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By the Time I Get to Arizona: Estimating the Impact
of the Legal Arizona Workers Act
on Migrant Outflows

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Impact of the *Legal Arizona Workers Act* on
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Abstract

In 2007, the State of Arizona passed the *Legal Arizona Workers Act* (LAWA)
which required all employers to verify the legal status of all prospective employ-

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ees. Using the American Community Survey, we show that LAWA induced a large emigration away from Arizona. We estimate that roughly 36,000 Mexican-born people left Arizona as a consequence of LAWA and that about 25% of those who left relocated to New Mexico suggesting that LAWA had spillovers on adjoining states. Finally, the effects of LAWA were the most pronounced in the farming and construction sectors.

JEL Classification: J61, J68

Key words: E-Verify, Legal Arizona Workers Act, Spillover

1 Introduction

The United States lacks a coherent immigration policy. As a consequence of a failure to pass a cohesive policy through Congress, President Obama has resorted to executive actions whereby he has attempted to give some immigrants permits to work as well as certain protections against deportation. In addition, many states have enacted their own legislation with some being friendly towards immigrants and some being quite hostile towards immigrants. A recent New York Times editorial from April 1, 2015 describes this morass by saying, “A country that has abandoned all efforts at creating a saner immigration policy has gotten the result it deserves: not one policy but lots of little ones, acting at cross purposes and nullifying one another. Not unity but cacophony, a national incoherence...”¹ Similarly, Durand and Massey (2003) point out that current laws have serious negative consequences, and conclude that despite the increased spending on border security, the result has been “the worst of all possible worlds: continued Mexican migration under conditions that are detrimental to the US, its citizens, and the migrants themselves” (Durand and Massey 2003, p. 250).

One notable example of a state passing its own immigration legislation is Arizona

¹The article can be located here: <http://www.nytimes.com/2015/04/02/opinion/the-scrambled-states-of-immigration.html>

which enacted the *Legal Arizona Workers Act* (LAWA) in 2007. This law requires all employers in the state to verify the legal status of all prospective employees; an employer who is found to “knowingly employ an unauthorized alien” (LAW 2008, p. 3) is ordered to “terminate the employment of all unauthorized aliens” (LAW 2008, p. 5), and is subject to a probation period of five years during which the employer is required to file quarterly reports of all hired employees. A second violation results in a permanent revocation of all licenses held by the employer. Employers are encouraged to use the E-Verify program to “[create] a rebuttable presumption that an employer did not knowingly employ an unauthorized alien” (LAW 2008, p. 8).² Undocumented workers are reported to United States Immigration and Customs Enforcement and to local law enforcement. Effectively, this law makes it very difficult for undocumented workers to be employed in the state of Arizona. As pointed out by Bohn, Lofstrom, and Raphael (2014), mandatory use of E-Verify would most likely be a part of any comprehensive national immigration policy if it were to pass.

In this paper, we investigate how LAWA impacted emigration from Arizona. In particular, we build on and extend the work of Bohn, Lofstrom, and Raphael (2014) who were the first to demonstrate that LAWA induced a vary large out-migration

²E-Verify confirms employment eligibility by comparing an employee’s Form I-9 to data from US Department of Homeland Security and Social Security Administration records. The E-Verify program is a tool to ensure employees are working legally; lawmakers are the ones deciding how rigorously to enforce rules regarding hiring employees, thereby choosing how broadly the E-Verify program should be used. Use of the program is required for all federal agencies and contractors.

from Arizona. We are able to replicate the core findings from that paper both qualitatively and, to some extent, quantitatively using a different data source and related but slightly different methods. Specifically, we find that LAWA caused about 36,000 Mexican-born people to leave Arizona. This lends further credence to the important finding that LAWA did indeed induce emigration from Arizona. Similarly, we also show that the largest effects were among high school drop-outs.

However, we also offer some interesting and important additional results. First, we show that LAWA had the largest impact in the farming and construction sectors. Next, we demonstrate that the effects of the law varied by the demographic structure of the household. In particular, the effects were the largest for individuals without dependents but we saw no impact for Mexican-born parents with US-born children nor did we see an effect for US-born household heads with Mexican-born spouses. Finally, we find that about one out of four Mexicans who left Arizona relocated to New Mexico and, hence, LAWA had massive spillover effects on adjoining states.

There are several policy implications to our findings. First, the fact that we find very large declines in employment in the construction and farming sectors suggests that any attempt to incorporate E-Verify into a national immigration policy will harm these sectors in the absence of additional provisions. One such provision could be a temporary workers program that would allow these industries to hire workers on

a temporary basis as was the case with the now defunct Bracero Program. Second, the large spillover effects that we estimate strongly indicate that attempts to reduce undocumented immigration at the state level will have externalities and, thus, be inefficient. The solution to this is a cohesive federal policy.

This paper fits into a related literature that investigates the effects of immigration policy. For example, the efficacy of the E-Verify program was analyzed by Amuedo-Dorantes and Bansak (2012) and they find that E-Verify had large effects on the employment prospects of “likely unauthorized” migrants. In addition, Amuedo-Dorantes, Bansak, and Raphael (2007) and Kossoudji and Cobb-Clark (2002) have investigated the impact of the Immigration Reform and Control Act. This work suggests that there is a wage penalty associated with being an undocumented worker. Finally, Hanson and Spilimbergo (1999) investigated the impact of US border enforcement on migrant apprehension and finds that migrant apprehensions decline in response to more enforcement which indicates that fewer potential migrants attempt to cross when the border is more heavily patrolled. All of this work (including our own) suggests that there are large migrant responses to immigration policy, but our own work does suggest that blunt policies may have some undesirable consequences.

The balance of this paper is organized as follows. In the next section, we describe the data. After that, we discuss our estimation strategy. Next, we discuss our

results. Finally, we conclude.

2 Data

We use data from the American Community Survey (ACS) spanning the years 2005 to 2011 which are available through the Integrated Public Use Microdata Series (IPUMS). We include both males and females in the sample and we do not reduce the age range. The states that we include in the sample are Arizona, California, New Mexico and Texas since all four states border Mexico and have a large Hispanic population. We report summary statistics by state for our sample in Table 1.

In Figure 1, we present the Mexican share in each of the states from our sample. First, we see that all four states in our study have high Mexican populations with New Mexico having the lowest at about 6% and California having the highest at just over 10%. Arizona is in the middle with 6-8% of its population being Mexican. Next, the figure shows a decline in the share of the population born in Mexico in all four states between 2007-2008. Notably, the decline in Arizona is steeper and persists through 2011. Finally, we note that the trends in the figure prior to 2007 are similar in all four states, so the trends pre-LAWA are parallel in all four states.

3 Estimating the Impact of LAWA

LAWA requires employers to ensure that all employees are legal. In principle, this prevents all unauthorized immigrants from working. The inability to work and earn a livelihood should encourage unauthorized immigrants to leave Arizona and discourage unauthorized immigrants from moving to Arizona. To see if this is indeed the case, we examine if the share of the Mexican-born population changes in Arizona after the passage and implementation of LAWA relative to our control states.

We focus on the Mexican-born population instead of all foreign-born individuals for two reasons. First, about 60% of unauthorized immigrants are from Mexico with no other sending country accounting for more than 6% of the total (*e.g.* Hoefler, Rytina, and Baker (2010)). Second, more than half of the foreign-born population in Arizona was born in Mexico; Canada (5% of the foreign born population), Germany (4%), and India (3%) are the next three largest foreign-born populations with Indian migrants contributing to 2% of the unauthorized immigrant population.

Next, we focus on all Mexican-born individuals instead of just non-citizens for two reasons. First, Massey (2010) and Massey and Bartley (2005) point out issues with popularly used surveys. Surveys such as the ACS only record whether an individual is a citizen or non-citizen, even though the non-citizen population includes legal resident aliens and non-immigrants such as students and temporary

workers. Second, even foreign-born individuals who are in the state legally could choose to move away from the stricter policies. Individuals could be part of a mixed-status household with at least one household member who is an illegal immigrant necessitating a move to accommodate the member of the household who is an unauthorized immigrant. Alternatively, individuals could move to avoid discrimination or complications stemming from the policy, such as incorrectly being considered an unauthorized immigrant by E-Verify.

Our core results come from a standard diﬀs-in-diﬀs model. Specifically, if we let i denote the individual, s denote the state and t denote the survey year, we estimate the model

$$MexB_{ist} = \beta_s + \beta_1 Post_t + \beta_2 AZ_s + \beta_3 (Post_t * AZ_s) + \beta_4 X_{it} + \beta_5 E_{st} + \varepsilon_{ist} \quad (1)$$

where $MexB_{ist}$ is an indicator that is turned on if the respondent is Mexican born; β_s is a state fixed effect; $Post_t$ is an indicator that is turned on after the intervention; AZ_s is an indicator for living in Arizona; X_{it} is a vector that contains a parsimonious set of individual-level controls including age, age squared, and gender; and E_{st} is a vector of time-variant state-level controls. We estimate this model using both a linear probability model (LPM) and a logit model. Finally, we clustered the standard errors by state and employed the weights provided by the ACS.

The parameter of interest is the interaction coefficient, β_3 , which identifies the causal effect of LAWA on migration out of Arizona. This is the diff-in-diffs estimator. Choosing the year of intervention (*i.e.* the year in which $Post_t$ is turned on) is not straightforward, since there is no evidence of whether or not passing LAWA itself might encourage Mexicans to move out of Arizona or, alternatively, if Mexicans might wait until the implementation of LAWA before emigrating from Arizona. To address this, we run two specifications. The first is with $Post_t$ defined as 2007 and later and the second defines it as 2008 and later. As discussed above, we use California, New Mexico and Texas as the control group. Like Arizona, these states have large Hispanic populations and they border Mexico. Once again, as we have shown in Figure 1, there are no pre-existing trends in the share of Mexican-born people in Arizona vis-á-vis the control states.

Importantly, none of our control states can be affected by concurrent policies that might affect immigration. Though there was numerous legislation passed that addressed immigrants specifically, very little legislation was passed in the control states in either 2007 or 2008 that affected the immigrant population on the scale or scope of LAWA. According to Hegen (2008) and Hegen (2009), California passed 11 laws relating to immigrants in 2007 and five immigrant-related laws in 2008; New Mexico passed two immigrant-related laws in 2007 and three in 2008; and Texas

passed nine immigrant-related laws in 2007 and did not conduct regular sessions in 2008. While that is a sizable number of laws that are immigrant-related, none of these had anywhere near the impact of LAWA. In fact, most of these laws simply clarified that previously implemented policies did in fact apply to migrants or that migrant status should not affect access to government services. In short, none of the laws negatively affected migrant livelihood like LAWA did. Finally, there is little evidence that any of these laws was well publicized. We report all migrant-related laws passed by California, New Mexico, and Texas in an on-line appendix available from the corresponding author.

Having said that, there are some issues that may affect the interpretation of our estimates. First, if LAWA induced spillovers so that there was migration out of Arizona into our control states then this will bias the diffs-in-diffs estimate. Importantly, however, the bias will be downwards (in absolute value) in this case, so that the true impact of LAWA would actually be greater than what we estimate. While it is true that Bohn, Lofstrom, and Raphael (2014) do not find evidence of any spillovers, their synthetic control states are different from ours. As we will see, most of the evidence of spillovers that we do find involves out-migration to New Mexico which was not chosen by their procedure to be an important control state. Second, the Great Recession coincided with the passage of LAWA. One response

to this critique can be found in Bohn, Lofstrom, and Raphael (2014) who provide evidence that the effects of the recession were uniform in states such as Arizona and California, so our (and their) diffs-in-diffs strategy should address this concern. Similarly, we note that Figure 1 shows that there was a small decrease in the share of Mexican-born people in 2008 in all four states which indicates that the impact of the Great Recession was uniform across Arizona and the control states. In addition, we also include E_{st} which contains proxies for state-specific economic conditions. A third concern is that the Arizona legislature passed SB1070 in 2010 which required all immigrants to carry proof of citizenship. To allow us to disentangle LAWA from SB1070, we will estimate the model both with and without the 2010 and 2011 surveys.³

4 Results

4.1 Core Results

We begin our analysis by estimating equation (1) using the LPM and employing the full sample from 2005-2011 and 2008 as the year of intervention. These results are

³However, in our view, if we do find that the combination of the two laws drives the Mexican-born population out of the state of Arizona then we would still consider that an important result as it indicates that laws that make life harder for immigrants reduce immigrant populations.

displayed in column 1 of Table 2. We see that the diff-in-diff estimate is -0.0088. This indicates that there was a 0.88 percentage point decline in the Mexican-born population in Arizona after LAWA was implemented. This estimate implies that approximately 54,400 people left Arizona in response to LAWA; this out-migration constitutes about a 12% decline in Arizona's Mexican-born population.

We also see that the diff-in-diff estimate is negative and statistically significant in all the LPM specifications which we display in the odd numbered columns. Notably, we see the estimate in column 3, where we exclude the years 2010-2011, drops to -0.00541. One possible reason for this is that this specification excludes the years corresponding to SB1079 which arguably was as onerous for immigrants as LAWA. Next, in columns 5 and 7, we use 2007 as the intervention year and we see that the point-estimate of the impact of LAWA declines. If we compare columns 1 and 5, we see that the estimate drops from -0.0088 to -0.00564 and if we compare columns 3 and 7, we see that the estimate drops from -0.00541 to -0.00321. The fact that the estimate declines when we use the year in which LAWA was passed but was not actually law suggests that immigrants were not anticipating the impact of LAWA prior to it becoming law. Finally, even when we use 2007 as the intervention year, we still see that excluding 2010-2011 from the estimations results in smaller effects.

One concern with the LPM is that the predicted values of the dependent variable

could be less than zero or greater than one. To address this, we estimate equation (1) using a logit model. We report these results in the even numbered columns in Table 2. Note, however, that the “Post*AZ” coefficient estimates in these columns are not directly comparable to the diffs-in-diffs estimate from the LPM.⁴ Instead, a more appropriate comparison is between “Post*AZ” in the odd columns from the LPM and the “Marginal FX” in the even columns from the logit.

On the whole, the results from the logit estimation and the LPM are very similar. For example, when we use the intervention year 2008, we see that the interaction coefficient is -0.135. The marginal effect of this estimate implies a decrease in the Mexican-born population in Arizona of approximately one percentage point which translates to about 61,800 people leaving the state. This constitutes about a 14% decline in the Mexican-born population in Arizona which is very similar to the LPM specification. Next, as with the LPM, omitting 2010 and 2011 from the sample results in a smaller decline in the Mexican-born population that is close to 6.75% of this population. Finally, as with the LPM, changing the intervention year to 2007 decreases the marginal effect by 40% which, once again, suggests that the passage of

⁴Norton, Wang, and Ai (2004) and Puhani (2008) disagree as to how to appropriately evaluate the marginal effects of the interaction term; Norton, Wang, and Ai (2004) argue that “the marginal effect of a change in both interacted variables is not equal to the marginal effect of changing just the interaction term” (p.154) in nonlinear models, thus STATA’s pre-packaged commands that compute marginal effects, such as `margin`, are incorrect; Puhani (2008) argues that cross difference Norton, Wang, and Ai (2004) calculate is not “not equal to the treatment effect and thus not an interest parameter” (p.7) in nonlinear models.

LAWA itself did not have a major impact.

All of the results in Table 1 are qualitatively similar to Bohn, Lofstrom, and Raphael (2014), but smaller in magnitude. We postulate two reasons for this. The first is that Bohn, Lofstrom, and Raphael (2014) use Hispanic non-citizens, whereas we use people who were born in Mexico. This may suggest that authorized Mexican-born people were not intimidated by the legislation and, thus, chose to remain in Arizona. The second reason is that, by design, we chose states close to or sharing a border with Arizona. This increases the likelihood of observing spillovers in our sample which would then attenuate our estimates of the impact of LAWА. We will address this point later in the paper.

For the duration of the paper, we will use the LPM with 2008 as the year of intervention and with 2005-2009 as the sample years. First, using the LPM simplifies the interpretation of the interaction variable and the results from it are very similar to the marginal effects from the logit model. Next, all of the results suggest that the decline in the share of the Mexican-born population in Arizona occurred primarily after the implementation of LAWА. Lastly, Arizona SB 1070 probably resulted in additional Mexican-born emigration from Arizona. As we want to exclude the effects of Arizona SB 1070 on migration decisions, we omit 2010 and 2011 from the sample in the coming sections.

4.2 Effects by Industry and Occupation

We now investigate which sectors were affected the most by LAWA. Since many unauthorized immigrants have low levels of education, they tend to find jobs in low-skilled sectors such as agriculture, services/hospitality and construction as discussed in Passel and Cohn (2009). Moreover, it is often easier for many employers in these sectors to pay their workers under the table which also makes these sectors attractive to undocumented workers. On the other hand, jobs in sectors such as the high tech industry, professional services and the government either require more skills (*e.g.* high tech, professional services) or were more stringent about hiring legally prior to the passage of LAWA (*e.g.* government jobs). Accordingly, LAWA should have had larger effects in the farming, services/hospitality and construction sectors than in the high tech, professional and government sectors. To address this, we estimate the original *diffs-in-diffs* regression by industry and occupation. Note that while occupation tends to be more accurate when differentiating between skill levels, the samples tend to be smaller than when defining the sector by industry. Accordingly, we use both industry and occupation in the coming analysis. Assigning industries and occupations to sectors is detailed in Table A1.

We report the results by occupation in Table 3 and by industry in Table 4. Overall, these results indicate that there has been a significant decline in the number

of Mexican-born individuals in the agricultural, services/hospitality and construction sectors but not the high tech, professional services and government sectors. Looking at the negative estimates in Columns 1-3, we see that they are larger than the comparable estimate from column 3 of Table 2 (which is our preferred estimate, thus, far) which was -0.00541. Note that the estimates in the farm and construction occupations are larger by an order of magnitude of ten. The estimates in Table 4 for the farm, services/hospitality and construction industries are also negative and highly significant but they are smaller which is probably a reflection of the relative lack of accuracy of industry as compared to occupation.⁵

An alternative way to look at the effects of LAWA by sector is to estimate a difference-in-difference-in-difference model (DDD). Accordingly, we estimate the model:

⁵There are two seemingly odd results in Tables 3 and 4. First, the estimate for professional services in column 5 of Table 3 is positive and significant at the 5% level, whereas the corresponding estimate in Table 4 is not significant. In addition, we also see a negative and significant estimate in the hi-tech industry in Table 4 which we do not see in Table 3. Note, however, that the magnitude of the significant estimates is small. So, the magnitude of the coefficients and the lack of consistency in these two sectors across the two specifications suggests that the hi-tech and professional services were not significantly affected by LAWA. Second, the increase in the number of Mexican-born people in the government sector after 2007 in both tables could be a concern. The occupations that were considered in the government sector was limited to police department and fire department jobs, implying Arizona hired a lot of police and fire fighters who were born in Mexico after LAWA. The source of this apparent increase is likely due to a sampling issue - the 2007 sample has 4 Mexican-born people working in an Arizona government occupation while the 2008 sample has 8 Mexican-born people working in an Arizona government occupation.

$$\begin{aligned}
MexB_{ist} = & \gamma_s + \gamma_1 Post_t + \gamma_2 AZ_s + \gamma_3 (Post_t * AZ_s) + \gamma_4 Sector_i + \gamma_5 (Post_t * Sector_i) \\
& + \gamma_6 (AZ_s * Sector_i) + \gamma_7 (Post_t * AZ_s * Sector_i) + \gamma_8 X_{it} + \gamma_9 E_{st} + \epsilon_{ist}
\end{aligned}$$

where $Sector_i$ is a vector of dummy variables for each of the six sectors and the other variables are the same as in equation (1). These results are reported in Table 5.

Looking at Table 5, we see that all three “low-skilled” sectors (agriculture, services/hospitality and construction) experienced large declines in Mexican-born people. Moreover, the size of the coefficients on these triple interactions is significantly larger than the $Post*AZ$ interaction coefficient indicating that the bulk of the impact of LAWA was felt in these sectors. In particular, farming and construction were heavily impacted by LAWA. Using the estimates in column 1, which use occupation to proxy for sector, we find that approximately 4,000 Mexican-born people left Arizona’s agriculture sector, about 3,700 left services/hospitality and 2,600 left construction. Using the estimates in column 3, which use industry to proxy for sector, we find that almost 2,800 Mexican-born people left Arizona’s agriculture sector, about 2,100 left the services/hospitality sector and 15,000 left construction.⁶

One concern with this analysis is that the temporary nature of many agriculture and construction jobs might allow illegal immigrants to move from these sectors

⁶The number of workers in construction according to occupation is less than 20% of the number of workers in construction when using industry to define sectors

to other low-skilled occupations. Negative coefficients may either indicate leaving the state or, alternatively, simply leaving the occupation or industry. To resolve this, we group all “low-skilled” jobs (farming, services/hospitality, construction) and all “high-skilled” jobs (high tech, professional services, government) together. The results in columns 2 and 4 of Table 5 indicate that there was between a 2.5 to 4.1 percentage point decline in the low-skilled Mexican-born population. Finally, note that while the $Post*AZ*high$ interactions in columns 2 and 4 are significant and positive, these estimates are roughly the same magnitude and opposite sign as the double interaction, $Post*AZ$, which indicates a null effect for high skilled workers.

4.3 Effects by Education

We now conduct a similar exercise to the one above except that now we do so by education. Specifically, we compare whether less-educated Mexicans were more likely to emigrate from Arizona than more-educated Mexicans. We define less-educated people to be those without a high school degree. To avoid including individuals who do not have a high school degree but are not necessarily less-educated, *i.e.* children and teens, we either restrict the sample to individuals 18 and older.

We begin by estimating equation (1) for those without a high school degree and those with a high school degree. The results are reported in the first two columns of

Table 6. Indeed, we see a large effect of LAWA on Mexican-born people without a high school degree in the first column. The estimate indicates that the share of the population that is Mexican-born decreased by 1.5 percentage points. On the other hand, the *diffs-in-diffs* estimate for individuals with a high school degree is negative, but much smaller than for high school dropouts.

Next, we estimate a difference-in-difference-in-difference model similar to the model in the previous section except with education level dummies instead of sector dummies. We report the results in the third column of Table 6. The coefficient on the triple interaction suggests a sizable percent of Mexicans without a high school degree left in response to LAWA. The triple-*diffs* estimate indicates an additional 1.5 percentage point decline for high school dropouts and, in total, this corresponds to a decrease of over 25% of the Mexican population. Finally, the coefficient on the *Post*AZ* interaction is negative and statistically significant indicating that more-educated Mexican-born people also left Arizona due to LAWA.

4.4 Household Composition Effects

We now investigate how the effects of LAWA vary with household composition. We do so by estimating equation (1) by using different demographic sub-samples and also by modifying the dependent variable in the regression. The results are reported

in Table 7.

First, we consider households both without and with dependents which we define as spouses, children, grandchildren and individuals younger than 18 years old. In column 1, where we report the results for people without dependents, we see that this group experienced a 0.624 percentage point decline in the Mexican-born population. This effect is larger than the analogous estimate in column 3 of Table 2 which was 0.541 percentage points. Next, in column 2, we report the effects of LAWA for households with dependents and find that there was a 0.677 percentage point decline for this sub-group which is similar to the effect for individuals without dependents. However, the share of the Mexican-born population without dependents is almost half of the share of households with a Mexican-born head of household and, so in absolute numbers the effects in column 1 are about twice as large as those in column 2.⁷ Thus, it appears that individuals without dependents were more mobile.

Next, we investigate if having American-born dependents affects a Mexican-born head of household's mobility. To do this, we estimate a regression similar to equation (1), but with Mexican-born individuals with US-born dependents as the dependent

⁷Mexican-born individuals living in a household without any dependents made up 5.6% of the population living in a household without any dependents and, so the decrease of 0.62 percentage points represents an 11% decrease. On the other hand, Mexican-born heads of household in a household with at least one dependent made up 9.8% of all households with at least one dependent and, so the decrease of 0.68 percentage points represents a 6.9% decrease.

variable. We report the results in column 3. We see that the *diffs-in-diffs* estimator is small and statistically insignificant. This suggests that Mexican-born heads of household are more reluctant to move if they have American-born dependents.

Finally, we explore the possibility that LAWA affected native-born US citizens. This could happen, for example, if natives had Mexican spouses. In this case, they may choose to move away from Arizona to facilitate finding a job for their spouse. To explore this possibility, we estimate a *diffs-in-diffs* model using a sample of American-born household heads and an indicator for having a Mexican-born spouse as the dependent variable. In column 4, we see that the *diffs-in-diffs* estimate is statistically insignificant. This implies that households with an American head and a Mexican-born spouse did not respond to LAWA. This result is, in some ways, similar to the result in column 3 where we showed that Mexican-born heads with American-born dependents also did not respond to LAWA; presumably, American heads of household with Mexican spouses either have American-born dependents or are simply more rooted in the US.

4.5 Spillovers

We conclude our empirical analysis by investigating if any of the migrants who left Arizona migrated to the adjoining states of California or New Mexico. In other

words, we now consider the possibility that LAWA had spillover effects on bordering states. To consider these possible spillovers, we estimate:

$$\begin{aligned}
 MexB_{ist} = & \alpha_s + \alpha_1 Post_t + \alpha_2 AZ_s + \alpha_3 (Post_t * AZ_s) + \alpha_4 CA_s + \alpha_5 (POST_t * CA_s) + \\
 & \alpha_6 NM_s + \alpha_7 (POST_t * NM_s) + \alpha_8 X_{it} + \alpha_9 E_{st} + u_{ist}
 \end{aligned}$$

where CA_s and NM_s are dummy variables for being located in California or New Mexico and everything else is defined as before. Texas is our control state. Note that, as we have discussed, if there are any spillovers then the previous estimates of the effects of LAWA should be biased towards zero and, so the estimate of α_3 in this model should be larger in magnitude than the corresponding estimates from Table 2.

We report the results in Table 8. These estimates use the same sample and intervention year as the estimates in column 3 of Table 2. First, we see that the coefficient on the $Post_t * AZ_s$ is -0.00589, whereas the corresponding estimate from Table 2 was -0.00541. This indicates that there were modest spillovers. However, the migrants left Arizona for New Mexico, not California. Indeed, we see that the coefficient on $POST_t * NM_s$ is 0.00486 and is highly significant.

These estimates indicate that of the 36,360 Mexicans that left Arizona in response

to LAWA, 9,670 moved into New Mexico. This highlights that having a decentralized immigration policy can have externalities on adjoining states. A centralized policy, on the other hand, should affect all states equally and, hence, would better internalize these externalities.

5 Conclusion

In this paper, we investigated the effect of the Legal Arizona Workers Act which required employers to confirm the legal status of all prospective workers in Arizona on emigration from the state. Using the American Community Survey, we demonstrate that LAWA did indeed induce workers to leave Arizona. In particular, we show that about 36,000 Mexican-born individuals left Arizona in response to the law. This is similar to the results from Bohn, Lofstrom, and Raphael (2014) who use a different data source.

Importantly, we also build on previous work in the following ways. First, we show that the effects of LAWA were most concentrated among the least educated and in the construction and farming sectors. The latter of these two results suggests that any attempt to incorporate E-Verify into a comprehensive national migration policy should be accompanied by a temporary workers program to avoid harming these sectors. Second, we document that LAWA was associated with spillovers into

adjoining states. Particularly, we show that one out of four people who left Arizona in response to the law relocated to New Mexico. Hence, the effects of LAWAs on the US, as a whole, were smaller than its impact on Arizona which underscores a potential inefficiency of lacking a cohesive national migration policy.

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Figure 1: Share of Population Born in Mexico

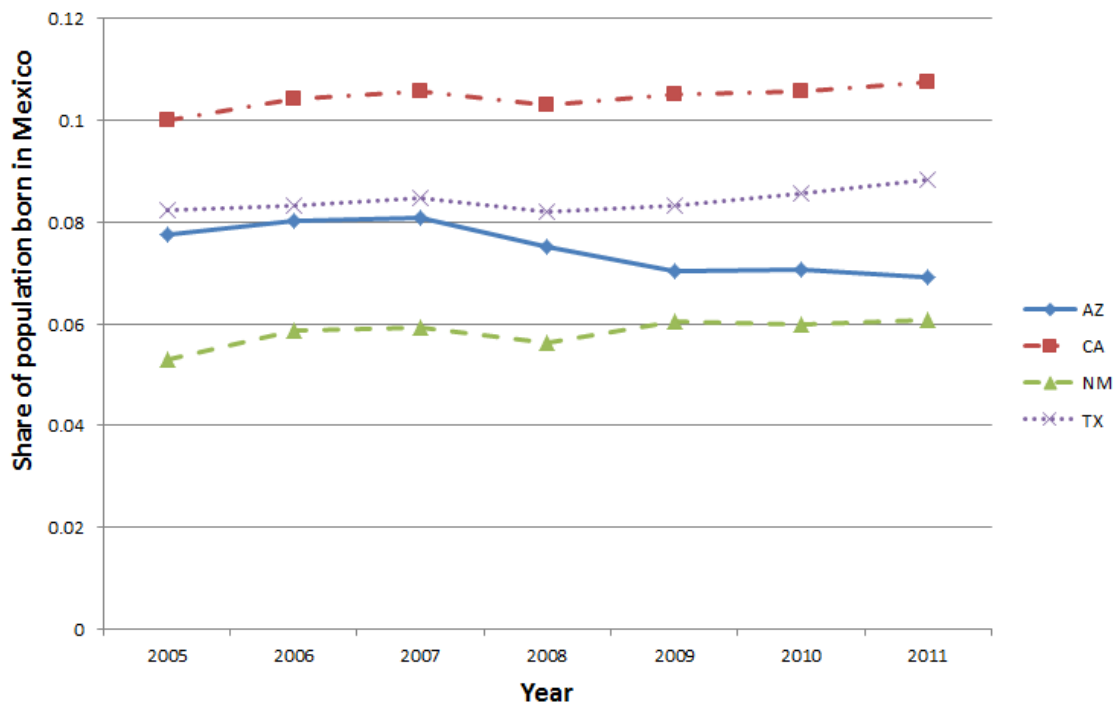


Table 1: Summary Statistics, 2005-2011

	Entire population			Mexican-born population		
	Age	Sex	n	Age	Sex	n
Arizona	38.75	0.51	431,871	37.77	0.492	32,242
California	37.69	0.508	2,457,4335	39.94	0.49	256,932
New Mexico	39.57	0.513	131,887	40.66	0.489	7,697
Texas	37.1	0.512	1,637,278	39.84	0.495	138,052
All four states	37.63	0.51	4,658,471	39.76	0.492	434,923

Notes: Female = 1 for sex

Table 2: Probability of being Mexican-born

	2008 Intervention				2007 Intervention			
	2005-2011 Sample		2005-2009 Sample		2005-2011 Sample		2005-2009 Sample	
	LPM	logit	LPM	logit	LPM	logit	LPM	logit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
age	0.0079*** (0.0007)	0.115*** (0.0051)	0.0079*** (0.0007)	0.114*** (0.0052)	0.0079*** (0.0007)	0.115*** (0.00511)	0.0079*** (0.0007)	0.114*** (0.0052)
age ²	-9.25e-05*** (7.64e-06)	-0.0014*** (6.36e-05)	-9.32e-05*** (7.76e-06)	-0.0014*** (6.53e-05)	-9.25e-05*** (7.64e-06)	-0.0014*** (6.36e-05)	-9.32e-05*** (7.76e-06)	-0.0014*** (6.53e-05)
sex	-0.0123*** (0.0005)	-0.132*** (0.0032)	-0.0135*** (0.0003)	-0.144*** (0.0056)	-0.0123*** (0.0005)	-0.132*** (0.0032)	-0.0135*** (0.0003)	-0.144*** (0.0056)
State GDP	-3.64e-09 (7.50e-09)	-3.11e-08 (8.01e-08)	-1.07e-08 (7.50e-09)	-1.25e-07 (8.68e-08)	-2.25e-08 (1.67e-08)	-2.43e-07 (1.89e-07)	-6.04e-08** (1.65e-08)	-6.94e-07*** (2.23e-07)
Unemp. rate	-0.0005 (0.0003)	-0.0035 (0.0034)	-0.0005 (0.0004)	-0.005 (0.0043)	-0.001* (0.0004)	-0.0099** (0.0047)	-0.0017** (0.0004)	-0.0184*** (0.0052)
AZ	-0.0014 (0.0053)	-0.0035 (0.0564)	-0.0063 (0.0052)	-0.0688 (0.0610)	-0.0157 (0.0117)	-0.164 (0.133)	-0.0421** (0.0114)	-0.479*** (0.155)
Post	-0.0017 (0.0015)	-0.0197 (0.0160)	-0.0018 (0.0014)	-0.0194 (0.0148)	0.0012 (0.0017)	0.0131 (0.0198)	0.0031 (0.00145)	0.0364* (0.0189)
Post*AZ	-0.0089*** (0.0004)	-0.135*** (0.046)	-0.0054*** (0.0002)	-0.158*** (0.0457)	-0.0056*** (0.0004)	-0.221* (0.119)	-0.0032** (0.0007)	-0.485*** (0.143)
Marginal FX		-0.0100		-0.0063		-0.0057		-0.0044
Constant	-0.0021 (0.0126)	-3.893*** (0.118)	0.0066 (0.0177)	-3.763*** (0.178)	0.0172 (0.0189)	-3.675*** (0.207)	0.0564 (0.0249)	-3.192*** (0.300)
Observations	3,959,432	3,959,432	3,271,764	3,271,764	3,959,432	3,959,432	3,271,764	3,271,764
R-squared	0.029	0.051	0.029	0.051	0.029	0.051	0.029	0.051

Notes: Robust standard errors in parentheses. Clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1. Marginal effects calculated using STATA's *margin* command.

Table 3: Probability of being Mexican-born by Sector: Occupation

	Farm	Services/ Hospitality	Construction	Hi Tech	Professional Services	Government
	(1)	(2)	(3)	(4)	(5)	(6)
age	0.0290*** (0.0004)	0.0294*** (0.0017)	0.0308*** (0.0005)	0.0002 (0.0003)	0.0007** (0.0001)	0.0016 (0.0014)
age ²	-0.0004*** (1.23e-05)	-0.0003*** (2.41e-05)	-0.0004*** (1.03e-05)	-8.93e-06 (4.09e-06)	-1.65e-05*** (1.28e-06)	-2.23e-05 (1.47e-05)
sex	-0.0005 (0.0391)	-0.0227 (0.0224)	-0.148* (0.0622)	0.002 (0.0014)	-0.0044* (0.0014)	0.0032 (0.0049)
State GDP	2.70e-08 (1.12e-07)	2.66e-08 (1.76e-08)	-2.20e-07* (8.71e-08)	-3.66e-08 (3.42e-08)	3.26e-08** (6.68e-09)	-1.36e-07 (9.10e-08)
Unemp. rate	-0.0017 (0.0034)	-0.0003 (0.001)	-0.0081* (0.0028)	-0.0006 (0.0003)	0.0002 (0.0003)	-0.0039* (0.0016)
AZ	0.192 (0.0817)	0.0409* (0.0134)	-0.153* (0.0620)	-0.0253 (0.0253)	0.0180** (0.0048)	-0.109 (0.0661)
Post	0.0072 (0.0105)	-0.0076 (0.0058)	0.0107 (0.0115)	0.0006 (0.0011)	0.0016 (0.0012)	0.0116 (0.0052)
Post*AZ	-0.0686*** (0.0028)	-0.0167*** (0.0027)	-0.0504*** (0.0016)	0.0004 (0.0018)	0.0017** (0.0004)	0.0141*** (0.0009)
Constant	-0.130 (0.126)	-0.331*** (0.0217)	0.157 (0.0875)	0.0666 (0.0289)	0.0076 (0.0091)	0.141 (0.109)
Observations	38,266	192,253	28,719	59,232	558,922	16,437
R-squared	0.090	0.042	0.032	0.002	0.004	0.003

Notes: Robust standard errors in parentheses. Clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1. Intervention year defined as 2008, 2005-2009 sample.

Table 4: Probability of being Mexican-born by Sector: Industry

	Farm	Services/ Hospitality	Construction	Hi Tech	Professional Services	Government
	(1)	(2)	(3)	(4)	(5)	(6)
age	0.0233*** (0.0034)	0.0306*** (0.0009)	0.0091*** (0.0005)	0.0004 (0.0003)	0.0036*** (0.0003)	0.0005 (0.0003)
age ²	-0.0003*** (4.64e-05)	-0.0004*** (1.01e-05)	-0.0002*** (5.62e-06)	-2.65e-05** (5.37e-06)	-4.51e-05*** (3.64e-06)	-1.49e-05** (2.70e-06)
sex	-0.15** (0.0302)	0.112*** (0.0125)	-0.222*** (0.0131)	0.0335** (0.0077)	0.0102** (0.0024)	0.0318** (0.0057)
State GDP	1.00e-07 (1.38e-07)	-1.33e-07** (3.38e-08)	-8.25e-08 (4.93e-08)	9.56e-08 (5.94e-08)	5.11e-08*** (8.34e-09)	-5.71e-08* (1.81e-08)
Unemp. rate	-2.30e-05 (0.0034)	-0.0002 (0.0019)	-0.0039* (0.0015)	0.0018 (0.0008)	0.0011 (0.0005)	0.0009 (0.0008)
AZ	0.253* (0.103)	-0.118** (0.0228)	-0.0797 (0.0357)	0.0498 (0.0431)	0.0272** (0.006)	-0.0404* (0.0132)
Post	0.0043 (0.0104)	-0.001 (0.0100)	0.0057 (0.0047)	-0.0065* (0.0027)	-0.0009 (0.0018)	-0.001 (0.0024)
Post*AZ	-0.0355*** (0.0026)	-0.0301*** (0.0042)	-0.0417*** (0.0006)	-0.0083*** (0.0013)	0.0001 (0.0002)	0.0046*** (0.0006)
Constant	-0.134 (0.107)	-0.233*** (0.0371)	0.376*** (0.0486)	0.0170 (0.0526)	-0.0668** (0.0151)	0.0882** (0.0170)
Observations	53,959	35,781	139,951	61,898	647,360	116,024
R-squared	0.115	0.057	0.056	0.015	0.004	0.009

Notes: Robust standard errors in parentheses. Clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1. Intervention year defined as 2008, 2005-2009 sample.

Table 5: Probability of being Mexican-born: Difference-in-difference-in-difference

	Occupation		Industry	
	(1)	(2)	(3)	(4)
Post	-0.0017 (0.0009)	-0.0018 (0.001)	-0.0026* (0.001)	-0.0027 (0.0012)
AZ	-0.0203** (0.0049)	-0.0182** (0.0046)	-0.0139** (0.0044)	-0.0137** (0.0037)
Post*AZ	-0.0046*** (0.0002)	-0.0046*** (0.0002)	-0.0016** (0.0004)	-0.0016** (0.0004)
Post*AZ*farm	-0.0664*** (0.0049)		-0.0364*** (0.0053)	
Post*AZ*sh	-0.0110* (0.0041)		-0.0284*** (0.0024)	
Post*AZ*const	-0.0455*** (0.0024)		-0.0474*** (0.0035)	
Post*AZ*hitek	0.0052** (0.0011)		-0.0054*** (0.0006)	
Post*AZ*prof	0.0062*** (0.0008)		0.0025*** (0.0003)	
Post*AZ*gov	0.0158*** (0.0007)		0.0069 (0.0042)	
Post*AZ*low		-0.0257*** (0.0039)		-0.0412*** (0.0002)
Post*AZ*high		0.0063*** (0.0008)		0.0026** (0.0006)
Observations	3,271,764	3,271,764	3,271,764	3,271,764
R-squared	0.093	0.080	0.080	0.075

Notes: Robust standard errors in parentheses. Clustered at the state level. Services/hospitality abbreviated to “sh”, construction abbreviated to “const”, high tech abbreviated to “hitek”, professional services abbreviated to “prof”, government abbreviated to “gov”. Low-skilled sector grouping abbreviated to “low”, high-skilled sector grouping abbreviated to “high”. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Probability of being Mexican-born: Education

Sample	No High School Degree (1)	High School Degree (2)	Entire Sample (3)
age	0.0161*** (0.0017)	-0.0006** (0.0002)	0.0037*** (0.0003)
age ²	-0.0002*** (1.85e-05)	-1.13e-05** (2.32e-06)	-6.26e-05*** (3.59e-06)
sex	-0.0238*** (0.0008)	-0.0069*** (0.0009)	-0.0113*** (0.0006)
State GDP	-3.95e-08 (5.53e-08)	4.89e-08** (9.58e-09)	3.73e-08** (9.54e-09)
Unemp. rate	-0.0024 (0.0019)	0.001 (0.0005)	0.0004 (0.0007)
Post	0.0147 (0.0072)	-0.0047 (0.0024)	-0.0022 (0.0025)
AZ	-0.004 (0.0404)	0.0421*** (0.0069)	0.0443** (0.0089)
NOHS			0.367*** (0.0290)
AZ*NOHS			-0.0261 (0.0288)
Post*AZ	-0.0154*** (0.0021)	-0.0033*** (0.0005)	-0.0032*** (0.0003)
Post*NOHS			0.0094* (0.003)
Post*AZ*NOHS			-0.0142** (0.0032)
Constant	0.206** (0.0478)	0.0699*** (0.0104)	-0.0005 (0.0178)
Observations	418,381	1,979,487	2,397,868
R-squared	0.070	0.015	0.192

Notes: Standard errors in parentheses. Clustered at the state level. No high school degree abbreviated to "NOHS". Odd numbered columns have samples of individuals 16 and older, even numbered columns have samples of individuals 18 and older. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Probability of being Mexican-born: Household Composition

Dep. Variable	mexb	mexb	ambdep_mexbhh	mexbsp
Sample	Dependent-less individuals	Heads of household	Heads of household	American heads of household
	(1)	(2)	(3)	(4)
age	-7.28e-05 (0.0004)	-0.0029** (0.0006)	-0.0009** (0.0003)	-0.0006* (0.0002)
age ²	-7.11e-06* (3.00e-06)	-6.82e-06 (4.05e-06)	-1.49e-05** (3.24e-06)	1.63e-06 (1.88e-06)
sex	-0.0510*** (0.0039)	-0.0309*** (0.0051)	-0.0121** (0.0034)	-0.0057** (0.0014)
GDP	5.30e-08 (5.25e-08)	2.51e-08 (1.68e-08)	1.53e-08 (6.62e-09)	3.97e-09 (3.19e-09)
Unemp. rate	-0.0006 (0.0015)	0.0009 (0.0006)	0.0004 (0.0003)	0.0002* (7.57e-05)
AZ	0.0376 (0.0384)	0.0147 (0.0118)	0.0062 (0.0048)	-0.0034 (0.0022)
Post	-0.0023 (0.0034)	0.0003 (0.0021)	8.79e-05 (0.0012)	-0.0004 (0.0005)
Post*AZ	-0.0062** (0.0018)	-0.0068*** (0.0009)	0.0014 (0.0008)	0.0005 (0.0004)
Constant	0.0783 (0.0514)	0.273*** (0.0375)	0.135*** (0.0150)	0.0456*** (0.0075)
Observations	547,458	830,592	1,215,798	937,760
R-squared	0.017	0.026	0.028	0.004

Notes: Robust standard errors in parentheses. Clustered at the state level. ambdep_mexbhh = 1 if the individual is a Mexican-born head of household that has at least one American born child. mexbsp = 1 if the individual is an American-born head of household with a spouse born in Mexico. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Net Effects of LAWA: Effects on Arizona, California, and New Mexico

	(1)
age	0.0079*** (0.0007)
age ²	-9.32e-05*** (7.76e-06)
sex	-0.0135*** (0.0003)
State GDP	-9.65e-09 (6.38e-09)
Unemp. rate	-0.0004 (0.0004)
Post	-0.0018 (0.0008)
AZ	-0.0054 (0.0047)
CA	0.0252*** (0.0043)
NM	-0.0416*** (0.0055)
Post*AZ	-0.0059*** (0.0007)
Post*CA	-0.0009 (0.0008)
Post*NM	0.0049*** (0.0002)
Constant	0.005 (0.0169)
Observations	3,271,764
R-squared	0.029

Notes: Standard errors in parentheses. Clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table A.1: Sector by Occupation or Industry

	Occupation codes, 1990 basis	Industry codes, 1990 basis
Farm	479 to 486 Farm occupations, except managerial; gardeners and groundskeepers	up to 033, excluding 000 Agriculture, forestry, and fisheries
Services/hospitality	405, 407, 434 to 453 Private household, food preparation and service occupations	761, 762, 770 Personal services: private households, hotels and motels, lodging places
Construction	865 to 874 Helpers, construction and extractive occupations	060 All construction
Hi Tech	064, 213 to 225, 229, 308 Computer systems analysts and computer scientists, technicians, computer software developers, computer operators	322, 342 to 372 Manufacturing computers and related equipment, electrical machinery, transportation equipment, professional equipment
Professional	up to 201, excluding 064 Managerial and professional specialty occupations, excluding computer systems analysts	700 to 712, 812 to 893 Financial, insurance, and real estate; professional and related services
Government	417, 418 Fire fighting, police, detectives	900 to 992 public administration, active duty military