Migration and competition for schools: evidence from primary education in England*

Preliminary and incomplete version

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Abstract

The paper investigates the impact of immigration on the school system in England. We exploit the increase in competition for schools due to the massive inflow of migrants from A8 countries after 2004, and investigate the impact on natives' allocation in primary schools. In particular, because of their faith, the rapid increase in Polish-born resident in England has boosted the competition for Catholic schools, on average better performing and already oversubscribed. This quasi-experimental setting enables us to estimate the impact of a positive demand shock on natives' enrollment and its consequences on their final allocation. We deal with the endogenous sorting of Polish migrants by adopting a novel instrumental variable based on the dispersal policy implemented in the UK after WWII. Our results Results suggest that a higher presence of non-natives lowers the probability of natives of attending Catholic schools. We observe that areas characterized by increase in competition for schools due to Polish settlements experience a shift of natives from Catholic to non-faith schools. However, we do not find evidence of detrimental effects on natives associated to changes in allocation. Finally, we show that the results are not driven by the 'London effect'.

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1 Introduction

The debate on the effects of immigration on the native population has been largely dominated, both in the economic literature and in policy circles, by the potential impact of migrants on the labor market success of natives (Dustmann et al., 2016). Only recently, the literature started exploring other areas outside the labor market. Impact on public finances is one, and impact on education is a part of it.

England, the case study considered here, following the massive post-2004 inflow of migrants from A8 countries, faced a significant increase in demand for schools. Indeed, between 2001 and 2011, the overall number of pupils enrolling in primary schools has increased by 6 percent, with urban areas increasing the intake by more than 15 percent. And, while the number of native students entering school remained stable, the number of the non-natives increased from $60,000$ to $100,000$.

The increase in the number of foreign pupils may have boosted the competition for schools as well as affected the pattern of peer effects within schools. Over the last decade, English primary schools experienced an unprecedented shortage of places and the number of pupils accepted in their first school choice has been constantly decreasing. According to the Department for Education, in 2017 only 83 percent of pupils were able to meet their first choice, corresponding to a drop of 4 percentage point compared to the academic year 2014/2015.[1] The share is even lower in major metropolitan areas, such as Greater London, where only 68 percent of applicants was accepted in the preferred school.

Against this background, this paper explores the impact of immigration on on natives' allocation in primary schools and the implications that it may entail.

We might expect that foreign students impact on natives via two potential channels: on the one hand, they alter classrooms' composition, possibly generating peer effects on native outcomes (e.g. attainment, probability of dropout, attendance); on the other hand, a sharp increase in the demand for schools may generate displacement effects if the number of applicants exceeds the existing capacity.

Over the recent years, several studies investigated peer effects across countries and stages of schooling. One of the first contribution was provided by Betts (1998) who finds that the presence of immigrants negatively affect the probability of completing high school for American-born minorities. Gould et al. (2009) also find a negative impact of non-native students on high

[1] Data are available from 2014/2015 onwards.

school achievement and dropout rate of natives in Israel. Chin et al. (2013), find positive effects on natives' test scores when student with limited proficiency in English are taught in separate classes. More recently, Hunt (2017) finds that the presence of immigrants in the population positively affects the probability that natives complete 12 years of schooling.

In the context of early education in England, the main contributions is by Geay et al. (2013). In a setting similar to the one exploited in this paper, they fail to detect detrimental effect of non-natives on natives' achievement in primary schools once pupils' characteristics are accounted for. In particular, they exploit the inflow of Polish students to Catholic schools and find positive effects on math scores. Their result might be explained by the fact that second generation immigrants, especially Eastern European ones, are on average better educated than the native population (Dustmann et al. 2010, 2011).

However, peer effects may indeed contaminated by reallocation. Indeed, the school attended as well as the peer composition of the class is the result of reallocation of students that may be due to displacement effects. Among the first to investigate displacement effects, Hoxby (1998) finds small negative effects on native college enrollment in US. Similarly, Borjas (2004) finds that the displacement mainly affects white native men, and becomes stronger in elite institutions. More recently, Machin and Murphy (2017) exploit the historical distribution of foreign students in UK universities to predict their enrollment and find no evidence of displacement.

Only recently, following findings on the importance of early stage education choices on adult outcomes (Chetty et al., 2011; Heckman, 2006), the focus has shifted to early education. Detrimental effects occurring in early stage might have long term consequences and harm educational returns, thus resulting in long term losses. The main contributions are by Cascio and Lewis (2012), who show that the arrival of immigrants shifts natives towards less-affected schools districts, while Betts and Fairlie (2003) show that natives respond to immigration by moving to private schools. Similarly, Farre et al. (2015) find that Spanish households react by increasing educational expenditures and switching to private schools.

In this paper we investigate displacement effects in England by exploiting the post-2004 inflows of migrants from A8 countries. Following the 2004 EU enlargement the inflow of migrants, especially from from Eastern European, massively increased. The number of Eastern European resident in UK between 2004 and 2015 increased by nine-fold and accordingly, pupils from Eastern Europe are the fastest growing group in English schools (Tereshchenko and Archer, 2014). Among the new European members, the increase was driven by Poles. Being

Poland a Catholic country, the rapid increase of Polish-born resident in England has affected the competition for Catholic schools, already high because among the best performing schools. Indeed, Catholic schools, on average, perform better than the other state-funded schools and are over-represented in the best school league tables. Such inflow makes England the ideal setting to study detrimental effects for two reasons: first because of the magnitude of the shock; second because Polish kids have a high degree of substitutability with natives. Given that the admission to Catholic schools is based on faith, Polish students are likely to meet the requirements and therefore compete with natives for the best schools.

The empirical analysis focuses on native students enrolling in primary school between 2001-2013 and estimates the impact of the increase in non-native pupils in the neighborhood on their school allocation. In particular, we look at the impact on the school allocation of natives, with focus on distance from school, school quality, peer groups, and religious denomination. Previous studies shown that school quality and distance from school play a key role in driving parental decisions (Echols et al., 1990; Taylor, 2001; Jacob and Lefgren, 2007; Gibbons et al., 2008). Moreover, the positive correlation between house prices and school performance in England documented by Gibbons and Machin (2013) provides further evidence. In addition to distance and school quality, we look at peer groups. In particular, we look at the proportion of free-school meal (FSM) eligible, non-natives, black-origin, Asian, and white non-native pupils.

To address the endogeneity of migrants' residential choice, we the large inflows of Polish migrants. We construct two alternative versions of the shift-share predictor for the settlement of the newcomers from Poland, both related to the tendency of immigrants to settle in areas with large share of migrants from the same country (Card and DiNardo, 2000; Card, 2001). First, we exploit the dispersal policy implemented by UK Government to disperse Polish soldiers at the end of WWII. The allocation of Polish soldiers across military camps decided in the 1940s represents a good predictor of newcomers settlement decision and it is exogenous to natives sorting into primary schools. Alternatively, we use as a proxy for Polish settlement the distribution of Roman Catholic churches. The empirical strategy relies on Poles' likelihood of settling in the proximity of Roman Catholic churches. (Marzec, 1988). Both instruments work as good predictors for non-native pupils enrolling in primary schools.

Results on native enrollment show that the higher presence of non-native pupils - predicted by Polish settlements - lowers the probability of attending Catholic schools, increases the probability of attending non-faith schools. In particular, the IV estimates show that a ten percentage

point increase in the share of non-natives living in the neighborhood would decrease by between 2 and 3 percentage points the share of natives enrolling in Catholic schools. Despite evidence of displacement, a further investigation on schools characteristics reveal that natives are, on average, able to find school substitutes similar in quality to Catholic schools. In particular, we find negative effects small and precisely estimated on the quality of the schools attended by natives and no effects on distance from school. Finally, we look into school composition. Results show that natives displaced from Catholic schools are more likely to enroll in community schools traditionally characterized by a higher proportion of FSM eligible and non-natives. Indeed, we observe that natives are more likely to attend schools with higher presence of FSM and non-native peers. Overall, the results suggest that parents are not willing to give up on school quality and distance from school, while peer composition and denomination do not seem to matter.

2 Background

2.1 Polish Migration in the UK

The first significant inflow of Polish migrants into the UK dates back to the 1940s. After WWII more than 150 thousands Polish-born moved to UK. Some of them were soldiers who decided to settle in UK after the end of the war, while others decided to leave their country after the formation of the post-war state (Lopez Rodriguez et al., 2010). In order to avoid Poles to concentrate in London and South of England, the Government introduced a dispersal policy that sorted them in in military camps used as bases during the WWII.

The second migration wave from Poland occurred at the end of the cold war, in the late 1980s and early 1990s. These are the so called 'post-wall' migrants. Unlike the first wave, they were few and represented a temporary migration, whose aim was to increase income and quality of life at home rather than settle in Britain. The relationship between the two generations of Polish migrants was quite limited as well as the participation of the 'post-wall' inflow to the British society (Jordan, 2002; Morokvasic, 2004).

Following the 2004 enlargement of the European Union, UK, unlike other members of the EU, did not adopt transition periods to limit the access to the labour market to the new entrants.[2] Poland was one of the countries that joined the EU in 2004 and and since then the number of

[2]New entrants were immediately granted of free movement across the EU, but only Ireland, Sweden, and the UK allowed free access to their labour markets. Transition periods were up to seven years

Polish born resident in the UK has dramatically increased (figure 1). Indeed, Poles represented over half of the total inflow from 2004 Accession Countries between 2004 and 2008 (Home Office, 2008). In 2012 there were more than 600,000 Polish born resident in the UK was 646,000, thus representing one of the largest foreign-born communities (Rowthorn, 2014).

Poles are on average more educated compared to other migrants (Tereshchenko and Archer, 2014). Educations is perceived as crucial in facilitating social mobility both in Poland and, even more, in foreign countries (Lopez Rodriguez et al., 2010; Francis and Wong, 2013). In addition, Poland is a country with a strong Catholic tradition. Figure 2 shows the top 5 most religious European Countries, and Poland is in fourth position. The massive inflow of Polish migrants further boosted the competition for Catholic schools, already high due to their high performance, on average better than other type of schools. In Catholic schools the admission process is based on faith. Schools require baptism certificates (sometimes even within six months of birth), weekly mass attendance, collaboration and participation to religious activities, and, in some cases, they make use of interviews to assess the religious commitment of the families (Allen, 2007). Therefore, due to their faith, Polish pupils are likely to meet such requirements and therefore likely to compete for Catholic schools with natives.

The lack of data on pupils' country of birth makes it hard to identify Polish-born in primary schools. Gaey et al. (2013) show that the number of white-origin (European) pupils whose first language is other than English and are enrolled in Catholic schools has doubled between 2005 and 2009. Using the same data, we show that the trend persists after 2009 (figure 3). Indeed, in 2001 only 2 percent of other white-origin non-native pupils were enrolled in Catholic schools, while in Spring 2014 they represented more than the 8 percent than the total number of pupils. Interestingly, we do not observe the same trend for Church of England or community schools. While one cannot a priory exclude that inflows from other countries contribute to the competition for Catholic schools, aggregate data on immigrants by year and country of origin show that neither any of the other EU new-entrants is among the top-10 most representative nationalities in 2011, nor other European countries (table 1). On the contrary Poland, appears in the ranking in 2011 in second position, while the other countries show similar trends between 2001 and 2011. Therefore, the composition of post-enlargement migration into the UK and the rise of white non-English speaking pupils in Catholic schools is a clear signal of the increased presence of Poles.

2.2 The English School System

State-funded schools, which represent the vast majority of primary and secondary schools, are managed by Local Education Authorities (LEA). They differ on several dimensions, such as admission criteria, composition of the governing body, and religious affiliation. Community, Voluntary Aided (VA), and Voluntary Controlled (VC) schools are the most common type of state-funded schools.[3] Community schools are entirely managed by the LEA, whereas VA and VC schools, that account for around 30 percent of primary schools, have a certain degree of autonomy from local governments. One of the main differences between VA and VC schools is the composition of the governing body. In VA, the majority of the body consists of members appointed by the foundation (often a church). In VC ones, instead, foundation governors represent a minority.[4] Out of the total number of faith schools, around 1 out of 3 is affiliated to the Roman Catholic Church (Geay et al., 2013).

While non-faith schools, if oversubscribed, give priority to special needs, pupils whose siblings are already enrolled the schools, and pupils living in the proximity of the school, faith ones do not recruit students from the immediate neighborhoods (Allen and West, 2011). Indeed, data reveal that pupils attending schools whose admission process is based on faith rather than distance from school, tend to live more distant from the school (Table 2).[5]

As previously mentioned, Catholic schools are on average better performing. Table 3 shows schools performance by type of schools measured at baseline year 2001. The table shows the share of students reaching the top level (Level 5) in math and English tests as well as those reaching the two highest levels (Level 4 and 5). First, we notice that Catholic schools perform, on average, much better than community schools, and slightly better than Church of England schools. Interestingly, also other religious schools perform well.[6] The last section of the table show the composition of schools. We do not observe significant differences on share FSM presence between Catholic and community schools, while the share is lower in Church of England and other religious schools. Community schools exhibit the highest share of non-native

[3]Other less common types of state-funded schools are Foundation schools, Free schools and City Technology Colleges. Additionally, special schools and Pupil Referral Units provide education specifically for students with special needs.

[4]In addition, VA schools admission is mainly based on faith, while VC schools can recruit both staff and pupils according to non-secular criteria. Both VA and VC schools are state-funded, but the latter are owned by the LEA, while VA are not. Among VA schools the most common are Roman Catholic and Church of England schools.

[5]Information regarding admission procedure for years following 2011 are no longer available in the same format.

[6]'Other schools' category contains, among others, Greek, Muslim, and Jewish schools.

pupils, especially black-origin.[7]

Once we split the sample of community schools between those above and below the median of the distribution of share of top students, we observe that school composition strongly differ among the two groups (table 4). Top-performing community schools exhibit a significant lower share of FSM eligible, non-natives, and non-natives black-origin students. Interestingly, their composition is quite similar to one observed in Catholic schools.

Because high performing, Catholic schools are likely to be oversubscribed. The regulation on class size dictates that each class should not contains more than 30 pupils.[8] Therefore, we expect that the distribution of enrollment displays jumps at 30 (and intervals of 30). Indeed, Figure 4 shows that school enrollment - measured as the total number of students accepted in Reception year - peaks at intervals of 30. We reasonably assume that schools whose enrollment is 30, 60 and so on, are likely to be oversubscribed, namely the number of applications either matches or exceeds the number of seats available. We then repeat the same exercise distinguishing by type of schools (figure 5). Once we split the sample we observe heterogeneity across schools. In particular, Catholic schools more likely to peak at 30, thus suggesting that they are more likely to be oversubscribed compared to the other types of school.

3 Data and Sample Selection

We use the National Pupil Database (NPD), a unique, rich dataset containing information on individual pupils and schools in England. Within the NPD, the Pupil Level Annual School Census (PLASC) provides information for all pupils attending state-funded schools in England from Reception to Year 6 (the last year of primary school), from school year 2001/2002 onwards. The NPD coverage is restricted to state-funded schools.

The dataset contains detailed demographic characteristics such as gender, ethnicity, eligibility for FSM and special educational need (SEN) status, school attended, and language spoken at home.[9] It also provides information on lower super output area of residence. In England there in total 32,482 lower SOAs.[10] The average population of a LSOA is between 1000 and

[7]The category black-origin non-natives contains pupils whose first language is not English and whose ethnic group is black, both Caribbean and African, or other black

[8]Exceptions apply to Special Educational Need (SEN) pupils with statement. We do not include them in our sample.

[9]The variable identifies whether the language to which the child was exposed during early development was English or a language different from English.

[10]We use the 2001 lower SOAs. Currently there are 32,844 SOAs. The change happened in 2011 but NPD

3000 people, comprising between 400 and 1,200 households. In addition, the dataset contains the exact distance in miles between home and school attended by pupils.

The NPD also contains information on students' performance. Primary education in England is organized into two phases, Key Stage 1 (KS1) and Key Stage 2 (KS2). Children enter primary school in Reception year, when they are aged 5. KS1 runs from Reception to Year 2, when students are aged 7. KS2 runs from Year 3, when students are aged 8, to Year 6, when students are aged 11. State-funded schools enroll about 95% of all students, and are free to attend (Department for Education, 2016). KS1 tests were marked by schools' teachers and they were abolished in 2004. For the purpose of our study, we use only KS2 tests. They have the advantage of being standardized tests graded by external markers hired by the Government. Because teachers are not involved in the marking procedure, such tests provide a reliable measure of quality comparable across schools. Students are also awarded a Level of attainment depending on the score they obtain. The NPD provides both pupils' test score and Level for each test. In particular, pupils can be awarded Level 3 to Level 5, where Level 5 represents the highest level.[11] We will measure school quality based on Key Stage 2 test scores in math and English and we will only include in our final sample pupils eligible for the test and whose the test score is available.

We complement NPD with the school census, which provides information on schools (e.g. identifier, address, type), number of pupils by grade, as well as number of teachers by category (e.g. qualified, non-qualified teachers and teaching assistants). From school year 2010/2011 the census provides also information on schools' religious affiliation.

To build our instrumental variable, we use as a proxy for past Polish settlement the distance between the lower SOA and the closest military camp used to disperse Polish soldiers and refugees at the end of WWII. We obtained the location and address of the camp and we recover the current postcode.[12] The main sources of information are collected from The National Archives, History of the Polish Ex-combatants Association, and The Sikorski Institute. The list of camps is publicly available and it is, to the best of our knowledge, the most complete dataset available. The dataset contains 113 resettlement camps across England. Figure 8 shows the distribution of resettlement camps across lower SOAs in England.

provides data for 2011-2012 academic year using SOAs as defined in 2001

[11] These levels are meant to capture the position of the student in the achievement distribution. Hence, students awarded Level 3 are students performing below expectations, those awarded Level 4 are students working at the expected level and Level 5 students are those performing above the average.

[12] http://polishresettlementcampsintheuk.co.uk/

Finally, in alternative to military camps, we use as a proxy for Polish settlements the distribution of Roman Catholic churches provided by the Catholic Directory for England and Wales. Data on churches are available at postcode level and we can identify the number of churches in each lower SOA. Our dataset contains in total 2712 Roman Catholic churches across England (figure 7). The database also contains Catholic churches founded by Polish immigrants right after the WWII. The share of churches in each lower SOA will then be use to allocate yearly Polish inflow of migrants between 2001 and 2013.

4 Conceptual framework

4.1 Defining parental choice

During the application process parents are asked to rank between three to six schools, from the most to the least favorite. Unless schools are oversubscribed, parental preference is the first criteria that schools use to recruit students. In other words, if the first choice school receives less applications than its capacity, the probability of the pupil of being accepted is equal to one.

We assume that the parental utility is defined as follow:

$$U_j = f(Q_s, \Pi_s, D_{js}, R_{js}), \tag{1}$$

where Q_s is the quality of the school, measured as students' performance, Π_s is the school composition (e.g. share of FSM eligible, non-natives..), D_{js} indicates the distance from school, and R_{js} represents the religiosity of the parents. We assume that the utility in increasing in school quality and quality of peers, and decreasing in distance from schools (distant schools imply higher time and transportation costs). We also include religiosity and we assume that the utility of parents who apply to faith schools increases if their child is accepted. On the contrary, if parents do not apply to faith schools, religiosity will have no effects on their utility.[13] Schools can be community (c) of faith (f). The probability of being accepted in a community school is given by:

$$P_{jc} = f(S_{jc}, D_{jc}, D_{-jc}). \tag{2}$$

If the school is undersubscribed, namely the number of the applications is lower than the total

[13] Because our sample contains only state-funded schools we do not include in the utility function monetary expenses that parents face if they decide to apply for private schools.

capacity, the probability of being accepted in the first choice is 1. If the school is oversubscribed, admission depends on criteria other than parents' preference. In particular, S_{jc} indicates whether the students have a sibling already enrolled in the schools; D_{jc} is the distance from the school; D_{-jc} is the distance from school of the competing applicants. Both S_{jc} and D_{-jc} positively affect the probability of being accepted, while D_{jc} goes in the opposite direction. For community, and more in general non-faith schools, the above requirements are dictated by the Local Education Authority.

Faith schools admit pupils based primarily on faith. As mentioned in the previous section, schools require require baptism certificates, regular mass attendance, and active participation to religious activities within the local community. The probability of being accepted in a faith school can be represented as follow:

$$P_{jf} = f(S_{jf}, X_{jf}, X_{-jf}). \tag{3}$$

As before, if the school is undersubscribed, then the probability of being accepted is 1. If not, other criteria apply. In particular, S_{jf} indicates whether the students have a sibling already enrolled in the school. X_{jf} and X_{-jf} indicates respectively applicant's own faith and the faith of the other applicants. Following the admission regulation for faith-schools, the probability is increasing in X_{jf} and decreasing in X_{-jf}.

In our setting, an a positive shock in the demand for schools, which reflects into an increase in the number of applications, will lower the probability of being accepted in the first school choice. When the latter becomes unavailable, parents will be forced into their second choice.

If first and second choice are perfect substitute, the utility remains unchanged. If first and second choice differ, then the utility will be affected. Suppose that first and second choice are equally good, but the second choice is more further away. If unable to meet the first choice, parents will face transportation additional costs for a given school quality. In other words, when families rank their second and third favorite schools, they necessarily give up on some dimensions of their utility, and therefore pay a price. The empirical question we aim to address is, precisely, which dimensions parents are more likely to give up and at what price.

In this setting we assume that the supply is fixed. In principle, supply could adjust in two ways: on the one hand through the opening of new schools. In the empirical analysis we control for the number of schools by type and therefore accounting for opening and closures of schools. On the other hand schools might increase class size or add one extra class. An increase in class

size is feasible if schools are not oversubscribed. The regulation, in fact, states that classes with more than 30 students must be spitted. Therefore, if classes are already full capacity - as often the case for Catholic schools - a mere increase of class size would not be possible. Schools can, instead, add an extra class. However, unlike secondary schools, primary ones are generally small and hardly find physical space to add extra classrooms.

4.2 Defining competition areas

A crucial aspect of our empirical analysis is the level at which the competition for schools takes place. Primary schools are relatively small and quite spread out all over the country, especially in densely populated areas. As underlined in the previous section, distance from school has a strong impact on the probability of being accepted in non-faith schools. Therefore, parents have a high incentive to live near the school. Students enrolled in faith schools, despite they do not recruit from the immediate neighborhoods, tend to live relatively close to the school. Indeed the average distance is less than 3 kilometers (Table 2). This fact would suggest that competition for primary schools takes place at very local level. In our data there are two geographical layers we can exploit: LEA and lower SOA level. There are in total 152 Local Education Authorities in England with an average population of around 350,000 residents, while the average population of lower SOAs is between 1,000 and 3,000. On the one hand, given their large size, it is hard to assume that pupils who live at opposite ends of LEA compete for the same schools. On the other hand competition goes beyond lower SOAs' border. Indeed, pupil level data on residence and school location show that most of the pupils attend schools in LSOAs other than those in which they reside. This implies that lower SOAs are not credible competition areas. Therefore, we trace a 3km radius around the centroid of each lower SOA and we will assume that the competition takes place within such circles (Figure 6).[14]

Notably, competition areas only include LSOAs belonging to the same LEA. While pupils are allowed to apply to schools located outside their LEA of residence, the number of such cases is negligible.[15] The main advantage of using overlapping areas is to build realistic markets in which parents and pupils compete for schools.

[14] We use 3 km radius because is the average distance from faith schools.

[15] Gibbons et.al (2013) using the NPD calculates that the total number of pupils attending a school located in a different LEA of residence is approximately 3.3 percent.

5 Empirical analysis

5.1 The empirical specification

Our empirical analysis investigates the impact of migration on natives' allocation in primary schools. In particular, we are interested in displacement effects. We exploit variation within neighborhoods - the so called competition areas - and across natives cohorts. In particular, we restrict our sample to natives enrolling in primary schools between 2001 and 2013 and estimate the impact of the increase in the share of non-natives starting primary school on natives enrollment.

Hence, we are interested in estimating the following specification:

$$\Delta Y_{iat} = \alpha_0 + \beta_0 \Delta m_{iat} + \beta_1 \Delta W_{iat} + \gamma_i + \delta_t + \eta_{iat} \tag{4}$$

The unit of observation is the LSOA, denoted by i. ΔY_{iat} measures the change in the share of natives in Reception year resident in the LSOA i in competition area a at time t. All the differences are computed with respect to the baseline year 2001. The outcome variables measures changes in natives' allocation by type of school. Δm_{iat} is the change in the share of non-natives enrolling in primary school in year t in competition area a. The denominator is the total number of pupils enrolling in primary schools in baseline year 2001[16]. We define as non-natives pupils whose first language spoken at home is other than English. The coefficient of interest is β_0, representing the impact of non-natives starting primary school on native outcomes. ΔW_{at} is a vector of area characteristics. Specifically, we control for the number of schools by type in each competition area to capture, if any, supply adjustment. In particular, we control for opening and closing of Catholic, Church of England, and community schools. Controls also include the share of FSM eligible pupils living in the area as an index of deprivation. Finally, we control for time-invariant LSOAs characteristics by adding (γ_i). We also include year (δ_t) fixed effects.

We estimates equation (4) with a focus on the characteristics of schools attended by natives. The empirical question we address is what dimensions parents are more willing to give up in case of displacement effects. In order to answer the question, we look at the impact of non-natives on the type of schools attended by natives, where the type is proxied by religious denomination, school quality, peer composition, and distance from school. We define school

[16]We use as denominator the population of pupils entering primary school at baseline in order to exploit the variation in the share of non-natives induced by changes in the numerator only

quality as the share of top students in maths and English in each school, computed as the share of students reaching Level 5 or Level 4 above. We proxy school composition by the share of FSM eligible and non-native students. We also stratify non-natives students according to their ethnic background and we calculate the share of white, Asian, and black origin non-native pupils enrolled in each school attended by natives.

Finally, we look at the impact on distance from school, which is measured as the distance in miles from pupils' postcode of residence to school postcode.

Importantly, school characteristics are measured at baseline year 2001. In other words, we intend to characterize the school allocation of natives abstracting from consequences, if any, of migration on changes in the characteristics of a given school. This approach allows us to identify displacement effects, uncontaminated by peer effects generated by the presence of immigrants.

5.2 Addressing endogeneity of migrants' residential choice

OLS estimates of (4) would not account for the endogeneity of migrants' residential choices. If unobservable local shocks that attract migrants have an impact on natives' allocation through channels other than immigration, OLS results would be biased. Suppose that some areas experience positive shocks that both attract more migrants - whose presence increases the competition for schools - and increase investment in schools - thus positively affecting natives enrollment. The two effects would work in opposite directions, and the OLS estimates might be downward biased.

The ideal experiment would randomly allocate non-native pupils across neighborhoods. In absence of that, we deal with the endogenous selection of migrants by adopting an instrumental variable approach.

In particular, we exploit the massive post-2004 inflow of Polish migrants to the UK and features of their settlements uncorrelated to school quality as a source of exogenous variation in the competition for schools. However, if newcomers' settlements are driven by unobservables correlated to natives' allocation, the exclusion restriction would be violated. The issue has been address in the literature by using the past settlement instrument, which relies on the assumption that new migrants tend to settle where migrants coming from the same country have settled before (Card and Di Nardo, 2000; Card, 2001). Despite the instrument has proved to be a strong predictor of current inflow of migrants, few concerns remain. Indeed, if past settlements of migrants are correlated to socio-economic conditions persistent over time, estimates may be

biased and the exclusion restriction violated (Jaeger et al., 2017). In our setting, we rely on two versions of the shift-share predictor for the share of non-natives students; one based on the dispersal policy introduced by the UK Government in the late 40s and another based on the distribution of Roman Catholic churches.

After the end of the WWII thousand of Polish soldiers decided to settle in UK instead of returning to Poland. In order to avoid a concentration of Poles in London and South East of England, the Government decided to temporarily sort them in military camps no longer in use after the end of the war. The key advantage of using the dispersal policy is that Poles were allocated in military camps on a no choice basis. The underlying assumption of our identification strategy is that unobservables determining the location of Polish past settlements are not correlated with shocks to current natives' allocation in primary schools.

The first stage specification is the following:

$$\Delta M_{iat} = \alpha_0 + \beta_0 \cdot \left(\Delta Polish_t \cdot \frac{1/log(dist_{ia})}{\sum_{a=1}^{n}[1/log(dist_a)]} \right) + \beta_1 \Delta W_{iat} + \gamma_i + \delta_t + \eta_{iat} \qquad (5)$$

where β_0 represents the predicted allocation of new comers Poles using the distribution of military camps across England. The instrument allocates the national inflow of Polish migrants between year t and baseline year 2001 proportionally to the inverse of the distance of each competition area to the closest military camp. The intuition is that the lower the distance, the higher the number of Polish migrants the instrument allocates in the area[17].

Furthermore, we build an alternative instrument based on the distribution of Roman Catholic churches. Due to their faith, Polish migrants were likely to settle close to Roman Catholic churches already existing, or to create their own congregation (Marzec, 1988). Catholic churches were built much before the 2004 migration flows and we argue that their location is exogenous with respect to the current distribution of natives pupils. Our assumption is that any sorting of natives must have happened independently on Poles' arrival since churches were established several decades before. We claim that the only way the presence of churches affects current natives' outcomes is through their attractiveness for new Polish migrants. The exclusion restriction would also be violated if the presence of churches lead to the opening of new Catholic schools. In that case, our instrument would affect the allocation of natives through channels other than the recent inflow of Poles. Nevertheless, our specification include controls for openings and

[17] We also use the distance to the second closest camps and results are robust

closure of schools.

This motivates the first stage regression:

$$\Delta M_{iat} = \alpha_0 + \beta_0 \cdot \left(\Delta Polish_t \cdot \frac{\text{Churches}_{ia}}{\sum_{a=1}^{n} \text{Churches}_a} \right) + \beta_1 \Delta W_{iat} + \gamma_i + \delta_t + \eta_{iat} \tag{6}$$

Similarly to equation (5), the above specification allocate the national net inflow of Poles between 2001 and year t using the share of Roman Catholic churches in each competition area a weighted for the total number of churches in the country.

Results of the first stage regressions are shown in Table 5. Panel A shows results using the distance from the closest military camps. The most complete specification in column 3 includes both lower SOA (γ_i) and year (δ_t) fixed effects. Estimates imply that one standard deviation increase in the number of Poles in the competition area predicts an increase in non-native enrollment of 3.6 percentage points, which correspond to about one third of the SD of the dependent variable. Panel B shows the results using the presence of Roman Catholic churches. The estimates are also positive and statistically significant with a somewhat lower F stat compared to Panel A. The most complete specification in column 3 suggests that 1 SD increase in the number of Poles lead to an increase of 2 percentage points of the share of non-native pupils enrolling in Reception year.

Despite both instruments work as good predictors of non-natives, they might capture different compliers. Table 9 compares areas respectively above the 50th (columns 2 and 3) and 75 percentile (columns 4 and 5) of the distribution of both instruments. The first column shows the statistics for the whole sample. Compared to column 1, the instruments predict a higher share of Polish in areas where the demand and the supply for school is higher (columns 2-5), and school quality is below the national average. As expected, the instruments have higher predicted power in areas where teh concentration of Poles is higher[18]. In particular, military camps are a better predictor than churches of Polish settlements in 2011. If we compare columns 4 and 5 we observe that the main difference between areas where the instruments strongly predict Polish settlement is respectively in the presence of non-natives enrolling in school (lower in areas with higher presence of churches), as well as school supply. In particular, areas strongly predicted by the presence of churches are characterized by more Roman Catholic and Church of England schools and less community schools compared to areas strongly predicted by mil-

[18] We obtain information on Polish resident in England at lower SOA level from 2001 and 2011 Census data

itary camps. This suggests that displacement, if any, might have different effects on natives' allocation depending on the school supply available to pupils.

6 Results

6.1 Religious denomination

Table 6 presents OLS and IV estimates on migrants' flows on the school allocation of natives. The dependent variable measures the change in natives' enrollment by type of school. To abstract from ex post reallocation effects potentially induced by immigrants' presence in school, we focus only on native pupils enrolling in Reception year, which is the first year of primary schools. We split schools according to their religious affiliation: Roman Catholic, Church of England, community, and other religious schools, such that we will have four different outcome variables. Community refers to non faith schools, while other religious include all faith schools other than Roman Catholic and Church of England ones. The OLS results in Panel A show that a higher presence of non-natives lead to a decrease of natives in Catholic schools and an increase of the enrollment in community schools. In particular, 10 percentage point increase in the share of non-natives with respect to 2001, lower by nearly 1 percentage point the share of natives enrolling in Catholic schools and increases by approximately the same the share of natives in community schools. We do not find effects on enrollment in Church of England schools and other faith schools. Panel B show the IV results using as instrumental variable the distance to the closest military camp. Results go in the same direction as the OLS estimates but the magnitude is stronger. In particular, 10 percentage point increase in the share of non-natives decreases by 3.1 percentage points the share of natives enrolled in Catholic schools, 1.4 percentage point in Church of England, and increases by 4.4 pp the share of natives in community schools. Such difference between OLS and IV suggests that the former would provide downward bias estimates of the impact of migrants on natives' enrollment and that natives living in the proximity of military camps respond differently compared to the whole sample. Alternatively, we adopt as instrumental variable the presence of Roman Catholic churches. As mentioned in the previous section we may expect compliers to be different. IV estimate are shown in Panel C. We still observe a lower enrollment in Catholic schools and a higher presence of natives in community schools, but the magnitude is lower compared to the previous IV results. In addition, we do not find statistically significant effects on enrollment in Church of England schools. The compar-

ison between the two instruments suggest two possible mechanisms: on the one hand in areas characterized by a high number of Catholic churches, either displacement is lower, or pupils manage to substitute their favorite Catholic schools with another Catholic school (something we cannot observe in absence of data on ranking). On the other hand, areas close to military camps either suffer from stronger displacement effects, or pupils displaced from Catholic schools are more likely to substitute Catholic with community schools.

6.2 School quality and distance

The results from the previous section show that, if displaced, natives are more likely to substitute Catholic schools with community schools. In this section and the following we investigate the 'anatomy' of the displacement. In other words we investigate where natives enroll in the presence of displacement from Catholic schools. In particular, we explore which dimensions (e.g. quality, peers, distance from school) parents are more willing to give up when unable to meet their first choice. If parents are able to find a perfect substitute for their first choice, then we expect to find no impact on schools characteristics. We start by looking at school quality measured at baseline year (2001). Panel A of Table 7 shows the OLS estimates.

School quality is measured using the share of students reaching Level 5 in maths and English, as well as the share of students above Level 4 (that include both Level 4 and Level 5). Both OLS and IV results suggest that a higher presence of non-native is negatively associated the the quality of schools attended by natives. In particular, the IV estimates in Panel B suggest that 10 percentage point increase in the share of non-natives would led natives to attend schools in which the share of top students is between 0.5 and 0.3 percentage points lower compared to the schools attended by pupils living in the same neighborhood and enrolling in 2001. However, the magnitude is quite small considering that, on average, the share of students reaching Level 5 in math and English test in 2001 was, respectively, 35 and 47 percent.

Panel C displays IV estimates using Catholic churches as instrumental variable. Interestingly, do not find any effects on school quality. With the only exception of the result on Level 4 above top students (which is statistically significant only at the ten percent level), all the other results are not significant. Such finding suggest that natives living in areas characterized by churches, despite the increase in competition for faith schools, might have access to a better supply and therefore more likely to enroll in schools equally good performing compared to their first choice.

Finally, we do not find any effect on distance from school which can be interpreted as a signal that parents are not willing to give up on distance. Considering that pupils enrolling in primary schools are not-self traveler we reasonably expect distance from schools being a strong component of parental utility. Even if unable to meet their first choice, parents seem not willing to choose further away schools.

6.3 Peer groups

We finally look at peer groups. We proxy peer composition by measuring the share of FSM eligible and non-natives in schools attended by natives. We also construct the share of non-natives by ethnic group. OLS and IV results are shown in Table 8. The estimates are rather similar, with the latter being stronger. In particular, the result suggest that natives experiencing higher competition predicted by Polish arrival are more likely to attend schools with higher share of FSM eligible and non-natives. In particular, among non-natives, Asian minority seem to be the one driving the results. In term of magnitude of the effects, IV estimates in Panel B (using military camps as instrumental variable) suggest that a 10 percentage point increase in the share of non-natives enrolling in primary schools (compared to 2001) would lead natives to attend schools with a nearly 0.5 pp more FSM students and nearly 1 pp more non-native students.

As for the previous section, Table 8 shows results on peer composition in areas where the allocation of Polish migrants is predicted by the presence of churches. Results in Panel C are slightly different compared to the previous estimates. We do not find effects on FSM eligible peers, while the presence of non-natives seem to push natives in school where the presence of other non-natives is significantly higher compared to 2001, and almost entirely driven by Asian origin students. These results confirm that the compliers responding to the instruments are different from each other.

6.4 Direct impact of migrants on schools

In this section we investigate how the presence of migrants directly affected school characteristics. While in the previous sections all outcomes on schools characteristics were measured at baseline, we now allow them to change over time. We no longer focus on characteristics of schools were natives are displaced to, but rather on how the presence of non-natives affects schools. In particular, being our compliers areas characterized by a high presence of Polish

migrants, we explore how schools likely to be attended by Polish pupils has changed following their enrollment.

Similarly to Gaey et al.(2013), we investigate whether the presence of non-native pupils has had any impact on schools, and in particular on school quality. One of the main concern when evaluating the impact of migration on native students is that a language barriers or potential lack in motivation due to more disadvantage socio-economic backgrounds faced by foreign students – compared to natives – might entail detrimental effects on natives.

Table 10 shows the results. As before Panel B shows the IV estimates using the proximity to military camps. OLS estimates are positive but either very small or not statistically significant. IV results, instead, suggest positive and quite strong results in math. The estimates suggest that a 10 percent increase of non-natives would increase the share of top student in Math by 2.2 percentage point – Level 5 – and 3 percentage points – level 4 +. Interestingly, results on English test are not statistically significant. Panel C shows IV estimates when exploiting the presence of churches as instrumental variable. The results are similar and even stronger. Our findings are in line Gaey et al. (2013) who find that a higher share of white non-natives white in class – proxy for Polish pupils – positively affect math test scores of natives. Our estimates do not isolate the so called peer effect. They rather provide an overall effect on schools which is a combination of schools choice (displacement) and school composition (peers).

7 Heterogeneous effects

7.1 FSM eligible

In this section we focus on native pupils that might be more affected by the presence of non-natives. The displacement from Catholic schools and the consequent inflow of natives from to community schools might generate further displacement effects from community schools. In particular, if, as suggested by previous results, community schools are good performing schools, we might believe that they are also likely to be oversubscribed. Unlike faith schools, community schools recruit pupils based on distance from school, thus inflating the price of houses in the proximity of good schools. If competition for community schools increases as well, the close pupils live to the school, the higher is their the probability of being accepted. Therefore, we might expect that disadvantage pupils who cannot afford living the proximity of the school, might be displaced as a result. In other words, we investigate whether the presence of higher

share of non-natives generate 'chain displacement' among natives.

In order to investigate heterogeneous effects, we restrict the sample and focus on FSM eligible natives. Therefore, we keep only lower SOAs where there is a positive number of FSM eligible, which means that we lose slightly more than 50 percent of areas. Not surprisingly, families whose children are eligible for FSM tend to concentrate rather than spread across all neighborhoods. Column 1 and 2 of table 11 show the results on natives enrollment. Similar to the results for the whole sample, we find that the presence of non-natives lead to lower enrollment in Catholic schools and higher in community ones. Compared to the whole sample, the impact seem to be lower for FSM students. Moreover, we do not find impact on school quality and peer groups (Table **??**. None of the coefficients is statistically significant suggesting that FSM eligible are not the group of natives who drive the results in the previous section. It is worth mentioning that when we restrict the sample to FSM and ethnic minority students, the distribution of Catholic churches become a weak instrument. Therefore, we will only use the distance from military camps.

7.2 Ethnic minorities

Finally, we restrict our sample to native students belonging to ethnic minorities. We define ethnic minorities those pupils whose first language is English and belong to ethnic groups different from British or Irish. As for FSM eligible, pupils the number of observations is significantly smaller. Also for ethnic minorities we only consider IV estimates that exploit the proximity to military camps. When we exploit the presence of Catholic churches to predict Polish settlements, the F-stat from the first stage regression is above 5, thus suggesting that the instrument is too weak to be considered valid. While compared to the whole sample FSM natives seem to suffer less displacement effects, the opposite happens to ethnic minorities (table 11). In particular, IV estimates in column 6 show that the negative effects on enrollment in Catholic schools is slightly higher than the results on the whole sample. In addition, ethic minorities seem to suffer displacement effects also from Church of England schools. When we look at schools characteristics in table 12 column 6, we observe that also ethnic minorities are more likely to attended schools with higher share of FSM eligible and non-natives. However, we can say less about school quality because none of the coefficients, despite the magnitude is similar to the previous estimates, is statistically significant. The standard errors, maybe due to the lower number of observations, are quite high. Only results on math Level 5 are statistically significant at 10 percent

level and would suggests that ethnic minorities suffer from a bigger loss in school quality than the whole sample.

7.3 Urban areas

Given the difference, both in terms of demand and supply of schools, between rural and urban areas, we investigate heterogeneous effects across locations. We start by excluding rural areas from our sample. We distinguish between rural and urban lower SOAs according to the definition provided by ONS21[19]. Out of the total sample, 90 percent of areas are considered urban. Therefore, restricting the sample to urban lower SOAs implies that we loose about ten percent of our observations.

Results on natives' enrollment are shown in Table 13. The coefficients of both OLS and IV estimates are similar to the one we find using the whole sample of SOAs. We still observe a lower share of natives enrolled in Catholic schools, as well as Church of England (column 1 and 3) and a higher presence of natives in community schools. The displacement seems to be stronger compared to the whole sample. Also results on schools characteristics confirm the pattern we found in the whole sample (Table **??**. Column 3 shows the IV results using the presence of military camps. We find that the negative impact on school quality is slightly stronger when we restrict the sample to urban areas. This suggests that displacement is stronger in urban areas, as well as its consequences on school quality. As for the whole sample, we find no impact on school quality when we use the presence of churches as instrument.

7.4 'London effect'

In addition, we might suspect that results are driven by Greater London, where school demand and supply, as well as and the number of migrants are considerably higher compared to the rest of the country. The percentage of Polish born resident in England in 2011, despite lower compared to other nationalities, is around 25 percent (Vargas-Silva, 2014). One out of four Polish resident in UK lives in Greater London. IV results on enrollment (table 13) show that, once we exclude Greater London from our sample the displacement from Catholic schools is higher (column 2), thus confirming that the whole sample results cannot be attributed to Greater

[19]Lower SOAs classification build up from the OA (output area) classification, with assignment to urban or rural made by reference to the category to which the majority of their constituent OAs is assigned. In particular, OAs are treated as 'urban' if they were allocated to a 2011 built-up area with a population of 10,000 people or more, while all remaining OAs are classed as 'rural'.

London solely. Similarly, table 14 shows IV results on school characteristics. Notably, also in this case, excluding London from our sample does not alter the results.

8 Conclusion

The paper studies the impact of migration on the allocation of natives in primary schools. By exploiting the massive post-2004 increase of migrants from Poland, we investigates evidence of displacement effects in between 2001 and 2013 cohorts of natives students enrolling in primary schools. Indeed, the arrival of Polish migrants, because of their Catholic faith, boosted the competition for Catholic schools, already oversubscribed and among the best performing ones. We exploit Polish settlement to predict the share of non-native pupils starting primary school. We adopt two version of the shift-share predictor for presence of non-native pupils at neighborhood level a set of instrumental variables based the distribution of Roman Catholic churches and the distribution of military camps used to allocate Polish soldiers after WWII as a proxy for past Polish settlement.

Results show that areas experiencing a higher increase of non-natives are characterized by lower presence of natives in Catholic schools ad higher in non-faith ones. In particular, 10 percent increase of non-natives enrolling in primary school would decrease between by 2.3 and 3 percentage point the share of natives attending Catholic schools. We also find smaller, but statistically significant, results for Church of England schools. The results suggest that in areas where the presence of non-natives is predicted by Polish settlement, in the presence of displacement, natives are more likely to substitute Catholic schools with non-faith ones, thus giving up on school religiosity. We further explore how competition for schools affected the quality as well as the peer composition of schools attended by natives. Given that Catholic are among the best performing schools in England, we test whether an increase of competition for schools affect the quality of the schools attended by natives. We find negative effects on school quality. Despite statistically significant, the magnitude of the results suggests, even if displaced from Catholic schools, natives manage to enroll in schools equally good. It is also suggestive of the fact that parents might be more willing to give up on religiosity rather than school quality. Results on school composition, instead, show that natives exposed to higher competition for schools are more likely to attend school with higher share of non-natives as well as FSM eligible students. Moreover, we do not find results on distance from school.

In addition, we investigate evidence of heterogeneous effects across pupils and areas. We restrict the sample to FSM eligible and ethnic minorities and investigate whether there are categories of natives whose loss from displacement are higher. We do not find any evidence of loss for FSM eligible natives. When we restrict the sample to ethnic minorities we find that they suffer a higher displacement compared to ethnic majorities - defined as British or Irish. Results on school quality would suggest that they enroll in lower performing schools, especially when looking at the share of top students, but the results are statistically not significant.

Finally, heterogeneous effects across areas show that the effects are stringer in urban areas. We also show that results are not driven by the so callled 'London effect'.

Overall, we find that even in the presence of displacement, natives do not seem to give up on distance for school, whose estimate is always zero and never statistically significant. We also find that natives are able to substitute Catholic schools with similar performing schools, mostly non-faith. That suggest that if Catholic schools re no longer available, parents are willing to give up on religious denomination rather than school quality. Interestingly, natives are also likely to enroll in schools whose share of non-natives and FSM eligible students is higher, thus suggesting that native parents do not perceive peer composition as a first order concern.

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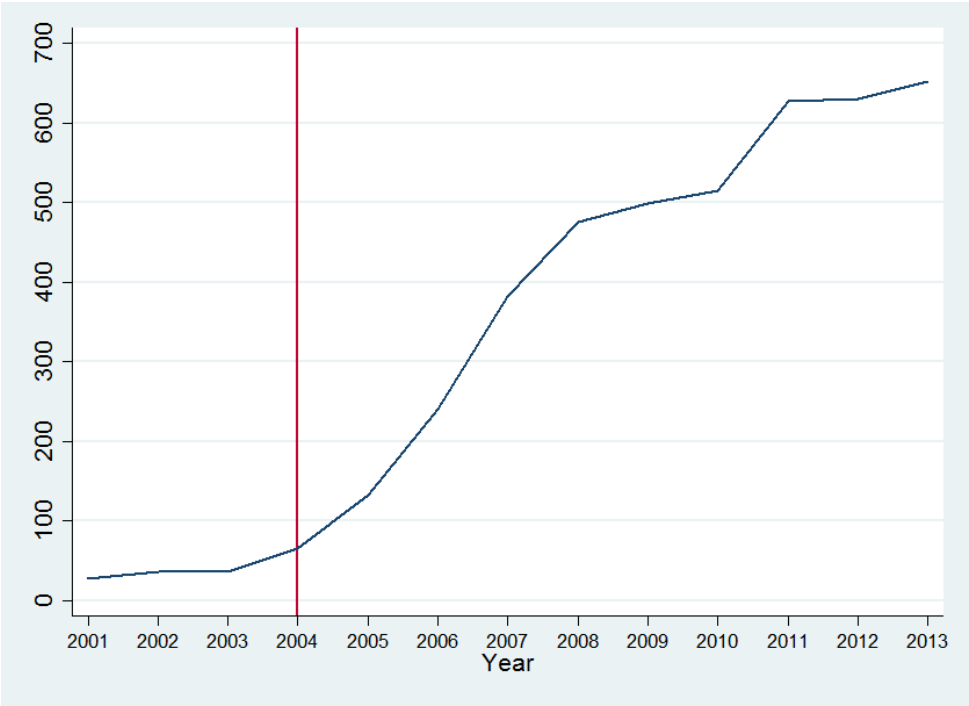
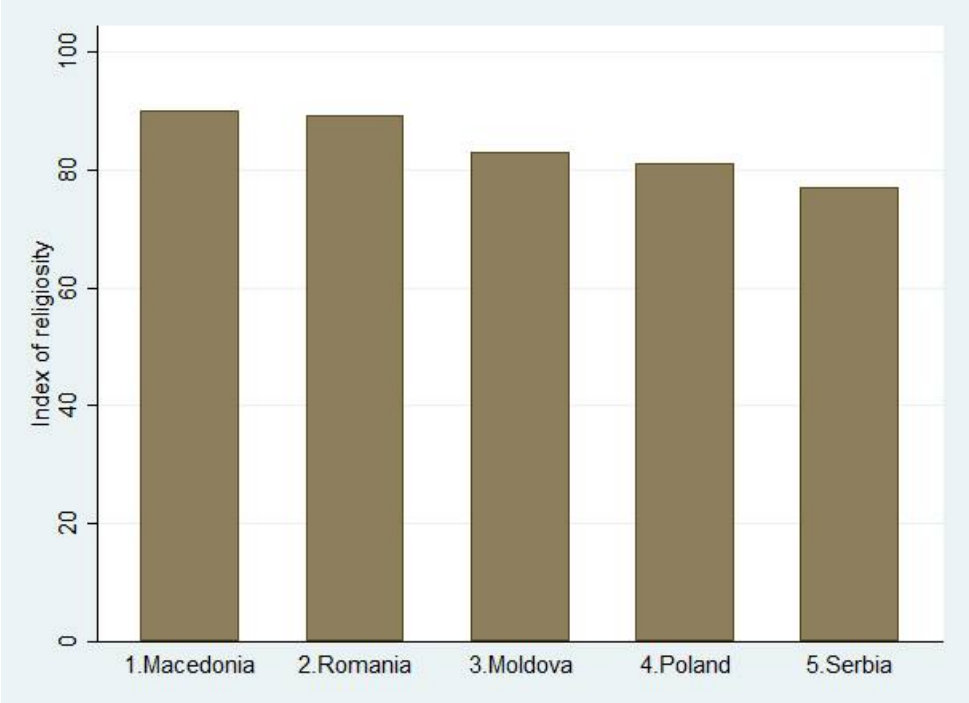
Figure 1. Polish-born resident in UK from 2001 to 2013 (thousands)



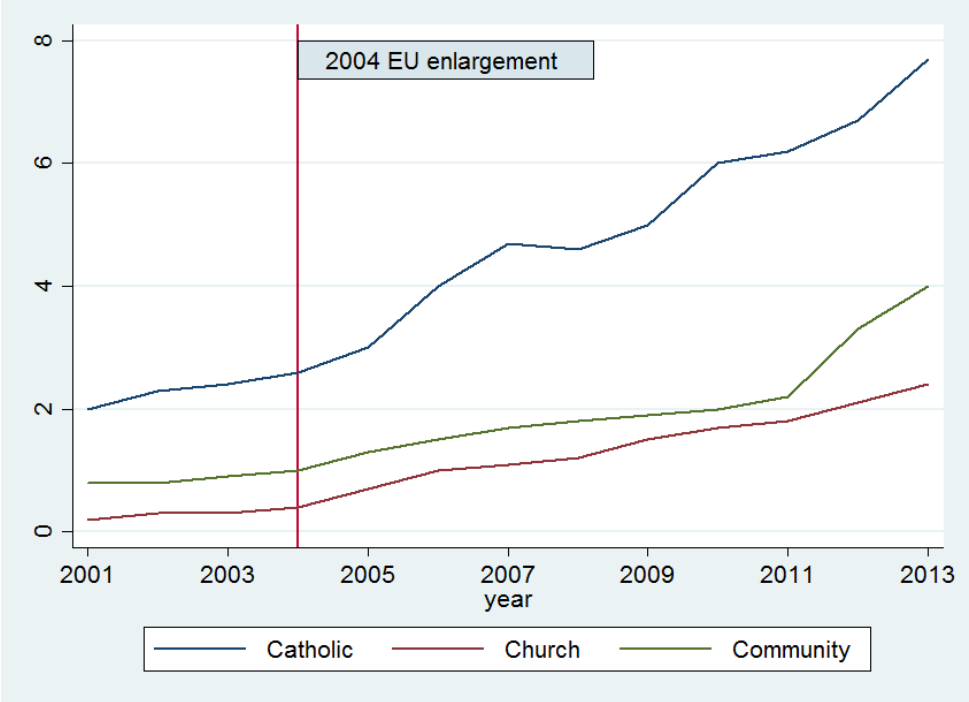
Note. Source: Office for National Statistics

Figure 2. Top-5 most religious countries in Europe



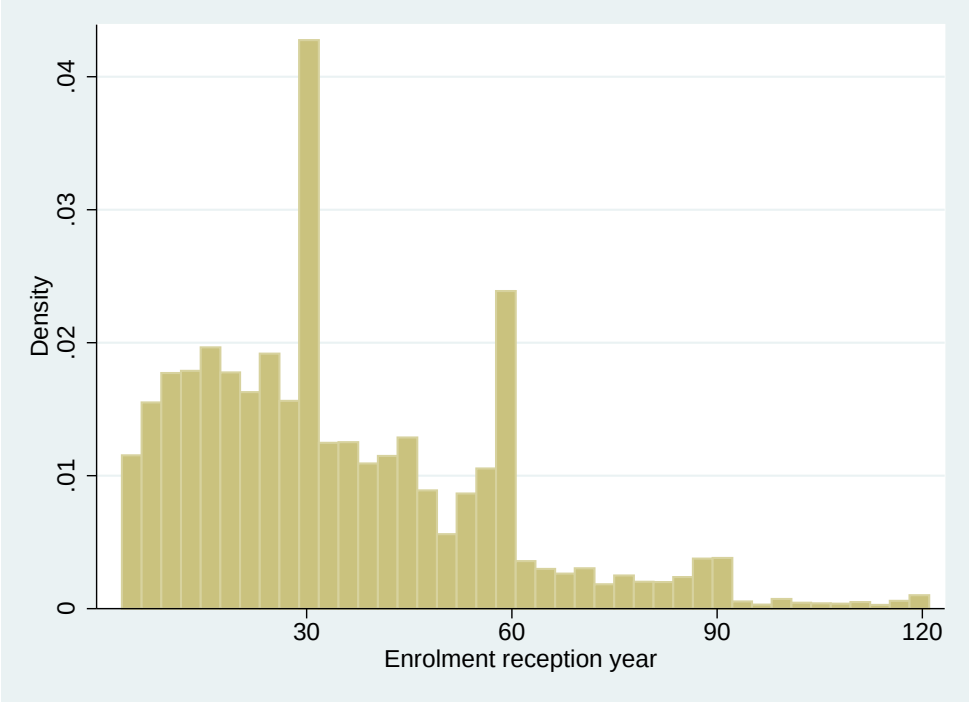
Note. The index has been published by WIN-Gallup International and refers to 2012. It is based on survey data. Respondents are asked whether they consider themselves religious, not religious, or atheist. The index represents the percentage of people who declared to be a religious person.

Figure 3. Non-natives white-origin pupils in primary schools



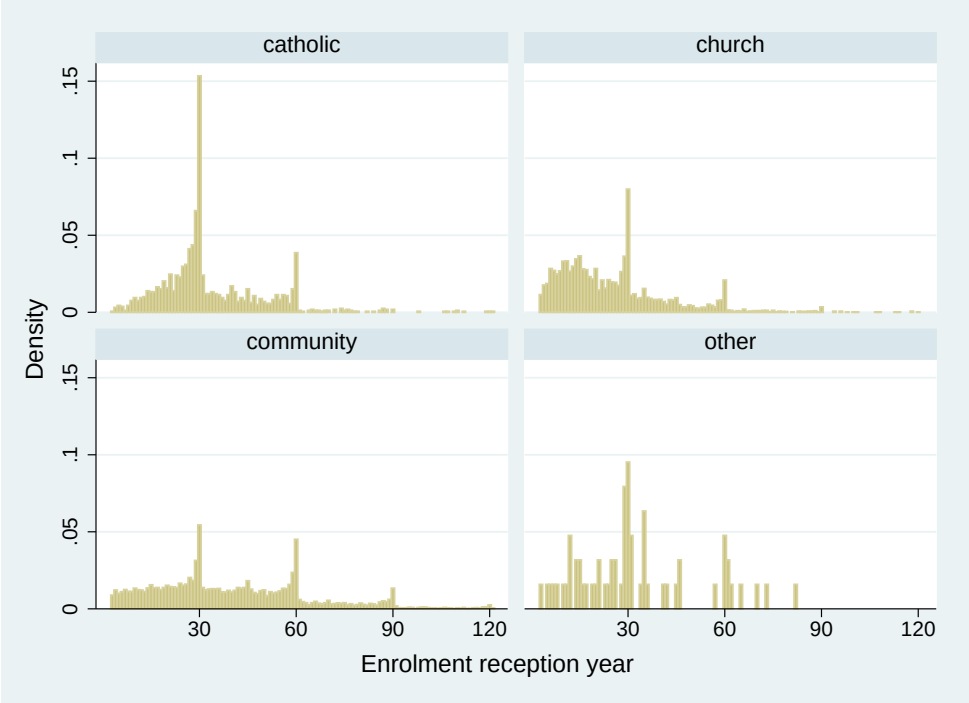
Note. The figure shows share of white-origin pupils whose first language is other than English enrolled in primary school by year and type of school.

Figure 4. Number of pupils enrolled in Reception year



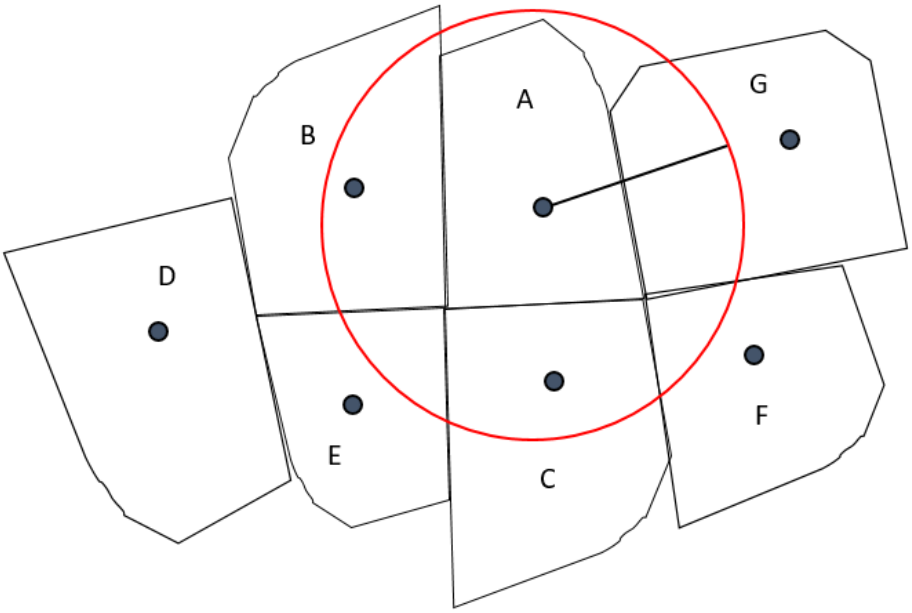
Note. The figure shows aggregated data at school level. Enrollment is measured as the total number of pupils attending Reception year.

Figure 5. Number of pupils enrolled in Reception year by type of school



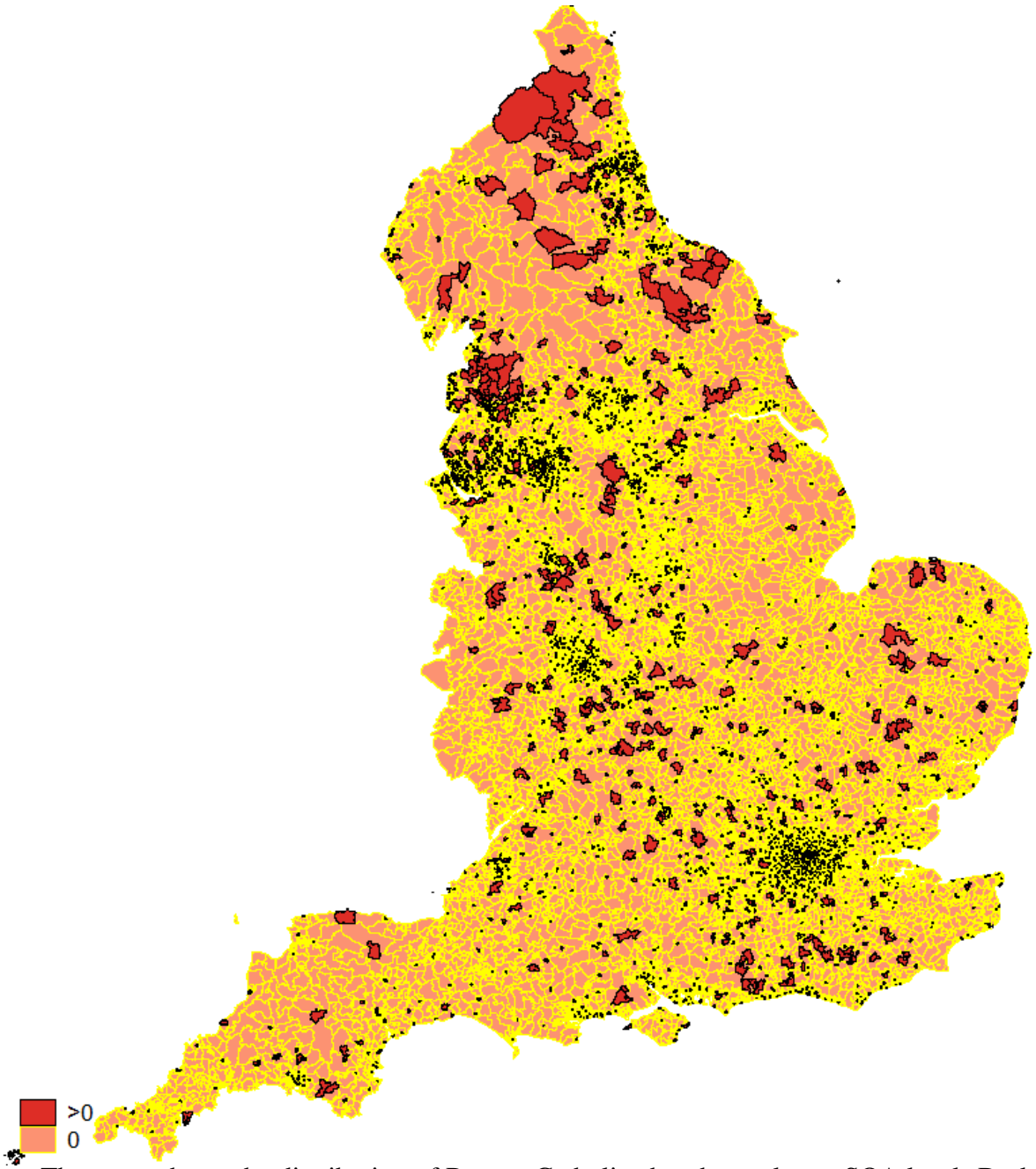
Note. The figure shows aggregated data at school level. Enrollment is measured as the total number of pupils attending Reception year. Figures are disaggregated by type of schools.

Figure 6. Schematic representation of competition areas



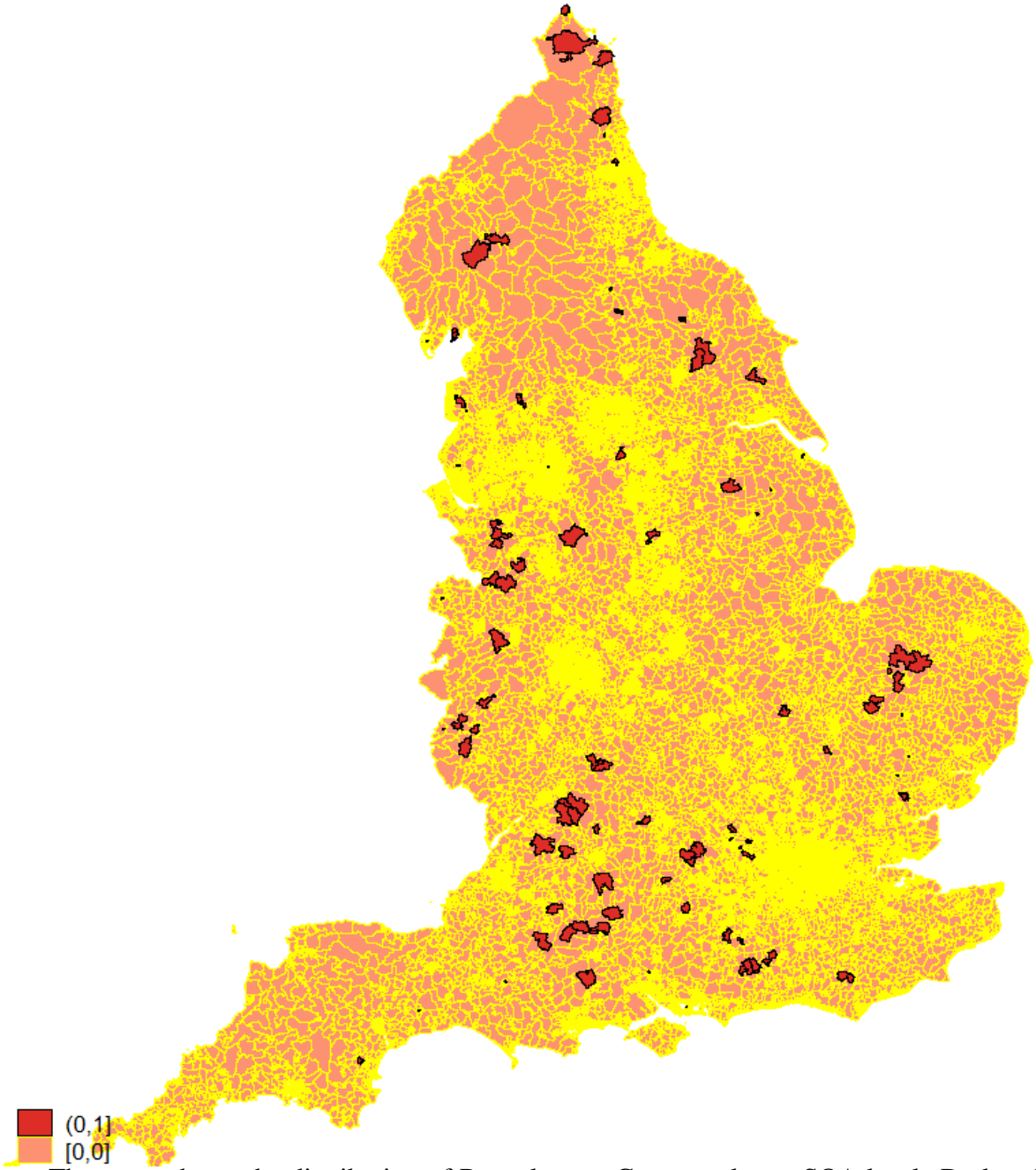
Note. Letters A, B, and C indicates the lower SOA in which pupils live. For each of them we trace a 3 kilometers radius in which pupils compete for schools. If the centroid is within the radius, we consider the whole lower SOA as part of the competition area. With respect to the above figure, lower SOAs A, B, and C would belong to the same competition area.

Figure 7. Distribution of Roman Catholic churches in England by lower SOA



Note. The maps shows the distribution of Roman Catholic churches at lower SOA level. Dark red areas indicates the presence of at least one church.

Figure 8. Distribution of military camps in England by lower SOA



Note. The maps shows the distribution of Resettlement Camps at lower SOA level. Dark red areas indicates the presence of at least one camp.

Table 1. UK residents by country of birth in 2001 and 2011

Country of birth	2001	Country of birth	2011
Ireland	473,000	India	694,000
India	456,000	**POLAND**	579,000
Pakistan	308,000	Pakistan	482,000
Germany	244,000	Ireland	407,000
Bangladesh	153,000	Germany	274,000
Jamaica	146,000	Bangladesh	212,000
USA	144,000	Nigeria	191,000
South Africa	132,000	South Africa	191,000
Kenya	127,000	USA	177,000
Italy	102,000	Jamaica	160,000

Note. Source: Census data

Table 2. Distance in miles from current and nearest school.

	2001	2011
Panel A. Entire sample		
Distance from current school	0.76	0.84
Distance from nearest school	0.32	0.33
Panel B. Schools with admission criteria based on faith		
Distance from current school	1.71	1.76
Distance from nearest school	0.33	0.33

Note. The sample includes pupils enrolled in Reception year in 2001 and 2011 respectively

Table 3. Schools characteristics

	Type of school			
	Roman Catholic	Community	Church of England	Other religious
% English Level 5	34.5	25.5	34.2	40.2
	(16.2)	(16.9)	(17.7)	(17.6)
% math Level 5	31.8	24.8	31.2	35.5
	(15.3)	(16.0)	(16.7)	(19.0)
% both tests Level 5	22.1	16.0	21.6	24.4
	(13.4)	(12.9)	(14.4)	(15.4)
% English Level 4+	81.8	69.	80.6	84.6
	(12.2)	(23.0)	(14.3)	(13.1)
% math Level 4+	80.4	68.5	78.5	84.7
	(14.5)	(23.1)	(15.2)	(12.2)
% both tests Level 4+	74.4	61.2	72.6	78.5
	(15.0)	(23.0)	(16.7)	(14.4)
% FSM eligible	15.8	16.6	9.8	8.3
	(14.5)	(16.6)	(11.5)	(10.6)
% non-natives	5.8	9.5	4.6	7.0
	(13.1)	(19.7)	(13.9)	(17.2)
% non-natives black-origin	0.7	0.7	0.3	0.06
	(3.1)	(3.0)	(1.7)	(0.5)
Observations	1,585	9,293	4,058	66

Note. The sample contains 15,003 primary schools and refers to the baseline year 2001. Other religious category contains schools with a religious affiliation, such as Greeks, Muslim, Jewish. Standard deviation in parenthesis.

Table 4. Community schools characteristics

	Below median	Above median
Panel A. Math Level 5		
% FSM eligible	28.4	12.6
	(17.7)	(13.0)
% non-natives	13.0	7.1
	(23.3)	(16.6)
% non-natives black-origin	1.0	0.4
	(3.9)	(1.7)

	Below median	Above median
Panel B. English Level 5		
% FSM eligible	29.6	11.4
	(17.4)	(11.6)
% non-natives	14.2	5.9
	(24.5)	(14.2)
% non-natives black-origin	1.0	0.3
	(3.9)	(1.6)

Note. The sample contains 9,293 primary community schools and refers to the baseline year 2001. Standard deviation in parethesis

Table 5. First stage regressions

	Dep. variable: Δ(Non-natives$_{it}$ / Total pupils$_{i2001}$)		
Independent variable	(1)	(2)	(3)
Panel A. IV:Distance from camps			
Inflow of Poles	5.036***	3.577***	3.612***
	(0.450)	(0.563)	(0.533)
F-stat	125.43	40.4	45.97
Panel B. IV:Presence of churches			
Inflow of Poles	4.556***	2.001***	1.960***
	(0.516)	(0.461)	(0.459)
F-stat	78.01	18.8	18.25
Lsoa FE	Yes	Yes	Yes
Year FE	No	Yes	Yes
Controls	No	No	Yes
Observations	311,001	311,001	311,001

Table 6. Impact of non-natives on religious denomination

	Dependent variable:			
	ΔCatholic	ΔChurch of England	ΔCommunity	ΔOther faith
	(1)	(2)	(3)	(4)
Panel A. OLS				
ΔNon-natives	-0.077***	-0.014	0.081***	0.010
	(0.018)	(0.013)	(0.021)	(0.006)
Panel B. IV camps				
ΔNon-natives	-0.308***	-0.136***	0.438***	0.005
	(0.061)	(0.041)	(0.082)	(0.014)
Panel C. IV churches				
ΔNon-natives	-0.260***	-0.119	0.385***	-0.006
	(0.089)	(0.075)	(0.124)	(0.020)
Lsoa FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	311,001	311,001	311,001	311,001

Table 7. Impact of non-natives on school quality and distance from school

	Dependent variable:				
	ΔLev5 Eng	ΔLev4+ Eng	ΔLev5 math	ΔLev4+ math	ΔDistance
	(1)	(2)	(3)	(4)	(4)
Panel A. OLS					
ΔNon-natives	-0.014***	-0.012**	-0.014***	-0.012**	-0.001
	(0.005)	(0.005)	(0.005)	(0.006)	(0.001)
Panel B. IV camps					
ΔNon-natives	-0.052***	-0.041***	-0.043***	-0.037***	-0.001
	(0.017)	(0.013)	(0.015)	(0.014)	(0.001)
Panel C. IV churches					
ΔNon-natives	-0.016	-0.031*	-0.010	-0.029	-0.000
	(0.022)	(0.018)	(0.021)	(0.021)	(0.003)
Lsoa FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	311,001	311,001	311,001	311,001	311,001

Table 8. Impact of non-natives on peer groups

	Dependent variable:				
	ΔFSM	ΔWhite origin	ΔNon-natives	ΔBlack origin	ΔAsian origin
	(1)	(2)	(3)	(4)	(4)
Panel A. OLS					
ΔNon-natives	0.016***	-0.003	0.006	-0.002	0.008
	(0.005)	(0.002)	(0.009)	(0.002)	(0.008)
Panel B. IV camps					
ΔNon-natives	0.042***	0.003	0.098***	0.004	0.086***
	(0.015)	(0.005)	(0.029)	(0.004)	(0.026)
Panel C. IV churches					
ΔNon-natives	-0.007	0.008	0.159**	0.008	0.143**
	(0.024)	(0.007)	(0.065)	(0.007)	(0.059)
Lsoa FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	311,001	311,001	311,001	311,001	311,001

Table 9. Characteristics of compliers

	Whole sample	Above 50th percentile		Above 75th percentile	
	(1)	(2)	(3)	(4)	(5)
		Camps	*Churches*	*Camps*	*Churches*
Population	52,313	83,277	84,735	107,811	101,068
% non-natives pupils Reception year	15	24	24	32	29
% urban areas	89	99	99	99	99
% FSM eligible	17	22	23	25	26
Number of churches	3	4	5	6	7
Number of Catholic schools	2	3	4	4	5
Number of Church of England schools	2	3	3	3	4
Number of community schools	9	14	14	18	17
% English Level 5	41	38	37	36	36
% English Level 4+	83	81	81	80	80
% math Level 5	30	28	28	28	27
% math Level 4+	77	75	75	73	74
% Polish-born 2001	0.11	0.16	0.17	0.2	0.2
% Polish-born 2011	1	1.5	1.4	1.7	1.4

Note. Out of the 155,415 lower SOAs in the top 50 percent of the distribution of the IV prediction, almost 90 percent are present in the distribution of both the instruments. If we look at the top 25 percent, 75 percent of the areas are in both distributions

Table 10. Direct impact of migration on school quality

	Dependent variable:			
	ΔLev5 Eng	ΔLev4+ Eng	ΔLev5 math	ΔLev4+ math
	(1)	(2)	(3)	(4)
Panel A. OLS				
ΔNon-natives	-0.004	0.004	0.032**	0.042***
	(0.013)	(0.010)	(0.013)	(0.012)
Panel B. IV camps				
ΔNon-natives	0.095	0.120**	0.226***	0.305***
	(0.059)	(0.050)	(0.064)	(0.077)
Panel C. IV churches				
ΔNon-natives	0.184**	0.150**	0.343***	0.383***
	(0.083)	(0.070)	(0.101)	(0.108)
Lsoa FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	315,187	315,187	315,187	315,187

Table 11. Heterogeneous effects by FSM status and ethnicity on religious denomination

	FSM eligible		Ethnic majoritiy		Ethnic minoroities	
	OLS	IV camps	OLS	IV camps	OLS	IV camps
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
ΔCatholic	-0.044**	-0.188***	-0.043**	-0.220***	-0.106***	-0.333***
	(0.019)	(0.066)	(0.017)	(0.060)	(0.029)	(0.099)
ΔChurch of England	0.002	-0.113	-0.020*	-0.142***	-0.005	-0.151*
	(0.016)	(0.070)	(0.012)	(0.042)	(0.022)	(0.088)
ΔCommunity	0.037	0.304***	0.052**	0.351***	0.096***	0.454***
	(0.022)	(0.107)	(0.021)	(0.076)	(0.033)	(0.123)
Δother faith	0.006	-0.003	0.011**	0.011	0.016	0.030
	(0.005)	(0.012)	(0.005)	(0.011)	(0.010)	(0.038)
F-stat First stage	*	24.6	*	46.5	*	17.2
Lsoa FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	138,851	138,851	293,260	293,260	135,423	135,423

Table 12. Heterogeneous effects by FSM status and ethnicity on quality and peer groups

	FSM eligible		Ethnic majoritiy		Ethnic minoroities	
	OLS	IV camps	OLS	IV camps	OLS	IV camps
Outcomes	(1)	(2)	(3)	(4)	(5)	(6)
ΔFSM	-0.005	0.037	0.009*	0.003	0.013*	0.056**
	(0.008)	(0.029)	(0.005)	(0.018)	(0.008)	(0.025)
ΔWhite	-0.003*	0.012	-0.001	0.003	-0.001	0.001
	(0.002)	(0.007)	(0.002)	(0.008)	(0.002)	(0.009)
ΔNon-native	-0.023*	0.038	-0.005	0.000	-0.016	0.098**
	(0.012)	(0.034)	(0.007)	(0.020)	(0.014)	(0.039)
ΔBlack	-0.006**	-0.004	-0.001	-0.001	-0.003	-0.001
	(0.003)	(0.012)	(0.001)	(0.005)	(0.004)	(0.012)
ΔAsian	-0.013	0.023	-0.002	0.000	-0.010	0.092**
	(0.011)	(0.026)	(0.005)	(0.015)	(0.013)	(0.037)
ΔLev5 Eng	0.010	-0.039	-0.015***	-0.025	-0.004	-0.060
	(0.007)	(0.028)	(0.004)	(0.019)	(0.008)	(0.037)
ΔLev4+ Eng	0.001	-0.026	-0.011**	-0.015	-0.006	-0.037
	(0.006)	(0.025)	(0.005)	(0.015)	(0.008)	(0.031)
ΔLev5 math	0.005	-0.046**	-0.010**	-0.024	-0.014*	-0.062*
	(0.006)	(0.022)	(0.004)	(0.015)	(0.007)	(0.034)
ΔLev4+ math	0.007	-0.010	-0.009	-0.009	-0.013	-0.018
	(0.007)	(0.025)	(0.006)	(0.017)	(0.010)	(0.034)
Δdistance	0.000	-0.001	-0.001	0.001	-0.000	0.000
	(0.001)	(0.002)	(0.001)	(0.005)	(0.001)	(0.003)
F-stat Firsts stage		24.6		46.5		17.2
Lsoa FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	138,851	138,851	293,260	293,260	135,423	135,423

Table 13. Heterogeneous effects by urban areas and Greater London on religious denomination

	Dependent variable							
	ΔCatholic		ΔCoE		ΔCommunity		ΔOther faith	
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(5)	(6)
Panel A. OLS								
ΔNon-natives	-0.070***	-0.070***	-0.011	-0.019	0.071***	0.074***	0.011	0.015**
	(0.019)	(0.019)	(0.014)	(0.017)	(0.022)	(0.024)	(0.007)	(0.007)
Panel B. IV camps								
ΔNon-natives	-0.299***	-0.486***	-0.146***	-0.252***	0.441***	0.756***	0.004	-0.019
	(0.076)	(0.120)	(0.049)	(0.083)	(0.100)	(0.171)	(0.018)	(0.020)
Panel C. IV churches								
ΔNon-natives	-0.223*	-0.282*	-0.129	-0.123	0.368**	0.440**	-0.016	-0.035
	(0.132)	(0.154)	(0.110)	(0.120)	(0.180)	(0.207)	(0.033)	(0.044)
Lsoa FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Include London	Yes	No	Yes	No	Yes	No	Yes	No
Observations	278,780	229,153	278,780	229,153	278,780	229,153	278,780	229,153

Table 14. Heterogeneous effects by urban areas and Greater London on quality and peer groups

	OLS		IV - camps		IV - churches	
Outcomes	(1)	(2)	(3)	(4)	(5)	(6)
ΔFSM	0.017***	0.012**	0.058***	0.015	-0.014	-0.074*
	(0.005)	(0.005)	(0.019)	(0.026)	(0.036)	(0.040)
ΔWhite	-0.002	-0.000	0.005	-0.006	0.015	0.002
	(0.002)	(0.002)	(0.007)	(0.005)	(0.011)	(0.008)
ΔNon-native	0.004	-0.003	0.110***	0.133**	0.212**	0.158*
	(0.010)	(0.007)	(0.034)	(0.064)	(0.103)	(0.084)
ΔBlack	-0.002	-0.004	0.003	0.000	0.008	-0.002
	(0.003)	(0.004)	(0.005)	(0.004)	(0.012)	(0.009)
ΔAsian	0.006	-0.003	0.096***	0.140**	0.191**	0.171**
	(0.009)	(0.006)	(0.030)	(0.062)	(0.093)	(0.083)
ΔLev5 Eng	-0.016***	-0.010**	-0.073***	-0.069**	-0.023	0.012
	(0.005)	(0.005)	(0.022)	(0.033)	(0.033)	(0.035)
ΔLev4+ Eng	-0.013**	-0.008*	-0.054***	-0.062**	-0.044	-0.025
	(0.006)	(0.005)	(0.017)	(0.027)	(0.029)	(0.028)
ΔLev5 math	-0.015***	-0.011**	-0.059***	-0.045	-0.016	0.016
	(0.005)	(0.005)	(0.019)	(0.027)	(0.032)	(0.035)
ΔLev4+ math	-0.013**	-0.007	-0.046***	-0.067**	-0.035	-0.046
	(0.006)	(0.006)	(0.017)	(0.028)	(0.033)	(0.037)
Δdistance	-0.001	-0.002*	-0.000	-0.002	0.001	-0.001
	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)	(0.005)
Lsoa FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Include London	Yes	No	Yes	No	Yes	No
Observations	278,780	229,153	278,780	229,153	278,780	229,153

Appendix