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Murat Güray Kirdar, İsmet Koç and Meltem Dayıoğlu

August 2022

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Murat Güray Kırdar[1], İsmet Koç[#] and Meltem Dayıoğlu[1]

August 22, 2022

[1] Department of Economics, Boğaziçi University, Bebek, Istanbul 34342, Turkey e-mail: murat.kirdar@boun.edu.tr.

[#] Institute of Population Studies, Hacettepe University, Ankara, 06800 Turkey, e-mail: iskoc@hacettepe.edu.tr

[1] Department of Economics, Middle East Technical University, Ankara, 06800, Turkey, e-mail: dmeltem@metu.edu.tr

Abstract

Although school integration of the children of economic migrants in developed countries is well-studied in the literature, little evidence based on large-scale representative data exists on the school integration of refugee children—many of whom live in low- or middle-income countries. This study focuses on Syrian refugee children in Turkey and examines the underlying causes of native–refugee differences in school enrollment. For this purpose, we use the 2018 Turkish Demographic and Health Survey, which includes a representative sample of Syrian refugee households. Accounting for a rich set of socioeconomic variables, we find that the native–refugee gap in school enrollment drops by half for boys and two-thirds for girls, but the gap persists for both genders. When we restrict the sample to refugees who arrived in Turkey at or before age 8 and account for socioeconomic differences, the native–refugee gap completely vanishes for both boys and girls, indicating that school integration of refugee children in Turkey has been possible conditional on their age at arrival. We also find that the timing of boys' school dropouts coincides with their entry into the labor market, whereas girls' dropouts mostly occur before marriage age. Finally, we reveal important differences between natives and refugees, as well as early and late arrivers among refugees, in never starting school, grade progression and repetition, dropping out, and grade for age.

1. Introduction

The global number of refugees reached 27.1 million at the end of 2021 (UNHCR, 2022),[1] the highest figure since 2010, and children (aged 17 and younger) constitute nearly 40 percent of this population. Syria is the top source country of refugees in the world. Since the start of the conflict in 2011, nearly six million Syrians have fled the country and sought refuge in nearby countries (Turkey, Lebanon, Jordan, Iraq, and Egypt). Turkey hosts the highest number of Syrian refugees, currently at 3.7 million; nearly 47 percent of which are under 18, and a third of which are of school-age (aged 5–17) (Turkish Presidency of Migration Management, TPMM, 2021). The overwhelming majority (98.7 percent) of the Syrian refugees in Turkey live outside of camps (TPMM, 2021).

Migrant children's integration into the schooling systems of host countries is well-studied in the literature.[2] However, these studies are mostly about the children of economic migrants in developed countries. Little evidence exists regarding the integration of refugee children into the schooling systems of low- or middle-income countries,[3] when most refugees live in neighboring countries that are either low- or middle-income countries. To the best of our knowledge, this is the first study to examine the school integration of refugees in a low- or middle-income country using a nationally representative dataset of both natives and refugees.

The children of refugees differ from those of economic migrants in important ways regarding school integration. First, refugees experience the traumatic events of conflict and forced migration, which could have long-term effects on their physical and mental health—profoundly affecting children's school integration and success. Second, the children of refugees face poverty, as refugees leave their jobs and often their physical assets behind when fleeing a conflict zone.

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[1] In addition, 4.4 million Venezuelans were displaced abroad and there were 4.6 million asylum seekers at the end of 2021.

[2] See Basu, 2018; Böhlmark, 2008; Chiswick and DebBuma, 2004; Entorf and Lauk, 2008; Gang and Zimmermann, 2000; Jensen and Rasmussen, 2011; OECD, 2012; van Ours and Veenman, 2006.

[3] Related research considers the effect of violent armed clashes on children's human capital accumulation. See Akresh and de Walque (2008) for Rwanda, Di Maio and Nandi (2013) for Palestine, Leon (2012) for Peru, and Shemyakina (2011) for Tajikistan. Unlike our study, the children in these settings endured armed conflict within their countries or were refugees in neighboring countries for a short period before returning to their home countries.

Moreover, refugee adults have poorer labor market outcomes in destination countries (Brell et al., 2020; Demirci and Kirdar, 2021). Low parental income implies a higher marginal utility of children's employment at the expense of schooling. Third, economic migrants are generally selected based on education and health, and they choose a destination country based on the match of their skills with the requirements of the destination labor market. This feature of economic migration is likely to reflect on children favorably. Such destination selections are unlikely for refugees fleeing to a neighboring country following a conflict, and we provide evidence for this in our context.

Syrian refugees began arriving in Turkey as early as April 2011. They were initially hosted in camps, where children attended schools set up at the initiative of camp administrators. These camp schools were later turned into Temporary Education Centers (TECs) and established in off-camp areas as refugees gradually moved out of camps. Starting with the 2014–2015 school year, Syrian refugee children were accepted into Turkish public schools. The latest statistics of the Ministry of Education of Turkey (MoNE) indicate that over a third of school-aged Syrian children are not attending school (MoNE, 2021a).[4] Among Turkish school-aged children, near-universal school enrollment rates are achieved at the primary and lower-secondary school levels, while school enrollment at the high school level is lower at 85 percent (MoNE, 2021b). These statistics suggest significant gaps in schooling between native and refugee children.

In this study, we seek to understand the underlying causes of the differences in schooling outcomes of native and refugee children. For this purpose, we analyze several outcomes, including enrollment status, ever having attended school, grade for age, as well as school performance indicators, such as progressing, repeating, and dropping out conditional on enrollment. We also examine children's employment and marriage outcomes to better understand the observed patterns in schooling outcomes. For this purpose, we use the Turkey Demographic Health Survey (TDHS), which, for the first time in 2018, included a separate module entitled the TDHS Syrian Migrant Sample (TDHS-S) to cover Syrian refugees. The TDHS-S provides rich information on Syrian

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[4] This is despite significant improvement in school enrollment over time; while 41 percent of Syrian children were enrolled in the 2014–2015 school year, and this rate increased to 64 percent in the 2020–2021 school year. The most significant improvement was at primary and middle school levels, where the enrollment rate reached nearly 80 percent; however, enrollment remained low at 39 percent at the high school level (MoNE, 2021a).

children and their families and is *representative* of the Syrian population in Turkey (HUIPS, 2019a; HUIPS, 2019b).

The TDHS data reveal substantial native–refugee gaps in children's school enrollment. The baseline native–refugee gap (which still accounts for key variables, such as age, relationship to the household head, and survey month) is 32.3 percentage points for boys and 24.8 percentage points for girls. Our results show that a substantial portion of the schooling gap between native and refugee children arises due to socioeconomic differences between the two populations. After accounting for a rich set of socioeconomic characteristics, the baseline native–refugee gap reduces to 15.3 percentage points for boys and 8.2 percentage points for girls. A key finding is that when we restrict the refugee children to those who arrived in Turkey at or before age 8, the native–refugee gap completely vanishes for both boys and girls—after accounting for the covariates.

The patterns in native–refugee differences in boys' paid employment are parallel to those for school enrollment, in which accounting for our rich set of covariates reduces the baseline refugee–native gap in paid work among boys, but a significant gap remains. When we restrict the refugee sample to boys who arrived at or before age 8, the native–refugee gap in paid work also vanishes after including the rich set of covariates. Moreover, the timing of school dropouts coincides with the timing of labor market entry among boys. Among refugee girls, the timing of marriage does not seem to coincide with the timing of school dropouts. When marriage rates rise considerably (after age 15), we observe no notable change in enrollment rates—suggesting that girls who marry are already out of school.

The native–refugee differences in school enrollment result from refugees' higher propensity for never enrolling in school. Once we account for the socioeconomic differences between natives and refugees, they are not more likely to drop out of school (on average). We also examine the native–refugee differences in school performance. Refugee boys are, on average, 5.6 percentage points less likely to progress to the next grade than native boys, whereas the gap among girls is much smaller and not statistically significant. Refugee boys are less likely to progress in grade 1 due to a higher probability of repeating this grade and in grades 5–7 because of a higher likelihood to drop out (as they enter the labor market). In terms of grade for age, refugees are about 0.7 grades behind among both boys and girls, even after accounting for socioeconomic differences.

The gap between early (at or before age 8) and late arrivers among refugees in school enrollment vis-à-vis natives results from differences in both ever having been to school and dropping out. Late arrivers among refugees are more likely to never enroll and more likely to drop out than natives, whereas no such difference exists between early-arriver refugees and natives. Late arrivers among boys also display lower performance in grade progression than natives.

This study contributes to the literature in four ways. First, to the best of our knowledge, this is the first study to examine the native–refugee differences in school enrollment in a low- or middle-income country—using a representative dataset for both refugees and natives. Moreover, it does so in the context of the largest refugee group in a single country in the world. While the challenges in the school integration of the children of economic migrants are likely to apply to refugee children, refugee children face additional challenges. These include schooling interruptions prior to arriving in the host country, difficulties in school access, and the trauma experienced (Dryden-Peterson, 2015). The relevant literature is primarily populated with qualitative studies that examine the difficulties refugee children face in integrating into new school systems, refugee children's special schooling needs, and educational policies.[5] A few quantitative studies examine refugee children's schooling outcomes, but these do not compare the outcomes of native and refugee children as we do, instead focusing on only refugees (for instance, see Eryurt (2021), Krafft et al. (2022)).[6]

Second, earlier studies on immigrant children's schooling outcomes, most of which are in the context of rich countries, do not distinguish the children of economic migrants from the children of refugees (for instance, see Ammermueller, 2007; Colding et al., 2009; Entorf and Lauk, 2008; Jense and Rasmussen, 2011; Schnepf, 2007; van Ours and Veenman, 2003). An advantage of our study, compared to these studies, is that the forced nature of migration and our focus on a single

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[5] For instance, see Block et al. (2014), Buckner et al. (2017), Celik and Icduygu (2019), Charles and Denman (2013), Crul et al. (2019), and Ferfolja and Vickers (2010).

[6] Krafft et al. (2022) examine Syrian refugee children's schooling outcomes in Jordan, finding that Syrian children's schooling was disrupted due to the conflict in Syria and they have difficulty integrating into Jordanian public schools; however, their enrollment at the basic education level recovers to pre-conflict levels over time. Eryurt (2021) considers early school dropout behavior among Syrian refugee children aged 6–18 in Turkey, determining that employed children are more likely to be out of school. Some studies examine the effect of cash transfer programs for refugee households on their children's schooling and employment outcomes (see De Hoop et al. (2019), Moussa et al. (2022), and Altindag and O'Connell (2020) for Lebanon, and Aygun et al. (2021) and Ozler et al. (2020) for Turkey).

ethnic group allow us to side-step issues related to the selective nature of economic migration and migration policies that change immigrant compositions. In fact, using both the 2009 Syria Family Health Survey and the 2018 TDHS, we show that the educational distribution of the Syrian refugees in Turkey is similar to that in Syria in 2009—adjusting for the birth cohorts and for the distribution of origin Syrian provinces of the refugees in Turkey. Therefore, we can better assess the role of individual and household level factors that give rise to educational inequalities.

Third, we contribute to the "critical age at arrival" discussion in the literature demonstrating that immigrants who arrive at younger ages typically have smaller education gaps than those who arrive older (Ansala et al., 2020; Basu, 2018; Böhlmark, 2008; Chiswick and DebBurman, 2004; Gang and Zimmermann, 2000; van Ours and Veenman, 2006).[7] The critical age at arrival for migrant children is reported to be 10 in the context of Sweden by Böhlmark (2008), 4 for Turkish and Moroccan girls in Holland but 11 for boys by van Ours and Veenman (2006), and 9 for Mexican-descent and 12 for European-descents immigrants to the US by Gonzalez (2003). The identified critical age at arrival we find for school integration (age 8) corresponds to a couple of years after the school start age of 6 in Turkey. An important issue to emphasize here is that migrant children's age at arrival could be endogenous in the context of economic migration, where children may join their parents some years later; however, our micro-level data show that 90.2 percent of the children in our sample arrived in Turkey in the same year as the household head, 95.4 percent arrived within one year, at most, and 98.2 percent arrived within two years, at most. In other words, in a forced migration context, it is difficult for household heads to choose the time that their children arrive.

Fourth, we demonstrate the critical interplay between school enrollment and child labor among refugee children, which is likely to be particularly important for migrant and refugee children in poorer host countries. For example, the timing of increased school dropouts among refugee boys coincides with their entry into the labor market in large numbers. Moreover, our finding of critical age at arrival of 8 applies to both school enrollment and child labor among refugee boys. This finding highlights a policy challenge, suggesting that school enrollment of children in impoverished households cannot be improved without addressing the opportunity costs of schooling. In this sense, Turkey's Emergency Social Safety Net (ESSN) program, which provides

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[7] Earlier age at arrival implies, conditional on age, better proficiency in the host country's language, cultural assimilation, and a longer amount of time spent in the host country's schooling system.

unconditional cash transfers to refugee households according to specific eligibility criteria (primarily based on household composition), is potentially a critical intervention.

2. Background Information

2.1 Syrian refugees in Turkey

Refugees fleeing the war in Syria began entering Turkey in the Spring of 2011. In the beginning, they were housed in public buildings, with the expectation that this would be a short-lived circumstance. However, as the war escalated and larger numbers of refugees sought refuge in Turkey, camps were established by the Disaster and Emergency Management Agency (AFAD) to house the refugees. By the end of 2013, nearly 200 thousand refugees were hosted in 21 camps (Kirisci and Ferris, 2015), and their total number reached almost 600,000, as shown in Appendix Figure A1. As the war dragged on, the number of refugees further increased, and a higher proportion of refugees began to live in off-camp areas. By the end of 2015, the number of Syrian refugees totaled 2.5 million, only about 10 percent of which lived in refugee camps. By the end of 2018, the year that the TDHS was conducted, the number of Syrian refugees had reached 3.6 million, at which time, only 1.5 percent of Syrian refugees were in camps.

The status of Syrian refugees in Turkey is somewhat peculiar because they are not recognized as refugees under Turkish law.[8] In 2014, they were given "temporary protection status" (Directive no. 2014/6883; published in Official Gazette on 10/2/2014), and with it, access to free health and education services and public assistance.

2.2 Schooling systems and educational outcomes

The Turkish educational system offers 12 years of compulsory education structured into 4 years of primary, 4 years of lower-secondary, and 4 years of upper-secondary (high school) education. All children in Turkey, including foreign nationals and children with temporary protection status, are entitled to 12 years of free education in public schools. The Syrian education system is somewhat different from the education system in Turkey in that it consists of 6 years of primary education, 3 years of lower-secondary (middle school), and 3 years of upper-secondary (high

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[8] Turkey signed the Geneva Convention on the Status of Refugees with geographical limitations.

school) education. Primary and lower-secondary education are compulsory, but upper-secondary education is not (Emin, 2016).

Figure 1 presents the enrollment rates of Syrian children aged 7–17 in pre-war Syria in 2009 and compares them to those in Turkey in 2008. At the time, compulsory education in Turkey was limited to 8 years; therefore, children in both countries were expected to stay in school for about the same number of years. Among 7–11-year-olds, enrollment rates both for girls and boys in the two countries were quite high, exceeding 95 percent. Among children aged 12–17, enrollment rates fell to 69 percent for girls and 67 percent for boys in Syria. We also observe a significant drop in the enrollment rate of Turkish children in this age group but not to the extent observed for Syrians, resulting in a gap of 13 percentage points for boys and 9 percentage points for girls. Enrollment rates by age and gender in pre-war Syria suggest that around 2 percent of Syrian boys and 3 percent of Syrian girls never started school. In contrast, the proportion of children who never started school in Turkey was negligible.

Based on the MoNE statistics, Figure 2 shows that the school enrollment rate of Syrian children was low in the early years of their arrival. For instance, enrollment was only 30.4 percent in the 2014–2015 school year; however, it steadily rose in the following two years, reaching 59.1 percent in the 2016–2017 school year. In the 2018–2019 school year—the year to which the data used in our empirical analysis corresponds—the enrollment rate was 61.4 percent. The latest data for the 2020–2021 school year shows an overall enrollment rate of 64.2 percent. Despite substantial improvements, as Figure 3 shows, more than one-third of children are still out of school (MoNE, 2021a).[9] For the 2020–2021 school year, the highest school enrollment rate is observed for primary and secondary school-age children, at 79–80 percent, and the lowest rate for high school-age children at 39 percent (MoNE, 2021b).

In the early years of the conflict, Syrian refugee children in camps attended schools organized on camp administrators' initiative. These schools followed the curriculum of Syrian schools in the Arabic language of instruction, using Syrian teachers and volunteers.[10] As the number of refugees

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[9] In the 5-year strategic plan of MoNE for the 2019–2023 period, the school enrollment rate is set forth as 75 percent by the year 2023 (MoNE, 2021c).

[10] The education curriculum was designed by the Interim Syrian Government and modified by the Turkish MoNE (Emin, 2016).

in off-camp areas grew over time, such schools were also opened in off-camp areas. In April and September 2013, MoNE published two circulars aimed to set a standard for Syrian children's education.[11] With another circular published a year later (September 2014), these schools were recognized as TECs.[12] In the same year, Syrian refugees were given temporary protection status, and access to public schools along with it; hence, starting with the 2014–2015 school year, Syrian children could choose to attend TECs or public schools.

TECs were criticized for fostering cultural and linguistic separation between Syrian refugees and host communities (Amaç and Yaşar, 2017). In response to these criticisms, and with the realization that Syrian refugees are unlikely to return to Syria for years to come, 15 hours of Turkish lessons per week were added to the program starting with the 2016–2017 school year (Emin, 2016). Another measure was the requirement for children starting first, fifth, and ninth grades either in TECs or public schools to follow the Turkish curriculum (Çoşkun et al., 2017). A gradual transfer of students from TECs to public schools was also planned. As of the 2019–2020 school year, TECs are closed and nearly all students are transferred from TECs to public schools (MoNE, 2021c).

During the transition of Syrian refugee children from TECs to public schools, a series of programs were implemented to ease their integration. These interventions funded by international organizations complemented MONE's efforts. Among these programs, Promoting the Integration of Syrian Children into the Turkish Education System (PICTES) was unique due to its scope and size (Arık Akyuz et al., 2018). PICTES was implemented under the FRiT framework (The EU Facility for Refugees in Turkey), with a budget of 300 million Euros for the 2016–2018 period. Interventions such as Turkish and Arabic language education, early childhood education, remedial courses, transport support, and school supplies were financed through PICTURES in the 23 most refugee-dense Turkish provinces (MoNE, 2020). Another program that aims to promote the school integration of refugee children in Turkey is the Conditional Cash Transfer for Education program. This program, which has been running with UNICEF support since 2003, was extended in 2017 to include refugee children (TRC, 2018).

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[11] Circulars dated 4/26/2013 and 9/26/2013 (no. 10230228/235/2693370).

[12] Circular no. 10230228/235/4145933 dated 9/23/2014.

2.3 Labor market outcomes, income, and poverty among refugees

Syrian refugees did not have the right to work until 2016, except for special circumstances.[13] While 7,692 work permits were issued to Syrians between 2011 and 2015, this number increased to 132,618 between 2016 and 2019 (Turkish Ministry of Labor, 2022).[14] However, the TDHS-S data suggest that nearly 60 percent of adult male Syrians work, representing about 715,000 persons. The employment rate among adult women is meager, at 5.9 percent.[15] Employed Syrians overwhelmingly (98 percent) work in the informal sector (Demirci and Kirdar, 2021), holding low-skill jobs in construction, agriculture, and textile manufacturing (Erdoğan, 2014; Ferris and Kirisci, 2016; ILO, 2021). As a result, they earn less than natives. Pinedo-Caro (2020) reports that although the majority of Syrian men work long hours, they earned 1,300 TL per month on average in 2017, which was 7 percent below the minimum monthly wage in that year.

Paid employment is also quite frequent among refugee children. Based on the 2018 TDHS-S, Dayioglu et al. (2021) calculate that a remarkable 48 percent of boys aged 15–17 are in paid employment, although the corresponding number for girls aged 15–17 is much lower, at 8.5 percent. Dayioglu et al. (2021) also report that the above rates are much higher than the employment rates of children in Syria before the war. According to the 2009 Syrian Family Health Survey (SFHS), the paid employment rate among 15–17-year-olds was 29 percent for boys and 4.2 percent for girls.

The majority of Syrian refugees live in poverty. The UN World Food Programme (2016) reports that 28.6 percent of Syrian refugees that resided outside camps were food insecure, and 93 percent were below the national poverty line. In the pooled sample of natives and Syrian refugees in the 2018 TDHS, over three-quarters of the Syrian refugee population are in the bottom wealth quintile (Dayioglu et al., 2021).

Syrian households have received various kinds of social assistance since their arrival. The most important among these has been the ESSN program. This unconditional cash transfer program was

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[13] Decree no 2016/8375 published in Official Gazette no. 29594 dated 1/15/2016.

[14] These numbers do not correspond to the number of individuals because an individual might receive multiple permits due to time-limited permits. Nimer and Rottmann (2021) discuss the reasons for this low enrollment.

[15] Using the 2009 Syrian Family Health Survey (SFHS-2009), we estimate that the employment rate of adult women in pre-war Syria was 12.9 percent.

first implemented in November 2016, reaching 1.8 million refugees as of February 2021 (IFRC, 2021). Moreover, the amount of pay is sizable; for the average Syrian household with six members (based on the 2018-TDHS-S), the monthly payment is 720 TL (around USD 105), excluding top-ups. Aygun et al. (2021) calculate that this monthly payment is about 36 percent of the average monthly consumption value of refugee households in the nationally representative micro-level dataset used in their study. More importantly, they find that these cash transfers substantially alleviate extreme poverty, reduce a family's need to resort to harmful coping strategies, reduce child labor, and increase school enrollment for both boys and girls.

3. Conceptual Framework

In the educational investment model of Schultz (1961) and Becker (1993), it is optimal to continue to invest in schooling as long as the marginal rate of return from investing each additional unit of funds is higher than its marginal cost (interest rate). The marginal rate of return to schooling is the difference between the marginal benefits (increase in earnings and psychic benefits of schooling) and the marginal production cost of investing in it (direct expenses, foregone earnings as the opportunity cost, and psychic costs). Within this framework, it is not clear a priori whether refugees would invest more or less in schooling. The marginal benefits of schooling could be higher for refugee children because education allows them to acquire host-country-specific human capital (such as language skills and familiarity with the environment) faster than natives. In contrast, the opportunity cost of children's schooling would be higher for refugee families because they are poorer, on average; hence, their children need to work. Moreover, the productivity of schooling could be lower for refugee children, as their parents are less educated, and they might face language challenges.

In the decision-making process outlined above, an important feature of the environment surrounding the refugee children in Turkey is the uncertainty regarding their future location. Investment in Turkish-language education would have low returns in the case of a return to Syria. This is only relevant for refugee children who enroll in public schools, which became possible in 2014, as children enrolled in TECs received instruction in Arabic. Although the number of students in public schools has exceeded the number in TECs since the 2017–2018 school year (Figure 2),

Syrian refugees have also become more likely to permanently settle, as the duration of their residence in Turkey increased (Balcilar and Nugent, 2019).

4. Data and Empirical Methodology

4.1 Data

The data for this study are obtained from the Turkey Demographic and Health Survey (TDHS), which is conducted every five years to gather information on demographic and health outcomes of women and children. For the first time in 2018, the TDHS included a module (TDHS-S) to collect information on Syrian refugees in Turkey. The questionnaires used in both surveys were essentially the same, with some additional questions added to the Syrian questionnaire to elicit information relevant to the Syrian sample. Both the TDHS and TDHS-S collect rich information on sample households' demographic and socioeconomic characteristics, including children's schooling, irrespective of whether or not they live with their mother. In addition, both the TDHS and TDHS-S are representative of their respective populations. Our main target group is school-aged children. Considering late school entry for both Turkish and Syrian children, we restrict the sample to 7–17-year-olds. There are 3,950 children in this age group in the Turkish sample, and the Syrian sample includes 1,460 for a total of 5,410 children aged 7–17 in the pooled sample.

The main outcome variables in our analysis are school enrollment, paid employment, and children's marital status. Employment and marital status information are gathered for individuals 12 years of age and above; therefore, our analyses on children's paid employment and ever-married status are based on 12–17-year-olds. As additional school outcomes, we examine ever starting school, grade for age, grade progression, grade repetition, and school dropouts. In examining ever starting school, we restrict the sample to 8–17-year-old children, as some children delay school entry. We generate school performance indicators of progression, repetition, and dropouts using the information on children's grade levels in previous and current school years. Therefore, these outcomes are defined conditional on enrollment in the previous school year.

The TDHS includes detailed information on the demographic and socioeconomic characteristics of children and their households. Apart from basic demographics, we have information on

children's age at arrival in Turkey,[16] the survival status of their parents, their relationship to the household head (son/daughter, son/daughter-in-law, nephew, brother, and other familial designations), current region of residence (12 regions of Turkey at the NUTS-1 level), and the type of place they reside in (urban/rural/camp). Household level information includes household wealth, household composition, number of adult household members in paid employment, female headship, age and education level of the head, and whether the head is employed. Household wealth is accounted for using dummies for various deciles of wealth, [17] where deciles higher than 5 are grouped with the fifth decile because few refugee households exist in higher deciles. Household composition variables include household size, number of children aged 7–17, number of children under age 7, and number of elderly (above age 65). Although we primarily rely on the TDHS-S for empirical analysis, we also use the 2008 Turkey Demographic and Health Survey (TDHS-2008) and 2009 Syria Family Health Survey (SFHS-2009) as complementary data sets to provide information on the enrollment rates of Turkish and Syrian children in the pre-war period.

4.2 Descriptive statistics

Table 1 presents the descriptive statistics for native and refugee children. Panel (A) shows that the average school enrollment rate is 92 percent for native children (ages 7–17) but only 63.7 percent for Syrian refugee children. In contrast, the average employment rate is higher among Syrian children, as shown in panel (B). While only 4.4 percent of native children (ages 12–17) are in paid employment, 20.3 percent of Syrians are. The paid employment rate of Syrian boys is remarkable, at 32.4 percent. Panel (B) also shows that Syrian children (ages 12–17) are more likely to be married, as 5.1 percent of refugee children are ever-married compared to less than 1 percent of native children.

Panel (C) presents a remarkable native–refugee gap in the fraction never enrolled in school among 8–17-year-old children. While 0.9 percent of native children have never been to school, it is 11.1 percent for refugee children. Panel (D) of Table 1 presents grade progression outcomes conditional on school enrollment. Refugee children are 6 percentage points less likely to progress to the next grade level. Of this difference, 4.7 percentage points come from a higher likelihood of grade

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[16] We generate this variable using the information on the date of arrival and the child's age.

[17] Household wealth is constructed by adding 21 different household assets defined as dichotomous (0-1) variables.

repetition and 1.4 percentage points from a higher probability of dropout. In addition, while not much gender difference exists among natives in grade progression, refugee boys are about 4 percentage points less likely to progress than refugee girls.

As shown in panel (A) of Table 1, the average age of refugee children at arrival is just under 8, and the average number of years spent in Turkey is almost 4. Appendix Figure A2 provides the histograms of age at arrival and years in Turkey for the refugee sample. The density at each tail of the age at arrival distribution (when age at arrival is 0 or 1 and 15–17) is much lower. About 90 percent of the sample have been in Turkey for 2–6 years, and about 7.5 percent have been in Turkey for less than 2 years.

The summary statistics for the control variables in panel (A) show that refugee households predominately reside in urban areas; only about 5 percent of children are in camps. Nearly three-quarters of native children are in urban areas, and the rest are in rural areas. The most striking difference between the two groups of children pertains to household income. A total of 43.6 percent of refugee children are in the lowest wealth decile, and another 36.5 percent are in the bottom second decile; therefore, over 80 percent of refugee children are in the bottom quintile. In contrast, less than 10 percent of native children are in the bottom quintile of the wealth index.

Syrian children have more crowded households, with more dependents but fewer employed members, and have younger and less educated household heads than native children. A significant difference in parental survival also exists between the two groups of children. While 2.3 percent of native children have lost their fathers and less than 1 percent have lost their mothers, the corresponding figures for Syrian children are 7.6 and 1.6 percent, respectively.

Figure 3 compares the fractions of Syrian and Turkish children, by gender, enrolled in school in panel (A), in paid employment in panel (B), and ever-married in panel (C). As shown in panel (A), Syrian children have lower enrollment rates, regardless of age and gender.[18] However, the gap widens after age 12. Panel (B) provides clues about Syrian boys' drop in enrollment rate. Syrian boys have remarkably high employment rates, particularly after age 15. Moreover, a comparison of the plots in panels (A) and (B) indicates a joint movement between boys' enrollment and paid work. For instance, the paid employment rate of Syrian boys exhibits sharp hikes from age 12 to

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[18] Syrian children have a lower enrollment rate at age 7 than at ages 9–11, suggesting a late school start for some.

13 and especially from age 14 to 15, and we also see significant drops in enrollment rates at the same age transitions. This is not visible for girls due to their lower paid employment rates.

Panel (C) shows that ever-married rates of Syrian girls rise remarkably after age 15. About 40 percent of 17-year-old Syrian girls are ever-married. However, a comparison of panels (A) and (C) does not suggest a co-movement between ever-married and enrollment status among girls. School dropouts among girls mostly occur by age 15; however, marriage before this age is rare. In contrast, as marriage remarkably accelerates after age 15, no substantial drop in the enrollment rate of girls occurs. This suggests that girls do not leave school to marry, at least in large numbers.

4.3 Estimation

In the estimation of native–refugee differences by gender, we pool the school-age children in our sample (7–17-year-olds) and use the following specification,

$$y_i = \alpha_0 + \alpha_1 syrian_i + \alpha_2 fem_i + \alpha_3 syrian_i * fem_i + \sum_{j=7}^{17} \beta_{j-6} * I(age = j) + X_i' \Psi + u_i,$$

(1)

where y_i stands for enrollment status; $syrian_i$ is a dummy variable for Syrian refugees; fem_i is a dummy variable for girls; $I(age = j)$ is an indicator function that takes the value of one if age is equal to j and zero otherwise; X stands for all other control variables (as explained above and presented in Table 1); and u is the error term. Some essential characteristics of refugee children that would affect their schooling, such as age at arrival and years since arrival, do not enter equation (1) to allow us to easily interpret the coefficient of the Syrian dummy; however, we examine how the age at arrival and years since the arrival of refugee children matter in separate heterogeneity analyses.

Equation (1) estimates the native–refugee differences by gender, but assumes common age effects by refugee status and gender. We also seek to understand the native–refugee differences by gender at each age separately. For this purpose, in an alternative specification, we extend equation (1) to include full interactions of refugee status, gender, and age dummies to estimate native–refugee differences by age and gender, as follows.

$$y_i = \gamma_0 + \sum_{j=7}^{17} \gamma_{j-6} * I(age = j) + \sum_{j=7}^{17} \delta_{j-6} * syrian_i * I(age = j) + \sum_{j=7}^{17} \varepsilon_{j-6} * fem *$$
$$I(age = j) + \sum_{j=7}^{17} \zeta_{j-6} * syrian_i * fem_i * I(age = j) + X_i' \Phi + v_i,$$
(2)

where δ_j denotes the native–refugee gap among boys at age j, ε_j stands for the gender gap at age j, and ζ_j shows the difference in the native–refugee gap between girls and boys at age j.

We further extend equation (1) in two alternative ways, allowing the refugee effect to vary by (i) age at arrival and gender, as given in equation (3), and (ii) years since arrival and gender, as given in equation (4).

$$y_i = \eta_0 + \eta_1 syrian_i + \eta_2 fem_i + \eta_3 syrian_i * fem_i + \sum_{j=7}^{17} \theta_{j-6} * I(age = j) + \sum_{j=0}^{17} \kappa_j * syrian_i *$$
$$I(age\ at\ arrival = j) + \sum_{j=0}^{17} \lambda_j * syrian_i * fem * I(age\ at\ arrival = j) + \boldsymbol{X_i' \Gamma} + w_i, \qquad (3)$$

$$y_i = \mu_0 + \mu_1 syrian_i + \mu_2 fem_i + \mu_3 syrian_i * fem_i + \sum_{j=7}^{17} \xi_{j-6} * I(age = j) + \sum_{j=0}^{7} \pi_j * syrian_i *$$
$$I(years\ in\ Turkey = j) + \sum_{j=0}^{7} \rho_j * syrian_i * fem * I(years\ in\ Turkey = j) + \boldsymbol{X_i' \Theta} + z_i, \quad (4)$$

All equations are estimated using ordinary least squares. Sampling weights at the household level are used. Standard errors are clustered at the household level as children from the same household enter the regression.

5. Results

5.1 Native–refugee differences in school enrollment

5.1.1 Main results

Table 2 displays the native–refugee differences in school enrollment and how they change as we gradually add groups of control variables for background characteristics, which come from the estimation of equation (1). In the baseline specification, where we only control for age, survey month, and child's relationship to the household head, Syrian boys are 32.3 percentage points less likely to be enrolled in school than Turkish boys; however Syrian girls do somewhat better, being 24.8 percentage points less likely to be in school than Turkish girls. This pattern of Syrian girls faring better than Syrian boys compared to natives holds in all specifications. The reasons for this will become apparent when we examine child labor.

In columns (2)–(6) in Table 2, we add different groups of control variables, and in column (7), we add them all together. As demonstrated in the table, introducing each group of controls reduces the native–refugee gap, and the key control variable is household wealth. Introducing this control variable in column (3) reduces the native–refugee gap for boys from 32.3 to 17.3 percentage points. When we introduce all control variables in the final column, the gap for boys drops by more than half, from 32.3 to 15.4 percentage points. Similarly, the gap for girls decreases from 24.8 to 8.2 percentage points. In other words, socioeconomic differences between natives and Syrian refugees explain a substantial part of the differences in school enrollment rates; however, they do not eliminate them.

In panel (B) of Table 2, we restrict the sample of Syrian refugee children to those who arrived in Turkey at age 8 or earlier.[19] The results change tremendously in this case. In column (1), with the baseline specification, refugee boys (girls) are 15.8 (14.2) percentage points behind native boys (girls) in school enrollment. No significant difference exists between refugee boys and girls in this sample regarding comparison with natives of the same gender. The critical finding is that the native–refugee gap vanishes when we control for all background characteristics in column (7).

These findings provide us with two critical insights. First, a large part of the difference in the school enrollment of Syrian and native children can be explained by socioeconomic characteristics. In fact, the gap reduces by more than half for boys and falls by two-thirds for girls. Nonetheless, the native–refugee gap persists, even after controlling for these background characteristics. The second insight is that the gap between native and refugee children completely disappears once we consider refugee children who arrived in Turkey at or before age 8 and account for the differences in the socioeconomic characteristics simultaneously.

5.1.2 Heterogeneity by age

This subsection examines the native–refugee differences in the predicted enrollment rates by age and gender, using equation (2). Figure 4 reveals that the native–refugee gap in enrollment (shown

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[19] The reason for the selection of this particular age will become apparent when we examine the differences by age at arrival by estimating equation (3).

above in Table 2) stems from the gap at ages 12–17 for boys and at ages 13–17 for girls.[20] It is important to note that we do not interpret these as age effects on enrollment, but rather examine the predicted enrollments by age. This is because older refugee children in our sample enter Turkey on average at a later age; hence, these effects confound the effects of age and age at arrival—an issue that we examine in the next subsection. Figure 4 also indicates that, at each age, Syrian boys fare worse than girls in school enrollment in comparison to their native counterparts. This finding is in line with the observations in panel (B) of Figure 3, where Syrian boys are more likely to be in paid work than Syrian girls at each age, and particularly after age 15.

5.1.3 Heterogeneity by age at Arrival and years since arrival

Figure 5 shows how refugee–native differences in school enrollment vary by age at arrival (Panel A) and years in Turkey (Panel B) for boys and girls separately based on the results of estimating equations (3) and (4), respectively. Note that both equations also include age dummies as controls. The refugee–native differences by age at arrival display striking patterns. As shown in panel (A), the refugee–native difference in predicted school enrollment widens sharply once age at arrival takes a value higher than age 8. This widening gap is especially pronounced among boys. Essentially, refugee children who arrive after age 8 are at a disadvantage. Quantitatively, for refugee children who arrive at age 10, the native–refugee gap is 33 percentage points among boys and 27 percentage points among girls. This gap becomes 43 and 30 percentage points for boys and girls, respectively, for refugees arriving at age 12. For those arriving at age 15, the gap reaches 52 and 28 percentage points for boys and girls, respectively. Conversely, for children who arrive at age 8 or earlier, there is no evidence of a refugee–native gap (after accounting for age and several background characteristics)—in line with our findings in panel (B) of Table 2. These findings highlight how critical age at arrival is for refugee children's school enrollment.[21]

Panel (B) of Figure 5 demonstrates how refugee–native differences in school enrollment vary by years since arrival. Evidence of a refugee–native gap among boys exists for all values of duration

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[20] Essentially, the native–refugee differences given in Table 2 are weighted averages of the age-specific native–refugee differences in Figure 4.

[21] In the context of Hispanic immigrants in the US, Akresh and Akresh (2011) find that foreign-born children taking achievement tests in English rather than in their native language (Spanish) are at a disadvantage; however, foreign-born children who arrive in the US at an early age do not benefit from taking the test in Spanish.

of residence in Turkey; however, among boys, the gap is wider for more recent arrivals. In fact, the gap during the first year of residence is vast. Among girls, evidence of a sizable refugee–native gap in school enrollment also exists during the first year of residence; however, the gap becomes much narrower beyond the first year. Quantitatively, the refugee–native gap in predicted enrollment is 45 percentage points for refugee boys and 36 percentage points for refugee girls during their first year of residence in Turkey. In essence, refugee children are particularly less likely to be enrolled in school during their first year of residence. This implies that policies to integrate refugee children should start immediately after their arrival in the host country.

A limitation of the above analysis by years in Turkey is that since our data include a single cross section, years in Turkey also stand for the year-of-arrival. If the unobserved characteristics of the year-of-arrival cohorts change over time, the variable on the duration of residence would capture the variation across year-of-arrival cohorts, as well as the integration effect over time. Although we cannot examine these unobserved characteristics, we can at least examine how the observed characteristics of different year-of-arrival cohorts compare (Appendix Table A1). First, we should note that the number of observations for the latest two year-of-arrival cohorts (2017 and 2018) and for the earliest cohort (2011) is much fewer than the middle cohorts. Appendix Table A1 shows that not much difference exists in household size and composition, household wealth, survival status of parents, and household head's age across year-of-arrival cohorts of children; however, we observe that the household heads of the latest two arriving cohorts are slightly more educated. This finding may raise concerns that these cohorts are more positively selected. This is likely to be a minor concern given the modest magnitudes of the differences. Moreover, the effect of any positive selection would be an underestimation of the estimated enrollment gap between children with less than two years in Turkey and the rest in Figure 5.

5.2 Robustness checks

5.2.1 Robustness of the results on enrollment by age at arrival

Results by year-of-arrival cohorts

There is fundamental collinearity between age, age at arrival, and years in Turkey; hence, the age at arrival effects in equation (3)—estimated controlling for age—also partially captures the effects of years in Turkey. In particular, holding age constant, when we increase the age at arrival by one,

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we decrease the years in Turkey by one. As shown in panel (B) of Figure 5, the change in the years in Turkey matters in the first two years of residence but not much afterward. Therefore, in this section, we put restrictions on the year-of-arrival (and hence on the years in Turkey) in our sample. First, we exclude children who arrived in 2017 and 2018 because the first two years of residence matter to the enrollment outcomes. We also exclude children who arrived in 2011 because this cohort is somewhat different in certain characteristics, as are the 2017 and 2018 cohorts (see Appendix Table A1). Hence, we are left with the 2012–2016 cohorts, which constitute 89.2 percent of our sample. Then, we estimate equation (3) using four alternative year-of-arrival groups: 2012–2013, 2013–2014, 2014–2015, and 2015–2016. For instance, when we estimate equation (3) with a sample including only the 2012 and 2013 arrival cohorts, increasing the age at arrival by one implies decreasing the years in Turkey from 6 to 5, which does not matter much and certainly does not matter as much as decreasing the years in Turkey from 1 to 0.

Figure 6 presents the results of this analysis for the four groups of year-of-arrival values in panels (A)–(D). For the 2012–2013 cohorts in panel (A), the native–refugee gap first occurs at the age at arrival value of 8 for both boys and girls. In panel (B), we observe the gap first at the age at arrival value of 8 for girls and 9 for boys. In panels (C) and (D), the age at arrival value is 9 for boys and a bit later for girls. Essentially, our finding in Figure 5 that the refugee–native difference in predicted school enrollment widens sharply once age at arrival takes a value higher than 8 holds.

Results by age groups

Children arriving under age 8 are younger at the time of the survey by construction, and we know the refugee–host gap grows with age. Although the age fixed-effects control for this, if the supports do not have much overlap, a weighting issue could be driving some of these effects; hence, we examine the robustness of our findings by taking narrower age bands in our estimation. Figure 7 displays the refugee–native differences in predicted enrollment by age at arrival for six different age intervals: [7,12], [8,13], [9,14], [10,15], [11,16], and [12,17]. For the younger age groups in panels (A) to (C), differences in enrollment between natives and refugees appear at the age at arrival value of 8 for both boys and girls. For the older age groups in panels (D) and (E), the differences emerge at age 9 for boys and slightly later for girls. In addition, the widening native–refugee gap after age 8 is more visible for boys than girls, as in Figure 5. Essentially, the key

finding in Figure 5 regarding how age at arrival matters for refugee children's school integration holds for alternative age groups.

5.2.2 Alternative ways of accounting for wealth

The distribution of household wealth substantially differs between natives and refugees (Table 1), and household wealth is a key variable in accounting for the native–refugee schooling gaps (Table 2). In the estimation equations, household wealth is entered as decile dummies (where deciles above the fifth are grouped due to the low incidence of refugees in this part of the distribution). Here we estimate equation (2) using household wealth as a continuous variable.[22] The results given in Appendix Table A2 validate our key finding that the native–refugee gap vanishes once we restrict the sample of refugee children to those arriving before age 8 and account for the covariates. Moreover, the magnitudes of the estimated coefficients are similar.

Next, we conduct our analysis by restricting the native and refugee samples to the bottom two quintiles of the wealth distribution, as most Syrian refugees are in this part of the distribution. Appendix Table A3 shows that our qualitative findings are robust. Quantitatively, the baseline gap for boys in this restricted sample is 22.3 percentage points, and this reduces to 11.1 percentage points once we account for all sets of covariates, indicating a percentage drop of about 50 percent, as in Table 2 with the full sample. In addition, panel (B) of Table A3 indicates that once we restrict the sample of refugee children who arrive at age 8 or earlier, the baseline gap for boys is 10.7 percentage points, and this reduces to 0.1 percentage points controlling for all set of covariates. The patterns are similar for girls, but the magnitudes of the gaps are smaller. In essence, our key finding holds that school integration of refugee children is possible if they arrive before age 8.

5.2.3   Potential educational selection in the arrival of Syrian refugees

Ferris and Kirisci (2016) report that most of the refugees stated that they left Syria for security reasons and chose Turkey as their destination due to proximity. In this context, wherein refugees flee to a neighboring country, self-selection in the migration decision is less likely. Nonetheless, using both the 2009 SFHS and the 2018 TDHS, we check for any evidence of a selection in terms of educational attainment of Syrian adults. There are two important caveats in this exercise. First,

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[22] It takes integer values from 0 to 21.

since Syrian refugees in Turkey are disproportionately from the northern part of the country, we make an adjustment using the information in the 2018 TDHS regarding the birth province of Syrian refugees.[23] In particular, after we calculate the educational distribution for each province in Syria using the 2009 SFHS, we weight them using the province of birth distribution of Syrian refugees in Turkey. Second, due to the 9-year gap between the two surveys, we conduct our analysis by birth cohorts. In particular, we compare the educational attainment of the same birth cohorts in Syria and in Turkey.

Appendix Table A4 provides the results. For the younger birth cohorts (1979–1988 and 1969–1978), the share with at least a primary school degree is similar; however, the share with at least a secondary school degree is 7–9 percentage points higher for the refugees in Turkey, and the share with at least a high school degree is slightly higher as well. In other words, refugees are somewhat more positively selected in terms of education among the younger birth cohorts. The results are mixed for the 1959–1968 and 1949–1958 birth cohorts; while the fraction with at least a primary school degree is lower among the refugees, the fractions with at least a secondary school degree is higher. For the 1939–1948 and 1929–1938 birth cohorts, the educational attainment of refugees is somewhat lower at each level of attainment. Overall, Appendix Table A4 shows no evidence of a significant selection in terms of educational attainment in the exodus of Syrian refugees into Turkey.

5.3 Understanding school enrollment gaps in the context of child labor and marriage

In this section, we repeat the analysis in Section 5.1 using paid employment and marriage as dependent variables to understand the relationships between the native–refugee schooling gaps reported in the previous sections with the gaps in child labor and marriage.

5.3.1 Native–refugee differences in child labor

Table 3 replicates the analysis in Table 2 when the dependent variable is children's paid employment. Interestingly, the patterns are very similar to those in Table 2. In panel (A) of Table 3, the baseline specification shows that refugee boys are 27.4 percentage points more likely to be

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[23] We assume that refugees in Turkey did not change provinces between birth and the time of their exodus to Turkey.

in paid employment than native boys. In contrast, the gap is much narrower among girls, at 6.5 percentage points. Once we account for socioeconomic characteristics, the gap between native and refugee boys reduces to 19.4 percentage points and vanishes for girls.

Panel (B) of Table 3 shows that when we restrict the refugee sample to those arriving in Turkey at or before age 8, the refugee–native gap in paid employment among boys at the baseline reduces significantly (from 27.4 to 9.6 percentage points). In addition, once we account for socioeconomic characteristics, the statistical evidence of a refugee–native gap vanishes. Quantitatively, the gap decreases to 3.2 percentage points. These results are very much in parallel with the findings for children's schooling outcomes.

In essence, we find that refugee boys are much more likely to be in paid employment than native boys, whereas a small gap exists among girls. Once we account for the socioeconomic differences between natives and refugees, the gap in paid employment among girls vanishes; however, the gap among boys persists, albeit at a much lower level. As was the case for school enrollment, once we restrict the refugee sample to those who arrived at early ages, the gap in paid employment among boys also vanishes. These results suggest that an essential reason for the refugee–native gap in school enrollment of boys is their much higher probability of paid employment. It also explains why the refugee–native gap in school enrollment is wider for boys than girls in Table 2.

5.3.2 Native–refugee differences in marriage

Table 4 presents the results in which the dependent variable is ever-married status. The estimates in panel (A) for the full sample indicate no evidence of a gap between native and refugee boys. The small and imprecisely estimated gap at the baseline (0.5 percentage points) turns negative when we include all control variables. Conversely, a clear gap exists among girls at the baseline, which falls by half (from 2.2 to 1.1 percentage points) when we add all control variables. Although this gap is not statistically significant at the conventional levels, its magnitude is still notable given that 10.2 percent of 12–17-year-old girls are ever-married.

When we restrict the refugee sample to those who arrived at or before age 8 in panel (C), no evidence of a native–refugee gap in girls' ever-married status is observed, even with the baseline specification; however, when we increase the arrival age to 12 (Panel B), the lowest age that girls are likely to enter the marriage market, a gap of 0.9 percentage points emerges at the baseline. The

inclusion of all controls closes this gap. These results essentially suggest that while refugee girls are at a higher risk of marriage, this is driven by those who arrived in Turkey at older ages (after age 12). In other words, the critical age at arrival for marriage among girls is higher (age 12) than the critical age at arrival (age 8) for school integration.

5.3.3 School enrollment, paid employment and marriage by age, age at arrival, and years in Turkey

Figure 8 compares the native–refugee gaps in predicted paid employment and predicted marriage by age, age at arrival, and years in Turkey with the corresponding patterns in predicted enrollment. This analysis provides us with further clues about the observed patterns in the native–refugee enrollment gap. Panel (B) of Figure 8 shows that the native–refugee gap in boys' paid employment exists at each age after 12. At the same time, the gap becomes substantially more pronounced after age 15, reaching above 30 percentage points. In other words, refugee boys are more likely to be paid workers than native boys, particularly after age 15. In contrast, we observe no such gap in paid employment between native and refugee girls. The much higher employment rates of refugee boys, particularly at ages 15–17, coincide with their declining school enrollment rates.

Panel (C) of Figure 8 shows the native–refugee gap in ever-married status by age. The gap among girls becomes visible after age 15. It is about 2 percentage points at ages 15 and 16 but statistically insignificant at the 5 percent level. The gap rises to 6.6 percentage points at age 17 and becomes statistically significant. A comparison of panels (A) and panels (C) indicates that the changes in the predicted enrollment and ever-married rates by age are not parallel for girls. While the predicted ever-married rates rise after age 14, and notably at age 17, the predicted school enrollment rates are relatively constant after age 14.

Refugee–native differences in paid employment by age at arrival, given in panel (E) of Figure 8, show patterns that are consistent with those for school enrollment in panel (D). For instance, refugee boys who arrive in Turkey after age 8 are much more likely to be working for wages than native boys. In addition, the changes in predicted enrollment and predicted paid enrollment by age at arrival are quite parallel in panels (D) and (E). Among girls, no difference exists in paid employment between refugee and native children, regardless of the age at arrival. Panel (F) presents the predicted refugee–native differences in ever-married status by age at arrival. For girls,

the predicted gap by age at arrival starts rising after age 12, which is consistent with our findings in Table 4.

Panel (H) shows that refugee–native difference in predicted paid employment for boys exists for all years of residence in Turkey but the first one. This might be expected, as settling in a new country and searching for a job takes time. In line with the previous graphs, no refugee–native difference exists for girls at any value of the duration of residence. Finally, panel (I) reveals that refugee girls with less than two years in Turkey are more than 7 percentage points more likely to be ever-married than natives. Despite its large magnitude, this gap is not statistically significant at conventional levels.

5.4 Other schooling outcomes, including performance indicators

5.4.1 Main results

In the previous sections, we examined enrollment outcomes; however, another important indicator of refugees' school integration is their performance in school. For this purpose, we examine their grade progression, grade repetition, and dropout outcomes in this section. It is important to note that these outcomes are defined conditional on enrollment in the previous school year. Since we use a selected sample of children in this section, we interpret our findings accordingly. To understand this selection, we also examine the status of never enrolling in school. Finally, we also examine grade level attainment conditional on age.

Table 5 presents how the native–refugee gaps in these five outcomes change when we account for the covariates, based on the estimation of equation (1). Panel (A) shows the native–refugee gap in never enrolling in school. Refugee boys and girls are 10.3 and 7.7 percentage points more likely to never enroll in school at the baseline, respectively; and these gaps reduce to 5.5 and 2.8 percentage points once we control for the full set of covariates. As in enrollment, a significant drop occurs in the never enrolled in school gap once we account for the native–refugee differences in socioeconomic characteristics; nonetheless, the gap persists.

Panel (B) shows the gap in grade progression for the sample of enrolled children. The results in panel (A) imply that refugees are a more select group in the pool of ever-enrolled children. Despite this, panel (B) indicates that refugee boys are 5.6 percentage points less likely to progress even

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after accounting for the covariates; however, the gap among girls is much smaller at 1.5 percentage points and statistically insignificant. In other words, among boys in school, refugees are less likely to progress although they are already more selected.

Panels (C) and (D) provide further clues about the gaps in grade progression. Panel (C) shows that both refugee boys and girls are more likely to repeat a grade level. After accounting for the covariates, the repetition probability is 5.9 (3.6) percentage points higher for refugee boys (girls). In contrast, no gap remains in the likelihood of dropping out between refugees and natives for either gender group once we account for the covariates. In essence, refugee children are more likely to never start school but not more likely to drop out conditional on starting. However, conditional on starting, they are less likely to progress because they are more likely to repeat a grade level. Finally, panel (E) shows that refugee children are, on average, a grade behind native children, conditional on age. When we account for all covariates, this gap reduces to about 0.72 grades for boys and 0.66 grades for girls.

5.4.2 Heterogeneity in grade progression by grade level

To examine how the native–refugee gaps in grade progression varies by grade level, we estimate equation (2) replacing age with grade level attained in the previous school year. Figure 9 shows how the predicted probabilities of progressing, repeating, and dropping out change by grade level—conditional on enrollment in the previous school year. Panel (A) shows that, among boys, refugees are less likely to progress in grade 1 and in grades 5–7, despite the fact that they are less likely to ever enroll in school. Among girls, no obvious differences exist in progression between refugees and natives (except for grade 6), which is consistent with the findings in Table 5. As shown in panel (B), refugee boys are more likely to repeat grade 1 than native boys, but no such difference exists among girls. Repeat probabilities for refugee boys and girls are higher than their native counterparts in grades 2–6, but they are marginally statistically insignificant. This pattern is consistent with the finding in Table 5 indicating that the repeat probability (averaged over grades) is higher for refugees among girls and boys. Panel (C) indicates that the dropout probability in the first few grades is lower for refugees because they are more likely to drop out earlier (i.e., never start school). However, refugees' dropout probability vis-à-vis natives increases gradually from grades 2–3 until grades 6–7.

Taken together, these results imply that refugee boys are less likely to progress in grade 1 because they are more likely to repeat this grade level. Refugees have a higher propensity to repeat grades than natives; however, their lower propensity to drop out in primary school grade levels (conditional on remaining in school until these grades) balance the higher likelihood of repeating and no native–refugee gap in progressing exists in primary school grade levels—except for boys in grade 1. Nevertheless, the dropout probability of refugees vis-à-vis natives rises gradually by grade level, becoming higher than that of natives in middle school grade levels. This finding, combined with the already higher propensity to repeat results in a lower probability of progressing in middle school (grades 5–8), especially for boys. It is notable that these grades correspond to the ages at which refugee boys start entering the labor market in large numbers.

5.4.3 Heterogeneity by age at arrival

We estimate equation (3) to see how never enrolling in school, progressing, repeating, dropping out, and grade for age change by age at arrival. As panel (A) of Figure 10 illustrates, while no native–refugee gap in never enrolling in school exists before age 8 for boys or girls, a gap appears after age 8, which is consistent with our findings regarding the relationship between enrollment and age at arrival in Section 5.1. Note that refugee children who arrived in Turkey after age 8 were in Syria during a period of war at the time of their school start age. In panel (B), we observe a native–refugee gap in progressing after grade 8 for boys but not for girls. In other words, age at arrival matters for boys' grade progression but not for girls. Panel (C) shows that age at arrival does not matter much in grade repetition. However, panel (D) demonstrates that the dropout probability at low values of age at arrival is lower for refugees than natives among both boys and girls, but no such difference exists at higher values of age at arrival. Finally, panel (E) of Figure 10 shows that age at arrival is important in the grade for age gap. This gap first appears statistically after the age at arrival value of 3 and grows gradually as age at arrival rises.

Essentially, both the higher probability of never enrolling in school and the higher probability of dropping out for refugee children arriving at or after age 8 contribute to the lower probability of enrollment. In addition, we find that age at arrival is also important for boys' but not girls' grade progression. We attribute this gendered difference to the fact that labor market opportunities are stronger pull factors for boys who arrive at later ages than girls. In addition, age at arrival does not seem to matter in grade repetition for either gender.

6 Discussion and Conclusion

In this study, we examined the integration of Syrian refugee children into the Turkish school system. For this purpose, we used a recent representative dataset on Syrian refugees, the 2018 TDHS-S, conducted as an ad-hoc module of the TDHS, as well as the TDHS.

The data reveal significant differences in school enrollment between native and refugee children. A significant fraction of these differences (about half for boys and two-thirds for girls) can be explained by differences in socioeconomic characteristics between Syrian and Turkish households. A key finding is that once we restrict the refugee sample to children who have arrived in Turkey at or before age 8 and account for the socioeconomic differences, the native–refugee gap completely disappears both for boys and girls. The difference between early arrivers (at or before age 8) and late arrivers in school enrollment stems for the late arrivers' higher propensity to never enroll in school as well as the higher probability of dropping out. We also find a strong association between the timing of school dropouts and the timing of labor market entry among refugee boys, suggesting that these decisions are driven by a similar set of underlying factors. Conversely, no such association is observed between the timing of school dropouts and the timing of marriage among refugee girls.

The native–refugee differences in school enrollment essentially stem from refugees' higher propensity for never enrolling in school. When we control for the socioeconomic differences between refugees and natives, refugees are, on average, no more likely to drop out than natives once they are enrolled in school. In terms of school performance, conditional on enrollment, refugee boys fall behind native boys, although they are a more select group due to their lower enrollment rates. Among boys, refugees are less likely to progress in grade 1, due to a higher probability to repeat, and less likely to progress in middle school grade levels (5–8), due to a higher likelihood to drop out. The timing of the dropout at the middle school level coincides with the timing of entry into the labor market. In addition, both refugee boys and girls lag behind natives in terms of grade for age (about 0.7 grades), even after accounting for the socioeconomic differences.

Our results highlight the importance of age at arrival for refugee children's school integration. While this issue has been examined in some earlier studies, our study circumvents issues related

to the selective nature of economic migration and migration policies that change the immigrant composition, affirming that children who arrive older are at a clear disadvantage. This finding also speaks to the wider literature on migration policies regarding family unification adopted by western countries resulting in the late arrival of immigrant children. As they are less influenced by selective migration and migration policies, our results confirm the evidence from Western Europe and North America that the late arrival of children carries high costs in terms of educational outcomes that may translate into gaps in the labor market and other long-term outcomes.

In our setting, arrival just a few years after school start age is enough to cause possibly permanent deficits in school attainment vis-à-vis native children. Although instruction in Arabic was available in schools established for refugees, it seems that this was not sufficient to overcome barriers caused by difficulties such as schooling interruptions before arriving in the host country, difficulties in school access, and the trauma experienced during the war. In addition, for children who arrive beyond a certain age, another challenge is starting school with native children that are younger than themselves. This implies that special programs for refugee children—especially for those who arrive older—such as remedial and make-up courses, language instruction, the use of Syrian teachers, and counseling (for post-traumatic disorders) are essential. Although Turkey implemented such policies, they were implemented somewhat late, as the country did not have a well-coordinated action to accommodate the refugees in the early years of the conflict, during which it seems that many children dropped out of school. Part of the reason for the slow start of some programs was the expectation that refugees would be repatriated within a short period of time, which may also partially explain families' behavior. Investing in Turkish-specific skills may not be worthwhile after all in Syria.

Differences in the socioeconomic characteristics between Turkish and Syrian households explain a large proportion of the differences in children's schooling outcomes. In particular, household wealth is identified as a key factor, as poverty among the refugee households pushes children into employment. Although evidence for this only exists for boys, as our employment data is limited to paid employment, the opportunity cost of refugee girls' school enrollment is presumably also high due to their contribution to household chores and employment as unpaid family workers. In fact, Dayioglu and Kirdar (2022) report that 16.6 percent of girls but 1.9 percent of boys among 12–17-year-old native children spend at least 16 hours per week (equivalent to the definition of full-time market work) on home chores. This implies that interventions aimed at improving refugee

households' income and living conditions could help improve children's school outcomes. In fact, Aygun et al. (2021) find that the ESSN program substantially improved school enrollment of both boys and girls among refugees. It is critical to sustain this program in the near future to close the schooling gap between native and refugee children. Notably, our findings come from a year in which the ESSN program had reached only a limited number of households.

As the number of refugees surges worldwide, millions of children face the risk of being "left behind" in terms of school attainment. Education is the most crucial tool for the long-term integration of children of refugees, and returns to education could be even higher for refugee children than native children. In contrast, a lack of integration could drive these children into harmful coping strategies and generate social tension between the local population and refugees; therefore, addressing the educational challenges from the very start is essential for refugees' economic and social integration.

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Tables and Figures

Table 1: Descriptive Statistics

	Native Sample			Refugee Sample		
	All	Male	Female	All	Male	Female
A) Full Sample						
Enrolled	0.920	0.925	0.916	0.637	0.605	0.673
Age	12.092 (3.14)	12.055 (3.13)	12.129 (3.15)	11.581 (3.09)	11.664 (3.12)	11.489 (3.05)
Female	0.491	--	--	0.475	--	--
Type of Place of Residence						
Urban	0.746	0.748	0.743	0.949	0.952	0.947
Rural	0.254	0.252	0.257	--	--	--
Camp	--	--	--	0.051	0.048	0.053
Household Wealth Decile						
1	0.028	0.031	0.025	0.436	0.435	0.437
2	0.068	0.069	0.066	0.365	0.361	0.369
3	0.057	0.054	0.060	0.098	0.098	0.098
4	0.164	0.158	0.169	0.079	0.082	0.076
5 or higher	0.683	0.687	0.679	0.023	0.025	0.021
Number HH Members Paid Employed	1.106 (0.71)	1.117 (0.73)	1.094 (0.70)	0.824 (0.81)	0.814 (0.82)	0.836 (0.80)
Household Head Paid Employed	0.719	0.725	0.714	0.453	0.445	0.462
Number of HH Members	5.433 (1.98)	5.356 (1.94)	5.513 (2.00)	7.904 (3.10)	7.808 (3.18)	8.011 (2.99)
Number of Children Aged 7 to 18	2.233 (1.21)	2.172 (1.18)	2.297 (1.23)	3.538 (1.65)	3.481 (1.63)	3.601 (1.67)
Number of Children Under 7	0.549 (0.81)	0.521 (0.79)	0.578 (0.83)	1.457 (1.41)	1.417 (1.43)	1.500 (1.39)
Number of Elderly (above 65)	0.217 (0.52)	0.229 (0.53)	0.204 (0.50)	0.181 (0.45)	0.180 (0.45)	0.183 (0.45)
Household Head Education						
No education	0.072	0.067	0.077	0.134	0.137	0.130
Incomplete primary	0.039	0.040	0.038	0.074	0.078	0.071
Complete primary	0.396	0.388	0.405	0.327	0.320	0.336
Incomplete secondary	0.045	0.046	0.045	0.110	0.112	0.108
Complete secondary	0.107	0.113	0.100	0.185	0.177	0.193
Complete high school / higher	0.335	0.339	0.331	0.161	0.166	0.155
Missing	0.006	0.006	0.006	0.009	0.010	0.008
Household Head Male	0.902	0.915	0.888	0.897	0.893	0.900
Age of Household Head						
15-24	0.006	0.009	0.003	0.019	0.020	0.018
25-34	0.089	0.084	0.094	0.146	0.138	0.154
35-44	0.491	0.496	0.485	0.457	0.452	0.462
45-64	0.370	0.368	0.373	0.352	0.361	0.341
65+	0.044	0.044	0.045	0.027	0.028	0.025
Father Alive	0.977	0.979	0.976	0.924	0.918	0.930
Mother Alive	0.993	0.995	0.991	0.984	0.983	0.985
Number of observations	7,219	3,702	3,517	3,010	1,574	1,436
B) Sample of 12- to 17-year-old children						
Paid Employment	0.044	0.056	0.032	0.203	0.324	0.065
Ever married	0.006	0.001	0.011	0.051	0.007	0.102
Number of observations	4,013	2,051	1,962	1,460	776	684
C) Sample of 8- to 17-year-old children						
Never Been to School	0.009	0.010	0.008	0.111	0.122	0.097
Number of observations	7,215	3,698	3,517	3,009	1,573	1,436
D) Conditional on Enrollment Last Year						
Advanced	0.942	0.944	0.939	0.882	0.862	0.901
Repeated	0.027	0.027	0.027	0.074	0.086	0.062
Dropped out	0.031	0.029	0.034	0.045	0.052	0.037
Grade Level Last Year	6.661 (3.06)	6.602 (3.04)	6.723 (3.08)	4.220 (2.42)	4.114 (2.33)	4.325 (2.50)
Number of observations	6,588	3,381	3,207	1,760	887	873

Notes: The data come from the native and refugee samples of the 2018 Turkish Demographic and Health Survey. Information on paid employment and marital status is available only for 12- to 17-year-old children. Standard deviation for continuous variables are given in parantheses.

Table 2: Difference between Refugees and Natives in School Enrollment Status

	Dependent Variable: School Enrollment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Baseline	Baseline + Region Controls	Baseline + Household Wealth Controls	Baseline + Paid Jobs of HH Members	Baseline + Household Composition Controls	Baseline + Household Head Charac.	All Controls
A) Full Sample							
Syrian	-0.323***	-0.307***	-0.173***	-0.304***	-0.284***	-0.296***	-0.154***
	[0.021]	[0.023]	[0.023]	[0.021]	[0.021]	[0.021]	[0.025]
Syrian * Female	0.075***	0.074***	0.077***	0.073***	0.075***	0.072***	0.072***
	[0.018]	[0.018]	[0.018]	[0.018]	[0.018]	[0.018]	[0.017]
Syrian + Syrian * Female	-0.248***	-0.234***	-0.096***	-0.231***	-0.209***	-0.224***	-0.082***
	[0.020]	[0.023]	[0.023]	[0.020]	[0.020]	[0.020]	[0.025]
Observations	10,228	10,228	10,228	10,228	10,228	10,228	10,228
R-squared	0.283	0.289	0.312	0.289	0.292	0.305	0.334
B) Age at arrival <=8 for Syrians							
Syrian	-0.158***	-0.135***	-0.022	-0.144***	-0.123***	-0.133***	-0.004
	[0.021]	[0.023]	[0.024]	[0.021]	[0.021]	[0.021]	[0.026]
Syrian * female	0.016	0.013	0.020	0.015	0.015	0.014	0.015
	[0.020]	[0.020]	[0.019]	[0.020]	[0.020]	[0.019]	[0.019]
Syrian + Syrian * Female	-0.142***	-0.122***	-0.002	-0.129***	-0.108***	-0.119***	0.011
	[0.020]	[0.023]	[0.024]	[0.021]	[0.020]	[0.020]	[0.025]
Observations	9,044	9,044	9,044	9,044	9,044	9,044	9,044
R-squared	0.110	0.119	0.147	0.116	0.121	0.136	0.168
Type and region of location of residence dummies		yes					yes
Region of location of reisidence dummies		yes					yes
Wealth-decile dummies			yes				yes
Number of adults with paid job (log)				yes			yes
Household head has paid job				yes			yes
Household size (log)					yes		yes
Number of children aged 7-18 (log)					yes		yes
Number of children under 7 (log)					yes		yes
Number of adults over 65 (log)					yes		yes
Household head education level dummies						yes	yes
Household head age and gender interaction dummies						yes	yes
Father alive						yes	yes
Mother alive						yes	yes

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. All regressions also include gender dummy, age dummies, dummies for child's type of relationship to the household head, and dummies for survey month. In all variables with the logarithmic transformation but household size, one is added to the variable before the transformation is taken. "Syrian + Syrian * female" gives the estimates for the linear combination of the coefficients of Syrian and Syrian*female variables. Sampling weights at the household level are used. Standard errors are clustered at the household level. Statistical significance: * 10 percent level, ** 5 percent level, *** 1 percent level.

Table 3: Difference between Refugees and Natives in Child Labor

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Dependent Variable: Child Labor			
	Baseline	Baseline + Region Controls	Baseline + Household Wealth Controls	Baseline + Paid Jobs of HH Members	Baseline + Household Composition Controls	Baseline + Household Head Charac.	All Controls
A) Full Sample							
Syrian	0.274***	0.268***	0.213***	0.276***	0.261***	0.262***	0.194***
	[0.025]	[0.028]	[0.029]	[0.026]	[0.026]	[0.026]	[0.031]
Syrian * Female	-0.209***	-0.210***	-0.209***	-0.210***	-0.208***	-0.208***	-0.208***
	[0.023]	[0.022]	[0.023]	[0.023]	[0.023]	[0.022]	[0.022]
Syrian + Syrian * Female	0.065***	0.058**	0.005	0.066***	0.053**	0.053***	-0.014
	[0.020]	[0.023]	[0.025]	[0.021]	[0.021]	[0.021]	[0.027]
Observations	5,473	5,473	5,473	5,473	5,473	5,473	5,473
R-squared	0.172	0.182	0.179	0.173	0.176	0.183	0.207
B) Age at arrival <=8 for Syrians							
Syrian	0.096***	0.086***	0.042	0.091***	0.091***	0.085***	0.032
	[0.031]	[0.033]	[0.035]	[0.032]	[0.032]	[0.031]	[0.037]
Syrian * female	-0.048	-0.048	-0.049*	-0.048	-0.049*	-0.048	-0.048
	[0.030]	[0.029]	[0.030]	[0.030]	[0.029]	[0.030]	[0.029]
Syrian + Syrian * Female	0.048**	0.038	-0.007	0.043*	0.043*	0.037*	-0.016
	[0.021]	[0.024]	[0.027]	[0.022]	[0.022]	[0.022]	[0.028]
Observations	4,331	4,331	4,331	4,331	4,331	4,331	4,331
R-squared	0.042	0.046	0.055	0.044	0.046	0.054	0.073
Type of location of residence dummies		yes					yes
Region of location of reisidence dummies		yes					yes
Wealth-decile dummies			yes				yes
Number of adults with paid job (log)				yes			yes
Household head has paid job				yes			yes
Household size (log)					yes		yes
Number of children aged 7-18 (log)					yes		yes
Number of children under 7 (log)					yes		yes
Number of adults over 65 (log)					yes		yes
Household head education level dummies						yes	yes
Household head age and gender interaction dummies						yes	yes
Father alive						yes	yes
Mother alive						yes	yes

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 12- to 17-year-old children. All regressions also include gender dummy, age dummies, dummies for child's type of relationship to the household head, and dummies for survey month. In all variables with the logarithmic transformation but household size, one is added to the variable before the transformation is taken. "Syrian + Syrian * female" gives the estimates for the linear combination of the coefficients of Syrian and Syrian*female variables. Sampling weights at the household level are used. Standard errors are clustered at the household level. Statistical significance: * 10 percent level, ** 5 percent level, *** 1 percent level.

Table 4: Difference between Refugees and Natives in Ever Married Status

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Dependent Variable: Ever Married				
	Baseline	Baseline + Region Controls	Baseline + Household Wealth Controls	Baseline + Paid Jobs of HH Members	Baseline + Household Composition Controls	Baseline + Household Head Charac.	All Controls
A) Full Sample							
Syrian	0.005	0.006	-0.004	0.006	0.004	0.003	-0.005
	[0.004]	[0.005]	[0.006]	[0.005]	[0.005]	[0.004]	[0.006]
Syrian * Female	0.016**	0.016**	0.017**	0.016**	0.016**	0.017**	0.016**
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Syrian + Syrian * Female	0.022***	0.022***	0.013*	0.023***	0.020***	0.020***	0.011
	[0.007]	[0.008]	[0.007]	[0.007]	[0.007]	[0.007]	[0.008]
Observations	5,474	5,474	5,474	5,474	5,474	5,474	5,474
R-squared	0.75	0.75	0.751	0.75	0.75	0.753	0.754
B) Age at arrival <=12 for Syrians							
Syrian	0.004	0.004	-0.004	0.005	0.002	0.004	-0.005
	[0.003]	[0.004]	[0.005]	[0.004]	[0.004]	[0.003]	[0.005]
Syrian * female	0.005	0.005	0.005	0.005	0.005	0.006	0.005
	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Syrian + Syrian * Female	0.009**	0.009	0.001	0.010**	0.007	0.009**	0.000
	[0.004]	[0.006]	[0.005]	[0.005]	[0.004]	[0.005]	[0.006]
Observations	5,195	5,195	5,195	5,195	5,195	5,195	5,195
R-squared	0.705	0.705	0.706	0.705	0.705	0.708	0.710
C) Age at arrival <=8 for Syrians							
Syrian	0.010	0.009	0.007	0.010	0.010	0.010	0.007
	[0.009]	[0.009]	[0.010]	[0.009]	[0.009]	[0.009]	[0.010]
Syrian * female	-0.008	-0.008	-0.008	-0.008	-0.008	-0.009	-0.009
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.008]	[0.007]
Syrian + Syrian * Female	0.002	0.001	-0.001	0.002	0.002	0.001	-0.002
	[0.002]	[0.002]	[0.003]	[0.002]	[0.002]	[0.001]	[0.004]
Observations	4,332	4,332	4,332	4,332	4,332	4,332	4,332
R-squared	0.726	0.726	0.726	0.726	0.726	0.729	0.730
Type of location of residence dummies		yes					yes
Region of location of reisidence dummies		yes					yes
Wealth-decile dummies			yes				yes
Number of adults with paid job (log)				yes			yes
Household head has paid job				yes			yes
Household size (log)					yes		yes
Number of children aged 7-18 (log)					yes		yes
Number of children under 7 (log)					yes		yes
Number of adults over 65 (log)					yes		yes
Household head education level dummies						yes	yes
Household head age and gender interaction dummies						yes	yes
Father alive						yes	yes
Mother alive						yes	yes

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 12- to 17-year-old children. All regressions also include gender dummy, age dummies, dummies for child's type of relationship to the household head, and dummies for survey month. In all variables with the logarithmic transformation but household size, one is added to the variable before the transformation is taken. "Syrian + Syrian * female" gives the estimates for the linear combination of the coefficients of Syrian and Syrian*female variables. Sampling weights at the household level are used. Standard errors are clustered at the household level. Statistical significance: * 10 percent level, ** 5 percent level, *** 1 percent level.

Table 5: Difference between Refugees and Natives in Other Schooling Outcomes

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Baseline	Baseline + Region Controls	Baseline + Household Wealth Controls	Baseline + Paid Jobs of HH Members	Baseline + Household Composition Controls	Baseline + Household Head Charac.	All Controls
A) Never Been to School (Age>=8)							
Syrian	0.103***	0.102***	0.053***	0.101***	0.092***	0.098***	0.055***
	[0.014]	[0.015]	[0.014]	[0.014]	[0.013]	[0.013]	[0.015]
Syrian + Syrian * Female	0.077***	0.076***	0.026**	0.074***	0.064***	0.073***	0.028**
	[0.011]	[0.013]	[0.012]	[0.011]	[0.011]	[0.011]	[0.013]
Observations	9,287	9,287	9,287	9,287	9,287	9,287	9,287
R-squared	0.066	0.069	0.089	0.067	0.069	0.090	0.115
B) Advanced (conditional on enrollment)							
Syrian	-0.104***	-0.082***	-0.070***	-0.096***	-0.087***	-0.097***	-0.056**
	[0.020]	[0.022]	[0.023]	[0.020]	[0.020]	[0.020]	[0.025]
Syrian + Syrian * Female	-0.062***	-0.042**	-0.028	-0.054***	-0.045**	-0.057***	-0.015
	[0.018]	[0.020]	[0.021]	[0.018]	[0.018]	[0.018]	[0.023]
Observations	8,348	8,348	8,348	8,348	8,348	8,348	8,348
R-squared	0.051	0.055	0.058	0.054	0.055	0.059	0.067
C) Repeated (conditional on enrollment)							
Syrian	0.061***	0.051***	0.064***	0.059***	0.059***	0.062***	0.059***
	[0.017]	[0.018]	[0.019]	[0.017]	[0.017]	[0.017]	[0.021]
Syrian + Syrian * Female	0.037***	0.028*	0.040**	0.035**	0.035**	0.038***	0.036*
	[0.014]	[0.016]	[0.017]	[0.014]	[0.015]	[0.014]	[0.019]
Observations	8,348	8,348	8,348	8,348	8,348	8,348	8,348
R-squared	0.018	0.021	0.019	0.018	0.019	0.022	0.027
D) Drop out (conditional on enrollment)							
Syrian	0.043***	0.031**	0.006	0.036***	0.028**	0.036***	-0.003
	[0.012]	[0.014]	[0.014]	[0.013]	[0.012]	[0.012]	[0.015]
Syrian + Syrian * Female	0.025**	0.014	-0.012	0.019	0.010	0.019*	-0.021
	[0.011]	[0.013]	[0.014]	[0.011]	[0.011]	[0.011]	[0.015]
Observations	8,348	8,348	8,348	8,348	8,348	8,348	8,348
R-squared	0.067	0.071	0.077	0.071	0.072	0.078	0.087
E) Grade for Age (conditional on enrollment)							
Syrian	-1.030***	-1.013***	-0.725***	-1.016***	-0.965***	-1.007***	-0.717***
	[0.075]	[0.084]	[0.082]	[0.076]	[0.076]	[0.077]	[0.091]
Syrian + Syrian * Female	-0.983***	-0.970***	-0.667***	-0.969***	-0.913***	-0.956***	-0.658***
	[0.070]	[0.080]	[0.080]	[0.071]	[0.072]	[0.071]	[0.089]
Observations	8,550	8,550	8,550	8,550	8,550	8,550	8,550
R-squared	0.92	0.92	0.921	0.92	0.92	0.921	0.922

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children in panels (B) to (E) but to 8- to 17-year-old children in panel (A). The age restriction is different in panel (A) due to late school start for some children. The samples in panels (B) to (E) include children who are enrolled. The set of control variables in each column is the same as that in Tables 2 to 4. "Syrian + Syrian * female" gives the estimates for the linear combination of the coefficients of Syrian and Syrian*female variables. Sampling weights at the household level are used. Standard errors are clustered at the household level. Statistical significance: * 10 percent level, ** 5 percent level, *** 1 percent level.

Figure 1. Pre-war Period School Enrollment Rates of Syrian and Turkish Children by Age and Gender, SFHS-2009 and TDHS-2008
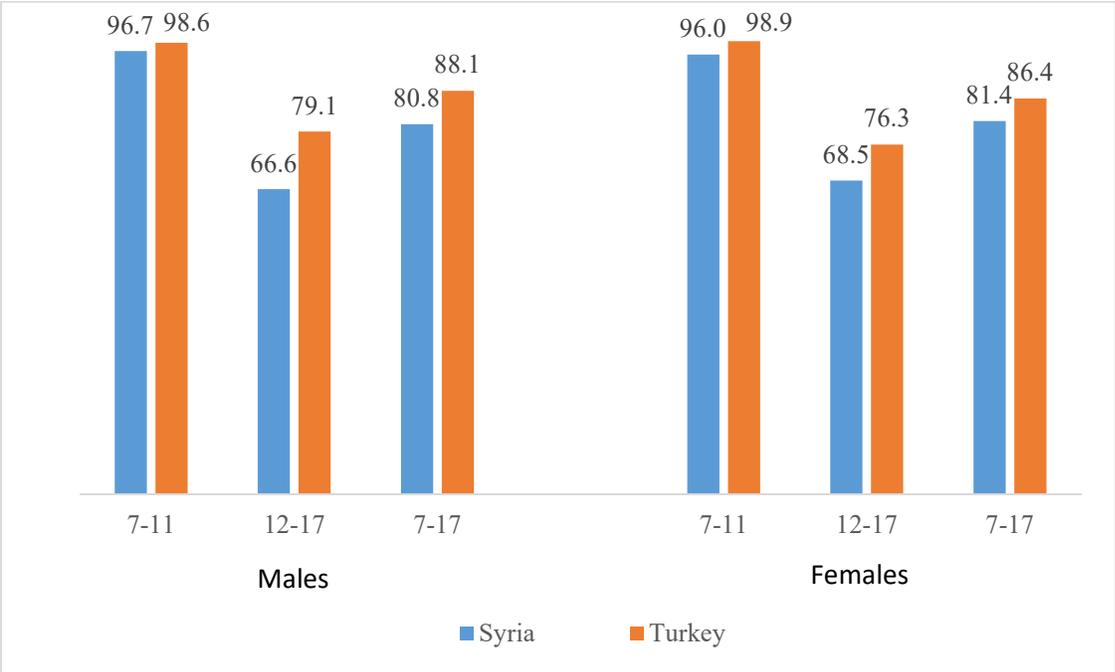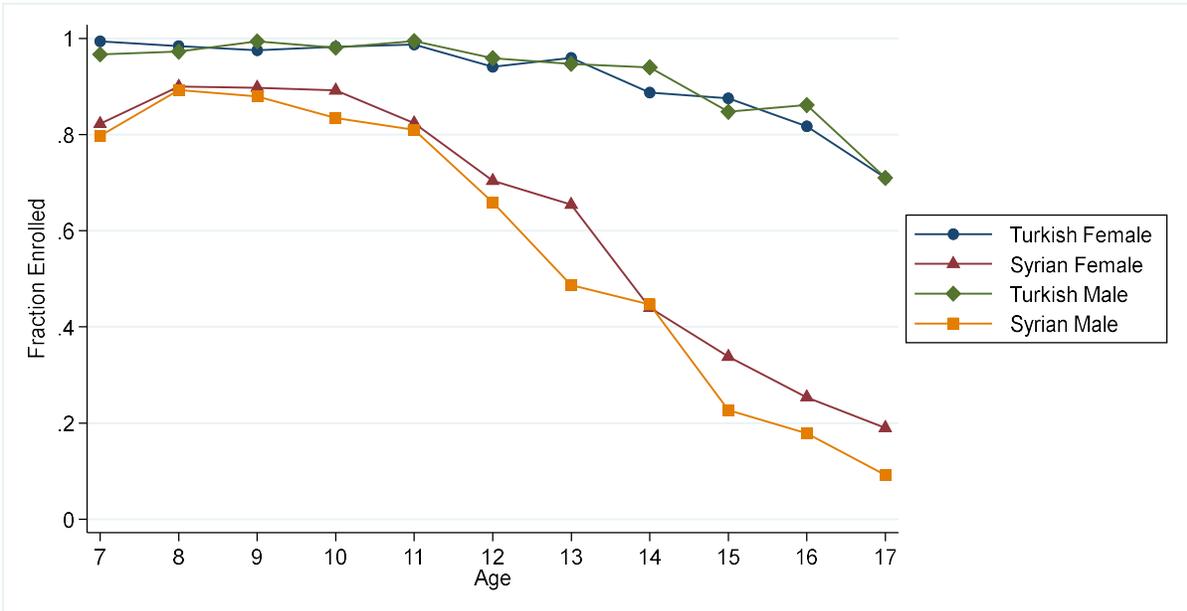

Source: TDHS-2008 and SFHS-2009

Figure 2: Number of Syrian Students in TECs, Public Schools and Out-of-School Children, and School Enrolment Rates
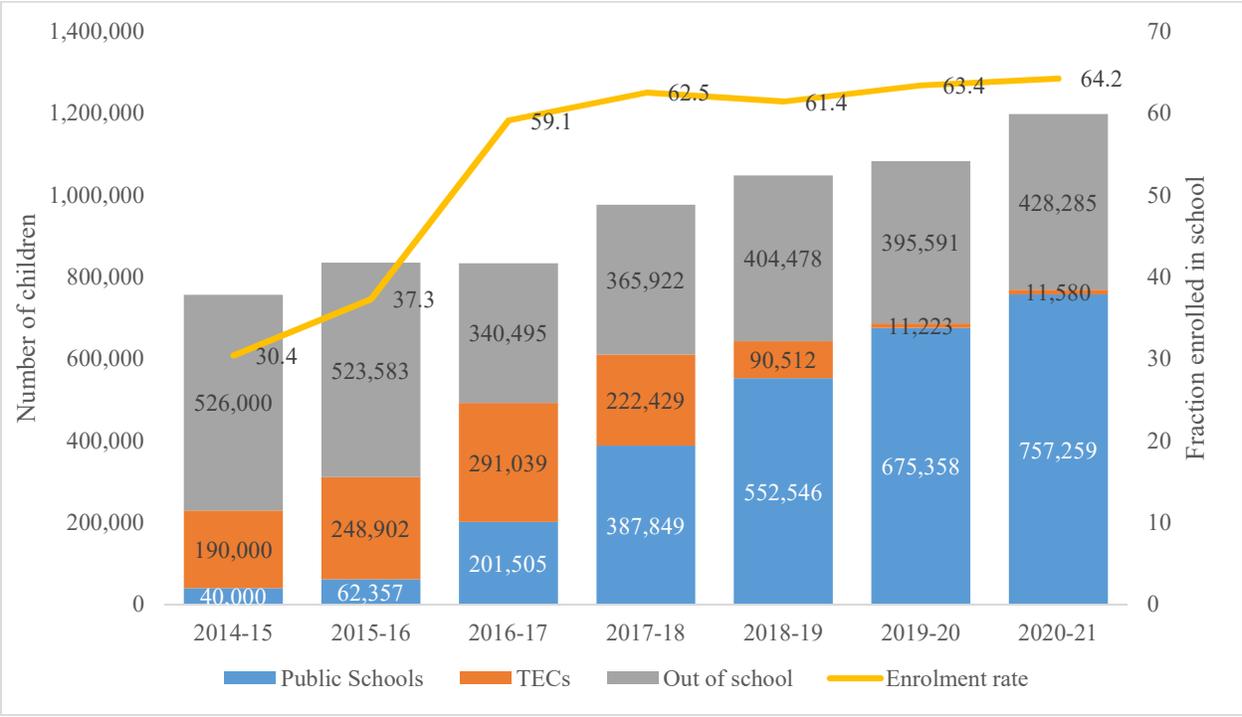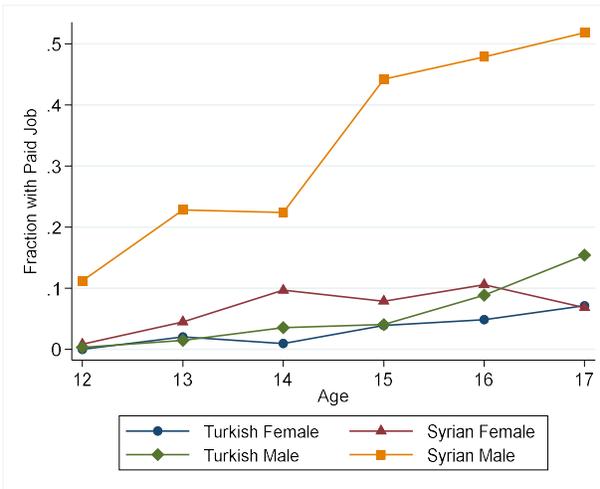

Source: MoNE, 2021a; Note: Children aged 7-17.

Figure 3: School Enrollment, Paid Work, and Ever Married Status by Native-Refugee Status and Gender
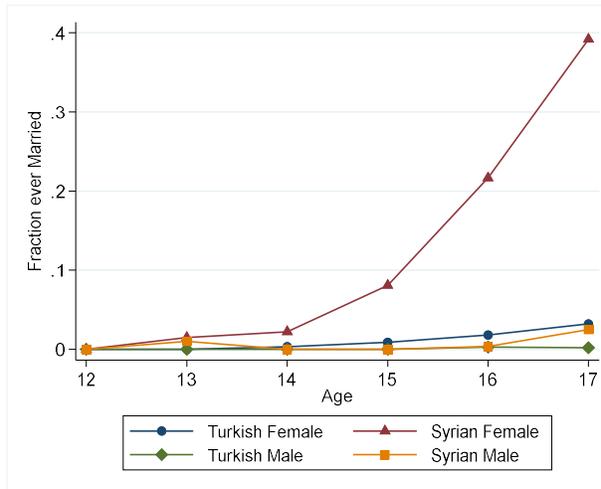
A) Fraction Enrolled in School
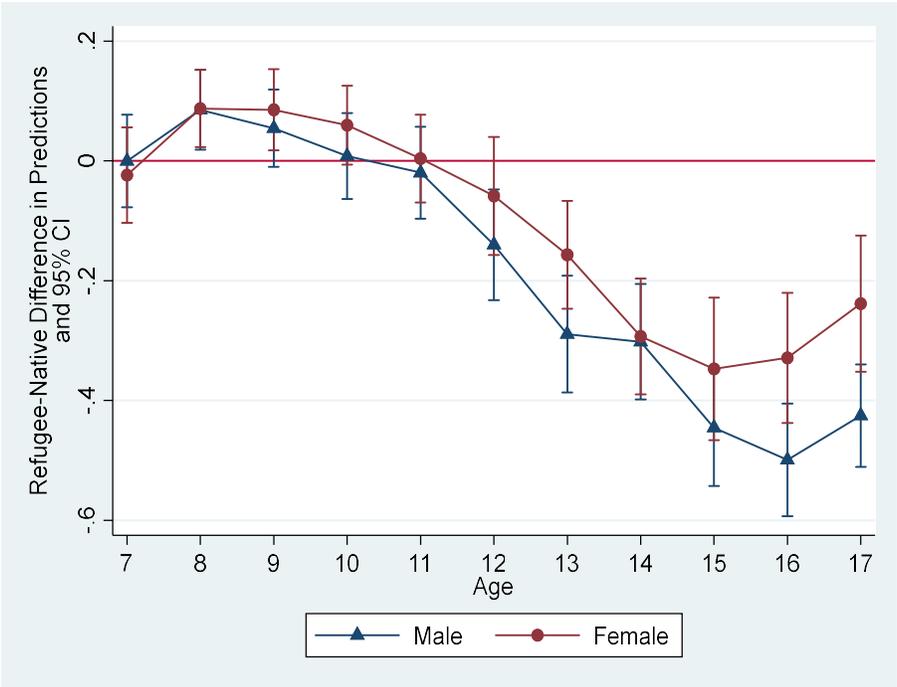

B) Fraction with Paid Job

C) Fraction Ever Married

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children in schooling outcomes and 12- to 17-year-old children in employment and marriage outcomes.

Figure 4: Refugee-Native Differences in Predicted Enrollment by Age after Accounting for the Covariates

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. The predicted values in the graph come from the estimation of equation (2) in the text.

Figure 5: Refugee-Native Differences in Predicted Enrollment by Age at Arrival and Years in Turkey, after Accounting for the Covariates

A) Predicted Enrollment by Age at Arrival
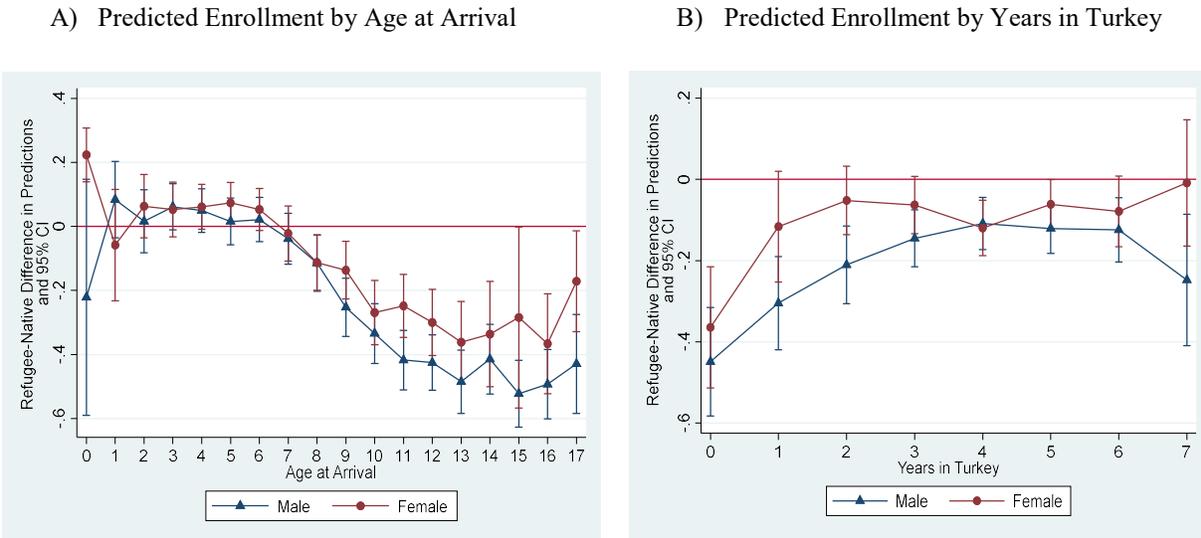
B) Predicted Enrollment by Years in Turkey

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. The predicted values in panel (A) come from the estimation of equation (3) in the text, and those in panel (B) come from the estimation of equation (4) in the text.

Figure 6: Refugee-Native Differences in Predicted Enrollment by Age at Arrival for Selected Values of Year of Arrival (Years in Turkey)
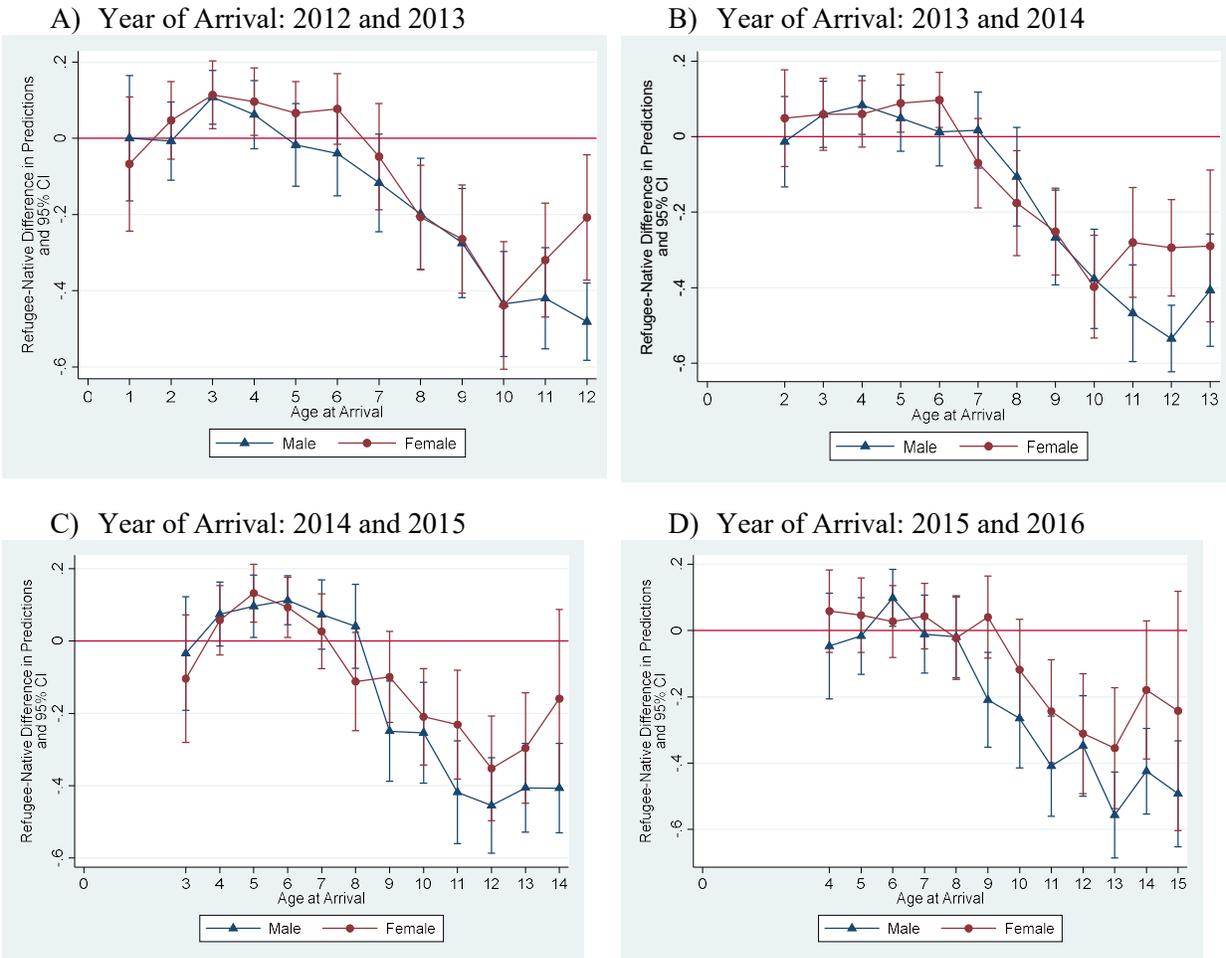

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. In each panel, the sample is further restricted to the year-of-arrival cohorts given in the panel headings. The predicted values come from the estimation of equation (3) in the text.
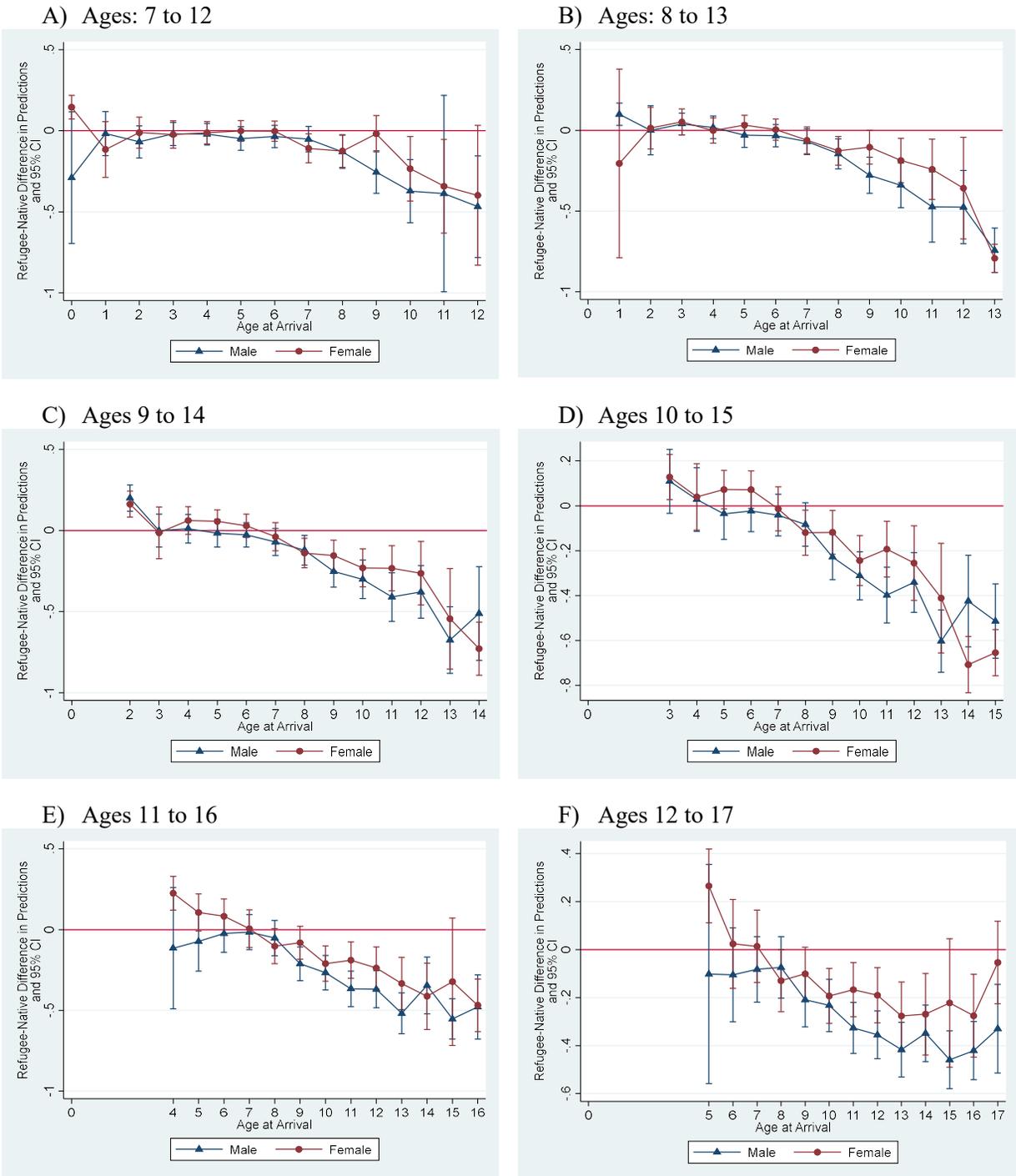
Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. In each panel, the sample is further restricted to the age groups given in the panel headings. The predicted values come from the estimation of equation (3) in the text.

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Figure 8: Refugee-Native Differences in Enrollment, Paid Employment, and Ever-Married Status by Age, Age at arrival, and Years in Turkey

A) Predicted Enrollment by Age

B) Predicted Paid Employment by Age

C) Predicted Ever Married Status by Age

D) Predicted Enrollment by Age-at-arrival

E) Predicted Paid Employment by Age-at-arrival

F) Predicted Ever Married Status by Age-at-arrival

G) Predicted Enrollment by Years in Turkey

H) Predicted Paid Employment by Years in Turkey

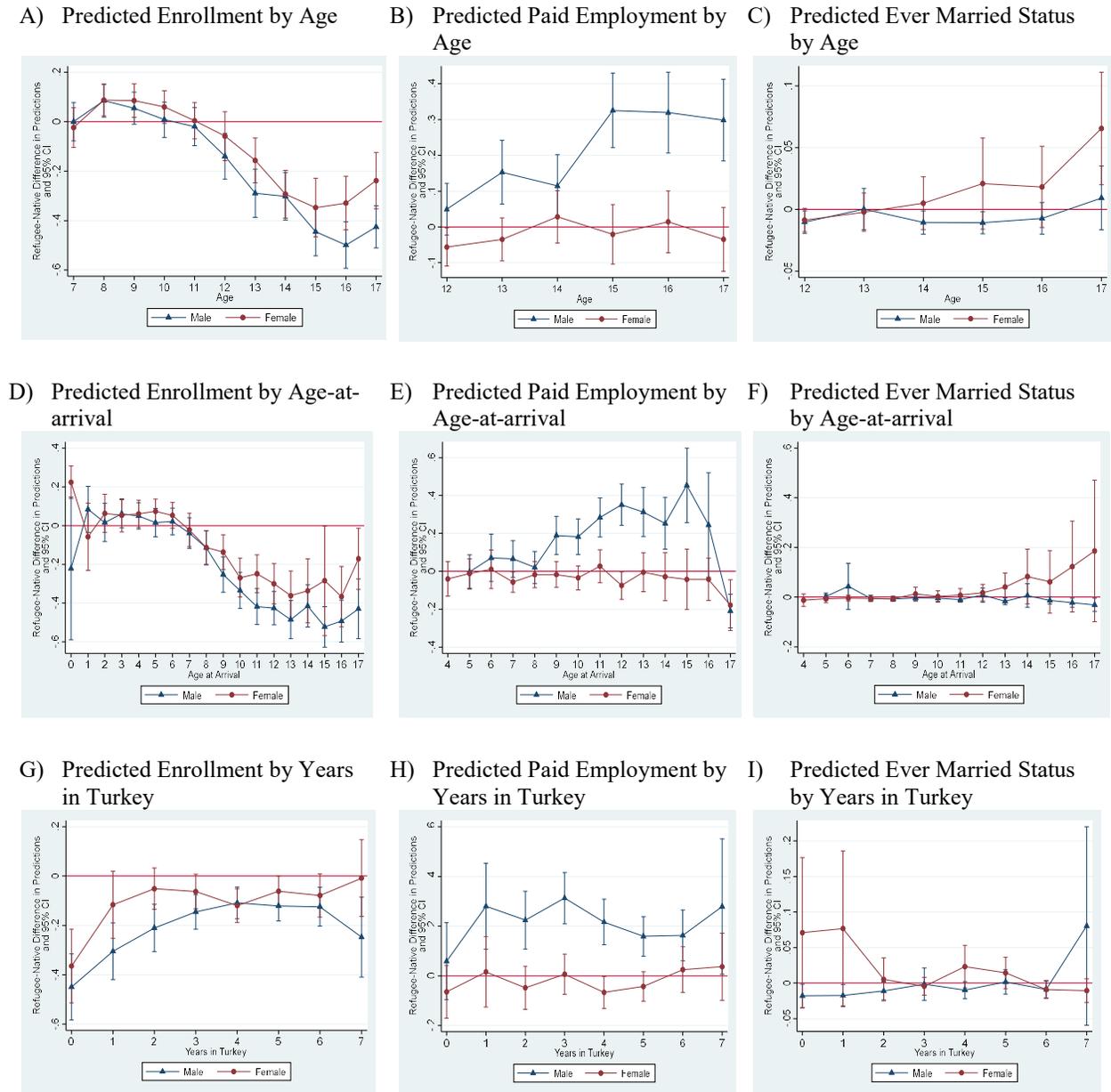I) Predicted Ever Married Status by Years in Turkey

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. The figure shows how the predicted probabilities of enrollment, paid employment, and ever-married status change by age in the first row (based on the estimation of equation (2)), by age at arrival in the second row (based on the estimation of equation (3), and by years in Turkey in the third row (based on the estimation of equation (4)).

Figure 9: Refugee-Native Differences in School Performance Indicators by Grade Level after Accounting for the Covariates – Conditional on Enrollment

A) Progressed

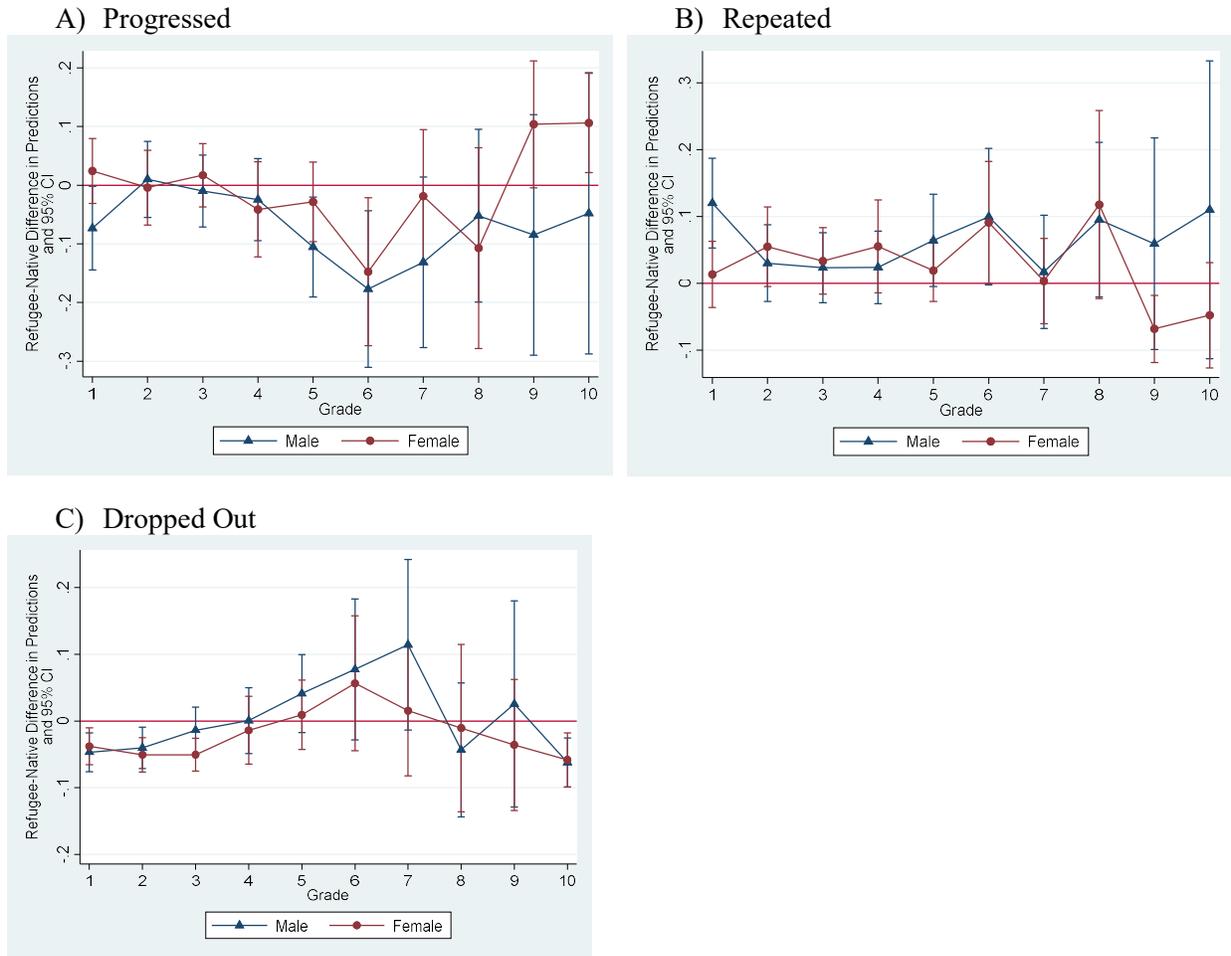B) Repeated

C) Dropped Out

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. The figure shows how the predicted probabilities of progressing, repeating, and dropping out change by grade level—conditional on enrollment in the previous school year. The predicted values come from the estimation of equation (2) in the text where age is replaced by grade level attained in the previous school year.

Figure 10: Refugee-Native Differences in Other Schooling Outcomes by Age at Arrival after Accounting for the Covariates

A) Never Been to School

B) Progressed (conditional on enrollment)

C) Repeated (conditional on enrollment)

D) Dropped Out (conditional on enrollment)

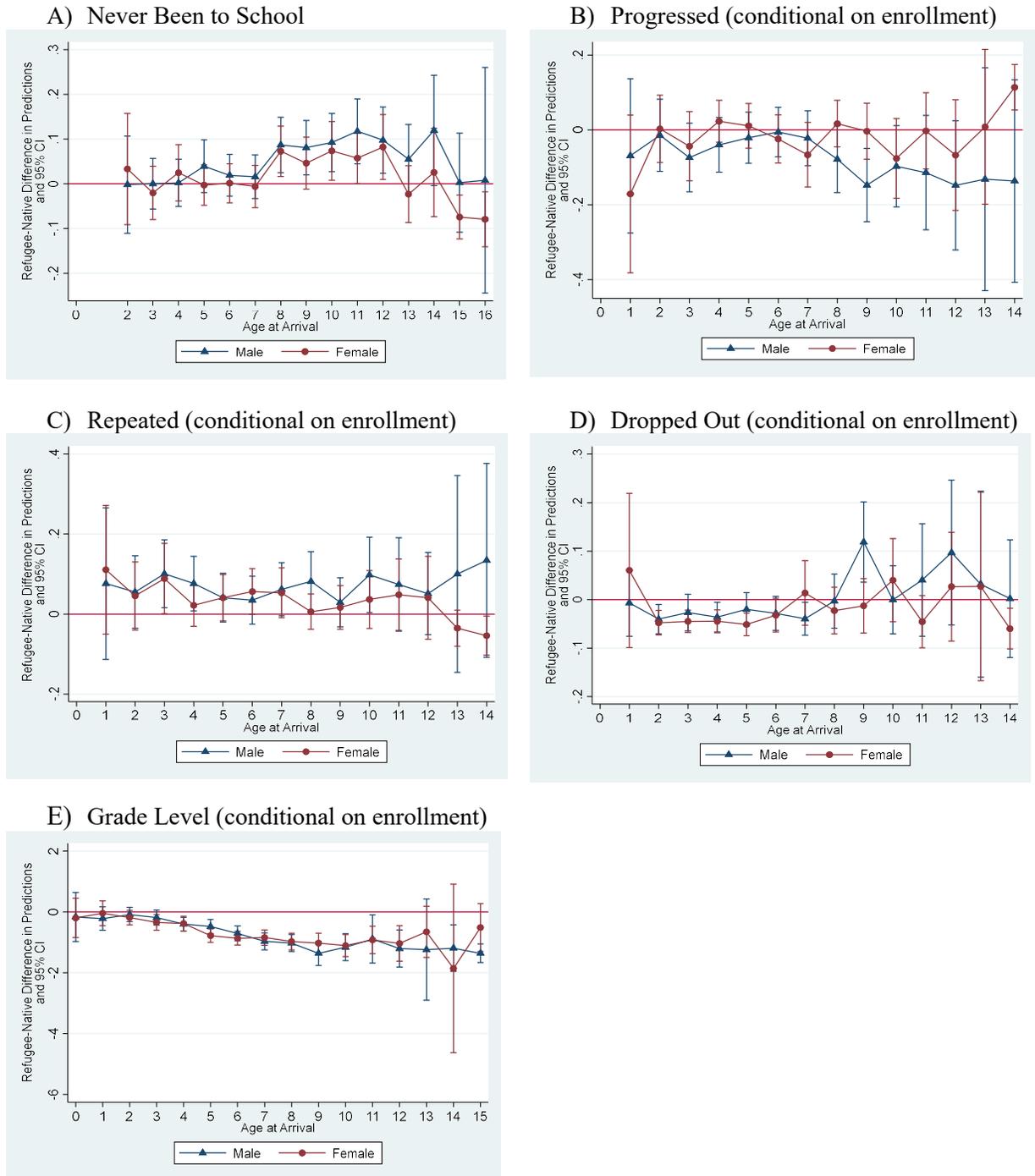E) Grade Level (conditional on enrollment)

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. The figure shows how the predicted probabilities of never enrolling in school, progressing, repeating, dropping out, and grade for age change by age at arrival. The predicted values come from the estimation of equation (3) in the text.

APPENDIX (Not for Print Publication)

Table A1: Key Characteristics of Different Year-of-Arrival Cohorts

Year of Arrival	2018	2017	2016	2015	2014	2013	2012	2011	All
Number of Observations	108	117	309	516	576	868	417	93	3004
Percentage of Observations	3.60	3.89	10.29	17.18	19.17	28.89	13.88	3.10	100
A) Household Head's Education									
At Least Primary School	0.806	0.832	0.814	0.788	0.763	0.775	0.857	0.656	0.790
At Least Secondary School	0.491	0.476	0.369	0.369	0.290	0.313	0.388	0.349	0.348
B) Household Head's Age at Arrival	40.440	38.222	41.007	39.188	39.136	38.554	36.290	37.228	38.816
C) Variables that are Influenced by Post-arrival Events									
Household Size	8.581	7.541	8.196	7.848	7.344	8.438	7.427	7.516	7.904
Number of Children	5.063	4.405	5.072	4.582	4.340	4.980	4.555	4.263	4.698
Number of Elderly	0.185	0.097	0.158	0.145	0.125	0.240	0.213	0.333	0.181
Household Head Female	0.130	0.123	0.131	0.162	0.050	0.080	0.096	0.253	0.103
Father Alive	0.917	0.822	0.868	0.923	0.958	0.954	0.957	0.868	0.931
Mother Alive	0.944	0.991	0.984	0.988	0.995	0.977	0.991	1.000	0.985
Household Wealth Score	2.370	3.181	2.736	3.283	3.274	2.932	3.279	2.527	3.070
Household Head has Paid Job	0.324	0.438	0.507	0.436	0.456	0.453	0.502	0.253	0.453
Total HH Members with Paid Job	0.833	0.800	0.885	0.884	0.744	0.845	0.796	0.688	0.824

Notes: The data come from the native and refugee samples of the 2018 Turkish Demographic and Health Survey. The sample is restricted to 7- to 17-year-old children.

Table A2: Native-Refugee Gaps in School Enrollment with an Alternative Measure of Household Wealth

	Dependent Variable: School Enrollment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Baseline	Baseline + Region Controls	Baseline + Household Wealth Controls	Baseline + Paid Jobs of HH Members	Baseline + Household Composition Controls	Baseline + Household Head Charac.	All Controls
A) Full Sample							
Syrian	-0.323***	-0.307***	-0.197***	-0.304***	-0.284***	-0.296***	-0.179***
	[0.021]	[0.023]	[0.022]	[0.021]	[0.021]	[0.021]	[0.024]
Syrian * Female	0.075***	0.074***	0.073***	0.073***	0.075***	0.072***	0.069***
	[0.018]	[0.018]	[0.018]	[0.018]	[0.018]	[0.018]	[0.017]
Syrian + Syrian * Female	-0.248***	-0.234***	-0.124***	-0.231***	-0.209***	-0.224***	-0.110***
	[0.020]	[0.023]	[0.021]	[0.020]	[0.020]	[0.020]	[0.023]
Observations	10,228	10,228	10,228	10,228	10,228	10,228	10,228
R-squared	0.283	0.289	0.307	0.289	0.292	0.305	0.329
B) Age at arrival <=8 for Syrians							
Syrian	-0.158***	-0.135***	-0.043*	-0.144***	-0.123***	-0.133***	-0.028
	[0.021]	[0.023]	[0.022]	[0.021]	[0.021]	[0.021]	[0.024]
Syrian * female	0.016	0.013	0.015	0.015	0.015	0.014	0.011
	[0.020]	[0.020]	[0.019]	[0.020]	[0.020]	[0.019]	[0.019]
Syrian + Syrian * Female	-0.140***	-0.123***	-0.028	-0.127***	-0.108***	-0.118***	-0.017
	[0.020]	[0.023]	[0.022]	[0.021]	[0.020]	[0.020]	[0.024]
Observations	9,044	9,044	9,044	9,044	9,044	9,044	9,044
R-squared	0.110	0.119	0.143	0.116	0.121	0.136	0.163
Type and region of location of residence dummies		yes					yes
Region of location of reisidence dummies		yes					yes
Wealth score			yes				yes
Number of adults with paid job (log)				yes			yes
Household head has paid job				yes			yes
Household size (log)					yes		yes
Number of children aged 7-18 (log)					yes		yes
Number of children under 7 (log)					yes		yes
Number of adults over 65 (log)					yes		yes
Household head education level dummies						yes	yes
Household head age and gender interaction dummies						yes	yes
Father alive						yes	yes
Mother alive						yes	yes

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children. All regressions also include gender dummy, age dummies, dummies for child's type of relationship to the household head, and dummies for survey month. In all variables with the logarithmic transformation but household size, one is added to the variable before the transformation is taken. "Syrian + Syrian * female" gives the estimates for the linear combination of the coefficients of Syrian and Syrian*female variables. Sampling weights at the household level are used. Standard errors are clustered at the household level. Statistical significance: * 10 percent level, ** 5 percent level, *** 1 percent level.

Table A3: Native-Refugee Gaps in School Enrollment – Sample Restricted to Bottom Two Quintiles of the Wealth Distribution

|			Dependent Variable: School Enrollment				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Baseline	Baseline + Region Controls	Baseline + Household Wealth Controls	Baseline + Paid Jobs of HH Members	Baseline + Household Composition Controls	Baseline + Household Head Charac.	All Controls
A) Full Sample							
Syrian	-0.223***	-0.201***	-0.143***	-0.215***	-0.210***	-0.222***	-0.111***
	[0.032]	[0.034]	[0.033]	[0.031]	[0.032]	[0.035]	[0.036]
Syrian * Female	0.082***	0.078***	0.087***	0.081***	0.080***	0.079***	0.076***
	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.021]
Syrian + Syrian * Female	-0.141***	-0.123***	-0.056*	-0.134***	-0.130***	-0.142***	-0.035
	[0.032]	[0.034]	[0.034]	[0.032]	[0.032]	[0.034]	[0.036]
Observations	5,520	5,520	5,520	5,520	5,520	5,520	5,520
R-squared	0.313	0.323	0.332	0.317	0.317	0.332	0.365
B) Age at arrival <=8 for Syrians							
Syrian	-0.107***	-0.082**	-0.038	-0.103***	-0.097***	-0.102***	-0.001
	[0.033]	[0.035]	[0.035]	[0.033]	[0.033]	[0.035]	[0.037]
Syrian * female	0.035	0.031	0.043*	0.035	0.034	0.032	0.032
	[0.024]	[0.024]	[0.024]	[0.024]	[0.024]	[0.024]	[0.023]
Syrian + Syrian * Female	-0.072**	-0.050	0.004	-0.068**	-0.063*	-0.067**	0.031
	[0.033]	[0.035]	[0.035]	[0.033]	[0.033]	[0.035]	[0.037]
Observations	4,358	4,358	4,358	4,358	4,358	4,358	4,358
R-squared	0.134	0.148	0.154	0.137	0.137	0.151	0.188
Type and region of location of residence dummies		yes					yes
Region of location of reisidence dummies		yes					yes
Wealth-decile dummies			yes				yes
Number of adults with paid job (log)				yes			yes
Household head has paid job				yes			yes
Household size (log)					yes		yes
Number of children aged 7-18 (log)					yes		yes
Number of children under 7 (log)					yes		yes
Number of adults over 65 (log)					yes		yes
Household head education level dummies						yes	yes
Household head age and gender interaction dummies						yes	yes
Father alive						yes	yes
Mother alive						yes	yes

Notes: The data come from the 2018 Turkish Demographic and Health Survey. The data include both the refugee and native samples. The sample is restricted to 7- to 17-year-old children in the bottom two quintiles of the household wealth distribution. All regressions also include gender dummy, age dummies, dummies for child's type of relationship to the household head, and dummies for survey month. In all variables with the logarithmic transformation but household size, one is added to the variable before the transformation is taken. "Syrian + Syrian * female" gives the estimates for the linear combination of the coefficients of Syrian and Syrian*female variables. Sampling weights at the household level are used. Standard errors are clustered at the household level. Statistical significance: * 10 percent level, ** 5 percent level, *** 1 percent level.

Table A4: Educational Selection in the Arrival of Syrian Refugees in Turkey

Birth Cohort	A) 2018 Turkey DHS			B) 2009 Syria FHS		
	Primary or Higher	Secondary or Higher	High School or Higher	Primary or Higher	Secondary or Higher	High School or Higher
1979-1988	0.799	0.327	0.160	0.765	0.256	0.112
1969-1978	0.770	0.291	0.131	0.750	0.199	0.117
1959-1968	0.553	0.240	0.116	0.619	0.220	0.142
1949-1958	0.450	0.248	0.143	0.460	0.165	0.105
1939-1948	0.272	0.128	0.078	0.356	0.128	0.085
1929-1938	0.166	0.033	0.000	0.198	0.058	0.040

Notes: The data comes from the Syrian sample of the 2018 Turkey Demographic and Health Survey in panel (A) and from the 2009 Syria Family Health Survey in panel (B). The table compares the educational attainment of selected birth cohorts in the two datasets. Since the Syrian refugees in Turkey are more likely to be from the northern provinces of Syria, the provincial means obtained from the 2009 Syria Family Health Survey are weighted according to the distribution of birth provinces of Syrians in Turkey. These weights also change by the birth cohorts. The youngest individual is 21 years old in the 2009-SFHS and 30 years old in the 2018-TDHS. The minimum age restriction (21) is imposed so that we can examine high school completion status without censoring.

Figure A1: Number of Syrian Refugees in Turkey
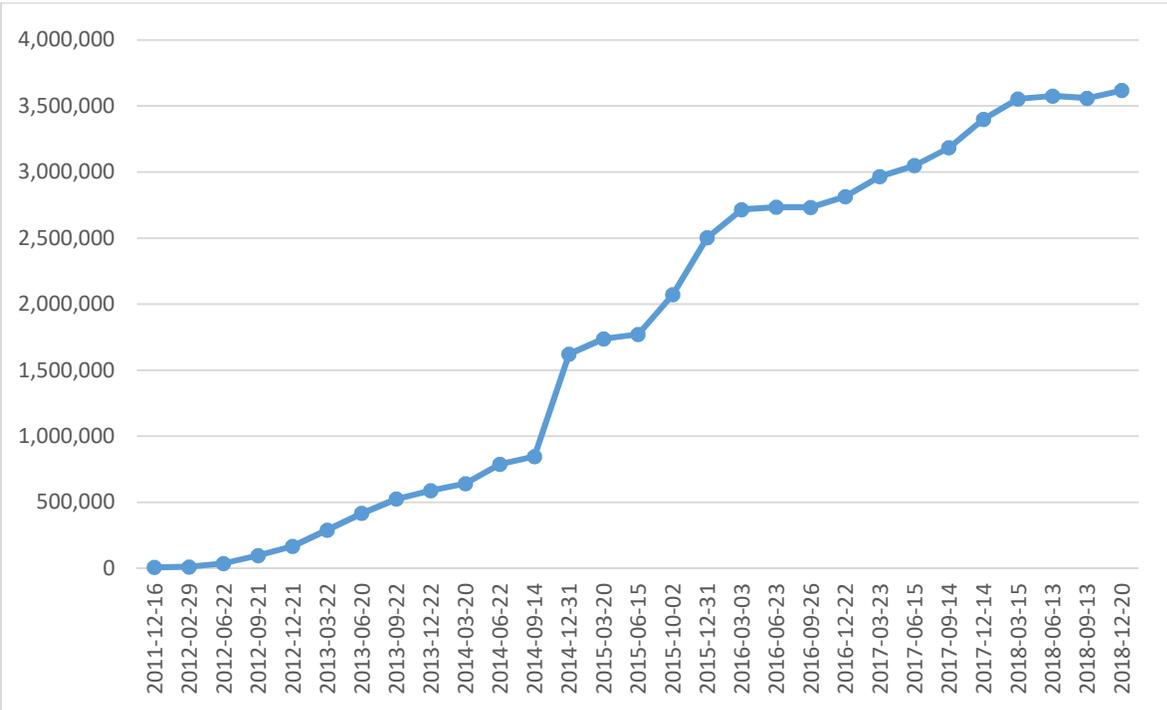
Source: UNHCR (2019).

Figure A2: Distributions of Age at Arrival and Years in Turkey for Syrian Refugees

A) Age at Arrival

B) Years in Turkey