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Abstract

We study the effects of the 1990-2000 inflow of Yugoslav refugees to Switzerland on incumbent pupils. Using administrative records from Geneva, we examine two integration mechanisms: language-support classes before entering regular classes and ability-based sorting into academic tracks. We find asymmetric effects between immigrant and native incumbents. First, a higher refugee concentration in language classes reduces grade repetition among low-achieving immigrants but increases it among natives. Second, a higher within-track refugee concentration improves immigrants' upward track transitions but raises natives' risk of downward transitions. Cross-track spillovers also arise: high-track refugees increase natives' upward transitions whereas low-track refugees lower downward transitions.

Keywords: Education; Refugees; Peer effects; School segregation; School choice

JEL Codes: H75, F22, I21, J15

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1 Introduction

By 2023, the number of forcibly displaced individuals exceeded 117 million (United Nations High Commissioner for Refugees (UNHCR), 2023). Refugee resettlement has raised concerns in host countries, particularly over perceived adverse effects of sudden, large-scale inflows on local communities. Because children account for a substantial share of resettled refugees, a central question is their impact on the academic performance of incumbent pupils. In response, many host countries have introduced programs to mitigate potential negative effects, notably language support programs. A prominent form of such support, widely adopted in countries like Australia, Canada, the Netherlands, and Switzerland (Schleicher, 2006), is "immersion with a preparatory phase", where refugee pupils receive targeted language training before entering regular classes. While this approach may mitigate the adverse refugee peer effects compared to direct immersion with parallel language support (e.g., Diette and Oyelere, 2014; Özek, 2023), it remains unclear whether the presence of refugees in preparatory classes, prior to regular classroom integration, entails costs for incumbent pupils. This paper examines how changes in the within-school, grade-level ratio of refugees in preparatory classes affect the educational outcomes of incumbent pupils.

A related literature also suggests that adverse effects of refugees on incumbents are larger when refugee cohorts include more pupils with special education needs and lower academic abilities (Imberman et al., 2012; Özek, 2023). In such case, grouping refugees with incumbent pupils of similar academic ability may help teachers adjust their teaching to a more appropriate level for the pupils, thereby mitigating potential negative effects. We examine whether such ability sorting, particularly the matching of lower-ability incumbent pupils with lower-ability refugees and higher-ability refugees with higher-ability incumbents, alleviates negative spillovers.

We investigate these issues in the context of Switzerland for two reasons. First, to facilitate integration into the Swiss education system, schools provide preparatory classes for newly arrived pupils requiring language support. In French-speaking Switzerland, these are known as "welcome classes" (classes d'accueil). In primary school, newly arrived pupils directly enter regular classes and attend welcome classes on a part-time basis. In lower secondary school, they first attend welcome classes and join incumbent pupils in regular

classes only after completing this preparatory stage ("immersion with a preparatory phase"). Welcome classes focus on language courses and, when needed, include additional academic support in core subjects. Second, Switzerland has an early implementation of ability-sorting, where pupils are grouped into different academic tracks in lower secondary schools (grades 7-9). Specifically, pupils who perform better in the last grade of primary school (6th grade) enter classes with advanced learning objectives (advanced track), while others attend classes with basic requirements (basic track).[1]

Our identification exploits the large and sudden inflow of Yugoslav refugees in the 1990s following the outbreak of armed conflicts.[2] We use administrative, pupil-level records covering the universe of pupils in compulsory schooling (primary and lower secondary) in the canton of Geneva. Between 1990 and 2000, more than 3,000 pupils from the former Yugoslavia were assigned to Geneva schools (around 3% of incumbent pupils). We study three outcomes: (i) grade repetition in primary and lower secondary school; (ii) academic performance at the end of primary education, measured by initial placement in the advanced track in grade 7; and (iii) track switches between the advanced and basic tracks during grades 7-9.[3]

To address potential selection of refugees into particular neighborhoods or schools, our empirical strategy exploits within-school variation in the grade-level ratio of refugee pupils and estimates effects separately for native and immigrant pupils. In lower secondary school, we further disaggregate the analysis by incumbent pupils' track (advanced vs. basic) and distinguish between refugees assigned to welcome classes and those in regular classes (either

[1] A very small number of pupils may attend a class without distinction of level (mixed track), for example if they follow extracurricular activities such as sports or art, but those play a minor role in terms of size. We come back to this below.

[2] The Log revolution started in August 1990 in Croatia, spread to Slovenia in 1991 and to Bosnia and Herzegovina in 1992. Estimates suggest the various episodes of civil unrest in former Yugoslavia triggered the displacement of more than 3.7 million people between 1991 and 2000, both internally and to other countries (Radović, 2005). Of the almost 260,000 Yugoslav refugees who came to Western Europe, 76% settled in Austria and 17% in Switzerland (Borjas and Monras, 2017). This significant influx had socio-economic and cultural implications for the receiving countries, shaping their policies and societies in the aftermath of the conflicts (see, e.g., Angrist and Kugler, 2003; Couttenier et al., 2019).

[3] As we explain in more details below, conditional on grades, pupils may either move up to the advanced track if they perform well, or join the basic track if they experience difficulties (and may thereby avoid repeating a grade in the advanced track). Note that while it is sufficient to focus our research on lower secondary schools to address the objectives of our paper, we also include primary school pupils to assess any potential pre-existing effects of refugees prior to their entry into the secondary education system.

advanced or basic track). We estimate models with school-by-year and grade fixed effects, comparing outcomes across grades within the same school and year. The only exception is advanced-track attendance in grade 7, for which we use school and year fixed effects, comparing outcomes across cohorts within schools.

The main identification concern is that refugee assignment across grades within schools may not be fully random. We assume that temporal variation in refugee concentration is driven solely by the overall inflow of Yugoslav refugees to Geneva and its associated age composition, both plausibly exogenous to school-grade characteristics. As a robustness check, we instrument the grade-level refugee ratio with the ratio of grade-specific age-eligible refugees based on birth dates, leveraging the fact that grade allocation in Switzerland is strictly age-based.

Our results for primary school show that a higher grade-level ratio of Yugoslav refugees slightly reduces the probability of grade repetition among immigrant incumbents, with no significant effect for natives. The reduction is driven by recently arrived refugees in welcome classes but does not affect sorting into the advanced track at the end of grade 6. In lower secondary, the ratio of refugees in welcome classes has asymmetric effects. For natives, a one-percentage-point increase in the refugee ratio raises grade repetition by 0.25 percentage points in the advanced track and by 0.28 in the basic track, whereas among immigrant incumbents in the basic track it reduces repetition by 0.26 percentage points. These results suggest that welcome classes generate positive spillovers for lower-achieving immigrant pupils but increase pressure on borderline natives.

Ability-based sorting shows further evidence of divergence between native and immigrant pupils. Among natives in the advanced track, a one-percentage-point increase in the ratio of advanced-track refugees raises the probability of downgrading to the basic track by 0.58 percentage points. Among natives in the basic track, a one-percentage point increase in the ratio of basic-track refugees lowers the probability of promotion to the advanced track by 2.46 percentage points. By contrast, among immigrant pupils, the effects are reversed: in the advanced track, a higher ratio of advanced-track refugees reduces the probability of downgrading by 0.9 percentage points, while in the basic track, a higher ratio of basic-track refugees increases the probability of promotion to the advanced track by 1.39 percentage

points. Overall, within ability-based tracks, refugee exposure is associated with downward pressure for natives and improved mobility for immigrants.

Finally, cross-track spillovers are also present. A higher ratio of refugees in the basic track lowers the probability that advanced-track incumbents are downgraded, for both natives and immigrants. However, among immigrant pupils in the advanced track, this reduced downgrading is accompanied by a higher risk of grade repetition. For natives in the basic track, a higher ratio of refugees in the advanced track increases promotion to the advanced track by 2.75 percentage points. These cross-track effects indicate that refugee presence shapes classroom dynamics not only within but also across academic tracks.

1.1 Relation to the literature

We contribute to the literature examining how exposure to foreign-born pupils, and particularly to the distinct group of refugees, affects the educational outcomes of incumbent pupils.[4] First, to the best of our knowledge, we provide the first evidence on how the within-school concentration of refugees in preparatory language support classes, prior to entry into regular classrooms, affect incumbents' education outcomes. Prior research has focused on refugees already attending classrooms with incumbent pupils. This margin is policy-relevant because many countries adopt a refugee immersion program with a preparatory phase in their education system.

Second, we study the consequences of ability sorting at the school-grade level whereby refugees are grouped with incumbents of similar academic ability. This margin is new and policy-relevant in systems with early tracking (e.g., Germany and Austria; Ruhose and Schw-

[4] Most studies in this literature focus on immigrant pupils without distinguishing between economic migrants and refugees. Findings are mixed: while several studies document negative spillovers on incumbents' educational outcomes (e.g., Gould et al. (2009); Jensen and Rasmussen (2011); Brunello and Rocco (2013); Hardoy and Schøne (2013); Ohinata and Van Ours (2013); Schneeweis (2015); Tonello (2016); Ballatore et al. (2018); Frattini and Meschi (2019); Bossavie (2020)), others report zero or even positive effects (e.g., Hunt (2017); Figlio et al. (2024); Conger (2015); Hardoy et al. (2018)). In the Swiss context, Chuard et al. (2025) examined how ethnic clustering in schools, measured through exposure to foreign language-speaking peers, affects educational outcomes of ethnic minority pupils. However, this substantial evidence on immigrant peer effects may not extend to refugees, whose characteristics and integration trajectories differ fundamentally from those of economic migrants. Refugees experience forced and often traumatic displacement, face heightened emotional and psychological challenges as a result of these experiences, and arrive under distinct legal and institutional frameworks (Fazel et al., 2012). These factors can influence both their own academic performance and their interactions with incumbent pupils, implying that peer effects identified in standard immigration contexts may not generalize to refugee inflows.

erdt, 2016). Our setting also captures scenarios where schools strategically group refugees within classrooms alongside incumbent pupils of similar academic ability, even in the absence of formal tracking policies. Relatedly, Özek (2023) examines the effects of environmental refugees on high- and low-performing incumbent pupils in Florida public schools, a context without formal tracking but where high- and low-performing pupils may be sorted into advanced and basic course levels in some subjects. Unlike that study, which relies on the overall grade-level share of refugees, we distinguish refugee exposure by ability track, allowing us to identify both within- and across-track spillovers.

Third, we provide the first evidence from Switzerland on the educational impacts of refugee pupils displaced by war and political unrest. Our study complements recent work by Morales (2022) and Green and Iversen (2022) who use administrative data from American and Norwegian schools and show, respectively, positive and negative effects on math and no effects on English/Norwegian. Unlike these studies, which pool refugees from multiple origins over extended periods, we focus a contemporaneous cohort from a single origin (former Yugoslavia), thereby reducing compositional and timing heterogeneity. This distinction matters because educational performance typically improves with time spent in the host country (Ohinata and Van Ours, 2012).

Also related to our work, Figlio and Özek (2019) and Özek (2023) examine environmental refugees in Florida public schools, reporting null and adverse effects on incumbents' academic achievement, respectively. Our research, in contrast, focuses on political refugees. This distinction is important, as prior work shows that exposure to violence in home countries can shape subsequent behavior and adjustment in host settings (e.g., Couttenier et al., 2019). Considering war refugees from Syria, Assaad et al. (2023) and Almuhaisen (2024) report, respectively, null and negative effects on education outcomes of natives in Jordan, whereas Tumen (2018, 2021) report positive effects for Turkish pupils. Unlike these studies, which rely on aggregate regional measures of refugee presence, we use administrative data that identify refugee pupils at the school-grade level. This fine-grained identification enables us to analyze how the resettlement of refugee children, who constitute a large share of asylum applicants, affects incumbent pupils within schools.

Moreover, while most of these studies on refugee effects focus on test score outcomes,

our research examines, in addition to grade repetition, the consequences on pupils' track placement in lower secondary school. This is important because track assignment represents a high-stakes educational outcome that shapes subsequent educational and labor market opportunities. Hanushek and W ößmann (2006), examining education systems across countries, find that tracking tends to enhance the achievement of high-ability pupils at the expense of low-ability pupils. Evidence from Geneva in Petrucci et al. (2022) similarly shows that pupils in the basic track perform worse by the end of compulsory education and are less likely to pursue the academic track, rather than the vocational track, in upper secondary school compared to peers in advanced tracks. Such educational stratification is likely to translate into divergent labor market outcomes. For instance, Golsteyn and Stenberg (2017) and Korber (2019) show that although vocational-track graduates may initially benefit from specialized skills, general-education (academic-track) graduates experience higher wage growth over time.

The remainder of the paper is organized as follows. Section 2 provides background information on the institutional features of the Geneva education system. Section 3 describes the data. Section 4 outlines the empirical strategy. Section 5 presents the results and robustness checks. Section 6 concludes.

2 Institutional background

In Geneva, compulsory education lasts for eleven years. Starting at the age of four, children have to attend kindergarten for two years, followed by six years of primary school and three years of lower-secondary education (see Figure 1).

In primary school, the teaching program is standardized across all schools in the canton. In grades 1 and 2, no formal marks are assigned: assessment takes the form of written evaluations describing the child's performance. From grade 3 onward, pupils are graded on a 1-6 scale, where 6 is the highest mark, 4 indicates a sufficient pass, and below 4 is insufficient. In addition to academic achievement, teachers regularly assess pupils' progress, learning abilities, and behavior, following the learning objectives laid out in the curriculum. Assessment results collected throughout the year determine whether a pupil advances to the

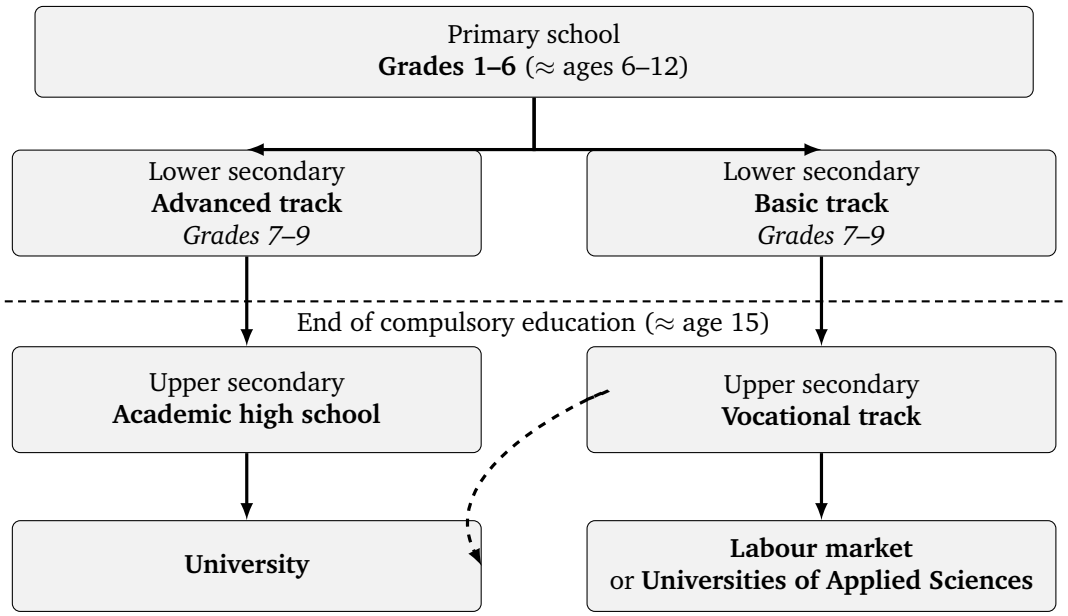


Figure 1: Schematic overview of Geneva education system

next grade.

At the beginning of lower secondary school (around age 12), pupils are placed into different academic tracks based on their performance in the final year of primary school. Those with stronger results in core subjects are assigned to a more demanding academic track (advanced track), while others are placed in less demanding tracks (basic track). Within tracks, the teaching program is uniform across all schools in the canton. Advanced tracks follow extended curricular requirements and enroll a standard class size, whereas basic-track classes are deliberately smaller, enabling more teacher attention per pupil and employing teaching methods tailored to pupils with lower academic achievement. Thus, while advanced tracks offer more rigorous challenges, basic tracks provide a more accessible path, albeit with lower academic expectations. A third option, mixed-track classes, enrolls pupils without distinction of academic level, often those combining school with extracurricular commitments (e.g., sports or arts). Because they represent only a small share of pupils, we exclude them from the analysis. In all tracks, pupils are graded on the same 1-6 scale, with 4 as the passing threshold. Assessments conducted throughout the year determine whether a pupil advances to the next grade.

By the end of lower secondary education (around age 15), pupils face two main options

for non-compulsory upper secondary education: academic and vocational tracks.[5] The academic track typically gives access to university, whereas the vocational track prepares pupils for skilled employment. A smaller share of vocational diploma holders may also pursue additional studies in specialized high school subjects to obtain a certificate granting access to bachelor-level programs at selected tertiary institutions.

2.1 Welcome classes

At the primary school level (grades 2-6), pupils who lack sufficient command of French are enrolled part-time in welcome classes (generally four half-days per week) and part-time in regular classes. This arrangement aims to ensure continuity in social integration while building language skills. The welcome-class teacher collaborates closely with the regular class teacher to monitor progress. Pupils typically spend no more than one year in welcome classes, with full transition to a regular class occurring once their French skills are deemed adequate. Formal grading does not take place in these welcome classes; pupils are instead assessed through written evaluations.

At the lower secondary level, pupils with limited French proficiency are enrolled full-time in welcome classes. These are typically capped at twelve pupils, allowing for individualized teaching. While the central focus is on language, the curriculum also covers basic mathematics, history and geography, physical education, English, and in some cases the pupil's native language, ensuring an average educational standard. Pupils are placed in welcome classes corresponding to their age group (seventh, eighth, or ninth grade). Transition to mainstream classes can occur at any point during the school year, once the pupil is considered able to follow the curriculum successfully. The decision is made at the request of the class teacher and requires agreement between the school administration, the pupil, and the parents. For most ex-Yugoslav refugees in the 1990s, the stay in welcome classes lasted around one year, with only a few remaining for two years.

[5] Pupils from the advanced track in lower secondary are primarily prepared for academic high school, although pupils from the basic track can also access the academic route by adding an additional year to their curriculum. In practice, however, those from the basic track more often pursue vocational training.

3 Data and descriptive statistics

3.1 Data

We use administrative data on the universe of pupils enrolled in public schools of Geneva between 1990 and 2000. Individual-level records include information on pupils' school, grade, class type (regular or welcome class) and academic track, along with a small number of demographic characteristics including date of birth, gender and mother tongue. More importantly for the purpose of this study, we observe the history of nationalities, country of origin and dates of first arrival to Geneva for non-locally born pupils.

We analyze outcomes for pupils in primary school (grades 1-6) and lower secondary school (grades 7-9). We first create an indicator for grade repetition in primary school (grades 1-5) and lower secondary school (grades 7-9). This variable equals 1 when the pupil repeats the same grade, and 0 otherwise. At the end of grade 6, pupils are sorted into the advanced or basic tracks, and grade repetition is almost inexistent. Instead, the academic performance of pupils is evaluated during this year to determine whether they are eligible to attend the advanced track. For pupils in grade 6, we construct an indicator equal to 1 if a pupil is placed in the advanced track during the first grade of lower secondary school (grade 7), and 0 otherwise.

In lower secondary school, some pupils may still switch between the advanced and basic tracks. Pupils initially placed in the advanced track who do not achieve sufficient grades may avoid repeating the year by transferring to the basic track. We identify these pupils using an indicator variable equal to 1 if a pupil in grade 7 or 8 who was initially in the advanced track switches to the basic track in grade 8 or 9, respectively. Pupils who move from the advanced to the mixed track are treated as if they did not switch tracks, since attending the mixed track does not necessarily reflect a decline in academic performance. Conversely, pupils in the basic track with sufficiently good grades may be promoted to the advanced track. We construct an indicator variable equal to 1 if a pupil initially in the basic track in grade 7 or 8 moves to the advanced track in grade 8 or 9, respectively.

For pupils who repeat a grade, we use the track from the first year they attended grade 8 or 9 to determine whether they switched tracks relative to grade 7 or 8, respectively. For

repeaters in grades 7 or 8, we use the track from the last year they attended the grade to assess whether a track switch occurred when moving to grade 8 or 9. We do not define the track-switching variable within the same grade for repeaters who did not change tracks during their repeated years. In such cases, duplicate observations within that grade are excluded, and only the last year of repetition is retained in the analysis sample. However, if a track change occurred during the repeated years, we retain that observation.[6]

While our outcomes do not include standardized test scores, grade repetition and track switching represent high-stakes educational transitions determined by teachers' evaluations and formal institutional criteria. These transitions capture educational progression and stability, offering valuable insights into how refugee exposure influences pupils' trajectories, even if they do not directly measure underlying achievement levels.

We identify refugee pupils as those who arrived in Geneva between August 1990 and December 2000 and either hold Yugoslav nationality or have a country of origin that is part of former Yugoslavia. Pupils who entered Geneva before August 1990 are classified as economic immigrants.[7] The remaining pupils are categorized as either Swiss natives (with Swiss nationality and born in Switzerland) or other immigrants (holding a current or former nationality other than Swiss or former Yugoslavian, or an origin from a foreign country outside of former Yugoslavia).

3.2 Descriptive statistics

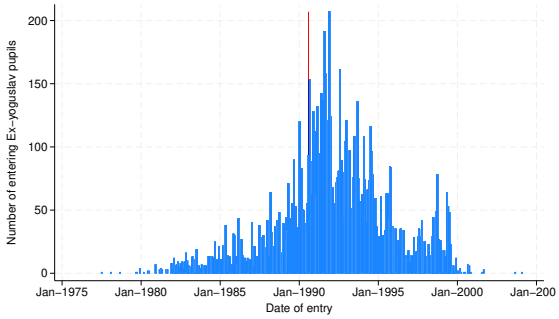
Panel (a) of Figure 2 shows the number of pupils from former Yugoslavia who attended primary schools between 1990 and 2000, by date of entry to Geneva. As expected, most arrivals occurred between 1990 and 1995, and even though their influx decelerated thereafter, it still continued in small numbers until another slight increase during the Kosovo war in 1998 and

[6] This choice reflects the fact that track switching is generally not expected when pupils repeat a grade. However, pupils moving from the basic to the advanced track may voluntarily repeat a grade to catch up with the more demanding curriculum. Also, for this reason, in defining the grade repetition variable in lower secondary school, pupils who repeat a grade but simultaneously move from the basic to the advanced track are not counted as grade repeaters, since they achieve a higher educational outcome.

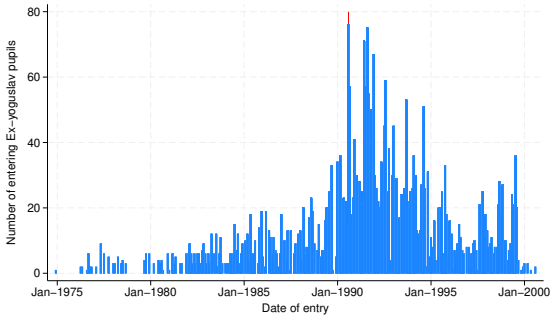
[7] Our classification of refugees therefore includes asylum-seekers, recognized refugees, and pupils who arrived through family reunification. Note that August 1990 marks the beginning of the Log Revolution in Croatia. In the robustness checks, we also consider an alternative cutoff date (June 1991), capturing only those who arrived after witnessing the armed conflicts that started in June 1991.

Figure 2: Distribution of ex-Yugoslav pupils by date of entry to Geneva

(a) Primary school: all grades



(b) Lower secondary school: all grades



Notes: This figure presents the number of ex-Yugoslav pupils who entered Geneva before 2000. Panel (a) reports figures for primary school pupils and panel (b) refers to pupils on lower secondary school. The red vertical line refers to August 1990 and indicates the beginning of migration associated with the conflict in former Yugoslavia.

1999. Panel (b) shows similar patterns considering ex-Yugoslav pupils in lower secondary schools.

Our analytical sample includes all native and non-Yugoslav immigrant pupils enrolled in Geneva's public schools between 1990 and 2000. For primary school, the data comprise 238,316 pupil-grade-year observations across grades 1-6. Of these, 201,128 observations correspond to grades 1–5, including duplicates of pupils who repeated a grade (114,660 for Swiss natives and 86,442 for immigrants). For 6th graders, we only use the 26,961 observations of pupils who attended either the advanced or the basic track in the 7th grade (15,661 Swiss natives and 11,300 immigrants).[8] For lower secondary school, we use data from 14 establishments offering both advanced and basic tracks, resulting in a sample of 65,630 pupil-grade-year observations in the advanced track (41,744 correspond to Swiss natives and 23,886 to immigrants) and 24,884 in the basic track (9,645 correspond to Swiss natives and 15,239 to immigrants).

Table 1 reports descriptive statistics for our sample. Columns (1) to (3) present data

[8] For the grade 6 analysis, we drop 7,450 observations of pupils who attended three special lower secondary schools that use a mixed track system. Additionally, we exclude pupils who, in grade 7, attended welcome classes, private schools, or schools outside the canton of Geneva. We also remove a small number of duplicate observations for pupils who repeated the grade. Finally, lower secondary school outcomes are not observed for 1,162 sixth graders, 80% of whom are immigrant pupils. To assess whether attrition at the transition from primary to lower secondary is systematically related to refugee exposure, we estimate the effect of grade-level ratio of refugees on the probability that a pupil observed in grade 6 is not in grade 7 (considering any type of education). Appendix Table A1 shows no evidence that higher refugee exposure in primary school increases the likelihood of being unobserved in grade 7, suggesting that any selective attrition is unlikely to bias our main results.

Table 1: Summary statistics

	Primary school			Secondary school: advanced track			Secondary school: basic track		
	Natives	Immigrants	Refugees	Natives	Immigrants	Refugees	Natives	Immigrants	Refugees
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression outcomes									
Grade repetition	0.02	0.04	0.09	0.04	0.03	0.03	0.02	0.01	0.01
	(0.13)	(0.19)	(0.28)	(0.19)	(0.18)	(0.16)	(0.12)	(0.12)	(0.10)
Advanced track in grade 7	0.84	0.67	0.52	-	-	-	-	-	-
	(0.37)	(0.47)	(0.50)						
Track switch	-	-	-	0.06	0.11	0.06	0.13	0.09	0.13
				(0.23)	(0.31)	(0.23)	(0.33)	(0.29)	(0.33)
Demographics									
Male	0.51	0.51	0.50	0.49	0.47	0.43	0.57	0.56	0.53
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)	(0.50)	(0.50)
Age	8.63	8.79	8.72	13.26	13.39	13.62	13.82	13.97	14.12
	(1.80)	(1.87)	(1.90)	(0.99)	(1.04)	(1.00)	(1.09)	(1.11)	(1.04)
Swiss nationality	1.00	0.36	0.44	1.00	0.38	0.34	1.00	0.20	0.21
	(0.04)	(0.48)	(0.50)	(0.00)	(0.49)	(0.47)	(0.00)	(0.40)	(0.40)
Mother tongue: French	0.94	0.29	0.02	0.93	0.33	0.01	0.95	0.20	0.00
	(0.24)	(0.45)	(0.15)	(0.26)	(0.47)	(0.11)	(0.22)	(0.40)	(0.05)
Observations	135513	102803	6514	41744	23886	536	9645	15239	733

Notes: This table reports the average of each variables and standard deviations are presented in parenthesis. Observations are pupils enrolled in a Geneva primary public school (grades 1-6 in columns 1-3) and lower secondary public school (grades 7-9 in columns 4-9) between 1990 and 2000. In columns 1-3, grade repetition refers to grades 1-5, advanced track attendance to grade 6, and demographics to grades 1-6. Duplicate observations for those repeating a grade are included. The variable "Advanced track in grade 7" only uses data for grade 6.

for primary schools, (4) to (6) for pupils in the advanced track of lower secondary schools and (7) to (9) for the basic track of lower secondary schools. Within each category, we further distinguish Swiss natives, immigrants (excluding those from former Yugoslavia), and Yugoslav refugees. Between 1990 and 2000, there were 6,514 pupil-grade-year observations of Yugoslav refugees in primary schools, representing 2.6% of all primary school observations. In lower secondary schools, Yugoslav refugees accounted for 2,399 pupil-grade-year observations, corresponding to 2% of all lower secondary observations. Among these, 536 correspond to refugees in the advanced track, 733 to those in the basic track, and 798 to those enrolled in welcome classes, representing around 22% of all pupils who attended welcome classes between 1990 and 2000. Of those in welcome classes, 568 attended for only one academic year, while the remainder either repeated a grade or attended multiple grades across different years.

Educational outcomes in primary school show that native incumbent pupils have a lower probability of repeating a grade than immigrants and ex-Yugoslav refugees. They are also more likely to be admitted into the advanced track after grade 6. In lower secondary school, however, grade repetition rates are similar across natives, immigrants, and refugees. We

further observe that immigrant pupils initially in the advanced track are more likely than both natives and refugees to switch down to the basic track, while those initially in the basic track are less likely to move up to the advanced track, suggesting lower academic performance in both tracks. Finally, we note some relatively small demographic differences across groups, for instance, in gender composition, the share who acquired Swiss nationality, and the proportion whose first language is French.

4 Empirical strategy

Our objective is to estimate the impact of ex-Yugoslav refugees on education outcomes of Swiss and non-Yugoslav immigrant incumbent pupils. Our data enables us to consider the following outcome variables: (i) grade repetition in primary school (grades 1-5), (ii) sorting into advanced track after the 6th grade, (iii) grade repetition in lower secondary school (grades 7-9) for pupils in advanced and basic tracks, and (iv) track switching for pupils in lower secondary school (grades 7-9), from advanced to basic for pupils in the advanced track and from basic to advanced for pupils in the basic track.

Previous literature has shown that newly arrived immigrants are more likely to self-select into areas with larger shares of immigrants, particularly those from the same country of origin (e.g., Figlio and Özek, 2019; Card, 2001). As the Swiss education system requires that pupils attend public schools depending on their geographic location, this could induce nonrandom sorting across schools. A naive comparison of the educational performance of incumbent pupils in schools with high versus low concentration of refugee pupils would therefore likely yield biased results, as effects may be confounded by unobserved differences at the school level.

To account for the potential school selection issue, we follow previous peer effects studies (e.g., Carrell et al., 2018; Figlio and Özek, 2019; Green and Iversen, 2022) and consider within schools variations in the concentration of refugees. We further focus the analysis at the grade-level so as to account for any potential systematic assignment of refugees across classrooms based on unobservable characteristics that are correlated with education performance (for example, teacher quality). Accordingly, our main treatment variable is the ratio

of the number of ex-Yugoslav refugee pupils to the number of all incumbent pupils in school s, grade g and year t, denoted Ref_{gst}.

For all outcomes, we examine refugee effects separately for Swiss native pupils and for all other immigrant pupils. Formally, we estimate the following model for grade repetition and track switching:

$$Y_{igst} = \alpha_0 + \alpha_1 Ref_{gst} + \sigma X_i + \delta_{st} + \zeta_g + \varrho_{st} grade + \eta_{igst} \quad (1)$$

where Y_{igst} is the education outcome of incumbent pupil i, δ_{st} represents school×year fixed effects and ζ_g are grade fixed effects.[9] The variable *grade* (ranging from 1 to 9) is interacted with school-by-year dummies, which allows for school-specific linear trends. These trends mitigate concerns about unobserved factors that change over time within schools, such as teacher quality, pupil demographics, or neighborhood composition, that may correlate with both refugee concentration and educational outcomes. Identification of α_1 therefore comes from deviations in the grade-level refugee ratio from each school's trend, effectively comparing different grades within the same school over time. X_i is a vector of individual characteristics that may affect educational performance, including gender, French as the mother tongue, whether the pupil has Swiss nationality, and the grade-level ratio of ex-Yugoslav pupils considered in this study as economic immigrants. η_{igst} is the error term. Standard errors are clustered at the school×year×grade level, as we assume interdependence across pupils only within a given school, grade, and year. We return to the issue of clustering when discussing robustness checks (Section 5.4).

In lower secondary education, we further disaggregate the analysis by track. We estimate separate effects for pupils in the advanced and basic tracks and distinguish three types of refugee exposure: refugees in welcome classes, those in the advanced track, and those in the basic track. Thus, while the baseline specification captures the overall grade-level ratio of refugees, this extended specification includes separate measures for each class type within the same regression model, allowing us to identify both within-track and cross-track spillovers.

[9] Results are robust to alternative fixed effects structures. Specifically, we retain school×year fixed effects and replace grade fixed effects with (i) school×grade fixed effects, (ii) grade×year fixed effects, and (iii) both school×grade and grade×year fixed effects. In all cases, the results remain substantially unchanged, and in several instances coefficients become more precisely estimated (available upon request).

Conditioning on observed track placement, however, raises two potential concerns. The first is reflection over time (Manski, 1993): the achievement of refugees in a given track may itself have been influenced by prior exposure to high- or low-achieving incumbent pupils in earlier grades, so that current refugee composition partly reflects past peer effects. The second is post-treatment conditioning, whereby past refugee exposure may have influenced incumbents' own track assignment (for instance, by inducing some to switch tracks), thus affecting the composition of the analyzed sample. We address these issues in two ways in Section 5.4. First, we separate recent from continuing refugees, isolating the impact of newcomers whose placement was less likely shaped by prior peer exposure. Second, we re-estimate models restricting the sample to grade 7, where track placement is determined by primary-school performance and precedes lower-secondary peer interactions.

The equation for the probability to attend the advanced track in grade 7, denoted Y_{ist+1}, is as follows:

$$Y_{ist+1} = \beta_0 + \beta_1 \textit{Ref}_{st} + \theta X_i + \gamma_s + \kappa_t + \tau_s t + u_{ist} \tag{2}$$

where $\textit{Ref}_{st}$ is the ratio of ex-Yugoslav refugee pupils in grade 6 of school s and year t. γ_c and κ_t are, respectively, school and year fixed effects, τ_s denotes a time trend for school s and accounts for changes in the education outcomes that might be correlated with other school-level trends. In this context, identification of β_1 comes from the deviation in the grade-level ratio of refugee pupils from its school long-term trend. u_{ist} is an error term and standard errors are clustered at the school$\times$year level, ruling out temporal interdependence.

Another potential threat to identification in equations 1 and 2 is the strategic allocation of refugees across grades. While this is arguably unlikely, given that pupils in Geneva are required to attend school with others of the same age, it is still important to validate this assumption. In practice, temporal variation in refugee exposure across grades should depend only on overall inflows from former Yugoslavia and the corresponding age composition of these inflows–both of which can reasonably be considered exogenous to within-school, across-grade factors that might correlate with incumbent pupils' outcomes.

To further support this claim, we implement two complementary strategies. First, we examine whether observable characteristics of incumbent pupils differ systematically across school-grade cohorts with varying refugee exposure. These balance tests, reported in Section

5.4, help assess whether the variation we exploit can plausibly be considered exogenous. Second, we implement an instrumental variable approach, instrumenting the grade-level refugee ratio with the ratio of refugees who should be enrolled in each grade based on their birth dates.[10] This approach assumes that the naturally occurring age distribution of ex-Yugoslav refugees across grades within schools is orthogonal to incumbent pupils' and school-by-grade characteristics. We then re-estimate equation (1) using two-stage least squares (2SLS):

$$\begin{aligned} Ref_{gst} &= \rho_0 + \rho_1 A_{gst} + \varpi X_i + \delta_{st} + \zeta_g + v_{gst} \\ Y_{igst} &= \lambda_0 + \lambda_1 \hat{Ref}_{gst} + \mu X_i + \delta_{st} + \zeta_g + \epsilon_{igst} \end{aligned} \tag{3}$$

where A_{gst} is the ratio between the number of refugees enrolled in school s and are age appropriate to attend grade g and the number of incumbent pupils within the same school and grade. We run the same procedure for equation (2).

Finally, we consider the possibility that changes in the ratio of ex-Yugoslav refugee pupils drive native or other immigrant pupils to change schools, move municipalities or even leave the canton. Such nonrandom mobility in response to the refugee inflows may bias estimates. For example, if higher socioeconomic households are more likely to opt out of schools with a higher concentration of refugees, then estimates may be biased into finding negative effects. We assess this empirically in Section 5.4, where we show that refugee inflows did not trigger systematic mobility across schools, municipalities, or out of Geneva.

5 Results

This section first reports results for primary school pupils, then turns to lower-secondary outcomes separately for the advanced and basic tracks. We then present robustness checks to assess the consistency and validity of the main findings.

5.1 Primary school

Table 2 reports the estimated effects of refugee inflows on primary school pupils. Panel (a) presents results for grade repetition in grades 1-5, and panel (b) for advanced-track at-

[10] In Geneva, children must have the required age by July 31 of the current year to enter a given grade.

Table 2: Refugee effects in primary school

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Ratio of grade-level refugees	0.007	0.007	-0.047**	-0.050**	-0.018	-0.021
	(0.014)	(0.014)	(0.021)	(0.021)	(0.013)	(0.013)
Observations	114660	114660	86442	86442	201128	201128
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
Panel b. Advanced track at grade 7						
Ratio of grade-level refugees	-0.042	-0.039	0.225	0.235	0.098	0.101
	(0.128)	(0.127)	(0.169)	(0.169)	(0.114)	(0.111)
Observations	15658	15658	11299	11299	26959	26959
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 12 separate OLS regressions. Each entry in panels (a) is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition for grades 1 to 5. Similarly, panel (b) reports the effect of within-school differences in ex-Yugoslav refugee concentration on advanced track attendance after grade 6. The sample includes all pupils enrolled between 1990 and 2000 in primary school. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level in panel (a) and at the school×year in panel (b). *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

tendance in grade 7 among pupils in grade 6. Columns (1)-(2) show results for natives, columns (3)-(4) for immigrant incumbents, and columns (5)-(6) for the full sample (excluding Yugoslavs). All regressions include school-by-year and grade fixed effects in panel (a), and school and grade fixed effects in panel (b). Column (2) adds controls for gender, whether French is the mother tongue, and the grade-level ratio of ex-Yugoslav pupils considered in this study as economic immigrants. Columns (4) and (6) additionally control for Swiss nationality. Specifications including controls correspond to our preferred models.

Panel (a) shows no statistically significant effect of refugee presence on grade repetition among natives. By contrast, immigrant pupils are less likely to repeat: a one-percentage-point increase in the ratio of refugees in the same grade is associated with a 0.05 percentage point decrease in their repetition probability. These potential positive refugee impacts do not, however, seem to be large enough to raise the probability of attending an advanced track class for immigrant 6th graders. This relationship is also statistically non-significant for

native pupils.

We further examine whether the effects differ between recent and continuing refugees. Although this distinction was introduced in Section 4 to address potential reflection concerns in lower secondary school, applying it here also helps assess heterogeneity in exposure duration. Appendix Table A8 shows that the reduction in immigrant grade repetition is driven almost entirely by recent arrivals attending welcome classes and regular classes on a part-time basis. Continuing refugees, who are already fully integrated into regular classes, exhibit weaker and statistically less significant effects. For natives, neither group matters.

5.2 Lower secondary school: Advanced track

Table 3 reports the estimated effects of refugee exposure for pupils in the advanced track of lower secondary school. Panel (a) presents results for grade repetition, and panel (b) for the probability of switching to the basic track. We first estimate the impact of the overall grade-level ratio of refugees (*Treatment 1*), and then distinguish by refugee type: those in welcome classes versus those enrolled directly in advanced or basic tracks (*Treatment 2*). The structure of the table mirrors the previous analysis.

In the aggregate, the grade-level ratio of refugees does not significantly affect the probability of grade repetition among native pupils (panel (a), *Treatment 1*). However, decomposing by type (*Treatment 2*) reveals that a one-percentage-point increase in the ratio of Yugoslav refugees assigned to welcome classes is associated with a 0.25 percentage point increase in the probability of grade repetition among natives in the advanced track. By contrast, the same welcome-class ratio of refugees has no significant effect on the probability of grade repetition among advanced-track immigrant incumbents. The finding that welcome-class exposure raises repetition among natives suggests a mechanism operating through school-wide dynamics rather than direct peer spillovers.

We find no evidence that refugee presence in advanced-track classrooms (capturing within-class peer composition) affects grade repetition (Panel (a), *Treatment 2*). However, there is suggestive evidence (significant at the 10% level) that it shapes track mobility (panel (b), *Treatment 2*). A one-percentage-point increase in the ratio of advanced-track refugees is associated with a 0.58 percentage point increase in the probability of downgrading to the basic

Table 3: Refugee effects in secondary school – track with advanced learning objectives

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.077	0.077	0.200*	0.202*	0.118	0.119
	(0.096)	(0.097)	(0.111)	(0.111)	(0.080)	(0.080)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.243**	0.254**	0.044	0.037	0.166	0.172*
	(0.118)	(0.119)	(0.159)	(0.160)	(0.102)	(0.103)
Ratio of grade-level refugees (advanced track)	-0.208	-0.218	-0.148	-0.130	-0.197	-0.193
	(0.228)	(0.228)	(0.207)	(0.206)	(0.173)	(0.171)
Ratio of grade-level refugees (basic track)	0.146	0.136	0.610***	0.616***	0.340**	0.337**
	(0.181)	(0.185)	(0.182)	(0.183)	(0.143)	(0.146)
Observations	41744	41744	23886	23886	65630	65630
Panel b. From advanced track to basic track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.157	-0.134	-0.700**	-0.685**	-0.381**	-0.360**
	(0.142)	(0.144)	(0.317)	(0.317)	(0.167)	(0.169)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.036	0.022	-0.022	-0.010	0.015	0.015
	(0.235)	(0.234)	(0.371)	(0.380)	(0.215)	(0.216)
Ratio of grade-level refugees (advanced track)	0.562*	0.580*	-0.886*	-0.901**	-0.146	-0.117
	(0.311)	(0.306)	(0.458)	(0.454)	(0.263)	(0.259)
Ratio of grade-level refugees (basic track)	-1.054***	-0.978***	-1.563***	-1.589***	-1.289***	-1.295***
	(0.274)	(0.283)	(0.600)	(0.586)	(0.335)	(0.331)
Observations	24173	24173	13754	13754	37928	37928
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grades 7-9 in the advanced track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

track for natives, but lowers that of immigrant incumbents by 0.9 percentage points.

When we further separate refugee exposure into recent arrivals, defined as those attending a regular class for the first time after completing a welcome class, and continuing refugees, who have attended a regular class for more than one year, we find that these effects are driven mainly by the continuing refugees (significant at the 5% level; Appendix Table A9). This finding suggests that the observed impacts arise from sustained adjustments in classroom dynamics rather than short-term inflows or temporary disruptions.

Turning to the role of refugees in the basic track, we find that a higher ratio of refugees in the basic track reduces the probability that advanced-track pupils are downgraded into

the basic track, for both natives and immigrants (panel (b), *Treatment 2*). Specifically, a one-percentage-point increase in the refugee ratio is associated with a 0.98-point decrease in downgrading for natives and a 1.6-point decrease for immigrants. This reduced downgrading is accompanied by an increased grade repetition in the advanced track, particularly for immigrant incumbents (panel (a), *Treatment 2*). A one-percentage-point increase in the basic-track refugee ratio raises their repetition probability by 0.62 percentage points. Repetition therefore appears to substitute for downgrading when the basic track becomes more refugee-dense.

Appendix Table A9 further shows that the decline in downgrading is driven mainly by recent arrivals, indicating that short-term inflows play a larger role. The rise in repetition among immigrant incumbents, by contrast, is associated with both recent and continuing refugees. For natives, the repetition effect is weaker and only marginally significant.

5.3 Lower secondary school: Basic track

Table 4 reports results for incumbent pupils attending the basic track. Panel (a) presents estimates for grade repetition and panel (b) for the probability of switching to the advanced track. As before, we report both the aggregate refugee ratio (*Treatment 1*) and the decomposition by welcome-class, advanced-track, and basic-track refugees (*Treatment 2*).

Panel (a) (*Treatment 1*) shows that among immigrant pupils, a one-percentage-point increase in the refugee ratio within the same grade and school is associated with a 0.2-percentage-point decrease in the probability of grade repetition. Decomposing this effect (*Treatment 2*) indicates that it is driven by welcome-class refugees: a one-percentage-point increase in their ratio is associated with a 0.26-percentage-point decline in immigrant pupils' likelihood of repeating a grade. By contrast, suggestive evidence (significant at the 10% level) points to an opposite pattern among natives in the basic track, for whom a higher ratio of welcome-class refugees increases the probability of grade repetition by about 0.28 percentage points.

Results in panel (b) (*Treatment 2*) provide further evidence that grouping refugees and incumbent pupils within the same track generates asymmetric spillovers: negative for natives, positive for immigrant incumbents. For natives, a higher ratio of refugees in the basic track

Table 4: Refugee effects in secondary school – track with basic learning objectives

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.107	0.101	-0.201**	-0.198**	-0.093	-0.094
	(0.116)	(0.116)	(0.086)	(0.086)	(0.074)	(0.074)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.287*	0.282*	-0.260**	-0.255**	-0.039	-0.039
	(0.154)	(0.154)	(0.126)	(0.127)	(0.109)	(0.109)
Ratio of grade-level refugees (advanced track)	-0.092	-0.101	-0.081	-0.077	-0.066	-0.064
	(0.248)	(0.251)	(0.160)	(0.159)	(0.136)	(0.137)
Ratio of grade-level refugees (basic track)	-0.040	-0.043	-0.172	-0.171	-0.137	-0.141
	(0.193)	(0.192)	(0.125)	(0.124)	(0.110)	(0.110)
Observations	9645	9645	15239	15239	24884	24884
Panel b. From basic track to advanced track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.525	-0.488	0.506*	0.447	0.132	0.131
	(0.464)	(0.462)	(0.281)	(0.286)	(0.235)	(0.237)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	-0.507	-0.449	0.212	0.163	-0.085	-0.044
	(0.597)	(0.598)	(0.406)	(0.398)	(0.330)	(0.330)
Ratio of grade-level refugees (advanced track)	2.756*	2.751*	0.290	0.072	1.294**	1.124**
	(1.490)	(1.476)	(0.464)	(0.459)	(0.530)	(0.526)
Ratio of grade-level refugees (basic track)	-2.412***	-2.459***	1.401***	1.390***	0.063	0.073
	(0.806)	(0.804)	(0.411)	(0.424)	(0.362)	(0.371)
Observations	4924	4924	7857	7857	12789	12789
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grades 7-9 in the basic track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

is associated with a 2.46-percentage point decrease in their probability of upward mobility into the advanced track. For immigrant incumbents it is associated with a 1.39-percentage-point increase. By contrast with the advanced track, where switching dynamics are mainly associated with continuing refugees already embedded in classrooms, recent arrivals drive these outcomes in the basic track (Appendix Table A10).

Finally, panel (b) (*Treatment 2*) also points to suggestive cross-track spillovers. Among natives, a higher ratio of refugees in the advanced track is associated with a 2.75-percentage-point increase in the probability of switching upward from the basic track (significant at the

10% level). This effect is driven by non-recent refugees in the advanced track (Appendix Table A10).

5.4 Robustness checks

In this section, we address several concerns related to the validity of our identification strategy and the interpretation of our results.

Insufficient variation in refugee concentration.—An important concern for our empirical strategy is that estimated zero effects for some educational outcomes are driven by insufficient variation in refugee concentration. In Appendix Figure A1, we provide evidence that most primary and lower secondary schools had considerable variation in the ratio of ex-Yugoslav refugee pupils across grades and over time. Moreover, panel (d) of the same Figure reveals important variability in treatment variables when distinguishing refugees by the type of class they are attending (welcome, basic- and advanced-track classes).

Testing for random sorting across grades within schools.—To assess whether the within-school, across grade variation in refugee exposure can be considered plausibly exogenous, we test for systematic differences in observable characteristics of incumbent pupils across school-grade cohorts with differing refugee ratios. Specifically, we regress the grade-level refugee ratio on individual characteristics available in the data: gender, age, French as mother tongue, whether the pupil has Swiss nationality, and the grade-level ratio of ex-Yugoslav economic immigrants, while including the relevant fixed effects. The correlation with pre-1990 ex-Yugoslav immigrants is particularly informative: if refugee placement policies systematically directed refugee children into school-grades with higher concentrations of earlier immigrants, our identifying variation could partly reflect long-standing settlement patterns rather than quasi-random inflows. The regressions are estimated separately for Swiss natives and other immigrant incumbents. We conduct this analysis for each definition of refugee exposure used in the main models: (i) overall refugee ratio; and (ii) refugee ratio by class type (welcome, basic, advanced).

The results, reported in Appendix Tables A2-A4, show that the estimated coefficients are generally small in magnitude and statistically insignificant, with occasional significant results that are marginal in size (typically below 0.001). This pattern provides little evidence of

systematic placement of refugees into school–grade cells that would correlate with the demographic composition of natives or immigrants. We therefore interpret the within-school, across-grade variation in refugee exposure as plausibly exogenous. While we cannot completely rule out correlations with unobserved pupil characteristics, the absence of correlation with observed covariates makes such bias unlikely.

Instrumenting refugee ratio.—While the balance tests above indicate that the variation in refugee exposure is plausibly exogenous, we further test this assumption by re-estimating our main models using an instrumental variables approach. Specifically, we instrument the grade-level ratio of refugees with the ratio of age-eligible refugees who should be enrolled in each grade based on their birth dates (see Section 4). The second-stage 2SLS results, reported in Appendix Tables A5-A7, closely mirror our baseline findings. All main effects remain statistically significant, with slightly larger magnitudes compared to OLS estimates. This consistency reinforces the robustness of our conclusions on refugee impacts presented in Section 5.

Non-random assignment to tracks—Our baseline specification for lower secondary school captures the effect of refugee exposure conditional on current track placement, which raises two potential concerns. Specifically, reflection may occur if refugee pupils' current track placement reflects prior interactions with incumbent pupils in earlier grades, and post-treatment conditioning may arise if incumbent pupils' own current track assignment has been influenced by earlier refugee exposure. We assess the relevance of these mechanisms in two ways.

First, we split refugee exposure into recent arrivals, defined as those attending a regular class in a given track for the first time after completing a welcome class, and thus have not been previously exposed to the track environment, and continuing refugees, who have already attended a regular class for more than one year.[11] This distinction helps isolate inflows whose track placement is less likely to have been shaped by prior peer interactions, thereby reducing the scope for the dynamic reflection bias. Appendix Tables A9 and A10 reveal that most of the main results are almost entirely driven by recent inflows, suggesting that the baseline effects in Tables 3 and 4 are unlikely to reflect dynamic reflection bias.

[11] For simplicity, in *Treatment 1* specifications, refugees attending a welcome class are included among continuing refugees, since *Treatment 1* results aggregate all refugees at the grade level.

Second, we restrict the sample to grade 7 pupils, whose track assignment is based on primary-school performance. This specification eliminates channels for both post-treatment conditioning and dynamic reflection bias. Results in Appendix Tables A11 and A12 show patterns broadly consistent with our baseline findings. In the advanced track, refugee exposure continues to reduce the probability of switching into the basic track, with effect sizes similar in magnitude to the main analysis. In the basic track, coefficients are likewise aligned with baseline estimates, though some become less precise due to the smaller sample size. A few coefficients change sign, but these are small and statistically insignificant. Importantly, we find no systematic deviations that would suggest bias from reflection or post-treatment conditioning, reinforcing the credibility of our baseline results.[12]

Non-random pupil mobility.—Another concern is the possible nonrandom sorting of incumbent pupils in response to the inflow of ex-Yugoslav refugee pupils, as changes in the composition of existing pupils could bias our estimates. For example, if those most affected by the inflow of refugees are also more likely to change schools, then failure to account for such endogenous pupil mobility may result in spurious associations between the ratio of ex-Yugoslav refugee pupils and incumbent pupils' outcomes. To test for this, we examine transfers between public schools, movement from public to private schools, and moves across municipalities within or out of Geneva. Because these tests rely on observing mobility the following year, we exclude the last observation for each pupil. Appendix Table A13 reports the results. We find no evidence that native or immigrant pupils move in response to changes in the ratio of grade-level refugees. Focusing on movements between municipalities, we find that only 0.01% of incumbent pupils in primary schools, and even fewer in lower secondary schools, moved out of Geneva during their studies in a public school. Data also show that no pupil in public schools has moved municipalities within Geneva between 1990 and 2000.

Alternative clustering.—Estimates from model (1) are clustered at the school×year×grade level, constraining interdependence within schools to particular years and grades. In this robustness check, we re-estimate effects clustering the errors at the school and at the school×year

[12] The ratio of refugees in welcome classes is not subject to dynamic reflection or post-treatment conditioning concerns. Placement into welcome classes occurs immediately upon arrival and is independent of prior exams. In the main results (Table 4), the effects of refugee exposure on grade repetition among basic-track pupils are driven mainly by the ratio of refugees in welcome classes. These findings can therefore be interpreted as free from the two potential biases, further reinforcing the credibility of our estimates.

levels. As there are only few lower secondary schools in Geneva, clustering at the school level may increase the probability of type-2 error. Hence, for this exercise, we compute the p-values using the wild cluster bootstrap approach (Roodman et al., 2019). As shown in Appendix Tables A14-A19, statistical significance is slightly reduced but remains for most estimates reported in Section 5. Similarly, for the subsample of 6th graders (model (2)), where standard errors are clustered at the school×year level, we additionally check robustness to clustering at the school level only, to account for potential correlations in education outcomes across successive years. Results in panel (b) of Appendix Table A14 remain unchanged.

Alternative definitions for refugees.—In this robustness check, we test the sensitivity of our main results to alternative definitions of refugee pupils. In the main analysis, we considered as refugees both those who arrived to Geneva during the social unrest of 1990 and those who arrived after witnessing armed conflicts that started in June 1991. If these two groups are demographically different, then we may be undermining the impact of receiving war-driven refugees on incumbent pupils.

In Appendix Tables A20-A22, we re-estimate effects considering only those who arrived since June 1991 as refugees, and those who arrived before as immigrants. Results show that, overall, our main results remain substantially the same, except for some positive refugee effects which become slightly lower and less statistically significant. For example, Appendix Table A20 shows that the decrease in the probability of grade repetition for primary school immigrants is no longer statistically different from zero. This is not surprising. Yugoslav refugees who arrived after witnessing armed conflicts must have more difficulties to adapt to the schooling life (see, e.g., Couttenier et al. (2019)).

6 Discussion and conclusion

In recent years, there has been growing debate over limiting refugee inflows, driven largely by concerns about the potential costs refugees may impose on host communities, particularly in schools. In this paper, we use administrative data on refugees from former Yugoslavia who arrived in Geneva between 1990 and 2000 to examine their effects on incumbent pupils in primary and lower secondary schools. In the latter, we focus on two integration strategies:

welcome classes, where refugees receive targeted language instruction and specific training before entering regular classrooms, and ability-based grouping, which places refugees and incumbents together according to academic performance.

Findings suggest that the implications of refugee pupils differ for native and immigrant incumbents. In primary school (grades 1–5), we find no evidence that refugees affect the probability of grade repetition among natives, whereas immigrant pupils experience a small decline. Drawing on previous literature (e.g., Duflo et al., 2011), one plausible explanation is that teachers adapt their pedagogy when classroom composition changes, for example, by devoting additional time to reviewing material or slowing the pace of instruction–adaptations that may disproportionately benefit immigrant pupils. This interpretation is reinforced by the fact that the effect is driven mainly by recently arrived refugees, who alternated between welcome classes and regular classroom instruction on a part-time basis. Importantly, however, these positive impacts are modest and not sufficient to raise the probability that immigrant pupils transition to an advanced track class at the end of sixth grade.

In lower secondary school, we find that welcome classes for newly arrived refugee pupils negatively affected natives in both the advanced and the basic tracks, increasing their probability of grade repetition. These effects are best understood as stemming from institutional strain rather than direct peer spillovers. By contrast, we observe positive spillovers for immigrant incumbents in the basic track, who appear to benefit from the additional support and pedagogical adjustments associated with welcome classes.

We further find that grouping refugees with incumbents of similar academic ability (within tracks) generates asymmetric outcomes: immigrant pupils tend to benefit, while natives are disadvantaged. For natives, in the advanced track, a higher ratio of advanced-track refugees raises the probability of switching downward into the basic track, whereas in the basic track, a higher ratio of basic-track refugees reduce their likelihood of switching upward into the advanced track. Both effects point to a deterioration in their academic progression. For immigrant pupils, however, these relationships are reversed: their switching probabilities suggest improved upward track mobility and reduced downward transitions. If these dynamics were driven purely by larger class sizes, we would expect negative consequences for both natives and immigrants. Instead, the divergent effects suggest that teachers adjust their

instructional practices in ways that disproportionately benefit immigrant pupils, whose learning needs may align more closely with those of refugee peers, while reducing the attention or support available to native pupils.

We also find suggestive evidence of cross-track peer effects. Specifically, a higher ratio of refugees in the basic track reduces the probability that both native and immigrant pupils in the advanced track switch tracks downwards, suggesting that the presence of lower-track refugees may reinforce incumbents' commitment to remaining in the advanced track. In particular, when immigrant pupils experience difficulties, they appear more likely to repeat a grade while staying in the advanced track rather than switching to the basic track. Conversely, for natives in the basic track, a higher ratio of advanced-track refugees increases the probability of upward mobility into the advanced track. This pattern is consistent with the idea that observing high-performing refugees may raise educational aspirations and motivate greater academic effort among native pupils.

In sum, our findings highlight the double-edged nature of integration strategies. Welcome classes and ability-based grouping can support immigrant pupils' progression, but they also generate institutional pressures and relative-performance effects that disadvantage natives at promotion margins. Because these impacts on grade repetition and track switching shape pupils' long-term educational and labor market trajectories, integration policies must balance the benefits for newcomers with compensatory support for vulnerable incumbents.

Our analysis opens avenues for further work. In particular, more granular data could shed light on the mechanisms through which welcome-class cohorts affect incumbents. Similarly, examining the direct and indirect channels through which ability-based grouping influences both natives and immigrants would help refine integration strategies for future refugee arrivals.

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Appendix A Additional tables and figures

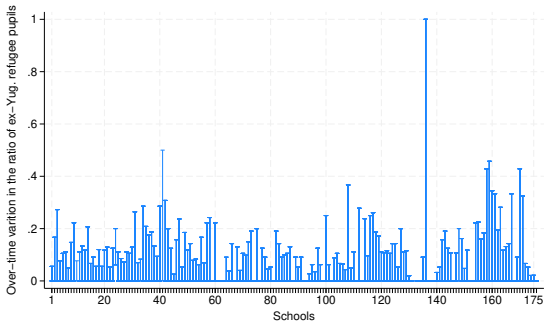
Table A1: Transition from primary to lower secondary: Evidence on selective attrition

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Not observed in grade 7						
Ratio of grade-level refugees	-0.034	-0.032	-0.080	-0.086	-0.052	-0.056
	(0.030)	(0.029)	(0.079)	(0.078)	(0.038)	(0.037)
Observations	23845	23845	13007	13007	36853	36853
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

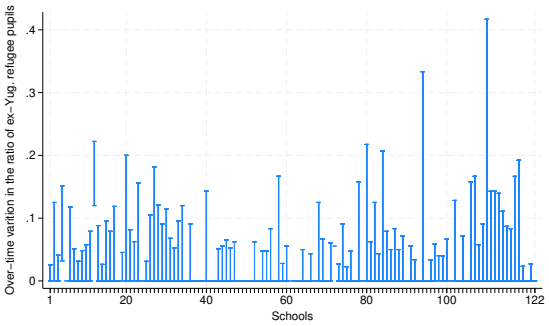
Notes: This table reports coefficients from 6 separate OLS regressions. The outcome variable equals one if a pupil observed in grade 6 is not observed in grade 7, and zero otherwise. Each entry is an estimate of the effect of within-school grade-level ex-Yugoslav refugee concentration on the probability of non-observation at the transition to lower secondary. The sample includes all pupils enrolled between 1990 and 2000 in grade 6, regardless of the type of education they subsequently attend in lower secondary school. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level in panel (a) and at the school×year in panel (b). *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Figure A1: Yearly variation in grade-level ex-Yugoslav refugee ratios within schools, 1990–2000

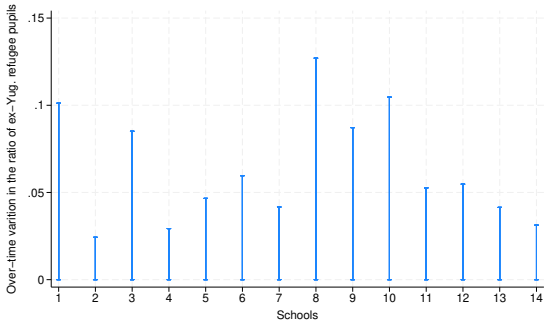
(a) Primary schools: grades 1-5



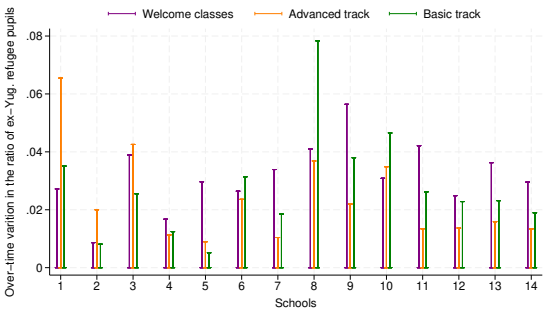
(b) Primary schools: grade 6



(c) Lower secondary schools: grades 7-9



(d) Lower secondary schools: grades 7-9: by type



Notes: This figure presents the within-school over time variation in the ratio of ex-Yugoslav refugees, across grades 1–5 (panel (a)), for grade 6 (panel (b)), and across grades 7–9 (panels (c)–(d)). In panel (d), the variation is further disaggregated by class type: welcome classes, advanced-track classes, and basic-track classes. Each capped spike represents the cross-grade-year range in refugee concentration for a given school.

Table A2: Changes in the ratio of refugees and observable characteristics - Primary school

	Natives	Immigrants	All pupils
	(1)	(2)	(3)
Panel a. Ratio of grade-level refugees in grades 1-5			
Ratio of grade-level ex-Yug. immigrants	-0.004	0.047	0.021
	(0.026)	(0.035)	(0.028)
Age	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Male	-0.000	0.000*	0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		-0.000	-0.000**
		(0.000)	(0.000)
Observations	114660	86442	201128
Grade fixed effects	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes
Panel b. Ratio of grade-level refugees in grade 6			
Ratio of grade-level ex-Yug. immigrants	0.007	0.096	0.049
	(0.059)	(0.076)	(0.062)
Age	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Male	0.000	-0.001	-0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	-0.000	-0.000	0.000
	(0.001)	(0.001)	(0.000)
Latest nationality: Swiss		-0.000	-0.000
		(0.001)	(0.000)
Observations	15658	11299	26959
Year fixed effects	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes

Notes: This table reports coefficients from 6 separate OLS regressions. Panel (a) presents estimates of the relationship between demographic characteristics and the within-school, grade-level ratio of ex-Yugoslav refugees for grades 1–5. Panel (b) reports analogous estimates for grade 6. The sample includes all primary school pupils enrolled between 1990 and 2000. Columns (1), (3), and (5) report results for Swiss natives, other immigrant pupils, and the full sample of incumbents, respectively. Standard errors in parentheses are clustered at the school×grade×year level in panel (a) and at the school×year in panel (b). *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A3: Changes in the ratio of refugees and observable characteristics – advanced track

	Natives	Immigrants	All pupils
	(1)	(2)	(3)
Panel a. Ratio of grade-level refugees: All			
Ratio of grade-level ex-Yug. immigrants	-0.087	-0.095	-0.090
	(0.083)	(0.080)	(0.079)
Age	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Male	0.000	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		-0.000	-0.000
		(0.000)	(0.000)
Observations	41744	23886	65630
Panel b. Ratio of grade-level refugees: Welcome classes			
Ratio of grade-level ex-Yug. immigrants	0.030	0.001	0.019
	(0.058)	(0.055)	(0.056)
Age	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Male	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		0.000**	0.000**
		(0.000)	(0.000)
Observations	41744	23886	65630
Panel c. Ratio of grade-level refugees: Advanced track			
Ratio of grade-level ex-Yug. immigrants	-0.044	-0.030	-0.038
	(0.030)	(0.037)	(0.032)
Age	0.000*	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Male	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	0.000**	-0.000**	0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		-0.000*	-0.000**
		(0.000)	(0.000)
Observations	41744	23886	65630
Panel d. Ratio of grade-level refugees: Basic track			
Ratio of grade-level ex-Yug. immigrants	-0.073	-0.052	-0.064
	(0.046)	(0.054)	(0.048)
Age	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Male	0.000*	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		-0.000***	-0.000***
		(0.000)	(0.000)
Observations	41744	23886	65630
Grade fixed effects	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes

Notes: This table reports coefficients from 12 separate OLS regressions. Each entry shows the association between the grade-level ratio of ex-Yugoslav refugees and observable characteristics of incumbent pupils, estimated separately for natives (column 1), other immigrant pupils (column 2), and the full sample (column 3). The sample includes all pupils enrolled in grades 7-9 in the advanced track in a Geneva lower secondary school between 1990 and 2000. Panel (a) uses the overall ratio of refugees across all class types, while panels (b)–(d) focus on refugees in welcome classes, advanced-track classes, and basic-track classes, respectively. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A4: Changes in the ratio of refugees and observable characteristics – basic track

	Natives	Immigrants	All pupils
	(1)	(2)	(3)
Panel a. Ratio of grade-level refugees: All			
Ratio of grade-level ex-Yug. immigrants	-0.064	-0.061	-0.062
	(0.083)	(0.086)	(0.083)
Age	0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Male	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		0.001***	0.000***
		(0.000)	(0.000)
Observations	9645	15239	24884
Panel b. Ratio of grade-level refugees: Welcome classes			
Ratio of grade-level ex-Yug. immigrants	-0.006	-0.033	-0.024
	(0.058)	(0.055)	(0.055)
Age	0.000	0.000**	0.000**
	(0.000)	(0.000)	(0.000)
Male	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		0.000**	0.000*
		(0.000)	(0.000)
Observations	9645	15239	24884
Panel c. Ratio of grade-level refugees: Advanced track			
Ratio of grade-level ex-Yug. immigrants	-0.033	-0.011	-0.018
	(0.030)	(0.035)	(0.033)
Age	-0.000	0.000**	0.000*
	(0.000)	(0.000)	(0.000)
Male	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		0.000***	0.000***
		(0.000)	(0.000)
Observations	9645	15239	24884
Panel d. Ratio of grade-level refugees: Basic track			
Ratio of grade-level ex-Yug. immigrants	-0.023	-0.006	-0.013
	(0.058)	(0.066)	(0.062)
Age	-0.000	0.000*	0.000
	(0.000)	(0.000)	(0.000)
Male	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Mother tongue: French	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Latest nationality: Swiss		0.000	0.000
		(0.000)	(0.000)
Observations	9645	15239	24884
Grade fixed effects	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes

Notes: This table reports coefficients from 12 separate OLS regressions. Each entry shows the association between the grade-level ratio of ex-Yugoslav refugees and observable characteristics of incumbent pupils, estimated separately for natives (column 1), other immigrant pupils (column 2), and the full sample (column 3). The sample includes all pupils enrolled in grades 7-9 in the basic track in a Geneva lower secondary school between 1990 and 2000. Panel (a) uses the overall ratio of refugees across all class types, while panels (b)–(d) focus on refugees in welcome classes, advanced-track classes, and basic-track classes, respectively. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A5: 2SLS estimates of refugee effects in primary school

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Ratio of grade-level refugees	-0.010	-0.008	-0.091**	-0.092**	-0.044**	-0.047**
	(0.023)	(0.023)	(0.036)	(0.036)	(0.022)	(0.022)
Observations	114660	114660	86442	86442	201128	201128
First-stage F-statistic	937.618	937.010	696.441	697.106	890.034	889.433
Panel b. Advanced track at grade 7						
Ratio of grade-level refugees	-0.120	-0.127	0.263	0.273	0.076	0.077
	(0.156)	(0.154)	(0.201)	(0.208)	(0.140)	(0.139)
Observations	15658	15658	11299	11299	26959	26959
First-stage F-statistic	1137.784	1155.170	1011.466	1015.286	1209.292	1224.708
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 12 separate regressions. Each entry in panel A (B) is an estimate of the effect of cross-grade within-school (within-school) differences in ex-Yugoslav refugee concentration instrumented with the age-appropriate refugee ratio variable, on grade repetition (advanced track attendance). Kleibergen-Paap Wald F-statistics are reported as a test of the first-stage strength of the instrument. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A6: 2SLS estimates of refugee effects in lower secondary school – advanced track

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Ratio of grade-level refugees	0.223	0.224	0.656*	0.646*	0.363*	0.360*
	(0.226)	(0.227)	(0.362)	(0.360)	(0.216)	(0.215)
Observations	41744	41744	23886	23886	65630	65630
First-stage F-statistic	72.097	73.367	26.228	27.248	50.349	51.572
Panel b. From advanced track to basic track						
Ratio of grade-level refugees	0.661	0.586	-1.891**	-1.938**	-0.315	-0.291
	(0.413)	(0.378)	(0.885)	(0.917)	(0.340)	(0.340)
Observations	24152	24152	13751	13751	37904	37904
First-stage F-statistic	54.818	59.360	16.191	17.444	35.050	37.641
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 12 separate regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration instrumented with the age-appropriate refugee ratio variable, on grade repetition (panel A) and track switching (panel B). Kleibergen-Paap Wald F-statistics are reported as a test of the first-stage strength of the instrument. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A7: 2SLS estimates of refugee effects in lower secondary school – basic track

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Ratio of grade-level refugees	0.191	0.185	-0.561**	-0.563**	-0.284	-0.283
	(0.295)	(0.295)	(0.277)	(0.273)	(0.194)	(0.192)
Observations	9645	9645	15239	15239	24884	24884
First-stage F-statistic	41.160	41.399	20.301	20.518	26.417	26.645
Panel b. From basic track to advanced track						
Ratio of grade-level refugees	-0.210	-0.187	2.295***	2.180***	1.289**	1.264***
	(0.944)	(0.967)	(0.797)	(0.754)	(0.502)	(0.474)
Observations	4917	4917	7857	7857	12782	12782
First-stage F-statistic	50.629	51.721	21.003	21.971	30.169	31.266
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 12 separate regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration instrumented with the age-appropriate refugee ratio variable, on grade repetition (panel A) and track switching (panel B). Kleibergen-Paap Wald F-statistics are reported as a test of the first-stage strength of the instrument. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A8: Refugee effects in primary school: recent vs. continuing refugees

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Grade repetition						
Ratio of grade-level refugees (recent)	-0.040	-0.040	-0.115*	-0.115*	-0.075**	-0.078**
	(0.031)	(0.031)	(0.069)	(0.069)	(0.036)	(0.036)
Ratio of grade-level refugees (non recent)	0.017	0.017	-0.036	-0.040*	-0.008	-0.010
	(0.016)	(0.016)	(0.023)	(0.023)	(0.014)	(0.014)
Observations	114660	114660	86442	86442	201128	201128
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 6 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration-distinguishing between recent arrivals, defined as refugees in their first year in Geneva who attend a welcome class half-time, and continuing refugees, who have already spent at least one year in school-on grade repetition for grades 1 to 5. The sample includes all pupils enrolled between 1990 and 2000 in grades 1-5 of primary school. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level in panel (a) and at the school×year in panel (b). *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A9: Refugee effects in secondary School: recent vs. continuing refugees – advanced track

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all, recent)	0.355	0.357	0.622**	0.628**	0.451*	0.446*
	(0.311)	(0.316)	(0.304)	(0.303)	(0.257)	(0.259)
Ratio of grade-level refugees (all, non recent)	0.038	0.039	0.155	0.158	0.076	0.079
	(0.094)	(0.095)	(0.114)	(0.114)	(0.079)	(0.079)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.236**	0.246**	0.051	0.045	0.166*	0.172*
	(0.118)	(0.119)	(0.154)	(0.154)	(0.101)	(0.101)
Ratio of grade-level refugees (advanced track, recent)	0.811	0.860	-0.795	-0.796	0.148	0.183
	(0.635)	(0.640)	(0.657)	(0.654)	(0.509)	(0.511)
Ratio of grade-level refugees (advanced track, non recent)	-0.337	-0.353	-0.022	-0.002	-0.211	-0.210
	(0.233)	(0.233)	(0.222)	(0.221)	(0.177)	(0.175)
Ratio of grade-level refugees (basic track, recent)	0.623*	0.604*	1.229***	1.241***	0.850***	0.828***
	(0.342)	(0.346)	(0.372)	(0.370)	(0.284)	(0.285)
Ratio of grade-level refugees (basic track, non recent)	-0.020	-0.025	0.411**	0.414**	0.174	0.179
	(0.208)	(0.214)	(0.205)	(0.206)	(0.162)	(0.166)
Observations	41744	41744	23886	23886	65630	65630
Panel b. From advanced track to basic track						
Treatment 1:						
Ratio of grade-level refugees (all, recent)	-1.362***	-1.274***	-1.855**	-1.805**	-1.628***	-1.511***
	(0.310)	(0.318)	(0.742)	(0.745)	(0.365)	(0.375)
Ratio of grade-level refugees (all, non recent)	1.463***	1.379***	1.394*	1.347*	1.507***	1.387***
	(0.365)	(0.372)	(0.722)	(0.730)	(0.368)	(0.381)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.118	0.102	0.065	0.076	0.091	0.087
	(0.222)	(0.222)	(0.368)	(0.379)	(0.205)	(0.210)
Ratio of grade-level refugees (advanced track, recent)	-0.950	-0.844	-1.116	-1.116	-1.135	-1.045
	(0.718)	(0.716)	(2.146)	(2.153)	(1.030)	(1.039)
Ratio of grade-level refugees (advanced track, non recent)	0.815**	0.813**	-1.037**	-1.052**	-0.066	-0.041
	(0.329)	(0.314)	(0.432)	(0.430)	(0.248)	(0.241)
Ratio of grade-level refugees (basic track, recent)	-1.833***	-1.776***	-2.750***	-2.767***	-2.339***	-2.264***
	(0.368)	(0.371)	(0.703)	(0.698)	(0.374)	(0.373)
Ratio of grade-level refugees (basic track, non recent)	-0.553	-0.468	-0.716	-0.744	-0.582	-0.644*
	(0.382)	(0.398)	(0.676)	(0.655)	(0.359)	(0.362)
Observations	24173	24173	13754	13754	37928	37928
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration-distinguishing between recent arrivals-refugees attending a regular class in a given track for the first time after completing a welcome class-and continuing refugees, who have already spent at least one year in a regular class-on grade repetition (panel a) and track switching (panel b). The sample includes pupils enrolled in grade 7 in the advanced track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A10: Refugee effects in secondary School: recent vs. continuing refugees – basic track

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all, recent)	-0.397	-0.413	0.160	0.172	-0.056	-0.051
	(0.343)	(0.346)	(0.251)	(0.246)	(0.215)	(0.214)
Ratio of grade-level refugees (all, non recent)	0.174	0.169	-0.243***	-0.240***	-0.097	-0.099
	(0.122)	(0.122)	(0.090)	(0.090)	(0.077)	(0.077)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.285*	0.280*	-0.267**	-0.261**	-0.045	-0.045
	(0.157)	(0.156)	(0.125)	(0.125)	(0.109)	(0.109)
Ratio of grade-level refugees (advanced track, recent)	-0.171	-0.208	0.830	0.867*	0.465	0.469
	(0.584)	(0.591)	(0.506)	(0.520)	(0.406)	(0.414)
Ratio of grade-level refugees (advanced track, non recent)	-0.098	-0.104	-0.157	-0.154	-0.128	-0.125
	(0.264)	(0.266)	(0.173)	(0.171)	(0.142)	(0.142)
Ratio of grade-level refugees (basic track, recent)	-0.375	-0.384	-0.058	-0.051	-0.200	-0.191
	(0.470)	(0.471)	(0.287)	(0.281)	(0.272)	(0.272)
Ratio of grade-level refugees (basic track, non recent)	0.082	0.081	-0.197	-0.198	-0.112	-0.119
	(0.217)	(0.215)	(0.140)	(0.141)	(0.120)	(0.122)
Observations	9645	9645	15239	15239	24884	24884
Panel b. From basic track to advanced track						
Treatment 1:						
Ratio of grade-level refugees (all, recent)	-3.867***	-3.884***	0.938*	0.944*	-0.906**	-0.835*
	(0.830)	(0.838)	(0.523)	(0.507)	(0.458)	(0.433)
Ratio of grade-level refugees (all, non recent)	4.102***	4.162***	-0.524	-0.601	1.265**	1.174**
	(1.052)	(1.048)	(0.547)	(0.517)	(0.527)	(0.506)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	-0.282	-0.235	0.269	0.207	0.041	0.065
	(0.620)	(0.619)	(0.400)	(0.395)	(0.333)	(0.335)
Ratio of grade-level refugees (advanced track, recent)	-0.336	-0.129	-1.740	-1.456	-1.123	-0.836
	(2.184)	(2.230)	(1.233)	(1.250)	(1.153)	(1.172)
Ratio of grade-level refugees (advanced track, non recent)	3.033*	2.989*	0.739	0.400	1.615***	1.354***
	(1.617)	(1.607)	(0.461)	(0.457)	(0.503)	(0.501)
Ratio of grade-level refugees (basic track, recent)	-4.244***	-4.278***	1.916***	1.749***	-0.299	-0.346
	(0.974)	(0.986)	(0.494)	(0.499)	(0.446)	(0.438)
Ratio of grade-level refugees (basic track, non recent)	-0.836	-0.895	0.949*	1.069*	0.330	0.391
	(1.161)	(1.163)	(0.570)	(0.577)	(0.533)	(0.528)
Observations	4924	4924	7857	7857	12789	12789
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration-distinguishing between recent arrivals-refugees attending a regular class in a given track for the first time after completing a welcome class-and continuing refugees, who have already spent at least one year in a regular class-on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grades 7-9 in the basic track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A11: Refugee effects in grade 7 of secondary school – advanced track

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.063	0.069	0.033	0.038	0.050	0.062
	(0.175)	(0.172)	(0.120)	(0.126)	(0.121)	(0.121)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.142	0.150	0.163	0.159	0.168	0.179
	(0.178)	(0.176)	(0.168)	(0.179)	(0.133)	(0.135)
Ratio of grade-level refugees (advanced track)	0.154	0.184	-0.051	-0.188	0.061	0.037
	(0.331)	(0.339)	(0.270)	(0.247)	(0.240)	(0.239)
Ratio of grade-level refugees (basic track)	-0.090	-0.107	-0.081	0.038	-0.122	-0.084
	(0.315)	(0.310)	(0.187)	(0.215)	(0.201)	(0.205)
Observations	13509	13509	7841	7841	21350	21350
Panel b. From advanced track to basic track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.666***	-0.703***	-0.816**	-0.836**	-0.707***	-0.748***
	(0.198)	(0.193)	(0.401)	(0.400)	(0.194)	(0.196)
Observations	11659	11659	6632	6632	18291	18291
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	-0.902***	-0.912***	0.762	0.760	-0.207	-0.214
	(0.325)	(0.322)	(0.493)	(0.498)	(0.284)	(0.281)
Ratio of grade-level refugees (advanced track)	-0.570	-0.486	-1.192*	-1.127	-1.046***	-0.945***
	(0.379)	(0.379)	(0.681)	(0.688)	(0.365)	(0.359)
Ratio of grade-level refugees (basic track)	-0.165	-0.304	-2.286***	-2.404***	-1.005**	-1.192***
	(0.399)	(0.401)	(0.730)	(0.755)	(0.436)	(0.454)
Observations	11659	11659	6632	6632	18291	18291
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes pupils enrolled in grade 7 in the advanced track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A12: Refugee effects in grade 7 of secondary school – basic track

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.134	0.111	-0.151	-0.155	-0.052	-0.061
	(0.233)	(0.227)	(0.182)	(0.185)	(0.154)	(0.155)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.403	0.384	-0.287	-0.295	-0.012	-0.017
	(0.317)	(0.309)	(0.197)	(0.198)	(0.166)	(0.165)
Ratio of grade-level refugees (advanced track)	-0.868	-0.737	0.641*	0.642*	0.190	0.227
	(0.528)	(0.532)	(0.378)	(0.373)	(0.366)	(0.368)
Ratio of grade-level refugees (basic track)	0.183	0.086	-0.572**	-0.574**	-0.299	-0.342
	(0.390)	(0.389)	(0.260)	(0.270)	(0.216)	(0.218)
Observations	2801	2801	4490	4490	7291	7291
Panel b. From basic track to advanced track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.624	-0.489	1.051	0.953	0.485	0.514
	(0.816)	(0.810)	(0.648)	(0.676)	(0.506)	(0.524)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.481	0.430	-0.243	-0.261	0.053	0.135
	(1.031)	(1.031)	(0.956)	(0.976)	(0.720)	(0.735)
Ratio of grade-level refugees (advanced track)	0.114	0.290	1.656	0.893	1.392	0.969
	(1.731)	(1.723)	(1.064)	(1.067)	(0.847)	(0.887)
Ratio of grade-level refugees (basic track)	-2.419*	-2.213*	1.999*	2.331*	0.543	0.789
	(1.315)	(1.313)	(1.175)	(1.338)	(0.890)	(0.954)
Observations	2388	2388	3707	3707	6095	6095
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grade 7 in the basic track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A13: Refugee effects on incumbent pupils' mobility

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Primary school: from public to private school						
Ratio of grade-level refugees	0.009	0.009	-0.010	-0.010	-0.001	-0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)
Observations	101268	101268	73761	73761	175084	175084
Panel b. Primary school: from a public to another public school						
Ratio of grade-level refugees	-0.029	-0.029	-0.047	-0.041	-0.040	-0.038
	(0.044)	(0.044)	(0.048)	(0.048)	(0.039)	(0.039)
Observations	100785	100785	73339	73339	174178	174178
Panel c. Secondary school (advanced track): from public to private school						
Ratio of grade-level refugees	-0.024	-0.025	-0.037	-0.036	-0.026	-0.026
	(0.049)	(0.048)	(0.047)	(0.047)	(0.035)	(0.034)
Observations	25918	25918	14683	14683	40601	40601
Panel d. Secondary school (advanced track): from a public to another public school						
Ratio of grade-level refugees	0.024	0.020	0.135	0.136	0.043	0.040
	(0.104)	(0.103)	(0.145)	(0.145)	(0.095)	(0.096)
Observations	25741	25741	14623	14623	40364	40364
Panel e. Secondary school (basic track): from public to private school						
Ratio of grade-level refugees	-0.217	-0.210	0.071	0.062	-0.024	-0.025
	(0.132)	(0.133)	(0.058)	(0.057)	(0.060)	(0.060)
Observations	5158	5158	8154	8154	13312	13312
Panel f. Secondary school (basic track): from a public to another public school						
Ratio of grade-level refugees	-0.087	-0.082	-0.233	-0.222	-0.206	-0.200
	(0.274)	(0.272)	(0.328)	(0.323)	(0.234)	(0.229)
Observations	5119	5119	8132	8132	13251	13251
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate regressions. Each entry in the Table is an estimate of the effect of ex-Yugoslav refugee concentration on the probability to move from a public to a private or another public school. The sample includes pupils enrolled in all grades in primary public school in panels A and B, in all grades in lower secondary school in the advanced track in panels C and D and in the basic track in panels E and F, between 1990 and 2000. Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A14: Refugee effects in primary school, cluster errors at school level

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Ratio of grade-level refugees	0.007	0.007	-0.047**	-0.050**	-0.018	-0.021
	(0.017)	(0.017)	(0.023)	(0.023)	(0.015)	(0.015)
Observations	114660	114660	86442	86442	201128	201128
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
Panel b. Advanced track at grade 7						
Ratio of grade-level refugees	-0.042	-0.039	0.225	0.235	0.098	0.101
	(0.130)	(0.128)	(0.149)	(0.148)	(0.104)	(0.103)
Observations	15658	15658	11299	11299	26959	26959
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 12 separate OLS regressions. Each entry in panel (a) is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition for grades 1 to 5. Similarly, panel (b) reports the effect of within-school differences in ex-Yugoslav refugee concentration on advanced track attendance after grade 6. The sample includes all pupils enrolled between 1990 and 2000 in primary school. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. P-values are computed using the wild cluster bootstrap approach (Roodman et al., 2019).

Table A15: Refugee effects in secondary school – advanced track, cluster errors at school level

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.077	0.077	0.200	0.202	0.118	0.119
	(0.097)	(0.099)	(0.143)	(0.143)	(0.084)	(0.084)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.243	0.254	0.044	0.037	0.166	0.172
	(0.183)	(0.185)	(0.168)	(0.175)	(0.158)	(0.162)
Ratio of grade-level refugees (advanced track)	-0.208	-0.218	-0.148	-0.130	-0.197	-0.193
	(0.244)	(0.254)	(0.286)	(0.275)	(0.148)	(0.142)
Ratio of grade-level refugees (basic track)	0.146	0.136	0.610**	0.616**	0.340***	0.337***
	(0.223)	(0.247)	(0.157)	(0.155)	(0.116)	(0.132)
Observations	41744	41744	23886	23886	65630	65630
Panel b. From advanced track to basic track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.157	-0.134	-0.700*	-0.685*	-0.381	-0.360
	(0.237)	(0.247)	(0.384)	(0.372)	(0.251)	(0.247)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.036	0.022	-0.022	-0.010	0.015	0.015
	(0.483)	(0.474)	(0.549)	(0.558)	(0.363)	(0.360)
Ratio of grade-level refugees (advanced track)	0.562	0.580	-0.886	-0.901	-0.146	-0.117
	(0.517)	(0.511)	(0.629)	(0.588)	(0.370)	(0.349)
Ratio of grade-level refugees (basic track)	-1.054**	-0.978*	-1.563*	-1.589*	-1.289**	-1.295**
	(0.467)	(0.470)	(0.523)	(0.532)	(0.457)	(0.463)
Observations	24173	24173	13754	13754	37928	37928
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grades 7-9 in the advanced track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. P-values are computed using the wild cluster bootstrap approach (Roodman et al., 2019).

Table A16: Refugee effects in secondary school – basic track, cluster errors at school level

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.107	0.101	-0.201*	-0.198	-0.093	-0.094
	(0.140)	(0.141)	(0.115)	(0.111)	(0.090)	(0.089)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.287	0.282	-0.260*	-0.255	-0.039	-0.039
	(0.188)	(0.186)	(0.141)	(0.141)	(0.118)	(0.117)
Ratio of grade-level refugees (advanced track)	-0.092	-0.101	-0.081	-0.077	-0.066	-0.064
	(0.332)	(0.350)	(0.194)	(0.194)	(0.114)	(0.116)
Ratio of grade-level refugees (basic track)	-0.040	-0.043	-0.172	-0.171	-0.137	-0.141
	(0.219)	(0.215)	(0.086)	(0.085)	(0.069)	(0.073)
Observations	9645	9645	15239	15239	24884	24884
Panel b. From basic track to advanced track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.525	-0.488	0.506	0.447	0.132	0.131
	(0.547)	(0.556)	(0.390)	(0.399)	(0.326)	(0.327)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	-0.507	-0.449	0.212	0.163	-0.085	-0.044
	(0.721)	(0.709)	(0.703)	(0.682)	(0.468)	(0.458)
Ratio of grade-level refugees (advanced track)	2.756	2.751	0.290	0.072	1.294**	1.124
	(1.909)	(1.906)	(0.632)	(0.613)	(0.762)	(0.764)
Ratio of grade-level refugees (basic track)	-2.412	-2.459*	1.401**	1.390**	0.063	0.073
	(1.146)	(1.141)	(0.655)	(0.708)	(0.501)	(0.528)
Observations	4924	4924	7857	7857	12789	12789
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grades 7-9 in the basic track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. P-values are computed using the wild cluster bootstrap approach (Roodman et al., 2019).

Table A17: Refugee effects in primary school, cluster errors at school×year level

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Ratio of grade-level refugees	0.007	0.007	-0.047**	-0.050**	-0.018	-0.021
	(0.016)	(0.016)	(0.023)	(0.023)	(0.015)	(0.015)
Observations	114660	114660	86442	86442	201128	201128
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 12 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition for grades 1 to 5. The sample includes all pupils enrolled between 1990 and 2000 in primary school. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A18: Refugee effects in secondary school – advanced track, cluster errors at school×year level

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.077	0.077	0.200	0.202	0.118	0.119
	(0.107)	(0.108)	(0.132)	(0.132)	(0.089)	(0.090)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.243*	0.254*	0.044	0.037	0.166	0.172
	(0.140)	(0.141)	(0.198)	(0.199)	(0.125)	(0.126)
Ratio of grade-level refugees (advanced track)	-0.208	-0.218	-0.148	-0.130	-0.197	-0.193
	(0.252)	(0.255)	(0.246)	(0.244)	(0.179)	(0.178)
Ratio of grade-level refugees (basic track)	0.146	0.136	0.610***	0.616***	0.340**	0.337**
	(0.204)	(0.208)	(0.185)	(0.186)	(0.150)	(0.153)
Observations	41744	41744	23886	23886	65630	65630
Panel b. From advanced track to basic track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.157	-0.134	-0.700	-0.685	-0.381	-0.360
	(0.200)	(0.203)	(0.444)	(0.444)	(0.236)	(0.238)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.036	0.022	-0.022	-0.010	0.015	0.015
	(0.329)	(0.329)	(0.520)	(0.533)	(0.303)	(0.305)
Ratio of grade-level refugees (advanced track)	0.562	0.580	-0.886	-0.901	-0.146	-0.117
	(0.437)	(0.429)	(0.643)	(0.637)	(0.371)	(0.365)
Ratio of grade-level refugees (basic track)	-1.054***	-0.978**	-1.563*	-1.589*	-1.289***	-1.295***
	(0.384)	(0.398)	(0.842)	(0.822)	(0.473)	(0.468)
Observations	24173	24173	13754	13754	37928	37928
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grades 7-9 in the advanced track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A19: Refugee effects in secondary school – basic track, cluster errors at school×year level

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees (all)	0.107	0.101	-0.201*	-0.198*	-0.093	-0.094
	(0.144)	(0.144)	(0.104)	(0.103)	(0.093)	(0.093)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.287	0.282	-0.260	-0.255	-0.039	-0.039
	(0.196)	(0.196)	(0.158)	(0.158)	(0.139)	(0.138)
Ratio of grade-level refugees (advanced track)	-0.092	-0.101	-0.081	-0.077	-0.066	-0.064
	(0.272)	(0.277)	(0.179)	(0.179)	(0.135)	(0.137)
Ratio of grade-level refugees (basic track)	-0.040	-0.043	-0.172	-0.171	-0.137	-0.141
	(0.203)	(0.201)	(0.148)	(0.143)	(0.127)	(0.125)
Observations	9645	9645	15239	15239	24884	24884
Panel b. From basic track to advanced track						
Treatment 1:						
Ratio of grade-level refugees (all)	-0.525	-0.488	0.506	0.447	0.132	0.131
	(0.634)	(0.633)	(0.390)	(0.396)	(0.328)	(0.330)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	-0.507	-0.449	0.212	0.163	-0.085	-0.044
	(0.811)	(0.814)	(0.559)	(0.547)	(0.457)	(0.457)
Ratio of grade-level refugees (advanced track)	2.756	2.751	0.290	0.072	1.294*	1.124
	(2.049)	(2.032)	(0.643)	(0.637)	(0.742)	(0.737)
Ratio of grade-level refugees (basic track)	-2.412**	-2.459**	1.401**	1.390**	0.063	0.073
	(1.110)	(1.108)	(0.572)	(0.593)	(0.507)	(0.519)
Observations	4924	4924	7857	7857	12789	12789
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: This table reports coefficients from 24 separate OLS regressions. Each entry is an estimate of the effect of cross-grade within-school differences in ex-Yugoslav refugee concentration on grade repetition (panel a) and track switching (panel b). The sample includes all pupils enrolled in grades 7-9 in the basic track in a Geneva lower secondary school between 1990 and 2000. Columns (1) and (2) report estimates for Swiss native pupils. Columns (3) and (4) report estimates for all other immigrant pupils, and columns (5) and (6) report estimates for the full sample of incumbent pupils. Even columns control for demographic characteristics as described in the main text. Standard errors in parentheses are clustered at the school×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Table A20: Refugee effects in primary school – June 1991 cutoff

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Ratio of grade-level refugees	0.013	0.014	-0.024	-0.026	-0.004	-0.006
	(0.015)	(0.015)	(0.022)	(0.022)	(0.014)	(0.014)
Observations	114487	114487	86428	86428	200941	200941
Panel b. Advanced track at grade 7						
Ratio of grade-level refugees	-0.038	-0.032	0.295	0.305*	0.133	0.141
	(0.139)	(0.138)	(0.182)	(0.184)	(0.119)	(0.117)
Observations	15658	15658	11299	11299	26959	26959
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: Standard errors in parentheses are clustered at the school×grade×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. For details, see Table 2.

Table A21: Refugee effects in secondary school – advanced track, June 1991 cutoff

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees	0.103	0.102	0.206*	0.211*	0.134	0.134
	(0.106)	(0.107)	(0.117)	(0.117)	(0.086)	(0.086)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.240*	0.250**	0.095	0.090	0.182*	0.187*
	(0.124)	(0.125)	(0.160)	(0.161)	(0.107)	(0.107)
Ratio of grade-level refugees (advanced track)	-0.150	-0.171	-0.193	-0.186	-0.182	-0.185
	(0.245)	(0.247)	(0.236)	(0.236)	(0.188)	(0.188)
Ratio of grade-level refugees (basic track)	0.236	0.224	0.707***	0.726***	0.423***	0.418***
	(0.205)	(0.207)	(0.198)	(0.199)	(0.161)	(0.161)
Observations	41744	41744	23886	23886	65630	65630
Panel b. From advanced track to basic track						
Treatment 1:						
Ratio of grade-level refugees	-0.103	-0.091	-0.624*	-0.623*	-0.318*	-0.305*
	(0.148)	(0.149)	(0.322)	(0.320)	(0.172)	(0.172)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	-0.026	-0.042	0.106	0.136	0.021	0.033
	(0.226)	(0.224)	(0.364)	(0.371)	(0.216)	(0.216)
Ratio of grade-level refugees (advanced track)	0.754**	0.789**	-1.184**	-1.179**	-0.127	-0.085
	(0.368)	(0.365)	(0.570)	(0.571)	(0.318)	(0.318)
Ratio of grade-level refugees (basic track)	-0.884***	-0.837**	-1.251*	-1.360*	-1.072***	-1.126***
	(0.310)	(0.323)	(0.757)	(0.735)	(0.406)	(0.398)
Observations	24173	24173	13754	13754	37928	37928
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: Standard errors in parentheses are clustered at the school×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. See Table 3 for details.

Table A22: Refugee effects in secondary school – basic track, June 1991 cutoff

	Natives		Immigrants		All pupils	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel a. Grade repetition						
Treatment 1:						
Ratio of grade-level refugees	0.165	0.158	-0.162*	-0.163*	-0.038	-0.040
	(0.125)	(0.124)	(0.097)	(0.097)	(0.083)	(0.082)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	0.263*	0.261*	-0.197	-0.197	-0.007	-0.008
	(0.151)	(0.151)	(0.132)	(0.132)	(0.111)	(0.111)
Ratio of grade-level refugees (advanced track)	0.141	0.112	0.147	0.150	0.172	0.171
	(0.270)	(0.271)	(0.171)	(0.172)	(0.146)	(0.148)
Ratio of grade-level refugees (basic track)	-0.058	-0.054	-0.193	-0.195	-0.155	-0.157
	(0.227)	(0.223)	(0.146)	(0.147)	(0.128)	(0.128)
Observations	9645	9645	15239	15239	24884	24884
Panel b. From basic track to advanced track						
Treatment 1:						
Ratio of grade-level refugees	-0.668	-0.615	0.387	0.306	0.013	0.018
	(0.478)	(0.479)	(0.295)	(0.303)	(0.245)	(0.252)
Treatment 2:						
Ratio of grade-level refugees (welcome classes)	-0.507	-0.468	-0.056	-0.126	-0.231	-0.211
	(0.619)	(0.625)	(0.404)	(0.405)	(0.332)	(0.336)
Ratio of grade-level refugees (advanced track)	3.294**	3.322**	0.336	0.171	1.587***	1.512***
	(1.378)	(1.363)	(0.612)	(0.604)	(0.526)	(0.524)
Ratio of grade-level refugees (basic track)	-3.900***	-3.885***	1.398***	1.309***	-0.414	-0.444
	(0.710)	(0.721)	(0.429)	(0.453)	(0.394)	(0.390)
Observations	4924	4924	7857	7857	12789	12789
Grade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School×Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: Standard errors in parentheses are clustered at the school×year level. *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. See Table 4 for details.