Immigrant Integration in Massachusetts (Extended Abstract: NBER Immigration)

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1 Introduction

Children in immigrant families are a large, growing, and increasingly diverse part of our public schools. Today, about one out of four children in the country have at least one immigrant parent and more than 10% of school children are classified as English Learners (Urban Institute, 2024; National Center for Education Statistics (NCES), 2024). A large majority of children in immigrant families (90%) were born in the United States (Urban Institute, 2024). As the immigrant population has grown and dispersed, entering communities that have not traditionally served as immigrant destinations, schools have had to adapt to changing student demographics. The recent migrant crisis has brought this issue into sharp relief, as districts have struggled to rapidly incorporate new arrivals.

That immigration has unalterably changed the composition of our public schools is undeniable. What is less understood is how students, communities, and school and district leaders are responding to these changes. A growing quasi-experimental literature using cohort-level variation in exposure to immigrant peers has considered the effects of immigrant peers on the educational outcomes of non-immigrant students, generating mixed results (D. Figlio & Özek, 2019; Özek, 2023; D. N. Figlio et al., 2021; Morales, 2022). One explanation for these mixed results is that immigration takes many forms and these different forms may elicit different responses from natives, while the existing literature has largely focused on the impacts of one "type" of immigrant arriving at one time in one place. Immigrants are represented at both tails of the socioeconomic spectrum: while foreign-born adults in the United States are both more likely to have a graduate degree than native-born adults, they are also 3.5 times as likely to have less than a high school diploma (U.S. Census Bureau, n.d.). The literature on political and economic effects of immigration has long made the distinction between "high-skilled" and "low-skilled", but the literature on the effects of immigration on schools has less frequently considered this distinction, in part because of data limitations and in part because most of the prior work has focused on changes in one immigrant group.

In this paper, we use richly detailed data from the Commonwealth of Massachusetts and "shift-share" instrumental variable strategies to identify the causal effect of immigration on public schools. At this stage of our research, we are focused on the following 3 primary research questions:

1. How has immigration affected the demographics, mobility, and enrollment choices of students in Massachusetts? What are the consequences of these changes for student integration?
2. How have schools and school districts responded to immigration? How has immigration affected school resources, policies, and resource allocation?
3. How do these effects vary for different types of immigration?

In future work, we will consider the effects of immigration on student-level outcomes.

2 Context

Massachusetts – which has long served as a destination for immigrant families – has seen dramatic changes in the number, distribution, and composition of immigrant and English learner (EL) students over the past 20 years. Since 2000, the English learner (EL) population in Massachusetts has doubled (Mitchell, 2017). Today, about 24% of students in MA public schools have a first language that is not English and 11% are classified as English language learners (ELs), with much higher shares in immigrant-receiving destinations such as Boston, Worcester, and Lawrence (Massachusetts Department of Elementary and Secondary Education (MA DESE), 2021). The geography of immigrant and EL students in the state is also changing, with immigrants increasingly settling outside of major cities (Boston Indicators, 2019). Massachusetts is also home to an incredibly diverse immigrant population, with no single country representing more than 10% of the foreign-born population in the state (MIRA Coalition, 2019). Immigrants in Massachusetts also come from a range of educational and socioeconomic backgrounds; while immigrants are more likely than native-born adults to have a Bachelor's degree, they are also more likely to have less than a high school diploma. Although Massachusetts is a conventionally liberal state, with eight "sanctuary cities", the incorporation of new arrivals to existing school communities has not been seamless, with many district leaders expressing concern about their ability to serve the latest wave of immigrants. The diversity and growth of the immigrant population in Massachusetts, coupled with our access to uniquely detailed student-level detail, make this a compelling setting for this work.

3 Data and Sample

Data on students, schools, and teachers come from the Massachusetts Department of Elementary and Secondary Education (MA DESE). K-12 education

records include student-level enrollment and demographic measures – including place of birth, home language, and an indicator for being an immigrant – and a range of short and long-run outcome measures, including standardized test scores, SAT and AP test-taking and scores, and high school graduation. National Student Clearinghouse data provide information on college enrollment, persistence, and completion. Records from the Massachusetts Department of Unemployment Assistance, accessed through a data partnership with MA DESE, provide individual-level data on earnings and employment. Student-class-teacher linkages allow us to construct individual measures of coursework completed and teachers and peers encountered in class. MA DESE records also provide detailed data on school spending, funding, staffing, and EL models.

Our sample is drawn from all students who attended Massachusetts public schools between SY 2001-02 and SY 2023-24. We identify students as immigrants based on place of birth as reported in K-12 records, identifying all students born outside the United States or a U.S. territory as an immigrant.[1] We identify second-generation immigrants using data on parental place of birth from birth records.[2] Using these methods, we classify 5.6% of students in our sample as first-generation immigrants and 17.9% as second-generation immigrants.

Table 1 shows characteristics of non-immigrants, first generation students, and second generation students in immigrant families in our sample. Immigrant students in our sample have worse educational outcomes than native-born students but that second-generation students closely resemble native-born students across a range of outcomes. For example, the four-year college graduation rate for Massachusetts high school students is 39% for both non-immigrants and second generation immigrants. However the graduation rate is 24% for first generation immigrants. The table also shows prevalence of the most common languages students speak at home. Spanish and Portuguese are the most common languages, followed by Chinese and Haitian.

Figure 1 shows how Massachusetts demographics have shifted from over 80% of students from non-immigrant families in 2002 to about 64% in 2022. The proportion of second generation immigrants had a steady increase over that period from around 10% to over 20%.

4 Identification and 2SLS Estimates

We are interested in the relationship between immigrant presence and district-level outcomes. This can be modeled as follows:

$$Y_{dt} = \alpha_0 + \beta \frac{Immig_{dt}}{Enroll_{dt}} + \theta_t + \nu_d + \epsilon_{dt}, \tag{1}$$

where Y_{dt} is an outcome observed for district d observed in year t (e.g., share

[1] This means we identify individuals who were born in U.S. territories, such as Puerto Rico, as non-immigrants.

[2] We note that we are unable to identify second-generation students who were born outside Massachusetts. These students would be treated as native students in our analysis.

of students who are white) and $\frac{Immig_{dt}}{Enroll_{dt}}$ is the percent of students in the district who are immigrants. θ_t are year fixed effects. ν_d are district fixed effects.[3]

Direct estimates of β would likely be biased by time-varying factors that affect growth of the immigrant population; for instance, if immigrants choose to settle in places that are experiencing economic gains. We address the endogeneity of immigrant locations using variations of "shift-share" instruments. These approaches have been used extensively in the literature on immigration to isolate plausibly exogenous shocks to immigrant stocks (Card, 2001; Edo & Özgüzel, 2023). The intuition behind this approach is that immigrants tend to settle in places where earlier immigrants from that country have established communities. As an illustration of this tendency, consider Figure 1 below. Brookline and Everett are two school districts in Massachusetts that were were similar in terms of overall immigrant share of enrollment in 2002, the baseline year, but differed in the composition of those immigrants: Everett had a substantial Brazilian population in the district, while Brookline did not. Massachusetts saw large increases in Brazilian immigrants, particularly after 2010. As shown by Figure 1, the share of all students in Everett who were Brazilian immigrants grew substantially over time, but the share of all students who were Brazilian in Brookline changed very little. New Brazilian immigrants opted to settle in the district with an existing Brazilian population when selecting among these two immigrant-receiving destinations.

Formally, the shift-share instruments propose that new immigrants from a particular area will distribute themselves across destinations in a way that is proportionate to the baseline share of immigrants from that country in the destination. Accordingly, we define the predicted immigrant student population in district d in year t as follows:

$$\widehat{Immig}_{djt} = \frac{Immig_{dj,2002}}{Migrants_{j,2002}} Migrants_{jt}, \tag{2}$$

where $Migrants$ is the number of immigrants from country j in the United States in year t as reported by MPI (Migration Policy Institute (MPI), 2024). Summing these over all countries by district gives an estimate of the total number of immigrants in district d in year t ($\widehat{Immig}_{dt}$), which serves as our instrument for the number of immigrant students in a district:

$$Z_{dt}^{number} = \widehat{Immig}_{dt} \tag{3}$$

One important contextual feature for our setting is the declining school-age population of Massachusetts (Metropolitan Area Planning Council (MAPC), 2024), a trend that is largely due to declining birth rates. To improve the precision of our instrument, we construct a measure of predicted native-born enrollment using a "shift-share" approach that allocates the state-wide native-born population to districts based on the share of students in the state enrolled

[3]In our IV estimates, we will also consider estimates that control for baseline district characteristics instead of fixed effects

in that district in the baseline year, as follows:

$$\widehat{Native}_{dt} = \frac{Native_{d,2002}}{Native_{s,2002}} Native_{st}, \tag{4}$$

where $Native_{st}$ is the state-wide native-born student population in year t.

Taken together, the predicted native-born and immigrant populations form our instrument:

$$Z_{dt}^{share} = \frac{\widehat{Z}_{dt}^{number}}{\widehat{Native}_{dt} + \widehat{Z}_{dt}^{number}} \tag{5}$$

The goal of our instrumental variable strategy is to identify plausibly exogenous variation in the presence of immigrants over time. However, several relevant threats to identification remain. The first is that counties with larger immigrant populations may differ from counties with smaller immigrant populations across economic, demographic, or political dimensions that also relate to the characteristics of their local schools. The inclusion of district fixed effects in our model eliminates bias due to time-invariant differences across districts. Year fixed effects address common shocks across all school districts. A source of bias remains, however, if predicted changes in immigration are associated with changes in key demographic, economic, or educational outcomes in the pre-period that are also related to changes in local schools.

Following (Mayda et al., 2022), we plan to formally assess this possibility by examining pretreatment (1990-2000) trends in local conditions and predicted changes in immigration using our instruments. This is effectively the same as assessing whether there are differential pretrends across districts with different predicted treatment intensity. We will do this by regressing the pretreatment characteristic on the predicted change in immigration. If we find significant differences in pretrends, we will incorporate time trends interacted with district baseline characteristics in our estimating equations.

One additional concern about this identification strategy is that changes in the total number of immigrants from a country could be related to "pull" factors in the destination districts. This concern may be more relevant than it appears at face value, at least in some cases: our estimates suggest that over 1% of the entire Brazilian-born population in the United States were public school students in Massachusetts as of 2017 (Blizzard & Batalova, 2019). Given that, it is not unreasonable to worry that local labor market conditions in Brazilian-receiving destinations in Massachusetts could encourage further migration out of Brazil.

To address this concern, we adapt the approach used by Derenoncourt (2022) and Boustan (2016) to identify variation in immigration based on "push" factor conditions in sending countries as opposed to "pull" factors in the destination. We do this by predicting the ratio of immigrants from country j living in the United States in year t relative to the number living in the U.S. in 2000 as follows:

$$\frac{\widehat{Migrants}_{jt}}{Migrants_{j2000}} = \alpha_0 + \gamma X_{j,(t-1,t-2,t-3)} + \omega_j + \kappa_t + \epsilon_{jt}, \tag{6}$$

where $X_{t-1,t-2,t-3}$ is a vector of lagged country-level economic, social, environmental, and other conditions in the past three years. We use LASSO to select the country-level indicators included in $X_{t-1,t-2,t-3}$ from among a large set of potential predictors we assemble from the following sources:

1. World Bank Development Indicators Database: Economic, social, agricultural, and environmental indicators.
2. EM-DAT: Number affected by natural disasters
3. Uppsala Conflict Data Program: Presence of armed conflicts/wars, intensity of conflicts/wars

We predict this ratio using the variables identified by lasso and then use that predicted ratio to generate a predicted number of immigrants from country j in the U.S. in year t, as follows:

$$\widehat{Migrants}_{jt} = \frac{\widehat{Migrants}_{jt}}{Migrants_{j2000}} * Migrants_{j2000} \tag{7}$$

We then use this predicted number of immigrants in the U.S. to construct the "pull" version of our instrument for the number of immigrants:

$$Z^{number}_{push,dt} = \frac{Immig_{dj,2002}}{Migrants_{j,2002}} \widehat{Migrants}_{jt}, \tag{8}$$

Similarly, bu substituting $Z^{number}_{push,dt}$ for Z^{number}_{dt} in equation 5, we are able to produce the "push" specification of our instrument for the immigrant share of enrollment.

5 Results

5.1 First Stage Effects

Table 2 shows our first stage estimates. Column 1 shows the relationship between a one-student increase in the predicted number of immigrants on the actual number of immigrants in the district. The model controls for year fixed effects and baseline traits from 2001-2002 including racial demographic shares, share of low-income students, English learners, and immigrant students, and the number of immigrant students. An increase in the predicted number of immigrant students using the shift-share instrument by one student predicts an increase of immigrant students by 0.646 students. The first stage is significant at the 1% level with a strong F-stat of 212. Column 2 shows the first stage estimates with district fixed effects instead of the baseline controls. It is substantively similar and statistically significant, but noisier with a weaker F-stat. Columns 3 and 4 show the analagous first stage regressions with the push instrument and find similaar first stages of ranging from 0.75 students to 1.47 students. Columns 5 through 8 show the first stage regressions with share of

immigrant as the endogenous variable and predicted share as the instrument. A one percentage point increase in predicted migrant share corresponds to an actual increase in immigrant share by 0.343-0.689 percentage points.[4]

5.2 Effects on Demographic Variables

Table 3 shows the effects of an additional immigrant student on enrollment demographics in the district in OLS, shift-share instrument, and push instrument models. There is a negative but not statistically significant estimate for total enrollment. Focusing on students not from immigrant families shows that an additional immigrant student leads to about three fewer non-immigrant students. This decline is present for White, Asian, and Black families, but not Hispanic families.

An additional immigrant student is linked with over 3 new English learners. This large effect could stem from second generation students, including new siblings of immigrants, as well as first generation immigrants.

Table 4 shows the analagous results in terms of share of the population and with immigrant share as the endogenous variable. We are currently investigating where students who leave the district enroll and the traits of students who leave the district.

5.3 Effects on School Resources

Table 5 shows the effect of an additional immigrant student on school funding sources and spending per pupil. The share of school funding from the federal government declines while local and state revenue remain fairly stable. Initial investigations show that the federal decline is due to special education funding. We find evidence of spending per pupil declining across two separate data sources, Common Core of Data and Massachusetts Department of Elementary and Secondary Education. This stems from declining student enrollment and reduced federal revenue. We are currently processing additional school finance outcomes for additional analyses and to further understand what leads to the federal decline.

5.4 Effects on Teacher Characteristics

Table 6 shows the effect of a one percentage point increase in immigrant share on the proportion of teachers with various characteristics. Largely, immigration is not significantly changing teacher qualifications or demographics. It appears to be linked with slightly lower average years of teaching experience, but no change in the representation of new teacher (defined as in the district or school for two years or less). There are small increases in the presence of Hispanic teachers.

[4] We note that the first-stage for our push specification with baseline controls is not significant.

Table 7 shows the effect of a one immigrant student increase on full time equivalent school staff per pupil. Schools increase English learner staff, which appears driven by increases in English Learner content support and core teachers, but not paraprofessionals or EL directors.

6 Next Steps

Our next steps for this work include the following:

- **Heterogeneity:** Develop "skill-level" specific versions of instruments to separately examine effects of immigration of the children of "high-skilled" (parents have BAs or higher) and "low-skilled" (parents have lower levels of educational attainment") immigrants. Also examine heterogeneity by district characteristics (e.g. "new destinations" vs. established immigrant communities).
- **Additional Outcomes:** Clean and assess effects on detailed school expenditure and finance data; within-school tracking measures; etc.
- **Robustness:** Assess pre-treatment trends (as described). Consider approach to addressing serial correlation proposed by (Jaeger et al., 2018).

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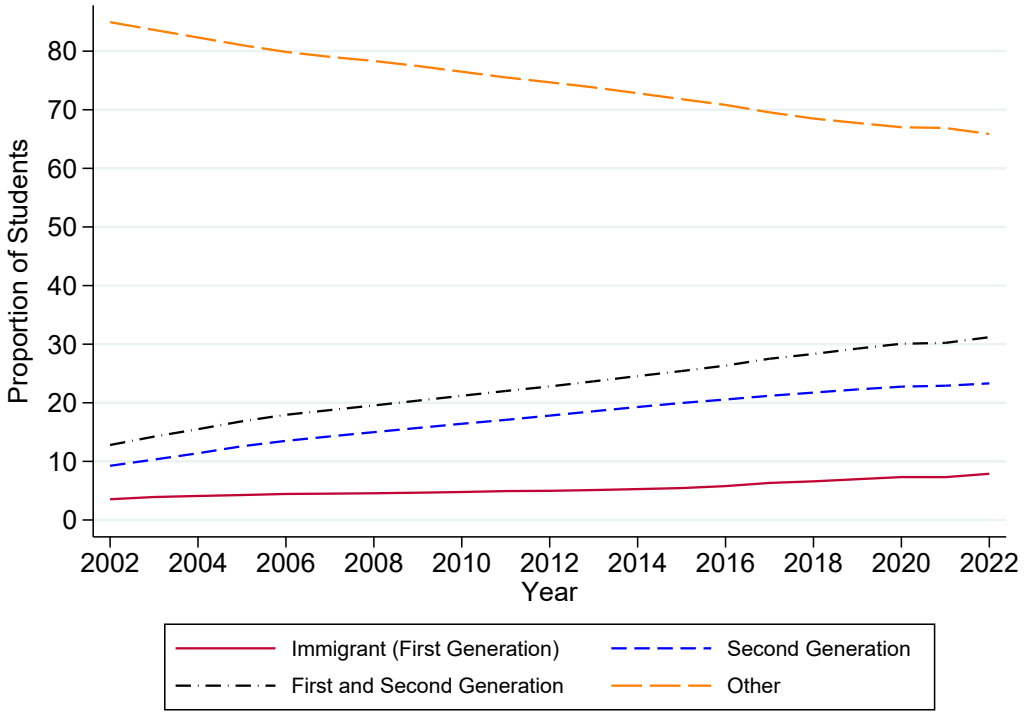
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Figure 1: State-level Student Trends by Immigrant Generation

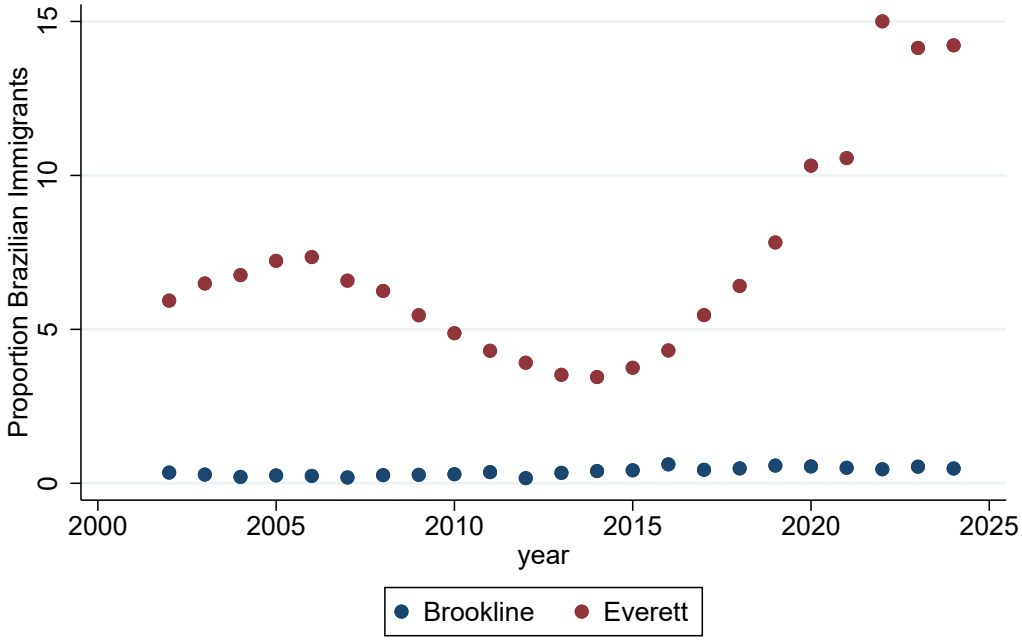


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Figure 2: Brazilian Population in Two Massachusetts School Districts



Everett had 6% Brazilian enrollment in 2002 and 12.4% immigrant enrollment in 2002.
Brookline had <0.34% Brazilian enrollment in 2002 and 13.8% immigrant enrollment in 2002.

Table 1: Summary Statistics

	Full Sample	Native	Immigrant	Second-Gen
	(1)	(2)	(3)	(4)
A. Demographic characteristics				
Female	0.485	0.486	0.484	0.483
Black	0.649	0.758	0.193	0.329
Latinx	0.087	0.062	0.207	0.157
Asian	0.172	0.128	0.401	0.290
White	0.060	0.024	0.180	0.174
English learner	0.084	0.034	0.556	0.149
Special education	0.185	0.196	0.089	0.172
Low income	0.326	0.282	0.607	0.426
Beginning proficiency	0.014	0.005	0.124	0.019
Intermediate proficiency	0.031	0.012	0.188	0.062
Advanced proficiency	0.012	0.005	0.075	0.026
Former English Learner	0.061	0.024	0.269	0.151
Has birth record in Massachusetts	0.762	0.762	0.000	1.000
N	22,704,524	17,363,622	1,269,960	4,070,941
B. Outcomes				
Centered Math Score	0.020	0.048	-0.441	0.032
Centered English Score	0.021	0.064	-0.607	-0.001
Ever suspended	0.022	0.023	0.024	0.017
Attendance rate	0.846	0.854	0.766	0.837
Take SAT	0.541	0.543	0.451	0.564
SAT >1000	0.331	0.341	0.188	0.328
Score 4 or 5 AP	0.161	0.158	0.129	0.185
Aspire to 4-year college	0.609	0.613	0.483	0.628
Dropout of HS	0.029	0.029	0.043	0.023
Grad HS in 5 years	0.814	0.830	0.745	0.751
Enroll in 4-year college	0.473	0.479	0.305	0.495
Graduate 4-year college within 6	0.383	0.390	0.244	0.390
C. Language spoken at home				
Spanish	0.105	0.065	0.328	0.207
Chinese	0.013	0.004	0.050	0.039
Haitian	0.010	0.002	0.063	0.024
English	0.782	0.899	0.076	0.502
Portuguese	0.023	0.005	0.139	0.064
N	22,704,524	17,363,622	1,269,960	4,070,941

Notes: This table shows demographic and outcome summary statistics by immigrant generation for students in Massachusetts.

Table 2: First Stage

	Outcome: Number of Immigrants				Outcome: Percent Immigrant			
	Shift-Share		Push		Shift-Share		Push	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Instrumental Variable	0.303***	0.391***	0.253	0.812***	0.347*	0.562***	0.108	0.856***
	(0.067)	(0.110)	(0.236)	(0.235)	(0.188)	(0.123)	(0.231)	(0.188)
N	4107	4145	4107	4145	4107	4107	4107	4107
F-stat	20	13	1	12	3	21	0	21
p-value	0.000	0.000	0.285	0.001	0.066	0.000	0.639	0.000
Controls	Y		Y		Y		Y	
District & Year FE		Y		Y		Y		Y

Notes: This table shows the first stage estimates. Columns 1 through 4 show the effect of the shift-share or push instruments on the number of immigrants in the school district with both baseline control variables or district and year fixed effects. Columns 5 through 8 show the analagous results with percent immigrant in the district as the endogenous variable. Data is at the school district by year level for 2001-2002 through 2019-2020. Baseline control variables include district enrollment in 2001-2002, racial demographic shares in 201-2002, the share of low income, English learner, and immigrant students in 2001-202, year fixed effects, and the number of immigrants in 2001-2002.

Table 3: Enrollment Effects - Levels

	OLS		Shift-share		Push	
	(1)	(2)	(3)	(4)	(5)	(6)
Total enrollment	1.210***	0.842*	-0.514	-0.676	-1.454	-0.519
	(0.291)	(0.508)	(1.804)	(1.432)	(3.505)	(1.542)
Students not from immigrant family						
Any	-1.342***	-1.262**	-3.101*	-3.295**	-4.990	-2.981**
	(0.420)	(0.542)	(1.731)	(1.295)	(3.777)	(1.403)
White	-0.862**	-0.601***	-0.133	-0.764	-1.015	-0.770*
	(0.364)	(0.211)	(0.369)	(0.466)	(2.457)	(0.438)
Asian	-0.007	-0.030	-0.235***	-0.146***	-0.382	-0.108**
	(0.034)	(0.032)	(0.057)	(0.055)	(0.376)	(0.054)
Black	-0.127	-0.745	-3.378***	-2.386*	-5.850	-2.111
	(0.273)	(0.502)	(1.199)	(1.283)	(4.718)	(1.327)
Hispanic	-0.352	0.040	0.316	-0.238	1.777	-0.229
	(0.283)	(0.210)	(1.087)	(0.383)	(3.854)	(0.419)
Ever English learner	1.540***	2.243***	5.162***	3.927***	7.951	3.452***
	(0.205)	(0.451)	(1.791)	(0.880)	(6.606)	(0.859)
N	4107	4145	4107	4145	4107	4145
Controls	Y		Y		Y	
District & Year FE		Y		Y		Y

Notes: This table shows the results of OLS and 2SLS analysis of the impact of one additional immigrant student in the district on demographic enrollment numbers.

Table 4: Enrollment Effects - Shares

	OLS		Shift-Share		Push	
	(1)	(2)	(3)	(4)	(5)	(6)
Share of not	-1.967***	-1.377***	-6.291**	-3.152***	-19.000	-3.338***
immigrant families	(0.204)	(0.136)	(2.978)	(0.571)	(37.229)	(0.651)
Students not from immigrant family						
Share White	-1.507***	-0.994***	-3.900**	-2.029***	-11.648	-2.403***
	(0.250)	(0.167)	(1.620)	(0.662)	(21.102)	(0.750)
Share Asian	0.003	-0.029	-0.400	-0.050	-1.007	0.000
	(0.075)	(0.035)	(0.283)	(0.056)	(2.280)	(0.071)
Share Black	-0.036	-0.103***	-0.111	-0.424**	1.095	-0.295**
	(0.042)	(0.034)	(0.203)	(0.187)	(2.414)	(0.146)
Share Hispanic	-0.376**	-0.206**	-1.712	-0.511*	-6.993	-0.488*
	(0.165)	(0.084)	(1.426)	(0.289)	(15.893)	(0.278)
Share ever English	1.201***	1.166***	5.532**	3.509***	12.926	3.499***
learner	(0.133)	(0.129)	(2.332)	(0.814)	(24.129)	(0.818)
N	4107	4145	4107	4107	4107	4107
Controls	Y		Y		Y	
District & Year FE		Y		Y		Y

Notes: This table shows the results of OLS and 2SLS analysis of the impact of a one percentage point increase in immigrant share in the district on demographic enrollment shares.

Table 5: School Finance Effects - Levels

	OLS		Shift-share		Push	
	(1)	(2)	(3)	(4)	(5)	(6)
Percent Federal revenue	-0.001***	-0.002***	-0.002***	-0.002***	-0.006	-0.003***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.006)	(0.001)
N	3971	3999	3971	3999	3971	3999
Percent local revenue	-0.002	-0.002**	-0.005	-0.002	0.003	-0.002
	(0.004)	(0.001)	(0.006)	(0.003)	(0.024)	(0.003)
N	3971	3999	3971	3999	3971	3999
Percent state revenue	0.004	0.004***	0.007	0.004	0.003	0.005*
	(0.004)	(0.001)	(0.006)	(0.003)	(0.021)	(0.003)
N	3971	3999	3971	3999	3971	3999
Spending per pupil (from	-1.341	-2.375***	-3.790*	-2.241**	-8.499	-2.157**
CCD)	(0.991)	(0.407)	(2.042)	(0.884)	(8.993)	(0.945)
N	3970	3997	3970	3997	3970	3997
Spending per pupil	-1.596*	-2.405***	-5.166**	-2.619***	-11.913	-2.506***
	(0.958)	(0.392)	(2.037)	(0.385)	(15.398)	(0.425)
N	3475	3502	3475	3502	3475	3502
Controls	Y		Y		Y	
District & Year FE		Y		Y		Y

Notes: This table shows the results of OLS and 2SLS analysis of the impact of one additional immigrant student in the district on school finance metrics.

Table 6: Teacher Characteristics

	OLS		Shift-share		Push	
	(1)	(2)	(3)	(4)	(5)	(6)
Licenced	0.000	-0.001	0.000	-0.001	0.003	-0.002
	(0.000)	(0.000)	(0.002)	(0.001)	(0.010)	(0.001)
Highly qualified	0.001	0.001	-0.003	-0.001	0.020	-0.003
	(0.002)	(0.004)	(0.014)	(0.006)	(0.039)	(0.006)
Advanced degree	-0.001	0.004	0.018	0.004	0.033	0.004
	(0.001)	(0.003)	(0.014)	(0.005)	(0.083)	(0.006)
Years teaching in MA	-0.064	-0.077	-0.382	-0.240***	-0.934	-0.203**
	(0.045)	(0.052)	(0.288)	(0.083)	(2.412)	(0.087)
Novice teacher	0.001	0.002	0.011	0.002	0.039	0.002
	(0.001)	(0.002)	(0.008)	(0.003)	(0.100)	(0.004)
New to school	0.000	-0.001	0.005	0.000	0.015	0.000
	(0.001)	(0.001)	(0.005)	(0.002)	(0.042)	(0.002)
Hispanic	0.000	0.001***	0.001	0.002**	0.005	0.002***
	(0.000)	(0.000)	(0.003)	(0.001)	(0.017)	(0.001)
White	0.001	0.000	0.006*	0.000	0.015	0.000
	(0.001)	(0.000)	(0.004)	(0.001)	(0.033)	(0.001)
Black	0.000	0.000	-0.004	0.001	-0.011	0.000
	(0.000)	(0.000)	(0.003)	(0.001)	(0.026)	(0.001)
Asian	0.000	0.000	-0.003*	0.000	-0.006	0.001
	(0.000)	(0.000)	(0.002)	(0.001)	(0.012)	(0.001)
Female	-0.005***	-0.002	-0.004	-0.001	0.031	0.000
	(0.002)	(0.002)	(0.010)	(0.003)	(0.098)	(0.003)
N	2615	2652	2615	2615	2615	2615
Controls	Y		Y		Y	
District & Year FE		Y		Y		Y

Notes: This table shows the results of OLS and 2SLS analysis of the impact of one additional immigrant student in the district on the proportion of full time equivalent teachers with various characteristics.

Table 7: Staff Characteristics

	OLS		Shift-share		Push	
	(1)	(2)	(3)	(4)	(5)	(6)
Teacher	0.721*	1.608**	9.282	4.844*	79.319	4.896*
	(0.382)	(0.723)	(5.630)	(2.641)	(959.257)	(2.773)
Counselor	0.007	0.019**	0.059	0.024***	0.638	0.036***
	(0.005)	(0.008)	(0.058)	(0.009)	(7.806)	(0.013)
Any employee	0.783	1.547	11.018	5.578**	75.823	5.801**
	(0.593)	(0.986)	(8.089)	(2.843)	(895.424)	(2.949)
EL content support	0.015	0.049	0.205	0.153	2.836	0.165
	(0.014)	(0.044)	(0.153)	(0.103)	(35.164)	(0.112)
EL core teacher	0.048**	0.064	0.411	0.224	5.105	0.268
	(0.021)	(0.043)	(0.254)	(0.171)	(62.325)	(0.200)
EL director	0.000	0.000	0.001	0.000	-0.010	0.000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.143)	(0.001)
General paraprofessional	0.005	0.016	-0.199	0.043	-1.653	0.017
	(0.019)	(0.025)	(0.239)	(0.037)	(20.450)	(0.017)
EL paraprofessional	0.011	0.046	0.023	0.000	-1.320	0.027
	(0.020)	(0.029)	(0.178)	(0.063)	(17.086)	(0.038)
Total EL staff	0.075**	0.160***	0.640	0.376*	6.611	0.460*
	(0.032)	(0.057)	(0.411)	(0.212)	(80.362)	(0.275)
	2615	2652	2615	2652	2615	2652
Controls	Y		Y		Y	
District & Year FE		Y		Y		Y

Notes: This table shows the results of OLS and 2SLS analysis of the impact of one additional immigrant student in the district on full-time equivalent staff counts.