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Are economic arguments against immigration missing the boat? The fiscal effects of the Mariel Boatlift

Lili Yao[1] | J. Brandon Bolen[2] | Claudia R. Williamson[3]

[1]College of Economics and Management, Northwest A&F University, Xianyang, Shaanxi, China

[2]School of Business, Mississippi College, Clinton, Mississippi, USA

[3]Department of Finance and Economics, University of Tennessee at Chattanooga, Chattanooga, Tennessee, USA

Correspondence
Claudia R. Williamson, Department of Finance and Economics, University of Tennessee at Chattanooga, 615 McCallie Ave Chattanooga, TN 37403, USA.
Email: claudia-williamson@utc.edu

Abstract
Opponents of migration argue that natives bear the fiscal costs of immigration. Estimates suggest the long-run fiscal effect of immigration for local governments is negative, largely due to the costs of educating immigrant children. We test whether migration affects local government fiscal outcomes using a synthetic control method and the 1980 Mariel Boatlift as a natural experiment. We find no effect of the mass influx of migrants to Miami on various fiscal outcome measures, suggesting concerns over the fiscal effects of immigration are "missing the boat."

KEYWORDS
fiscal policy, immigration, Mariel Boatlift, synthetic control method

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1 | INTRODUCTION

In a 1999 interview with the Institute for Liberty and Policy Analysis (ISIL), Nobel Laureate Milton Friedman famously declared, "you cannot simultaneously have free immigration and a welfare state." Friedman's concern was one that is shared by many—that natives shoulder the fiscal burden of immigration.[1] Simply put, open borders allow immigrants to consume government benefits at natives' expense by taking more out of the public coffers than they pay

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[1]See Friedman (1999). Supporting this view, directly examining attitudes toward immigration, Lange (2021) finds that individuals living under socialism hold more negative views about immigration.

in. According to a 2019 Gallup poll, 42% of Americans believe immigrants are making the tax situation worse in the United States compared to only 20% that believe immigrants are making the tax situation better.[2] We test whether immigration causes fiscal harm by exploiting the 1980 Mariel Boatlift as a natural experiment and employing a synthetic control methodology (SCM).

Whether or not immigrants *actually* consume government benefits at natives' expense is a complicated empirical question (Bisin & Zanella, 2017; Preston, 2014; Vargas-Silva, 2014). Answering this question requires making assumptions, like whether immigrants should be assigned the average or marginal cost of government services. When an immigrant enters the United States, for example, the marginal cost of providing national defense to that one additional person is zero. National defense is non-rivalrous, meaning that an additional person consuming national defense does not diminish the ability of others to continue consuming the service. It is also non-excludable, indicating that it would be difficult or impossible to provide defense to only those who pay for it. For pure public goods, such as national defense, it is appropriate to assign immigrants the marginal cost of the good or service when measuring the fiscal impact of immigration.

However, other government services are not pure public goods when they are either rivalrous, excludable, or both. Education, for example, is provided by state and local governments in the United States despite being both rivalrous and excludable. Therefore, for government-provided private goods, like education, it might be appropriate to assign the average cost rather than the marginal cost.

This example highlights another complexity—the fiscal effects of immigration depend on whether one is measuring the fiscal effect on the federal, state, or local government. Federal governments provide different services than state and local governments. Notably, the federal government provides old-age benefits, like Social Security and Medicare, while local governments provide young-age benefits, such as public education. Therefore, the fiscal effect of immigration varies with the level of government and also with immigrant characteristics, like age and education, and how these characteristics change over time.

According to the 2016 report by the National Academies of Sciences, Engineering, and Medicine (2016), the long-run total fiscal effect (federal, state, and local) of immigration to the United States is a net benefit of $58,000 on average per immigrant and $259,000 on average per new immigrant. Though, the report finds that immigration's fiscal impact is generally negative at the state and local levels where the costs of educating immigrant children are born.[3] However, the estimated state and local fiscal effect is not a causal estimate. Immigrants might choose to locate in cities with generous state and local public services, like higher quality schools.[4] Or, some confounding factor, like the abundance of jobs, increases immigrant population and subsequent spending on local government services.

We simplify the complexity of estimating a causal effect by exploiting a natural experiment. In 1980, 125,000 Cubans fled to the United States. The Cuban government declared that all Cubans wishing to emigrate from Cuba could exit through the port of Mariel. Now commonly known as the Mariel Boatlift, this mass migration was an exogenous shock to the immigrant population of Miami, resulting from an unexpected change to emigration restrictions in Cuba.

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[2]See Gallup poll results at https://news.gallup.com/poll/1660/immigration.aspx.
[3]See page 11 of 2016 report from the National Academies of Sciences, Engineering, and Medicine. https://www.nap.edu/read/23550/chapter/2#10
[4]Nejad and Young (2016) document that economic freedom is a significant pull factor for international migration.

In the proceeding section, we provide a more detailed history of the Mariel Boatlift and academic studies that utilize it as a natural experiment.

The influx of 125,000 immigrants, which is 0.06% of the 1980 U.S. population, is hardly enough to significantly impact the federal government's fiscal situation. However, the Mariel Boatlift increased the population of Miami by 8% and its Cuban population by 20%. Furthermore, it is at the local level where we would most expect to find a negative fiscal effect of immigration. Many of the services provided by local governments are not pure public goods. Increased consumption of these services by immigrants will create a fiscal burden for natives unless immigrants are paying for these services through tax contributions. Therefore, this natural experiment provides an opportunity to build on prior works and create a synthetic counterfactual to examine local fiscal effects of immigration.

We analyze seven different fiscal outcomes to assess the fiscal impact of the Mariel Boatlift. This includes share of the population under 16 years old, share of the population enrolled in K-12, local government consumption, spending on transfers and subsidies, spending on insurance and retirement payments, sales tax revenue, and property/other tax revenue.

We find very little evidence of a fiscal burden on Miami resulting from the Mariel Boatlift.[5] This finding, which contradicts existing estimates, is particularly important because the Mariel Boatlift allows for stronger causal estimates than previous studies and because the uniqueness of the boatlift's participants make the estimates more of an upper rather than a lower bound estimate of the fiscal burden on natives. For example, these Cuban immigrants were less educated and more likely to work in low-skilled service jobs and as laborers than the existing Cuban population in Miami prior to the boatlift (Card, 1990). In addition, Cuban President Fidel Castro opened Cuban prisons and mental health facilities to transport prisoners to Mariel to emigrate from Cuba. This suggests that the unique demographic of immigrants in the Mariel Boatlift might be more costly for local governments due to a higher propensity for criminal activity and a lower skilled labor force than a typical immigration cohort (Billy & Packard, 2020; Peri & Yasenov, 2019).

This paper contributes directly to literature devoted to the fiscal effects of immigration, specifically the disagreement surrounding local fiscal effects. The findings of the 2016 report from the National Academies of Sciences, Engineering and Medicine, the 1997 report from the National Research Council (1997), and Orrenius (2017) find negative short-run fiscal effects for local governments. Alternatively, Card (2007) finds no relation between local fiscal burdens and immigrant population. Nowrasteh (2015) includes a summary of this literature.

Our study has implications for understanding the institutional effect of immigration, which includes how immigrants affect government expenditures. Borjas (2015) argues that migration of labor, unlike capital, affects institutions that govern economic activity, a fact often ignored by classic economic arguments for free migration (Clemens, 2011; Kennan, 2017). A growing empirical literature addresses this argument and finds no evidence to support Borjas' concerns (Ager & Brueckner, 2018; Bologna Pavlik et al., 2019; Cachanosky et al., 2021; Clark et al., 2015; Clemens & Pritchett, 2019; Nowrasteh et al., 2020; Nowrasteh & Powell, 2020; Padilla & Cachanosky, 2018, 2020; Powell et al., 2017; Tuszynski & Stansel, 2020; Yao et al., 2021).[6]

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[5]Similarly, Gunadi (2020) finds no adverse effects of immigration on U.S. natives' health outcomes.
[6]Similarly, Forrester et al. (2019) examine the relation between immigration and terrorism and document no relation as measured by the number of attacks or victims in destination countries.

Finally, this article contributes to the understanding of the effects of the Mariel Boatlift, an immigration event that has received considerable attention especially from economists estimating the labor market effects of immigration (Borjas, 2017; Borjas & Monras, 2017; Card, 1990; Clemens & Hunt, 2019; Peri & Yasenov, 2019).

2 | THE MARIEL BOATLIFT

On April 1, 1980 Hector Sanyustiz and four others drove a bus through a fence of the Peruvian embassy in Cuba. Cuban guards opened fire, resulting in the death of one Cuban guard killed by crossfire and a demand from the Cuban government that the five be returned for trial in the guard's death. The Peruvian government refused and granted them political asylum instead. Within a few days, the Cuban government withdrew its guards from the Peruvian embassy in Cuba and thousands of Cubans crowded the embassy seeking asylum.

In the following days, the Cuban government announced that those who wished to emigrate could do so if another country granted them entry. On April 14, President Jimmy Carter announced that the United States would accept 3500 refugees from Cuba who would pass through Costa Rica. However, on April 20, 1980 Fidel Castro announced that anyone wishing to leave Cuba could emigrate through the port of Mariel, an event now known as the Mariel Boatlift. For the next several months, 125,000 Cubans fled to Florida, including prisoners and mental health patients transported by the Cuban government to Mariel to emigrate from Cuba.

The federal government, the Florida state government, and nongovernmental organizations provided emergency aid to feed and shelter the Marielitos, but according to Miami Mayor Maurice Ferré, the federal government "did not take responsibility, and the taxpayers of Miami-Dade County were severely burdened." Bob Graham, the governor of Florida at the time of the Mariel Boatlift, states, "there was some Federal assistance, but the additional costs were significantly paid by local and state governments."[7]

Estimates suggest that roughly 50% to 60% of these "Marielitos" settled permanently in Miami (Card, 1990; Peri & Yasenov, 2019). Little is known about the demographics of the Marielitos due to the unauthorized nature of their immigration to the United States. Though, data suggests that the Marielitos who settled permanently in Miami were younger, more likely to be male, and had far fewer years of education than the Miami population before the boatlift (Peri & Yasenov, 2019). Even relative to the existing Cuban population in Miami prior to the boatlift, the Marielitos were younger, more likely to be male, less educated, and more likely to work in low-skilled service jobs and as laborers (Card, 1990).

Because the Mariel Boatlift was unexpected and its participants had little ability to choose their destination, the boatlift serves as a natural experiment by which many scholars have studied the effects of immigration. The earliest study by Card (1990) finds that the boatlift had an insignificant effect on the employment and wages of low-skilled non-Cubans in Miami. Subsequent labor market studies by Borjas (2017), Clemens and Hunt (2019), and Peri and Yasenov (2019) have built on the foundation laid by Card (1990) using modern causal inference approaches. The Mariel Boatlift is also used to examine immigration's effects on crime, voting patterns, and native fertility (Billy & Packard, 2020; Seah, 2018; Thompson, 2022).

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[7]According to interviews with Bob Graham and Maurice Ferré in Fetzer (2016).

Few studies to date estimate the fiscal effect of the Mariel Boatlift on Miami.[8] The natural immigration experiment created by the boatlift, however, provides an opportunity to observe the fiscal effects of immigration at the local government level. In fact, the unique demographic composition of the Marielitos, most notably its disproportionately high population of criminals, mental health patients, and individuals with fewer labor market skills, makes the Mariel Boatlift a likely case for finding a fiscal burden on natives. We follow the causal inference approaches established in the labor market studies of the Mariel Boatlift to estimate its fiscal effect on Miami's local government. Specifically, we follow the synthetic control approach of Peri and Yasenov (2019).

3 | EMPIRICAL METHODOLOGY

We estimate the fiscal effects of the Mariel Boatlift by comparing the observed fiscal outcomes in Miami following the Mariel Boatlift to the outcomes that would have occurred without the Mariel Boatlift. To do so, we use a SCM, to create a counterfactual, or an estimate of the fiscal outcomes that would have occurred in Miami without the boatlift. SCM is an empirical technique that creates a counterfactual using a weighted combination of metropolitan areas not affected by the Mariel Boatlift (Abadie & Gardeazabal, 2003). This synthetic Miami created by SCM more closely approximates the fiscal outcomes that would have occurred in Miami without the influx of migrants than can any single comparison city. Peri and Yasenov (2019) use SCM to create a counterfactual to examine the effects of the Mariel Boatlift on labor market outcomes in Miami, improving on the seminal study of the boatlift by Card (1990).

SCM measures the effect of an exogenous shock (treatment) on an outcome variable, like the effects of the unification of East and West Germany on West Germany's economic growth and the effects of Proposition 99 in California on cigarette sales (Abadie et al., 2010; Abadie et al., 2015), and the economic effects of political leaders in Latin America, including Hugo Chavez (Absher et al., 2020; Grier & Maynard, 2016). In this study, we use SCM to estimate the effect of the Mariel Boatlift on fiscal outcomes in the city of Miami following the methodology of Peri and Yasenov (2019).[9]

We use seven different fiscal measures to assess the fiscal impact of the Mariel Boatlift. The share of the population under 16 years old and the share of the population enrolled in K-12 are used as measures of the fiscal burden of the dependent population following Card (2007). We also local government revenue and expenditure measures as a percent of personal income from Stansel (2019), including government consumption spending, spending on transfers and subsidies, spending on insurance and retirement payments, sales tax revenue, and property/other tax revenue.

The share of the population under 16 years old and the share of the population enrolled in K-12 measure the local fiscal burden of providing for this dependent population. If immigrants

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[8]Fetzer (2016) examines how the Mariel Boatlift affected Miami's gross public revenues in a cursory empirical analysis comparing Miami to a group of four arbitrarily selected comparison cities using a fixed-effects panel model. While this study provides valuable insight into the events surrounding the Mariel Boatlift, its ethnographic and simplistic empirical approach distinguish it from this article and other empirical studies of the effects of the Mariel Boatlift.
[9]SCM is also used by Powell et al. (2017) and Nowrasteh et al. (2020) to measure the effects of mass migration on a country's economic institutions.

TABLE 1 Summary statistics and data source

Variables	Years	Obs.	Mean	SD	Min	Max	Source
Share of population under 16/over 65	3	84	0.36	0.03	0.3	0.44	IPUMS
Share of population under 16	3	84	0.26	0.04	0.18	0.33	IPUMS
Share of African American population	3	84	14.08	8.02	2.03	39.37	IPUMS
Share of population enrolled in K-12	3	84	0.15	0.02	0.11	0.18	IPUMS
Government consumption (% personal income)	9	252	8.58	1.4	5.82	12.72	Stansel (2019)
Transfers and subsidies (% personal income)	9	252	0.18	0.32	0	1.76	Stansel (2019)
Insurance and retirement payments (% personal income)	9	252	0.2	0.18	0	0.86	Stansel (2019)
Sales tax revenue (% personal income)	9	252	0.65	0.55	0	2.75	Stansel (2019)
Property and other tax revenue (% personal income)	9	252	3.44	0.91	1.45	6.73	Stansel (2019)
Hispanic (% population)	19	532	0.06	0.09	0	0.45	CPS1973-1978; MORG1979-1991
Low-skilled worker (% labor force)	19	532	0.2	0.06	0.08	0.38	CPS1973-1978; MORG1979-1991
High-school diploma (% native-born population)	3	86	71.24	10.64	49.42	90.15	IPUMS

migrate as or with children or start families after immigration, local government spending on education will increase. Education costs are commonly cited as the reason for the fiscal burden placed on local governments by immigration.

Government consumption is total expenditures minus fixed capital expenditures, interest on debt, and transfers to individuals, governments, and businesses. Transfers and subsides include transfers to individuals and businesses. Insurance and retirement expenditures include employment insurance, workers compensation, and pension plans. These three measures of government spending represent a complete picture of local government spending with the exception of capital outlays and interest on debt.

The two measures of government revenue, sales tax revenue and property/other tax revenue, represent the primary sources of local government revenue. We examine these tax revenue measures alongside government expenditure measures for evidence that immigration affects local government's fiscal situation, such as through increasing the costs of providing services like education or law enforcement without an offsetting increase in revenue.

We create panel data of 28 U.S. cities from 1973 to 1991 by merging the metropolitan fiscal data from Stansel (2019), the May extracts (1973–1978) and the Merged Outgoing Rotation Groups (MORG, 1979–1991) from the Current Population Survey (CPS). The Mariel Boatlift occurred in 1980. Therefore, we have 7 pre-treatment years and 11 post-treatment years of data. Miami is the single treated unit.[10]

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[10]Current Population Survey (CPS) data is available starting in 1973, limiting the number of pre-treatment years to seven.

TABLE 2 Goodness of fit indicators

Predictor variables	Population under 16		Enrolled in K-12		Government consumption		Transfers and subsidies		Insurance and retirement payments		Sales tax revenue		Property and other tax revenue		Average
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	
Share of Hispanic population	23.21	19.74	23.21	21.91	23.21	19.58	23.21	19.16	23.21	27.05	23.21	17.52	23.21	22.90	26.11
Share of low-skilled workers	30.11	18.18	30.11	19.77	30.11	26.23	30.11	27.53	30.11	25.53	30.11	23.89	30.11	23.21	19.92
Share high school diploma (native-born population)	58.75	70.67	58.75	68.49	58.75	60.66	58.75	61.02	58.75	62.84	58.75	63.96	58.75	65.97	72.97
Share of African American	17.26	10.58	17.26	6.64	17.26	19.60	17.26	13.58	17.26	17.26	17.26	10.41	17.26	18.09	13.96
Population under 16 (1973)	26.13	26.08													30.15
Population enrolled in K-12 (1973)			14.27	14.26											16.19
Population under 16 (1975)	23.57	23.56													27.19
Population enrolled in K-12 (1975)			14.16	14.17											16.10
Population under 16 (1977)	22.47	22.44													25.86
Population enrolled in K-12 (1977)			14.09	14.09											16.01

(Continues)

TABLE 2 (Continued)

Predictor variables	Population under 16		Enrolled in K-12		Government consumption		Transfers and subsidies		Insurance and retirement payments		Sales tax revenue		Property and other tax revenue		Average
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	
Government expenditures (1973)					7.22	7.22									8.31
Government expenditures (1975)					7.74	7.74									8.62
Government expenditures (1977)					8.07	8.07									8.74
Transfers and subsidies (1973)							0.00	0.00							0.43
Transfers and subsidies (1975)							0.00	0.00							0.37
Transfers and subsidies (1977)							0.00	0.00							0.32
Insurance and retirement payments (1973)									0.06	0.06					0.17
Insurance and retirement payments (1975)									0.06	0.06					0.18
Insurance and retirement									0.07	0.07					0.18

TABLE 2 (Continued)

Predictor variables	Population under 16		Enrolled in K-12		Government consumption		Transfers and subsidies		Insurance and retirement payments		Sales tax revenue		Property and other tax revenue		
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Average
payments (1977)															
Sales tax revenue (1973)											0.55	0.53			0.47
Sales tax revenue (1975)											0.54	0.53			0.52
Sales tax revenue (1977)											0.52	0.52			0.56
Property and other tax revenue (1973)													3.30	3.30	4.25
Property and other tax revenue (1975)													3.30	3.30	4.06
Property and other tax revenue (1977)													3.25	3.25	3.79
RMSPE	0.02		0.01		0.00		0.00		0.00		0.01		0.00		

Note: We synthesize Miami with seven predictor variables: dependent variable in 1973, 1975, 1977; share of Hispanic population (CPS1973-1978; MORG1979-1991), share of low-skilled workers (CPS1973-1978; MORG1979-1991), share of African American population (IPUMS), and share of native-born population with a high-school diploma (IPUMS).

The synthetic Miami is created from a weighted combination of the remaining 27 untreated cities. We use SCM to select the control group matching on lagged values of the outcome variable, the share of Hispanic population, the share of low-skilled workers, and the share of native-born population with a high-school diploma. The cities used to construct a synthetic Miami with their respective weights are provided in the figures showing the results for each of the fiscal outcome measures. Table 1 provides summary statistics for the 28 cities represented in the data set.

The similarity between Miami and synthetic Miami prior to treatment serves as a measure of the goodness of fit of synthetic Miami. Table 2 provides information about the goodness of fit of synthetic Miami, using the distance of means and the root mean squared predicted error (RMSPE). The RMSPE falls between 0.0 and 0.02, indicating the bias (deviation of synthetic unit from the treated) with respect to the predictors is very small. Overall, this suggests our synthetic is a close approximation to the real Miami.

We provide additional tests of the goodness of fit of the synthetic Miami and the robustness of our results in the proceeding section. We perform placebo tests, where we synthesize each city in the control group and compare it to its actual values to create a distribution of deviations between cities and their controls. This approach allows us to test for the goodness of fit of the synthetic Miami and for the statistical significance of the effect of the Mariel Boatlift on Miami's fiscal outcomes.

We also perform tests of the sensitivity of our results to the composition of the synthetic control. Finally, we apply a regression approach using feasible generalized least squares (FGLS) following Peri and Yasenov (2019) as a final test of the goodness of fit of our synthetic and the robustness of our results.

4 | RESULTS

Figure 1 displays the synthetic control results for the seven fiscal outcome measures. The first two panels, Figure 1a,b, display the measures of the fiscal burden of the dependent population.[11] Table 3 lists the corresponding point estimates and *p*-values. The weighted combinations of cities composing the synthetic control group are listed in the notes beneath each figure heading.

We find a positive but statistically insignificant effect of the Mariel Boatlift on the population under 16 and the population enrolled in K-12 education according to the point estimates and *p*-values in Table 3. The graphical representations of the effects in Figure 1 show Miami's population under 16 and population enrolled in K-12 exceeding the counterfactual, but these effects are not statistically significant at the 5% level. Thus, there is limited evidence that the Mariel Boatlift increased the short-run fiscal burden by increasing the young dependent population.[12]

Figure 1c–e includes the SCM results estimating the effects of the Mariel Boatlift on measures of local government spending. Following Stansel (2019), we divide government spending

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[11]Card (2007) uses both the dependent population under 16 and over 65 years old. Here, we focus on the dependent population under 16 given the often-cited costs of educating immigrant children for natives.

[12]The K-12 population, both immigrant and non-immigrant, places a fiscal burden on local governments in the short run. Estimating the long-run net fiscal impact of the K-12 population requires accounting for the future taxes paid and retirement benefits drawn by this population. Therefore, the fiscal burden created by increases to the K-12 population that is identified in this article represents only a short-run measure of fiscal impact.
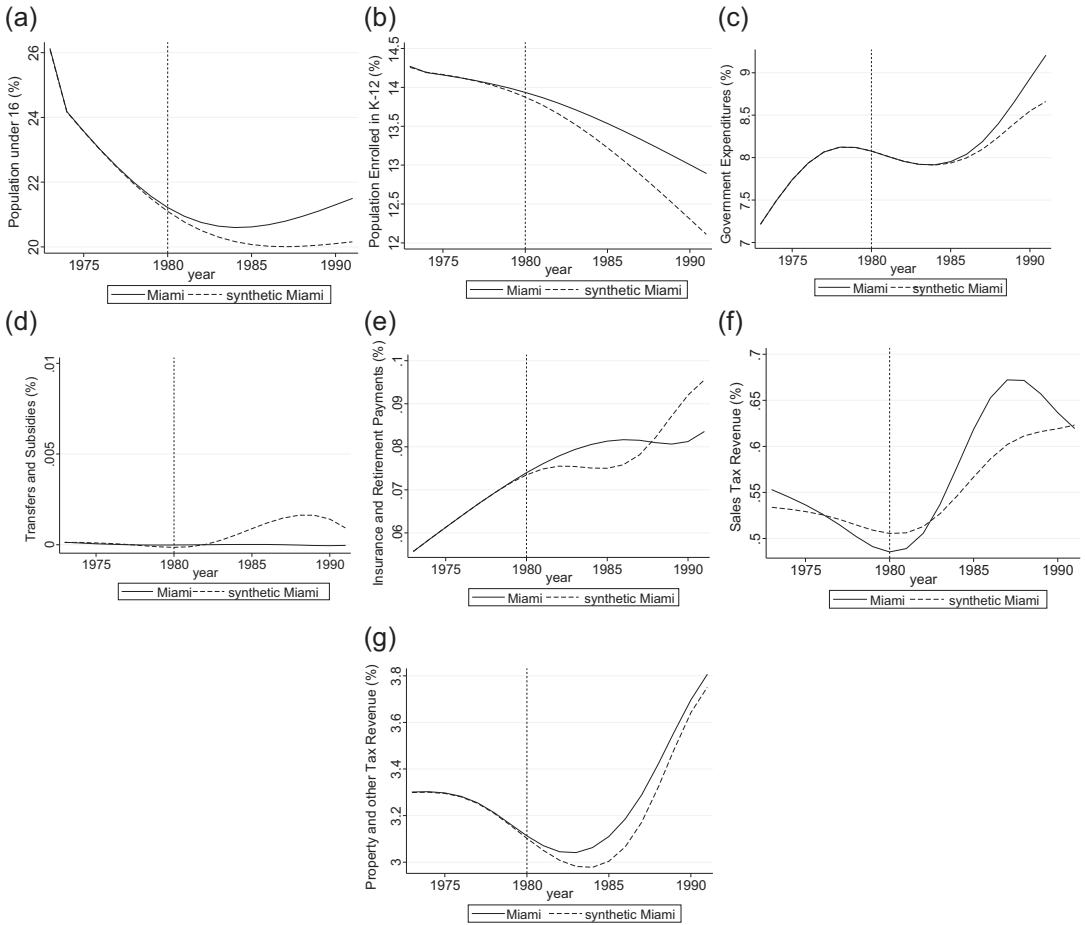
FIGURE 1   Effects of the Mariel boatlift on the fiscal burden. (a) Share of population under 16. (b) Share of population enrolled in K-12. (c) Government consumption (% personal income). (d) Government transfers and subsidies (% personal income). (e) Government insurance and retirement payments (% personal income). (f) Sales tax revenue (% personal income). (g) Property and other tax revenue (% personal income). *Notes*: For figures 1-4, we synthesize Miami with seven predictor variables: dependent variable in 1973, 1975, 1977; share of Hispanic population (CPS1973-1978; MORG1979-1991), share of low-skilled workers (CPS1973-1978; MORG1979-1991), share of African American population (IPUMS), and share of native-born population with a high school diploma (IPUMS). Shares of population by age and enrolled in K-12 are collected from IPUMS. Data on government consumption, government transfers and subsides, government insurance and retirement payments, sales tax revenue, and property tax revenue are collected from Stansel et al. (2019). (a) The cities with positive weights in the synthetic control are as follows: San Francisco, CA 71%, Tampa, FL 21%, Portland, OR 7%. (b) The cities with positive weights in the synthetic control are as follows: San Diego, CA 52%, Tampa, FL 36%, Portland, OR 12%. (c) The cities with positive weights in the synthetic control are as follows: Tampa, FL 37%, Atlanta, GA 29%, New Orleans, LA 18%, Cleveland, OH 10%, Cincinnati, OH 5%. (d) The cities with positive weights in the synthetic control are as follows: Tampa, FL 85%, Houston, TX 8%, New Orleans, LA 7%. (e) The cities with positive weights in the synthetic control are as follows: Dallas, TX 41%, Houston, TX 26%, Cleveland, OH 18%, Atlanta, GA 10%, Cincinnati, OH 5%. (f) The cities with positive weights in the synthetic control are as follows: Tampa, FL 73%, San Francisco, CA 27%. (g) The cities with positive weights in the synthetic control are as follows: Tampa, FL 38%, Washington, DC 35%, Detroit, MI 12%, Dallas, TX 11%, New York, NY 6%.

TABLE 3 Effects of the Mariel Boatlift on local government financing

Year	Population under 16		Enrolled in K-12		Government consumption		Transfers and subsidies		Insurance and retirement payments		Sales tax revenue		Property and other tax revenue	
	Effect	p-value	Effect	p-value	Effect	p-value	Effect	p-value	Effect	p-value	Effect	p-value	Effect	p-value
1980	0.10	.19	0.06	.22	0.01	.89	0.00	.74	0.00	.74	−0.02	.37	0.02	.67
1981	0.16	.15	0.09	.22	0.03	.78	0.00	.78	0.00	.70	−0.02	.56	0.05	.67
1982	0.23	.15	0.14	.22	0.06	.78	0.00	1.00	0.00	.74	−0.01	.74	0.09	.63
1983	0.32	.15	0.19	.19	0.10	.74	0.00	.81	0.00	.74	0.01	.89	0.15	.63
1984	0.41	.15	0.25	.19	0.15	.70	0.00	.74	0.01	.74	0.03	.63	0.22	.63
1985	0.52	.15	0.31	.19	0.22	.70	0.00	.74	0.01	.81	0.05	.48	0.29	.59
1986	0.64	.11	0.38	.15	0.30	.63	0.00	.78	0.01	.93	0.06	.56	0.35	.52
1987	0.77	.11	0.46	.15	0.39	.52	0.00	.78	0.00	.93	0.07	.59	0.38	.52
1988	0.90	.11	0.54	.15	0.50	.44	0.00	.78	0.00	.93	0.06	.59	0.39	.48
1989	1.04	.07	0.62	.15	0.63	.37	0.00	.81	−0.01	.89	0.04	.74	0.37	.44
1990	1.18	.07	0.70	.15	0.77	.30	0.00	.89	−0.01	.81	0.02	.89	0.36	.52
1991	1.32	.07	0.78	.15	0.95	.26	0.00	.85	−0.01	.85	−0.01	.96	0.35	.52

Note: This table presents estimated treatment effects of the Mariel Boatlift on Miami's local government financing with corresponding permutation test *p*-values.
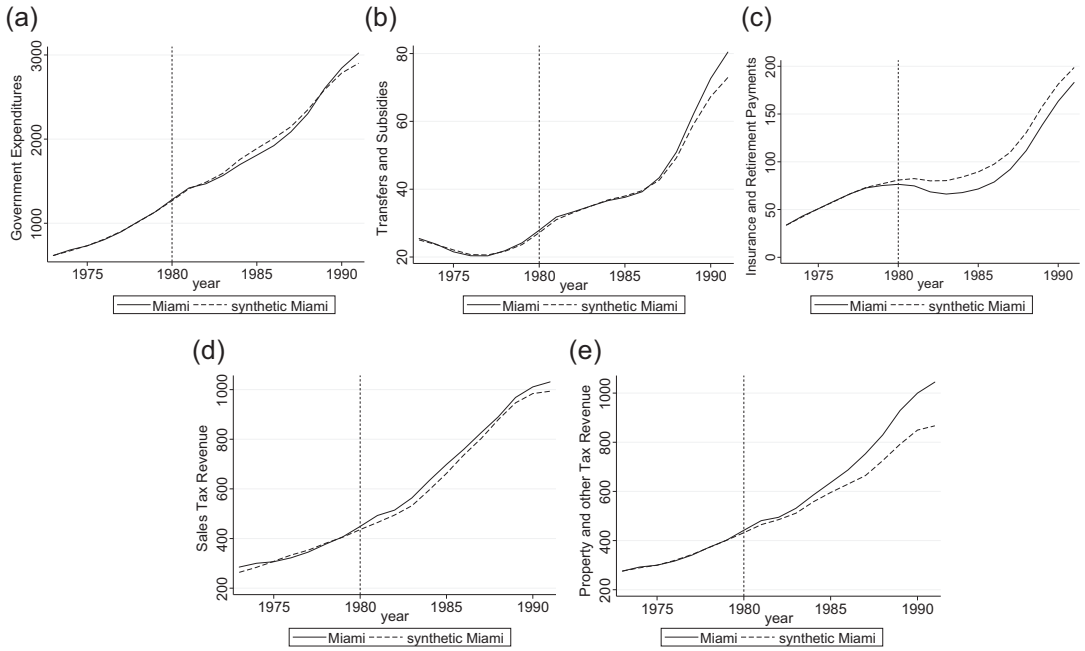
FIGURE 2 Effects of the Mariel boatlift on the fiscal burden (in absolute terms). (a) Government consumption (in thousands of dollars). (b) Government transfers and subsidies (in thousands of dollars). (c) Government insurance and retirement payments (in thousands of dollars). (d) Sales tax revenue (in thousands of dollars). (e) Property and other tax revenue (in thousands of dollars). *Notes*: For figures 1-4, we synthesize Miami with seven predictor variables: dependent variable in 1973, 1975, 1977; share of Hispanic population (CPS1973-1978; MORG1979-1991), share of low-skilled workers (CPS1973-1978; MORG1979-1991), share of African American population (IPUMS), and share of native-born population with a high school diploma (IPUMS). Shares of population by age and enrolled in K-12 are collected from IPUMS. Data on government consumption, government transfers and subsides, government insurance and retirement payments, sales tax revenue, and property tax revenue are collected from Stansel et al. (2019). (a) The cities with positive weights in the synthetic control are as follows: Indianapolis, IN 65%, Tampa, FL 13%, Baltimore, MD 12%, New Orleans, LA 9%, St. Louis, MO 1%. (b)The cities with positive weights in the synthetic control are as follows: Tampa, FL 84%, New Orleans, LA 9%, Cincinnati, OH 6%. (c) The cities with positive weights in the synthetic control are as follows: Tampa, FL 80%, Baltimore, MD 12%, Dallas, TX 5%, New York, NY 3%. (d) The cities with positive weights in the synthetic control are as follows: Portland, OR 65%, Seattle, WA 26%, Tampa, FL 9%. (e) The cities with positive weights in the synthetic control are as follows: Cincinnati, OH 45%, Detroit, MI 25%, Baltimore, MD 16%, New York, NY 11%, Seattle, WA 2%, Indianapolis, IN 1%.

into three categories: general consumption expenditures, transfers and subsidies, and insurance and retirement payments. The point estimates of the effects of the mass migration on transfers and subsidies and insurance and retirement payments are zero or very near zero and statistically insignificant throughout the sample period. The point estimates of the effects on government consumption approach one percentage point of average personal income, but the effects are also statistically insignificant.

Figure 1f,g includes the SCM estimates for the effects of the Mariel Boatlift on local tax revenue. We divide tax revenue into sales tax revenue and property tax and other tax revenue. Miami and most other metropolitan areas do not have a local income tax, so we do not include income and payroll tax revenue when analyzing how the Mariel Boatlift affected fiscal

TABLE 4 Effects of the Mariel Boatlift on local government financing (spending and tax measures in Dollar values)

Year	Government consumption		Transfers and subsidies		Insurance and retirement payments		Sales tax revenue		Property and other tax revenue	
	Effect	*p*-value	Effect	*p*-value	Effect	*p*-value	Effect	*p*-value	Effect	*p*-value
1980	37.66	.63	1.40	.81	−10.79	.37	23.14	.44	18.21	.48
1981	39.37	.67	1.30	.93	−20.72	.33	41.64	.33	26.31	.52
1982	11.47	.96	0.44	.89	−33.32	.33	33.16	.44	21.36	.67
1983	7.69	.96	0.07	1.00	−44.41	.33	46.93	.37	32.50	.63
1984	−20.75	.89	−0.81	.96	−59.58	.22	54.52	.30	40.68	.63
1985	−30.42	.89	−1.75	.93	−73.28	.15	53.89	.37	54.48	.67
1986	−34.09	.93	−2.08	.96	−79.42	.15	40.68	.56	71.92	.56
1987	−1.63	.96	−1.46	1.00	−80.38	.19	40.14	.48	101.91	.44
1988	23.19	.81	−0.90	1.00	−79.50	.22	28.23	.67	118.70	.41
1989	97.58	.67	0.53	1.00	−70.31	.26	42.15	.59	153.87	.37
1990	152.75	.52	2.47	.96	−59.75	.22	49.70	.56	168.02	.33
1991	223.34	.44	4.54	.89	−45.41	.48	63.84	.59	196.14	.19

Note: This table presents estimated treatment effects of the Mariel Boatlift on Miami's local government financing in thousands of dollars with corresponding permutation test *p*-values.

institutions at the local level. The estimated effect of the immigration shock to sales tax revenue is small, never exceeding 0.01 percentage points. The effect on property and other tax revenue is larger than the effect on sales tax revenue, but it is also statistically insignificant. Thus, we find no evidence that the mass influx of migrants had any effect on Miami's local fiscal outcomes.

Figure 2 shows the synthetic control estimates of the effect of the Mariel Boatlift on the measures of government spending and taxes, except each measure is in thousands of dollars rather than in percentage terms. Table 4 lists the corresponding point estimates and *p*-values. Note that these estimates include only the fiscal outcomes initially scaled as a percentage of personal income in Figure 1 (government consumption in Figure 1c, transfers and subsidies in Figure 1d, insurance and retirement payments in Figure 1e, sales tax revenue in Figure 1f, and property and other tax revenue in Figure 1g). These additional estimates test for whether the boatlift had an absolute fiscal effect on Miami even if there is no evidence of a fiscal effect as a percentage of income. The results are materially unchanged from Figure 1–2. Each point estimate is statistically insignificant according to Table 4, suggesting the Mariel Boatlift had no fiscal effect on Miami's local government budget.

The results are also robust to calculating spending and tax measures on a per capita basis rather than calculating these measures as a share of income.[13] Additionally, the results are robust to the following individual changes to the synthetic control estimate: dropping the share of the population that is Hispanic as a predictor, dropping the share of the population that is

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[13]Further, in the per-capita results, we find similar results when income is included as predictor in the synthetic control estimation.
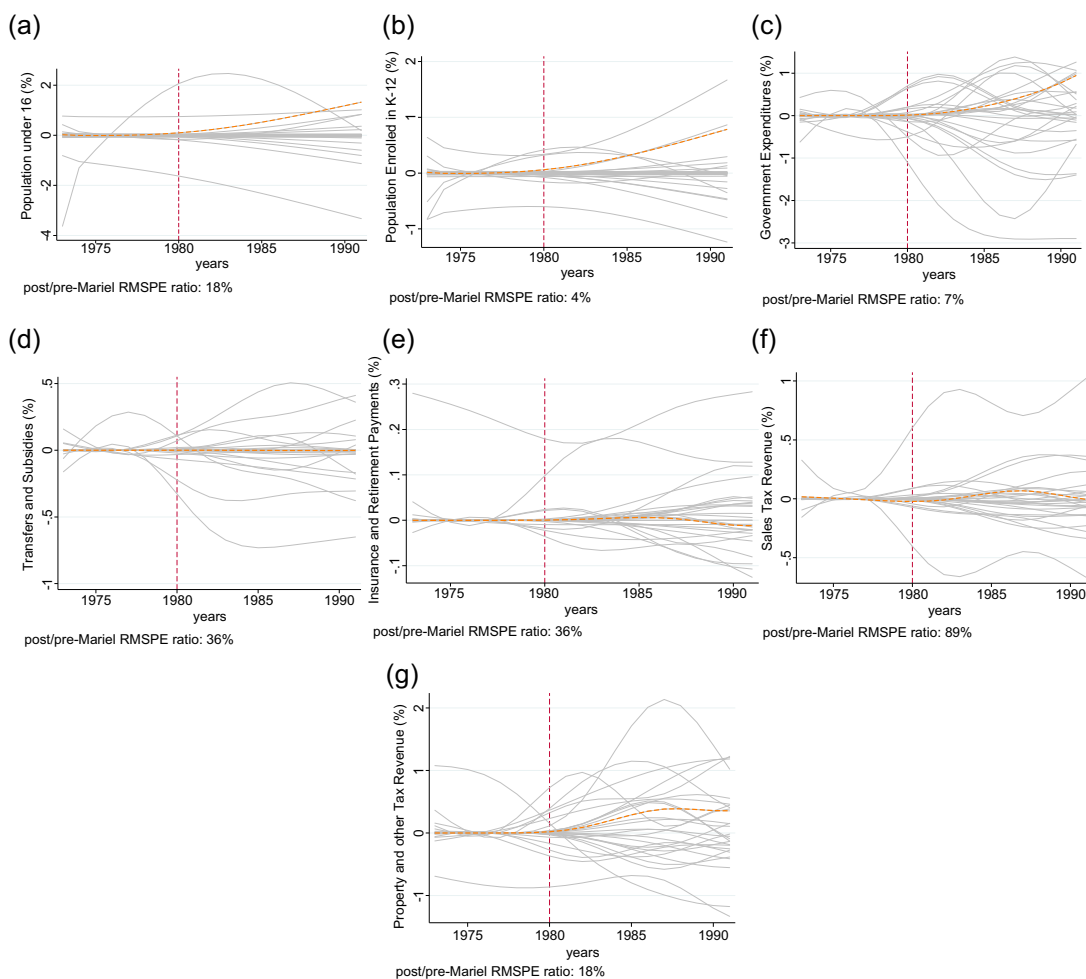
FIGURE 3 Mariel boatlift and local government financing, synthetic control method placebos. (a) Share of population under 16, in-place placebo test. (b) Share of population enrolled in K-12, in-place placebo test. (c) Government consumption (% personal income), in-place placebo test. (d) Government transfers and subsidies (% personal income), in-place placebo test. (e) Government insurance and retirement payments (% personal income), in-place placebo test. (f) Sales tax revenue (% personal income), in-place placebo test. (g) Property and other tax revenue (% personal income), in-place placebo test. *Notes*: For figures 1-4, we synthesize Miami with seven predictor variables: dependent variable in 1973, 1975, 1977; share of Hispanic population (CPS1973-1978; MORG1979-1991), share of low-skilled workers (CPS1973-1978; MORG1979-1991), share of African American population (IPUMS), and share of native-born population with a high school diploma (IPUMS). Shares of population by age and enrolled in K-12 are collected from IPUMS. Data on government consumption, government transfers and subsides, government insurance and retirement payments, sales tax revenue, and property tax revenue are collected from Stansel et al. (2019). [Color figure can be viewed at wileyonlinelibrary.com]

African American as a predictor, adding the share of manufacturing as a predictor, adding the share of immigrant population as a predictor, and adding the share of the population under 16 and over 65 as a predictor.[14]

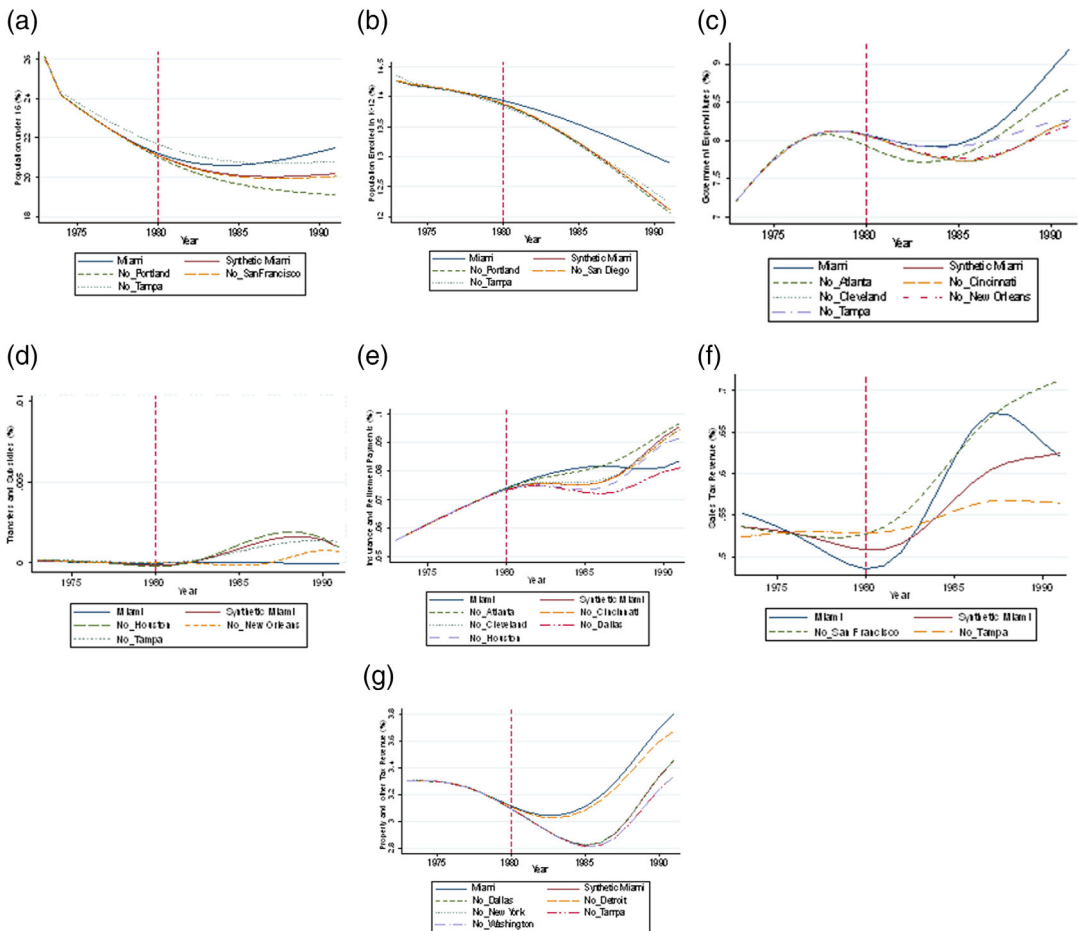[14]These results are not tabulated but are available upon request.

FIGURE 4 Mariel boatlift and local government financing, leave one out. (a) Share of population under 16, leave one out. (b) Share of population enrolled in K-12, leave one out. (c) Government consumption (% personal income), leave one out. (d) Government transfers and subsidies (% personal income), leave one out. (e) Government insurance and retirement payments (% personal income), leave one out. (f) Sales tax revenue (% personal income), leave one out. (g) Property and other tax revenue (% personal income), leave one out. *Notes*: For figures 1-4, we synthesize Miami with seven predictor variables: dependent variable in 1973, 1975, 1977; share of Hispanic population (CPS1973-1978; MORG1979-1991), share of low-skilled workers (CPS1973-1978; MORG1979-1991), share of African American population (IPUMS), and share of native-born population with a high school diploma (IPUMS). Shares of population by age and enrolled in K-12 are collected from IPUMS. Data on government consumption, government transfers and subsides, government insurance and retirement payments, sales tax revenue, and property tax revenue are collected from Stansel et al. (2019). [Color figure can be viewed at wileyonlinelibrary.com]

Figure 3 shows the results of placebo tests for each of the seven fiscal outcomes. The gray lines depict the differences between each donor-pool city's actual fiscal outcomes over time and its respective synthetic's fiscal outcomes. The orange lines in each panel of the figure show the difference between Miami's fiscal outcome over time and its synthetic fiscal outcome. Comparing the orange line in each panel of the figure to the gray lines prior to 1980 shows the goodness of fit of the synthetic Miami relative to the synthetics for the other cities. Comparing the orange

line in each panel of the figure to the gray lines after 1980 shows the effects of the Mariel Boatlift on Miami (orange line) relative to the donors (gray lines).

Here, we discuss two ratios. The first ratio is the percentage of control cities with a pre-Mariel RMSPE at least as large as Miami. This percentage is a measure of goodness of fit of our synthetic Miami to the real Miami before the Mariel Boatlift. A high percentage means the synthetic Miami fits the real Miami before the boatlift better than the synthetics for the control cities fit the real control cities. The fiscal measures for government consumption spending, transfers and subsidies spending, insurance and retirement spending, and property/other tax revenue show very high percentages ranging from 85% to 96%. The other measures show pre-RMSPE ratios of 57% for population enrolled in K-12, 28% for sales tax revenue, and 46% for population under 16. There is no specific rule of thumb by which to compare the percentages, but the synthetic control is a poorer fit for the measures of dependent population (population under 16 and K-12 enrollment) and sales tax revenue relative to the other fiscal outcomes.

Another measure of goodness of fit and statistical significance of the estimated effect of the boatlift is a percentage of control cities with a larger ratio of the post-RMSPE values to the pre-Mariel RMSPE values than Miami. We calculate this percentage for each fiscal outcome and include it at the bottom of each Figure. A large post-pre ratio represents a large and significant effect after the exogenous shock (large post-Mariel RMSPE) and/or a well fit synthetic before the exogenous shock (small pre-Mariel RMSPE).

The percentages of cities with a post-pre RMSPE ratio at least as large as Miami are 18% for population under 16, 4% for K-12 enrollment, 7% for government consumption, 36% for both government transfers and subsidies and government insurance and retirement payments, 89% for sales tax revenue, and 18% for property/other tax revenue. A low percentage indicates that, relative to the control cities, Miami experienced either a large post-boatlift deviation from the synthetic (large post-RMSPE), a small pre-boatlift deviation from the synthetic (small pre-RMSPE), or both.

Consider the 7% number for government consumption. Miami experienced a positive deviation in government consumption from its synthetic after the Mariel Boatlift. Visually, this is shown in the deviation in the orange line from zero in Figure 3c after 1980. Recall that the percentage of cities with a pre-RMSPE value at least as large as that of Miami is 96%, meaning these cities' government consumption deviates more significantly from their synthetic before the Mariel Boatlift. This is shown visually in the lack of deviation in the orange line from zero in Figure 3c before 1980 relative to the control cities' gray lines. Therefore, the fact that only 7% of control cities have a post-pre RMSPE ratio at least as large as Miami is partially (or largely) driven by the relative goodness of fit of the government consumption synthetic (pre-RMSPE). So, given the insignificant result in Figure 1c and Table 3, we do not interpret this result as evidence of a significant effect of the Mariel Boatlift on government consumption. Rather, we interpret this finding as evidence of the goodness of fit of the synthetic of government consumption and a positive but insignificant effect of the Mariel Boatlift on government consumption.

However, for K-12 enrollment, only 4% of cities have a post-pre RMSPE ratio at least as large as Miami. And, for K-12 enrollment, the pre-RMSPE is roughly average (57% of cities have a pre-RMSPE at least as large as Miami). Therefore, the post-RMSPE is largely driving the finding that only 4% of cities have a post-pre RMPSE ratio at least as large as Miami. Visually, this is shown in the significant deviation of the orange line from zero in Figure 3b after 1980 and the relatively average deviation from the synthetic relative to the control cities' gray lines before 1980. This finding combined with the nearly significant effects of the Mariel Boatlift on the

population under 16 and K-12 enrollment shown in Table 3 indicate that there might be some evidence of an increase in the young, dependent population due to the boatlift.

For the other measures, the percentage of cities with a post/pre ratio at least as large as Miami ranges from 18% to 89%. These findings support the finding of no statistically significant effect of the Mariel Boatlift on government transfers and subsidies, government insurance and retirement payments, sales tax revenue, and property/other tax revenue, especially given the goodness of fit of the respective synthetics for all but sales tax.

Figure 4 includes a robustness test for each of the estimates of the effects of the boatlift on the seven fiscal outcome measures. In these tests, the synthetic Miami is recreated by leaving out one of the cities that compose the synthetic to determine if the result is sensitive to the inclusion of any one control city. For share of the population enrolled in K-12, the synthetic barely changes at all as each city is omitted one at a time (Figure 4b). For government consumption, government transfers and subsidies, and property/other tax revenues, omitting one city at a time from the synthetic Miami visually results in different counterfactuals, but the effects measured either stay roughly the same or shrink in each case (Figure 4c,d,g).

The effect of the Mariel Boatlift on population under 16 (Figure 4a), government insurance and retirement payments (Figure 4e) and sales tax revenue (Figure 4f) appear to be the most sensitive to the composition of the synthetic Miami. Though, the effect remains statistically insignificant in every iteration except for the "No Portland" iteration of population under 16 in Figure 4a. Thus, our results showing little fiscal effects of the mass immigration resulting from the Mariel Boatlift are robust to the composition of the counterfactual.[15]

5 | DISCUSSION

One possible explanation for the null fiscal-effect of the Mariel Boatlift on the city of Miami is that the Marielitos might have assimilated rapidly in Miami with the help of the existing Cuban population. This explanation might weaken the external validity of the results found here in so far as the refugee population of the Mariel Boatlift was uniquely similar to the population of its destination city. However, given the proclivity of immigrants to migrate to cities with an already established immigrant population, the Mariel Boatlift might be representative of immigration patterns to the United States more broadly (Zavodny, 1999).

Another possible explanation is that natives in Miami responded to the Mariel Boatlift by improving their own outcomes, such as continuing in their educations and/or labor force participation longer than they otherwise would do (Goswami, 2021; Hunt, 2017). Higher levels of education and higher labor force participation by natives decrease the fiscal burden on Miami's local government, potentially offsetting any additional burden posed by the influx of Cuban refugees.

Perhaps the influx of federal funding was enough to offset any burden created by the Marielitos. The federal government funded welfare programs for as many as 21,000 Marielitos in the first year after the boatlift and allocated money to Dade County schools to educate Marielito children. The federal government ultimately spent over $500 million to manage the influx of

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[15]Our results are also robust to the expansion of the post-treatment period to 2008 and to using alternative treatment years, including 1984 when Cuban refugees were eligible for permanent legal status. These results have been removed from the article due to length considerations, but they are available upon request.

immigrants (Fetzer, 2016). The immediate costs of processing and sheltering the immigrants, however, were born locally. Both the Mayor of Miami and the Governor of Florida at that time report that taxpayers of Miami-Dade County were severely burdened despite federal funding. Dade County reportedly spent at least $41 million of its own money managing the influx of migrants (Fetzer, 2016).

It is also possible that the influx of Cuban immigrants encouraged low-skilled natives to migrate out of Miami to avoid heightened labor market competition. The out-migration of low-skilled natives lightens the fiscal burden on Miami's local government, again potentially offsetting any burden posed by the influx of Cuban refugees.

6 | CONCLUSION

We test whether immigration affects the fiscal outcomes of America's cities using the natural experiment created by the Cuban government's relaxation of emigration restrictions, now commonly known as the Mariel Boatlift. Using a synthetic control method, we create a control group composed of a linear combination of U.S. metropolitan areas that provides a counterfactual for the Mariel Boatlift's effect on Miami's fiscal outcomes.

We examine seven different fiscal measures for evidence of a fiscal effect of the boatlift. We find virtually no effect of the Mariel Boatlift on the share of population under 16 or over 65 nor the share on the share of the population enrolled in K-12, two measures representing the dependent population typically associated with the costs of immigration. We find no effects on government spending on consumption, transfers and subsidies, nor insurance and retirement payments. Further, we also find no effect on sales tax revenue and property and other tax revenue.

In summary, our results suggest that the Mariel Boatlift did not create a fiscal burden in the city of Miami. It is possible that the unique demographic characteristics of the Marielitos limit the external validity of this result. It is also possible that the provision of financial aid to Miami by the federal and Florida state government mitigated the negative fiscal effects of the Mariel Boatlift. However, as we have previously stated, the Marielitos were disproportionately likely to have criminal histories and, thus, to impose costs on local law enforcement. Further, while federal and state funds might have offset the costs of immigration in the short-run, we find no evidence of a short- or long-run fiscal effect of the Mariel Boatlift on Miami.

Therefore, despite the uniqueness of this immigration event, our findings contradict the prevailing belief that immigration negatively impacts local fiscal outcomes and assuage concerns that natives shoulder the fiscal burden of immigration.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT
Data are available upon request.

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