Native Flight Responses to Immigration: Evidence from K-12 School Enrollments

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December 2021

Abstract

Over the past few decades, the U.S. has received a consistent and increasing influx of immigrants into the nation. Immigration poses challenges relating to diversity, inclusion and cohesion in education systems, including K-12 education. In the context of immigration, the theory of native flight argues that U.S. born populations move away from neighborhoods when an increasing number of immigrants move in. I test the theory of native flight in the context of K-12 school enrollments, by examining the impact of immigrant influx on public, private and public charter school enrollments, differentiating across U.S. born races and ethnicities. To do so, I merge yearly school enrollment measures from the common core of data (CCD) with immigration data from the American Community Survey (ACS) over the years 2005-2019. Using an instrumental variables approach (2SLS) to address potentially endogenous settlement patterns of immigrants into Metropolitan Statistical Areas (MSAs), I find that students of U.S. born race/ethnicities display heterogeneous enrollment responses to immigrant influx. Shares of White students and Black students in public non-charter schools decrease significantly in response to an increase in immigration. At the same time, the shares of Hispanic students and Asian students increase significantly in public non-charter schools. Analogous estimates for native flight into private schools lend further credence to public school estimates. Across private schools, the share of White students increases significantly in response to immigration. The share of Black students decreases across private schools as well, signalling a crowding-out effect. There are two key implications. First, significant White flight from the public-school system still exists over the past decade and a half. Second, while the increasing shares of White students in private schools might compensate for White students leaving the public school system, the shares of Black students are dropping across private and public schools.

Keywords: Native Flight ; K-12 Education; White Flight; Immigration.

JEL Codes: C26, I28, J15, J18

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1 Introduction

The share of immigrants in the U.S. has grown rapidly from 4.7% in 1970 to 13.7% in 2019 (Migration Policy Institute, 2022a). During this time the total number of immigrants in the U.S. grew more than four times (Figure 1). The share of children under 18 in the U.S. population living with at least 1 immigrant parent rose sharply from 13.4% in 1990 to 26% in 2017 (Migration Policy Institute, 2022a)[1]. A demographic change of this extent has substantial social, political and economic consequences.

For example, the impacts of immigration have been extensively studied in relation to the U.S. labor market (Altonji and Card, 1991; Foged and Peri, 2015; Llull, 2017; Ottaviano and Peri, 2012); native women's fertility (Furtado, 2015, 2016); social welfare programs (Borjas and Hilton, 1996; Borjas and Trejo, 1991), urbanization (James et al., 1998), healthcare (Lowell and Gerova, 2004) and educational achievement across different groups Jensen and Rasmussen (2011).

Altonji and Card (1991) were the first to provide empirical evidence on the impact of immigration on low-skilled natives[2]. While Altonji and Card (1991) found immigration had an ambiguous impact on the employment rates of low-skilled natives, they found that immigration had a significantly negative impact on wages for low-skilled native labor. More recent studies however explore other outcomes of labor supply. For example, Ottaviano and Peri (2012) found immigration had a small positive impact on wages of low-skilled native workers and had a significantly negative impact on wages for previous waves of low-skilled immigrant workers. Foged and Peri (2015) found that increased immigrant influx had a positive effect on native wages because low-skilled natives moved into occupations of more complex nature. Similarly, Llull (2017) found that native males either switch to white-collar occupations or increase their skill-levels to neutralize almost half of the negative impact that immigration has on native wages. In terms of women's fertility, Furtado (2015) found that low-skilled immigration could explain a significant portion of increases in the likelihood of child bearing and labor force participation amongst native skilled women. In her later work, Furtado (2016) argued that highly skilled, married women with college degrees become significantly more likely to bear children when immigration increases.

Immigration also poses challenges to the administration of the state welfare programs. Borjas and Trejo (1991)

[1]The share of first-generation immigrant children in the U.S. has steadily declined over the past two decades, as per Migration Policy Institute, the term first generation immigrant however includes only those who are born outside the U.S.

[2]Throughout this paper, "natives" refers to the overall U.S. born population.

found that immigration was associated with significant increases in spending on income transfer programs. Similarly, Borjas and Hilton (1996) found that immigrant households are not only significantly more likely to receive state welfare, but are also likely to have longer spells of staying on welfare. Similar studies exist in other sectors. For example, James et al. (1998) analyzed the impact of immigration on urbanization and found that immigrants have caused burgeoning of population in major urban cities since 1970, particularly growing in large urban centers with healthier economies. In the healthcare sector, Lowell and Gerova (2004) argued that immigrants have been important to fulfill the demand shortage of both high-skilled and low-skilled labor force.

Given that immigration has been so extensively linked with different social and economic implications, it is likely that immigration would also impact the demographics in K-12 schools. Contemporaneous immigration trends would suggest that school demographics are likely to undergo significant changes, similar to changes observed across other sectors within the U.S. In particular, this paper is motivated by existing literature on native flight[3] (as further discussed the subsection below) in the context of neighborhood and/ or school compositions.

The theory of native flight suggests that U.S. born students, regardless of race/ethnicity would move out of public schools and enroll in private schools or public charter schools as the immigrant population rises in their respective neighborhoods. The driving mechanisms of native flight are however not entirely clear (Murray, 2016). It could be the case that U.S. born groups do not find homophily with immigrant students (Kruse et al., 2016), and thus choose to move out to private schools in search for homophily. The reasons and motivations of the search for homophily among school students are also not very understood. For example, Kruse et al. (2016) studied homophily in Dutch and German schools and could not find any plausible explanation for the existence of ethnically homogeneous friendship groups that dominate the school friendship networks, but nevertheless discuss that they do find such ethnically homogeneous networks. Another possible mechanism for native flight could be the perception that increasing numbers of immigrant students decrease quality of education (Hunt, 2012) and services in the public schools. This could drive U.S. born populations away from public schools with relatively higher shares of immigrant enrollments.

In this context, two research questions emerge, (1): Is there evidence of native flight from public schools in response to immigrant influx? and (2): Do different race/ethnicity groups differ in terms of their native flight

[3] For example: Betts and Fairlie (2003); Gerdes (2013); Murray (2016); Rangvid (2009); Renzulli and Evans (2005); Wurdock (1981); Schneider (2008); Frey (1979)

response to immigration? Existing literature suggests that there would be significant native flight from public schools into private schools as immigrant influx increases across a geography. Similarly, the existing literature also indicates that flight patterns would be different across different race/ ethnicity groups. To be specific, one would expect that White students would show significantly higher rates of flight as compared to students of other race/ethnicities.

To arrive at a reliable and causal estimate of the impact of immigration on native flight in K-12 schools, the essay relies on an instrumental variables approach (2SLS) to address potentially endogenous settlement patterns of immigrants across Metropolitan Statistical Areas (MSAs)[4]. I examine race/ethnicity shares of enrollments across public, private and public-charter schools as key outcome variables, using immigration as a key independent variable in a exploiting the variation in immigration influx across MSA $\times$ year cells.

I add to the existing literature in multiple ways. To start with, it is likely that native flight patterns could have changed over the past decade or so, since demographics have been changing so rapidly that a saturation point might have reached. I rely on the most recent years of data to confirm previous trends. Second, I estimate native flight while simultaneously analyzing public schools and private schools as well as public charter schools. This approach helps distinguish the impact of native flight from other potential confounding reasons that could drive a reduction in public school enrollments. Relying on innovative data apportionment practices, I generate consistent MSA definitions over the years 2005-2019, which further helped in maintaining the validity of shift-share immigration instrument over these particular years. As detailed further in the paper, this approach to measure immigration at the MSA level is arguably better, allowing me to capture the socioeconomic characteristics of immigration settlement patterns which are usually more identifiable at the MSA level. Finally, I investigate if native flight trends are heterogeneous across U.S. born race/ethnicities.

After a brief discussion on the theory of native flight in the subsequent subsection, I present the data sources and discuss the descriptive statistics in section 2. In the third section, I present the empirical specification for data analysis. In the fourth section, I present key results. I conclude with a discussion and policy implications. Some robustness estimates based on a lagged measure of immigration and a measure of immigrants in young school-age population follow in the two appendices.

[4]A Metropolitan Statistical Area (MSA) is a geographical division drawn for statistical purposes around mean urban centers of business where large population packets begin to aggregate. An MSA can include more than 1 or 2 or 3 nearby adjacent cities and suburbs. For more information: https://usa.ipums.org/usa-action/variables/METAREA#description_section.

1.1 Native flight

The theory of "native flight" emerged from the idea of White flight (Frey, 1979; Wurdock, 1981) which argues that White households leave neighborhoods or urban centers when the concentration of non-White households begins to increase in a neighborhood or geographical area. The reasons for White flight lie in a search for racial homogeneity as well as fiscal features of the neighborhood (Frey, 1979).

Extending this concept, a related term coined to study the flight of U.S. born sub-populations is the term "native flight". When U.S. born sub-populations witness and experience higher levels of immigration, they tend to geographically distance themselves from those immigrants due to various underlying reasons. In most cases, the natives do so by moving into suburban neighborhoods and schools. The motivations for native flight could be any mix of political, economic, and social reasons. The term "native flight" has been used by Betts and Fairlie (2003), Gerdes (2013), Rangvid (2009), and Murray (2016), to study the response of different U.S. born groups as a response to immigration. Native flight in response to immigration has been studied to some extent in relation to K-12 education settings. Murray (2016) found evidence of increases in private school enrollment for White native students in smaller school districts in response to increased foreign born enrollment in public schools, particularly across suburbs and states which traditionally do not receive a large number of immigrants. Murray (2016) also found increased private school enrollment among Hispanic and native minorities in the states which have historically received larger shares of immigrants. Similarly, Schneider (2008) examined data for race/ethnicity wise student enrollments across Urban Los Angeles during the period of 1966-1980 and found evidence of White flight as a response to sub-urbanization. Schneider (2008) found that K-12 enrollments of White students were significantly lower in the urban Los Angeles during the period of 1966-1980, an era of sub-urbanization and desegregation movement in schools. At the same time, Schneider (2008) found increasing enrollments of students of other races. This literature suggests that it is important to examine the racial/ ethnic heterogeneity in the response of native flight to immigrant influx. It is possible that other U.S. populations such as Black or Hispanic sub-populations might also respond the same way one would expect for the White sub-population.

As outlined earlier, existing literature has found associations across immigration and native flight, although the number of studies on the topic remains low. The most recent work by Murray (2016) on this topic has examined if increased enrollment of foreign-born students in a public-school district leads to increases in U.S. born enrollment in private schools in the same school district. Murray (2016) has confirmed increased levels of White and Hispanic Student enrollments in private schools, but he does not consider race-ethnicity wise enrollments in public schools as outcomes. Instead, race-ethnicity wise enrollment outcomes in private schools are treated as outcome variables. Any estimates confirming analogous reductions in White student enrollments across public schools could strengthen the evidence of White flight. Other literature either uses older data as is the case with Betts and Fairlie (2003), focuses on particular, smaller geographies (for example see Schneider (2008)); or is based on geographies outside the U.S. (for example see Rangvid (2009)).

Based on Danish datasets, Jensen and Rasmussen (2011) provided evidence that children in schools with higher concentration of immigrants had lower test scores on maths and reading skills. Brunello and Rocco (2013) used a cross country analysis and provided similar evidence that test scores of native students dropped with increasing number of immigrant children in the classroom. This might explain why U.S. born students tend to move out of public schools when the share of immigrants rises within their neighborhoods or schools. It also, might be the case that the quality of education and services remains lower at schools with higher concentration of immigrants, thus motivating U.S. born students to move out of such schools.

The issue of native flight has important policy considerations. For example, the literature on school choice has argued that private school and charter school enrollment adds to racial and social segregation (Bifulco and Ladd, 2006; Carlson, 2014; Soderstrom and Uusitalo, 2010). Bifulco and Ladd (2006) and Hoxby (2001) link increased segregation with negative effects on student achievement. Bifulco and Ladd (2006) have also argued that public school finance which relies on per pupil funding, also suffers when students move out to private or charter schools as they take their public finance with them. Therefore, it is important that this policy issue gains research attention.

2 Data Description

Data for the paper are derived from multiple sources. School level enrollments and other data on characteristics of public schools come from the Common Core of Data (CCD) collected by the National Centre of Education Statistics (NCES) (U.S. Department of Education, 2019a), while data on private school enrollment and school characteristics come from the Private School Universe Survey (U.S. Department of Education, 2019b). Elementary and Secondary

Information System (*Elsi*) by NCES maintains data for each school in two universes: (i) Public School Universe Survey which maintains data from public schools and public charter schools from school year 1987-88 on-wards, and (ii) Private School Universe Survey maintains biennial data from school year 1997-98 onwards. Using *Elsi*, I extract pubic school data for the years 2005-2019 and private school data for each available year during the same period i.e. 2005-2019. To construct a measure for immigration, data for 166 Metropolitan Statistical Areas (MSAs)[5] is sourced from the U.S. Decennial Census of 1980 and the U.S. Census Bureau's annual American Community Survey (ACS) estimates for the years 2005-2019 (Ruggles et al., 2019).

2.1 Measures of school enrollment

The sample includes all public and private schools that existed[6] in 166 identified MSAs though the years 2005-2019. NCES maintains data for each public school data and private school, although while it maintains public school universe data for every year, it offers comparable data for private schools only for each alternating year. A strength of the NCES public and private school universe survey is that it provides several geographic identifiers for individual schools allowing them to be linked to MSAs, which allowed the author to attach MSA identifiers to each school. Since charter public schools are often specialized schools, charter public schools are identified and considered as a different category of schools different from regular, non-charter public schools. The overall sample consists of 63,860 public schools, and 30,578 private schools and 9489 public charter schools[7], across 166 MSAs. Descriptive statistics for public schools, private schools and public-charter schools are respectively presented in Table 1, Table 2 and Table 3.

The first outcome of interest is a measure of mean annual total enrollment. The overall enrollment trends across public and private schools have not changed much during the past few years. Mean total enrollment in public and private schools remains consistent over 2005-19 (Table 1 and Table 2), while mean total enrollment across public charters schools increases nearly two-fold over 2005-19 (Table 3). The overall enrollment trends from statistics provided by a recent report from the National Center for Education Statistics confirm the same, regular public school enrollments decreased slightly (from around 47.5 million to 47.1 million) over the past decade (U.S.

[5]Out of possible 384 MSAs, only 166 MSAs have been consistently identified in the ACS data across 2005-2019.
[6]and enrolled at least 1 student.
[7]The number of unique school in a calendar year might be different, as old schools shut down and new schools open.

Department of Education, 2021), the total private school enrollment fluctuate between 5 and 6 million students from 1999-2017 (U.S. Department of Education, 2017), and public charter school enrollments more than doubled during 2009-2018 (U.S. Department of Education, 2021).

The key outcome measures of school enrollment include race/ethnicity shares of enrollment for White, Black, Hispanic and Asian students. For public schools, mean percentage shares of race/ethnicity specific enrollment shares[8] are presented in Table 1 and graphed in figure 3. White student enrollments across public schools represented 52.2% of total enrollments in 2005, which dropped to 42.7% in 2019. The share of Black student enrollments across public schools dropped slightly from 18% in 2005 to 15.3% in 2019. The share of Hispanic student enrollments in public schools increased from 23.4% in 2005 to 30.8% in 2019, while the share of Asian student enrollments in public schools increased modestly from 5.7% in 2005 to 6.9% in 2019. In public schools, the reduction in the shares of White and Black student enrollments might not present the complete picture. As discussed above, the mean enrollment size across U.S. public schools is not increasing. Could it be the case that actual number of schools is increasing which could mean that White students and Black students are simply more spread across more number of schools? This is however not the case, not at least within the 166 sample MSAs. In 2005, the total student enrollment across non-charter public schools in 166 MSAs was 31.63 million. Out of these 31.63 million total enrollments, 16.53 million were White student enrollments, 5.69 million were Black student enrollments, 7.41 million were Hispanic student enrollments whereas 1.81 million were Asian student enrollments. In 2019, the same 166 MSAs had 32.95 million total student enrollments across public schools. Out of these 32.95 million enrollments, 13.90 million were for White students, 5.03 million were for Black students, 10.15 million were for Hispanic students and 2.26 million were for Asian students.

This shows that in terms of the shares of total enrollments as well as in terms of absolute numbers, White and Black student enrollments have consistently declined across public schools across 166 urban MSAs, even when total enrollments slightly increased over time. Overall, these trends signal that demographics within the public K-12 schools are changing rapidly with schools become more diverse over time, reflecting the changing demographics of the country.

Similar demographic changes are observed across private and public charter schools. The share of White

[8] weighted for total school enrollments

student enrollments fall across all types of schools, and the share of Hispanic and Asian student enrollments make up slightly higher proportions of total enrollments. Across private schools (Table 2.), the overall share of White student enrollments fell from 72.9% in 2006 to 63.2% in 2018. The shares of Black student enrollments across private schools remained consistent around 10% while the share of Hispanic student enrollments increased from 10.7% in 2006 to 12.8% in 2018. The shares of Asian student enrollments in private school was 4% in 2006, which increased to 7.3% in 2018. These trends are shown in figure 4. Besides shares of enrollment, it is also important to contextualize these statistics while keeping in mind the total number of enrollments. In 2006, there were a total of 3.16 million student enrollments across private schools within the 166 analysis MSAs. Out of these 3.16 million enrollments, 2.30 million were White student enrollments, 0.33 million were Black student enrollments, 0.34 million were Hispanic student enrollments, while 0.13 million were Asian student enrollments. In 2018, total private school enrollments across 166 sample MSAs dropped to 2.67 million. Out of these, 1.69 million were White student enrollments, 0.27 million were Black student enrollments, 0.34 million were Hispanic student enrollments and 0.20 million were Asian student enrollments. Overall, two important trends emerge for private school enrollments. First, across the 166 urban MSAs in the sample, overall private school enrollment has decreased by around 15% over 2006-2018. Overall, the share of White students and Black students has dropped across private schools, while the shares of Hispanic and Asian student enrollments has grown to some degree.

Across public charter schools (Table 3), White student enrollments were 37.2% of total enrollments in 2005, which fell to 27.7% in 2019. The share of Black enrollments in public charters fell from 35% in 2005 to 26.7% in 2019. Shares of Hispanic students in public charters increased the most over this time period, from 23.5% in 2005 to 36.3% in 2019. The shares for Asian students in public charters increased from 3.4% in 2005 to 4.5% in 2019. These trends are presented in figure 5. It also appears that enrollments across public charter schools have consistently increased over time. In 2005, only 0.71 million students attended public charters. Total enrollments across public charters increased by 400% to 2.82 million in 2019. In 2005, 0.26 million were White student enrollments, 0.25 million were Black student enrollments, 0.16 million were Hispanic student enrollments and 0.02 million were Asian student enrollments across public charter schools. In 2019, White student enrollments increased to 0.78 million, Black student enrollments increased to 0.75 million, Hispanic student enrollments increased the most to 1.02 million and Asian student enrollment increased to around 0.13 million. It could be worthwhile to explore if these demographic changes across public charter schools are linked with changes in the shares of foreign born population across metro areas.

Besides the key outcome measures, a matrix of control variables for each public school includes pupil-to-teacher ratio, number of full-time employed teachers, the level of school[9], schools agency type[10], and the Title-1 status of the school. For private schools, the control matrix also includes if the school has a religious or community affiliation.

2.2 The Share of Immigrants in the Population

The sample for immigration estimates includes all native (outside group quarters) and foreign born individuals in the American Community Survey (ACS) microdata, regardless of age, race or any other demographics. An immigrant is identified as someone who is foreign born and who is either not a citizen or is a naturalized citizen[11]. The key independent variable in the paper is the immigrant share of population within MSA $\times$ year cells. I attach this MSA $\times$ year level immigration measure to each school, which keeps my unit of analysis at School $\times$ MSA $\times$ year level.

This approach has been widely used in previous immigration literature dating back to Altonji and Card (1991), and has been used until recently, for example by Furtado (2016) and Jaeger et al. (2017). It could also be the case that U.S. born families do not move their children to private schools in response to immigration, but instead move towards suburban areas, with possibly lower levels of immigrant enrollments in public schools (Betts and Fairlie, 2003). If I were to take a county level or a school district level measure of immigration, such an approach would exclude specific smaller suburban counties from my sample altogether since smaller counties are not identified in ACS microdata extracts. This would introduce an upward bias in the estimate on public school flight, when despite changing schools students are in fact only moving to other public schools. The flight from urban public schools to suburban public schools is an intriguing question, but my focus for the paper remains on the flight out of public schools. On the contrary, as Betts and Fairlie (2003) have argued that MSA definition's usually encapsulate suburban geographies within the boundaries of the MSA, and thus a measure of immigration on the

[9] the highest and the lowest grades taught.

[10] This variable captures if the school agency is a regular local school district, or a regular local school district that is NOT a component of a supervisory union, or a local school district that is a component of a supervisory union, or an independent charter district, a regional education service agency (RESA), a state agency providing elementary and secondary education or a supervisory union administrative center or any other form of educational agency

[11] which would mean was not a citizen at birth.

MSA level allows me to reduce the possible bias that could arise from taking other geographical approaches to measure immigration.

166 MSAs are consistently recognized across 2005-2019. I restrict my analysis to these 166 MSAs to ensure consistency of geographical coverage for estimation purposes. The key independent variable is thus a measure of immigrants as a share of overall population within MSA $\times$ year cells. Mean yearly shares of immigrants in the sample population are presented in figure 2. Across the sample MSAs, the share of immigrants was around 14.9% in 2005, which increased to 16.7% in 2019.

Before concluding this section it is important to note that I use the immigrant and native population of all ages (in contrast to just the school-age population) to calculate the share of immigrants in the population. The median age of an immigrant is higher than the median age in the U.S., which means that school aged children (ages 0-17) make up around 5 percent of immigrants, whereas the same age bracket accounts for about 18 percent of the U.S. population (Migration Policy Institute, 2022b). Children of these immigrants born in the U.S. however are U.S. citizens by birth, but could nevertheless motivate native flight due to been ethnically different. For this reason, the political or racial dimension of the motive for native flight is perhaps better captured by an MSA level measure of immigration. Furthermore, the influx of immigrants in an MSA is more politically visible as compared to the influx of foreign-born students in schools. The higher median age of immigrant profile in the U.S. and its connection with possible influx of U.S. born but ethnically different[12] students in the public school system also suggests that an appropriate measure of immigration should consider immigrants of all ages, not just the age-bracket of immigrants that corresponds to school going age[13].

Immigrants have a tendency to settle into geographies in clusters, based on earlier settlement patterns of previous waves of immigrants (Altonji and Card, 1991; Card, 2009). They do so in order to gain network and peer support from previous immigrant settlers, which could possibly help them settling in, form connections and find work. For these reasons, some MSAs traditionally receive high shares of immigrants and some do not, introducing overtime variation in immigrant influx across MSAs. In 2019 for example, Table 4 lists the top 10 and bottom 10 MSAs with respect to the shares of immigrants. On one extreme, some southern MSAs like Miami-Fort Lauderdale-West Palm MSA in the state of Florida, those closer to the border of Mexico like El Paso MSA in the state of Texas, or

[12] being born to immigrant parents

[13] As a robustness test though, I later include the estimates based on an alternative measure of immigrants aged 3 to 20 in the paper.

some MSAs near the ports such as Los Angeles-Long Beach-Anaheim MSA in the state of California had immigrant shares as high as 24 to 40 percent. On the other hand, share of immigrants across many rural and far-lying MSAs such as Anniston-Oxford-Jacksonville MSA in the state of Alabama or the Saginaw MSA in the state of Michigan were as minimal as about 1 percent. This variation in immigrants shares of populations across MSAs can be exploited to estimate the impact of immigration on school enrollment demographics.

3 Empirical Strategy

The paper aims to estimate the impact of immigration on native flight in K-12 schools, with the key independent variable being the share of immigrants in the population within each MSA × year cell. Compared to measuring immigration on the county or school-district level, an MSA level measure of immigration offers several key advantages. An MSA level measure of immigration resonates more closely with political reasons of native or white flight. For example, an alternative approach could use a direct measure of foreign-born enrollment within the public schools district, as a key independent variable (for example in Murray (2016)). However, the rationale for not adopting this alternate approach to measure immigration lies in the multiple mechanisms which motivate native flight from public schools. The first mechanism is the search for homophily among students and families. Students and families tend to find and form networks with ethnically homogeneous people due to cultural and sociological reasons (Shrum et al., 1988). The second mechanism is the search for better quality schools, conditional on the assumption that families think that higher levels of immigrant shares in schools are associated with lower school quality. The third mechanism is political or racial motivation or desire to stay apart from immigrants. While it is admittedly hard to identify and isolate these three mechanisms of native flight in any empirical approach, I would argue that the measure of immigration on the MSA level provides a better approach to capture these mechanisms that motivate native flight. A measure of immigration capturing foreign shares of enrollment within schools would capture the motivation of the native population to keep their children in homogeneous groups with similar social, cultural and economic features. However, this approach still would not fully capture the political or racial mechanisms motivating native flight. Since parents arguably have more decision making responsibility in most school choice decisions, their decisions are logically more likely to be driven by the political visibility of immigrants within neighborhoods or geographies rather than the actual enrollment of foreign born students in the schools which their children attend.

As I have earlier argued, the influx of immigrants in an MSA is more politically visible as compared to the influx of foreign-born students in schools. For this reason, I argue that while MSA level influx of immigrants will correlate with increases in foreign-born student enrollment in public schools for obvious reasons, using MSA level immigrant patterns as a measure of immigration patterns offers a more direct and relevant mechanism to capture the political and racial dimension of native flight.

3.1 Empirical Specification

The main specifications for this paper take the following form:

$$Y_{s,m,t} = \gamma I_{m,t} + X^{'}_{s,m,t} + Z^{'}_{m,t} + \zeta_m + \eta_t + \varepsilon_{i,m,t} \tag{1}$$

In equation 1, the key dependent variable Y depicts various forms of outcomes which include log total enrollment and race/ ethnicity shares of White, Black, Hispanic and American Asian school enrollments[14] in school s located in MSA m in year t. Key independent variable I_{mt} in equation 1 is the share of immigrants in the population in MSA m in year t. $X^{'}$ is a vector of school level controls that control for time variant school characteristics such as pupil to teacher ratio, Title-1 status of school, number of full time employed teachers and type of school district. $Z^{'}$ is a vector for controls that control for time variant MSA characteristics, MSA fixed effects (ζ) control for time-invariant MSA fixed effects, while year fixed effects (η) control for year specific macroeconomic and policy shocks that systematically affect all metropolitan areas in the country[15]. The main specification also includes the disturbance term ε. Analogous specifications are run for the public (non-charter) school, private school, and public charter school samples. The key coefficient of interest γ is the coefficient on the share of immigrants in MSA m in year t. To account for the size of school, all regressions for race/ethnicity shares of enrollment are weighted for total school enrollment. Since the residuals are likely to be correlated within MSA $\times$ year cells, the standard errors are clustered at the same level, within MSA $\times$ year cells.

[14] For example, Share of White students = (total White students enrolled in school s in year t / total enrollment in school i in year t) $\times 100$.

[15] In equation 1 above, the year fixed effects are not interacted with MSA fixed effects, this is due to data limitations. Across many MSA $\times$ year cells, the number of schools allocated remains too few, which over-inflates the standard errors on the specifications. The instrument is also considerably weaker in settings with MSA $\times$ year fixed effects. Jaeger et al. (2017) in fact argue that a weak shift-share immigration instrument is more likely to meet the exclusion criteria. This would mean that perhaps the instrument is best suited to specification as shown in column (4) of Table 5. If the instrument becomes any weaker, it betters meets the exclusion criteria, but then the IV2SLS estimates could be biased.

3.2 Identification

Immigration and school enrollment decisions in equation 1 are potentially endogenous due to various reasons. Public school spending and immigrant patterns could be correlated (Mavisakalyan, 2011), as newer waves of immigrants could be inclined to settle in geographies with better schooling opportunities. Settlement decisions and patterns of both native and immigrant families influenced by factors other than immigration such as search for work, economic mobility or other socioeconomic changes, could also be spuriously correlated with children moving in and out of public or private schools (Betts and Fairlie, 2003). A similar source of endogeneity identified by Cascio and Lewis (2012) relates to the socioeconomic characteristics of a geography which might attract both immigrants and native populations at the same time, thus changing the composition of immigrants within both public and private schools. All these sources of endogeneity create a potential identification problem, which has been countered using an instrumental variable approach[16].

To counter this threat of endogeneity, the share of foreign-born population in this paper is instrumented via a shift-share past settlements instrument. Shift-share instrumental variable approach to instrument for immigration was first detailed out by Bartik (1991) and has been since extensively used in immigration related studies[17]. The shift-share past settlements instrument predicts current immigration share in MSA m at year t from country j, based on the shares of past settlements of immigrants from country j in MSA m at year $t-20$ or $t-30$. To illustrate, the instrument variable for this paper takes the following form:

$$Predicted\ Immigration_{m,t} = \sum_{j}^{n} \left(\frac{Immigrant_{m,j^{1980}}}{Immigrant_{US,j^{1980}}} \times Immigrants_{j,t} \right) \tag{2}$$

where: MSA=m, year=t, and j=origin country of the immigrants.

Thus, the predicted immigration in MSA m in year t is determined by the following three steps: (i) for each country of origin j, all immigrants are allocated to MSAs as per the actual distribution of immigrants from country j in

[16] Instrumental variable approach in econometrics was first outlined by Reiersol (1941), it is useful in estimating unbiased causal relationships between two variables, when the explanatory and dependent variable are endogenous, and/ or correlated with the error term of the estimating equation (Angrist et al., 1996). Under this approach an instrument variable is identified which is correlated with the endogenous explanatory variable but is uncorrelated with the error term.

[17] (For example see: Furtado (2015), Goldsmith-Pinkham et al. (2020), Jaeger et al. (2017), Murray (2016), and Romiti (2018) amongst others).

the year 1980[18,19], (ii) In each predicted year, same share of immigrants from country j are allocated to each MSA m as per the MSA allocations in 1980 above, and (iii) all predicted shares of immigrants from all j countries are summed up for each MSA m for year t, i.e. 2005-2019.

An example of this approach will work as follows. If 30% of immigrants from Italy were to settle in the MSA of Phoenix-Mesa-Chandler in 1980, and say if 10,000 immigrants from Italy came into the U.S. in 2018, this instrument will allocate 30% of these immigrants, i.e. 3000 immigrants from Italy to Phoenix-Mesa-Chandler for the year 2018. This is iterated over all countries of origin and summed up to find total predicted number of immigrants within each MSA $\times$ year cell.

The validity of the instrument lies in the argument that for several reasons, the past settlement patterns of the immigrants could not be correlated with the current socioeconomic changes in an MSA m. First, the national inflow of immigrants from any country at time t can be expected to be exogenous to the local conditions of an MSA m (Altonji and Card, 1991; Jaeger et al., 2017). Second, since the instrument allocates the share of current immigrants to MSAs based on past settlement patterns, even if the national inflow of immigrants from any country is not deemed to be exogenous to local economic conditions of the U.S. in the strictest sense, the current immigrant inflow trends cannot be related to local economic conditions[20] 20 or more years prior to today or in the year 1980 (Card, 2009; Altonji and Card, 1991). Finally, since the immigrants tend to settle in clusters in vicinity of geographic settlement locations of previous settlements, the previous settlement patterns serve as a good prediction mechanism for future settlement patterns (Card, 2009). Indeed, the instruments accuracy to predict future immigrant inflows is cited as one of its greatest weaknesses, as strong auto-correlation across yearly values of instrumented immigration can potentially conflate short-run impact with long-run impacts of immigration, particularly so for case of labor markets outcomes (Jaeger et al., 2017). If this is indeed the case, the instrument is also likely to fail in isolation of the

[18] The MSA definitions were revised in 2013 by the U.S. Census Bureau, and the older MSA definitions (as captured by the variable metarea in the ACS-IPUMS extracts) are not available for ACS data past 2011. The newer definitions of MSAs are instead captured by variable met2013 in ACS-IPUMS extracts, which is only available past the year 2005 onwards. The new MSAs and their boundaries, do not correspond directly to the older MSAs or their boundaries. However, the new 2013 based MSAs (variable met2013 in ACS-IPUMS), consist of entire counties, the boundaries for which seldom change. Some MSAs were merged and some were split, mostly added or subtracting entire counties. Since I wanted to include most recent data on school enrollment, for my independent variable I use new MSA definitions, defined by the variable met2013. To construct a reliable instrument based on 1980 definition, I manually construct the met2013 variable based on a combination of prior MSA codes and county fips codes where available. For example, say an MSA in 2005-2019 has 4 counties but the same MSA had only 2 counties in the year 1980. If the additional counties are identifiable in the year 1980, I add those to 1980 MSA definition. I was able to construct a reliable instrument this way for the 166 sample MSAs, as evidenced by the sample first stage. For more information: https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/historical-delineation-files.html

[19] A similar approach to manually match met2013 to metarea has been taken by Charles et al. (2018) in their AER paper on housing booms, labor market busts and college attendance, for more information please see: https://www.aeaweb.org/content/file?id=8025

[20] within the U.S. MSAs

exogenous and endogenous components of immigration (Jaeger et al., 2017). However, while dynamic adjustment of local wages in the long-run[21] in addition to the short-run shock on local wages[22] is a well documented process, there is no evidence that similar concerns exist in terms of school enrollment outcomes. Typical long-run adjustment in wages occurs because native workers either gain upward skill mobility or change careers. There can be no such response when it comes to school enrollments. In a sense, school enrollments can be measured as a stock rather than a flow[23]. The baseline year selected to calculate MSA shares of immigrants is 1980, which provides for a gap of at least 25 years between the baseline year and the prediction years.

To further control for systematic and contemporaneous economic pull and push factors affecting immigrant locating decision across cities, I control for MSA and year fixed effects, as well as a set of MSA specific time-variant controls, following the approach proposed in earlier immigration literature (Card and Peri, 2016; Cortes and Tessada, 2011; Llull, 2017; Foged and Peri, 2015; Furtado, 2015).

To test the strength of the instrument, I run the following first stage equation:

$$I_{m,t} = \gamma[ln(Predicted\ Immigration_{m,t})] + Z^{'}_{m,t} + \zeta_m + \eta_t + \varepsilon_{m,t} \tag{3}$$

where the dependent variable I_{mt} in equation 1 is the share of immigrants in the population in MSA m in year t, regressed on the instrumented (predicted) log-number of immigrants in MSA m in year t. Analogous to equation 1, $Z^{'}$ is a vector for controls that control for time variant MSA characteristics, MSA fixed effects (ζ) control for time-invariant MSA fixed effects, while year fixed effects (η) control for year specific macroeconomic and policy shocks.

The first stage estimates for strength of the instrument are presented in Table 5. Column (1) presents the baseline OLS specification with the instrument regressed on the shares of immigrants in the population. MSA level time variant controls are added in column (2), such as controls for mean poverty rates, mean household income, and mean household value. In column (3), MSA fixed effects are added, while the key specification of interest in column (4) includes both MSA and year fixed effects. For a robustness check, column (5) is a limited sample that excludes the cities of Miami, New York and Los Angeles as well as all the other MSAs in the state of California, as

[21] usually an upward impact on wages in the long-run
[22] usually negative pressure on local wages.
[23] A similar argument has been made in Butcher et al. (2021)

these cities and regions have historically received higher number of immigrants (Cortes and Tessada, 2011; Ruggles et al., 2019). All regressions are weighted for MSA populations, and standard errors are clustered into MSA × year cells.

In the key specification of interest presented in column (4), the coefficient on the instrument shows that for a 10 percent increase in the number of immigrants in an MSA m in year t, the share of immigrants in the population increases by around 0.47 percent. The F-statistic on this coefficient is 68.00, which is well above the recommended strength of F-statistic on the first stage (Cameron and Trivedi, 2010). Throughout columns (1) through (3), the instrument passes the required strength test. In column (5), when LA, Miami, New York and the cities in the state of California are removed from the model, the instrument remains reasonably robust, with an F-statistic of 23.09.

4 Results

The estimates for public school enrollment are presented in Table 6. The first column presents baseline OLS estimates, while the second column adds controls for time-variant MSA characteristics. In column (3), MSA fixed effects are added to the specification, in column (4), year fixed effects are added and MSA fixed effects are removed from the specification, while in column (5), both MSA and year fixed effects are included. Column (6) presents the IV2SLS estimates. Table 7 presents analogous estimates for private school enrollment and Table 8 presents analogous estimates for public charter school enrollment.

4.1 Public School Enrollment

I start by estimating the log of mean total enrollment in Panel A of Table 6. The baseline OLS estimate in column (1) indicates that mean total school enrollment increases by around one percent for a one percent increase in the share of immigrants in the population. The estimate remains significant but drops slightly in magnitude in column (2) when controls for time-variant MSA characteristics are added. When both MSA and year fixed effects are added in the fixed effects model, the effect size becomes statistically insignificant. However, throughout column (1) through (5), the estimates could be biased due to concerns for endogenous school enrollment and immigrant patterns. The IV2SLS estimate in column (6) indicates that mean total enrollment across public schools increases by 2.5 percent in association with a 1 percent increase in the share of immigrants in the population. In a rather simple interpretation, this estimates leads me to believe that the average school size increases in immigrant receiving MSAs.

Estimates for the share of White enrollment are presented in Panel B of Table 6. OLS estimates in columns (1) and (2) are both negative and significant, indicating a 1.274 percent to 1.386 percent decline in the share of White enrollment for a one percent increase in the share of immigrants in the population. Estimates are pretty similar in columns (4) and (5) when either of the MSA and year fixed effects are included in the specification. When the specification adds both MSA and year fixed effects, the magnitude of the slightly negative effect on shares of White enrollment is smaller and statistically insignificant. Once again, this is understandable in the context of endogeneity concerns. The IV2SLS estimate in column (6) is more likely to be unbiased, which indicates a 0.55 percent decline in the share of White enrollment for a one percent increase in the share of immigrants in the population.

Panel C of Table 6 presents estimates for the share of Black enrollment in public schools. Baseline OLS estimate indicates that the share of Black enrollment decreases by 0.35 percent for a one percent increase in the share of immigrants in the population. This small negative effect on the share of Black enrollment is sensitive to the inclusion of MSA level time variant controls and MSA or year fixed effects, but remains the same in magnitude and statistically significant when MSA level controls as well as MSA and year fixed effects are added in column (5). The effect size becomes bigger in magnitude in the IV2SLS estimate in column (6), which indicates a 0.76 percent decline in the share of Black enrollment for a one percent increase in the share of immigrants in the population.

Estimates for the share of Hispanic enrollment are presented in Panel D of Table 6. Baseline OLS estimate indicates that the share of Hispanic enrollment increases by 1.41 percent for a one percent increase in the share of immigrants in the population. This estimate remains robust across specifications (1) through (4). In column (5), when both year and MSA fixed effects are included, the effect size reduces to 0.26 percent, but is still strongly significant. As seen for the shares of White and Black enrollment, IV2SLS estimate is bigger than the OLS estimate and statistically significant, indicating that Hispanic enrollment increases by 0.48 percent for a one percent increase in the share of immigrants in the population.

Panel E of Table 6 presents estimates for the share of American Asian enrollment across public schools. Baseline OLS estimate indicates that the share of American Asian enrollment increases by 0.33 percent for a one percent increase in the share of immigrants in the population. This estimate remains robust across specifications (1) through (5). As seen previously, the second stage instrumental variable estimate is bigger than the OLS estimate and statistically significant, indicating that American Asian enrollment increases by 0.57 percent for a one percent increase in the share of immigrants in the population.

As expected, for the most cases IV2SLS estimates across Panel (A) through (E) are stronger and statistically significant than OLS estimates. This shows that OLS estimates are more likely to be biased towards zero and estimate a smaller effect size for the race/ethnicity wise shares of enrollment. Native flight from public schools is not homogeneous across all race/ethnicity groups. While the shares of White and Black enrollments fall by 0.55 and 0.76 percent, the shares of Hispanic and American Asian enrollment respectively increase by 0.48 percent and 0.57 percent. These findings perhaps also provide some insight into the mechanisms for native flight. While Hispanic and American Asian students might find some degree of homophily with immigrants, the White and Black sub-populations might not find the same degree of homophily and move away from public schools. In the context of increasing shares of immigrants in the U.S. population (figure 1), these estimates could be quite meaningful.

4.2 Private School Enrollment

Estimates on the log of total enrollment across private schools are presented in Panel A of Table 7. The slightly positive OLS estimate in column (1) indicates that private school enrollment increases by about one student for a percent increase in the share of immigrant population. However this estimate is not robust to changes in the specifications. The IV2SLS estimate in column (6) is small and statistically insignificant. This finding resonates with the descriptive evidence presented in section 2, indicating that total private school enrollment has remained consistent overtime.

Panel B of Table 7 contains estimates for the share of White student enrollments. While the OLS estimates in column (1) and (2) as well as column (3) and (4) are negative and statistically significant, the estimate turns positive but insignificant in the most stringent fixed effects specification in column (5). The IV2SLS estimate though is positive, bigger, and statistically significant, showing a 1.36 percent increase in the share of White student enrollments in private school, in response to a 1 percent increase in immigrant share on the MSA level. This findings confirm the theory that White students move out of public school and move into private schools in response to increased shares of immigrants on the MSA level.

In Panel C of Table 7, the estimates for the share of Black student enrollment across private schools are presented. The OLS estimate in column (2) is positive and significant but turns negative and significant when both MSA and year fixed effects are added in column (5). IV2SLS estimate in column (6) is greater in magnitude, and indicates that in response to a 1 percent increase in immigrant share on the MSA level, the share of Black student enrollments in private schools drops by 0.72 percent. This finding is a little bit surprising, yet explainable. It appears that the Black students are dropping out of both public and private schools at the same time. This might indicate some crowding out effect in both public and private schools for Black students, given that significant socioeconomic differences exist across Black and White households making them less likely to attend private schools or to keep attending and finishing public schools.

Panel D of Table 7 contains estimates for the share of Hispanic student enrollments. The positive OLS estimates on the share of Hispanic student enrollments are not robust to inclusion of both MSA and year fixed effects, and the same is confirmed via IV2SLS estimates. Once again the IV2SLS estimate is stronger in magnitude, however remains statistically insignificant. Although changes in the shares of immigration on the MSA level do not appear to influence Hispanic students to move out of private schools, yet this finding is expected given that the share of Hispanic public school enrollment was increasing in Table 6.

Panel E of Table 7 contains estimates for the share of American Asian student enrollments. For American Asian students as well, the positive OLS estimates on the share of Hispanic student enrollments are not robust to inclusion of MSA level controls or the inclusion of MSA and year fixed effects, and the IV2SLS estimates are also insignificant.

To sum up these findings, private school enrollments do not respond to the share of immigrants, except for the shares of White and Black students in private schools. While the effect on the share of White students is positive and understandable, the negative effect on the share of Black students is a little bit harder to interpret. It could be the case that the socioeconomic status of Black households and the resulting crowding out of Black students in private schools is driving these estimates. On the other hand, it might be also be a case that perhaps Black students are dropping out from K-12 schools altogether. Some descriptive analysis might shed some light on this, while in the 166 MSA's the total number of Black enrollments dropped across public and private schools (as noted in section 2), statistics from the Pew Research Center (2021) show that the Black population across the U.S. has indeed increased from 35 million to 47 million over the past two decades. This could indicate that Black students could be dropping and crowding out from both public and private schools. Alternatively, Black students might be moving outside these 166 MSAs, a theory which I cannot test due to data limitations.

4.3 Public-Charter School Enrollment

The estimates for public charter school enrollments are presented in Table 8. The IV2SLS estimates for the log total enrollments show a statistically significant decline of 3.75 percent in response to 1 percent increase in immigrant shares in the population. Given that the overall public charter school enrollment grew by around 400% over 2006-2018, this finding is intriguing. Perhaps, this finding is driven by the fact that there is some anecdotal evidence that immigrants might prefer public charter schools for specialized education (The New York Times, 2009; Learning for Justice, 2010). If indeed immigrants students are increasingly enrolling into public charter schools, the theory of native flight would predict that U.S. born students would move out of public charter schools.

For race-ethnicity shares, none of the IV2SLS estimates are statistically significant. Perhaps this is a small sample, and the smaller number of schools within MSA $\times$ year clusters probably inflates the standard errors. Nevertheless, while the coefficient on the shares of other races/ ethnicities is negative, the coefficient on the share of White enrollment is positive.

5 Robustness

Two concerns remain with the specification in equation 1. The first one is the possibility that school enrollment responses are lagged by one year, and any estimates that estimate contemporaneous school enrollment measures at the same time when shares of immigrants are measured could be spurious. While this is unlikely, it is still a possibility. A second concern is that school enrollment responses to share of immigrants in the younger population could be more relevant and different from the estimates presented in Table 6, Table 7 and Table 8. To address these concerns, I run additional specifications as robustness tests. Two of these robustness tests are briefly discussed in this section. In addition, I run additional regressions while taking the state of California, New York and New

Jersey, as well as the MSA's in Miami, Florida to ensure that estimates are not driven by these immigrant intensive states. My estimates remain robust to the change in the samples[24].

5.1 Lagged Responses to Immigration

I run a slightly modified version of the specification from equation 1, with the independent and instrumental variables replaced by first lags (as observed in year t-1) of each respective variable. This allows to check if there is any lagged response to immigration. The estimates for public school enrollment are presented in appendix Table A1, the estimates for private school enrollment are presented in appendix Table A2, while the estimates for public charter school enrollment are presented in appendix Table A3. Across public, private and public-charter schools, the OLS estimates and IV2SLS are remarkably similar to the main estimates discussed earlier in section 4. The estimates are just a tad bit stronger, which is expected since these estimates now might include the conflated effect of lagged immigrant share as well as the omitted contemporaneous immigration share in the population in year t.

5.2 Share of Immigrants in School-age Population

To address for this concern, I modify the independent variable to the share of immigrants in population aged 3 to 20, since this age resonates more closely with the school age native population. The instrument is still the same, which is the predicted number of immigrants in each MSA m in year t, based on past settlement patterns in year 1980. The first stage estimates using the modified independent variable are presented in Table B1. Across specification (4) and specification (5) of the first stage, the instrument passes the strength test, with the F-statistic well above the required threshold. Analogous estimates to those presented in Table 6, Table 7 and Table 8 are shown in Table B2, Table B3 and Table B4. Estimates for public school enrollments as presented in Table B2 as well as estimates for public charter school enrollments presented in Table B4 are almost identical to the baseline estimates in Table 6 and Table 8, though a little smaller in magnitude as compared to the main estimates. The IV2SLS estimates for private school enrollment in Table B3 are however insignificant across Panel A to E, which were significant for the share of White as well as Black enrollments in private schools in Table 7. The effect sizes on both estimates are almost identical to the main estimates in Table 7 but the standard errors in Table B3 are a

[24]Estimates are available with me, upon request.

bit inflated. This is perhaps expected, as shares of immigrants in young population are relatively smaller (about 1/4th of the share in all population). Considered together, these estimates based on immigrant share in young population indicate that the native flight phenomena is indeed better explained by political visibility of immigrants on the geographic level rather than actual enrollment of immigrant students within K-12 schools.

6 Conclusion

Estimates confirm the theory of native flight from public schools although not surprisingly, native flight is not homogeneous across U.S. born race/ ethnicities. The strongest evidence for native flight is supported for White students. There is sufficient evidence to suggest that the share of White student enrollments across public schools drop by as much as 0.55 percent in response to a 1 percent increase in the share of immigrant population. This decrease in the share of public school enrollments in supported by a corresponding increase in share of White student enrollment in private schools by 1.36 percent. Shares of Black student enrollments drop across public and private schools, and hence the theory of native flight for Black students is not entirely supported. For Hispanic and American Asian students, an opposite mechanism appears to work, their public school enrollments increase as a response to immigration. At the same time, estimates do not suggest that the shares of Hispanic or American Asian students across private schools change significantly in response to immigrant influx. This can perhaps be best explained by better homophily for them in public schools. Estimates for all non-White race/ethnicity groups are insignificant across private school enrollments, but share of White student enrollments increase across private schools. This difference is perhaps also driven by socioeconomic difference across White and non-White race/ethnicity groups.

Estimates from this paper are consistent with existing literature, although some small differences are also found. Betts and Fairlie (2003) found limited evidence of White flight from secondary schools, while Murray (2016) found evidence of native White flight in smaller school districts from states which do not traditionally receive immigrants. The estimates from this paper find overall evidence of White flight out of public schools as well as White flight towards private schools. Murray (2016) found evidence of Hispanic and minority native populations in states which traditionally receive immigrants. I do not find any evidence of Hispanic flight. On the contrary, Hispanic enrollments are indeed increasing across public schools. The case for American-Asian students is identical to that of Hispanics, American-Asian share of enrollments increase across public schools. Evidence of flight among Black students is not really supported, as it appears that Black enrollments are dropping across public and private schools.

The estimates for public charter schools are a bit puzzling. Total enrollment across public charter schools increased four-folds across the study period, but none of this can be attributed towards immigration, despite some thinking that immigrants might prefer to enroll in public charter schools (The New York Times, 2009; Learning for Justice, 2010). There are two questions which I am unable to answer. First, who is using public charter schools? Second, if immigrants indeed enroll in public charter schools, why does immigrant influx not impact public charter schools enrollment shares? A consistent theory of native flight would argue that if immigrants are likely to enroll in public charters, native populations should move way from them. There is no way in current data to confirm shares of immigrants within K-12 schools. It could also be the case that standard errors are inflated due to small sample size, and I simply do not have enough statistical power to identify a causal estimate.

Robustness tests in appendix B show that estimates are weaker though comparable when the independent variable is switched to the share of young population in the MSA. This lends some credibility to the theory that mechanisms for the native flight are perhaps embedded in political visibility at the geographic level, and perhaps not related to actual foreign-born enrollment in schools.

There are many research implications from this study. First, students of White origin are still leaving the public-school system as theory suggests. This is in line with the findings in Murray (2016), and Betts and Fairlie (2003). Future research should consider a strategy that includes areas outside the urban and suburban MSA geographies. Second, only White students are still more likely to enroll in private schools in response to immigrant influx. This points to the historical socioeconomic gaps across White population and other race/ ethnicities and presses the need for bridging the socioeconomic gap. Third, while this paper finds empirical evidence of native flight, the mechanisms for native flight are not entirely clear, and warrant further research. Future research should also consider the impact of native flight on segregation. If White students are enrolling in private schools as a response to increased immigration, do they move to more segregated schools? Are their motives better explained by the quality of instruction in private schools or available resources etc.? It is important that the motive of such differences in enrollment levels across different races and ethnic groups is further examined.

In terms of policy implications, I have earlier discussed existing research that has provided evidence that test scores of students drop when they are in the schools with higher concentration of immigrants. This could indicate that school resources, and the quality of education and services do not remain the same when there is an increase in the share of immigrant children in school. While in this paper, I have shown that students of White origin are indeed moving to private schools, policy-wise it becomes necessary to investigate about the level of school resources, quality of education and quality of services in schools with higher number of immigrant students. If this is not the case, educationists need to disseminate this info to students of such neighborhoods and schools where immigrant levels are high. Also, Bifulco and Ladd (2006) have argued that greater segregation in schools leads to wider test score gaps between students of minority and White origin. If students of White origin are indeed moving to more segregated schools, policy intervention is clearly needed to initiate behavioral nudges in such school districts to counter higher levels of segregation.

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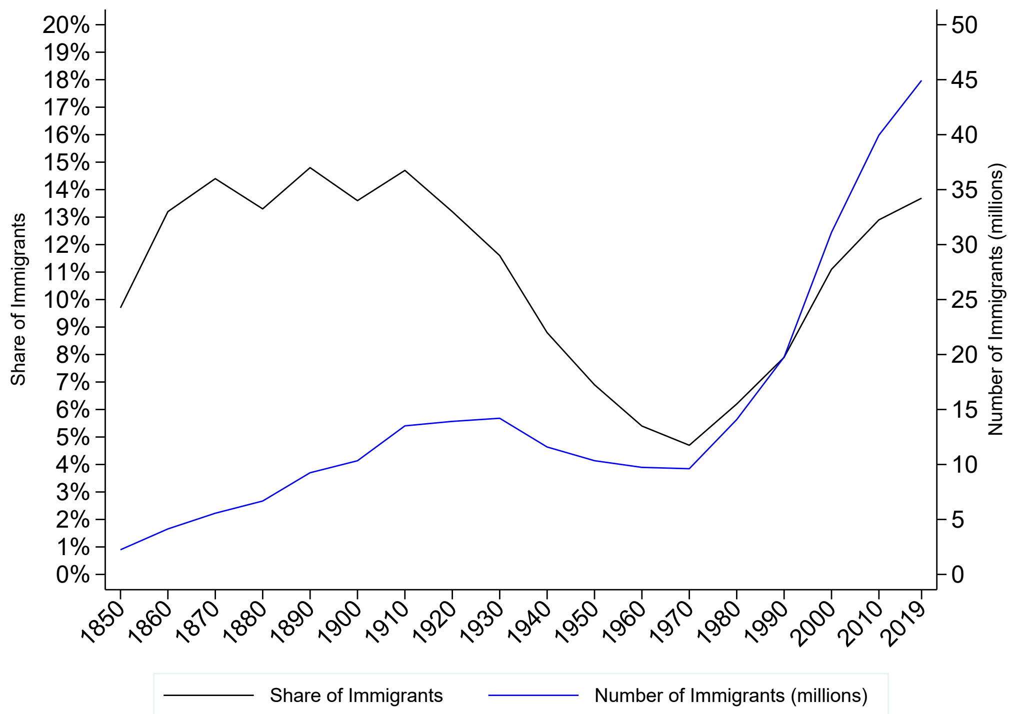
Figures and Tables

Figure 1: Share of Immigrants in the US 1850-2019



Source: Migration Policy Institute (2022a)

Table 1: Race/Ethnicity Shares of Enrollment in Public Schools

Year	Mean Total Enrollment	Race/Ethnicity Shares of Enrollment				
		White	Black	Hispanic	Asian	Other
2005	622.257	0.522	0.180	0.234	0.057	0.006
	(503.091)	(0.342)	(0.249)	(0.281)	(0.101)	(0.018)
2006	622.671	0.516	0.181	0.239	0.058	0.006
	(504.320)	(0.340)	(0.247)	(0.281)	(0.101)	(0.018)
2007	614.763	0.508	0.179	0.247	0.059	0.006
	(495.871)	(0.340)	(0.245)	(0.284)	(0.103)	(0.018)
2008	609.243	0.500	0.177	0.255	0.062	0.006
	(493.043)	(0.338)	(0.242)	(0.286)	(0.105)	(0.019)
2009	611.626	0.491	0.175	0.258	0.062	0.014
	(486.299)	(0.336)	(0.239)	(0.286)	(0.105)	(0.031)
2010	609.245	0.484	0.174	0.265	0.063	0.015
	(476.974)	(0.334)	(0.236)	(0.287)	(0.105)	(0.041)
2011	616.759	0.472	0.165	0.271	0.060	0.033
	(474.809)	(0.325)	(0.228)	(0.285)	(0.099)	(0.044)
2012	621.494	0.464	0.162	0.278	0.061	0.035
	(472.099)	(0.322)	(0.224)	(0.286)	(0.101)	(0.043)
2013	620.371	0.459	0.160	0.283	0.061	0.037
	(469.701)	(0.320)	(0.222)	(0.286)	(0.102)	(0.043)
2014	622.580	0.452	0.159	0.288	0.062	0.039
	(470.584)	(0.318)	(0.220)	(0.287)	(0.103)	(0.042)
2015	624.237	0.445	0.158	0.293	0.064	0.041
	(475.205)	(0.315)	(0.217)	(0.286)	(0.105)	(0.042)
2016	624.949	0.439	0.156	0.298	0.065	0.043
	(479.389)	(0.312)	(0.215)	(0.285)	(0.107)	(0.043)
2017	625.079	0.433	0.155	0.302	0.066	0.045
	(482.574)	(0.309)	(0.212)	(0.284)	(0.109)	(0.044)
2018	624.866	0.427	0.154	0.305	0.068	0.047
	(484.410)	(0.306)	(0.210)	(0.283)	(0.111)	(0.044)
2019	622.489	0.422	0.153	0.308	0.069	0.049
	(484.819)	(0.304)	(0.208)	(0.282)	(0.113)	(0.045)
Total	619.515	0.468	0.166	0.275	0.062	0.028
	(483.599)	(0.326)	(0.228)	(0.286)	(0.105)	(0.041)

Source.—Public and Private School Universe Survey 2005-2019.
Notes.—The table reports means and standard deviations of mean total enrollment and race/ethnicity shares of enrollment in public schools across US Metropolitan Statistical Areas. All observations for race/ethnicity specific enrollment shares are weighted by the total enrollment size of the school.

Table 2: Race/Ethnicity Shares of Enrollment in Private Schools

Year	Mean Total Enrollment	Race/Ethnicity Shares of Enrollment				
		White	Black	Hispanic	Asian	Other
2006	169.975	0.729	0.105	0.107	0.040	0.019
	(222.960)	(0.299)	(0.204)	(0.191)	(0.097)	(0.065)
2008	169.803	0.717	0.107	0.111	0.061	0.003
	(230.880)	(0.298)	(0.203)	(0.191)	(0.120)	(0.020)
2010	169.018	0.689	0.103	0.110	0.058	0.039
	(229.480)	(0.299)	(0.197)	(0.189)	(0.108)	(0.078)
2012	164.066	0.674	0.100	0.116	0.062	0.048
	(227.191)	(0.297)	(0.190)	(0.193)	(0.110)	(0.084)
2014	167.444	0.658	0.101	0.120	0.067	0.054
	(226.842)	(0.296)	(0.187)	(0.197)	(0.114)	(0.089)
2016	172.913	0.644	0.101	0.126	0.070	0.059
	(237.560)	(0.297)	(0.186)	(0.200)	(0.115)	(0.093)
2018	178.279	0.632	0.101	0.128	0.073	0.066
	(259.351)	(0.296)	(0.182)	(0.198)	(0.122)	(0.106)
Total	169.943	0.680	0.103	0.116	0.061	0.040
	(232.957)	(0.300)	(0.194)	(0.194)	(0.113)	(0.082)

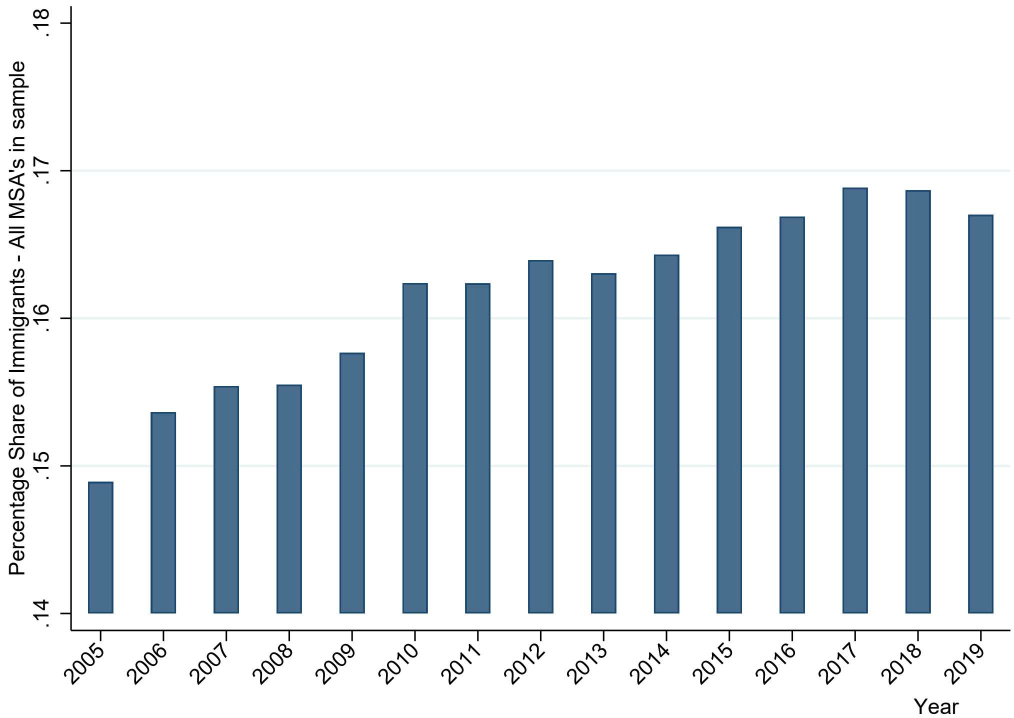
Source.—Public and Private School Universe Survey 2005-2019.
Notes.—The table reports means and standard deviations of mean total enrollment and race/ethnicity shares of enrollment in private schools across US Metropolitan Statistical Areas. All observations for race/ethnicity specific enrollment shares are weighted by the total enrollment size of the school.

Table 3: Race/Ethnicity Shares of Enrollment in Public Charter Schools

Year	Mean Total Enrollment	Race/Ethnicity Shares of Enrollment				
		White	Black	Hispanic	Asian	Other
2005	293.771	0.372	0.350	0.235	0.034	0.010
	(351.645)	(0.337)	(0.363)	(0.277)	(0.077)	(0.048)
2006	297.714	0.359	0.356	0.240	0.036	0.009
	(365.366)	(0.337)	(0.367)	(0.282)	(0.083)	(0.043)
2007	313.868	0.345	0.347	0.262	0.037	0.009
	(379.145)	(0.332)	(0.362)	(0.295)	(0.085)	(0.043)
2008	323.484	0.342	0.345	0.265	0.039	0.008
	(392.513)	(0.332)	(0.363)	(0.297)	(0.089)	(0.040)
2009	336.269	0.333	0.336	0.271	0.040	0.020
	(425.053)	(0.325)	(0.359)	(0.298)	(0.088)	(0.051)
2010	354.846	0.327	0.328	0.281	0.039	0.025
	(451.946)	(0.323)	(0.355)	(0.301)	(0.088)	(0.085)
2011	371.531	0.319	0.312	0.294	0.035	0.040
	(485.647)	(0.315)	(0.348)	(0.303)	(0.077)	(0.076)
2012	398.108	0.317	0.307	0.300	0.038	0.038
	(550.133)	(0.312)	(0.343)	(0.304)	(0.084)	(0.066)
2013	411.446	0.315	0.295	0.312	0.040	0.038
	(580.487)	(0.309)	(0.336)	(0.307)	(0.087)	(0.056)
2014	426.986	0.311	0.289	0.322	0.040	0.039
	(593.661)	(0.304)	(0.332)	(0.306)	(0.086)	(0.057)
2015	438.039	0.301	0.287	0.329	0.042	0.041
	(587.893)	(0.298)	(0.330)	(0.308)	(0.087)	(0.060)
2016	449.385	0.291	0.284	0.340	0.042	0.043
	(587.785)	(0.292)	(0.327)	(0.310)	(0.089)	(0.055)
2017	463.327	0.284	0.279	0.349	0.043	0.045
	(596.710)	(0.287)	(0.323)	(0.311)	(0.092)	(0.053)
2018	469.339	0.283	0.271	0.354	0.044	0.047
	(543.240)	(0.284)	(0.319)	(0.313)	(0.094)	(0.059)
2019	478.522	0.277	0.267	0.363	0.045	0.048
	(552.510)	(0.280)	(0.315)	(0.311)	(0.096)	(0.055)
Total	404.723	0.308	0.298	0.317	0.041	0.036
	(527.766)	(0.305)	(0.337)	(0.307)	(0.088)	(0.060)

Source.—Public and Private School Universe Survey 2005-2019.
Notes.—The table reports means and standard deviations of mean total enrollment and race/ethnicity shares of enrollment in public charter schools across US Metropolitan Statistical Areas. All observations for race/ethnicity specific enrollment shares are weighted by the total enrollment size of the school.

Figure 2: Share of Immigrants in the Sample MSA's 2005-2019



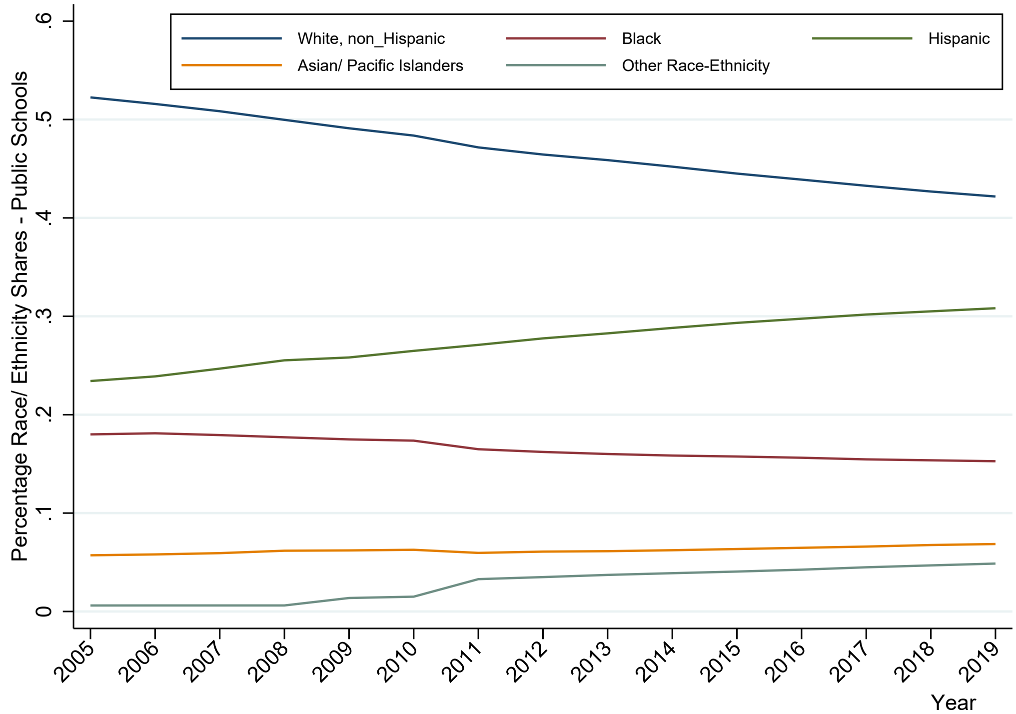
Source.—ACS 2005-2019, Ruggles et al. (2019)

Table 4: Variation in Immigrant Shares of Population across MSAs - 2019

MSA's with the highest shares of immigrants		MSA's with the lowest shares of immigrants	
MSA Name	Share of foreigners	MSA Name	Share of foreigners
San Diego-Carlsbad, CA	0.223	Johnstown, PA	0.005
Brownsville-Harlingen, TX	0.231	Anniston-Oxford-Jacksonville, AL	0.008
Trenton, NJ	0.235	Saginaw, MI	0.013
Salinas, CA	0.238	Muncie, IN	0.015
Mcallen-Edinburg-Mission, TX	0.239	Canton-Massillon, OH	0.016
El Paso, TX	0.241	Youngstown-Warren-Board, OH-PA	0.017
New York-Newark-Jersey City, NY-NJ	0.278	Michigan City- Laporte, IN	0.019
San Francisco-Oakland-Hayward, CA	0.299	Jackson, MI	0.019
Los Angeles-Long Beach-Anaheim, CA	0.329	Eau Claire, WI	0.020
Miami-Fort Lauderdale-West Palm, FA	0.391	Springfield, MO	0.021

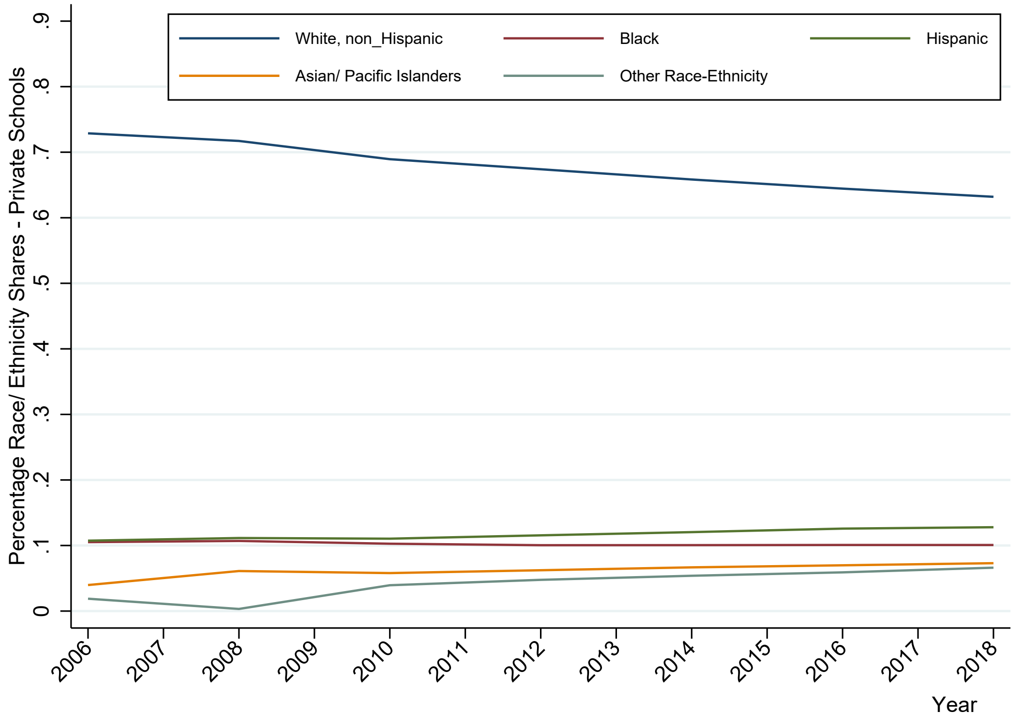
Source.—ACS 2005-2019, Ruggles et al. (2019)

Figure 3: Race/ Ethnicity Enrollment Shares in Public Schools: 2005-2019



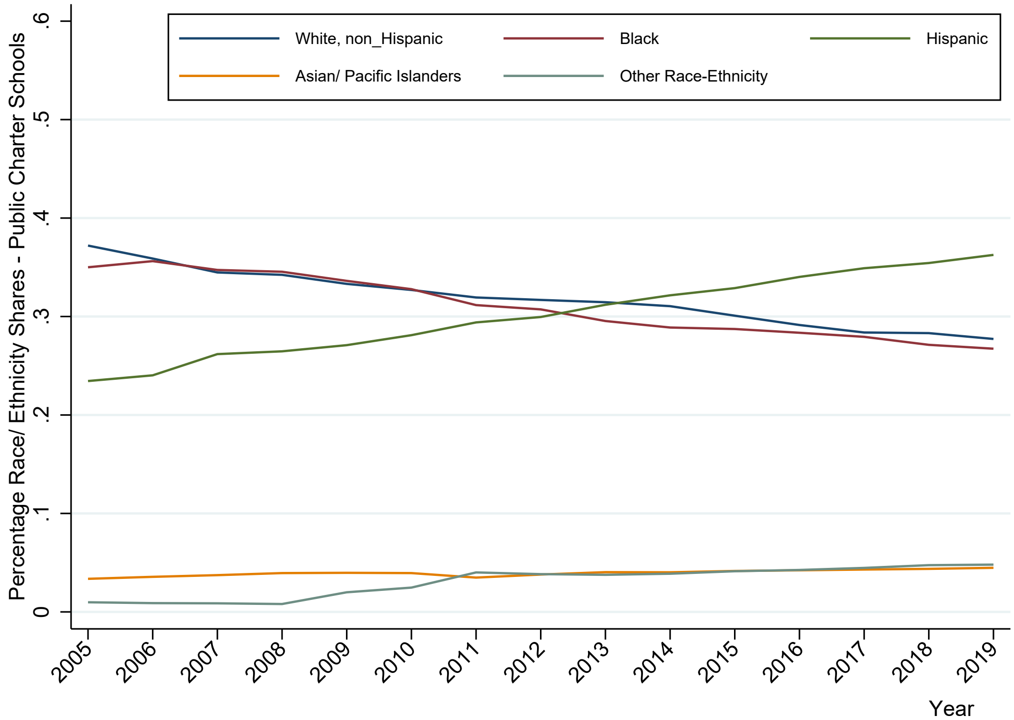
Source.—Public and Private School Universe Survey 2005-2019.

Figure 4: Race/ Ethnicity Enrollment Shares in Private Schools: 2005-2019



Source.—Public and Private School Universe Survey 2005-2019.

Figure 5: Race/ Ethnicity Enrollment Shares in Public Charter Schools: 2005-2019



Source.—Public and Private School Universe Survey 2005-2019.

Table 5: Sample First Stage

	Share of Immigrants in the Population				
	(1)	(2)	(3)	(4)	(5)
Log($\sum_j$ share$_{i,j,1980}$ x Total Immig$_{j,t}$)	3.594***	2.579***	6.285***	4.651***	2.124***
	(0.099)	(0.084)	(0.380)	(0.564)	(0.442)
First-Stage F-Statistic	1317.91	942.64	273.55	68.00	23.09
Number of MSAs	166	166	166	166	148
Controls	No	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Exc. Miami, New York, and all cities of California	No	No	No	No	Yes

Source.—- ACS 2005-2019 Ruggles et al. (2019)

Notes.— Standard errors clustered within MSA × year cells *** p<0.01, ** p<0.05, * p<0.1
OLS Regressions for the first stage (Total observations: N=2490; 166 MSA's x 15 years). The table presents coefficients and standard errors obtained by regressing the share of immigrants in the population on the predicted/ instrumented number of immigrants within MSA × year cells, conditional on MSA-level time variant controls. All regressions are weighted by the size of MSA population. Additional controls include MSA-level time-varying parameters which include percentage of population living below poverty level, mean housing values, and mean MSA family income.

Table 6: Public School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) Share of Immigrants	1.060***	0.706***	0.309	0.676***	-0.051	2.573***
	(0.073)	(0.081)	(0.307)	(0.079)	(0.337)	(0.738)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) Share of Immigrants	-1.386***	-1.274***	-1.208***	-1.266***	-0.177	-0.555*
	(0.036)	(0.059)	(0.136)	(0.059)	(0.131)	(0.310)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) Share of Immigrants	-0.346***	-0.061	-1.359***	-0.060	-0.293***	-0.760***
	(0.034)	(0.051)	(0.088)	(0.053)	(0.062)	(0.186)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) Share of Immigrants	1.409***	1.284***	1.109***	1.312***	0.256***	0.482**
	(0.048)	(0.080)	(0.086)	(0.081)	(0.077)	(0.213)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) Share of Immigrants	0.334***	0.132***	0.557***	0.115***	0.373***	0.572***
	(0.020)	(0.022)	(0.048)	(0.022)	(0.050)	(0.091)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** p<0.01, ** p<0.05, * p<0.1
The table reports coefficients and standard errors associated with regressions of various public school enrollment outcomes on percentage share of immigrants in the population, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and Title-1 status of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA × year cells. The sample does not include public charter schools.)

Table 7: Private School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) Share of Immigrants	0.194***	0.035	-1.551***	0.068	0.109	0.310
	(0.049)	(0.087)	(0.485)	(0.083)	(0.535)	(1.417)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) Share of Immigrants	-1.179***	-1.189***	-1.798***	-1.194***	0.434	1.357*
	(0.029)	(0.054)	(0.320)	(0.053)	(0.319)	(0.755)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) Share of Immigrants	0.020	0.294***	-0.371***	0.292***	-0.412***	-0.716*
	(0.039)	(0.048)	(0.139)	(0.048)	(0.152)	(0.422)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) Share of Immigrants	0.783***	0.917***	0.463***	0.955***	-0.067	-0.132
	(0.048)	(0.053)	(0.143)	(0.045)	(0.158)	(0.485)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) Share of Immigrants	0.259***	0.010	0.380***	-0.003	0.294*	-0.092
	(0.032)	(0.036)	(0.088)	(0.035)	(0.175)	(0.279)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** p<0.01, ** p<0.05, * p<0.1
The table reports coefficients and standard errors associated with regressions of various private school enrollment outcomes on percentage share of immigrants in the population, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and any religious affiliation of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA $\times$ year cells.

Table 8: Public Charter School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) Share of Immigrants	0.771***	1.084***	1.942**	1.022***	-3.383***	-3.745*
	(0.117)	(0.138)	(0.880)	(0.144)	(0.657)	(2.084)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) Share of Immigrants	-0.893***	-1.152***	-0.584***	-1.156***	-0.073	0.316
	(0.044)	(0.076)	(0.177)	(0.079)	(0.187)	(0.520)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) Share of Immigrants	-0.489***	0.160	-1.802***	0.165	-0.488***	-0.017
	(0.082)	(0.108)	(0.190)	(0.109)	(0.145)	(0.521)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) Share of Immigrants	1.317***	1.045******	1.519***	1.065***	0.641***	-0.507
	(0.055)	(0.085)	(0.140)	(0.090)	(0.118)	(0.367)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) Share of Immigrants	0.084***	0.038**	0.318***	0.028*	0.123*	-0.095
	(0.014)	(0.017)	(0.057)	(0.017)	(0.064)	(0.131)
Observations Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** p<0.01, ** p<0.05, * p<0.1
The table reports coefficients and standard errors associated with regressions of various public charter school enrollment outcomes on percentage share of immigrants in the population, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and Title-1 status of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA $\times$ year cells.

Appendix A: Regressions on Lagged Shares of Immigrants

Table A1: Public School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) L1.Share of Immigrants	1.047***	0.639***	0.585***	0.647***	0.085	2.397***
	(0.077)	(0.084)	(0.200)	(0.083)	(0.233)	(0.664)
Observations	702,905	702,905	702,905	702,905	702,905	702,905
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) L1.Share of Immigrants	-1.389***	-1.269***	-1.515***	-1.277***	-0.387***	-0.628**
	(0.038)	(0.061)	(0.119)	(0.061)	(0.122)	(0.309)
Observations	702,905	702,905	702,905	702,905	702,905	702,905
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) L1.Share of Immigrants	-0.351***	-0.070	-1.387***	-0.073	-0.195***	-0.744***
	(0.035)	(0.053)	(0.088)	(0.055)	(0.062)	(0.200)
Observations	702,905	702,905	702,905	702,905	702,905	702,905
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) L1.Share of Immigrants	1.418***	1.300***	1.257***	1.342***	0.375***	0.575**
	(0.050)	(0.084)	(0.085)	(0.085)	(0.085)	(0.227)
Observations	702,905	702,905	702,905	702,905	702,905	702,905
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) L1.Share of Immigrants	0.332***	0.129***	0.565***	0.112***	0.384***	0.657***
	(0.020)	(0.023)	(0.046)	(0.022)	(0.056)	(0.100)
Observations	702,905	702,905	702,905	702,905	702,905	702,905
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** p<0.01, ** p<0.05, * p<0.1
The table reports coefficients and standard errors associated with regressions of various public school enrollment outcomes on lagged percentage share of immigrants in the population, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and Title-1 status of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA $\times$ year cells. The sample does not include public charter schools.)

Table A2: Private School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) L1.Share of Immigrants	0.195***	0.071	-1.137*	0.096	0.254	0.570
	(0.049)	(0.092)	(0.605)	(0.088)	(0.602)	(1.284)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) L1.Share of Immigrants	-1.194***	-1.208***	-1.753***	-1.204***	0.480	1.408**
	(0.031)	(0.061)	(0.304)	(0.059)	(0.304)	(0.671)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) L1.Share of Immigrants	0.015	0.296***	-0.404***	0.293***	-0.498***	-1.005***
	(0.040)	(0.051)	(0.141)	(0.051)	(0.158)	(0.380)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) L1.Share of Immigrants	0.795***	0.951***	0.561***	0.975***	-0.025	-0.083
	(0.048)	(0.052)	(0.121)	(0.047)	(0.148)	(0.414)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) L1.Share of Immigrants	0.265***	0.009	0.420***	0.001	0.237*	0.192
	(0.031)	(0.037)	(0.091)	(0.036)	(0.125)	(0.249)
Observations Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** p<0.01, ** p<0.05, * p<0.1
The table reports coefficients and standard errors associated with regressions of various private school enrollment outcomes on lagged percentage share of immigrants in the population, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and any religious affiliation of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA $\times$ year cells.

Table A3: Public Charter School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) L1.Share of Immigrants	0.727***	1.099***	2.971***	1.081***	-2.140***	4.136
	(0.120)	(0.145)	(0.755)	(0.150)	(0.794)	(4.312)
Observations	54,972	54,972	54,972	54,972	54,972	54,972
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) L1.Share of Immigrants	-0.936***	-1.155***	-0.482***	-1.159***	-0.032	0.890
	(0.043)	(0.078)	(0.172)	(0.080)	(0.187)	(0.603)
Observations	54,972	54,972	54,972	54,972	54,972	54,972
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) L1.Share of Immigrants	-0.423***	0.171	-1.819***	0.164	-0.482***	-0.241
	(0.081)	(0.111)	(0.168)	(0.109)	(0.124)	(0.395)
Observations	54,972	54,972	54,972	54,972	54,972	54,972
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) L1.Share of Immigrants	1.303***	1.050***	1.430***	1.074***	0.621***	-0.816
	(0.057)	(0.088)	(0.157)	(0.092)	(0.171)	(0.538)
Observations	54,972	54,972	54,972	54,972	54,972	54,972
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) L1.Share of Immigrants	0.079***	0.034*	0.293***	0.029*	0.128**	0.049
	(0.014)	(0.018)	(0.048)	(0.018)	(0.062)	(0.088)
Observations	54,972	54,972	54,972	54,972	54,972	54,972
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** p<0.01, ** p<0.05, * p<0.1
The table reports coefficients and standard errors associated with regressions of various public charter school enrollment outcomes on lagged percentage share of immigrants in the population, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and Title-1 status of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA $\times$ year cells.

Appendix B: Regressions on Shares of Immigrants in Young Population

Table B1: Sample First Stage for Immigrant Share in Young

	Share of Immigrants in the Population Age 3-20				
	(1)	(2)	(3)	(4)	(5)
Log($\sum_j$ share$_{i,j,1980}$ x Total Immig$_{j,t}$)	0.939***	0.671***	-2.439***	4.706***	2.124***
	(0.031)	(0.039)	(0.303)	(0.554)	(0.442)
First-Stage F-Statistic	917.50	296.01	64.79	72.16	23.09
Number of MSAs	166	166	166	166	148
Controls	No	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Exc. Miami, New York, and all cities of California	No	No	No	No	Yes

Source.—- ACS 2005-2019 Ruggles et al. (2019)

Notes.— Standard errors clustered within MSA × year cells *** p<0.01, ** p<0.05, * p<0.1
OLS Regressions for the first stage. (Total observations: N=2490; 166 MSA's x 15 years. The table presents coefficients and standard errors obtained by regressing the share of immigrants in the population aged 3-20 on the predicted/ instrumented total number of immigrants within MSA × year cells, conditional on MSA-level time variant controls. All regressions are weighted by the size of MSA population. Additional controls include MSA-level time-varying parameters which include percentage of population living below poverty level, mean housing values, and mean MSA family income.

Table B2: Public School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) Share of Immigrants in Population 3-20	3.077***	1.597***	0.321*	1.743***	0.754***	2.454***
	(0.229)	(0.192)	(0.169)	(0.194)	(0.153)	(0.640)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) Share of Immigrants in Population 3-20	-3.936***	-2.476***	0.893***	-2.730***	0.150	-0.530*
	(0.144)	(0.161)	(0.114)	(0.170)	(0.093)	(0.288)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) Share of Immigrants in Population 3-20	-0.784***	0.027	0.738***	-0.191	-0.204***	-0.725***
	(0.132)	(0.155)	(0.072)	(0.168)	(0.051)	(0.191)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) Share of Immigrants in Population 3-20	3.842***	2.487***	-0.852***	2.817***	-0.229***	0.459**
	(0.189)	(0.233)	(0.089)	(0.246)	(0.069)	(0.207)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) Share of Immigrants in Population 3-20	1.002***	0.284***	-0.037	0.286***	0.243***	0.545***
	(0.080)	(0.068)	(0.039)	(0.069)	(0.038)	(0.093)
Observations	770,909	770,909	770,909	770,909	770,909	770,909
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** p<0.01, ** p<0.05, * p<0.1
The table reports coefficients and standard errors associated with regressions of various public school enrollment outcomes on lagged percentage share of immigrants in the population aged 3-20, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and Title-1 status of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA $\times$ year cells. The sample does not include public charter schools.)

Table B3: Private School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) Share of Immigrants in Population 3-20	0.740***	0.371	0.970***	0.346	0.369	0.297
	(0.175)	(0.237)	(0.343)	(0.231)	(0.317)	(1.367)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) Share of Immigrants in Population 3-20	-3.653***	-2.694***	0.777***	-2.895***	-0.158	1.303
	(0.124)	(0.159)	(0.228)	(0.132)	(0.153)	(0.861)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) Share of Immigrants in Population 3-20	0.152	0.641***	0.332***	0.625***	0.309***	-0.688
	(0.126)	(0.133)	(0.081)	(0.131)	(0.086)	(0.481)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) Share of Immigrants in Population 3-20	2.503***	2.374***	0.054	2.543***	0.330***	-0.126
	(0.168)	(0.126)	(0.127)	(0.094)	(0.127)	(0.476)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) Share of Immigrants in Population 3-20	0.746***	-0.073	-0.040	-0.089	0.077	-0.089
	(0.134)	(0.097)	(0.151)	(0.094)	(0.145)	(0.266)
Observations	119,197	119,197	119,197	119,197	119,197	119,197
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** $p<0.01$, ** $p<0.05$, * $p<0.1$
The table reports coefficients and standard errors associated with regressions of various private school enrollment outcomes on lagged percentage share of immigrants in the population aged 3-20, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and any religious affiliation of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA × year cells.

Table B4: Public Charter School Enrollment Estimates

	OLS		Fixed Effects			IV 2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Enrollment						
(%) Share of Immigrants in Population 3-20	1.048***	0.504	-6.328***	1.151***	-2.808***	-3.877*
	(0.392)	(0.376)	(0.752)	(0.332)	(0.703)	(2.173)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel B: Share of White Enrollment						
(%) Share of Immigrants in Population 3-20	-2.487***	-2.198***	0.471***	-2.279***	0.227	0.327
	(0.193)	(0.186)	(0.171)	(0.205)	(0.166)	(0.541)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel C: Share of Black Enrollment						
(%) Share of Immigrants	-1.037***	0.232	1.131***	-0.043	-0.262**	-0.018
	(0.254)	(0.266)	(0.135)	(0.267)	(0.125)	(0.540)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel D: Share of Hispanic Enrollment						
(%) Share of Immigrants in Population 3-20	3.468***	2.219***	-0.839***	2.492***	-0.054	-0.525
	(0.209)	(0.221)	(0.142)	(0.256)	(0.119)	(0.380)
Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes
Panel E: Share of Asian Enrollment						
(%) Share of Immigrants in Population 3-20	0.230***	0.063	-0.161***	0.072	0.042	-0.098
	(0.054)	(0.046)	(0.056)	(0.049)	(0.054)	(0.136)
Observations Observations	64,265	64,265	64,265	64,265	64,265	64,265
School Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time-variant MSA Controls	No	Yes	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	No	Yes	No	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes	Yes

Source.—Public and Private School Universe Survey 2005-2019 & ACS 2005-2019 Ruggles et al. (2019)
Notes.–*** $p<0.01$, ** $p<0.05$, * $p<0.1$
The table reports coefficients and standard errors associated with regressions of various public charter school enrollment outcomes on lagged percentage share of immigrants in the population aged 3-20, conditional on school level characteristics that include school-level, type of school, student-teacher ratio, total number of full-time employed teachers, and Title-1 status of school. Time-variant MSA level controls include mean poverty levels, mean household values, and mean household income. All regressions in Panel B through E are weighted for the total school enrollments. Standard errors are clustered within MSA × year cells.