may lead to lower labor productivity, which is bad for employers and workers alike.

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ABBREVIATIONS

CPI-W: Consumer Price Index for Urban Workers
CPS: Current Population Survey
DHS: U.S. Department of Homeland Security
ICE: U.S. Immigration and Customs Enforcement
IRCA: 1986 Immigration Reform and Control Act
LEHD: Longitudinal Employer-Household Dynamics
OLS: Ordinary Least Squares
QWI: Quarterly Workforce Indicators
SSN: Social Security Number
UI: Unemployment Insurance

It is also possible that E-Verify laws lead to greater churn in labor markets as employers hire unauthorized workers and then have to fire them after they fail the eligibility check. Because of concerns about discrimination, employers are prohibited by federal law from using E-Verify to screen workers before they are actually hired (Bruno 2013). Such churn is costly to employers and, as a result, may lead to lower wages and less employment. Alternatively, employer attempts to reduce churn may lead to higher wages, particularly among workers who can pass E-Verify.

U.S. natives and legal immigrants may see their wages and employment rise if employers substitute them for unauthorized workers when states require E-Verify. Alternatively, their employment and earnings may fall if they are complements to unauthorized immigrant workers in production or if an exodus of unauthorized immigrants reduces overall labor demand. Turnover among legal workers may rise in the short run but fall in the long run if E-Verify laws open up better job opportunities for them. The ambiguity of these predictions motivates this study's empirical examination of the effect of E-Verify laws on job turnover as well as on employment and earnings.

Previous findings on the labor market effects of state E-Verify laws are mixed. Studies report evidence of positive, negative, and null wage effects among immigrants who are likely to be unauthorized (Amuedo-Dorantes and Bansak 2014; Orrenius and Zavodny 2015). Findings on wage and employment effects among less-educated U.S. natives and naturalized immigrants, who are legally eligible to work but may compete with unauthorized immigrants for jobs, are mixed as well (Amuedo-Dorantes and Bansak 2014; Bohn, Lofstrom, and Raphael 2015; Orrenius and Zavodny 2015). State E-Verify laws appear to increase the probability that less-educated legal workers switch employers, perhaps to take advantage of new work opportunities, without affecting this propensity among likely unauthorized immigrant men (Orrenius and Zavodny 2015).

This study makes two contributions to the growing literature on the effects of E-Verify laws. First, this study examines hiring and separations rates in addition to employment and earnings. Earlier research focuses on population, employment, and earnings effects. The effects of E-Verify on job turnover have not been examined previously, with the exception of one limited look at month-to-month employer transitions

discussed in more detail below. Second, this study uses data from the Quarterly Workforce Indicators (QWI), a job-based dataset that combines employer records with administrative and household data. Earlier research on the effects of E-Verify laws used data solely from household surveys. The QWI data enable us to take a more detailed look at turnover and may provide a different perspective on employment and earnings effects than household surveys. In particular, the QWI data allow us to explore effects in industries that traditionally hire large numbers of unauthorized immigrants.

Understanding the effects of E-Verify laws is important for several reasons. More than 11 million unauthorized immigrants live in the United States, and most of them are in the labor force (Passel and Cohn 2016). In recent decades, immigrants, including unauthorized immigrants, have settled in new destinations across much of the United States (e.g., Coates and Gindling 2013; Massey and Capoferro 2008). The growth of immigrant populations in new areas prompted some of those areas to adopt laws aimed at discouraging immigrants from settling there, including the E-Verify laws examined here (e.g., Boushey and Luedtke 2011; Monogan 2013; Ybarra, Sanchez, and Sanchez 2016). In addition to activity at the state and local level, several bills that would require all employers to use E-Verify have been proposed in the U.S. Congress, including the comprehensive immigration reform bill that the Senate passed in 2013. When Congress and the President next consider immigration reform, expanding E-Verify may well be on the agenda.

The next section explains what E-Verify is and discusses which states already require some or all employers to use E-Verify. It also details previous research findings on the effects of state laws. Section III explains the QWI data and the empirical methodology used here. Section IV presents the results, which indicate that universal E-Verify laws reduce employment and job turnover among Hispanics. The drops in employment and turnover become larger as the share of Hispanic workers who are likely to be unauthorized falls. There is little evidence of effects among non-Hispanic whites or blacks overall or on average earnings among workers. Section V concludes.

II. BACKGROUND ON E-VERIFY AND ITS EFFECTS

E-Verify is a free online system run by the federal government that employers can use

TABLE 1
States Mandating Universal Use of E-Verify

State	Adoption Date	Implementation Date	Comments
Alabama	June 2011	April 2012	
Arizona	July 2007	January 2008	
Georgia	May 2011	January 2012	Size phase in; only applies to firms with more than ten employees
Mississippi	March 2008	July 2008	Size phase in
North Carolina	June 2011	October 2012	Size phase in; only applies to firms with 25 or more employees
South Carolina	June 2011	January 2012	
Tennessee	April 2016	January 2017	Firms with fewer than 50 employees only need to keep copy of documents
Utah	March 2010	July 2010	Only applies to firms with 15 or more employees

to check a worker's employment eligibility. Employers enter information from the employment eligibility form ("Form I-9") that all new hires are required to complete.¹ E-Verify compares that information with Social Security Administration and, if needed, Department of Homeland Security (DHS) records. If there is a discrepancy, the employer is notified of a tentative nonconfirmation and is told to notify the worker, who then has 8 federal work days to contest the discrepancy. During those 8 days, the employer cannot fire the worker because of the discrepancy. If the discrepancy is not resolved after that period, the employer must fire the worker. Employers are not allowed to ask applicants about their employment eligibility or verify their eligibility before making them a job offer. They are, however, required to post a notification in the workplace that they use E-Verify to screen new hires, which may deter unauthorized workers from applying there. Unauthorized workers can pass E-Verify only by committing identity fraud—supplying another person's valid social security number (SSN) and name.²

In 2008, Arizona became the first state to require all employers to use E-Verify. Table 1 lists the eight states that, as of early 2017, require all (or almost all) employers to use E-Verify and provides details about their policies. In addition to those eight states, 13 other states require some or all of the public sector

and/or government contractors to use E-Verify.³ The federal government also requires most federal contractors and subcontractors to use E-Verify for new hires and existing workers assigned to a covered federal contract. Laws that apply to the public sector are unlikely to affect many unauthorized immigrants since few of them have the education levels and English fluency required for most public sector jobs. Few unauthorized immigrants are likely to work for government contractors either since most of those firms are large corporations that required identity documents even before the introduction of E-Verify mandates. This analysis therefore focuses on universal E-Verify mandates.

States with mandatory E-Verify laws can impose only a limited set of punishments on non-compliant employers. The 1986 Immigration Reform and Control Act (IRCA) preempts state and local laws from imposing civil or criminal sanctions other than through licensing or similar regulations. Most state universal E-Verify laws therefore stipulate suspending or revoking a noncompliant firm's business license. The extent of compliance with the laws is unknown. About three-quarters of Arizona firms with five or more employees were enrolled in E-Verify as of September 2012, compared with about three-fifths in Alabama, one-half in South Carolina, and one-fourth in Mississippi and Utah (Arvelo 2013). Nationwide, more than 600,000 employers were enrolled in E-Verify as of 2016, and the share of new hires run through the E-Verify

1. Form I-9 was created after the 1986 Immigration Reform and Control Act required that workers be legally authorized to work in the United States. Prior to that law, employers could legally hire unauthorized immigrants.

2. In response to concerns about identity fraud, the system added a photo matching tool. Employers are required to verify that the photo in E-Verify is identical to the photo the employee presented when completing Form I-9, when possible.

3. The details about state laws here are based on information from LawLogix (<http://www.lawlogix.com/e-verify>) and Troutman Sanders (<http://www.troutmansanders.com/immigration/>); those sources also list the states with laws that apply to the public sector or government contractors. Robustness to several other codings of the laws is discussed later in the paper.

system appears to be approaching 50%.⁴ The large share of hires run through the system indicates that many employers in states that do not require E-Verify still use the system. There are at least two possible reasons for this: Multistate firms required to use it in one state may opt to use it in all states, and firms may try to offer their use of E-Verify as an affirmative defense if they are charged with knowingly employing unauthorized workers.

Previous research concludes that the population of less-educated Hispanic immigrants who are not naturalized U.S. citizens, a group that is particularly likely to be unauthorized, fell in states that began requiring all employers to use E-Verify. In Arizona, the share of the population composed of less-educated non-naturalized Hispanic immigrants fell substantially after that state's E-Verify requirement went into effect, both absolutely and relative to a synthetic control of other states (Amuedo-Dorantes and Lozano 2015; Bohn, Lofstrom, and Raphael 2014). Within states that had implemented a universal E-Verify requirement by 2014, the number of less-educated non-naturalized immigrants from Mexico and Central America fell by 6%, on average (Orrenius and Zavodny 2016).⁵

These population drops suggest that labor market outcomes worsened for unauthorized immigrants in states with E-Verify requirements. However, the evidence on such effects is mixed. Arizona's universal E-Verify mandate appears to have pushed large numbers of unauthorized immigrants from wage-and-salary employment into self-employment compared with a synthetic control (Bohn and Lofstrom 2013). Within all states with universal mandates, however, one study finds that the share of the likely unauthorized Mexican immigrant population in wage-and-salary employment or in self-employment did not change significantly when those states began requiring E-Verify

(Orrenius and Zavodny 2015). Another analysis finds that the overall employment rate fell among likely unauthorized Hispanic immigrants in states with a universal E-Verify law (Amuedo-Dorantes and Bansak 2014).⁶ Turning to wages, one study finds a positive wage effect among likely unauthorized Hispanic immigrant female workers, while another finds a negative effect among likely unauthorized Mexican immigrant male workers (Amuedo-Dorantes and Bansak 2014; Orrenius and Zavodny 2015). Importantly, analysis of employment rates and earnings may be confounded by the fact that immigrants who experience job or earnings losses may be particularly likely to leave the state, resulting in less-negative estimated effects than would otherwise be the case.

Evidence on the effect of E-Verify requirements on less-educated legal workers, who may be substitutable for unauthorized immigrants, is similarly mixed. In Arizona, the employment rate among non-Hispanic white U.S.-born men fell relative to a synthetic control, while employment rates changed little among Hispanics who are U.S. natives or naturalized U.S. citizens (Bohn, Lofstrom, and Raphael 2015). Within all states with a universal E-Verify mandate, there is evidence of a positive employment effect among non-Hispanic U.S.-born men and women and among Hispanic U.S.-born women, on average (Amuedo-Dorantes and Bansak 2014; Orrenius and Zavodny 2015).⁷ The laws also appear to have prompted some Mexican-born men who are naturalized U.S. citizens to move from self-employment into wage-and-salary jobs (Orrenius and Zavodny 2015). In Arizona, employment fell among less-educated non-Hispanic white U.S.-born men, but their earnings rose (Bohn, Lofstrom, and Raphael 2015). Within all states with a universal E-Verify law, average earnings rose among U.S.-born Hispanic and non-Hispanic male workers (Amuedo-Dorantes and Bansak 2014; Orrenius and Zavodny 2015).

4. The number of employers is from <http://www.uscis.gov/e-verify/what-e-verify>. The share of new hires is based on comparing the number of cases run through E-Verify in fiscal year 2014, according to USCIS (<http://www.uscis.gov/e-verify/about-program/history-and-milestones>), with the number of new hires in October 2013 through September 2014, according to the Bureau of Labor Statistics (<http://www.bls.gov/jlt/data.htm>). Private correspondence with DHS confirms the accuracy of this estimated share.

5. Analyses of omnibus immigration laws and laws that target employment of unauthorized immigrants, some of which include an E-Verify requirement, also find evidence of a decrease in the likely unauthorized immigrant population in states that have adopted them (Raphael and Ronconi 2009; Good 2013).

6. In addition, state laws that target employment of unauthorized immigrants more generally do not appear to have a significant effect on the employment rate among less-educated non-naturalized Hispanic immigrants but do have a negative effect among more-educated non-naturalized Hispanic immigrants (Raphael and Ronconi 2009).

7. State laws that target employment of unauthorized immigrants more generally appear to reduce the employment rate among less-educated Hispanics who are naturalized U.S. citizens while raising the employment rate among more-educated Hispanics who are naturalized U.S. citizens (Raphael and Ronconi 2009).

Most previous research on the effects of E-Verify laws focuses on demographic groups, not industries. Industries that disproportionately employ unauthorized immigrants, such as agriculture, construction, and leisure and hospitality, should be more affected by E-Verify requirements.⁸ An analysis of city and county anti-unauthorized immigrant laws, some of which require employers to use E-Verify, and County Business Patterns data finds a negative effect on the share of county employment in industries that employ a large share of unauthorized immigrants nationally (Pham and Van 2010). The most adverse effect is in the food services and drinking places industry. Interestingly, there appears to be a positive effect in several unauthorized immigrant-intensive industries: repair and maintenance, personal and laundry services, heavy and civil engineering construction, and food and beverage stores.⁹

Finally, there is limited evidence on how E-Verify laws affect job turnover. Data from household surveys indicate that when states adopted a universal E-Verify law, likely unauthorized Mexican women who were recent immigrants became more likely to switch employers, while there was no effect among likely unauthorized Mexican immigrant men (Orrenius and Zavodny 2015). Less-educated U.S.-born Hispanic men were more likely to switch employers after a state adopted a universal E-Verify law. Those results are based solely on workers who were employed in two consecutive months and remained in the same housing unit. This group may not be representative of all workers. In particular, residential moves are likely to be linked to employment transitions, especially moves across employers.

A major advantage of the data source used here is that it gives a more comprehensive picture of turnover than the earlier study in several ways. Most importantly, it attempts to follow workers as they move across employers even if they move residences. It also counts each

employer transition that occurs within a month; the household survey data used by Orrenius and Zavodny (2015) counts workers with two or more employer transitions within a month as a single transition. The data source used here is based on employer records linked to administrative and household data. It therefore captures turnover from the employer perspective. Transitions by workers from employment into nonemployment or vice versa are counted as part of turnover here, whereas in the earlier study turnover consisted solely of transitions across employers by workers who were employed in two consecutive months. Employer-provided data also may be more reliable than data from household surveys.

III. DATA AND EMPIRICAL METHODOLOGY

This study uses the QWI public-use data. The QWI is based on the longitudinal employer-household dynamics (LEHD) linked employer–employee microdata, a massive longitudinal database covering more than 95% of U.S. private-sector jobs. The QWI is available as state- or county-level quarterly aggregates for specific demographic and industry groups; unlike the LEHD data from which it is constructed, the QWI is not firm- or individual-level microdata. This study uses the state-level aggregates. The Census Bureau uses a number of sources to construct the LEHD data, including state unemployment insurance (UI) earnings records, the Quarterly Census of Employment and Wages, the 2000 Census, Social Security Administration records, and tax returns.¹⁰ The QWI is job-based, with workers who have multiple jobs counted at each job. Geography is based on place of work, not place of residence.

The data used here cover the period 2005 to 2014 and therefore include the period when seven of the eight states listed in Table 1 implemented a universal E-Verify policy. QWI state-level data are available for all states except Massachusetts and the District of Columbia during this period.¹¹

We examine five measures of labor market outcomes available in the QWI. Initial employment is the number of people employed on the first day of the quarter. Total employment is the number of people employed at any point during

8. Unauthorized immigrants account for about 5% of the U.S. labor force but 16% of workers in agriculture, 12% in construction, and 9% in leisure and hospitality (Passel and Cohn 2015).

9. Pham and Van (2010) examine employment shares, so employment must increase in some industries if it falls in other industries. However, Bohn and Santillano (2017) similarly find inconsistent effects of an immigration enforcement program, 287(g), across immigrant-intensive industries using county-level data. Employment levels fell in administrative services (e.g., landscaping, janitorial work, and maintenance) but rose in manufacturing.

10. For details on the QWI, see http://lehd.ces.census.gov/doc/QWI_101.pdf. The data are available at <http://lehd.ces.census.gov/data/#qwi>. We use the 2016 Q1 release of the data.

11. Data needed to create the separations and new hires rates are not available for Wyoming in Q4 2014.

TABLE 2
Descriptive Statistics, by Race/Ethnicity

	Initial Employment	Total Employment	Separations Rate	New Hires Rate	Average Earnings
Hispanics	671,121 (1,563,563)	827,011 (1,897,884)	26.8% (8.5)	24.0% (7.9)	\$6,937 (934)
Non-Hispanic whites	3,505,765 (3,117,076)	4,106,607 (3,647,486)	17.1% (3.6)	14.4% (3.2)	\$10,740 (2,083)
Non-Hispanic blacks	601,255 (711,278)	747,310 (878,112)	28.0% (8.7)	25.7% (9.0)	\$6,684 (1,109)

Notes: Shown are unweighted means, with standard deviations in parentheses. Average quarterly earnings are calculated as total payroll divided by total employment and is adjusted for inflation using the CPI-W, with Q4 2014 as the base period. The number of observations is 1,960 for employment and earnings, and 1,959 for the separations and new hires rates.

the quarter. The separations rate is the number of workers whose job ended in a given quarter as a share of employment. Separations can be voluntary—a worker quits—or involuntary—a worker is fired or laid off. The new hires rate is the number of workers newly hired during a given quarter as a share of employment.¹² Average quarterly earnings is total payroll divided by total employment and is adjusted for inflation using the Consumer Price Index for urban workers (CPI-W). This measure only includes workers—it will not capture an increase in the population with no earnings.

This study examines the QWI data along two dimensions: race/ethnicity and industry.¹³ The races/ethnicities that we examine are Hispanics (who can be of any race), non-Hispanic whites, and non-Hispanic blacks. All of these groups include U.S. natives, legal immigrants, and unauthorized immigrants. We focus on Hispanics since a large share of Hispanics in the United States are unauthorized—about 19% (Lopez, Morin, and Taylor 2010). The share is likely even higher among workers since many Hispanic U.S. citizens are too young to be in the workforce and since unauthorized immigrants are disproportionately in the labor force. We also examine non-Hispanic whites and blacks to see if there are effects on potentially competing groups comprised almost exclusively of legal workers.

Table 2 reports sample means by race/ethnicity for the labor market outcomes examined here. Separations and new hires rates are higher among Hispanics and blacks than

among whites, while average earnings are lower. These differences likely reflect differences in educational attainment, geographic location, and industry.

When stratifying the data by industry, we focus on industries in which unauthorized immigrants are concentrated, according to estimates from Passel and Cohn (2015). We show results for Hispanics in five unauthorized immigrant-intensive industries: construction, eating and drinking places, dry cleaning and laundry services, buildings and grounds services (which includes landscaping and janitorial services), and bakeries.¹⁴ Table 3 reports sample means for those industries across all workers in the three race/ethnicity groups examined here. The table also gives Passel and Cohn's (2015) estimates of the share of workers who are unauthorized immigrants in those industries as of 2012.¹⁵ The share of workers who are unauthorized immigrants in these industries ranges from 11% to 22% (vs. a national average of 5%). We also examine two industries that are very unlikely to employ unauthorized workers: police and law. These two industries serve as a specification check.

A. Unauthorized Immigrants and the QWI

A critical question for this study is whether the QWI includes unauthorized immigrant workers.

14. We estimated regressions for the industries detailed in Table B4 of Passel and Cohn (2015) that are available in the QWI at the 2-, 3-, or 4-digit NAICS code level, with the exception of private households because of coverage concerns. We show results for industries with a full sample of observations among Hispanics (1,960 observations for employment and earnings; 1,959 for separations and new hires rates).

15. We present a weighted average of Passel and Cohn's estimate of the share of workers who are unauthorized in landscaping services and services to buildings and dwellings, and in bakeries (except retail) and retail bakeries.

12. Separations and new hires rates are created here as a share of the average of employment at the beginning and end of the quarter.

13. The QWI data are also available for Asians, Native Americans, Native Hawaiians or other Pacific Islanders, and multiracial workers. We do not examine these groups because of very small population sizes in some states.

TABLE 3
Descriptive Statistics, by Industry

	Initial Employment	Total Employment	Separations Rate	New Hires Rate	Average Earnings	Share of Workers Unauthorized
Unauthorized immigrant-intensive industries:						
Construction	125,063 (138,203)	159,143 (175,248)	27.0% (7.3)	22.2% (7.9)	\$10,462 (1,659)	12
Eating and drinking places	172,877 (183,363)	231,119 (240,498)	17.1% (3.6)	14.4% (3.2)	\$3,163 (506)	11
Dry cleaning and laundry	5,567 (6,109)	6,607 (7,273)	19.0% (6.3)	16.8% (5.9)	\$5,870 (917)	19
Buildings and grounds services	33,541 (37,336)	43,780 (47,272)	31.7% (8.6)	27.5% (8.6)	\$5,055 (812)	22
Bakeries	5,113 (6,241)	5,921 (7,201)	17.9% (8.7)	16.1% (7.8)	\$7,687 (1,939)	14
Not unauthorized immigrant-intensive industries:						
Police	30,186 (44,547)	32,239 (47,241)	6.7% (4.1)	4.7% (2.1)	\$11,962 (2,548)	—
Law	21,140 (27,014)	23,518 (30,226)	10.7% (3.1)	8.9% (2.7)	\$16,473 (4,783)	—

Notes: Shown are unweighted means across Hispanics and non-Hispanic whites and blacks, with standard deviations in parentheses. Average earnings are adjusted for inflation using the CPI-W, with Q4 2014 as the base period. The number of observations is 1,960 for employment and earnings, and 1,959 for the separations and new hires rates. Share of workers unauthorized is from Passel and Cohn (2015).

There are several reasons to be concerned about this. Since the QWI is rooted in UI earnings records, it does not include workers who are “off the books” and not included as employees in those records. QWI coverage is therefore relatively incomplete for some industries that disproportionately hire unauthorized immigrants, most notably agriculture and private households. In addition, the QWI may underrepresent unauthorized immigrants since the data do not include the self-employed, although it is likely that unauthorized immigrants have lower self-employment rates than legal immigrants (Fairlie and Woodruff 2010). As discussed further below, a negative effect of E-Verify laws on employment in the QWI may partially reflect a shift into off-the-books employment or self-employment in response to the laws.

Unauthorized immigrant workers are present in the QWI but are undercounted. The Social Security Administration estimates that about one-half of unauthorized immigrant workers have payroll taxes withheld from their paychecks (Feinlab and Warner 2005). Workers who have taxes withheld are included in state UI records and hence should be in the QWI. An analysis of Georgia’s UI records concludes that they include about 22% of undocumented workers in that state (Hotchkiss and Quispe-Agnoli 2013). This share is likely an underestimate since it is based on categorizing workers as undocumented only if they have an invalid SSN—it misses workers

who use a false but valid SSN, a practice that may be more common in states that require E-Verify. These issues make it difficult to sign any bias on the estimates presented here.

B. Methodology

The aggregate nature of the QWI does not allow us to examine just workers who are likely to be unauthorized, namely low-education non-naturalized Hispanic immigrants. The fact that the data on Hispanics in the QWI combines unauthorized and legal workers means that, if E-Verify laws have countervailing effects on those two groups, they will cancel out at least partially in the regressions. Our regression model when looking at Hispanic workers therefore includes a measure of the share of them who are likely to be unauthorized. Specifically, the ordinary least squares (OLS) regression model we estimate among Hispanic workers has the basic form.

$$\begin{aligned}
 (1) \quad \text{Outcome}_{st} = & \alpha + \beta_1 \text{E-Verify}_{st} \\
 & + \beta_2 \text{Share Unauthorized}_{st-1} \\
 & + \beta_3 \text{E-Verify}_{st} * \text{Share Unauthorized}_{st-1} \\
 & + \beta_4 \text{Economic Conditions}_{st-1} \\
 & + \beta_5 \text{Immigration Policy}_{st} \\
 & + \text{State}_s + \text{Time}_t + \text{Trend}_{st} + \varepsilon_{st},
 \end{aligned}$$

where s indexes states and t indexes time. The dependent variable is the natural log of initial employment, total employment or average earnings, or the level of the separations rate or new hires rate.¹⁶ E-Verify is the fraction of the quarter that a state has a universal E-Verify mandate in effect. Share Unauthorized is the share of Hispanic workers in a state during the previous three quarters who have at most a high school diploma and are not U.S. citizens, either by birth or naturalization; many of the E-Verify studies discussed above use this group as a proxy for unauthorized immigrants.¹⁷ We created this proxy using data from the Current Population Survey (CPS) and lagged it in order to reduce concerns about endogeneity. Its unweighted mean across all states is 31%, and 47% across the seven states that implemented a universal E-Verify law during the time period we examine. We focus on the estimated coefficients on the E-Verify main effect and the interaction term. To conserve space, we only report estimated coefficients for those two variables here, but full results are available on request.

When we examine non-Hispanic whites or blacks, we estimate a similar specification but use the share of all workers who are likely to be unauthorized instead of the share of Hispanic workers who are likely to be unauthorized. This share is again a lagged three-quarter moving average constructed from the CPS using low-education non-naturalized Hispanic immigrants as a proxy for unauthorized workers, but now measured as a share of all workers. The unweighted mean of this variable across all states is 2.7%, and 3.7% across the seven E-Verify states. In regressions using the race/ethnicity data at the industry level, Unauthorized Share is not industry specific because the CPS is not large enough to create reasonable estimates of the unauthorized share at the industry-by-state level.

In all of the regressions, Economic Conditions controls for lagged business cycle conditions that may affect the number and labor market outcomes of unauthorized immigrants in a state. It includes five variables: the overall unemployment rate, real annual personal income per capita, annual government expenditures per

capita, single-family housing starts, and single-family construction permits.¹⁸ These variables are lagged 1 year, and all except the unemployment rate are logged. Immigration Policy is other state-specific measures of immigration enforcement: the presence of a 287(g) agreement with the federal government, and the initiation of Secure Communities.¹⁹ Both sets of variables are important controls since many of the E-Verify mandates coincided with the 2007–2009 recession and an increase in federal, state, and local immigration enforcement. Unauthorized immigrants tend to have more cyclical labor market outcomes than legal workers (Brown et al. 2014).

The regressions control for time-invariant state-specific factors with state fixed effects, and for business cycle, seasonal, and immigration trends shared across states with time (quarter-by-year) fixed effects. The regressions include state-specific linear time trends to control for underlying trends. Observations are weighted using the annual state population by race/ethnicity in the employment and earnings regressions, and by average employment in that cell for the separations and new hires rates regressions. The standard errors are clustered on the state.

The identification scheme used here compares labor market outcomes before and after states implemented E-Verify. Because the regressions include state fixed effects and state-specific time

18. The industry regressions also include another business cycle control variable, the labor market outcome under examination at the state*race/ethnicity level that does not include the industry under examination (e.g., total employment of Hispanics in the state not including those in construction when estimating total employment of Hispanics in construction).

19. Under the 287(g) program, state and local law enforcement enter into a partnership with U.S. Immigration and Customs Enforcement (ICE) to perform the functions of federal immigration agents. The regressions include two separate variables for the fraction of the quarter that a state has a task force enforcement model and a jail enforcement model in place. Under the task force enforcement model, law enforcement officers may interrogate and arrest alleged noncitizens who they believe to have violated federal immigration laws. Under the jail enforcement model, law enforcement officers may interrogate alleged noncitizens who have been arrested on state or local charges and may lodge immigration detainers on inmates thought to be subject to removal. The regressions also include a variable for the fraction of the quarter that a state has implemented Secure Communities. Under Secure Communities, participating jails submit arrestees' fingerprints to immigration databases, giving ICE access to information on individuals held in jails. These variables remain equal to one after the state has initiated the program. We thank Sarah Bohn for graciously providing the information on 287(g) laws.

16. We use the log of employment levels and earnings in order to make the data more linear. Employment levels and average earnings vary considerably across states.

17. No Cubans are classified here as likely unauthorized immigrants since during this time period all Cuban immigrants were eligible for legal status upon entering the United States.

trends, the estimated coefficient on the E-Verify variable measures the average change in a given labor market outcome within the seven universal E-Verify states after the requirement went into effect, controlling for the linear trend in that labor market outcome within each state and the other factors indicated. That estimated coefficient should be interpreted together with the estimated coefficient on the interaction term, which measures how the change in the labor market outcome after E-Verify varies with the share of workers who are unauthorized. States that have not adopted E-Verify do not contribute to the identification of the coefficients on the E-Verify main effect and the interaction term, but they do help identify the coefficients on the unauthorized share main effect, business cycle, and other immigration policy variables and the time fixed effects.

This approach assumes that E-Verify mandates are exogenous with respect to contemporaneous labor market outcomes. The results are biased if an improvement in or worsening of labor market conditions causes a state to enact an E-Verify mandate. Previous research concludes that the adoption of an E-Verify requirement is related to the change in the foreign-born population in a state, but it is not related to economic conditions there (Newman et al. 2012). This finding reduces concerns about endogeneity bias.

C. Expected Effects

The expected effect of E-Verify laws on the labor market outcomes of unauthorized immigrants and legal workers depends on the direction and relative magnitudes of changes in labor demand and labor supply. The intent of E-Verify laws is to reduce the demand for unauthorized workers. The effect on demand for legal workers is likely to be positive but depends on whether those workers are complements or substitutes for unauthorized workers and on whether overall labor demand falls because of higher employer costs or a smaller population after an E-Verify law goes into effect. Meanwhile, the laws are likely to reduce labor supply among unauthorized immigrants, partly as a result of some migrants leaving (or not moving to) states with those laws. Unauthorized immigrants may also become reluctant to enter the labor force once an E-Verify law goes into effect, or they may opt to work off the books or become self-employed. Labor supply among legal workers is unlikely to shift directly in response to E-Verify laws.

In the regressions, the E-Verify main effect captures the overall labor market impact of an

E-Verify law. In theory, this effect should be near zero for non-Hispanic blacks and whites since almost all of them are authorized workers; it may be negative if it is costly for employers to check all new hires' employment eligibility, as required by universal E-Verify laws. Discrimination may lead to a larger impact among Hispanics who are U.S. natives or legal immigrants if employers believe that they are unauthorized, that is, if employers engage in statistical discrimination. Alternatively, discrimination against work-authorized Hispanics might fall since E-Verify gives employers a tool to check workers' status.²⁰ Turning to the interaction of E-Verify and the unauthorized share, this variable captures how the labor market impact of an E-Verify law depends on the share of workers who are unauthorized in the state. If this share is larger, an E-Verify law may have less effect since employers may rely more on unauthorized workers and enforcing the law may be more costly. In that case, the estimated coefficient on the interaction term may be positive. However, it may be negative if having a larger unauthorized immigrant share boosts the negative effect of an E-Verify law. Other reasons make it theoretically ambiguous for employment, wages, and turnover, as discussed in turn below.

An E-Verify-induced decrease in labor supply or labor demand for unauthorized immigrants predicts a decrease in employment among unauthorized immigrants, all else equal. In addition, their employment might fall in the QWI if employers hire more unauthorized immigrants off the books or as self-employed independent contractors after an E-Verify law is in place, responses that would cause those workers to no longer appear in the data. The predicted effect on employment among Hispanics who are authorized to work is ambiguous, however, since we do not know the effect on demand for their labor. We therefore cannot predict the sign of the coefficient on the interaction term in the employment regressions for Hispanics. For non-Hispanic whites and blacks, we expect only a labor demand effect, but the direction of that effect is again theoretically ambiguous.

E-Verify's predicted effect on wages of unauthorized immigrants is ambiguous if both their labor supply and labor demand change.

20. There is some evidence that state immigration laws reduce employment among U.S.-born Hispanics, perhaps due to discrimination (Raphael and Ronconi 2009), although other research finds either a zero or positive effect (Orrenius and Zavodny 2015).

If labor supply falls more than labor demand, wages should rise, whereas wages should fall if labor demand falls more than labor supply. Research on the 1986 IRCA, which made it illegal to hire unauthorized workers, finds that wages of unauthorized Mexican immigrants fell (Donato and Massey 1993). Wages also fell among long-established Mexican immigrants, who are likely to have legal status, while wages of U.S.-born workers of Mexican origin changed little after IRCA (Sorensen and Bean 1994). IRCA had offsetting effects on average wages paid in unauthorized immigrant-intensive industries: paperwork costs reduced labor demand and pushed wages down, while increased demand for legal workers pushed wages up (Fry, Lowell, and Haghighat 1995).

Based on theory and the evidence on IRCA's effects, we do not have a clear prediction for the interaction term for Hispanics' average earnings.²¹ We also do not have a clear prediction for non-Hispanic blacks and whites since we do not know how demand for their labor changes as the unauthorized share changes. Furthermore, our measure of earnings is average payroll, which limits our ability to discern any effects since it combines effects on wages and employment.

Finally, an E-Verify law will reduce separations and new hires rates among unauthorized workers if it makes it harder for them to find another job. In effect, unauthorized immigrants may become trapped in their jobs.²² However, churn may increase if firms hire workers who cannot pass E-Verify and then need to fire them and hire other workers.²³ E-Verify may enable legal workers to move into better jobs, creating

more churn in the short run but less churn in the long run. Alternatively, firms required to use E-Verify may turn to workers who are legal but are not a good fit, creating more churn in the short and long run. The sign of the interaction term in the separations and new hires rates regressions is therefore theoretically ambiguous for all groups of workers examined here. If there is an effect on wages, it may help us sort out whether any observed decrease in churn among Hispanics is due to unauthorized workers being trapped in their jobs or to more stable job matches among remaining workers.²⁴ The former is likely to be associated with lower wages, and the latter with higher wages. However, a change in the composition of the Hispanic workforce toward a higher share of authorized workers and therefore lower turnover is also likely to be associated with higher wages.

IV. RESULTS

The results indicate that state universal E-Verify laws have significant effects on labor markets. The laws reduced employment, separations rates, and new hires rates among Hispanic workers overall. Interestingly, the reductions in employment and job turnover grow as the share of likely unauthorized Hispanic workers falls. Meanwhile, there is little evidence of an effect on average earnings, and there are few estimated effects among non-Hispanic whites or blacks. We first discuss the overall results by race/ethnicity and then the industry-level results.

A. Results by Race/Ethnicity

Employment and job turnover fell among Hispanics in states that began requiring all employers to use E-Verify. As Table 4 reports, the estimated coefficient on the E-Verify main effect is negative for initial and total employment, the separations rate, and the new hires rate. Meanwhile, the estimated coefficients on the interaction terms are positive for those outcomes. This means that the negative effects of E-Verify laws are smaller when the share of Hispanics who are unauthorized is larger. The last row of Table 4 reports the total effect, which is the sum of the estimated coefficients on the main effect and the interaction term evaluated at the weighted sample mean

21. Compositional changes in workers' characteristics due to E-Verify further complicate the interpretation of wage effects among Hispanics. If unauthorized immigrants earn less than other workers, either because of less bargaining power or lower productivity, then a drop in the number of unauthorized workers due to E-Verify may boost average wages among remaining Hispanic workers without those workers actually earning more. Along the same lines, increased hiring of unauthorized immigrants off the books also might boost average earnings among Hispanics in the QWI. There might be a compositional effect on job turnover rates for similar reasons—if turnover is higher among unauthorized workers and those workers disproportionately leave, turnover rates will fall.

22. Universal E-Verify laws do not require employers to check the status of existing employees, so turnover is unlikely to increase because employers fire current unauthorized workers and hire new workers.

23. Firms also might opt to hire workers who cannot pass E-Verify as independent contractors instead of as formal employees. Hiring independent contractors is prevalent in the construction sector.

24. However, E-Verify is unlikely to result in better job matches, on average, since it constrains employers' choice of workers.

TABLE 4
Effect of Universal E-Verify Laws on Labor Market Outcomes among Hispanics

	Initial Employment	Total Employment	Separations Rate	New Hires Rate	Average Earnings
E-Verify	-0.065*** (0.015)	-0.115*** (0.027)	-0.075*** (0.022)	-0.052** (0.021)	0.020 (0.012)
E-Verify * % Hispanics likely unauthorized	0.069* (0.037)	0.173*** (0.058)	0.148*** (0.048)	0.104** (0.049)	-0.006 (0.034)
Total effect	-0.042	-0.058	-0.027	-0.018	0.018

Notes: Each column is from a separate regression. Standard errors clustered on state are in parentheses. The total effect is the estimated coefficients of the two variables evaluated at the weighted sample mean for E-Verify states. Regressions also include variables controlling for immigration policy and the business cycle (see text for details), state and year*quarter fixed effects, and state-specific linear time trends.

* $p < .1$; ** $p < .05$; *** $p < .01$.

of the unauthorized share in E-Verify states.²⁵ These total effects are negative for employment and turnover. Initial employment fell by more than 4% and total employment by almost 6%. The separations rate fell by 2.7 percentage points, and the hiring rate by 1.8 percentage points. These are substantial drops in job turnover relative to the sample means in Hispanics' job turnover reported in Table 1.

The positive estimated coefficients on the interaction term may be puzzling at first glance. When considering them, it is important to keep in mind that the share of Hispanics who were unauthorized fell in E-Verify states. Indeed, our measure of the unauthorized share of Hispanic workers falls by about 3.7 percentage points from when the seven states' E-Verify laws went into effect through the fourth-quarter of 2014. The estimates therefore indicate that the drop in employment and job turnover became bigger as the unauthorized share fell. This is consistent with reductions in unauthorized worker shares leading to less job growth and dynamism among employers who hire Hispanic workers in E-Verify states.

The results do not indicate a significant effect on average earnings among Hispanic workers. This makes it impossible to know whether the drop in turnover is primarily due to unauthorized immigrants becoming trapped in their jobs, to legal workers moving into better jobs, or to changes in the composition of Hispanic workers. All three effects may occur, creating the null effect observed here.

Turning to non-Hispanic whites and blacks, we find few significant effects of E-Verify laws. When interpreting the results in Table 5, it is useful to keep in mind that the unauthorized share of all workers is small.²⁶ The estimated total effects are therefore small even though some of the estimated coefficients on the interaction term are quite large. The results suggest that whites' initial employment falls by less than 1%, while blacks' total employment falls by about one-tenth of 1%. The estimated coefficients are statistically significant for whites' separations rate but the total effect is zero. The estimated coefficient on the interaction term is negative for blacks' separations rate, but the total effect is again very small. The general lack of sizable or statistically significant effects for non-Hispanic blacks and whites is not surprising since they are less likely than Hispanic workers to be directly affected by the laws.

B. Results by Industry

Table 6 reports results for Hispanic workers in five industries with large shares of workers who are unauthorized. The estimated coefficients do not indicate a consistent pattern across industries. Initial employment fell considerably in construction, according to the total effect, while it rose slightly at eating and drinking places. The effect on total employment in the construction sector is not statistically significant, however, and the total effect is near zero at eating and drinking places. Effects on turnover are mixed as well. Evaluated at sample means, the total effects are positive for

25. The weighted mean of the share of Hispanic workers who are likely to be unauthorized is 0.327 across E-Verify states during the time period E-Verify requirements were in effect.

26. The weighted sample mean of the unauthorized share variable across E-Verify states during the time period E-Verify requirements was in effect is 0.042 for whites and 0.031 for blacks. The means differ since whites and blacks are distributed differently across states.

TABLE 5
Effect of Universal E-Verify Laws on Labor Market Outcomes among Non-Hispanics

	Initial Employment	Total Employment	Separations Rate	New Hires Rate	Average Earnings
Non-Hispanic whites					
E-Verify	-0.010** (0.005)	0.003 (0.008)	0.010* (0.005)	0.008 (0.005)	0.007 (0.011)
E-Verify * % workers likely unauthorized	0.116 (0.087)	-0.189 (0.187)	-0.249* (0.141)	-0.218 (0.145)	0.000 (0.192)
Total effect	-0.005	-0.005	0.000	-0.001	0.007
Non-Hispanic blacks					
E-Verify	-0.005 (0.008)	0.014** (0.007)	0.016 (0.010)	0.016 (0.010)	-0.013 (0.013)
E-Verify * % workers likely unauthorized	-0.070 (0.178)	-0.493** (0.227)	-0.443* (0.243)	-0.451 (0.291)	0.379 (0.280)
Total effect	-0.007	-0.001	0.002	-0.002	-0.001

Notes: Each column is from a separate regression. Standard errors clustered on state are in parentheses. The total effect is the estimated coefficients of the two variables evaluated at the weighted sample mean for E-Verify states. Regressions also include variables controlling for immigration policy and the business cycle (see text for details), state and year*quarter fixed effects, and state-specific linear time trends.

* $p < .1$; ** $p < .05$; *** $p < .01$.

the separations and new hires rates in construction, but negative at dry cleaners and bakeries. As with the average earnings results for Hispanics in Table 4, none of the earnings results are significant at the industry level for Hispanics in Table 6.

In results not shown here, we find some evidence of effects on employment and job turnover in unauthorized immigrant-intensive industries for non-Hispanic whites and blacks. In the construction sector, initial and total employment rose as the share of all workers who are likely to be unauthorized fell, as did the new hires rate for whites. In the dry cleaning and laundry sector, initial and total employment fell for both blacks and whites, and the declines grew as the unauthorized share fell. In building and ground services, the new hires rates rose for whites as the unauthorized share fell, and initial and total employment rose for blacks. In the bakeries sector, initial and total employment rose for whites when states began requiring E-Verify and continued to rise as the unauthorized share fell. The overall picture that emerges thus tends to be positive effects for non-Hispanic whites and blacks over time in sectors that tend to employ large numbers of unauthorized workers, but the effect is not uniform across industries and there is no positive overall effect for those groups, as Table 5 shows.

Although agriculture accounts for a disproportionate share of unauthorized immigrant workers, not all agricultural jobs are covered by the UI system and hence coverage in the QWI is

incomplete.²⁷ In addition, large numbers of unauthorized immigrants working in agriculture may be off the books regardless of the presence of E-Verify laws. In results not shown here, we find evidence of an increase in initial and total employment and a rise in the separations rate among Hispanic workers in agriculture; there is also an increase in total agricultural employment among non-Hispanic whites. The increase in employment could be due to more hiring of Hispanics on the books after states begin requiring E-Verify.

As a specification check or falsification test, we examine two industries that are particularly unlikely to employ many unauthorized workers: police and law. These industries could nevertheless be affected by E-Verify laws via changes in labor demand. Table 7 shows the results, which are in striking contrast to the results in Tables 4 and 6. When evaluated at sample means for the unauthorized Hispanic share, there is evidence of a small positive effect on employment in these two sectors. In the legal sector, this could be due to an increase in demand for legal services by Hispanics in states that began requiring E-Verify. In several of those states, the laws requiring employers to use E-Verify were omnibus immigration laws that also included measures such as requiring law enforcement to check the legal status of people during routine interactions, such

27. About 16% of workers in agriculture are unauthorized, according to Passel and Cohn (2015).

TABLE 6

Effect of Universal E-Verify Laws on Labor Market Outcomes among Hispanics, in Unauthorized Immigrant-Intensive Industries

	Initial Employment	Total Employment	Separations Rate	New Hires Rate	Average Earnings
Construction					
E-Verify	-0.219** (0.103)	-0.165 (0.104)	0.063* (0.035)	0.084*** (0.024)	0.046 (0.053)
E-Verify * % Hispanics likely unauthorized	0.276 (0.200)	0.118 (0.206)	-0.163* (0.092)	-0.209*** (0.053)	-0.023 (0.104)
Total effect	-0.129	-0.126	0.010	0.016	0.038
Eating and drinking places					
E-Verify	0.096* (0.050)	0.077 (0.047)	-0.051 (0.032)	-0.019 (0.026)	-0.012 (0.029)
E-Verify * % Hispanics likely unauthorized	-0.275** (0.111)	-0.238** (0.102)	0.125 (0.091)	0.053 (0.073)	0.115 (0.076)
Total effect	0.006	-0.001	-0.010	-0.002	0.026
Dry cleaning and laundry					
E-Verify	0.050 (0.058)	0.006 (0.048)	-0.039 (0.034)	-0.044* (0.026)	0.003 (0.029)
E-Verify * % Hispanics likely unauthorized	-0.154 (0.123)	-0.073 (0.106)	0.094 (0.065)	0.106** (0.052)	0.003 (0.065)
Total effect	0.000	-0.018	-0.008	-0.009	0.004
Building and grounds services					
E-Verify	0.023 (0.053)	0.008 (0.047)	0.017 (0.023)	0.000 (0.015)	-0.023 (0.059)
E-Verify * % Hispanics likely unauthorized	-0.021 (0.122)	-0.029 (0.108)	-0.024 (0.054)	-0.009 (0.038)	0.130 (0.145)
Total effect	0.016	-0.001	0.009	-0.003	0.019
Bakeries					
E-Verify	0.125 (0.179)	0.031 (0.201)	-0.113** (0.045)	-0.089 (0.055)	-0.008 (0.080)
E-Verify * % Hispanics likely unauthorized	-0.064 (0.387)	0.206 (0.441)	0.249* (0.136)	0.209 (0.166)	-0.079 (0.189)
Total effect	0.104	0.098	-0.032	-0.021	-0.034

Notes: Each pair of estimates is from a separate regression. Standard errors clustered on state are in parentheses. The total effect is the estimated coefficients of the two variables evaluated at the weighted sample mean for E-Verify states. Regressions also include variables controlling for immigration policy and the business cycle (see text for details), state and year*quarter fixed effects, and state-specific linear time trends.

* $p < .1$; ** $p < .05$; *** $p < .01$.

as issuing speeding tickets and other measures.²⁸ Hispanics may have increased their demand for legal services by fellow Hispanics as a result of the laws. In the police sector, initial employment and average earnings among Hispanics rose. This result suggests that state E-Verify laws coincide with an increase in resources for law enforcement, which is not surprising given the omnibus nature of several of the state laws. There are no significant effects on job turnover in either sector.

As for the control variables, the measures of lagged economic conditions are generally related

to contemporaneous labor market conditions in expected ways.²⁹ For example, the lagged unemployment rate is negatively related to employment, while lagged real income per capita is positively related to employment. Lagged permits are positively related to employment and job turnover. The measures of other state-level immigration policies are not significantly related to most of the labor market outcomes we examine.

C. Robustness of the Results

E-Verify laws may affect labor market outcomes before they actually go into effect. If we create the E-Verify variable using the date a universal E-Verify mandate became law rather than

28. Arizona enacted the first omnibus immigration law—SB 1070—in 2010, 3 years after its E-Verify law. Alabama, Georgia, and South Carolina's E-Verify requirements were part of omnibus immigration laws in 2011. Utah also enacted an omnibus immigration law in 2011, a year after its E-Verify law. See <http://www.ncsl.org/research/immigration/omnibus-immigration-legislation.aspx> for details on state omnibus immigration legislation.

29. For brevity, results on the variables other than E-Verify are not shown in Tables 4 and 5. Full results are available on request.

TABLE 7

Effect of Universal E-Verify Laws on Labor Market Outcomes among Hispanics, in Not Unauthorized Immigrant-Intensive Industries

	Initial Employment	Total Employment	Separations Rate	New hires Rate	Average Earnings
Police					
E-Verify	0.182* (0.099)	0.138 (0.119)	0.002 (0.047)	0.019 (0.018)	0.083*** (0.029)
E-Verify * % Hispanics likely unauthorized	-0.425 (0.325)	-0.371 (0.380)	-0.077 (0.138)	-0.081 (0.057)	-0.188*** (0.066)
Total effect	0.043	0.017	-0.023	-0.007	0.022
Law					
E-Verify	0.146*** (0.021)	0.100*** (0.038)	-0.038 (0.029)	-0.046 (0.033)	0.025 (0.043)
E-Verify * % Hispanics likely unauthorized	-0.341 (0.050)	-0.225*** (0.086)	0.098 (0.065)	0.123 (0.078)	-0.057 (0.087)
Total effect	0.035	0.026	-0.006	-0.006	0.006

Notes: Each pair of estimates is from a separate regression. Standard errors clustered on state are in parentheses. The total effect is the estimated coefficients of the two variables evaluated at the weighted sample mean for E-Verify states. Regressions also include variables controlling for immigration policy and the business cycle (see text for details), state and year*quarter fixed effects, and state-specific linear time trends.

* $p < .1$; ** $p < .05$; *** $p < .01$.

the date it went into effect, the results for Hispanics are similar to those reported in Table 4, but the estimated coefficients tend to be slightly smaller. The estimated coefficient on the E-Verify main effect for average earnings becomes statistically significant and indicates a 2% increase. Employers may have initially increased pay in an attempt to attract more workers before the laws went into effect.

E-Verify laws that apply only to the public sector or government contractors have little effect on the labor market outcomes examined here. A variable that measures whether a state requires either of those types of employers to use E-Verify is significantly negatively related to average earnings among Hispanics but not to employment or job turnover; the estimated effect is small at less than 1%. Controlling for the presence of those laws has little impact on the estimated coefficients on the universal E-Verify law main effect and the interaction term for Hispanic workers; the only change compared with Table 4 is that the estimated coefficient on the interaction term in the initial employment regression is no longer statistically significant.

The results for Hispanic workers may be driven by E-Verify states with relatively large numbers of Hispanics. Arizona was the first state to require all employers to use E-Verify, as well as the state with the largest Hispanic population and the highest unauthorized immigrant share. Estimates from DHS indicate that Arizona had more

than a half-million unauthorized immigrants living there in January 2007, a year before its E-Verify law went into effect (Hoefer, Rytina, and Baker 2008). Arizona drives most of the results—only the estimated coefficient on the main effect in the initial employment regression remains statistically significant if that state is not included in the sample. The results are generally robust to dropping the other E-Verify states one by one.³⁰

States that do not require E-Verify do not contribute to the identification of the coefficients on the E-Verify variable and the interaction term. Nonetheless, the results may be sensitive to which non-E-Verify states are included in the sample since they contribute to the identification of the other coefficients. Following Das and Polachek (2015), we examined the robustness of the results to restricting the sample to relatively similar states. All of the universal E-Verify states are in the South or Southwest, so we restricted the sample to states in those regions. The results are generally similar to those shown in Table 4.³¹

30. The results in Table 4 are robust to dropping Alabama, Mississippi, South Carolina, and Utah from the sample. If Georgia is dropped, the estimated coefficient on the main effect for earnings becomes significant and equals 2%. If North Carolina is dropped, the estimated coefficients on the interaction term for initial employment and the new hires rates are no longer statistically significant.

31. The one exception is that the estimated coefficient on the interaction term in the initial employment regression is no longer statistically significant.

Finally, the results are robust to several other codings of state E-Verify laws. Since August 2011, Louisiana has required all private employers to use E-Verify or retain a copy of new hires' employment authorization documents. Since January 2012, Tennessee has required all employers with six or more workers to use E-Verify or have new hires show a valid driver's license; in 2017, it began requiring all large employers to use E-Verify but allowed small employers to just keep a copy of employment authorization documents. Because these alternatives were in place during the time period examined here, Louisiana and Tennessee are not considered universal E-Verify states in this analysis. South Carolina also had a universal mandate with an alternative process from July 2009 until January 2012. The results in Table 4 are generally robust to classifying Louisiana or Tennessee as a universal E-Verify state or South Carolina as an E-Verify state beginning in July 2009.³²

V. CONCLUSION

Labor market fluidity and dynamism is important to the efficient allocation of workers across jobs and industries (Davis and Haltiwanger 2014). Regulations that impede worker mobility and labor-market turnover can adversely affect employment and labor productivity and slow economic growth. Our results suggest E-Verify laws may do some or all of these things because states have lower employment and less turnover after they implement mandatory E-Verify laws. Since we rely on aggregate data, there is not conclusive evidence of the incidence of the impacts. There is good reason to suspect that mandatory E-Verify laws might trap unauthorized workers in their existing jobs, and we find evidence among Hispanic workers consistent with this possibility. However, the observed declines in separations and new hires rates for Hispanic workers are also consistent with more job stability or a compositional shift toward more-stable workers as a result of E-Verify laws.

The laws appear to have little effect on average earnings among Hispanic workers but do lead to substantial employment declines for that group. The drop in employment levels is consistent with other evidence that some likely

unauthorized immigrants leave or do not move to E-Verify states. Policymakers considering requiring employers to use E-Verify or a similar system should carefully consider the benefits of such policies alongside their costs, including the possibility of reduced labor-market turnover that hinders labor market efficiency and slows economic growth.

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