

The effect of mass legalization on US state-level institutions: Evidence from the Immigration Reform and Control Act

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Abstract

A new case for immigration restrictions argues that migrants may transmit low productivity to their destination countries by importing low-quality economic institutions. Using the 1986 Immigration Reform and Control Act (IRCA) as a natural experiment, we test whether the legalization of undocumented immigrants affects the quality of state-level economic institutions in the United States. Using synthetic control models, we find that, in the short run, legalization may increase the burden of government spending. However, in the long run, we find statistically insignificant effects of legalization on economic institutions.

Keywords: Immigration, Institutions, Labor Mobility, Synthetic Control Method

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1. Introduction

Classic economic theory suggests that the spatial reallocation of labor from low to high-productivity countries increases global economic efficiency, *ceteris paribus*. Scholars estimate that the gains in global economic efficiency from eliminating migration barriers may be tens-of-trillions of dollars (Clemens 2011). However, the classic theoretical argument for efficiency gains from free migration often treats laborers like putty-clay capital. That is, migrants simply are inputs in the production function with no ability to alter institutions, the rules that govern economic activity, under which resources are put to productive use.

Understanding that cross-country differences in economic outcomes result from differences in political and economic institutions (Acemoglu and Robinson 2012), Borjas (2015) contends that migrants, unlike capital, affect the culture and institutions of their destination countries and may, therefore, transmit low productivity from poor to rich countries. Borjas argues that migrants are not simply workers, they are people (Freeman 2006); thus, it “seems inconceivable” for billions of immigrants to move to industrialized economies without transferring the institutions that led to poor economic conditions in their home countries.

This new case for immigration restrictions suggests that unrecognized costs are generated by free migration policies as well as other immigration policies, like granting amnesty to previously undocumented immigrants. In this paper, we test whether Borjas’s argument should increase the expected costs of policies granting legal status to previously undocumented immigrants, like the politically contested law called Deferred Action for Childhood Arrivals (DACA).

To do so, we rely on a change in US immigration policy, the Immigration Reform and Control Act (ICRA) of 1986, as a state-level exogenous shock. That immigration reform

approximates a situation similar to that described by Borjas (2015)—the mass legalization in a high-productivity country of culturally distant immigrants from low-productivity countries. IRCA represents an exogenous shock to the legalized populations of US states rather than an exogenous shock to the flow of immigrants, which would approximate Borjas’s claims more precisely. Nevertheless, IRCA changed the ability of previously undocumented immigrants to influence institutions by competing in formal labor markets and voting, which may provoke a response from natives.¹ We study how IRCA’s mass legalization of immigrants affected state-level economic institutional quality.²

Migrants can influence institutions directly by participating in the political process and indirectly by influencing the attitudes and opinions of natives. If immigrants degrade the institutions of their destination country sufficiently such that productivity declines, immigration may reduce global efficiency. On the other hand, if institutions are unaffected or improved by immigrants, such that productivity remains the same or increases, then the claims of classic economic theory hold or even strengthen.

The immigration debate has given birth to a growing empirical literature. Clemens and Pritchett (2019) model migrants as productivity transmitters and estimate dynamically efficient migration levels. Overall, their work supports lowering strict immigration barriers, but their findings suggest the possibility that immigrants from poor countries might transfer low productivity to richer countries, thus offsetting the global efficiency gains found in Clemens (2011).

¹ Borjas (2017) finds that undocumented immigrants have stronger work ethics than other groups in the population, so many immigrants likely were participating in labor markets prior to IRCA. However, as noted by Baker (2015), IRCA expanded educational opportunities and job advancement among beneficiaries, increasing competition with natives for more desirable jobs.

² Our study focuses on the effects of immigration on formal economic institutions and complements other studies, such as Pavlik et al. (2019), which examines the effects of immigration on informal institutions.

Other scholars examine immigration's effect on institutions directly, finding no significant impact. For example, Clark et al. (2015) provide the earliest study of immigrants' effects on institutions. They find no evidence of a negative effect, and some evidence of a positive effect, of immigration on a country's institutional quality. Thus, their findings support the economic arguments for relaxing global migration restrictions to increase global economic efficiency.

Powell et al. (2017) rely on a natural experiment involving the migration of Jews to Israel in the 1990s, which followed the relaxation of emigration restrictions in former Soviet-dominated countries as an exogenous shock to Israel's immigrant population. Using a synthetic control methodology, the authors find that immigration improved institutional quality. While that experiment buttresses the previous finding that immigration does not compromise institutional quality, its results may not apply broadly. More than 30% of the Soviet Union's diaspora were scientific and academic workers (Al-Haj 2004), and they primarily were Jewish, sharing similar cultural characteristics with the people of their destination country. Therefore, external validity may be limited by the uniqueness of that episode of mass migration.

Nowrasteh et al. (2020) follow a similar approach in measuring the effects of immigration on the institutions of Jordan. That study is distinct in that it measures the effect of mass migration on a country with initially weak institutional quality. In Jordan's case, the exogenous shock to migration is the population increase forced by Saddam Hussein's invasion of Kuwait in 1990. The authors find a positive effect of immigration on economic institutions. The Nowrasteh et al. study strengthens earlier findings and allows for causal claims, but it also is epiphenomenal: the destination country had weak institutions prior to mass migration, and the primarily Palestinian migrants shared similar cultural backgrounds with the people in the destination country.³

³ In addition to the studies listed here, Forrester et al. (2019) examine the relation between immigration and terrorism, finding no relation as measured by the number of attacks or victims in destination countries.

The uniqueness of the natural experiments summarized above does not disqualify them from contributing to the broader understanding of the relation between immigration and institutions; instead, they highlight the need for a mosaic of studies surrounding that relationship.

Similar to the foundation laid by Clark et al. (2015) in the international immigration literature, Padilla and Cachanosky (2018) lay the initial foundation for the study of the relations between immigration and state institutions. The authors find no economically significant association between immigration and institutions among US states. Supporting the same conclusion, Tuszynski and Stansel (2020) find no significant relation between immigration and the quality of US state-level economic institutions, regardless of the economic conditions in an immigrant's home country.

Our study adds to the state institutions literature by exploiting an exogenous change in US immigration policy, namely, the Immigration Reform and Control Act (IRCA) of 1986. Although IRCA represents an internal legal change, it was adopted at the federal level; thus, we utilize IRCA as a state-level exogenous shock to ask whether mass legalization affects state-level institutional quality, measured by economic freedom (Stansel, Torra and McMahon 2018).

IRCA approximates a situation complementary to that described by Borjas (2015). That is, roughly three million immigrants from primarily low-productivity countries are legalized in a high-productivity country with a cultural heritage different from those of migrants' native countries. For example, 90% of the immigrants legalized by IRCA were from Latin American countries with lower productivity levels and lower quality institutions than those of the United States.

The individuals legalized by IRCA were not immediately eligible for naturalization (which includes the right to vote). Therefore, the mechanism by which IRCA's immigrants could influence

state-level economic freedom in the short run likely was indirect, such as increasing competition in the labor market, changing the consumption of public goods and benefits, and influencing the attitudes of natives. Over time, as IRCA recipients gain the right to vote, they may affect state-level economic freedom directly by participating in the political process.

If Borjas is correct that immigrants import economically harmful cultural values, then we expect economic institutions to deteriorate as the legalization of previously undocumented immigrants allows participation in the political process, increases the consumption of public goods, and influences the attitudes and behaviors of natives. In the specific case of IRCA, institutional deterioration is less likely to be driven by cultural transmission because IRCA did not change the number or composition of immigrants to the United States. IRCA, however, did change the ability of immigrants to vote (eventually), consume public goods, and compete with natives in the labor force. Therefore, it is possible that, through those mechanisms or other similar mechanisms, IRCA leads to the deterioration of economic institutions in the long run.

Alternatively, IRCA may have a positive effect on economic institutions. Amnesty may expand opportunities for immigrants to compete in formal labor markets, to acquire private health insurance, to create jobs as entrepreneurs, to patent inventions, or to pursue countless other economic opportunities. If so, economic institutions may improve in quality as immigrants and natives become more prosperous and less reliant on the welfare state's benefits.

It also is probable that some combination of the just-mentioned possibilities will materialize. Thus, IRCA might not affect economic institutions because the positive effects of amnesty offset the negative effects of legalization, on average. From a theoretical perspective, therefore, it is difficult to predict *ex ante* the total effect IRCA will have on the quality of economic

institutions. As a result, we rely on estimations using synthetic control methodology to shed light on what is an empirical question.

In order to examine the effects of immigrant legalization under IRCA on US state-level economic freedom, we focus on the states to which the largest proportions of people legalized by IRCA migrated: California, Texas, New York, Illinois, Florida and Arizona. We pay special attention to California, which was home to roughly half of the immigrants granted legal status by IRCA and experienced the largest change in its legal population (5%).

Using synthetic control methods, we find no evidence of a long-term effect of the legalization of immigrants on economic freedom. We do note a short-run drop in economic freedom in California, driven mainly by an increase in government expenditures.⁴ In the long-run, however, we find that California's institutional quality converges with the control group within about eight years.⁵ Overall, our results suggest that legalizing low-skilled, undocumented immigrants from culturally diverse countries can cause temporary increases in state-level government expenditures. Such increases, however, simply may be a result of more immigrants being eligible for public benefits, and not caused by a direct change in policy. In the long run, we find no evidence suggesting that legalization of immigrants affects institutional quality across US states.

Like the previous natural experiments in the literature, the one at hand also reports results requiring caveats regarding external validity. Our natural experiment does not represent an exogenous shock to immigration, *per se*, but an exogenous shock to the legalized population of a

⁴ In a working paper, Padilla and Cachanosky (2020) also note a negative short-run relation between the quality of the institutions in immigrants' home countries and destination countries that dissipates in the long run.

⁵ Based on p-values presented in Table 5 and Table 7.

state. Therefore, our results address amnesty most directly, a hotly debated aspect of immigration policy typified by the controversy surrounding Deferred Action for Childhood Arrivals (DACA).

As such, the present paper most closely resembles that of Padilla and Cachanosky (2018). While the authors find no relation between the number of naturalized US citizens and the quality of economic institutions, they caution that “correlation is not causation” and “endogeneity problems are unavoidable” (p. 25). By utilizing IRCA as a natural experiment, we can minimize endogeneity concerns that plague prior results.

Collectively, our results are consistent with previous findings in the literature that immigration does not lower the quality of economic institutions. We find little evidence that IRCA’s legalization of three million undocumented migrants has a long-run negative effect on economic institutions. Thus, our results assuage concerns that granting legal status to immigrants leads to the transmission of low-quality economic institutions from low to high productivity countries, supporting economic arguments in favor of relaxing restrictions on the foreign-born population in the United States.

2. The Immigration Reform and Control Act of 1986 (IRCA)

In 1986, owing to an increasingly large unauthorized population within the United States, Congress passed the Immigration Reform and Control Act (ICRA). The law reduced the stock of undocumented immigrants by granting amnesty to people meeting certain criteria and aimed to reduce the flow of undocumented immigrants by enhancing enforcement measures.

IRCA was not the first amnesty law passed by the United States Congress. The Immigration Act of 1924 similarly legalized previously undocumented immigrants while also increasing penalties for illegal immigrants. Additionally, the Bracero Program, initiated in 1942, granted legal status to 55,000 undocumented Mexican immigrants working in agriculture (Calavita 2010). In

both 1958 and 1965, the dates determining eligibility for the Immigration Act of 1924 were changed, ultimately granting amnesty to immigrants entering before June 30, 1948. From 1959 to 1981, 44,106 undocumented immigrants were granted legal status, the vast majority of which were legalized prior to 1975 (Briggs 1984). By 1981, the number of legalizations dwindled to only 241 persons.⁶ By the time IRCA was implemented virtually no undocumented immigrants were being granted amnesty under other immigration laws.

Legalization under IRCA generally was available to workers who could provide evidence of continuous US residence before January 1, 1982. Less restrictive requirements were placed on seasonal agricultural workers meeting certain requirements. Black markets for fraudulent documentation emerged allowing unqualified undocumented immigrants to apply for and receive amnesty. Individuals with criminal records were excluded from IRCA's amnesty opportunity.

IRCA also increased the funding available for infrastructure at the border deterring illegal entry to the United States. Additionally, IRCA required employers to verify the legal status of workers and established penalties for noncompliance. However, unauthorized immigration resumed its upward trend soon after the passage of IRCA, indicating that IRCA did not change the long-run trend in the flow of migrants (Orrenius and Zavodny 2003).

Labor market opportunities improved for individuals who were legalized.⁷ Some states made public benefit programs available to immigrants legalized by IRCA and federal programs, such as food stamps ("SNAP") and Medicaid, were available to immigrants five years after legalization.⁸ Undocumented immigrants who did not qualify for amnesty under IRCA, however,

⁶ For further discussion of amnesty prior to IRCA, see Nowrasteh (2014) at <https://www.cato.org/blog/legalization-or-amnesty-unlawful-immigrants-american-tradition>.

⁷ See Kossoudji and Cobb-Clark (2002), Rivera-Batiz(1999), Lozano and Sorensen (2011), Pan (2012), and Amuedo-Dorantes et al. (2007).

⁸ Hu (1998) finds that immigrant age at arrival is a significant determinant of welfare participation.

experienced worsened labor market outcomes, including lower wages, worse working conditions, and longer unemployment spells.⁹ Scholars find that legalization is associated with lower crime rates; however, being ineligible for amnesty under IRCA is associated with higher crime rates owing to fewer labor market opportunities (Freedman et al. 2018; Baker 2015).

IRCA also introduced requirements to verify the immigration status of all alien applicants for public benefit programs, including Medicaid, food stamps, housing assistance, aid to families with dependent children (AFDC), educational grants, and unemployment compensation. The Immigration and Naturalization Service (now the Department of Homeland Security) verified eligibility for public benefits; the federal government also reimbursed states for the full costs of verification.

According to the *Statistical Yearbook* of the Immigration and Naturalization Service, IRCA legalized 2.7 million previously undocumented immigrants, the majority of whom were Latino (89%) and 43% were seasonal agricultural workers. Roughly 87.5% of the migrants legalized by IRCA resided in six states: California, Texas, New York, Illinois, Florida and Arizona (Pew Charitable Trusts 2014). The 44 other states individually were home to less than 1% of the people legalized under IRCA. The application process ended in 1988, and the majority of those legalized were granted legal status in the four years following the closing of the amnesty application window.

[Insert Table 1 Here]

Table 1 displays the number of immigrants legalized, the percentages of migrants legalized, and the 1990 population percentages legalized by IRCA in each of the six aforementioned states. California was home to the majority of those legalized by IRCA, accounting for 54% of the total,

⁹ See Donato et al. (1992), Donato and Massey (1993), Sorensen and Bean (1994), Bansak and Raphael (2001), and Bach and Brill (1991).

or roughly 5% of the state's legal population. By 1996, approximately the first year of eligibility, 20% of migrants had been naturalized. By 2001, 33% were naturalized; 41% were naturalized by 2009.

Because naturalization is required before one can vote, voting is a long-run mechanism by which IRCA potentially affects economic freedom. In the short run, IRCA's beneficiaries affect institutions of their destination states in less direct ways. For example, IRCA required training in the English language, which must be provided by states through community colleges or other educational institutions. That requirement put upward pressure on public education expenditures, creating a fiscal burden for natives, especially in the short run. However, if learning English allows for easier assimilation, the language requirement may lead to a long-run reduction in the fiscal burden.

IRCA also strengthened necessary verifications for employment and provision of public benefits, which imposed additional costs on states to implement and enforce. Those requirements also could put upward pressure on government expenditures. Moreover, tougher employment rules increased crime rates among those who were ineligible for legal status and, thus, may raise law enforcement costs for states (Freedman et al. 2018). IRCA recipients also were eligible for public benefit programs, which could increase state government expenditures.

Since increases in the size of government lead to reductions in economic freedom scores, ICRA's upward pressures on government spending could compromise economic freedoms in states with large numbers of newly legal immigrants. In addition, converting previously undocumented workers into legal immigrants could lead to increases in tax collections as percentages of income. If so, such increases in taxes (area 2 of economic freedom) may lower economic freedom.

Lastly, the effects of IRCA had on the attitudes and decisions of natives is a less direct mechanism that may affect economic institutions in destination states. Natives may respond negatively to federal legal changes affecting current residents by voting for policy changes that influence economic freedom at the state level. Natives also may be more likely to join labor unions or advocate for wage restrictions to protect themselves from strengthened labor market competition.

3. Empirical methodology

Our goal is to estimate the difference between observed economic freedom in states most affected by IRCA after 1986 versus what economic freedom would have been without ICRA's legalization of immigrants. To measure institutional quality, we rely on the Economic Freedom of North America (EFNA) index by Stansel, Torra and McMahon (2018).¹⁰ Higher quality institutions are those associated with more economic freedom, broadly defined as the protection of private property rights and voluntary exchange. For example, states with higher quality institutions redistribute less income from one person to another, tax smaller percentages of individuals' incomes, and protect voluntary labor agreements from wage restrictions and requirements to join unions. The index was first published in 2002, with data starting in 1981. The economic freedom index ranks each US state on a scale from 0 to 10, where 10 represents higher institutional quality. The overall score is an equally weighted average of three subcomponents measuring government spending, taxes, and labor market freedom.

In order to understand the institutional effect from IRCA, we rely on a synthetic control method (SCM), which is an empirical technique that weights multiple states to provide a better control group than any single one of them (Abadie and Gardeazabal 2003; Abadie et al. 2010;

¹⁰ Stansel and Tuszynski (2018) summarize studies using the EFNA index, totaling 235 published papers and book chapters.

Abadie et al. 2015). SCM, developed in Abadie and Gardeazabal (2003), can be applied to measure the effects of an exogenous shock, like a public program, on an economic outcome. For example, SCM has been used to study the unification of East and West Germany on West Germany's economic growth (Abadie et al. 2015); the effects of Proposition 99, California's tobacco control program, on cigarette sales (Abadie et al. 2010); how changes in policy affect terrorism in Spain (Abadie and Gardeazabal 2003); the economic effects of left-populist political leaders in Latin America (Absher, Grier and Grier 2020), and to study how Venezuela's leader, Hugo Chavez, affected that country's economic outcomes (Grier and Maynard 2016).

More related to our study, Peri and Yasenov (2019) apply SCM to show that an immigration shock (the Mariel Boatlift) did not lead to significant labor market effects, including reduced wages. SCM also is utilized by Powell et al. (2017) and Nowrasteh et al. (2020) to understand whether mass immigration into a country lowers that country's economic freedom. Neither study finds any evidence suggesting that mass immigration harms institutional quality.

SCM estimation requires panel data that includes treated and untreated cross-sectional components and time periods before and after the treatment. We build our panel dataset for all 50 states starting in 1981, the first year that economic freedom data are available, through 1997. In order to minimize potential confounding effects, we end the sample in 1997 because a new immigration law, the Illegal Immigration Reform and Immigrant Responsibility Act, took effect then. Our event of interest, IRCA, passed in 1986. Thus, we have six pre-treatment years (1981-1986) and 11 post-treatment years.

SCM creates a counterfactual by weighting pre-IRCA economic freedom scores and other predictive variables in various states, thus allowing us to create a synthetic IRCA state. The

synthetic tracks economic freedom after 1986 as if IRCA never happened,¹¹ allowing us to compare economic freedom scores in states most affected by immigrant legalization under IRCA to a synthetic state in which legalization of immigrants was minimal. The difference between the synthetic and real state are attributed to IRCA reforms after the intervention date.

To estimate that effect, we take two approaches. First, we aggregate the six states that legalized 87% of immigrants under IRCA into a single treated state weighted by the proportion of immigrants legalized under IRCA, or the intensity of treatment. Such an approach has the advantage of taking into account the varying intensity of treatment among the members of the treated group. Second, we apply the generalized synthetic control method for multiple treated units following Xu (2017). That approach does not account for the varying intensity of treatment; instead, it assigns treatment as a dichotomous variable.

For the first approach, we aggregate the IRCA states into four state groupings. First, we include the six states in which ICRA legalized more than 87% of immigrants as the treated states: California, Texas, New York, Illinois, Florida and Arizona. Our second group includes only the top two states, California and Texas, which legalized 53.6% and 15.3% of migrants, respectively. The third group includes the remaining four of the top six as the treated states: New York, Illinois, Florida and Arizona. Lastly, we examine California alone as the treatment group, the state legalizing just over 53% of IRCA immigrants. For the second approach following Xu (2017), California, Texas, New York, Illinois, Florida and Arizona serve as separate IRCA-treated states.

¹¹ Technically, the synthetic tracks economic freedom as if IRCA legalized very few individuals, rather than none at all. The synthetic closely approximates a situation in which IRCA never occurred because the states included in the synthetic control group experienced very small changes in their legalized populations.

The remaining 44 states combined received about 12% of the national legalized population under IRCA, none of which received more than 1% of the total. Those 44 states are included in the donor pool for both approaches.

To create the synthetic control, we generate counterparts to the IRCA-treated units. SCM generates and assigns weights to units in its donor pool. Instead of averaging the values of predictor variables in the control group, the SCM method assigns varying weights to the donor pool's units. As such, SCM places more weight on explanatory variables that influence the outcome variable more significantly (Abadie et al. 2010; Abadie et al. 2015). That creates a control group by manufacturing changes in a group of states similar to the IRCA state(s) under investigation. The synthetic state represents the outcome the state would have experienced; in other words, it creates a counterfactual.

The generalized synthetic control method (Xu 2017) allows for multiple treated units and variable treatment periods. Thus, we can include all six IRCA states as separate treated units to create counterfactuals for each from the donor pool based on a linear interactive fixed effects model that incorporates unit-specific intercepts interacted with time-varying coefficients.

4. Results

4.1 Synthetic control of aggregated IRCA states

We begin by applying SCM with our four aggregated IRCA states: (1) top six IRCA states: California, Texas, New York, Illinois, Florida and Arizona; (2) top two IRCA states: California and Texas, (3) the remaining four IRCA states: New York, Illinois, Florida and Arizona, and (4) California alone. We do not examine Texas independently owing to the inability to create a goodness of fit with a synthetic Texas (see Appendices 1 and 2).¹²

¹² Possibly explained by disproportionality between the education predictor variable and outcomes owing to economic growth.

For the first three aggregate IRCA states mentioned in the previous paragraph, we group the primary states into one IRCA state and then compare it to the control group. For example, we combine the top six IRCA states by weighting according to the proportions of immigrants legalized by IRCA: California (53.6%), Texas (15.3%), New York (5.3%), Illinois (5.4%), Florida (5.3%) Arizona (2.4%). We weight the variables using the share of legalized immigrants over the sum of the shares legalized in the six states (87%) by IRCA. Each variable representing the top six IRCA states is determined by summing 61.4% for California, 17.5% for Texas, 6.1% for New York, 6.2% for Illinois, 6.1% for Florida, and 2.7% for Arizona. The same process is repeated for the other two aggregates combining IRCA states into one state. For each aggregated IRCA state, summary statistics and data sources are provided in Table 2.

[Insert Table 2 Here]

For the donor pool, we pull from the other 44 states with few or no immigrants legalized by IRCA. To avoid the noise of a large number of predictor variables (McClelland and Gault 2017), we synthesize IRCA state(s) with five predictor variables: log GDP per capita in 1997 dollars from the Bureau of Economic Analysis (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalizations in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985. For robustness, we replace naturalization shares with urban population shares, also collected from IPUMS. We then restrict the donor pool to states most similar to each IRCA state(s) as selected by the synthetic control methodology to avoid interpolation biases from statistical overfitting that can occur from entering idiosyncratic variations from a large number of unrelated states (Abadie et al. 2015).

Table 3 lists the states in each synthetic control group, shares of legalized immigrants, and the assigned weights from the states entering the donor pool. As shown, legalized immigrant shares

range between 0.02% (West Virginia) and 0.52% (New Jersey) for the donor states. For the top IRCA states, our control group is comprised of 66% New Jersey, 22% Wyoming, and 12% Hawaii. A control group of those states, selected and weighted from a pool of 44 states using the synthetic control method, prevents overfitting because they have similar economic institutions, income levels, educational attainments, and naturalization rates.¹³

[Insert Tables 3 and 4]

Table 4 provides pre-IRCA values of the indicator variables and economic freedom scores for synthetic and real IRCA states listed by each aggregate. The average difference in economic freedom in 1981 between the real state and synthetic control across all four groups is 0.04. The values of the other variables match closely as well, with one exception. The share of naturalized citizens does not match as closely as the other predictor variables. However, we can generate goodness of fits between the synthetic and real values according to our predictor variables across all four samples, as indicated by the root mean squared predictive error (RMSPE) listed at the bottom of the table. For each IRCA state, according to the RMSPE values, the bias (deviation of synthetic unit from the treated) with respect to the predictors is 6% or less. Although no RMSPE rule of thumb exists, the smaller is the value the better the predictors are at explaining our outcome variable.

In the final column of the table, we report the donor pool average. Comparing these values to the real values of our IRCA subsamples suggests that they are not as well matched as the

¹³ New Jersey weighs heavily in the synthetic control estimations for the top six IRCA states, California plus Texas, and the four IRCA states because of similar pre-treatment values for economic freedom and log GDP per capita. For example, New Jersey's economic freedom score in 1981 is 4.53 and the top IRCA states' economic freedom score is 4.77. Economic freedom in 1981 is 4.75 for California plus Texas and 4.82 for the four IRCA states. Income per capita (logged) for the top IRCA states (4.40), California plus Texas (4.40), and the four IRCA states (4.35) also is similar to New Jersey's (4.36) in 1981. That evidence is suggestive that New Jersey is a major donor state because of similar pre-treatment values.

synthetic values. Thus, our synthetic state mimics pre-1986 IRCA states better than simply averaging similar types of controls.

To see how the exogenous shock from immigrant legalization under IRCA affects state-level economic freedom, Figures 1 a-d illustrate the real versus the synthetic control for our four aggregated IRCA states: top IRCA states, California plus Texas, four IRCA states and California by itself. Table 5 reports the numerical estimates. A negative sign on the point estimates indicates that the synthetic state's economic freedom is higher than the real state. The p-value denotes the portion of control units for which the estimated effect is at least as large as that of the treated unit.

[Insert Figure 1 and Table 5 Here]

When we enter California in the IRCA state sample, we see in Figures 1a, 1b and 1d a recurring trend. The synthetic state's economic freedom rises above the actual state's economic freedom after the passage of IRCA in 1986, suggesting that the legalization of immigrants reduced economic freedom. For California plus Texas (Figure 1b), the synthetic state is significantly higher only at the 10% level in 1989 and 1990 based on the p-values reported in Table 5. For the top six IRCA states (Figure 1a), the same pattern is visually evident, although it never is statistically significant. The point estimates for the four IRCA states (Figure 1c) generally are positive, although none are statistically significant.

Focusing on California in Figure 1d, divergence between the real California and synthetic California in economic freedom is evident in 1986. Visually, the divergence grows for about five years before the converge by 1995, with the real California starting to outperform the synthetic one. The p-values in Table 5, however, indicate that the differences are statistically significant (at 10% level) only in 1986 and 1989-1991.¹⁴ By 1992, no statistical difference is evident between

¹⁴ The p-values capture the proportions of gaps from the in-place placebo tests that are larger than the gap between real and synthetic California. See Figure 2 for the graphical representation of the in-place placebo tests.

the two states, providing evidence that the negative effect from IRCA on California’s economic freedom is short-lived and not as significant as appears in the figure.

Collectively, our results indicate that any influence from IRCA on a state’s economic freedom appears to be a short-run effect, suggesting that no long-run deterioration in economic institutions is caused by immigrant legalization.¹⁵

[Insert Figure 2 Here]

Figure 2 shows in-place placebo tests for each of the four aggregated IRCA states. The gray lines depict the differences between each donor-pool state’s actual economic freedom over time and its respective synthetic economic freedom. The orange lines in each panel of the figure show the difference between the aggregated IRCA state’s actual economic freedom over time and its respective synthetic economic freedom. Comparing the orange line in each panel of the figure to the gray lines prior to 1986 shows the goodness of fit of the synthetic aggregated IRCA state relative to the synthetics for the other states.

The pre-1986 RMSPEs for the top six IRCA states, California plus Texas, four IRCA states, and California alone are 0.06, 0.06, 0.02 and 0.02, respectively, as reported in Table 4. In the pre-1986 period, 64% of the donors have an RMSPE at least as large as the RMSPE for the top six IRCA states. For the other three aggregate IRCA states, the percentages are 58% (California plus Texas), 89% (four IRCA states), and 96% (California). Those findings provide strong support

¹⁵ Because some debate exists in the literature regarding controlling for both predictors and outcomes lags in synthetic control models, we also estimate the effects of IRCA in SCMs matched both on no outcome lags and with outcome lags only. No statistically significant differences are found from either of those approaches. The results are reported in Appendix 3. In addition, we enter urbanization shares in place of naturalized population shares in our models. The results are almost identical, with all four figures following similar paths. We also enter an alternate top-six IRCA state sample based on the national share of a state’s population (California, Texas, Illinois, Arizona, New Mexico and Nevada). Again, the results are similar, providing support for concluding that the findings are not sensitive to the construction of the IRCA sample. We do not report the additional findings, but they are available upon request.

for the goodness of fit of the synthetic controls for the four IRCA states and California; however, the goodness of fit is weaker for the top IRCA states and California plus Texas.

Comparing the orange line in each panel of the figure to the gray lines after 1986 shows the effects of IRCA on each aggregated IRCA state (orange line) relative to the donors (gray lines). The figures serve to visualize the p-values reported in Table 5. Deviations from zero in the orange line can be compared to the gray lines to determine the likelihood that those deviations are the result of random chance. The figure shows that the gray lines, representing donor states untreated by IRCA, deviate further from zero than the orange line in many instances.

One metric for evaluating the effect of IRCA on the aggregated IRCA state is to consider the distribution of ratios of post versus pre-IRCA RMSPE. The ratio of the two RMSPE values is 5.44 for the top IRCA states, 6.42 for California plus Texas, 6.78 for the four IRCA states, and 21.25 for California. We compare each ratio to the ratios of the donor states for each aggregate state. Fourteen donor states have post versus pre-IRCA RMSPE ratios at least as large as the top IRCA states, California plus Texas, and the four IRCA states. One donor state has a ratio at least as large as California. Thus, if one were to assign the treatment randomly, the probabilities of obtaining a post versus pre-IRCA RMSPE ratio as large as the four aggregated IRCA states are 33%, 33%, 33% and 4%, respectively. That finding is consistent with the p-values in Table 5 showing that IRCA's effect on economic freedom mostly is statistically insignificant.

[Insert Figures 3 and 4 Here]

Figure 3 provides support for the conclusion that our synthetic states track more accurately the evolution of the real IRCA states prior to the 1986 treatment period than afterwards. The figure documents the trend in economic freedom scores over the sample for synthetic and real top IRCA states, synthetic and real California, and the donor pool. As shown, synthetic top IRCA state and

synthetic California more closely map economic freedom scores prior to IRCA in real top IRCA state and real California. In addition, the same figure indicates a general overall trend in economic freedom across all five sub-groups, including our donor pool.

Figure 4 shows the results for each of the four aggregated IRCA states of synthetic controls when we omit one donor state at a time. Doing so produces new synthetic IRCA states for each aggregate state, allowing us to determine if the result is sensitive to a specific combination of donor states. For each of the four aggregated IRCA states, the differences between the synthetic state and the actual treated state after 1986 remain roughly constant or shrink in the tests with alternative donor pools, supplying confidence that our result is not sensitive to the omission of a single donor state.

4.2 Generalized synthetic control of a unified IRCA-treated state

For robustness, we adopt a generalized synthetic control method combining multiple treated units following Xu (2017).¹⁶ In that approach, California, Texas, New York, Illinois, Florida and Arizona remain separate treated units. Whereas the first approach aggregates IRCA-treated states before estimating the effect of IRCA, the second approach estimates the effect of IRCA on each of the six IRCA-treated states separately before aggregating the effect.

[Insert Figure 5 and Table 6 Here]

We estimate the effects of IRCA using the interactive fixed effects model including our standard control variables.¹⁷ The estimates displayed in Figure 5 along with the shaded confidence intervals tell a story similar to the estimates produced using the first approach. No evidence is

¹⁶ We also estimate an alternative synthetic control method for multiple treated units following Cavallo et al. (2013) and Absher, Grier and Grier (2020). The results are consistent with our initial SCM findings as well as Xu (2017). Because of the similarities, we do not tabulate these results to save space, but they are available upon request.

¹⁷ We generate results of the interactive fixed effects estimation (Xu 2017) without any control variables. The model passes the equivalence test, Wald test, and the placebo test associated with goodness-of-fit. The results support our findings including control variables; thus, we do not tabulate them, but they are available upon request.

found of a statistically significant effect of IRCA on economic freedom. Table 6 displays the point estimates from the interactive fixed effects model and the corresponding p-values.

Figure 5 also displays goodness-of-fit tests for the interactive fixed effects model. The Wald p-value displayed in the upper left corner of Figure 5A is 0.47, which denotes a failure to reject the null hypothesis that the pre-treatment residual averages over time jointly are close to zero. The placebo test p-value (0.91) supports the same conclusion. The placebo test p-value is the result of removing pre-treatment years from the range of model fitting and testing whether the estimated average treatment effect on the treated (ATT) in the placebo period is significantly different from zero. Figure 5b displays the results of the equivalence test, which asks whether the 90% confidence intervals of the estimated ATT exceed a pre-specified range. As shown, the interactive fixed effects model passes the equivalence test (the confidence interval never exceeds the bounds).

The short-run statistically insignificant negative effect estimated using the interactive fixed effects model is smaller in magnitude than the estimates derived from the weighted aggregate approach for the top six IRCA states in column one of Table 5. The estimate becomes positive from 1995 to 1997 unlike the estimates from the weighted aggregate approach. The less negative effect relative to the weighted aggregate approach probably is driven by the lower weight assigned to California when each treated unit is entered separately without accounting for intensity of treatment.

4.3 Dynamic event study model

To add robustness to our findings from the synthetic control method, we estimate a dynamic event study model (De Chaisemartin and d'Haultfoeuille 2020; Goodman-Bacon 2018) of the following form for states in year t :

$$Y_{st} = a + \sum_{i=2}^I \beta_i (\text{Lag } i)_{st} + \sum_{j=1}^J r_j (\text{Lead } j)_{st} + X'_{st} + FE_{state} + FE_{year} + \mathcal{E}_{st},$$

where Y_{st} represents economic freedom, rescaled from 0 to 1, X'_{st} includes our standard time-varying controls for log GDP per capita, high school diploma (% native population), and share of population that is naturalized. State and year fixed effects are entered and standard errors are clustered by state. Binary variables for event lags and leads likewise are included. As is standard, the first lag ($i=1$, the year of 1985) is omitted to provide a baseline reference.

The results presented in Appendix 4 support our main SCM findings for the top IRCA states, four IRCA states and California alone. Neither the event lags nor leads are statistically significant. The parallel trends assumption, however, fails for the California plus Texas and California specifications, as indicated by the significant joint F-statistics for lagged terms. Thus, we interpret the dynamic event study results with caution.

Combined, the results suggest that IRCA has no long-run impact on the quality of economic institutions. Furthermore, they suggest that California, the state most affected by IRCA, is driving the short-run result. Given that finding, we investigate California in more detail in the following section. California, legalizing 53% of IRCA immigrants and experiencing the largest shock to a state's legal population (5%), represents the most extreme case of IRCA's immigration reform.

5. Did IRCA reduce economic freedom in California?

5.1 Robustness checks

We estimate several types of specification checks for our SCM estimates with California. To provide additional confidence that immigrant legalization does not reduce institutional quality over time, we need the support of out-of-sample precision in the absence of similar interventions.

First, we pretend that IRCA was passed in 1983 instead of 1986 and repeat the experiment using the same donor states and indicator variables as before. That test allows us to check if the

results documented previously in Figure 1d are explained by an inability to predict California out-of-sample over any time horizon. If changing the intervention date results in a synthetic control that is not close to the actual 1986 intervention date then this robustness test should reduce our confidence that the change observed in 1986 was caused by IRCA.

Figure 6 presents the results with SCM using 1983 as the shock year. Synthetic California and real California are consistent with one another before 1983, and in that year, while the two start to diverge in 1986, the timing of IRCA. The test therefore buttresses the previous finding that the difference between the real California and the synthetic California is caused by IRCA in 1986 instead of other possible reasons. Little difference is evident in our ability to track real California post-intervention using the falsely created 1983 intervention.

[Insert Figure 6 Here]

To help distinguish between indirect versus direct (e.g., voting) effects in California, we adopt 1996 instead of 1986 as the shock year. The average time it took immigrants to become legal citizens is roughly 10 years; therefore, we identify 1996 as the first year of naturalization eligibility to test how immigrants could influence economic freedom by voting. To perform SCM, we extend our data sample from 1981 to 2016, synthesizing over six predictor variables: log GDP per capita, share of native population with high school diplomas in 1980, share of naturalized citizens in 1980, and economic freedom indexes in 1985, in 1990, and in 1995.

We report the results in Appendix 5. As shown, after 1996 synthetic and real California diverge. Synthetic California records higher economic freedom scores throughout the period. However, according to the p-values, real and synthetic California are statistically different only in 2002 (at the 1% level), 2003 (at 10%), and 2013-2015 (at 10%).¹⁸ That evidence suggests no direct,

¹⁸ The p-values correspond to the in-place placebo tests not reported but available upon request.

immediate negative effect from immigrant voting, but possible temporary dips in economic freedom over time. It is difficult to attribute the 2013-2015 reduction to IRCA since those years follow a global financial crisis. Overall, in only five of the 20 post-1996 years is economic freedom in synthetic California is statistically higher than in real California. Thus, we find no evidence that voting rights for legal immigrants persistently reduces institutional quality.

5.2 Components of economic freedom

Next, we examine ICRA's effects on the components of economic freedom. As discussed previously, IRCA may affect economic institutions by altering the consumption of public goods or states' fiscal positions, which should be evident in the Economic Freedom of North America's (EFNA)'s measure of government spending (Area 1), taxation (Area 2), or both. IRCA also may affect economic institutions by creating labor market opportunities or fostering resentment among natives causing them to pursue tighter labor market restrictions, which should be evident in the EFNA's measure of labor market freedom (Area 3). In order to understand how immigrant legalization by IRCA influenced economic institutional quality in California, we create synthetic controls using each of the three sub-areas of economic freedom. Figure 7 presents the results and Table 7 shows the numerical estimates and p-values for IRCA's effect on California's government spending (Figure 7a), taxes (Figure 7b), and labor market freedom (Figure 7c).

[Insert Figure 7 Here and Table 7 Here]

Contrary to the Figure 1d, Figure 7a diverges after legalization but does not experience convergence, suggesting that real California experienced an increase in government spending post-IRCA.¹⁹ As reported in Table 7, synthetic California's government spending is statistically

¹⁹ We estimate the effects of IRCA on government spending for the other aggregated IRCA states. The short-run statistically significant increase in government spending holds for the top IRCA states and California plus Texas but is not present in the four IRCA states. We believe that the differences between the estimates when California is

different from real California in 1986-1991 and 1993. The upward pressure on government expenditures created by IRCA's legal mandates, including legal status verification and access to public benefits, could explain the temporary increase. Similar to California's overall economic freedom, by 1994 no statistical difference exists between real and synthetic California's government spending. Overall, the evidence suggests that government spending may temporarily increase as newly legalized immigrants are eligible for and receive government transfers. As they assimilate into the economy, government spending returns to its pre-shock level.

Real California appears to do better in Area 2, taxes, than synthetic California, as shown in Figure 7b. However, based on the p-values reported in Table 7, no statistical difference emerges between real and synthetic California's taxes over the full sample period, suggesting that legalizing immigration does not increase the state-level tax burden.

Lastly, we examine labor market freedom in Figure 7c. Real California experiences a slight drop in labor market freedom post-1986 than it would have seen without IRCA. Synthetic California's labor market freedom score is statistically higher in 1989-1990. However, no statistical difference from 1991-1997 is evident, suggesting no long-run impact of immigrant legalization on labor market freedom. That result is especially interesting since IRCA primarily legalized low-skilled immigrants, many of whom work in agriculture. It should be labor markets, if anywhere, that Borjas's claim would be most evident because low-skilled natives experience stronger competition from immigrants and thus may benefit from labor market protections. However, we find no evidence to support that claim. In particular, it appears that ICRA did not alter attitudes of natives, causing them to vote for more labor market restrictions as a means of protecting their jobs and wages.

included (top six IRCA states, California plus Texas, and California) and the four IRCA states suggest that California is the main driver of the government spending mechanism.

5.3 How did IRCA increase government spending?

Combined, our results from studying California suggest that legalizing immigrants does not deteriorate institutions in the long run. However, a short run decline is possible, driven mainly by increases in government spending. Given that possibility, we are left asking how exactly did IRCA lead to a change in government spending in California? We now take a closer look at California's state and local government spending to provide a cursory examination of a few potential explanations.

Table 8 shows that California experienced a large increase in real government spending in 1990 around the same time that we observe the starkest difference between synthetic and real California. At the same time, per capita income growth declined in the following years as the US economy entered a recession in 1990.

[Insert Table 8 Here]

Education spending increased by 4 to 5 percentage points in three consecutive years from 1989 to 1991. It is reasonable to attribute at least some of that increase in spending to IRCA requirements for training immigrants in the English language. The demand for English language instruction in California, which was provided in large part by community colleges, outstripped supply (Pew Charitable Trusts 2014, p. 16). Because the increased demand for education was temporary and may have helped newly legalized immigrants assimilate in the long run, that explanation is consistent with a short-run reduction and long-run convergence in California's economic freedom.

Policing and related costs also rose in 1990 (15.1%) and again in 1991 (16.0%). Those increases can be explained partially by IRCA. Freedman et al. (2018) document rising crime rates among those who were ineligible for legal status under IRCA. California also increased healthcare

spending sharply from 1990 to 1992, averaging nearly 20% annual growth. IRCA recipients who were elderly, blind, disabled, or under the age of 18 became eligible for full Medi-Cal benefits effective October 1, 1988.²⁰

Although those data are only anecdotal and suggestive, it does provide insight into how the legalization of undocumented immigrants could affect state government expenditures. Changes in government spending may not be caused by immigrants, per se. Rather, the changes may be the effects of the legal requirements of amnesty (e.g., required training in the English language) or simply represent increases in the number individuals who are eligible for government transfers.

We find no evidence of increases in government spending in synthetic control results for the aggregate IRCA state grouping that includes New York, Illinois, Florida and Arizona. We do, however, find a similar trend when California is included in the aggregate IRCA groupings (top six IRCA states and California plus Texas), suggesting that California is driving the observed trends.²¹ The short-run increases in California's government spending might be driven by the larger proportions of special agricultural workers (SAWs) legalized in California. The number of SAW applicants exceeded estimates for the entire population of agricultural workers (not just undocumented farm workers) and was believed to include high percentages of fraudulent applications (Baker 2015). Therefore, the effect of IRCA on government spending in California might be attributed to the characteristics of the people granted amnesty in that particular state.²²

IRCA's effect on government spending in California appears to dissipate after a few years, but depending on the requirements of immigration reform, legalization can increase the size of government.

²⁰ https://files.medi-cal.ca.gov/pubsdoco/publications/masters-mtp/part1/obra_z01.doc

²¹ These synthetic control results are not tabulated to save space but are available upon request.

²² Clemens and Pritchett (2019) discuss how the transmission of institutions through migration depends on variation in the characteristics embodied in migrants.

6. Conclusion

The new economic case against relaxing immigration restrictions argues that immigrants transmit internationally the economic institutions that lead to low-productivity in their home countries. We exploit the Immigration Reform and Control Act (IRCA) of 1986 as a natural experiment to determine whether the mass legalization of three million previously undocumented illegal immigrants had a detrimental effect on economic institutions in US states.

We find that legalization has no long-run effect on state-level economic institutions, although it may temporarily cause an increase in government spending relative to personal income. Therefore, our findings assuage concerns that granting amnesties to illegal immigrants will reduce productivity in the United States and buttress arguments that relaxed immigration barriers lead to greater global economic efficiency.

The results reported herein have direct implications for the debate surrounding policies introduced by Deferred Action for Childhood Arrivals (DACA) in the United States. DACA protects about 700,000 young people (roughly 25% of the population legalized by IRCA), who entered the United States without documentation as children, from deportation and provides work and study permits. Our results suggest that these “Dreamers” represent no long-run threat to the quality of economic institutions in the states where they reside.

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Table 1: IRCA population legalized by state, 1990

Notes. IRCA data is collected from Statistical Yearbook of the Immigration and Naturalization Service (1989, 1990, 1991, 1992). # IRCA immigrants and % of total legalized represents the total numbers from 1989-1992. We use 1990 population data as a base year to calculate share of population by state. State population data are collected from IPUMS (US Census public-use microdata).

State	# IRCA immigrants	% of total legalized	% 1990 state population
California	1,439,266	53.6%	4.84%
Texas	409,905	15.3%	2.41%
New York	147,458	5.3%	0.82%
Illinois	144,095	5.4%	1.26%
Florida	142,964	5.3%	1.10%
Arizona	65,431	2.4%	1.79%
All other states	337,794	12.7%	0.22%

Table 2: Data and summary statistics

Notes. Economic freedom is overall score and collected from Stansel et al. (2018). BEA is Regional Economic Information System of the Bureau of Economic Analysis; IPUMS is US Census public-use microdata.

Variables	States	Years	Obs.	Mean	Std. Dev.	Min	Max	Source
Economic freedom	CA	17	17	4.46	0.24	4.09	4.74	Stansel et al. (2018)
Economic freedom	CA, TX	17	17	4.94	0.21	4.55	5.16	Stansel et al. (2018)
Economic freedom	NY, IL, FL, AZ	17	17	5.28	0.32	4.80	5.79	Stansel et al. (2018)
Economic freedom	CA, TX, NY, IL, FL, AZ	17	17	5.02	0.22	4.66	5.27	Stansel et al. (2018)
Economic freedom	44 Donor States	17	748	5.35	0.94	2.91	7.51	Stansel et al. (2018)
Log GDP per capita	CA	17	17	4.45	0.03	4.40	4.50	BEA
Log GDP per capita	CA, TX	17	17	4.44	0.03	4.39	4.50	BEA
Log GDP per capita	NY, IL, FL, AZ	17	17	4.42	0.04	4.35	4.49	BEA
Log GDP per capita	CA, TX, NY, IL, FL, AZ	17	17	4.44	0.03	4.39	4.50	BEA
Log GDP per capita	44 Donor States	17	748	4.38	0.10	4.15	4.79	BEA
Native born high school diploma (%)	CA	3	3	0.79	0.05	0.74	0.82	IPUMS
Native born high school diploma (%)	CA, TX	3	3	0.77	0.06	0.71	0.82	IPUMS
Native born high school diploma (%)	NY, IL, FL, AZ	3	3	0.78	0.09	0.67	0.85	IPUMS
Native born high school diploma (%)	CA, TX, NY, IL, FL, AZ	3	3	0.78	0.06	0.70	0.82	IPUMS
Native born high school diploma (%)	44 Donor States	3	132	0.78	0.10	0.53	0.92	IPUMS
Naturalized (%)	CA	3	3	0.10	0.04	0.07	0.14	IPUMS
Naturalized (%)	CA, TX	3	3	0.09	0.03	0.06	0.12	IPUMS
Naturalized (%)	NY, IL, FL, AZ	3	3	0.07	0.01	0.07	0.09	IPUMS
Naturalized (%)	CA, TX, NY, IL, FL, AZ	3	3	0.08	0.03	0.06	0.11	IPUMS
Naturalized (%)	44 Donor States	3	132	0.03	0.02	0.01	0.13	IPUMS

Table 3: Estimated synthetic control weights for economic freedom

Notes. Top IRCA states include California, Texas, New York, Illinois, Florida, and Arizona. CA+TX is California plus Texas. Four IRCA states include New York, Illinois, Florida, and Arizona. CA is California. We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.

	% legalized/1990 state population	Top IRCA States	CA + TX	Four IRCA states	CA
Alaska	0.13	0.00	0.00	0.00	0.03
Hawaii	0.18	0.12	0.17	0.00	0.54
Louisiana	0.07	0.00	0.00	0.08	0.00
Michigan	0.06	0.00	0.00	0.00	0.23
New Jersey	0.52	0.66	0.64	0.667	0.20
West Virginia	0.02	0.00	0.00	0.01	0.00
Wyoming	0.21	0.22	0.20	0.235	0.00
Sum	--	1.00	1.00	1.00	1.00

Table 4: Indicator goodness of fits

Notes. Top IRCA states include California, Texas, New York, Illinois, Florida, and Arizona. CA+TX is California plus Texas. Four IRCA states include New York, Illinois, Florida, and Arizona. CA is California. We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.

	Top IRCA states		CA + TX		Four IRCA states		CA		Donor pool
	Real	Synthetic	Real	Synthetic	Real	Synthetic	Real	Synthetic	Average
Log GDP per capita	4.402	4.403	4.407	4.405	4.364	4.393	4.415	4.412	4.324
High school diploma (1980)	0.751	0.741	0.761	0.743	0.710	0.721	0.791	0.760	0.696
Naturalization in 1980 (%)	0.159	0.056	0.175	0.055	0.100	0.055	0.215	0.036	0.013
Economic Freedom (1981)	4.769	4.707	4.748	4.680	4.824	4.806	4.125	4.113	5.015
Economic Freedom (1985)	5.149	5.208	5.113	5.181	5.255	5.269	4.608	4.603	5.271
RMSPE	0.06		0.06		0.02		0.02		

Table 5: Effects of IRCA on economic freedom

Notes. This table presents estimated treatment effects of IRCA on economic freedom scores in top IRCA states (California, Texas, New York, Illinois, Florida, and Arizona), CA+TX, four IRCA states (New York, Illinois, Florida, and Arizona), and CA with corresponding permutation test p-values.

	<u>Top IRCA States</u>		<u>CA + TX</u>		<u>Four IRCA States</u>		<u>CA</u>	
	Effect	p-values	Effect	p-values	Effect	p-values	Effect	p-values
1986	-0.049	0.773	-0.167	0.205	-0.008	0.977	-0.291	0.091
1987	0.083	0.614	-0.108	0.614	0.200	0.455	-0.332	0.227
1988	-0.187	0.545	-0.356	0.273	0.088	0.795	-0.473	0.136
1989	-0.416	0.182	-0.621	0.091	0.026	0.932	-0.716	0.091
1990	-0.452	0.159	-0.638	0.091	-0.121	0.705	-0.753	0.068
1991	-0.213	0.523	-0.401	0.273	0.008	1.000	-0.654	0.068
1992	-0.014	0.977	-0.188	0.727	0.273	0.591	-0.503	0.182
1993	-0.177	0.750	-0.267	0.568	0.127	0.864	-0.253	0.591
1994	-0.026	0.977	-0.063	0.864	0.288	0.409	-0.033	0.932
1995	-0.021	1.000	-0.031	1.000	0.292	0.545	0.077	0.955
1996	-0.014	0.977	0.014	0.977	0.307	0.523	0.203	0.682
1997	-0.390	0.386	-0.353	0.432	-0.001	1.000	-0.017	0.977

Table 6: Effects of IRCA on economic freedom, generalized synthetic control method

Notes. This table presents estimated treatment effects of IRCA on economic freedom scores in top IRCA states (California, Texas, New York, Illinois, Florida, and Arizona) as separate treated units with corresponding permutation test p-values.

	Top IRCA States	
	Effect	p-values
1986	-0.001	0.649
1987	0.001	0.876
1988	-0.007	0.539
1989	-0.008	0.610
1990	-0.009	0.589
1991	-0.003	0.840
1992	-0.004	0.863
1993	-0.007	0.768
1994	0.006	0.809
1995	0.011	0.674
1996	0.015	0.584
1997	0.015	0.517

Table 7: Effects of IRCA on California's economic freedom

Notes. This table presents estimated treatment effects of IRCA on California's three areas of economic freedom with corresponding permutation test p-values.

	<u>Area 1, Gov. Spending</u>		<u>Area 2, Taxes</u>		<u>Area 3, Labor Markets</u>	
	Effect	p-values	Effect	p-values	Effect	p-values
1986	-0.92	0.07	-0.08	0.61	-0.10	0.52
1987	-1.07	0.09	0.28	0.36	-0.12	0.70
1988	-1.12	0.07	0.00	1.00	-0.64	0.20
1989	-1.28	0.05	0.25	0.57	-1.13	0.00
1990	-1.26	0.07	0.08	0.82	-0.81	0.09
1991	-1.54	0.05	0.21	0.61	-0.40	0.25
1992	-1.36	0.16	-0.15	0.80	-0.15	0.70
1993	-1.35	0.09	-0.27	0.57	0.09	0.86
1994	-0.86	0.27	-0.19	0.80	0.16	0.68
1995	-0.62	0.50	-0.41	0.52	0.16	0.86
1996	-0.47	0.73	-0.46	0.41	0.11	0.77
1997	-0.88	0.27	-0.45	0.41	-0.24	0.84

Table 8: California state and local government spending

Notes. State and local spending data is from https://www.census.gov/library/publications/time-series/statistical_abstracts.html and <https://www.census.gov/programs-surveys/gov-finances.html>.

Year	Annual GDP Growth	Annual Population Growth	Total Spending Growth	Education Spending Growth	Welfare Spending Growth	Protection Spending Growth	Health Care Spending Growth	Pension Spending Growth
1986	3.0%	2.3%	7.1%	5.3%	3.2%	15.3%	5.8%	3.0%
1987	4.2%	2.3%	5.5%	4.7%	0.1%	7.4%	3.8%	3.7%
1988	3.0%	2.3%	1.3%	0.5%	3.2%	8.4%	5.3%	2.5%
1989	1.2%	2.3%	0.1%	4.1%	0.6%	-10.1%	0.2%	2.4%
1990	0.8%	2.3%	7.7%	5.4%	4.5%	15.1%	8.4%	4.1%
1991	-2.5%	1.3%	4.4%	4.1%	13.1%	1.9%	10.1%	1.1%
1992	-1.4%	1.3%	5.8%	-1.7%	6.7%	16.0%	37.9%	30.8%
1993	-1.3%	1.3%	0.1%	-3.2%	2.5%	-1.9%	2.7%	8.0%
1994	0.7%	1.3%	-0.2%	-4.7%	-4.7%	2.0%	4.9%	-6.1%
1995	2.3%	1.3%	1.1%	2.5%	1.4%	2.9%	-1.9%	10.9%

Figure 1: Economic freedom and IRCA states, synthetic control method

Notes. Economic freedom is the overall score from Stansel et al. (2018). Top IRCA states include California, Texas, New York, Illinois, Florida, and Arizona. Four IRCA states include New York, Illinois, Florida, and Arizona. We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.

Figure 1A: Economic freedom and top IRCA states

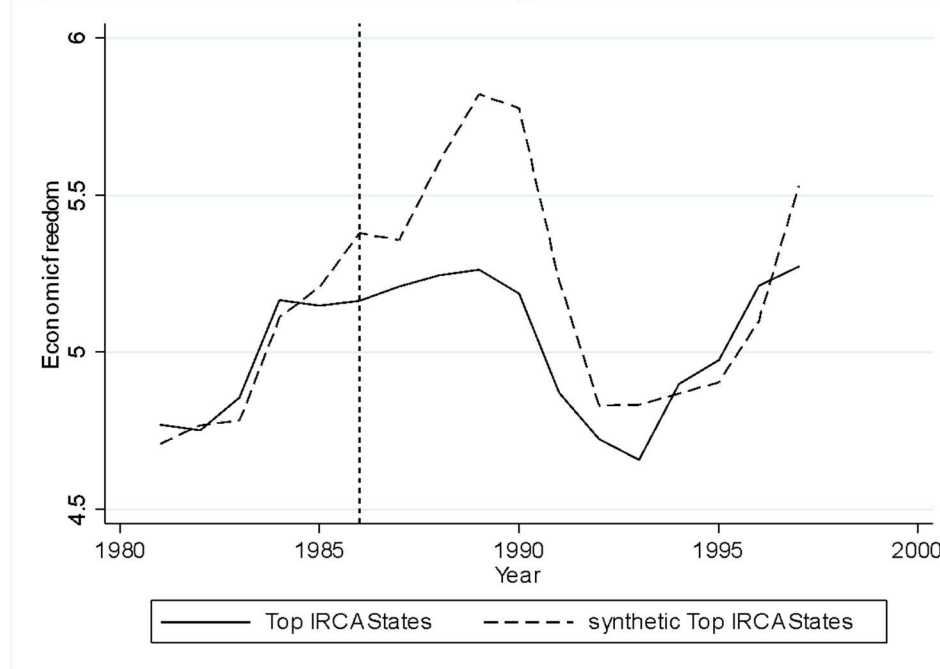


Figure 1B: Economic freedom and California plus Texas

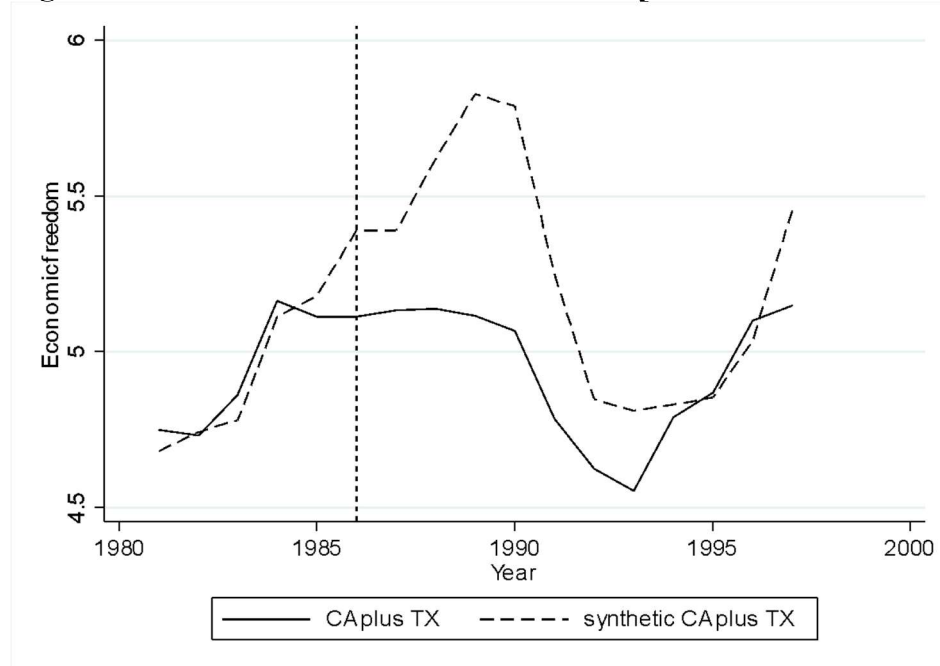


Figure 1C: Economic freedom and four IRCA states

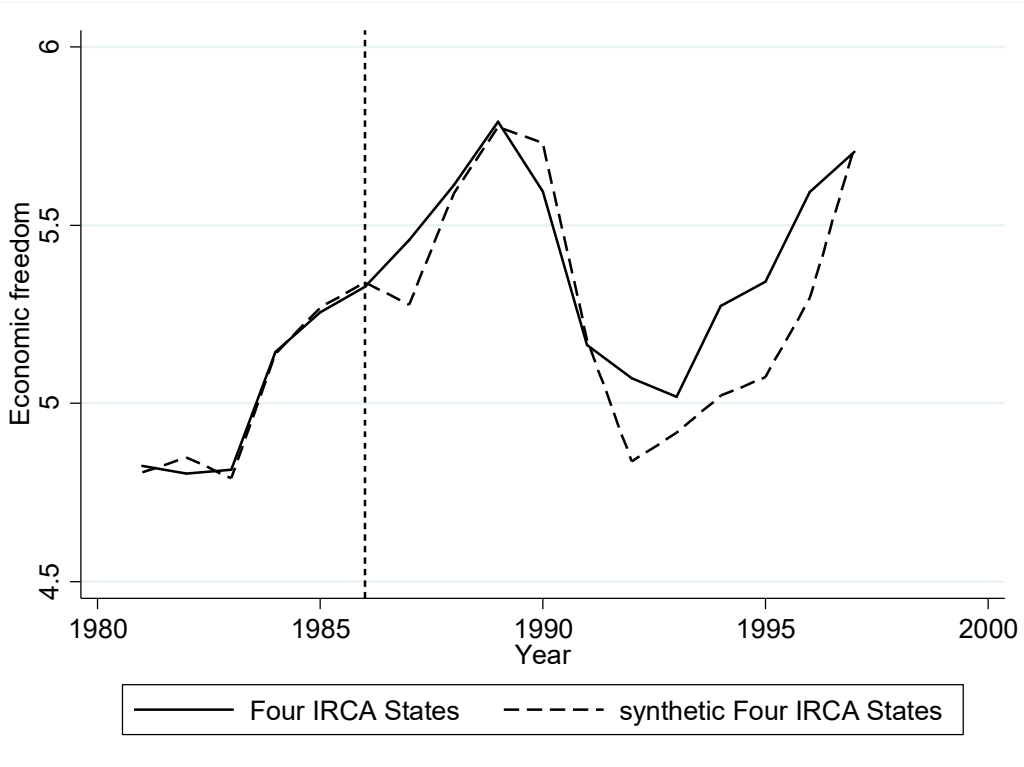


Figure 1D: Economic freedom and California

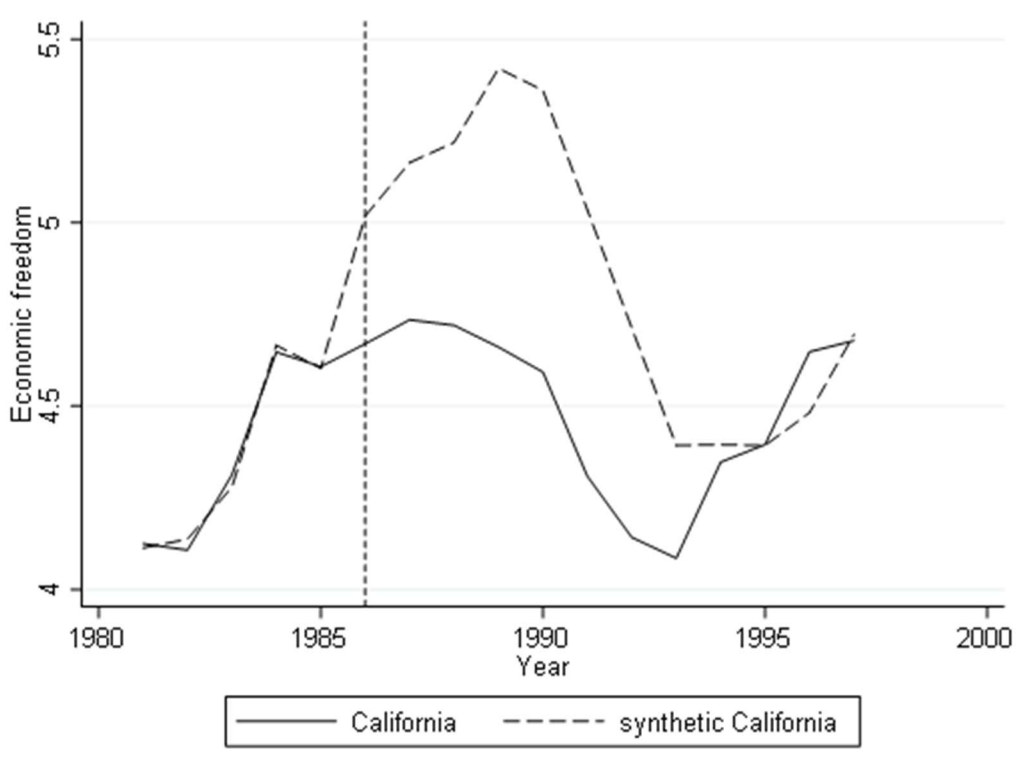


Figure 2: Economic freedom and IRCA states, synthetic control method placebos

Notes. Economic freedom is the overall score from Stansel et al. (2018). Top IRCA states include California, Texas, New York, Illinois, Florida, and Arizona. Four IRCA states include New York, Illinois, Florida, and Arizona. We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.

Figure 2A: In-place placebo test top IRCA states

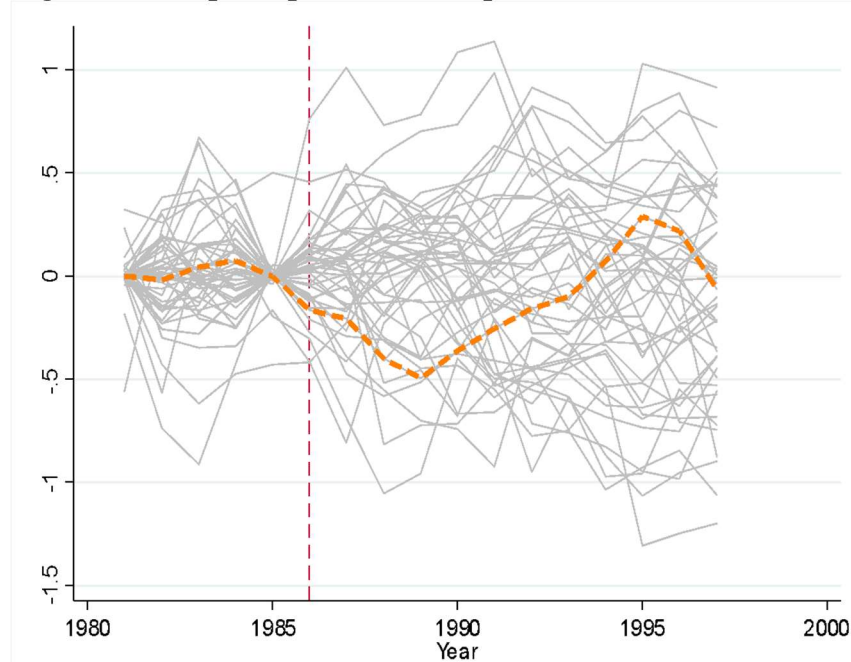


Figure 2B: In-place placebo test California plus Texas

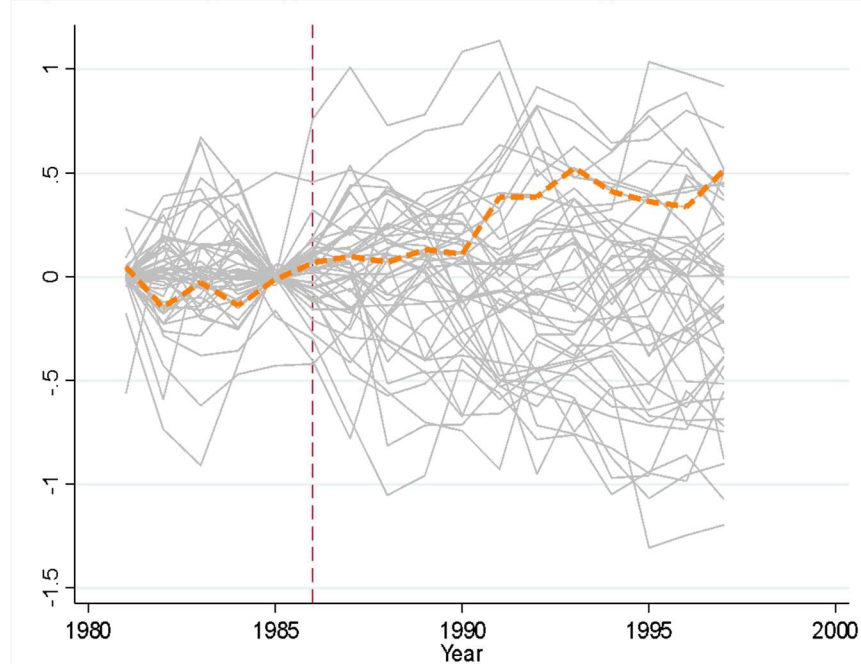


Figure 2C: In-place placebo test four IRCA states

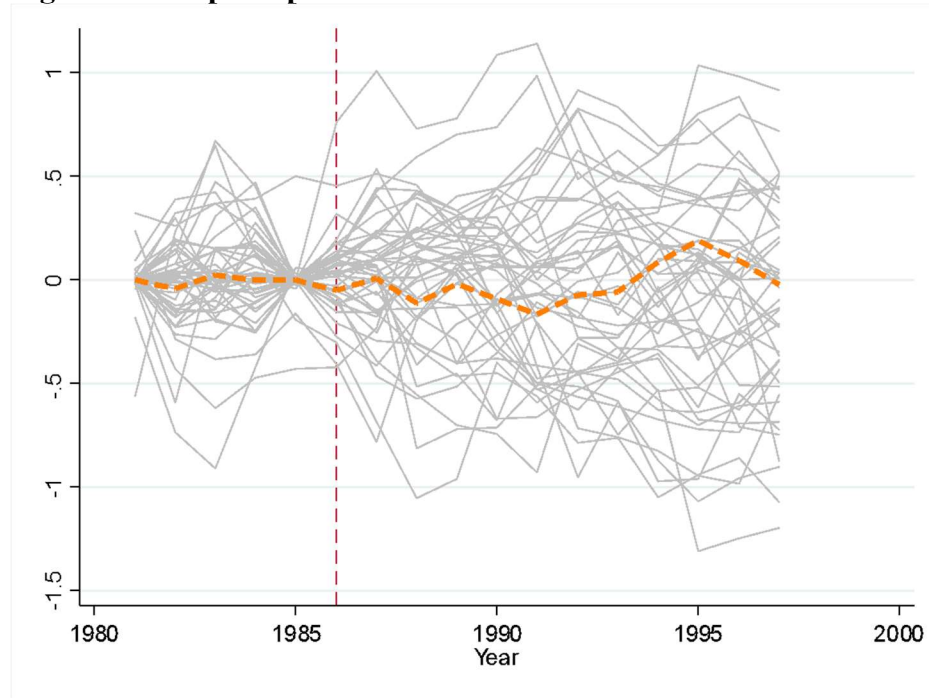


Figure 2D: In-place placebo test California

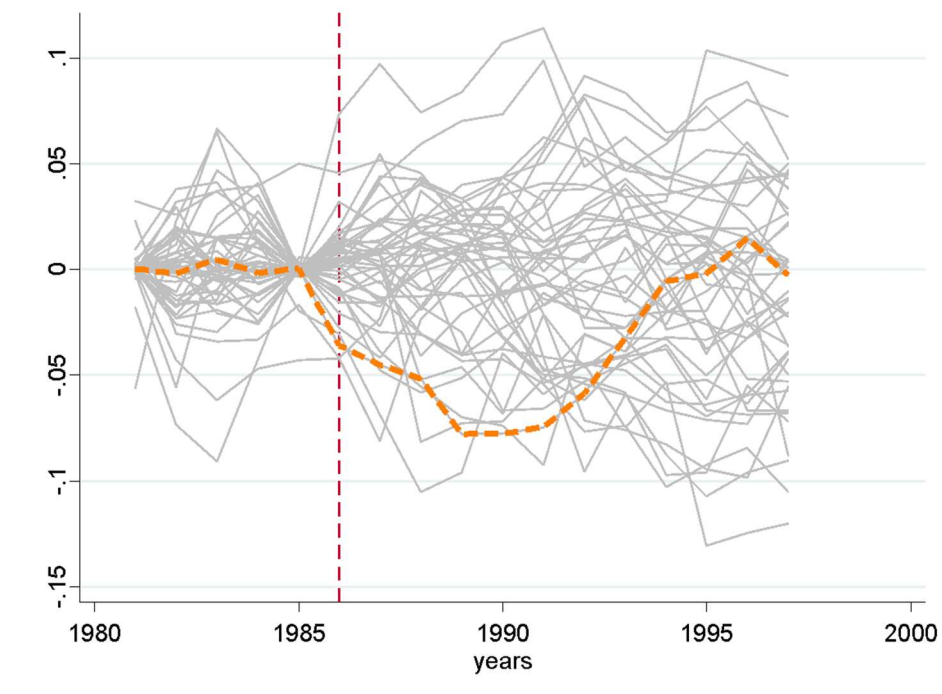


Figure 3: Economic freedom trends by IRCA states and donor pool

Notes. Economic freedom is the overall score from Stansel et al. (2018). Top IRCA states include California, Texas, New York, Illinois, Florida, and Arizona. We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma (IPUMS), share of naturalization (IPUMS), economic freedom in 1981, and economic freedom in 1985.

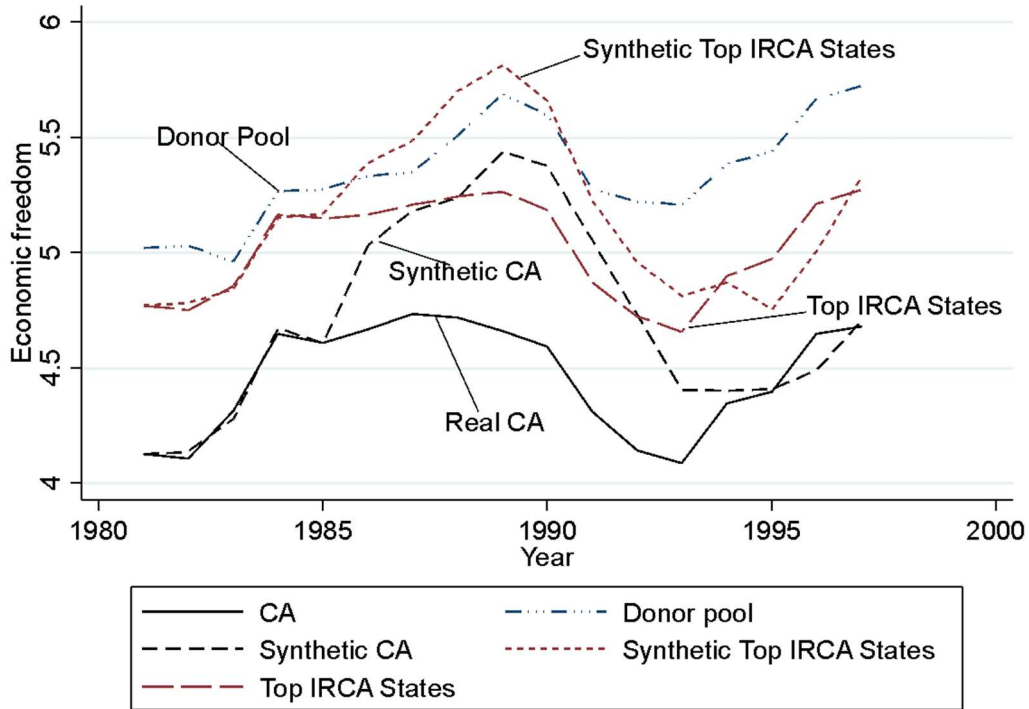


Figure 4: Economic freedom and IRCA, leave one out

Notes. Economic freedom is the overall score from Stansel et al. (2018). We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985. In Figure 4A, the line without Hawaii overlaps with the synthetic top IRCA states line.

Figure 4A: Top six IRCA states, leave one out

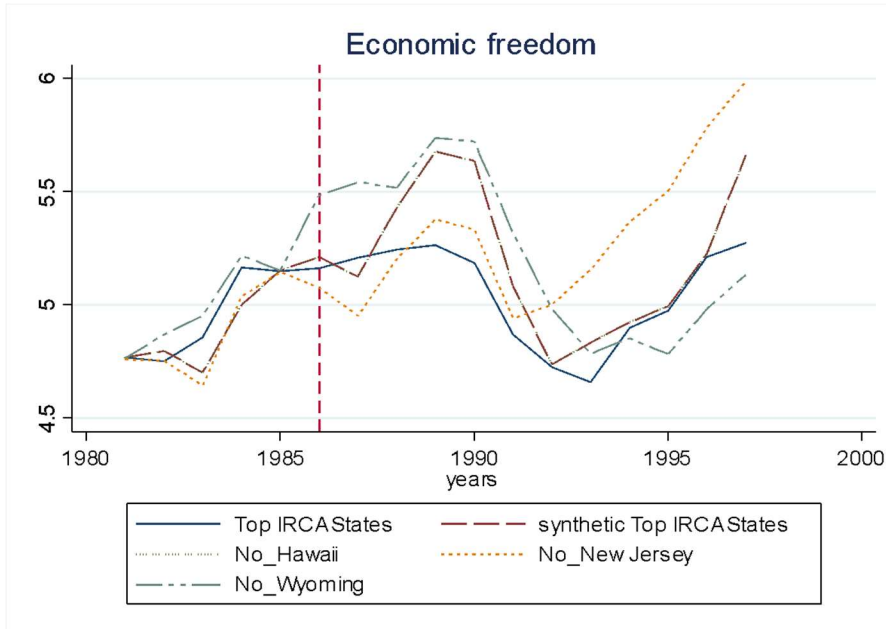


Figure 4B: California Plus Texas, leave one out

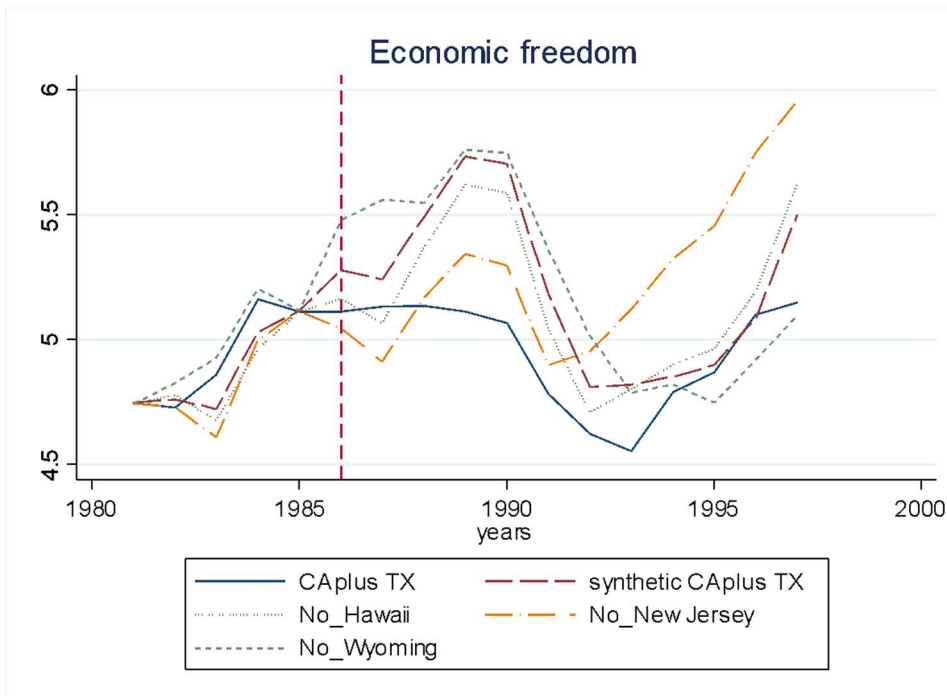


Figure 4C: Four IRCA states, leave one out

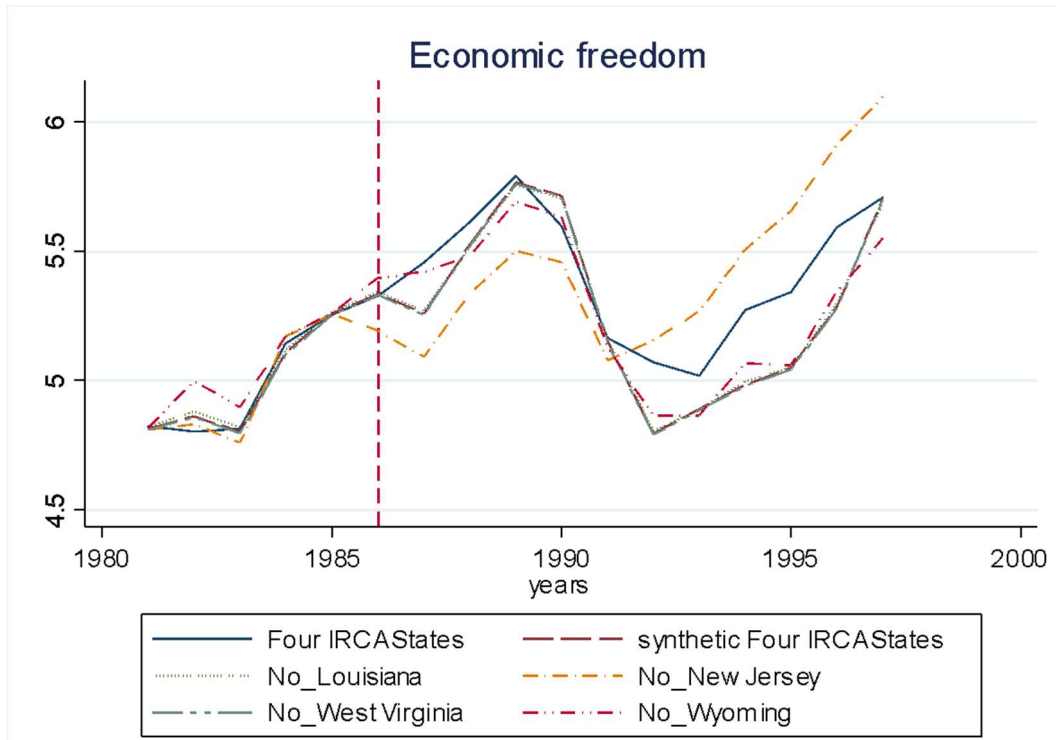


Figure 4D: California, leave one out

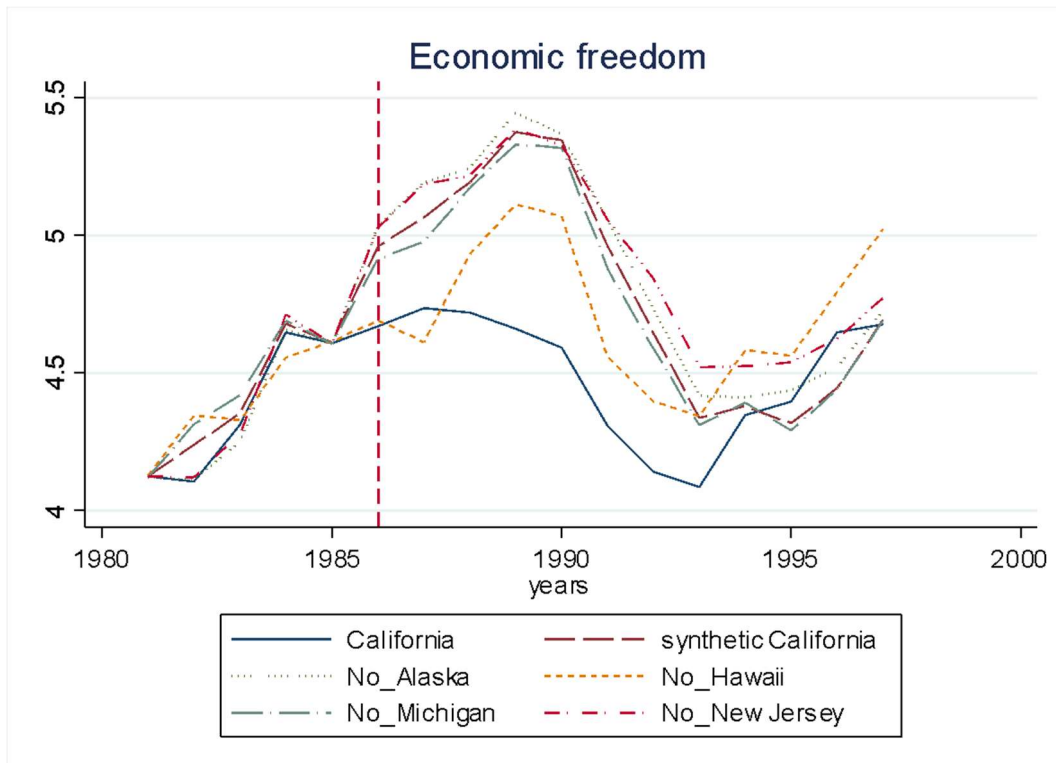


Figure 5: Economic freedom and IRCA states, generalized synthetic control method

Notes. Economic freedom is the overall score from Stansel et al. (2018). We synthesize IRCA state(s) with three predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma (IPUMS), share of naturalization (IPUMS).

Figure 5A: Generalized synthetic control for six IRCA states

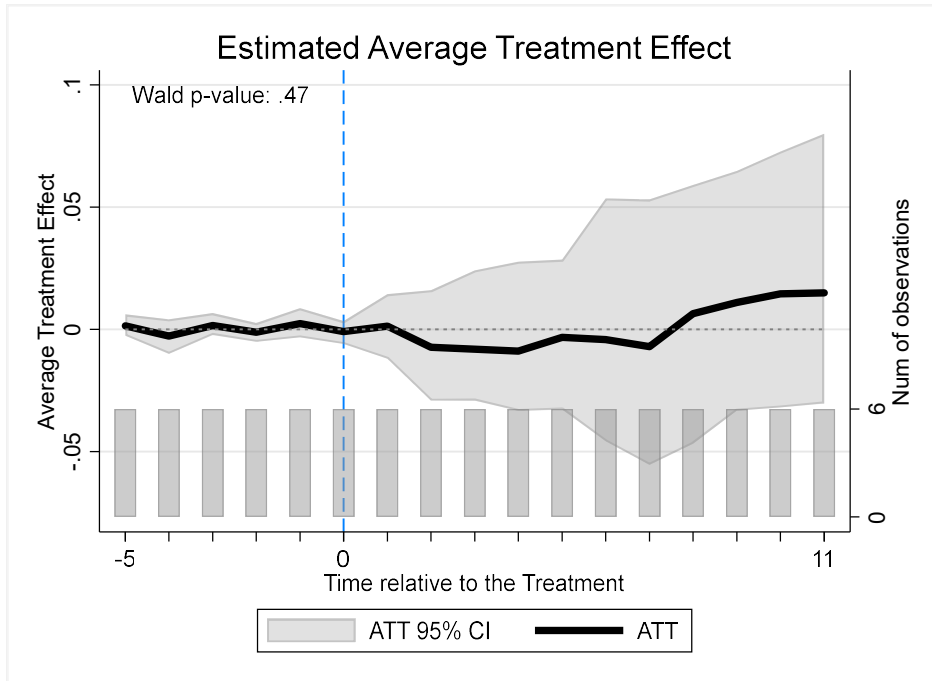


Figure 5B: Generalized synthetic control equivalence test

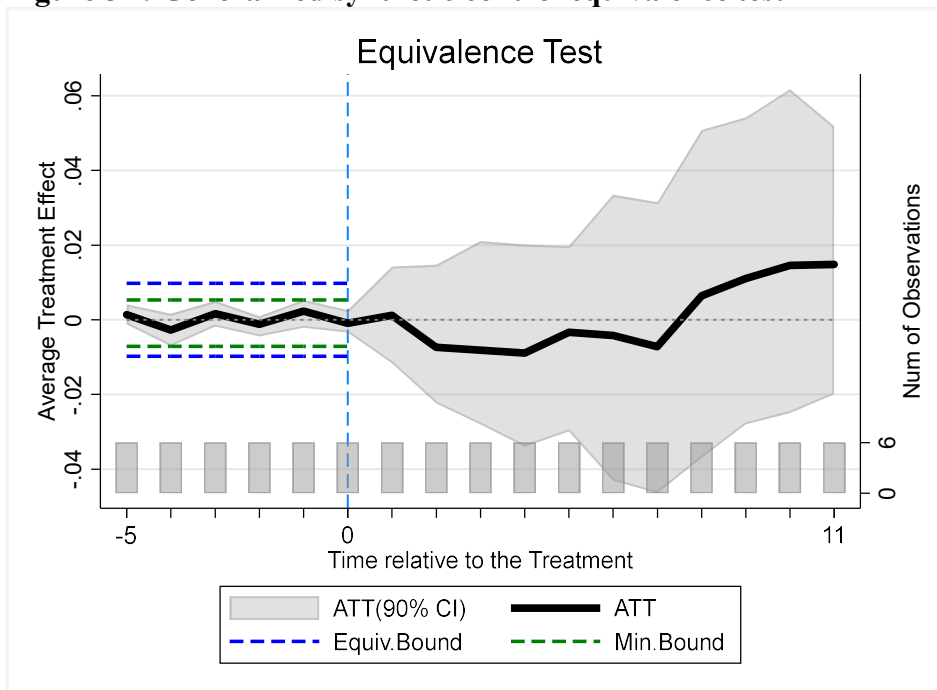


Figure 6: Economic freedom and California, robustness checks

Notes. Economic freedom is the overall score from Stansel et al. (2018). We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.

In-time placebo: if the event happened in 1983

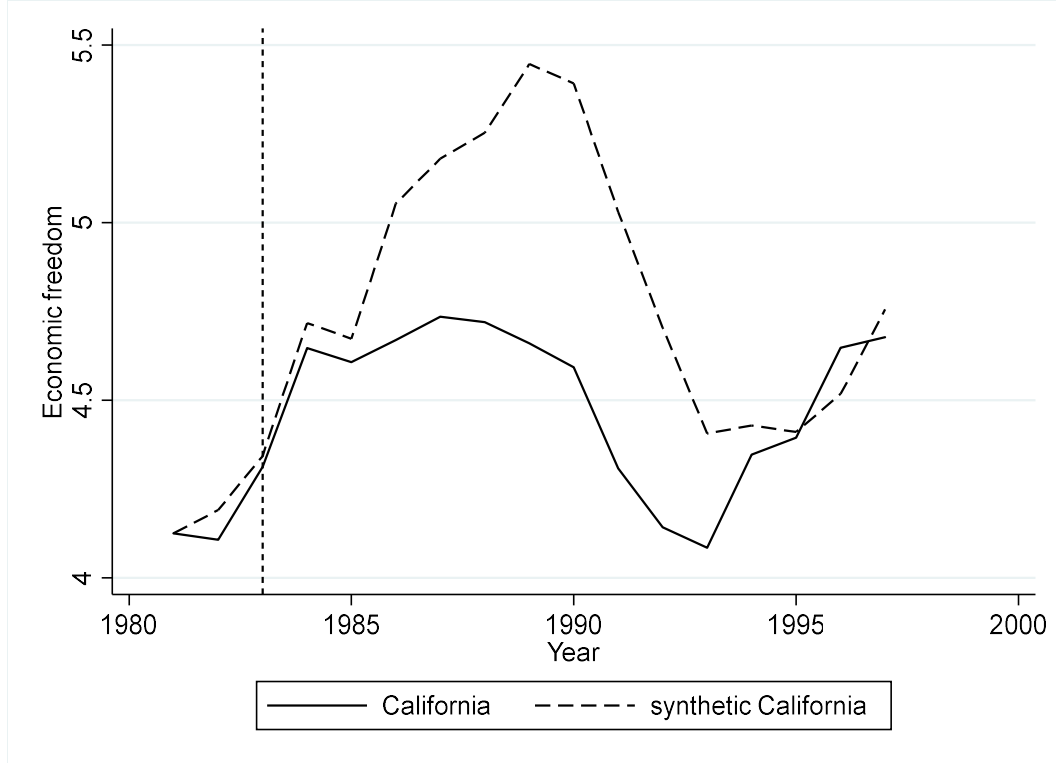


Figure 7: Economic freedom sub-indices and California

Notes. Economic freedom areas are the three sub-indices from Stansel et al. (2018). We synthesize IRCA state(s) with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.

Figure 7A: Government spending in California

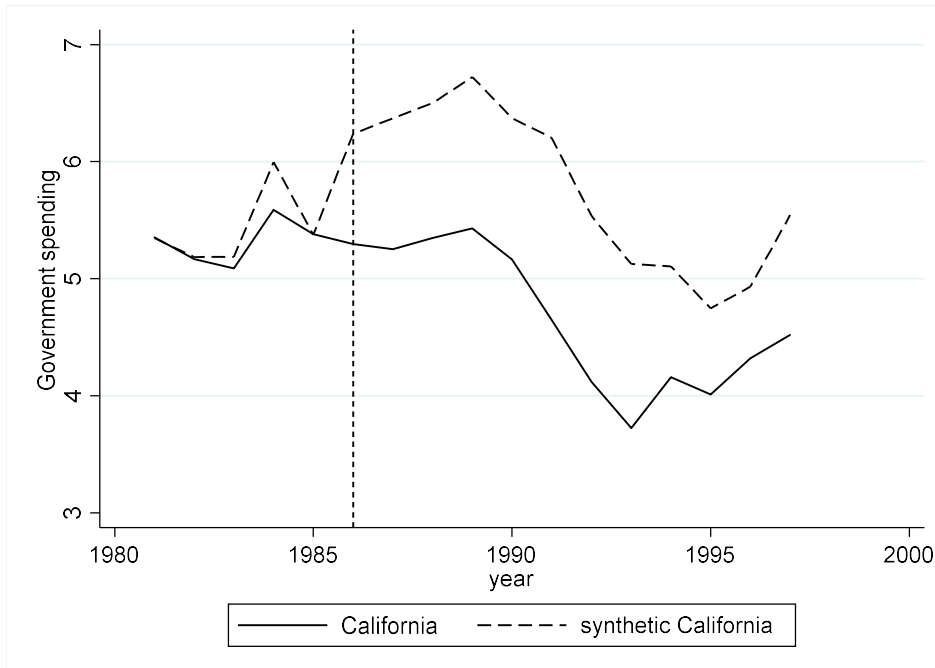


Figure 7B: Taxes in California

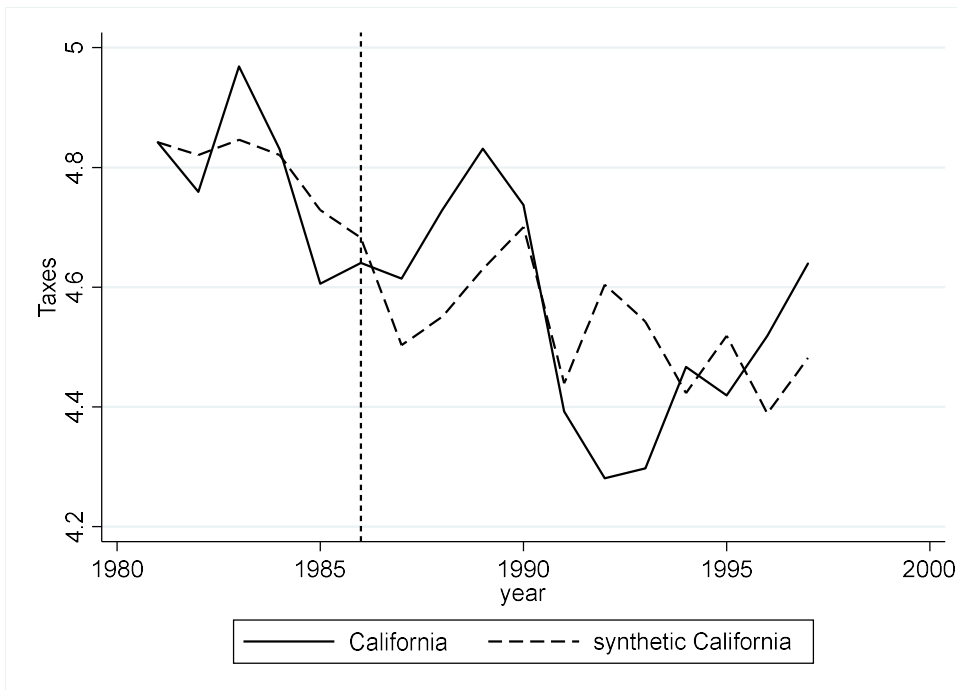
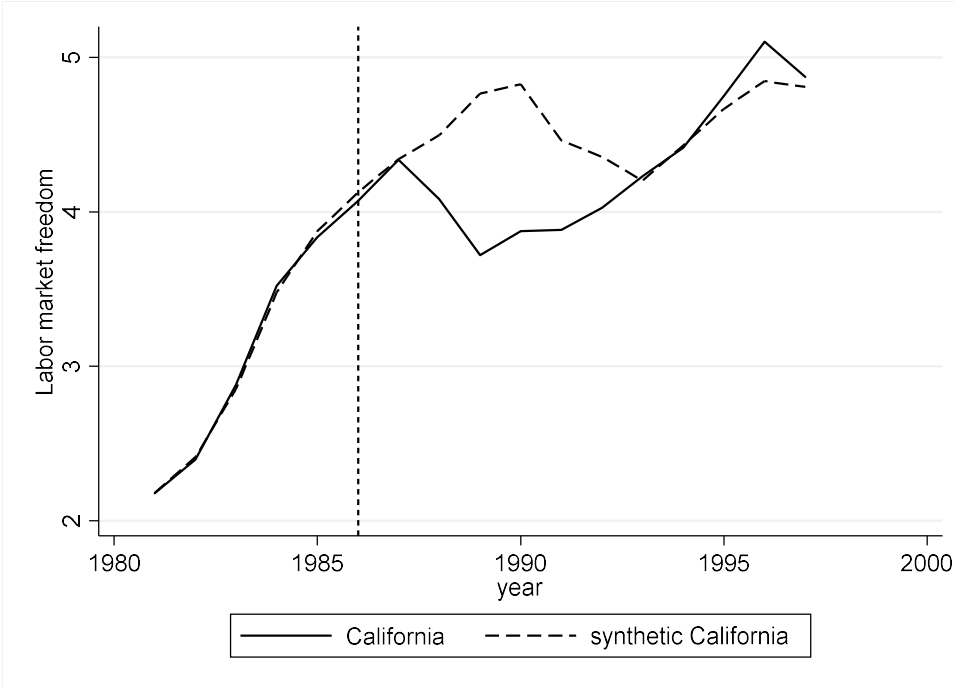


Figure 7C: Labor market freedom in California



Appendices

Appendix 1: Economic freedom and Texas

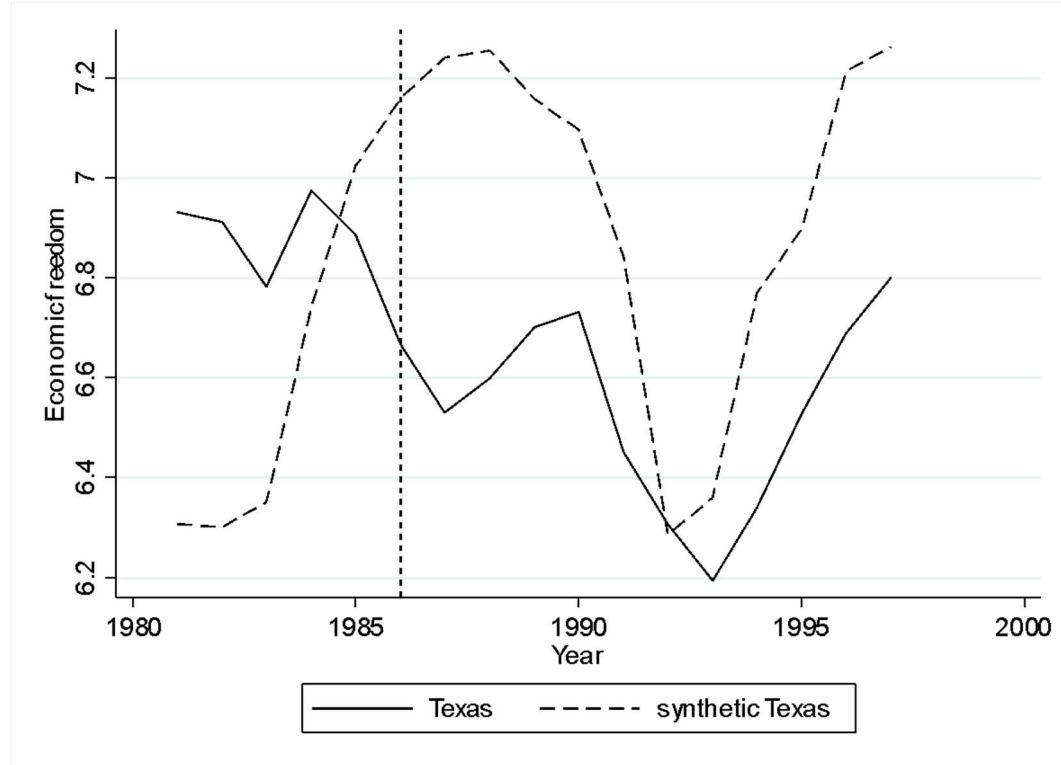
Notes. We synthesize with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.

Panel A: Indicator goodness of fits			
	Treated	Synthetic	Average
Log GDP per capita	4.379	4.296	4.324
High school diploma in 1980	0.660	0.747	0.694
Naturalized in 1980 (%)	0.034	0.002	0.010
Economic Freedom (1981)	6.931	6.307	5.063
Economic Freedom (1985)	6.886	7.024	5.311
RMSPE	0.452		

Panel B: Estimated synthetic control weights for economic freedom	
States	Weights
New Hampshire	0.919
North Dakota	0.081
Sum	1

Appendix 2: Economic freedom and Texas, SCM with naturalization

Notes. We synthesize with five predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1981, and economic freedom in 1985.



Appendix 3: Synthetic control results, robustness tests

Notes. This table presents estimated treatment effects of IRCA on economic freedom scores in top IRCA states (California, Texas, New York, Illinois, Florida, and Arizona), CA+TX, four IRCA states (New York, Illinois, Florida, and Arizona), and CA from synthetic control models matched using 1) both outcome lags and predictor variables, 2) only outcomes lags, and 3) only predictor variables. * denotes $p < 0.10$.

	<u>Top IRCA states</u>			<u>CA + TX</u>		
	Outcome Lags & Predictor Vars.	Only Outcome Lags	Only Predictor Vars.	Outcome Lags & Predictor Vars.	Only Outcome Lags	Only Predictor Vars.
1986	-0.049	-0.046	-0.533	-0.167	-0.040	-0.502
1987	0.083	-0.018	-0.516	-0.108	-0.029	-0.496
1988	-0.187	-0.148	-0.717	-0.356	-0.193	-0.712
1989	-0.416	-0.305	-0.767	-0.621*	-0.393	-0.776
1990	-0.452	-0.283	-0.736	-0.638*	-0.350	-0.717
1991	-0.213	-0.260	-0.391	-0.401	-0.292	-0.387
1992	-0.014	-0.357	-0.168	-0.188	-0.408	-0.316
1993	-0.177	-0.405	-0.224	-0.267	-0.453	-0.390
1994	-0.026	-0.372	-0.113	-0.063	-0.425	-0.331
1995	-0.021	-0.344	-0.016	-0.031	-0.378	-0.240
1996	-0.014	-0.347	-0.031	0.014	-0.386	-0.278
1997	-0.390	-0.349	-0.424	-0.353	-0.402	-0.612

	<u>Four IRCA states</u>			<u>California Only</u>		
	Outcome Lags & Predictor Vars.	Only Outcome Lags	Only Predictor Vars.	Outcome Lags & Predictor Vars.	Only Outcome Lags	Only Predictor Vars.
1986	-0.008	0.031	-0.530	-0.291*	0.093	-1.020
1987	0.200	0.135	-0.448	-0.332	0.246	-0.979
1988	0.088	0.127	-0.551	-0.473	0.086	-1.239
1989	0.026	0.139	-0.457	-0.716*	-0.175	-1.396
1990	-0.121	0.053	-0.529	-0.753*	-0.268	-1.367
1991	0.008	-0.042	-0.252	-0.654*	-0.175	-0.962
1992	0.273	-0.076	0.157	-0.503	-0.358	-0.671
1993	0.127	-0.123	0.113	-0.253	-0.280	-0.694
1994	0.288	-0.066	0.294	-0.033	-0.348	-0.541
1995	0.292	-0.064	0.372	0.077	-0.148	-0.448
1996	0.307	-0.049	0.390	0.203	-0.171	-0.437
1997	-0.001	-0.002	-0.026	-0.017	-0.223	-0.905

Appendix 4: Impact of IRCA on economic freedom, dynamic event study regression estimates

Notes. Dependent Variable is Economic freedom, overall score. Top IRCA states include California, Texas, New York, Illinois, Florida, and Arizona. CA+TX is California plus Texas. Four IRCA states include New York, Illinois, Florida, and Arizona. CA is California. Each specification includes time-varying controls for log GDP per capita, high school diploma (% native population), and share of population that is naturalized, and state and year fixed effects are included. Robust standard errors, in parentheses, are clustered by state. *** p<0.01, ** p<0.05.

Dep. Var: Economic freedom	(1)	(2)	(3)	(4)
	Top IRCA states	CA plus TX	Four IRCA states	CA
Controls	Yes	Yes	Yes	Yes
1981	-0.087 (0.107)	0.008 (0.121)	-0.089 (0.150)	-0.172 (0.390)
1982	-0.136 (0.088)	-0.015 (0.116)	-0.152 (0.108)	-0.214 (0.475)
1983	-0.043 (0.091)	0.147*** (0.047)	-0.095 (0.138)	0.059 (0.501)
1984	-0.052 (0.050)	0.121*** (0.041)	-0.098 (0.066)	0.070 (0.413)
1986	-0.032 (0.040)	-0.116*** (0.043)	-0.005 (0.048)	-0.045 (0.457)
1987	0.037 (0.071)	-0.112* (0.066)	0.091 (0.071)	0.001 (0.398)
1988	-0.039 (0.101)	-0.218** (0.084)	0.056 (0.117)	-0.133 (0.084)
1989	-0.076 (0.137)	-0.337*** (0.054)	0.080 (0.157)	-0.346 (0.352)
1990	-0.118 (0.141)	-0.290*** (0.045)	-0.017 (0.192)	-0.324 (0.274)
1991	-0.129 (0.133)	-0.297*** (0.095)	-0.080 (0.174)	-0.284 (0.632)
1992	-0.190 (0.157)	-0.256** (0.098)	-0.137 (0.213)	-0.246 (0.345)
1993	-0.228 (0.162)	-0.304** (0.125)	-0.171 (0.218)	-0.234 (0.384)
1994	-0.134 (0.143)	-0.266* (0.152)	-0.068 (0.167)	-0.113 (0.125)
1995	-0.101 (0.128)	-0.270*** (0.096)	-0.042 (0.147)	-0.178 (0.341)
1996	-0.087 (0.134)	-0.330*** (0.102)	0.004 (0.145)	-0.176 (0.573)
1997	-0.058 (0.137)	-0.342*** (0.103)	0.064 (0.130)	-0.222 (0.319)
Constant	-18.923*** (6.955)	-17.522** (6.748)	-18.486** (6.998)	-17.549** (6.774)
# observations	850	782	816	765
# states	50	46	48	45
Within R ²	0.20	0.20	0.18	0.18
Joint F-stat lag terms (p-value)	0.99 (0.42)	4.23 (0.01)	1.21 (0.32)	12.28 (0.00)
Joint F-stat lead terms (p-value)	2.06 (0.04)	12.60 (0.00)	5.38 (0.00)	19.60 (0.00)

Appendix 5: Economic freedom and California, robustness check

Notes. Data are collected from 1981-2016 with 1996 as shock year. We synthesize with six predictor variables: log GDP per capita (BEA), share of native population with at least a high school diploma in 1980 (IPUMS), share of naturalization in 1980 (IPUMS), economic freedom in 1985, economic freedom in 1990, and economic freedom in 1995. Donor states and weights include: New York (0.35), Arizona (0.33), Alaska (0.16), Massachusetts (0.15), Montana (0.02). RMSPE = 0.08.

