When Non-Natives Compete for Top Schools: Displacement and Attainment in Primary Education*

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Abstract

We study how migration-induced demand shocks affect natives' access to public schools by examining competition for rationed primary-school places in England after the 2004 EU enlargement. The post-enlargement inflow was large and concentrated among Polish migrants, who were disproportionately likely to satisfy faith-based admissions criteria and therefore intensified competition for high-performing public Catholic schools. To address endogenous migrant location choices, we construct an instrument for post-2004 Polish settlement patterns using the location and capacity of post-World War II Polish resettlement camps digitized from archival records. Combining this historical variation with administrative data on the universe of pupils in public primary schools, we estimate the causal effects of local exposure to non-native pupils at school entry. We find that higher non-native exposure displaces native pupils from Catholic schools toward non-faith schools and toward closer schools with weaker baseline performance and a less advantaged pupil intake. It also reduces natives' test scores at the end of primary school. Using sibling-priority rules and within-school designs with family fixed effects, we show that these attainment effects are driven primarily by displacement across schools rather than by adverse within-school interactions.

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1 Introduction

Across advanced democracies, immigration has become one of the most contested issues in public debate, despite limited evidence of adverse effects of immigration on natives' labor market outcomes (Dustmann et al., 2016). This disconnect suggests that opposition to immigration may be shaped by other margins, including the welfare state (Facchini and Mayda, 2009), compositional amenities (Card et al., 2012) and redistributive policies (Alesina et al., 2023). Discontent may be particularly salient when immigration increases demand for locally congested public services. Unlike in markets where prices adjust to changes in demand, access to such services is often rationed by capacity constraints and administrative allocation. Schools are a prominent example: because families value access to high-performing schools and school supply adjusts only slowly, migration-induced demand shocks may affect not only classroom composition but the allocation of native pupils across schools.

In this paper, we study how foreign migration, through increased demand for primary school places, affects native pupils' school allocation and educational outcomes in public primary schools in England. We focus on the large and sudden migration shock triggered by the 2004 EU enlargement. Between 2004 and 2014, approximately 1.1 million migrants arrived in the UK from the new member states, and approximately two thirds of these were from Poland. Over the same period, the share of primary school pupils in England who were non-native English speakers rose from 12% in 2004 to 22% in 2019. The rapid increase in the number of non-native pupils, reinforced by rising births to foreign-born mothers, increased demand for school places and fueled concerns about access to school seats.[1]

We leverage a distinctive feature of the English state school system to study migration-induced displacement of native pupils across schools. The interaction between migrants' religious affiliation and English school admission rules creates a sharp margin of competition for access to high-performing schools. Catholic primary schools account for around 10% of schools in England, are state funded and free to attend and their performance typically exceeds the national average. Unlike non-faith schools, which allocate places primarily based on residential proximity, Catholic schools can prioritize applicants according to religious affiliation, ranking Catholic children first, followed by children from other Christian denominations, and finally by children from other religions or without a religious affiliation. Because an overwhelming majority of Poland's population identifies as Catholic, Polish children were disproportionately likely to satisfy faith-based admission criteria. As a result, migrant inflows increased demand in a set of high-performing

[1] According to the 2013 British Social Attitudes Survey, 76.6% of respondents believed that immigration increased pressure on schools across Britain – with 43.9% saying it did so "a lot" – a far higher share than the 40.8% reporting that immigrants have a negative impact on the British economy (BSA Survey 2013). E.g., see media coverage in The Guardian (2015) and in The Telegraph (2016a, 2016b).

schools, generating a sharp source of competition for places in Catholic schools and displacing native pupils toward other schools.

We address the endogeneity of migrants' residential choices via an instrumental variable approach that exploits historical variation from an earlier wave of Polish settlements. Following World War II, a UK government dispersal policy assigned roughly 200,000 Polish citizens to resettlement camps located in pre-existing military sites across the UK. We digitize archival records from the 1940s to recover each camp's location and capacity, and use this information to predict the post-2004 distribution of Polish arrivals across English local areas. This predicted distribution, interacted with the large and sudden migration shock from Poland generated by the 2004 EU enlargement, provides an instrument for local exposure to non-native pupils. Because camp locations were determined by military infrastructure rather than local schooling conditions, the resulting variation is plausibly orthogonal to contemporaneous trends in local school markets. Consistent with this interpretation, the instrument does not predict local exposure to non-native pupils before EU enlargement, while it is strongly predictive thereafter: a one-standard-deviation increase in the instrument raises the local non-native share at school entry by 6.4 percentage points, relative to a baseline of 7.8%.

We combine this source of variation with administrative records covering the universe of pupils enrolled in England's public primary schools. Our data include approximately 10.5 million children from the 2001-2018 entry cohorts and contain information on pupils' demographic characteristics, residential location, and the religious denomination of the school attended. For the 2001-2012 entry cohorts, we additionally observe nationally standardized test scores in reading and math at the end of primary school.

Our empirical analysis distinguishes between two margins through which the migration shock may affect native pupils. First, we leverage area-level exposure to the presence of non-native pupils to estimate how migration-induced demand shocks affect native pupils' school allocation and their attainment at the end of primary school. A key empirical challenge is to define the relevant local school markets, since effective catchment areas are not administratively fixed, but are endogenously determined by school demand and supply. We address this using fine-grained geographic information on pupils and schools to construct local school markets and measure exposure to non-native pupils at the time of primary-school entry. These estimates capture the consequences of the migration shock when only school assignment adjusts. Second, we shift from area-level to school-level exposure to study the effects of within-school interactions, conditioning on school assignment and exploiting variation across cohorts within school, and across siblings within families. Together, these two approaches allow us to distinguish the effects of migration-induced reallocation across schools from those related to changes in peer composition within schools.

We provide three main sets of results. First, we document displacement effects by

examining how native enrollment shifts across school types in response to a migration-induced shock. Our IV estimates indicate that a 10 percentage point increase in the local non-native share reduces native enrollment in Catholic schools by about 1 percentage point, relative to a baseline of around 10%. This displacement is almost entirely absorbed by non-faith schools, where native enrollment increases by a similar magnitude from a baseline of about 70%. We find no evidence that these patterns reflect voluntary "native flight". If anything, residential mobility and voluntary school switching decline with the local concentration of non-native pupils, while the school allocation of natives with sibling priority for admission remains unaffected by non-native presence.

Second, the reallocation induced by the migration shock changes the characteristics of the schools attended by native pupils. Natives in more exposed areas attend schools with slightly weaker baseline performance, a less advantaged peer intake (measured before EU enlargement), and shorter commuting distances. A 10 percentage point increase in the local non-native share leads natives to enroll in schools whose baseline test scores are approximately 0.01 standard deviations lower in both reading and math and whose share of pupils eligible for free school meals is 0.6 percentage points higher, while reducing the distance traveled to school by about 0.06 km.

Third, we find that greater non-native exposure at school entry lowers natives' test scores at the end of primary school. A 10 percentage point increase in the local non-native share reduces reading and math test scores by 1.7%. These reduced-form attainment effects conflate two distinct channels: the displacement of natives toward lower-performing schools and within-school compositional changes induced by non-native inflows, which may affect both displaced and non-displaced pupils.

To disentangle these mechanisms, we implement two complementary strategies. First, we harness sibling priority in school admissions. Because younger siblings have priority over both faith and distance criteria when applying to the school attended by an older sibling, they are plausibly insulated from displacement induced by increased competition for places. Consistent with this, we find no evidence of displacement or poorer attainment for pupils whose older siblings are enrolled in Catholic schools, indicating that the negative attainment effects obtained in the full sample are driven primarily by reallocation toward schools with less favorable baseline characteristics. Second, we investigate the consequences of within-school exposure to non-natives by exploiting variation in exposure across cohorts within schools and across siblings within families. Once sorting into schools is accounted for, the effect of contemporaneous within-school exposure to non-natives is null or even positive. Taken together, these results imply that the negative reduced-form effect on attainment operates primarily via displacement across schools with different characteristics, rather than adverse within-school interactions.

A growing literature investigates the impacts of immigrant peers on the educational outcomes of natives in the US and a few other contexts. As migrant presence in schools

is often correlated with aspects of economic and educational (dis)advantage among natives, the approach in this body of work typically leverages variation in migrant presence from natural experiments and/or includes rich controls for school and pupil observables. Among studies that leverage within-school variation in migrant concentration across grades, estimates range from near zero (Geay et al., 2013; Ohinata and Van Ours, 2013; Schneeweis, 2015; Figlio and Özek, 2019; Bossavie, 2020), to negative (Gould et al., 2009; Ballatore et al., 2018; Frattini and Meschi, 2019; Özek, 2023). Figlio et al. (2024) further tighten the within-school design in the context of Florida public schools, by comparing the school performance of siblings exposed to different concentrations of immigrants in their respective cohorts. They find that the estimated relationship between migrant exposure and native attainment turns positive once family fixed effects are included. A common feature of these designs is that they condition on the school allocation of native pupils. These approaches therefore are not informative about responses operating through increased competition for school places and the resulting reallocation of native pupils across schools.

Our main contribution is to identify this displacement channel. We do so in a setting where access to schools is rationed by capacity constraints and admission rules, and where admission criteria give non-native pupils a comparative advantage in the competition for places at faith-based schools. Using an area-level design that measures local exposure to non-native pupils within finely defined school markets, we show that a migration-induced demand shock reallocates native pupils across schools at the time of primary-school entry. Our results complement studies that leverage geographic variation in the migrant share to document increased natives' incentives to invest in higher education (McHenry, 2015; Hunt, 2017; Bachli and Tsankova, 2023), as well as "native flight" to private schools or neighborhoods with lower migrant shares (Fairlie and Resch, 2002; Betts and Fairlie, 2003; Cascio and Lewis, 2012; Farre et al., 2018; Boustan et al., 2024).[2]

More broadly, our findings demonstrate that estimates of within-school effects need not capture the full impact of immigration on native pupils, as migrant inflows may induce reallocation of native pupils across schools, which we show to be an important margin of adjustment. Our second contribution is to bring together area-level displacement designs and within-school peer-effects designs in a unified empirical framework. This allows us to separately identify the effects of pupil reassignment across schools and changes in peer composition within schools – two channels that have largely been studied in isolation. The distinction is important because area-level exposure may alter school assignment, while the educational consequences of that reassignment depend both on the types of schools to which native pupils are displaced and on interactions within destination schools. By shedding light on both margins, our analysis helps explain the mixed evidence on

[2]In other related work by Llull (2018), natives adjust to immigration by changing education and/or occupation.

immigrant exposure in schools and provides a clearer framework for interpreting how immigration affects natives' human-capital accumulation.

The remainder of the paper is organized as follows. In Section 2 we describe the institutional background, discussing key features of primary education in England and Polish migration to the UK. In Section 3, we present our data sources and descriptive statistics. We discuss our empirical approach and identification strategy in Section 4. Section 5 reports our main results on natives' school enrollment, school characteristics, and educational attainment. Section 6 investigates mechanisms, focusing on within-school interactions using sibship information and measures of within-school exposure to non-native pupils. Section 7 concludes and discusses policy implications.

2 Institutional context

2.1 Primary education in England

Primary education in England lasts seven years. Pupils start Reception (kindergarten, or grade 0) in the school year in which they turn five and complete primary school at the end of grade 6, aged eleven. Pupils are internally assessed at the end of grade 2 (Key Stage 1, or KS1) and externally at the end of year 6 (Key Stage 2, or KS2). KS2 test scores are standardized at the national level, and widely used for school accountability, being disseminated through school Performance Tables since 1996.

The vast majority of primary schools in England are public, namely they are state-funded and free to attend. Approximately 95% of children are enrolled in public schools, which can be either secular or faith institutions. The most common religious denominations are Church of England (CofE) and Roman Catholic. Although they all operate within the state sector and follow the national curriculum, schools differ in the degree of autonomy they retain as a result of historical arrangements governing the incorporation of faith schools into the state system.

These arrangements created two administrative categories for faith schools: Voluntary Aided (VA) and Voluntary Controlled (VC) – a distinction that is relevant for admission criteria. VA schools (19% of all schools in our sample in 2001), which include all Catholic schools and 43% of CofE schools, act as their own admission authority. This means that, when oversubscribed, they may prioritize applicants based on evidence of religious affiliation. Catholic schools typically give priority to Catholic applicants, documented with evidence of religiosity (e.g. baptism, letter by priests or church attendance), followed by other Christian applicants, before allocating any remaining places by geographic proximity. CofE VA schools apply similar rules, prioritizing practicing CofE students. By contrast, admissions to VC schools, which represent about 13% of all schools, are almost

entirely CofE and are administered by Local Authorities, which allocate places primarily according to proximity when schools are oversubscribed. Virtually all secular schools fall into a third category, Community schools, which constitute 55% of all schools. These are also fully administered by Local Authorities and follow proximity-based admission criteria. One final category, Foundation schools, includes secular schools that retain some admission autonomy (only 2% of the sample).[3] Across all school types, statutory priority is given to pupils with special educational needs, children in foster care, and younger siblings of incumbent students.

Faith schools typically exhibit higher average attainment than non-faith schools in reading and math, as shown in Figure 1, which plots the density function of pupils reaching the highest levels of attainment at the end of primary school. Catholic education seems to be particularly sought after by British parents. For parents seeking to secure the best possible education for their children, the options appear to be either to pay the housing price premium associated with living near the best non-faith schools (Gibbons and Machin, 2006; Gibbons et al., 2013; Battistin and Neri, 2024) or to secure admission to top faith schools by strengthening their religious credentials.[4] Evidence from Gibbons and Silva (2011) suggests that most of this performance advantage reflects pupil sorting on pre-determined characteristics rather than differences in school effectiveness. Nonetheless, faith-school status is often valued by parents as a school attribute in its own right (Burgess et al., 2015). Consistent with this, high demand for seats in Catholic schools may reflect a combination of religious preferences, more affluent pupil intakes, and academic performance.

2.2 Polish immigration to the UK

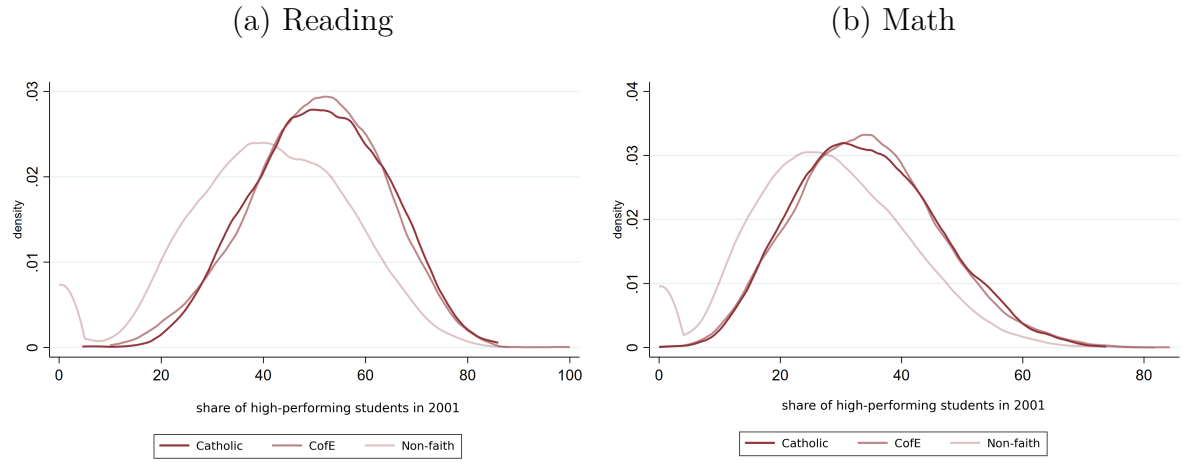
EU Enlargement. The 2004 enlargement of the European Union marked a sharp acceleration in the growth of the foreign-born population in the UK.[5] The UK was one of only three countries – alongside Ireland and Sweden – that granted immediate labor market access to citizens of the new EU member states upon enlargement. This policy generated a record increase in migration inflows, with around 1.1 million people arriving in the UK from the new member states between 2004 and 2014. As Figure A.2 shows, the number of Eastern European nationals (EU8) in the UK grew rapidly after 2004, while the number of migrants from pre-existing EU member states stagnated. Poles were the

[3]For 11% of the schools in the sample the information on administrative type is missing.

[4]British media have reported that competition for school places may be boosting baptisms years after children's birth and encouraging parents to "act Catholic" or even fabricate the nature of their religious affiliation (see Figure A.1).

[5]The 2004 EU enlargement extended EU membership and free-movement rights to ten new member states (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia), while allowing for transitional restrictions to labor mobility, which most incumbent members implemented for up to seven years.

Figure 1: Share of high-performing students in 2001, by religious affiliation of school



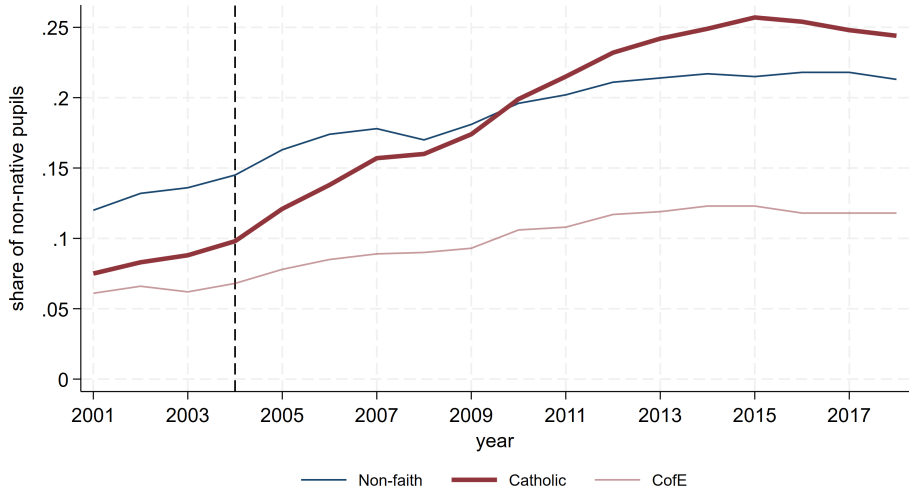
Notes. Panels (a) and (b) report the share of pupils reaching level 5 (i.e. the highest level) in KS2 tests in reading and math, respectively. Education outcomes are measured at baseline (2001).

largest group among EU8 migrants: their presence in the UK increased almost tenfold, from about 66,000 in 2001 to 654,000 in 2011, and by 2015 Poland had become the most common country of origin among migrants to the UK. The inflow of Polish workers after 2004 was accompanied by a sharp increase in the number of Polish-born children in the UK. According to the Census, the number of Polish nationals aged 0–15 in England and Wales grew from around 2,000 in 2001 to over 60,000 in 2011, the fastest increase among the largest migrant groups (Figure A.3). Meanwhile, births to Polish-born women rose sharply, in contrast to broadly stable birth numbers among other large migrant groups (Figure A.4).

Polish immigration after WWII. While Polish presence was limited upon EU enlargement, the UK had experienced a large inflow of Poles during and after WWII. Following the evacuation of the Polish Government-in-Exile to the UK in 1940, the arrival of Polish troops continued throughout the war. At the end of the conflict, during which the Polish armed forces made significant contributions to the Allied forces, Poland's eastern territories were incorporated into the Soviet Union and a communist government was established in the remainder of the country. Dissatisfied with the post-war settlement, many Polish soldiers decided not to return, and were joined by their families as well as previously deported civilians (Winder, 2004), bringing the total estimated number of Poles in the UK to over 250,000 in 1945 (Blaszczyk, 2020). The 1947 Polish Resettlement Act finally granted settlers British naturalization and government support. While official estimates for the immediate post-war period are scant, the 1951 Census records approximately 162 thousand Polish-born residents in the UK, up from 44 thousand in 1931 (Burrell, 2002). To avoid concentration in London and the South East, the government adopted a dispersal policy that assigned most Polish migrants to approximately

260 resettlement camps, largely former military sites vacated at the end of the war and mostly located in rural areas (see Figure B.3). Settlers gradually moved out of camps in search of better employment opportunities and accommodation, and by the mid-1960s all but a handful had been closed (Biegus and Biegus, 2013). As we discuss in Section 4.2, we leverage this early settlement pattern for our identification strategy to predict the residential distribution of Polish migrants following the 2004 EU enlargement. Appendix B provides additional details on Polish camps in the UK.

Figure 2: Share of non-native pupils by schools' religious affiliation



Notes. The Figure plots the share of non-native pupils entering in Reception year from 2001 to 2018 by school religious affiliation.

Catholicism in Poland. A distinctive feature of the Polish population – compared to most Western EU and other EU8 nationals – is its relatively high religiosity, with the vast majority adhering to Catholicism. Figure A.5 illustrates this point using European Social Survey data from 2002, and relating measures of religiosity to the share of respondents self-identifying as Catholic across countries. Poland stands out along all dimensions: almost 84% of respondents report high religiosity, about 56% attend religious services at least once a week, and the share identifying as Catholic is close to 100%. By contrast, in the UK the shares of highly religious respondents and weekly attendance are 54% and 13%, respectively, and fewer than 20% identify as Catholic.

These differences provide Polish families with a clear comparative advantage in meeting the faith-based admission criteria for Catholic schools in England. This advantage – potentially compounded by parental preference for Catholic education among Poles – is reflected in enrollment patterns. As shown in Figure 2, the share of non-native pupils in Catholic schools rises steeply after the EU enlargement, from 7% in 2001 to around

25% in 2014, outpacing the contemporaneous increases in non-faith schools (13% to 21% over the same period) and in CofE schools (6% to 12%). This disproportionate growth in Catholic schools underscores that Polish migration did not simply raise foreign enrollment uniformly across the system, but shifted it specifically toward schools where Polish pupils held a comparative advantage in admissions.

3 Data and summary statistics

National Pupil Database. Our main data source is the National Pupil Database (NPD), containing administrative records for the universe of pupils enrolled in state-funded schools in England (95% of school-age children). Our sample includes all pupils entering primary education between 2001 and 2018, corresponding to approximately 10.5 million individuals. The dataset contains information on pupil characteristics and attainment, including gender, ethnicity, eligibility for free school meals (FSM), main language spoken at home, school attended, distance to school, test scores, and Lower Super Output Areas (LSOA) of residence.[6]

We focus our analysis of pupil attainment on standardized scores at the end of primary school (KS2), based on externally graded tests. As our sample ends in 2018, KS2 test scores are available for entry cohorts 2001-2012, which are observed from grade 0 to 6. We use KS2 test scores in reading and math as our primary measures of achievement.[7] Reading scores are reported on a 0-50 scale. Math scores are reported on a 0-100 scale up to 2015 and on a 0-110 scale from 2016 onward. To facilitate comparisons across years, we standardize test scores to have mean 0 and standard deviation 1 within each year. Table A.1 reports summary statistics for pupil characteristics as well as the original (non-standardized) score scales.

The NPD does not provide information on pupils' citizenship or country of birth. We therefore proxy non-native status using information on language spoken at home, classifying pupils as non-native if they do not report English as their main home language. In the NPD, a pupil is recorded as having English as an additional language when they are exposed at home to a language other than English. This measure is well suited to our setting because language is a key dimension of migrant integration at school and a potential channel through which migrant pupils may affect native peers. Limited proficiency in the host-country language may slow classroom instruction or divert school resources toward language support and away from other learning activities. Our language-based definition may classify pupils from English-speaking immigrant backgrounds as

[6]LSOAs are small, relatively homogeneous geographic units developed by the Office for National Statistics (ONS) for statistical purposes, with a target population of about 700 households. According to the 2001 Census, there are 33,654 LSOAs in England. The average size of an LSOA is 4 square km.

[7]Information on test scores in other subjects is not uniformly available for our whole sample period.

native. On the other hand, it has the advantage of capturing UK-born children of foreign-born parents who do not speak English at home, and who contribute to rising demand for school places during periods of increasing migration.[8]

Family linkages are included in the 2007, 2012, and 2015 waves of the NPD, which provide the samples for our sibling-based analyses. We use primary school entrants from all three waves for studying enrollment outcomes (just over 1.2 million pupils), and restrict to 2007 and 2012 entrants for studying attainment by the end of our sample period (about 720,000 pupils). Around 18% of native pupils in the 2007, 2012 and 2015 entry cohorts have an older sibling concurrently enrolled in primary education.

School censuses. We link individual pupil data from the NPD with school-level information from the School Censuses, including the school location at the full postcode level, religious denomination (if any), and administrative status (VA, VC, or Community). In 2001, 10% of schools are Catholic, 25% are CofE, and 65% are non-faith (Table A.2).

Polish resettlement camps. Based on original records held at the UK National Archives, we identified and geolocated 260 camps across the UK, of which 235 in England, which hosted Polish soldiers and their families in the aftermath of World War II. For 165 camps, we were able to recover capacity information. Among camps in England with available capacity data, mean and median capacity were 348 and 150, respectively. Figure B.3 shows the geographic distribution of these camps, distinguishing those with capacity information (red) from those without (light blue). The average distance between an LSOA in our sample and the nearest camp is 13 kilometers, with distances ranging from less than 2 km to over 100 km.

4 Empirical strategy

We estimate the impact of foreign migration on the school allocation and attainment of native pupils based on the following specification:

$$y_{iat} = \alpha + \beta\ m_{at} + \boldsymbol{x_{iat}}'\boldsymbol{\zeta} + \psi_a + \psi_t + \varepsilon_{iat}, \tag{1}$$

where y_{iat} denotes an outcome for a native pupil i entering primary school in year $t = 2001, ..., 2018$ and living in area (LSOA) a, m_{at} denotes the local share of non-native pupils starting school in the same year, $\boldsymbol{x_{iat}}$ is a vector of individual characteristics, and ψ_a and ψ_t denote area and time fixed-effects, respectively. The non-native share

[8]Other studies have used language spoken at home to identify migrant pupils (e.g Friesen and Krauth, 2011; Geay et al., 2013). Appendix Figure A.6 compares this NPD measure of non-native pupils with the Census share of residents born outside the UK, excluding those born in Ireland. Across LSOAs in 2001 and 2011, the two measures are strongly positively associated, with a correlation of 0.844.

m_{at} is obtained as the number of non-native pupils starting school in year t, divided by the school entry cohort in 2001 or 2002 in area a.[9] The parameter β represents the impact on native outcomes of higher non-native concentration in their local area. We will consider three main educational outcomes: native enrollment by school religious affiliation (Catholic, CofE, Non-Faith; see Section 5.2), the characteristics and composition of the schools attended by natives (Section 5.3), and their educational attainment at the end of primary school (Section 5.4).

There are two main challenges to identifying the coefficient of interest, β, in specification (1). The first concerns the definition of effective "schooling markets," which should approximate the set of potential competitors for school places faced by pupils living in residential location a. The second refers to the residential choices of non-native pupils, which may be endogenous to local schooling outcomes. Below we discuss how we address each in turn.

4.1 Defining effective school markets

The English school system does not impose predefined catchment areas around schools. In non-faith schools, applications are ranked by residential proximity, and catchment areas arise endogenously as a function of school capacity and the local distribution of applicants. In faith schools, by contrast, the local distribution of applicants matters for admissions only when applicants satisfying the faith-based criteria do not fill available places. Consistent with these different admission criteria, average travel distance to school in our sample is 0.65 km for non-faith schools and 0.90 km for Catholic schools, while the corresponding 95th percentiles are 2.3 and 2.7 km, respectively.

We therefore define the effective competition zone, or catchment area, for pupils residing in LSOA a as the set of LSOAs whose centroid lies within 3 km of the centroid of area a and within the same Local Authority.[10] While pupils cannot in principle be prevented from applying to primary schools located outside their Local Authority of residence, such cases are negligible (Gibbons et al., 2013). The resulting competition zones contain, on average, 13.4 primary schools, including 2 Catholic and 2.2 CofE schools. This leads us to estimate a slightly modified version of specification (1):

$$y_{iat} = \alpha + \beta m_{\tilde{a}t} + \boldsymbol{x_{iat}}'\boldsymbol{\zeta} + \psi_a + \psi_t + \varepsilon_{iat}, \tag{2}$$

where $m_{\tilde{a}t}$ is a spatial moving average of m_{at}, measuring the share of non-native pupils residing in LSOAs whose centroid lies within 3 km of the centroid of a. Observations are still LSOA-specific, though their catchment areas overlap within Local Authorities. We

[9] We hold the denominator constant at baseline to exploit variation induced by changes in non-native presence, rather than changes in the local population size.

[10] Local Authorities (LA) are the main tier of local government in England, responsible for the provision of a wide range of public services, including education. There are 323 LAs in England.

cluster standard errors at the Local Authority level, to allow for correlated error terms across LSOAs. This is especially relevant because catchment areas $\tilde{a}$ overlap within, but not across, Local Authorities.[11]

4.2 Migrants' residential choices

If migrants tend to settle in areas where demand for school places is declining because of trending unobservables, OLS estimates of the coefficient β in equation (2) would understate the extent of competition for school places between natives and migrants, as well as its consequences for native schooling outcomes. Conversely, if migrants settle in areas where competition for school places is already rising, OLS estimates would overstate the effects of migrant pressure on school capacity. Notably, this bias may arise even if migrants do not choose where to live based on local school competition, since residential choices driven by other factors may still be correlated with trends in school demand. If migrants move into areas that are becoming less attractive to natives, for instance because of declining house prices, we may underestimate their impact on the local education system; by contrast, we may overestimate it if migrants settle in growing areas that offer improving labor-market opportunities.

To address the potential endogeneity of migrants' location choices, we build an instrument based on the tendency of migrants to settle in areas where earlier cohorts of fellow nationals had previously located (see Altonji and Card, 1991 and Card, 2001 for early applications of the "immigrant network" strategy). Given the dominant share of Poles in post-2004 migration to the UK, we exploit variation generated by the post-WWII dispersal policy that allocated Polish soldiers and their families to military camps vacated at the end of the war. These early Polish settlements gave rise to communities of Polish descent in nearby towns and areas, often organized around parishes, that persisted after the camps were dismantled. Insofar as these national networks provided local support and amenities attractive to later cohorts of Polish migrants, the location of resettlement camps can be used to predict the post-2004 geographic distribution of Polish immigration in the UK.

Specifically, the instrument used interacts the aggregate stock of Polish-born residents in England – which experienced a sharp surge after 2004 – with predetermined local exposure to postwar Polish resettlement camps. This exposure is based on a gravity measure that combines each camp's original capacity with its distance from each LSOA:

$$\hat{P}_{at} = \sum_{c} \frac{cap_c}{d_{ac}} \cdot P_t \tag{3}$$

where d_{ac} is the distance from the centroid of LSOA a to camp c, cap_c is the camp's

[11] Our estimated standard errors are entirely robust to an alternative (non-overlapping) clustering structure based on a 12-by-12 km grid.

original capacity, and P_t denotes the stock of Polish-born residents in England in year t. The term $\sum_c cap_c\, d_{ac}^{-1}$ captures baseline exposure to postwar Polish settlements, which is higher in areas closer to larger camps. In our empirical analysis, we average the instrument (3) at the catchment-area level $\tilde{a}$, as we do for the non-native share $m_{\tilde{a}t}$, and standardize it within year to ease the interpretation of first-stage estimates.[12]

The instrument is akin to a shift-share, or Bartik, design (Goldsmith-Pinkham et al., 2020; Borusyak et al., 2025), with a single aggregate shift, P_t, interacted with predetermined local exposure to that shift, $\sum_c cap_c\, d_{ac}^{-1}$.[13] Consistent with the "exogeneity of shares" perspective in the shift-share literature, identification relies on the predetermined component of exposure. Since our main specification includes LSOA fixed effects, time-invariant differences between areas closer to and farther from larger WWII camps are absorbed. Instead, identification comes from the fact that areas with greater historical exposure to Polish camps are predicted to experience larger increases in Polish migration when the national Polish-born population rises after EU enlargement. The exclusion restriction therefore requires that, absent the post-2004 Polish migration shock, areas with greater historical exposure to Polish resettlement camps would not have experienced differential changes in native pupils' school allocation or attainment relative to less exposed areas, conditional on LSOA fixed effects, year fixed effects, and individual controls.

This assumption is plausible because the baseline exposure measure is constructed from cross-sectional variation that predates our period of analysis by more than six decades and was generated by the availability of underutilized military sites, whose construction had been determined by military and strategic considerations during WWII. In this setting, the geographic distribution of Polish soldiers and their families who were hosted there in the late 1940s is arguably exogenous with respect to local schooling trends around the time of the EU enlargement. However, camps were not randomly placed across England: military facilities were often located in semi-urban areas, close enough to towns and transport infrastructure to serve strategic purposes, but far enough from densely populated areas to reduce civilians' exposure to air raids. A potential concern, therefore, is that former camp locations may be correlated with area characteristics that also predict post-2004 trends in local school markets. We address this concern by testing for differential pre-trends and by controlling for pre-2004 area characteristics.[14]

[12]The instrumental variable in our main analysis is constructed using the subset of camps for which we observe both location and capacity. As a robustness check, we build an alternative instrument based on all geolocated resettlement camps, including those with missing capacity information. In this version, local exposure is based on distance to camps only, without weighting by camp capacity (see Section 5.5).

[13]As our context has only one aggregate shift, we do not need to impose that the baseline exposure factors add up to one across areas.

[14]Marinoni (2023) and Hall and Manning (2024) develop an IV strategy similar to ours to investigate – respectively – the impact of ethnic enclaves on entrepreneurship and the impact of foreign migration on productivity. Their instruments are built using a subset of Polish resettlement camps and do not leverage information on camp capacity.

5 Main results

5.1 First-stage estimates

Table 1 reports first-stage estimates at the catchment area level, obtained by regressing the share of non-native pupils entering primary school in year t, $m_{\tilde{a}t}$, on the instrument $IV(\hat{P}_{\tilde{a}t})$ – both measured at the catchment area level $\tilde{a}$. Observations are weighted by the number of pupils residing in each LSOA. The specification in column (1) controls for year and LSOA fixed-effects only. Column (2) additionally controls for LSOA-level average pupil characteristics, including local shares by gender, socio-economic status, ethnicity, and special education needs. This is in line with our second-stage specification, which is estimated at the pupil level, with the addition of individual controls. We cluster standard errors at the Local Authority level (323 clusters). In both Columns (1) and (2), the IV strongly predicts non-native presence at the catchment area level, with an F-statistic around 50. According to our preferred specification in Column (2), an increase of one standard deviation in the instrument increases the share of local non-native pupils by 6.4 percentage points, relative to a baseline of 7.8%.

Table 1: First-stage estimates

	Non-native share ($m_{\tilde{a}t}$)			
	(1)	(2)	(3)	(4)
$\hat{P}_{\tilde{a}t}$	0.067***	0.064***	0.064***	0.061***
	(0.009)	(0.009)	(0.009)	(0.009)
Observations	535,429	535,429	533,718	533,718
Mean dep. var.	0.078	0.078	0.078	0.078
F-stat	51.19	49.68	51.43	49.98
Year & LSOA FE	✓	✓	✓	✓
Pupil controls		✓		✓
LSOA controls × t			✓	✓

Notes. Estimates are obtained from regressions of the local non-native pupil share in reception year, computed over the baseline number of local pupils, on the instrument $\hat{P}_{\tilde{a}t}$. All regressions are estimated at the catchment area level ($\tilde{a}$). Columns 2 and 4 additionally control for the local, time-varying shares of reception year pupils who are female, white, black, Asian, and FSM. Columns 3 and 4 additionally control for LSOA characteristics in 2001 (unemployment rate, population density, share low skilled, share of FSM), interacted with a linear time trend. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

A potential concern with our IV strategy is that the wave of migration following the 2004 EU Enlargement may have generated other local general-equilibrium effects. If these effects were common across areas, they would be absorbed by year fixed effects;

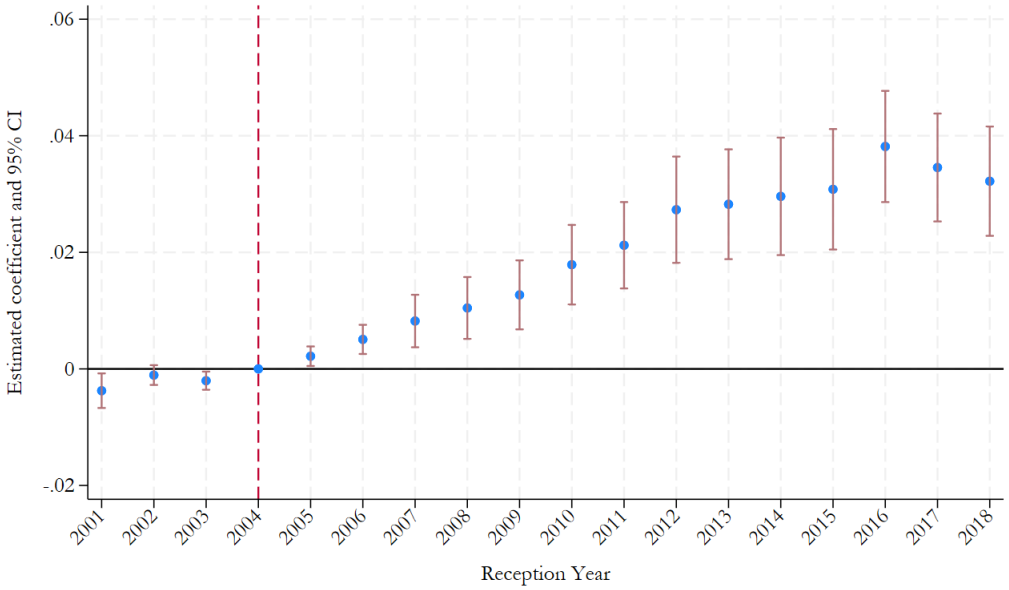
however, they may vary systematically across LSOAs and induce differential local trends. Moreover, the non-random location of military camps during WWII may also generate systematic differences in local trends across areas with different exposure to the Polish inflow, as discussed in the previous section. We address both concerns by conditioning on local controls. Rather than controlling for time-varying area characteristics – which may themselves respond to non-native inflows and are therefore potentially endogenous – we flexibly absorb differential local trends using baseline LSOA characteristics interacted with a linear time trend. These include the unemployment rate, population density, the share of low-skilled workers, and the share of FSM pupils, measured in the 2001 Census of Population and averaged at the catchment area level. The resulting estimates are reported in columns (3) and (4) of Table 1. Reassuringly, both the first-stage coefficients and the corresponding F-statistics remain remarkably stable across specifications, suggesting that differential local trends correlated with initial area characteristics are unlikely to be driving the predictive power of our instrument.[15]

To further probe the validity of our IV strategy, Figure 3 reports estimates from a dynamic version of the first-stage specification, in which the local share of non-native pupils, $m_{\tilde{a}t}$, is regressed on the cross-sectional component of the instrument, $\sum_c cap_c d^{-1} ac$, interacted with year dummies. The specification also includes year and LSOA fixed effects, as well as individual controls averaged at the local level. The figure shows that the geography of the camps does not predict the local share of non-native pupils before the 2004 EU enlargement, but becomes strongly predictive thereafter, with the relationship strengthening over time as the stock of migrants grows. This dynamic specification also provides evidence on the plausibility of the exclusion restriction.[16] If the geographic distribution of Polish resettlement camps were correlated with unobserved shocks that directly affect outcomes, such correlations should already be evident in the pre-enlargement period. Consistent with the validity of the instrument, the pre-2004 interaction coefficients are all close to zero.

[15]Table A.3 shows estimated correlations between the IV shares, $\sum_c cap_c\, d_{ac}^{-1}$, and the same characteristics. The estimates reported in column (1) deliver some significant correlations, suggesting that areas with higher predicted exposure tend to be more densely populated and have a lower share of low-skilled workers. The estimates, however, become non-significant once we control for Local Authority fixed effects in column (2). We also detect no significant correlations with the presence of faith schools, whether Catholic or CofE, or non-faith schools in the area (column (3)).

[16]Danieli et al. (2026) discuss the possibility that an instrument may affect outcomes through channels other than the treatment (alternative-path instruments). They propose testing for such channels using "negative control instruments," i.e. variables that should have no effect on the outcome under the IV assumptions of independence and exclusion. In our setting, the interactions between the cross-sectional component of the instrument ($\sum_c cap_c d^{-1} ac$) and the pre-2004 year dummies serve as natural negative controls.

Figure 3: Dynamic first-stage



Notes. The Figure plots coefficients and 95% confidence intervals from a regression of the non-native share $m_{\tilde{a}t}$ on the cross-sectional component of the instrument, $\sum_c cap_c\, d_{ac}^{-1}$, interacted with year dummies. The specification also includes year and LSOA fixed effects and individual controls averaged at the local level. Standard errors are clustered by Local Authority level (323 clusters).

5.2 Native enrollment by religious affiliation of schools

Table 2 examines how the local concentration of non-natives shapes the school allocation of native pupils. We estimate equation (2) by school religious affiliation: Catholic, CofE, or non-faith.[17] Odd-numbered columns report OLS estimates and even-numbered columns report IV estimates. The OLS estimate in column (1) implies that an increase of 10 percentage points in the non-native share reduces native enrollment in Catholic schools by 0.36 percentage points, relative to a baseline of about 10%. The corresponding IV estimate in column (2) is larger in magnitude, implying a decline of just under 1 percentage point. This pattern is consistent with OLS being attenuated by endogenous residential sorting – specifically, higher migrant inflows in areas where Catholic enrollment is rising on average. Natives are also less likely to enroll in CofE schools (columns 3-4), although the IV estimate is imprecisely estimated and not statistically significant. Finally, enrollment in non-faith schools (columns 5-6) increases with non-native exposure in both OLS and IV, with a larger effect under the latter. Taken together, these results point to a displacement of natives away from Catholic schools – and, to a much lesser extent, from CofE schools – which is absorbed by non-faith schools.

[17] Our CofE category also includes a tiny fraction (less than 1%) of schools with generic "Christian" denominations and specific denominations such as Free Church, Methodist, United Reformed Church.

Table 2: Non-native exposure and native enrollment
By religious affiliation of schools

	Catholic		CofE		Non-faith		Other	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-native share	-0.036***	-0.097***	-0.019**	-0.037	0.045***	0.104***	0.010***	0.030***
	(0.011)	(0.024)	(0.008)	(0.032)	(0.012)	(0.040)	(0.004)	(0.010)
Observations	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714
F-stat	-	51.149	-	51.149	-	51.149	-	51.149
Mean dep. var.	0.103	0.103	0.194	0.194	0.701	0.701	0.002	0.002
R-squared	0.121		0.407		0.332		0.376	
Year & LSOA FE	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓	✓

Notes. The Table reports estimates of equation (2), using native enrollment by school religious affiliation as the dependent variable. The IV in even-numbered columns is defined in equation (3). Individual controls include fixed effects for gender, ethnicity, and FSM status. The mean dependent variable is computed in the baseline year (2001). Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

The estimated enrollment effects may be potentially mediated by changes in the supply of school places, through the opening of new schools and/or higher enrollment within previously under-subscribed schools.[18] We explore these changes in Table A.4, where we note evidence of small and imprecise increases in the number of schools in areas with higher non-native presence (columns 1-3), but large and significant increases in enrollment at the intensive margin (columns 4-6). Whenever capacity constraints are initially binding, the displacement effects documented above may therefore understate the full extent of reallocation across school types.

To explore how displacement effects evolved over time, we estimate a dynamic, reduced-form specification, in which natives' enrollment by school religious affiliation is regressed on the cross-sectional component of the instrument interacted with year dummies. Estimates are reported in Figure 4 and fully confirm the expected patterns. As for the dynamic first-stage of Figure 3, the instrument only starts to predict the displacement of natives from Catholic (Panel (a)) to non-faith schools (Panel (c)) after EU enlargement – further supporting the exclusion restriction underlying our IV strategy – and the magnitude of the effects gradually grows over time. The estimates for CofE schools (Panel (b)) are mostly statistically insignificant, but they become systematically negative towards the end of our study period.

We posited that the observed changes in the school allocation of native pupils arise from the interaction of two factors: the higher prevalence of Catholic upbringing among non-native applicants and the greater admissions autonomy of faith schools. As explained in Section 2.1, autonomy is granted to most faith schools through VA status, which applies to all Catholic schools and 43% of CofE schools. Accordingly, one would expect the displacement effects reported in Table 2 to be driven primarily by VA schools, rather than by other school types whose admissions are administered by Local Authorities. Table A.5 reports estimates of enrollment responses by administrative status – VA, VC, and Community – rather than by religious affiliation. Consistent with the proposed mechanism, columns (1)-(3) indicate a significant reallocation of native pupils away from VA schools and towards Community schools, with a smaller and statistically insignificant increase for VC schools. When we further disaggregate CofE schools by administrative status (columns 4 and 5), point estimates are negative for VA schools and positive for VC schools, although neither is statistically significant at conventional levels.

Finally, we investigate whether the school-allocation effects of increased non-native presence vary systematically with local-area and family characteristics. From a policy perspective, it is important to assess whether school displacement disproportionately affects children from more deprived areas or less advantaged backgrounds. Table A.6

[18] Over our 2001-2018 study period, the total number of primary schools in England declines marginally from 18,276 to 17,980, with a 4% and 2% decline in the number of Catholic and non-faith schools, respectively, and a roughly constant number of CofE schools.

reports separate estimates by baseline area deprivation, measured using the 2001 Income Deprivation Affecting Children Index (IDACI), and by pupil background, proxied by eligibility for free school meals. Estimates in Panel (a) indicate very similar displacement from Catholic schools across levels of local deprivation, although some heterogeneity emerges in the reallocation between CofE and non-faith schools. Panel (b) suggests that, if anything, displacement effects from Catholic schools are stronger among non-FSM pupils. Overall, we find no evidence that reallocation effects associated with higher non-native presence have widened educational inequalities among native pupils.

Voluntary mobility One potential threat to our interpretation of the results as evidence of native displacement from Catholic schools is that the reallocation of native pupils may instead reflect voluntary native mobility away from schools with rising intakes of non-natives, consistent with "native flight" mechanisms.[19] We can test for behaviors consistent with native-flight effects by investigating patterns of residential and school mobility among pupils enrolled in primary school. Over the primary-school cycle, about 37% of pupils change residential location, 42% move to a different primary school, and 5% leave the state school system altogether (i.e. exit the NPD sample), capturing switches to private schooling, as well as cases of out-migration, serious illness, or death.

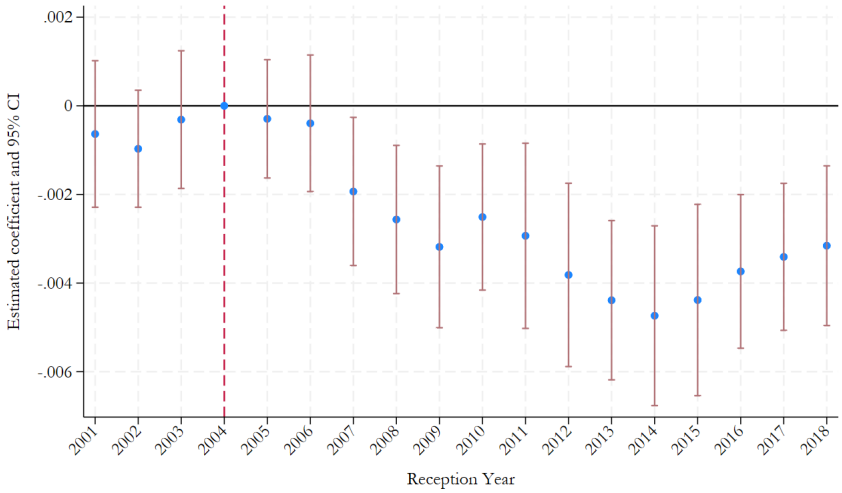
We explore mobility responses to the local non-native share in Table 3, where dependent variables are indicators for changing residential address during grades 1–6 after enrollment (column 1), moving to a different school (columns 2–5), or leaving the state school system (columns 6–9). For the latter two outcomes, we consider both overall mobility (columns 2 and 6) and unconditional mobility components by school type at entry (columns 3–5 and 7–9). Most estimates are close to zero and/or not statistically significant, while the only statistically significant estimates are negative (columns 5–7).[20] Overall, we find no evidence of increased voluntary mobility across schools in areas with rising concentration of non-natives, while exits from the state school system (presumably to private schools) significantly decline in areas with higher non-native shares. We therefore detect no evidence consistent with native-flight effects among those enrolled in primary school. Below in Section 6.1 we test for voluntary avoidance upon school entry by leveraging sibling-priority rules.

[19] In principle, data on school applications and rejections could shed light on both changing parental preferences and crowding-out effects. However, applications data become available in the NPD only from 2014 onward (Ovidi, 2025), ten years after the EU enlargement, preventing us from analyzing changes in parental preferences in response to migrant inflows.

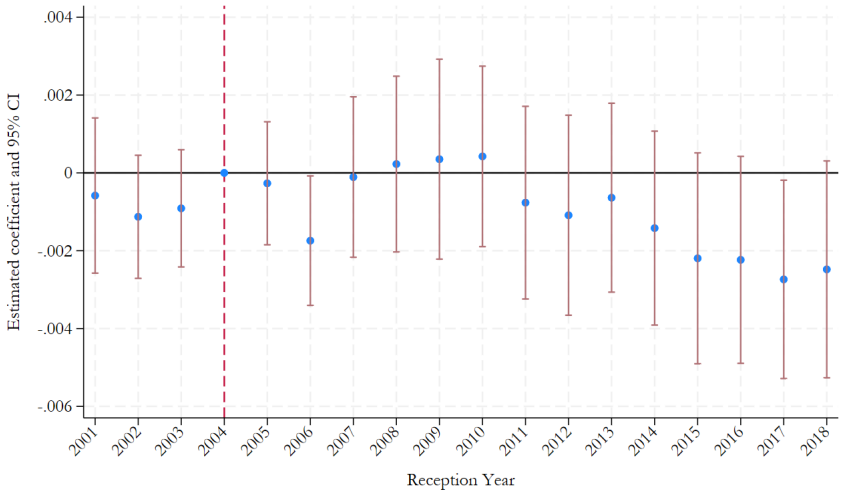
[20] In other regressions (not reported), we estimate conditional mobility responses by school type, which yield no positive and significant mobility response to non-native exposure. These conditional estimates, however, are subject to selection since enrollment in different school types is affected by migrant exposure, as we demonstrate in Table 2.

Figure 4: Non-native exposure and native enrollment
By religious affiliation of schools: Dynamic reduced-form estimates

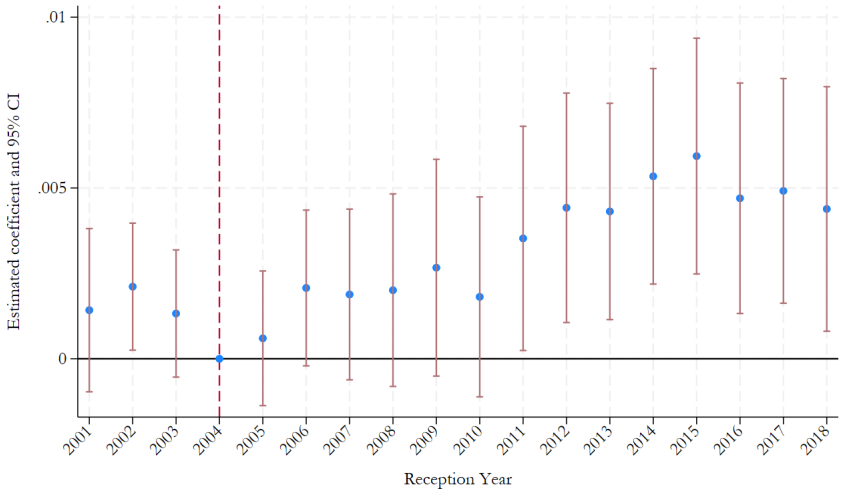
Panel (a): Catholic schools



Panel (b): CofE schools



Panel (c): Non-faith schools



Notes. The Figure plots estimates and 95% confidence intervals from regressions of native enrollment in Catholic schools (Panel (a)), CofE schools (Panel (b)) and non-faith schools (Panel (c)) on the cross-sectional component of the instrument, $\sum_c cap_c\, d_{ac}^{-1}$, interacted with year dummies. Regressions additionally control for fixed effects for year, LSOA, gender, ethnicity, and FSM status. Standard errors are clustered by Local Authority (323 clusters).

Table 3: Non-native exposure and native mobility

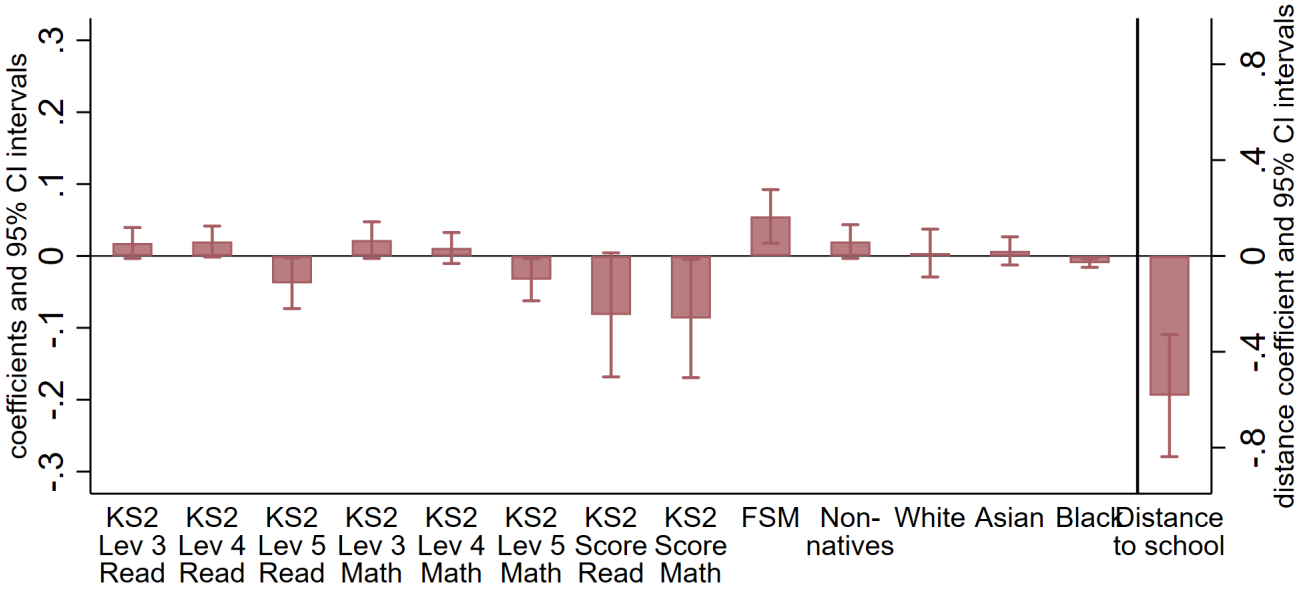
	Home movers	School movers				Leaving State school system			
		Any	Catholic	CofE	Non-faith	Any	Catholic	CofE	Non-faith
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Non-native share	0.068	-0.387	-0.028	-0.012	-0.346*	-0.190***	-0.150*	-0.065	-0.022
	(0.075)	(0.236)	(0.034)	(0.081)	(0.207)	(0.040)	(0.082)	(0.143)	(0.152)
Observations	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714	7,402,714
F-stat	51.149	51.149	51.149	51.149	51.149	51.149	51.149	51.149	51.149
Mean Dep. Var.	0.373	0.424	0.023	0.064	0.337	0.049	0.005	0.013	0.031
Year & LSOA FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes. The Table reports IV estimates of specification (2), where the IV is defined in (3). Outcomes are indicator variables equal to one if a pupil, once observed in year 0 (Reception), changes residential address (column 1), changes school (column 2-5), or exits the state school system (column 6-9). Columns (3)–(5) and (7)–(9) report unconditional components by school type at entry, estimated on the full native sample. Individual controls include fixed effects for gender, ethnicity, and FSM status. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

5.3 Native enrollment by school characteristics

Having shown evidence of native displacement from Catholic schools, we assess the extent to which natives tend to attend schools with systematically different characteristics (over and above religious affiliation) in areas with higher non-native inflows. We do so by focusing on *baseline* school characteristics to avoid conflating displacement effects with contemporaneous changes in school composition induced by migrant inflows. We define the baseline year as 2001; for schools created after 2001, the baseline is the first year the school appears in the school Census. We examine three sets of outcomes: baseline academic performance, student intake composition along various dimensions of disadvantage, and commuting distances. We measure academic performance using the share of pupils attaining Levels 3, 4, or 5 in KS2 reading and math – where Level 4 is the expected standard – and standardized reading and math test scores (see Section 2.1 for details on KS2 assessment).

Figure 5: Non-native exposure and native enrollment
By school characteristics



Notes. The figure plots IV estimates and 95% confidence intervals obtained from specification (2), using as dependent variables the baseline characteristics of schools attended by natives and the commuting distance to school (listed on the horizontal axis). The instrument is defined in equation (3). School characteristics are measured in 2001 (or, for schools created after 2001, in the first year a school appears in the School Census). Regressions additionally control for fixed effects for year, LSOA, gender, ethnicity, and FSM status. The mean dependent variable is computed in the baseline year (2001). Standard errors are clustered by Local Authority (323 clusters).

Figure 5 reports IV estimates alongside 95% confidence intervals for the impact of the local non-native share on the characteristics of the schools attended by natives, based on specification (2). The attainment measures suggest that when exposed to a higher local non-native share natives enroll, on average, in schools with lower average test scores.

Notably, the effects are similar for reading and math, small in magnitudes and not always statistically significant. In particular, a 10 percentage point increase in the local non-native share leads natives to enroll in primary schools where average reading and math attainment is 0.008 and 0.009 standard deviations lower, respectively. We also observe significant changes in peer composition: the same increase in the local non-native share leads natives to attend schools with a 0.55 percentage points higher share of low-SES pupils (proxied by eligibility for free school meals), 0.2 higher share of non-native pupils, and 0.1 lower share of black pupils. Finally, natives attend schools closer to their homes (by about 0.06 km for a 10 percentage point increase in the non-native share), consistent with reallocation towards non-faith schools, which typically admit pupils primarily on the basis of geographic proximity. Overall, when exposed to a higher non-native concentration, natives tend to enroll in (slightly) lower-performing schools, with a less-advantaged intake, and located closer to home.

5.4 Native attainment

To examine the effect of increased competition for school places on the educational attainment of native pupils at the end of the primary school cycle, we estimate equation (2) using standardized test scores in reading and math at KS2 as dependent variables. The right-hand side of the equation has the same structure as the specification we estimate for enrollment outcomes, which controls for the local share of non-native pupils in grade 0. We can perform this analysis on the subset of entry cohorts from 2001 to 2012 that we observe through primary school completion.

Table 4: Non-native exposure and native attainment

	Reading KS2 std score	**Math KS2 std score**
	(1)	(2)
Non-native share	-0.565***	-0.556**
	(0.198)	(0.220)
Observations	4,257,106	4,260,616
F-stat	35.014	35.120
Year & LSOA FE	✓	✓
Individual controls	✓	✓

Notes. The Table reports IV estimates of specification (2), where the IV is defined in equation (3) and test scores are used as dependent variables. Test scores are standardized by year to account for changes in the test scale over time. The sample includes entry cohorts from 2001 to 2012, observed from Reception (grade 0) through grade 6. Individual controls include fixed effects for gender, ethnicity, and FSM status. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

The results of this exercise are reported in Table 4. We detect negative and statistically significant effects of the non-native share on attainment in both subjects. For reading, a 10 percentage points increase in the local non-native share reduces test scores by 0.057 standard deviations, which corresponds to 0.54 score points on a scale from 0 to 50 (i.e. 1.7% of the baseline mean of 31 marks). For math, the effect is virtually identical, corresponding to about 1.14 score points on a scale from 0 to 100, or 1.7% relative to an average of about 70. While precisely estimated, these effects are economically small: native pupils who were exposed to larger shares of non-native pupils when they enrolled in primary education display marginally lower test scores at the end of the primary-education cycle. Similarly as for enrollment results, we detect no evidence that foreign migration may have widened educational inequalities among natives.

5.5 Robustness

To further assess the robustness of our estimates on enrollment and educational attainment, we perform several additional tests, whose results are reported in the Appendix. First, we consider alternative definitions of schools' catchment areas, which play the role of schooling markets. Since our main results are based on catchment areas within a 3 km radius from the centroid of an LSOA (Section 4.1), Table A.8 shows that the estimates for both native enrollment and native attainment, respectively, are robust (at least) for a range of radiuses between 1 and 5 km.

Second, we additionally control for a range of baseline LSOA characteristics (unemployment rate, population density, share low skilled, share of FSM), interacted with a linear time trend. The results, reported in Table A.9, show that our main findings are robust to the inclusion of these additional controls. One difference worth noting is that the estimated effects of the non-native share on native pupils' attainment are somewhat smaller in magnitude – about 18% lower than those reported in Table 4. We showed analogous robustness of the first-stage estimates to the inclusion of these controls in Table 1 of Section 5.1.

Finally, in Table A.10 we replicate all main first-stage, enrollment and attainment estimates using an alternative IV that only leverages distance to camps, unweighted by capacity: $\hat{P}^d_{at} = \sum_c d^{-1}_{ac} \cdot P_t$. This procedure has the advantage of using information on all surveyed camps, including those with missing information on capacity. Once more, all results remain very similar to those reported in the main text.

6 Mechanisms

The overall attainment effect identified in Section 5.4 conflates two distinct channels through which higher exposure to non-native pupils may affect natives' outcomes. First,

we provide evidence of *displacement* upon school entry, which alters the type of school native pupils attend relative to a counterfactual without local migration shocks.

Second, *compositional effects* may arise from exposure to non-native peers and associated interactions throughout the primary-education cycle. This channel may affect all native pupils, irrespective of whether they are displaced. Such compositional effects need not arise exclusively within schools, as peer and social interactions may also take place across schools within neighborhoods. Whereas displacement is expected to reduce attainment in our empirical context, the sign of compositional effects is ex ante ambiguous.

We attempt to disentangle these two channels in two steps. First, we leverage sibling-priority rules to mute the displacement margin for the subset of pupils with older siblings (Section 6.1). We then shift from area-level to school-level exposure to estimate the effects of changes in within-school peer composition, using a specification that accounts for the endogenous sorting of native families across schools (Section 6.2).

6.1 Evidence from siblings

This section focuses on the enrollment and attainment outcomes for a subpopulation that is expected to be shielded from displacement, namely pupils with an older sibling enrolled in primary school. Because siblings of currently enrolled pupils receive admission priority into state primary schools, their opportunity to attend the same school as their older sibling should be largely unaffected by local competition for places.[21] Furthermore, if the negative attainment effects operate primarily through changes in school assignment, they should be attenuated among pupils whose access to Catholic schools is protected by sibling priority.

We investigate whether increased competition from non-native pupils has a differential effect on enrollment and attainment for pupils who, at Reception, have an older sibling already enrolled in a Catholic primary school, for whom access to a Catholic school is not contested by the arrival of Polish pupils in the catchment area. To do so, we augment our baseline specification (2) with an indicator for having an older sibling in a Catholic school, $S_{\text{Cath},i}$, interacted with the local non-native share. The coefficient on the interaction term captures the additional effect of non-native inflows for pupils who are insulated from involuntary displacement. We instrument the local non-native share using our main instrument (equation (3)) and the interaction term using the corresponding interaction between the instrument and S_{Cath_i}. This analysis uses information on sibship from the NPD, which is only recorded in the 2007, 2012 and 2015 waves. To analyze attainment at the end of primary school, we focus on the 2007 and 2012 entry cohorts, which can be observed until school completion.

[21] Children with special educational needs and those in foster care also receive admission priority. Both groups represent a small share of pupils, and the latter is not observed in the data.

Table 5 reports IV estimates of the enrollment of natives according to school religious affiliation. For reference, columns (1), (3) and (5) report estimates of the baseline specification (2) in this subsample, closely replicating the displacement pattern from Catholic to non-faith schools observed in Table 2. Columns (2), (4), and (6) report estimates from the augmented specification. The main displacement effect for pupils without an older sibling in Catholic education (row 1) remains close to the baseline effects. By contrast, the coefficients on the interaction term (row 2) indicate that displacement out of Catholic schools is fully offset for pupils with an older sibling in a Catholic school (see column 2 and the p-value on the sum of coefficients in the first two rows). We find no differential effects on enrollment in CofE schools (column 4), while the interaction term offsets the main effects on enrollment in non-faith schools (column 6), as one would predict in the absence of displacement effects. Finally, the coefficient on the main effect S_{Cath_i} has the sign expected: pupils with an older sibling in a Catholic school are substantially more likely to enroll in a Catholic school than in CofE or non-faith schools.

Interestingly, these findings also argue against a native-flight interpretation of enrollment effects, reinforcing the evidence presented in Section 5.2 in the full sample. The fact that pupils with protected priority for admission to Catholic schools continue to exercise that priority despite increased non-native presence suggests that the enrollment patterns in the full sample are driven primarily by congestion and displacement, rather than by voluntary avoidance of schools with higher non-native shares.

Since pupils with an older sibling in Catholic education are plausibly shielded from displacement, we should observe little or no effect on the characteristics of the schools they attend. We test this prediction by repeating the analysis of Figure 5 using the augmented version of equation (2) introduced above. Figure 6 reports the estimated coefficients, together with 95% confidence intervals, for the main effect of the local non-native share (dark bars) and its differential effect for pupils with an older sibling in Catholic education (light bars).[22] For most characteristics, we cannot reject the hypothesis that the sum of the main effect and the interaction term is zero.[23] This pattern is consistent with sibling priority largely shutting down displacement, so that the characteristics of schools attended by these pupils are approximately invariant to non-native inflows.

Finally, we assess the effects on KS2 test scores by estimating IV regressions of the augmented version of equation (2). For pupils with an older sibling in Catholic education, any estimated effect should primarily capture within-school compositional changes, since we have shown that the displacement channel is effectively shut off for this group.

[22]For brevity, we do not report the baseline estimates in this subsample; the main effects of the non-native share are very similar to those shown in Figure 5.

[23]We test whether the sum of the two coefficients - the non-native share and its interaction term - equals zero. We cannot reject the null for the share of Asian pupils and distance from home, where both coefficients are negative. For the non-native share and KS2 Level-3 outcomes, the interaction term has the opposite sign of the main effect, as expected.

Table 5: Non-native presence and native enrollment
By older sibling's enrollment

	Catholic		CofE		Non-faith	
	(1)	(2)	(3)	(4)	(5)	(6)
Non-native share	-0.092**	-0.096**	-0.080	-0.078	0.152**	0.155**
	(0.040)	(0.039)	(0.051)	(0.051)	(0.063)	(0.063)
Non-native share		0.149***		-0.018		-0.116
$\times$ S_{Cath_i}		(0.038)		(0.068)		(0.071)
S_{Cath_i}		0.865***		-0.190***		-0.674***
		(0.011)		(0.018)		(0.020)
Observations	1,204,983	1,204,983	1,204,983	1,204,983	1,204,983	1,204,983
Mean dep. var.	0.100	0.100	0.206	0.206	0.692	0.692
Year & LSOA FE	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓
p-values		0.2085		0.2761		0.6891

Notes. The Table reports IV estimates of an augmented version of equation (2) which includes an interaction of the non-native share with an indicator for having an older sibling enrolled in a Catholic school (non-native share $\times S_{Cath_i}$), and further conditions on S_{Cath_i}. We instrument the non-native share using the IV defined in equation (3) and the interaction term using the corresponding interaction between the IV and S_{Cath_i}. The sample includes pupils who enter primary school (Reception year) in 2007, 2012, and 2015, the years for which information identifying siblings is available in the NPD records. Individual controls include fixed effects for gender, ethnicity. p-values reported in the last row are from tests that the sum of the first two coefficients equals zero. The mean dependent variable is computed in the baseline year (2001). Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

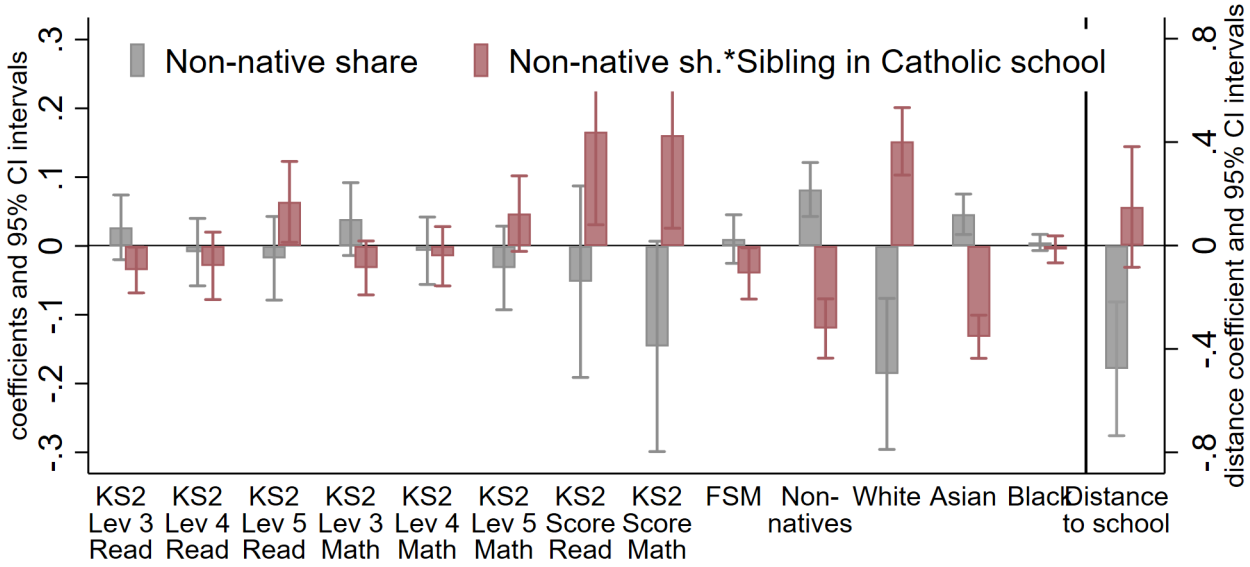
The estimates are shown in Table 6. For reference, columns (1) and (3) report estimates from the baseline specification (2) in this subsample: the effects on reading and math are negative – as in the full sample (Table 4) – but smaller in magnitude and statistically insignificant. This likely reflects the reduced sample size and, potentially, weaker negative effects in the more recent cohorts for which sibship information is observed.

Importantly, columns (2) and (4) show that any negative effects on attainment are fully reversed for pupils with an older sibling in Catholic education. Taken together, these findings indicate that the negative attainment effects reported in Table 4 are driven primarily by displacement across schools rather than by adverse within-school compositional changes. If anything, the evidence suggests that greater non-native exposure has positive effects on natives' test scores. We investigate this interpretation further in the next section.

6.2 School-level exposure to non-native pupils

The estimates presented in the previous sections, based on our *area-level* exposure approach, indicate that higher non-native presence in a local area upon school entry lowers

Figure 6: Non-native presence and native enrollment
By older siblings' enrollment – Baseline school characteristics



Notes. The Figure plots IV coefficients (with 95% confidence intervals) for the effect of non-native presence on the baseline characteristics of schools attended by natives and the distance to school (listed on the horizontal axis). All outcomes are measured in 2001 (or, for schools created after 2001, in the first year the school appears in the data). Estimates are obtained from an augmented version of equation (2) which includes an interaction of the non-native share with an indicator for having an older sibling enrolled in a Catholic school (non-native share $\times S_{Cath_i}$), and further conditions on S_{Cath_i}. We instrument the non-native share using the IV defined in equation (3) and the interaction term using the corresponding interaction between the IV and S_{Cath_i}. The sample includes pupils who entered primary school (Reception year) in 2007, 2012 and 2015, for which information on sibship is available in the NPD records. Regressions control for fixed effects for year, LSOA, gender, ethnicity, and FSM status. Standard errors are clustered by Local Authority (323 clusters).

native test scores at the end of primary school. Evidence from younger siblings suggests that this effect is primarily driven by displacement away from Catholic schools rather than direct exposure to non-native pupils in schools.

In this section, we complement the area-level analysis with a within-school approach that directly examines the effects of *within-school exposure* to non-native pupils on natives' test scores. This shift also changes the timing of exposure: whereas the area-level approach identified the effect of exposure at entry on attainment at the end of the primary-school cycle, here we relate natives' KS2 test scores to contemporaneous exposure to non-native pupils within their school and grade. Specifically, we estimate the following equation:

$$y_{ifsat} = \gamma + \delta m_{st} + \boldsymbol{x}'_{\boldsymbol{ifsat}}\boldsymbol{\zeta} + \phi_t + \phi_a + \phi_s + \phi_f + \eta_{ifsat}, \tag{4}$$

where y_{ifsat} represents reading or math test scores for native pupil i in family f, enrolled in the last grade of primary school s in year t, m_{st} is the share of non-native pupils in the same grade and school, $\boldsymbol{x}'_{\boldsymbol{ifsat}}$ is a vector of individual controls (gender, ethnicity and

Table 6: Non-native presence and native attainment
By older siblings' enrollment

	Reading KS2 std score		Math KS2 std score	
	(1)	(2)	(3)	(4)
Non-native share	-0.324	-0.328	-0.216	-0.225
	(0.220)	(0.221)	(0.225)	(0.226)
Non-native share $\times S_{Cath_i}$		0.339***		0.283***
		(0.099)		(0.098)
S_{Cath_i}		0.048**		0.025
		(0.021)		(0.020)
Observations	722,089	722,089	722,089	722,089
Year & LSOA FE	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓
p-values		0.9598		0.8014

Notes. The Table reports IV estimates of an augmented version of equation (2) which includes an interaction of the non-native share with an indicator for having an older sibling enrolled in a Catholic school (non-native share $\times S_{Cath_i}$), and further conditions on S_{Cath_i}. We instrument the non-native share using the IV defined in equation (3) and the interaction term using the corresponding interaction between the IV and S_{Cath_i}. The sample includes pupils who enter primary school (Reception year) in 2007 and 2012, the years for which information identifying siblings is available in the NPD records and grade 6 (KS2) results are observable by the end of the sample period. Individual controls include fixed effects for gender, ethnicity, FSM status, and having an older sibling. p-values reported in the last row are from tests that the sum of the first two coefficients equals zero. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

FSM status), and ϕ_t, and ϕ_a are fixed-effects for calendar time and LSOA of residence. We also gradually enrich this specification with school and family fixed-effects, ϕ_s, and ϕ_f, respectively.[24]

Moving from area-level to school-level exposure requires a different empirical strategy. While we can rely on a plausibly valid instrument for neighborhood-level exposure, we lack an analogous instrument for exposure at the school level. Moreover, we have shown that the type of school attended by native pupils is endogenous to non-native presence in the neighborhood.

To identify the causal effects of interest, we proceed in three steps. First, we compare test scores of native pupils from different cohorts within the same school by including school fixed effects ϕ_s in equation (4), thereby controlling for permanent differences between schools attended by natives and non-natives. This is a standard approach in the literature on migrant peers and educational outcomes, which exploits variation in exposure to foreign pupils across cohorts within schools, conditioning on school fixed effects to account for sorting across schools (Gould et al., 2009; Geay et al., 2013; Schneeweis, 2015;

[24]In the NPD data we have information about grades but not on classes. The average grade size is about 30 pupils.

Ballatore et al., 2018; Figlio and Özek, 2019; Frattini and Meschi, 2019; Bossavie, 2020; Özek, 2023). However, this specification does not address the non-random displacement of natives away from schools that attract non-native pupils, nor the possibility that native parents select schools based on anticipated non-native presence (although we find no evidence in this direction). In the second step, we compare outcomes across siblings, who typically attend the same school in different years and are therefore exposed to different non-native shares. As shown in Section 6.1, the presence of an older sibling mutes displacement effects arising from the presence of non-natives, owing to sibling-priority rules in school admissions. We therefore exploit this within-family variation and account for family-level sorting by including family fixed effects ϕ_f in equation (4). This approach follows the empirical strategy in Figlio et al. (2024) in leveraging sibship information to estimate specifications with family fixed effects. Finally, even with admission priority, younger siblings may still enroll in a different school from their older siblings in response to local non-native presence. Our third specification therefore uses exposure to non-native pupils in older siblings' schools as a regressor in younger siblings' test-score equations, in the spirit of an intention-to-treat design.

The results are reported in Table 7: Panels (a) and (b) refer to reading and math test scores, respectively. Column (1) estimates the baseline specification (4) by OLS on the full sample. We find that higher non-native presence is associated with a significant deterioration in natives' reading test scores. The effect on math scores is also negative, albeit smaller in magnitude and statistically insignificant.

The inclusion of school fixed effects in column (2) makes both coefficients positive and statistically significant, consistent with non-natives selecting into relatively lower-performing schools. Note the difference between this specification, based on OLS and capturing the effects of *all* non-natives present in a school (m_{st}), and the specifications in Section 5, which rely on an instrument whose compliers tend to enroll in relatively high-performing (i.e. Catholic) schools. When sorting into school is controlled for, a 10 percentage point increase in the non-native share is associated with improvements of around 0.01 standard deviations in both reading and math.

Columns (3) and (4) replicate, on the sibling subsample, the specifications estimated in columns (1) and (2), respectively. The results are very similar: once school fixed effects are included, the negative association between the non-native share and test scores turns positive and statistically significant. Column (5) additionally includes family fixed effects, exploiting variation in exposure across siblings from different cohorts who attend the same school: the estimated impact of non-native exposure remains positive and statistically significant, if anything growing slightly for reading relative to column (2). The specification in column (5) is the closest to Figlio et al. (2024)'s preferred specification and delivers effects that are closely comparable in magnitude.

Because Section 5 shows that higher non-native presence induces significant realloca-

Table 7: Within-School exposure to non-natives and native attainment

	Panel (a): Reading (Std Test Score)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-native share, own school	-0.075***	0.095***	-0.089***	0.111***	0.130***		
	(0.012)	(0.016)	(0.014)	(0.019)	(0.029)		
Non-native share, older sibling's school						-0.109***	0.104***
						(0.017)	(0.027)
Observations	4,212,103	4,211,996	2,049,637	2,049,412	1,732,514	990,312	989,748
	Panel (b): Math (Std Test Score)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-native share, own school	-0.011	0.101***	-0.026*	0.107***	0.096***		
	(0.014)	(0.017)	(0.014)	(0.019)	(0.027)		
Non-native share, older sibling's school						-0.079***	0.125***
						(0.011)	(0.022)
Observations	4,215,521	4,215,404	2,052,227	2,051,976	1,735,192	992,247	991,688
Sample	all	all	all siblings	all siblings	all siblings	younger siblings	younger siblings
Year & LSOA FE	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓
School FE		✓		✓	✓		✓
Family FE					✓		

Notes. The Table reports OLS estimates of equation (4). The non-native share is measured in grade 6 in the pupil's own school (columns 1-5) or in the next older sibling's school (columns 6-7). If older siblings are twins, one twin is selected at random. The sample in columns 1-2 includes all pupils with non-missing KS2 results. Columns 3-5 select all sibling sets with non-missing KS2 results, observed in 2007, 2012, and 2015, the years for which information identifying siblings is available in the NPD records. Columns 6-7 further select the subsample of pupils with an older sibling. School FE in column 7 refer to the older sibling's school. Individual controls include fixed effects for gender, ethnicity, and FSM status. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

tion of native pupils across schools, we estimate the specifications in columns (6) and (7) on the subsample of younger siblings, who are not exposed to displacement. We use the non-native share in the school attended by the next older sibling as an intention-to-treat measure of exposure. The same pattern emerges: when we exploit across-school variation, higher non-native presence is associated with lower reading and math scores among natives (column 6); once we focus on within-school comparisons by including school fixed effects, the estimates turn positive and statistically significant (column 7).

Taken together, the evidence from the sibling and within-school analyses presented in this section points to school displacement as the main margin underlying the negative attainment effects of area-level exposure documented in Section 5.4. Among pupils with an older sibling in a Catholic school, for whom the displacement response is muted, greater non-native exposure does not lead to systematic changes in the characteristics of the school attended or to lower attainment. At the same time, once we account for families' sorting across schools, we find no evidence that greater within-school exposure to non-native pupils adversely affects native attainment. If anything, the estimated effect is positive. We therefore interpret the negative attainment effects of local non-native exposure as operating primarily through the reassignment of native pupils across schools, rather than through adverse within-school interactions.

7 Conclusions

Immigration may affect native outcomes not simply through labor market adjustments, but also through access to locally congested public services. Public schools are a particularly salient case: places in over-subscribed schools are rationed by capacity constraints and admission rules, and migration-induced increases in pupil numbers may therefore affect not only classroom composition but also the allocation of native pupils across schools and, ultimately, their educational attainment.

We investigate these issues in the context of primary education in England in the aftermath of the 2004 EU Enlargement. Following enlargement, the UK attracted record waves of immigrants from new member states, most notably Poland. By leveraging variation in local exposure to non-native pupils, we show that higher concentration of non-natives in a local area reallocates natives' enrollment from Catholic to non-faith primary schools, with no evidence that these patterns reflect voluntary native flight from schools with a larger non-native intake. Second, natives in more exposed areas attend schools with slightly weaker baseline performance and a less advantaged pupil intake, but at shorter distances from their residences. Third, higher local non-native exposure at school entry lowers natives' reading and math achievement by the end of primary school.

The overall attainment effects reflect two distinct channels: the displacement of native pupils toward lower-performing schools and within-school compositional changes induced

by non-native inflows. We show that pupils who are plausibly insulated from displacement through sibling-priority rules experience neither changes in school allocation nor declines in attainment – if anything, they experience an improvement in attainment. In addition, the effect on native attainment of contemporaneous within-school exposure to non-native pupils is positive and significant, once sorting into schools is accounted for.

Our paper contributes to the debate on migration and integration by highlighting schools as institutions through which scarce public resources are allocated, as well as places where natives and migrants interact. Classrooms can foster social cohesion and a sense of belonging (Alan et al., 2021), integration may generate tensions whenever non-native inflows intensify competition for school places, and affect educational opportunities for native pupils. Whether real or perceived, such concerns may shape parental attitudes and, in turn, support for more restrictive migration policies. Understanding how immigrant pupil inflows affect natives' school allocation and educational outcomes is therefore central to designing policies that sustain social integration while preserving educational opportunities. To our knowledge, this paper provides the first causal evidence underlying one of the most widely held concerns about immigration, that is the increased pressure on access to school places.

Our results highlight an important tension: immigration can lower native pupils' attainment even when interactions with immigrant classmates are not harmful, because increased demand changes access to schools. This conclusion flips the discussion of typical policy levers from classroom composition to admissions rules and seat supply.

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Online Appendix

When Non-Natives Compete for Top Schools: Displacement and Attainment in Primary Education

Elisa Facchetti, Francesco Fasani, Elisabetta Pasini, Barbara Petrongolo

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B Historical background: Polish Resettlement Camps A16

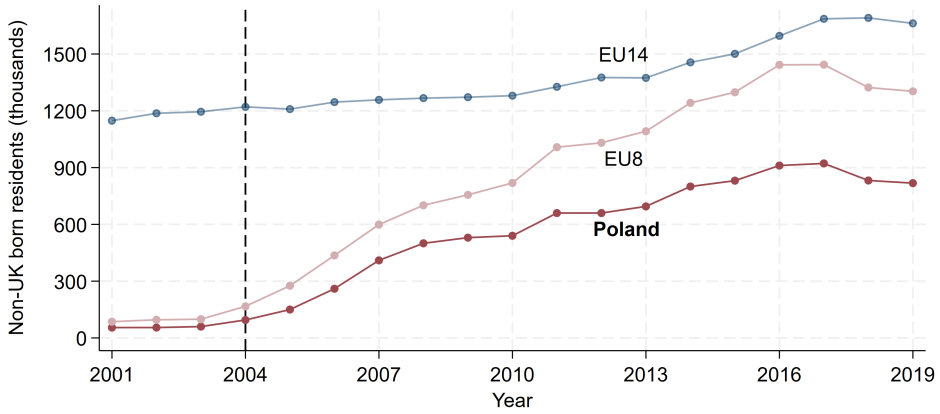
A Additional Figures and Tables

Figure A.1: Media coverage: School competition and demand for Catholic education



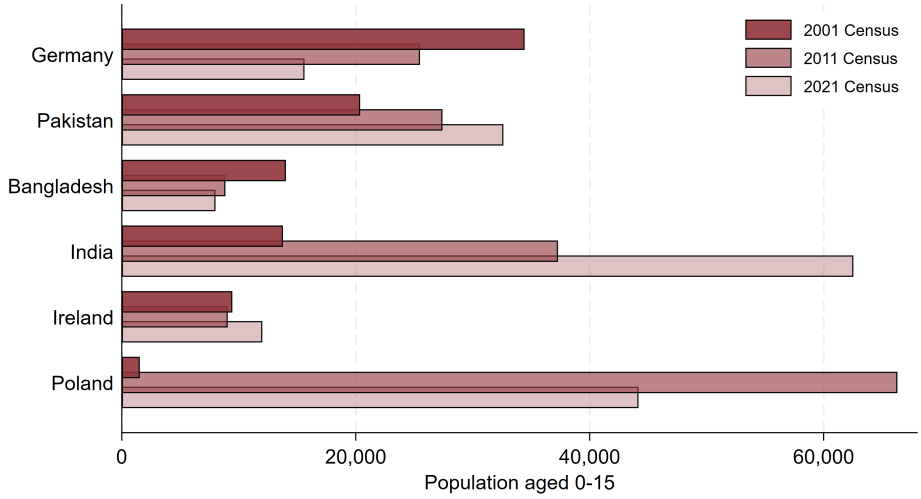
Sources: BBC News (12/01/2008): School choice 'boosting baptisms' and BBC News (02/03/2012): The great school place sausage machine

Figure A.2: EU-born residents in the UK: 2001-2019



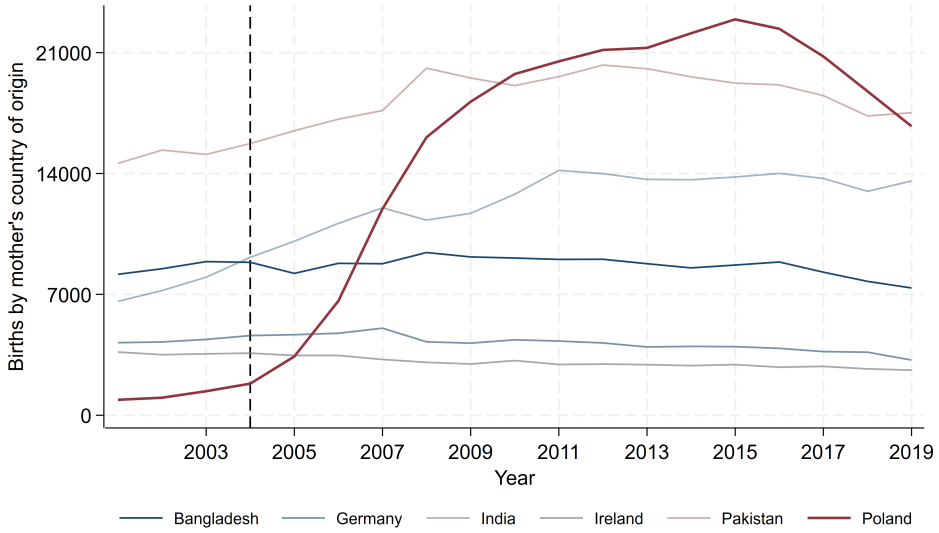
Notes. The figure reports the number of UK residents by country of birth. EU8 includes: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. EU14 includes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden. Source: Office for National Statistics, 'Population of the United Kingdom by country of birth and nationality' dataset (July 2020 - June 2021 edition).

Figure A.3: Foreign-born residents aged 0-15, by country of birth



Notes. The figure reports the number of residents in England and Wales aged 0-15 for six large migrant groups. We plot the four largest source countries over the period 2001-2021 (India, Pakistan, Poland, and Bangladesh), as well as Germany, the largest EU country of birth excluding Poland, and Ireland, the largest Catholic country of birth excluding Poland. Source: UK Census 2001, 2011 and 2021.

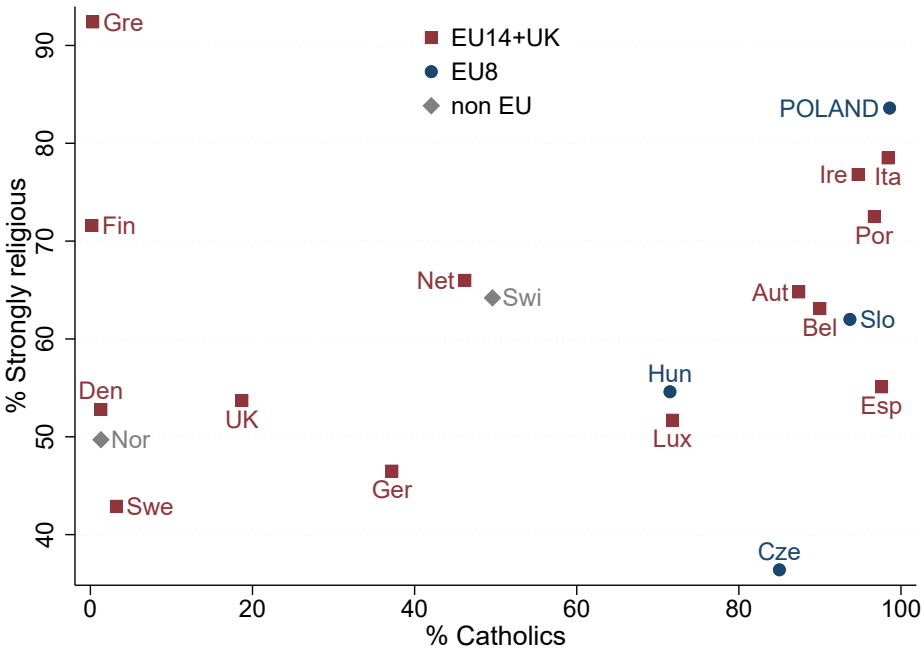
Figure A.4: Live births by mother's country of birth



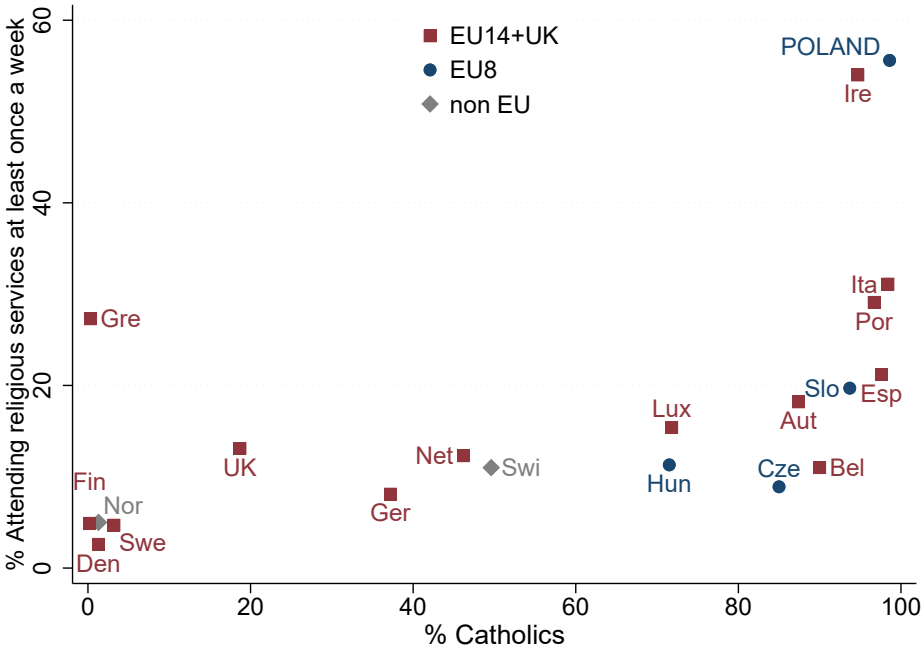
Notes. The figure reports the number of live births in England and Wales by mother's country of birth. We plot the four largest source countries over the period 2001-2019 (India, Pakistan, Poland, and Bangladesh), as well as Germany, the largest EU country of birth excluding Poland, and Ireland, the largest Catholic country of birth excluding Poland. Source: Office for National Statistics, 'Parents' country of birth dataset'.

Figure A.5: Religiosity and share of Catholics across European countries in 2002

(a) Degree of religiosity

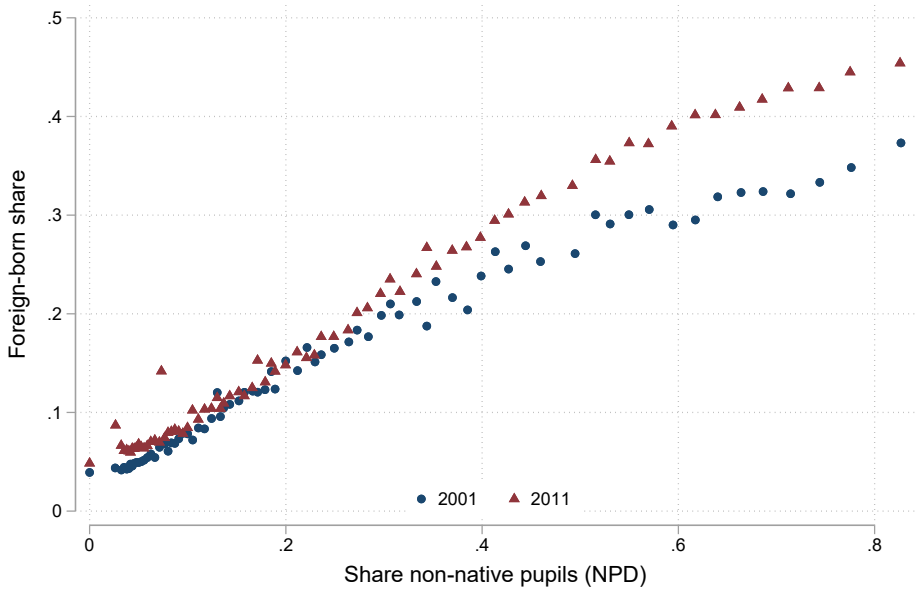


(b) Religious participation



Notes. Panel (a) plots the share of respondents who report to be strongly religious against the share reporting to be Catholic. Strongly religious is defined as reporting a value of 5 or more on a scale from zero ("Not religious at all") to ten ("Very religious"). Panel (b) plots the share of respondents who report attending religious services at least once a week against the share reporting to be Catholic. Source: authors' elaboration on data from the European Social Survey - Round 1 (collected in 2002).

Figure A.6: Non-native shares in the NPD and the Census



Notes. The figure compares two measures of local non-native presence at the LSOA-year level in 2001 and 2011. The horizontal axis reports the share of resident pupils whose main home language is not English, computed from the NPD as the number of such pupils divided by the total number of pupils residing in the same LSOA and year. The vertical axis reports the share of residents born outside the UK, excluding those born in Ireland, computed from the Census as the number of foreign-born residents divided by the total number of residents in the same LSOA and year. LSOA-year observations are pooled and assigned to 200 quantile bins based on the NPD share; each marker reports the within-bin mean of both measures by Census year (2001 and 2011). The correlation between the two measures is 0.820 in 2001 and 0.864 in 2011. Sources: authors' calculations using the National Pupil Database and the 2001 and 2011 UK Censuses.

Table A.1: Pupil characteristics

Variable	Mean	St. Dev.	Obs.
Female	0.49	0.50	10,503,912
Eligible for free school meals	0.16	0.37	10,503,906
White	0.78	0.41	9,978,468
Black	0.05	0.22	9,978,468
Asian	0.10	0.29	9,978,468
Native	0.83	0.38	9,801,687
Distance to school	0.74	1.54	10,501,466
Enrolled in Catholic School	0.09	0.29	10,503,912
Enrolled in CofE School	0.19	0.39	10,503,912
Enrolled in Non-faith School	0.71	0.45	10,503,912
Enrolled in "other" School	0.00	0.06	10,503,912
Enrolled in VA School	0.19	0.40	9,437,162
Enrolled in VC School	0.10	0.30	9,437,162
Enrolled in Community School	0.68	0.47	9,437,162
Enrolled in Foundation School	0.02	0.15	9,437,162
Level 3 in KS2 Reading	0.07	0.25	5,752,221
Level 4 in KS2 Reading	0.41	0.49	5,752,221
Level 5+ in KS2 Reading	0.52	0.50	5,752,221
Level 3 in KS2 Maths	0.11	0.32	5,796,020
Level 4 in KS2 Maths	0.47	0.50	5,796,020
Level 5+ in KS2 Maths	0.42	0.49	5,796,020
Test scores [0,50] KS2 Reading	30.99	9.51	5,932,492
Test scores [0,110] KS2 Maths (exam year $\geq$ 2016)	75.36	24.08	2,201,392
Test scores [0,100] KS2 Maths (exam year $\leq$ 2015)	68.69	20.55	3,735,291

Notes. The table reports summary statistics for pupil characteristics in our main analysis sample, including all pupils enrolled in Reception year (grade 0) between 2001 and 2018 in public primary schools in England. Native status is proxied by having English as main language spoken at home. Free school meal eligibility is means-tested. Source: National Pupil Database.

Table A.2: School characteristics (in 2001)

Religious affiliation	Catholic	CofE	Non-faith	Other
School size	219.84	166.30	234.78	258.10
% Male	50.33	50.94	52.36	52.13
% White	89.00	91.55	85.96	79.66
% Black	5.10	2.27	3.45	0.43
% Asian	1.43	2.28	5.88	8.26
% Native English speakers	93.96	95.49	90.80	85.03
% Free school Meal (FSM)	16.35	10.09	19.75	5.67
% Level 3 in KS2 Reading	7.51	7.88	11.78	3.58
% Level 4 in KS2 Reading	39.12	38.96	43.59	29.75
% Level 5+ in KS2 Reading	53.37	53.17	44.64	66.67
% Level 3 in KS2 Math	15.52	16.62	21.71	7.27
% Level 4 in KS2 Math	48.78	47.53	48.22	41.07
% Level 5+ in KS2 Math	35.71	35.85	30.07	51.66
Average KS2 Reading (std)	0.16	0.14	-0.09	0.47
Average KS2 Math (std)	0.12	0.10	-0.09	0.48
Number of schools	1744	4554	11947	31

Notes. The table reports summary statistics for schools at baseline (in 2001). Within the "CofE" category we included a small number of schools from other Christian affiliations (1 Free, 27 Methodist, 2 United Reform Church schools).

Table A.3: Correlations between IV shares and LSOA characteristics in 2001

	IV Shares		
	(1)	(2)	(3)
Population density	0.001***	0.000	0.000
	(0.000)	(0.000)	(0.000)
Unemployment rate	-0.007	-0.001	-0.001
	(0.012)	(0.001)	(0.001)
Share low skilled	-0.003***	-0.000	-0.000
	(0.001)	(0.000)	(0.000)
Share FSM pupils	0.000	-0.000	-0.000
	(0.001)	(0.000)	(0.000)
No. Catholic schools>0			0.001
			(0.001)
No. CofE schools>0			-0.000
			(0.001)
No. non-faith schools>0			-0.000
			(0.001)
Observations	31,265	31,265	31,265
Local Authority FE		✓	✓

Notes. The table reports estimates from regressions of the IV shares, $\sum_c cap_c\, d_{ac}^{-1}$, on LSOA characteristics measured at the catchment-area level using 2001 Census data: population density, the unemployment rate, the share of low-skilled workers, and the share of pupils eligible for FSM. In column (3), we include dummies taking value 1 if there is at least one Catholic, CofE or Non-Faith school in a catchment area, respectively. 30%, 24% and 6% of catchment areas have no Catholic, CofE and non-faith schools, respectively. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

Table A.4: Non-native presence and the supply of school places

	Number of primary schools			Number of pupils enrolled in Reception year		
	Catholic	**CofE**	**Non-faith**	**Catholic**	**CofE**	**Non-faith**
	(1)	(2)	(3)	(4)	(5)	(6)
Non-native share	0.102	0.627*	2.693	483.590***	298.284*	6,007.910***
	(0.287)	(0.350)	(1.869)	(102.651)	(163.425)	(1,050.787)
Observations	533,136	533,136	533,136	533,136	533,136	533,136
F-stat	38.069	38.069	38.069	38.069	38.069	38.069
Mean dep. var.	2.026	2.210	11.201	489.953	498.860	3,014.434

Notes. The table reports IV estimates of specification (2), where the IV is defined in (3). Outcome variables are measured at the catchment-area level and are disaggregated by religious denomination. All regressions include fixed effects for year, LSOA, gender, ethnicity, and FSM status. The mean dependent variable is computed in the baseline year (2001). Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** =0.05; *** = 0.01.

Table A.5: Non-native presence and native enrollment
By administrative status

	Voluntary Aided	Voluntary Controlled	Community	CofE		Foundation
				VA	VC	
	(1)	(2)	(3)	(4)	(5)	(6)
Non-native share	-0.149***	0.020	0.129**	-0.034	0.020	-0.000
	(0.041)	(0.026)	(0.052)	(0.023)	(0.026)	(0.012)
Observations	6,721,577	6,721,577	6,721,577	6,721,577	6,721,577	6,721,577
F-stat	51.464	51.464	51.464	51.464	51.464	51.464
Mean dep. var.	0.195	0.105	0.676	0.090	0.105	0.024

Notes. The table reports IV estimates of equation (2), where the IV is defined in (3). The dependent variables are indicators for enrollment in schools with different administrative status. All Voluntary Controlled schools in our sample are CofE, thus columns (2) and (5) coincide by construction. Observations with missing information on the school's administrative status are excluded (681,137). All regressions include fixed effects for year, LSOA, gender, ethnicity, and FSM status. The mean dependent variable is computed in the baseline year (2001). Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** =0.05; *** = 0.01.

Table A.6: Heterogeneous enrollment effects

	Catholic		CofE		Non-faith	
	Panel (a): Estimates by area deprivation					
	Deprived	Non-depr.	Deprived	Non-depr.	Deprived	Non-depr.
	(1)	(2)	(3)	(4)	(5)	(6)
Non-native share	-0.097***	-0.083**	-0.043	0.043	0.108**	0.023
	(0.028)	(0.040)	(0.029)	(0.067)	(0.043)	(0.071)
Observations	4,782,780	2,619,917	4,782,780	2,619,917	4,782,780	2,619,917
F-stat	51.124	37.447	51.124	37.447	51.124	37.447
Mean dep. var.	0.116	0.088	0.141	0.253	0.742	0.656
	Panel (b): Estimates by FSM status					
	FSM	Non-FSM	FSM	Non-FSM	FSM	Non-FSM
	(1)	(2)	(3)	(4)	(5)	(6)
Non-native share	-0.063*	-0.094***	-0.024	-0.041	0.073	0.102**
	(0.037)	(0.024)	(0.037)	(0.035)	(0.056)	(0.042)
Observations	1,177,251	6,224,917	1,177,251	6,224,917	1,177,251	6,224,917
F-stat	37.453	52.521	37.453	52.521	37.453	52.521
Mean dep. var.	0.098	0.104	0.123	0.207	0.779	0.687

Notes. The table reports IV estimates of equation (2), where the IV is defined in (3). Panel (a) reports estimates separately for pupils residing in deprived and non-deprived LSOAs, where deprivation is defined using the 2001 Income Deprivation Affecting Children Index (IDACI), that measures the share of children living in income-deprived households. Deprived LSOAs are those with an IDACI above the sample median. Panel (b) reports estimates separately by eligibility for free school meals (FSM). All regressions include fixed effects for year, LSOA, gender, ethnicity, and FSM status. The mean dependent variable is computed in the baseline year (2001). Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** =0.05; *** = 0.01.

Table A.7: Heterogeneous effects on KS2 test scores

	Reading KS2 std score		Math KS2 std score	
	Panel (a): Estimates by area deprivation			
	Deprived	Non-depr.	Deprived	Non-depr.
	(1)	(2)	(3)	(4)
Non-native share	-0.375**	-0.561**	-0.314*	-0.673**
	(0.177)	(0.228)	(0.185)	(0.272)
Observations	2,244,107	2,012,971	2,248,306	2,012,283
F-stat	30.204	35.658	30.301	35.784
	Panel (b): Estimates by FSM status			
	FSM	Non-FSM	FSM	Non-FSM
	(1)	(2)	(3)	(4)
Non-native share	-0.363	-0.534***	-0.476*	-0.516**
	(0.249)	(0.183)	(0.260)	(0.211)
Observations	669,269	3,586,436	672,511	3,586,715
F-stat	23.101	37.538	23.234	37.641

Notes: The table reports IV estimates of equation (2), where the IV is defined in (3). Panel (a) reports estimates separately for pupils residing in deprived and non-deprived LSOAs, where deprivation is defined using the 2001 Income Deprivation Affecting Children Index (IDACI), that measures the share of children living in income-deprived households. Deprived LSOAs are those with an IDACI above the sample median. Panel (b) reports estimates separately by eligibility for free school meals (FSM). All regressions include fixed effects for year, LSOA, gender, ethnicity, and FSM status. The mean dependent variable is computed in the baseline year (2001). Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** =0.05; *** = 0.01.

Table A.8: Native enrollment and attainment effects by alternative definitions of catchment areas

	Radius around LSOA centroid			
	1 km	2 km	4 km	5 km
	(1)	(2)	(3)	(4)
Panel (a): Native enrollment in Catholic schools				
Non-native share	-0.099***	-0.099***	-0.098***	-0.099***
	(0.024)	(0.024)	(0.024)	(0.025)
Panel (b): Native enrollment in CofE schools				
Non-native share	-0.038	-0.038	-0.037	-0.038
	(0.032)	(0.032)	(0.032)	(0.032)
Panel (c): Native enrollment in non-faith schools				
Non-native share	0.107***	0.107***	0.105***	0.106***
	(0.040)	(0.040)	(0.040)	(0.040)
Observations	7,324,035	7,324,035	7,324,035	7,324,035
F-stat	53.558	52.657	48.567	47.164
Panel (d): Reading std. test score				
Non-native share	-0.585***	-0.583***	-0.578***	-0.588***
	(0.200)	(0.201)	(0.204)	(0.211)
Observations	4,212,022	4,212,022	4,212,022	4,212,022
F-stat	38.651	37.111	31.337	28.873
Panel (e): Math std. test score				
Non-native share	-0.565**	-0.563**	-0.557**	-0.567**
	(0.221)	(0.221)	(0.223)	(0.230)
Observations	4,215,406	4,215,406	4,215,406	4,215,406
F-stat	38.739	37.205	31.449	28.983

Notes. The table reports estimates of equation (2), where the IV is defined in (3), for alternative definitions of the catchment areas, with a radius varying from 1 to 5 km; 3 km is our baseline measure (see section 4.1). Panels (a)-(c) report effects on native enrollment by religious affiliation of schools; panels (d)-(e) report effects on native KS2 reading and math test scores. Panels (a)-(c) are estimated on a common sample and share the same first stage, so observations and F-statistics are reported once for the three panels. All regressions include fixed effects for year and LSOA, and individual controls for gender, ethnicity, and FSM status. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

Table A.9: Native enrollment and attainment effects
With additional local controls

	LSOA control $\times t$				
	unempl. rate	pop. density	% low skilled	% FSM	All
	(1)	(2)	(3)	(4)	(5)
Panel (a): Native enrollment in Catholic schools					
Non-native share	-0.094***	-0.094***	-0.080***	-0.093***	-0.071***
	(0.024)	(0.025)	(0.024)	(0.024)	(0.025)
Panel (b): Native enrollment in CofE schools					
Non-native share	-0.035	-0.038	-0.028	-0.035	-0.025
	(0.031)	(0.035)	(0.030)	(0.031)	(0.034)
Panel (c): Native enrollment in non-faith schools					
Non-native share	0.099**	0.102**	0.079**	0.099**	0.067
	(0.039)	(0.043)	(0.039)	(0.039)	(0.042)
Observations	7,402,714	7,402,714	7,402,714	7,393,685	7,393,685
F-stat	53.144	50.369	54.672	53.790	51.465
Panel (d): Reading std. test score					
Non-native share	-0.375**	-0.762***	-0.288*	-0.431**	-0.461**
	(0.164)	(0.224)	(0.161)	(0.168)	(0.193)
Observations	4,257,106	4,257,106	4,257,106	4,252,677	4,252,677
F-stat	35.198	33.417	35.269	36.143	31.091
Panel (e): Math std. test score					
Non-native share	-0.364	-0.767***	-0.269	-0.424**	-0.461**
	(0.177)	(0.237)	(0.174)	(0.179)	(0.199)
Observations	4,260,616	4,260,616	4,260,616	4,256,186	4,256,186
F-stat	35.311	33.532	35.384	36.255	31.214

Notes. The table reports estimates of equation (2), where the IV is defined in (3), including additional controls for LSOA characteristics in 2001 (unemployment rate, population density, share low-skill population, share of FSM pupils), each interacted with a linear time trend; the last column includes all four simultaneously. Panels (a)-(c) report effects on native enrollment by religious affiliation of schools; panels (d)-(e) report effects on native attainment, measured by reading and math test scores. Panels (a)-(c) are estimated on a common sample and share the same first stage, thus observations and F-statistics are reported once for the three panels. All regressions include fixed effects for year, LSOA, gender, ethnicity, and FSM status. Standard errors are clustered by Local Authority (323 clusters). Significance: * = 0.1; ** = 0.05; *** = 0.01.

Table A.10: Enrollment and attainment results based on an alternative IV

	First Stage	Enrollment			Attainment	
	Non-native share	**Catholic**	**CofE**	**Non-faith**	**KS2 Reading (Std. test score)**	**KS2 Math (Std. test score)**
	(1)	(2)	(3)	(4)	(5)	(6)
Non-native share		-0.120***	-0.038	0.123***	-0.648***	-0.545**
		(0.022)	(0.035)	(0.041)	(0.206)	(0.220)
Distance IV	0.074***					
	(0.011)					
Observations	535,429	7,402,714	7,402,714	7,402,714	4,257,106	4,260,616
F-stat	48.89	49.45	49.45	49.45	38.67	38.714

Notes. The table reports estimates using the alternative distance instrument. Column 1 reports FS estimates, estimated on the sample of LSOAs. Columns 2-6 report the corresponding IV estimates of equation (2), with enrollment in columns 2-4 and KS2 test scores in columns 5-6. All regressions include year, LSOA, gender, ethnicity, and FSM status fixed effects. Standard errors are clustered by Local Authority (323 clusters). Statistical significance is denoted by * ($p<0.10$), ** ($p<0.05$), and *** ($p<0.01$).

B Historical background: Polish Resettlement Camps

B.1 WWII, the Polish Resettlement Act, and the camps

After the invasion of Poland by Nazi Germany from the west and by the Soviet Union from the east in September 1939, a Polish government-in-exile was established in France and subsequently moved to London after the German occupation of France in June 1940. During the war, Polish forces in exile fought alongside the Allies, initially in France and later largely under British operational command. At the end of the conflict, the postwar Polish state came under Soviet domination through the establishment of a satellite government that did not recognize the authority of the London-based government-in-exile, and the majority of Polish soldiers chose not to return (see Section 2.2). In 1946, the British government created the Polish Resettlement Corps to demobilize and resettle members of the Polish Armed Forces who had fought under British command and did not intend to return to Poland. The 1947 Polish Resettlement Act, one of Britain's first major postwar immigration measures, granted an estimated 200,000 Polish settlers the right to remain in Britain, together with employment and welfare support.

Polish immigrants were allocated by the government across the country, mainly using the military camps that hosted the Polish Resettlement Corps and that had previously served as facilities of the British, American, or Canadian armed forces during the war (e.g. soldiers' camps, PoW camps, RAF airfields, military hospitals). These camps were typically placed in rural areas, often on the outskirts of major cities but also in more remote locations that had been strategically positioned during WWII. Poles assigned to camps were not forced to stay there, but the provision of accommodation, health, and educational services played a crucial role in the persistence of these communities. Camps became real villages, with their own economic activities, shops, schools, and churches (see original pictures in Figure B.1), and remained active for up to two decades. As settlers gradually moved out in search of better work and accommodation, by the mid-1960s all but a handful of camps had been closed (Biegus and Biegus, 2013).

Although these Polish communities cannot be systematically traced in official records, because naturalized Polish immigrants became indistinguishable from British citizens, qualitative studies and media accounts suggest that Polish identity was preserved locally: "*In 2003, we have a diverse and dispersed Polish community, but it is a community that has maintained a strong sense of identity. We have in Leek and the Staffordshire Moorlands many second, third and even fourth generation Poles whose parents fled Nazi aggression*" Source: https://www.bbc.co.uk/stoke/features/polish/polish_community.shtml.

Figure B.1: Daily life in Polish resettlement camps

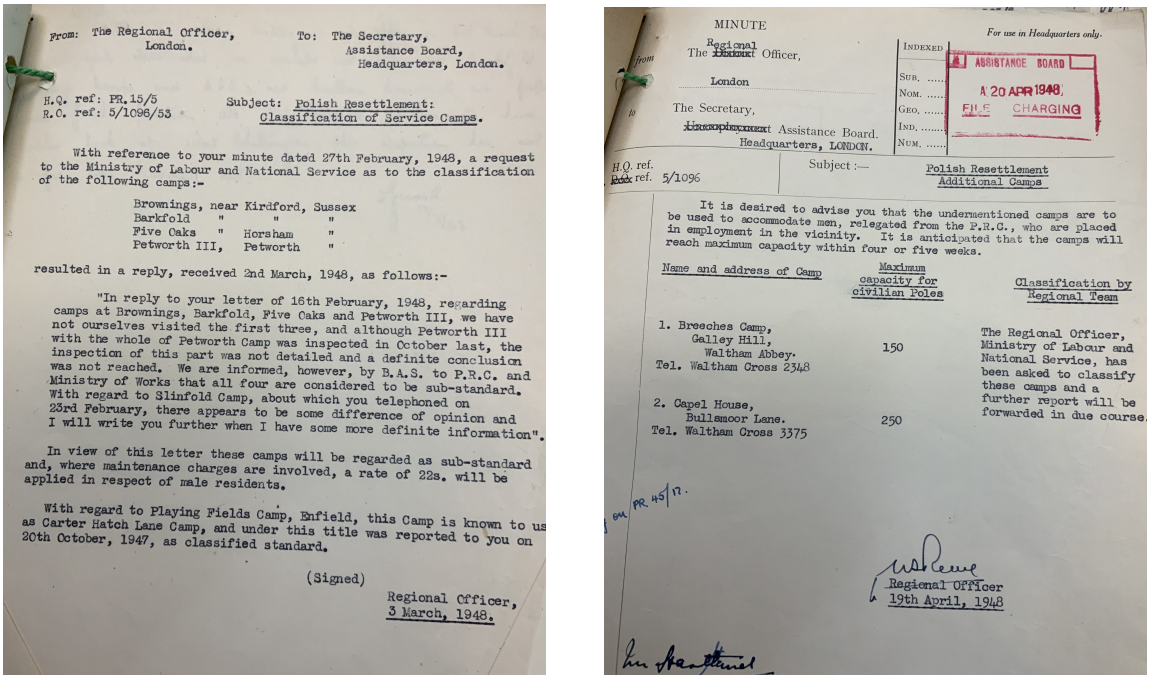


Notes. The above images are original pictures taken in Polish resettlement camps. Clockwise from top left: (i) Daglingworth camp, located close to Daglingworth (Gloucestershire); (ii) the entrance of one of the houses in Melton Mowbray camp (Leicestershire), (iii)-(v) a school, a wedding ceremony and a Communion ceremony, respectively, in the Springhill Lodges camp (Gloucestershire). Source: Biegus and Biegus (2013).

B.2 Recovering historical information from the UK National Archives

In order to construct a comprehensive and detailed map of the Polish Resettlement Camps, we collected information from original documents held at the UK National Archives. Each record can be requested on the National Archives webpage https://discovery.nationalarchives.gov.uk using the series and reference numbers provided. We gathered information on Polish Resettlement camps from the following records: AST 18 ("Polish Resettlement"), WO 315 ("Records concerning Polish Forces and Polish Resettlement Corps"), AST 7/1063 ("Maintenance of Poles") and AST 7/1255 ("Polish resettlement: ultimate permanent housing by local authorities"). From these records, we identified and geolocated 260 camps in the UK, including 235 in England. For 165 of these we were able to retrieve information on their capacity. Figure B.2 shows examples of the records we recovered: the one on the left provides the location of four camps, though without information on their size; the one on the right provides information on both camps' location and their maximum capacity. Figure B.3 shows the geographic distribution of these camps, distinguishing those with capacity information (red diamonds) from those without (light blue triangles).

Figure B.2: Sample of records from the National Archives



From: The Regional Officer, London.
To: The Secretary, Assistance Board, Headquarters, London.

H.Q. ref: PR.15/5
R.C. ref: 5/1096/53

Subject: Polish Resettlement: Classification of Service Camps.

With reference to your minute dated 27th February, 1948, a request to the Ministry of Labour and National Service as to the classification of the following camps:-

Brownings, near Kirdford, Sussex
Barkfold " " "
Five Oaks " Horsham "
Petworth III, Petworth "

resulted in a reply, received 2nd March, 1948, as follows:-

"In reply to your letter of 16th February, 1948, regarding camps at Brownings, Barkfold, Five Oaks and Petworth III, we have not ourselves visited the first three, and although Petworth III with the whole of Petworth Camp was inspected in October last, the inspection of this part was not detailed and a definite conclusion was not reached. We are informed, however, by B.A.S. to P.R.C. and Ministry of Works that all four are considered to be sub-standard. With regard to Slinfold Camp, about which you telephoned on 23rd February, there appears to be some difference of opinion and I will write you further when I have some more definite information".

In view of this letter these camps will be regarded as sub-standard and, where maintenance charges are involved, a rate of 22s. will be applied in respect of male residents.

With regard to Playing Fields Camp, Enfield, this Camp is known to us as Carter Hatch Lane Camp, and under this title was reported to you on 20th October, 1947, as classified standard.

(Signed)
Regional Officer,
3 March, 1948.

MINUTE

For use in Headquarters only.

The Regional Officer,
London

The Secretary,
Assistance Board.
Headquarters, LONDON.

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ASSISTANCE BOARD
20 APR 1948
FILE CHARGING

H.Q. ref. 5/1096

Subject :— Polish Resettlement Additional Camps

It is desired to advise you that the undermentioned camps are to be used to accommodate men, relegated from the P.R.C., who are placed in employment in the vicinity. It is anticipated that the camps will reach maximum capacity within four or five weeks.

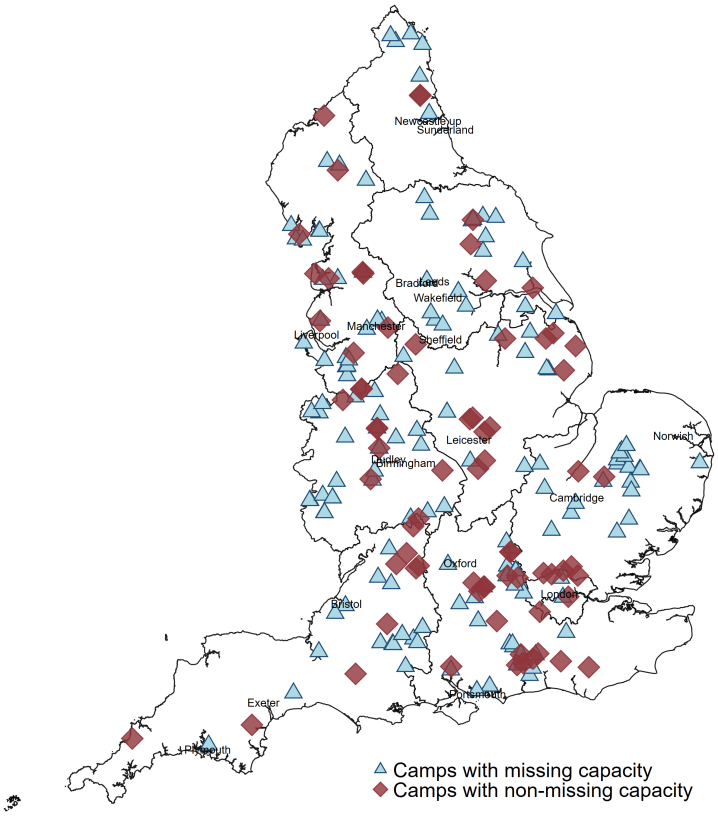
Name and address of Camp	Maximum capacity for civilian Poles	Classification by Regional Team
1. Breeches Camp, Galley Hill, Waltham Abbey. Tel. Waltham Cross 2348	150	The Regional Officer, Ministry of Labour and National Service, has been asked to classify these camps and a further report will be forwarded in due course.
2. Capel House, Bullsmoor Lane. Tel. Waltham Cross 3375	250	

PR. 45/17.

Regional Officer
19th April, 1948

Notes. The record on the left provides the location of four camps, omitting information on capacity; the record on the right provides information on both camps' location and their maximum capacity.

Figure B.3: Map of Polish resettlement camps



Notes. The map reports the distribution of Polish resettlement camps across England after WWII, distinguishing those with capacity information (red diamonds) from those without (light blue triangles). Source: authors' elaboration from records held at the UK National Archives.