



Unintended effects of the Alabama HB 56 immigration law on crime: A preliminary analysis



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HIGHLIGHTS

- We evaluate the consequence of Alabama HB 56 on crime.
- We use a synthetic control approach to constructing a counterfactual Alabama.
- Alabama HB 56 increased in violent crime rates, but had no significant impact on property crime rates.

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ABSTRACT

The Alabama HB 56 act passed in 2011 is the strictest anti-illegal immigration bill in the United States. Using the synthetic control method to create a counterfactual Alabama, this paper provides suggestive evidence that Alabama HB 56 led to an increase in violent crime rates, but had no significant impact on property crime rates.

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1. Introduction

Over the last decade, illegal immigration has received growing attention from researchers and governments. In 2007, Arizona passed the Legal Arizona Workers Act (LAWA), followed by SB 1070 in 2010. In 2011, Alabama enacted the Beason–Hammon Alabama Taxpayer and Citizen Protection Act (Alabama HB 56), which is the strictest anti-illegal immigration bill in the US (Fausset, 2011). Despite the growing interest in the relationship between immigrants' legal status and crime, causal evaluation of those policies is still subject to debate. While evidence of positive relationship between immigration and crime has been found

in some recent studies, such as Spenkuch (2013), a major vast literature suggests that immigrant legalization has contributed to a decline in crime rates (Baker, 2015; Mastrobuoni and Pinotti, 2015).

This paper evaluates the impact of Alabama HB 56 on crime rates using the synthetic control approach (Abadie and Gardeazabal, 2003). We create a counterfactual Alabama from a “donor pool” of other states based on crime reports, economic indicators, and sociodemographic characteristic during 1998–2014. The results suggest that Alabama HB 56 contributed to a sharp increase in violent crime rates in Alabama but had no significant impact on property crime rates.

Our study is motivated by a growing literature evaluating anti-illegal immigrant laws. For instance, using a synthetic control method, Bohn et al. (2014) find that the 2007 LAWA substantially reduced the proportion of undocumented immigrants in Arizona. Our study rather focuses on the unintended effects of Alabama HB 56 on crime.

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The rest of this paper proceeds as follow. Section 2 introduces the institutional background. Section 3 describes the methodology and data. Section 4 presents the results. Section 5 performs placebo tests to provide statistical inference, and Section 6 concludes.

2. Institutional background

The Alabama HB 56 Bill passed in June 2011 imposes extreme restrictions to undocumented immigrants in Alabama. It requires every public elementary and secondary school to determine whether students were born outside of the US or if their parents are undocumented. The Bill makes it a felony for an undocumented immigrant to “enter into any business transaction with a government agency”. It also prohibits signing rental agreements or providing housing accommodations for undocumented immigrants. Similar to other immigration acts, Alabama HB 56 also requires “every business entity or employer in the state to enroll in E-Verify”, the federal government’s online database used to check the employment eligibility of workers. As a consequence, undocumented immigrants have fewer opportunities for education, employment and businesses, thereby lowering opportunity cost for criminal behaviors.

3. Methodology and data

To evaluate the effect of HB 56, one needs to find a comparable counterfactual for Alabama. This paper employs a data-driven method to construct a synthetic Alabama, which is a weighted average over all the control states.

In the framework of the synthetic control method, J is the number of states, $j = 1$ is the treated state, Alabama. The rest of the states from $j = 2, \dots, J$ are the potential control alternatives constituting a “donor pool” to construct a synthetic Alabama. Define Y_{jt}^C and Y_{jt}^T as the outcome of unit j at time t in the control group and treatment group respectively. Let $W = \{w_1, w_2, \dots, w_{j-1}\}$ be the $(J - 1) * 1$ vector of weights, with $0 \leq w_j < 1$ and $w_1 + w_2 + \dots + w_{j-1} = 1$. By choosing the proper W^* , the following minimization problem can be solved at $t = T_0$, the pre-intervention period.

$$W^* = \underset{W}{\operatorname{argmin}} (Y_{1t}^T - Y_t^C W)' (Y_{1t}^T - Y_t^C W). \quad (1)$$

Then, the treatment effect can be calculated by applying W^* to $t = T_1$ post-intervention period.

Our outcome variables are crime rates at the state level which are obtained from the FBI’s Uniform Crime Reporting (UCR) statistics from 1998 to 2014.

To construct the synthetic Alabama, we combine state-level police labor force data from 1998 to 2014 from the Bureau of Labor Statistics (BLS) and calculate *per capita* statistics. We further control for state differences in death penalty legality.

Since Fajnzylber et al. (2002) find that cultural characteristics such as religion views and illicit drug use can affect an individual’s propensity to crime, we use the percentage of respondents who identify as Christian from Gallup’s polling data (2006–2014).

Due to data limitations, we use the number of hospital admission for primary substance abuse as control for illicit drug use. Specifically, we control alcohol and marijuana use per 100,000 habitants (accessed from the Substance Abuse and Mental Health Services Administration).

There is substantial evidence documenting how income inequality contributes to crime behavior, in particular violent crimes (Blau and Blau, 1982). Thus, the Gini index in the American Community Survey (2006–2014), and unemployment status in the Current Population Survey (1998–2014) are also included.

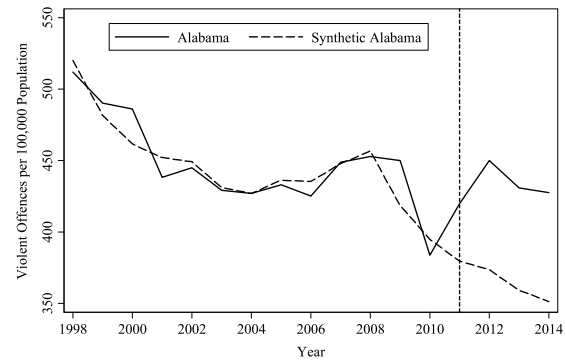


Fig. 1. Trends in violent crime cases.

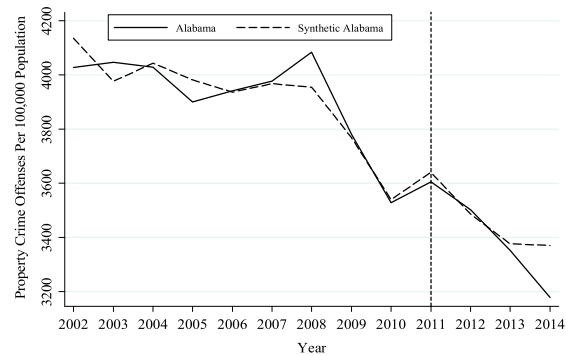


Fig. 2. Trends in property crime cases.

Regarding demographic aspects, we use the proportion of non-citizen Hispanics over 15-year-old without high school education as the proportion of the population most likely to be undocumented (Bohn et al., 2014).

Over the past decade, several states have launched their own immigration regulations. States impacted by similar interventions should be excluded from the donor pool (Abadie et al., 2015), thus we remove all the states that passed E-verify or Omnibus Immigration Legislation (OIL) around the same period.

4. Results

Violent crime

While evaluating the impact of Alabama HB56 on violent crime, synthetic Alabama was constructed by a combination of Kentucky (42.1%), Oklahoma (40.6%), Florida (9.6%), and New Mexico (7.6%), with W^* displayed in the parentheses.

Table 1 reports the pre-intervention comparison for Alabama and synthetic Alabama. The synthetic Alabama provides a close reproduction of Alabama.

Fig. 1 shows the trends for violent crime cases per 100,000 people in Alabama and synthetic Alabama. The magnitude of the estimated impact of HB 56 is significant in the post-intervention period. In the pre-intervention periods (1998–2010), the violent crime rate for synthetic Alabama is fairly close to the rate in actual Alabama showing a good model fit.

Property crime

Fig. 2 displays the total property crime rates from 2002 to 2014. There is no evidence of an impact of the immigration policy. Alabama and synthetic Alabama both experienced a decline in property crime rates during 2008–2014.

Table 1
Crime rate predictors: Mean trends (1998–2010).

	Alabama	Synthetic Alabama		Alabama	Synthetic Alabama
Violent crime rate	447.82	447.10	Hispanic noncitizen at 15 and older with less than high school	0.01	0.01
White	0.69	0.82			
Age under 18	0.25	0.25	Gini index	0.47	0.46
Age 18–44	0.35	0.35	Primary marijuana admission	139.17	94.47
Age 45–64	0.26	0.26	Primary alcohol admission	181.08	227.38
Less than high school	0.24	0.21	Detectives and criminal investigator	22.69	25.67
High school	0.33	0.33	Police and sheriff's patrol officers	206.04	190.99
Christian	0.87	0.83	Security guards	305.97	282.84
Unemployment rate	0.05	0.05	Death penalty	1.00	0.99

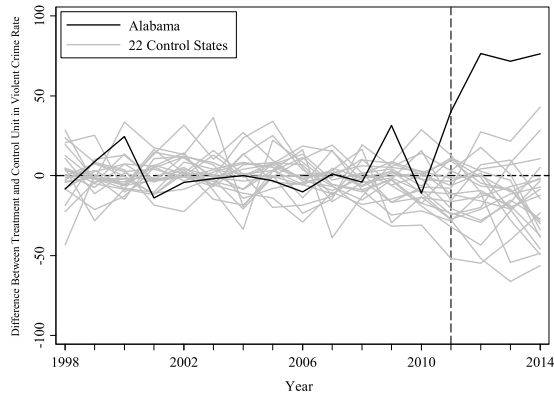


Fig. 3. Violent crime gaps in Alabama and placebo tests in 22 control states.

5. Placebo studies and robustness test

To validate our finding regarding violent crime, we implement placebo studies and robustness checks for inference (Abadie et al., 2010, 2015). In the placebo studies, we repeatedly assign the intervention to each of the control states in the donor pool which did not enact anti-illegal immigrant laws during the same period. If a significant placebo effect is detected, then the estimated shift for Alabama would be seriously undermined.

Fig. 3 displays the placebo test excluding states with pre-treatment periods' mean squared prediction error (MSPE) larger than twice of Alabama.¹ MSPE measures the magnitude of the difference in the outcome variable between the treated unit and its synthetic counterpart (Abadie et al., 2015). The states with large fluctuating MSPE in the pre-treatment period will not provide valid information. The black line denotes the gap in the outcome variable between the treated and synthetic control group, while the gray lines represent the gaps in each of the iterative application of intervention for the units in the donor pool. Twenty-two control states and Alabama are presented in Fig. 3. Alabama displays the largest gap-line in the post-intervention period. According to Abadie et al. (2010), the probability of estimating such a magnitude of gap-line under the random treatment assignment is as low as 1/22, which in terms of the inference interpretation means a *p*-value of lower than 5%.

We also perform the placebo tests by examining the distribution of post-pre MSPE ratio across states. A large post-period MSPE does not validate the treatment induced shift unless the post-pre period ratio of MSPE is also large. Fig. 4 reports how this ratio spreads across Alabama and all the other 37 control states. Alabama has a value of post-period about 27 times larger than the pre-period. If the treatment is randomly assigned to any state in

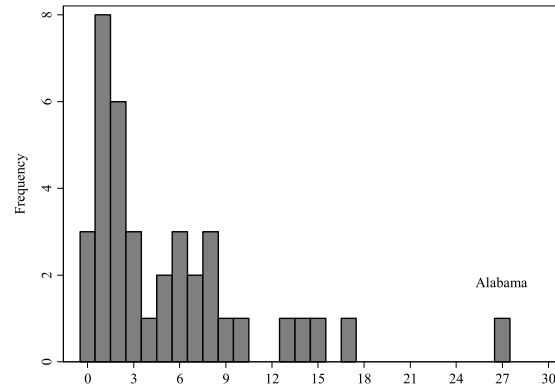


Fig. 4. Ratio of post/pre-HB56 MSPE: Alabama and 37 control states.

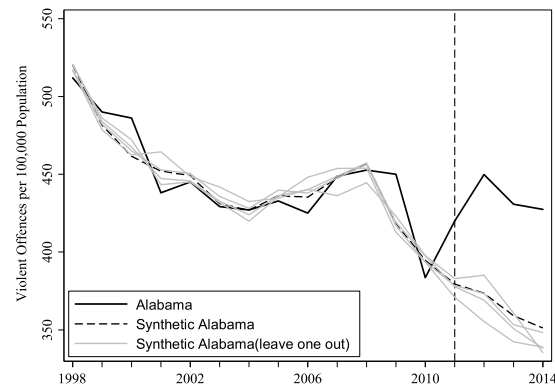


Fig. 5. Leave-one-out distribution of the synthetic control for Alabama.

the donor pool, the probability of obtaining a MSPE ratio as large as Alabama's is $1/37 = 0.027$.

We further implement the sensitivity test by leaving out the four states with positive weights one at a time and re-estimating the model. Fig. 5 plots the four synthetic groups constructed by leaving one state out together with the reproduction of Fig. 1. As seen, our result for violent crime is robust to the exclusion of any particular state with positive weight. All leave-one-out synthetic groups present similar effects to our findings. By sacrificing some extent of goodness of fit, it demonstrates our result is not driven by any particular state.

6. Conclusion

Using a synthetic control approach, this study finds unintended effects of Alabama HB 56 on violent crime. On the one hand, our results can be linked to the literature in which criminal behavior is analyzed based on the benefits and opportunity costs (Becker, 1968). Since Alabama HB56 restricts the employment of

¹ We also conduct placebo tests of discarding states with pre-period MSPE larger than ten times of Alabama and find similar results.

undocumented immigrants, it is expected to increase criminal activities because of lower opportunity cost of criminal behavior, although no effect is found on property crime. On the other hand, increased crimes may also be committed against undocumented immigrants, since undocumented victims have less incentive to report crimes against them. Due to lack of available data, whether the increase in violent crimes is committed by undocumented immigrants or against them merits further investigation.

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