Stuck with Boys: Return Prospects and Integration of Ukrainian Refugee Families *

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Abstract

Theory suggests that return plans shape migrants' integration efforts and outcomes, but identifying this effect is challenging. After the Russian invasion in February 2022, more than 5 million Ukrainian refugees fled to other European countries under the EU Temporary Protection Scheme (EU TPS). Initially, Ukrainian refugees expected a short war and conclude with Ukrainian victory. Expectations of a quick victory receded as the war dragged on. As Ukraine banned men aged 18–60 from leaving Ukraine, this increased the incentives of households with teenage boys to be outside Ukraine before their sons turn 18. Early-leaving households did not anticipate the offspring sex-specific future prospects when fleeing, enabling us to study the causal effect of gradually worsening return prospects by comparing observationally similar households with and without teenage boys. Using a 10-wave panel survey of more than 1,000 Ukrainian refugees across the EU fielded between mid-2022 and mid-2025, we establish that having a teenage boy strongly decreased parents' return intentions and actual return. We find that parents with boys are more likely to work, work more hours, but do not engage in more host country language learning. Parents also report lower return intentions among their teenage sons than daughters. The results of this study also suggests that uncertainty about staying prospects, such as under the EU TPS, could hamper integration.

Keywords: Ukraine, Refugees, Return Migration, Integration

JEL codes: D74, F22, J15, J24

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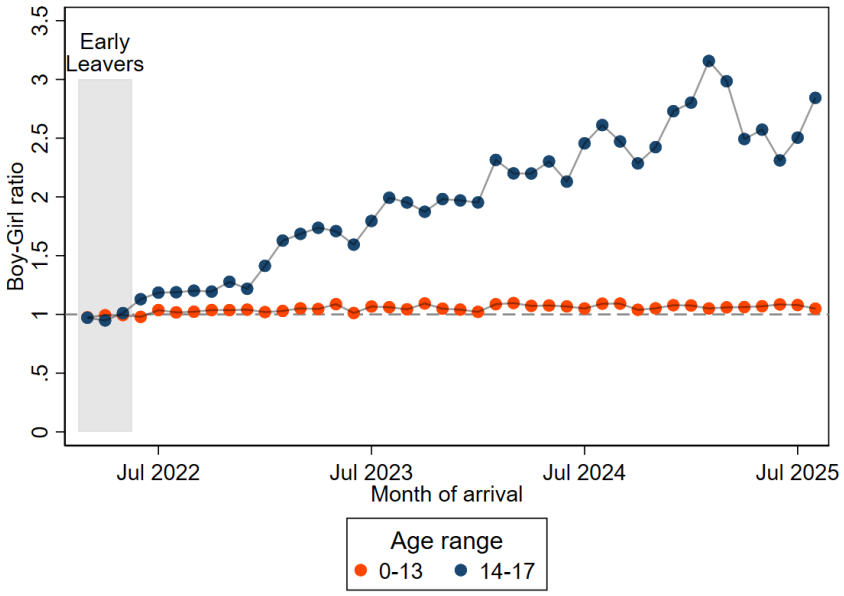
1 Introduction

Refugees have to make important decisions once arriving in a safe destination country. Are they staying in the current host country or do they move to another? Are they searching for jobs? Or do they invest time in learning the host-country language? All of these may be influenced by the prospects of returning home: the better return prospects, the weaker incentives to make host country-specific investments. However, studying the effect of return prospects on integration is challenging because of endogeneity of return intentions: improved integration may decrease return intentions, and return intentions and integration may be simultaneously affected by host country shocks. Despite several recent studies on the effect of conflict in migrants' home countries on integration (Bassetto and Freitas Monteiro, 2024; Adema et al., 2023; Zaiour, 2023), there is limited knowledge how changes in return prospects shape refugees' integration outcomes.

After the Russian invasion of Ukraine on the 24th of February, 2022, Ukraine declared martial law, which prohibits men between 18 and 60 to leave Ukraine (the *male travel ban*). As a result of the invasion, more than 5 million Ukrainians fled to other European countries. Although many Ukrainian refugees were initially very optimistic about Ukraine winning the war and planned to return, the war continued and return intentions decreased gradually (Adema et al., 2023). In combination with the male travel ban – which prohibits men aged 18-60 from leaving Ukrainian – worsening expectations strongly worsened the appeal for boys about to turn 18 to reside in Ukraine. Figure 1 shows that this translated to actual behavior: as the war lasted and expectations turned more negative, more families with teenage boys started leaving Ukraine. The boy-girl ratio among those leaving Ukraine aged 14-17 gradually increased to about 3.0. However, prior to June 2022 this ratio was close to 1. This suggests that most of *early-leaving* refugees fled out of immediate fear for their own and children's safety, but did not consider the sex-specific consequences for their offspring in case the war would prolong.

Figure 1: Boy-to-girl ratio among Ukrainian refugees by month of arrival



Note: Boy-to-girl ratio among new registrations for Temporary Protection Status across 30 European countries monthly between March 2022 and September 2025. Data from Eurostat table migr_asytpfm.

In this paper, we use this natural experiment to study the effects of households' reduced return prospects on households' outcomes using a 10-wave longitudinal panel of more than 1,000 Ukrainian refugees across Europe who were recruited between June and December 2022. By using child sex as an exogenous source of variation for *early leaving* parents' gradually changing return prospects, we shed light on the role of return prospects for refugee integration. We regress parent-level outcomes on a binary indicator for having at least one underaged teenage boy at the time of leaving Ukraine, while flexibly controlling for parent-levels characteristics as well as household composition. Specifically, we include fixed effects for the number of children of every age, which controls for the effect of the number of children and the age composition of children.

The main identifying assumption to interpret results as the causal effect of gradually worsening return prospects is the following: outcomes of households with a teenage boy would have been the same as those for observationally similar households with a teenage girl, if those with boys would instead have had girls.

There are two prominent threats to this assumption. First, families with teenage boys and girls could be differentially selected from the population of Ukraine. However, we find no considerable differences in respondents' characteristics, such as educational attainment or labor market outcomes prior to migration, nor do we find differential reasons in reasons for leaving Ukraine.

Second, return intentions and integration outcomes should have been the same for households with teenage boys and girls in absence of the shock in return prospects driven by conflict in the home country. To assess the plausibility of this assumption, we draw on migrants from a similar cultural background in the German Socio-Economic Panel and the European Social Survey. We show that staying intentions among migrants in Germany are independent of having teenage boys across migrant groups. Moreover, we show that employment outcomes of migrants from Eastern Europe across Europe and of natives in Ukraine do not depend on the sex of teenage children. In addition, we control in a robustness test for the number of boys in a household, which would absorb a general effect of having sons compared to having daughters, but does not change results. Hence, observationally similar households with teenage girls provide a suitable counterfactual for those with teenage boys.

We find that return intentions strongly diverge between parents with teenage boys and those without with the same number of children in average age. Compared to the mean on 53%, parents with at least one teenage boy at the time of leaving Ukraine are 11 percentage points less likely to have returned, or plan to return soon or when safe. Instead, these parents are more likely to be unsure about their return plans and 5 pp more likely to plan to settle outside Ukraine (compared to the mean of 21%). In addition, households with a teenage boy are more likely to have moved to a third country, indicating that families with boys tend to re-optimize their location once they realize a quick return is unlikely.

Using a design that only exploits within-individual changes in return (intentions), we find that the effect on return intentions as well as actual return arose gradually over time. By 2025, those with a teenage boy were 6.9 percentage points less likely to have returned to Ukraine. This finding is consistent with gradually worsening return intentions for those with teenage boys. When studying the effect of children by exact age, we find effects to be the strongest for those aged closest to 18, in line with the incentives to be outside Ukraine being strongest for boys closer to age 18. However, we find smaller effects for households with boys aged 11-14 and no effect of boys aged 9 or younger.

To examine the hypothesis that return intentions increases integration, we asked parents about their main activity. We find that families with teenage boys became 10 percentage points more likely to indicate that they are working in the host country by 2025. In July 2024 and May 2025 we asked respondents

how many hours they worked, how much they earned and how much they received in social benefits. We find that parents with teenage boys are more than 10 percentage points more likely to work any number of hours, and more likely to work at least 25 hours. On average, they earn 112 euros more than families without teenage boys (although statistically insignificant). These differences are not driven by subsequent sorting of families with boys into host countries with higher income levels. Although we find that economic integration improves, we do not find improved linguistic and social integration considerably, nor do we find that respondents are more likely to take language courses. This suggest that parents with boys prioritize current income over acquisition of host-country skills. We show that these results are not driven by selective return migration or selective migration to other host countries.

We additionally study the return intentions and integration of teenage children themselves. We asked parents to assess the return intentions of all of their children aged 12 and above, finding stark differences in return intentions between teenage boys and girls. On average, children have stronger intentions to settle outside of Ukraine than their parents. The boy-girl differences are even stronger among children themselves. Among boys (girls) aged 16-19 in July 2024, 60% (30%) wants to settle outside of Ukraine. We do not find sex differences in host country and Ukrainian (online or in-person) school enrollment. However, we find that teenage boys are considerably more likely to be enrolled in non-school clubs than teenage girls. As club membership typically requires membership fees, this finding is in accordance to parents having stronger incentives to work to invest in the social integration of their children.

To further explore how the war affected human capital accumulation of Ukrainian (refugee) teenage boys and girls, we turn to subject choice and grades obtained in Ukraine's school-leaving exams. We use test-taker level microdata from UA Center for Evaluation of the Quality of Education (UCEQA), which includes age, sex, school, subjects, grades, and test location. Since the 2022 invasion, UCEQA has also organized exam sessions in more than 30 countries abroad. Every summer, approximately 60% of a cohort takes this exam.

Although the number of test takers decreased slightly after the war and (sex-specific) selection into taking the test could have changed, it does enable us to document several empirical patterns in two distinct analyses. In the first we compare test-scores before and during the war, documenting that boys perform better during the war, consistent with increased incentives for boys to perform well to prevent future conscription. In the second analysis, we compare subject choice and grades for boys and girls, in Ukraine and outside. Unsurprisingly, we find that those abroad are less likely to take Ukrainian history and more likely to take foreign languages. In addition, we find that boys abroad are relatively more likely to take general (sciences and English) rather than country-specific (Ukrainian and other foreign languages) subjects. This is in line with greater uncertainty in return prospects for boys decreasing the expected return in country-specific skills. Analysis of grades in compulsory subjects suggest that refugee test takers outside of Ukraine are positively selected, start performing worse in Ukrainian language and better in foreign languages over time. Boys obtain relatively better grades than girls. This could be driven by a stronger positive selection or larger incentives increasing effort.

Our study contributes to the literature studying the role of return prospects in migrant return and integration. Several studies have examined the labor supply, savings and return migration responses of immigrants due to exchange rate and price shocks between migrants' sending and host country (Yang, 2006; Akay et al., 2021; Nekoei, 2013). Yang (2006) find that exchange rate shocks favoring the host country reduced return migration rates suggesting life-cycle rather than target-earning behavior among migrants. However, such shocks are not pure shocks in return prospects, as they affect the *relative* attractiveness of both the origin as well as the destination country.

A recent literature has studied the role of conflict at home on integration in various settings (Bassetto and Freitas Monteiro, 2024; Zaiour, 2023; Adema et al., 2023). Although conflict shocks strongly shapes the possibility and conditions for return, these studies cannot separate reduced return prospects from other mechanisms. For example, conflict in one's home country may induce trauma or increase the arrival of co-national migrants, which can independently affect integration outcomes. Moreover, these studies do not concern refugees specifically, with the exception of Adema et al. (2023).[1] In this paper, we instead focus on a shock that affects individual households based on the sex of teenage children, which enables us to isolate the effect of return prospects from unrelated channels, such as the role of trauma or wealth effects through the loss of assets.

We also contribute to the literature on the role child sex plays in return migration and migrant integration. One part of the literature have studied whether child sex affects return migration decisions.[2] Dustmann (2003) finds that having a girl increases return migration from Germany, but only among Turkish immigrants. Several papers have studied spillovers between children and parents. Amuedo-Dorantes, Arenas-Arroyo and Sevilla (2018) study how stricter immigration enforcement negatively affects migrant children. Only few studies have examined spillovers of policies affecting children on parents. Sajons (2016) finds that granting children citizenship reduce the likelihood that parents will return, consequently increasing their opportunity for integration. that children play in shaping parents' behavior. In this paper, we show how shocks affecting the ability of sons to return strongly affects parents' own return intentions.

This paper is organized as follows. Section 3 introduces our survey of Ukrainian refugees across Europe. Section 2 presents the context of Ukrainian refugee families that have been displaced following the 2022 Russian invasion and Section 4 discusses the identification strategy. Section 5 presents the results on parental return intentions and integration and children' return intentions and activities. Section 7 concludes and discusses future steps of this project.

2 The war in Ukraine, Ukraine's male travel ban and shocks to return prospects

Russia launched a large-scale invasion of Ukraine of February 24, 2022. The Ukrainian government directly enacted martial law (Pravda, 2022). This law prohibits men aged 18–60 to leave Ukraine, with few exceptions. Most notably, it excludes single fathers, fathers of three or more children, and caretakers of individuals with a disability. Although all adult men are not allowed to leave Ukraine, they are only conscripted at the age of 25, lowered from 27 in April 2024. In August 2025, after our data collection, Ukraine exempted men aged 18-22 from the male travel ban.

The Russian invasion unleashed the largest refugee flow within Europe since the second world war. The EU activated the temporary protection directive, giving Ukrainian refugees the right to settle, work and apply for social assistance in any EU member state. Other European countries such as the UK, Switzerland and Norway also provided shelter for Ukrainian refugees. In a matter of months, millions of Ukrainian refugees fled to other European countries. Figure A4a shows the distribution of Ukrainian refugees across Europe.

[1] Another exception is Aksoy et al. (2024), but they solely focus on children: they study how conflict in Syrian origin regions affects Syrian children' school performance of Turkey, finding that conflict in Syria improves Syrian children' test scores.

[2] The presence of children in migrant households could enable the transfer of host-specific skills (such as language) from parents to children. Although several studies have examined the effect of presence of children on integration, there is no conclusive evidence whether they affect integration (Chiswick and Miller, 2007; Zorlu and Hartog, 2018).

Figure A1 shows the cumulative number of refugees arriving by month for the same age categories as Figure 1. Although most arrived in the first months of the conflict, refugees continue to leave Ukraine more than two years after the war. Appendix Figure A2 shows sex ratios by age category among total beneficiaries of the Temporary Protection Status in August 2022 and August 2025. From a ratio close to 1 in August 2022, it rose to 1.38 among those aged 14-17 and to 1.04 among those aged 0-13.

What explains the strong increase in arrivals of families with boys? Figure A5 shows that over time the share of respondents believing that Ukraine would win the war decreased sharply since early 2023. Initially expectations were very optimistic, and very few families with boys expected the war to last beyond their sons 18th birthday. Worsening expectations about the outcome of the war increased the anticipated probability that sons will turn 18 before the war will end. The closer sons' are to age 18, the stronger the incentive not to return. If the sons are sufficiently young, parents could consider to return to Ukraine and anticipate the option to leave Ukraine again once their sons. However, as long as they expect a nonzero probability of the war continuing at the time sons have turned 18, this could still negatively impact return prospects for families with boys.

Importantly, the shock in return prospects should not be interpreted as the sole consequence of the male travel ban. Even in absence of the male travel ban return to Ukraine may be less appealing for families with boys than for girls. Importantly, men may be expected to serve in the army and are thus expected to be more exposed to conflict. However, the male travel ban caused a very strong incentive to be already outside Ukraine from the 18th birthday onward.

3 Survey of Ukrainian refugees across Europe

We collaborated with the survey company Verian to conduct an online panel survey of Ukrainian refugees across Europe. For the first wave (hereafter: baseline) survey, respondents aged 18 and over were recruited via Facebook ads, and for subsequent waves, contact was made via email. The baseline was conducted between 14 June 2022, and 22 December 2022. On average, respondents completed the survey 194 days after leaving Ukraine. The survey was completed by 11,783 respondents with Ukrainian citizenship, of whom 6,299 agreed to participate in future waves.[3] Figure A4a shows the distribution of Ukrainian refugees across European countries and Figure A4b shows the sampling rate across European destinations, dividing the number of baseline respondents by the number of Ukrainians registered for temporary protection in December 2022. All major host countries have a sampling rate of at least 1 in 1000 refugees. Those who agreed to be recontacted were asked by email to complete nine follow-up surveys between September 2022 and May 2025. The follow-up emails explicitly asked respondents who returned to Ukraine to complete the survey. Participants received a 3 Euro voucher to encourage participation and minimize attrition rates in each survey wave.

The first survey wave includes questions on migrants' demographic characteristics, past and present employment status, their reasons for leaving Ukraine, and region of origin in Ukraine. Moreover, we explore the intention to return through the following question in all waves: *What are your plans regarding returning to Ukraine?* Response options include: (i) *I intend to go back very soon*; (ii) *I intend to go back at some point later when I feel it is safe to return*; (iii) *I do not intend to go back and plan to settle outside Ukraine*; (iv) *Do not know yet*; (v) *Prefer not to answer*.

[3]In all analyses, we exclude the small proportion of respondents (101 in the baseline survey) who do not hold Ukrainian citizenship.

In subsequent waves, respondents were asked about their current country of residence, their expectations about the war, and a range of integration outcomes. Importantly, we ask respondents about their main activity (e.g., mainly working, mainly in training, or unemployed), the number of Ukrainian and local friends in the destination country, whether they are taking a language course, two questions on host country language skills (speaking and reading), and subjective integration. In wave 8 (July 2024) and 10 (May 2025) we asked respondents about the number of hours worked and about their earnings.

Importantly, in wave 6 (October 2023) we asked respondents to list all their children, report on their age and sex and whether they are living in the same household. In wave 8 (April 2024) we asked respondents to report on which schools each of their children is attending (in-person local, in-person Ukrainian and/or online Ukrainian schools) and, for those children aged 12 and above, their assessment of their children' return intentions.

4 Empirical strategy

We aim to estimate the effect of having a teenage boy in the household on a range of parent-level outcomes. We initially focus on having at least one teenage boy aged 11-18 at the time of wave 6, which was conducted in October 2023, between 17 and 20 months after early-leaving Ukrainian refugees left Ukraine. Hence, those boys were between 9.5 and 17.5 years old at the time of leaving Ukraine.[4] We estimate varieties of the following model:

$$y_i = \beta boy_i^{11-18} + \gamma^{'} \mathbf{X_i} + \psi_i^a + (\xi_i) + \epsilon_i \tag{1}$$

Here y_i is the outcome for individual i. As individuals are interviewed more than once, we cluster standard errors at the respondent level. boy_i^{11-18} is a binary indicator for having at least one boy between 11 and 18 at the time of arrival. $\mathbf{X_i}$ is a matrix of individual-level covariates, including age fixed effects, gender, education, a dummy for partner cohabiting, a dummy for partner back in Ukraine and initial destination country fixed effects, and ϵ_i is the unobserved error term.

As having a boy between 11 and 18 is correlated to household composition, we include fixed effects for the number of children for every age (ψ_i^a). This controls for the total number of children in the household as well as the age composition of the children in the household. The number of children may reflect fertility choices that are made together with labor supply decisions, which may also affect refugees' employment during their stay in the host country. Hence, controlling for the number of children prevents β to spuriously pick up the effect of more children in the household. The age of children in a household may shape the preference for working and ability to work. The younger children are, the more care they require, the lower the labor supply. This may be particularly relevant for women, who typically reduce labor supply in the first years after childbirth. As the presence of teenage boys may be correlated to having older children, inclusion of fixed effects for the age of the youngest child flexibly controls for the potentially confounding role of child age.

In principle one could additionally control for the presence of at least one boy, or fixed effects for the number of boys in a household (ξ_i). This could control for a general effect of having boys on e.g. labor supply that is independent of a boy's age. One drawback is that the effect on teenage boys may be present for all ages (although stronger for older boys) and affect forward-looking parents (hence such a control would absorb part of the effect). Another drawback of this is that the presence dummy captures all variation in

[4] We vary the relevant age ranges in section 5.2.

having teenage boys between households with and without boys. Inclusion of the number-of-boys fixed effects would further absorb all variation between households with different sex-compositions among their children. We find that the reduction in variation increases the standard errors considerably, but barely effect the point estimates in most cases. In a series of robustness test we further control for additional fixed effects that more flexibly control for household composition. As we rely on repeated observations for the same individuals, we cluster standard errors on the respondent level.

The main identifying assumption to interpret β as the causal effect of worsening return prospects for boys is the following: parents with boys and girls would have had similar mobility (intention) and integration outcomes. This could by violated by two distinct threats. First, even if the sex ratio among early-leavers is 1, families with and without teenage boys could be differentially selected in sex. We find that there are no discernible differences between families with and without teenage boys in section 4.1. Second, (migrant) parents with teenage boys could have different return intentions and economic (integration) outcomes even absent differential exogenous return prospects. Using data on culturally similar individuals (migrants and natives in Ukraine), we study this in section 4.2.

Sample restrictions and descriptives We exclude individuals that left Ukraine before the 24 of February as they may have been very different from those that left on or after the 24th. For example, they may have left Ukraine for employment and are hence different from those that left as refugees. Moreover, we exclude all respondents that left Ukraine on or after the first of June, as those are more likely to have left because of the sex-specific consequences for their offspring.

We construct the indicator for whether someone has at least one child aged 11-18 using all children, including those living outside of the household. The reason to also include those is that child presence in the household may be endogenous, particularly so if parents of teenage boys decide to return without their sons. Our final sample consists of 1,209 individuals that answered wave 6, with 5,172 unique responses. Table A1 reports the demographic characteristics of this sample. 89% of the sample is female and on average households have just 0.83 children. 24% of the observations have at least one boy aged between 11 and 18 in wave 6. Figure A6 shows the distribution of the number of children across the sample by age and sex.

4.1 Child sex and differential selection and sorting

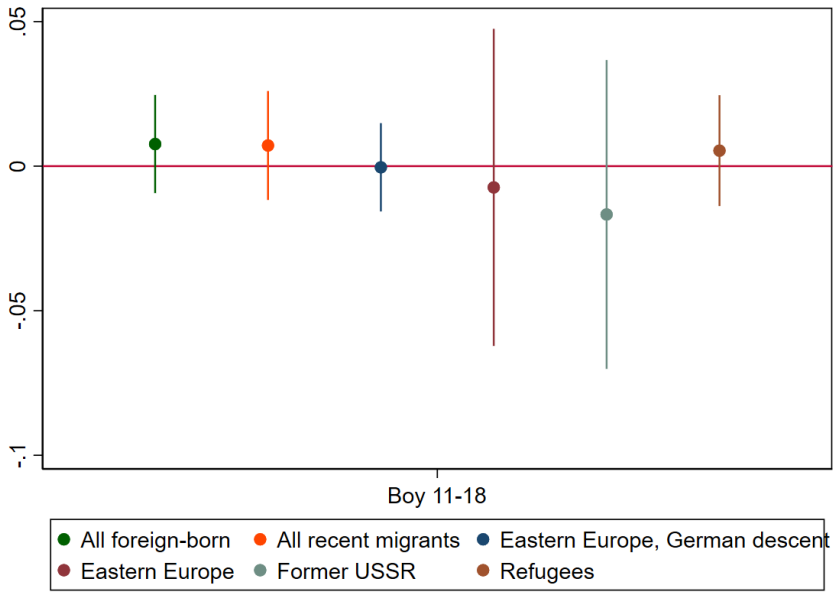
Strategic behavior of the parents poses a risk to the identification strategy. Although Figure 1 suggests that *early leavers* the propensity to leave with boys or girls is the same, the composition of those with boys and girls may be different. Table A2 and A3 shows the results of a series of regressions of respondent characteristics using the model of Equation 1, omitting the individual-level controls. We find that respondents with boys are slightly older, are more likely to have worked before arriving. Reassuringly, they are not different in terms of human capital and they did not sort in different countries initially. Moreover, we find that reasons for leaving Ukraine are not different for those with teenage boys. The test of joint significance of these factors in predicting the treatment is 0.053 (Table A2) and 0.11 (Table A3).

4.2 Child sex, return intentions and integration among other migrant groups

Return Intentions The German Socio-Economic Panel includes large migrant samples and a question on whether respondents want to stay in Germany or not. To test the identification assumption that individuals with teenage boys do not have different return intentions, we examine this among other migrant groups in

Germany. Using the model presented in Equation 1, Table 2 shows the effect of having a teenage boy on staying intentions in Germany. We find that households with boys aged 11-18 do not have an effect on staying intentions across migrant groups.

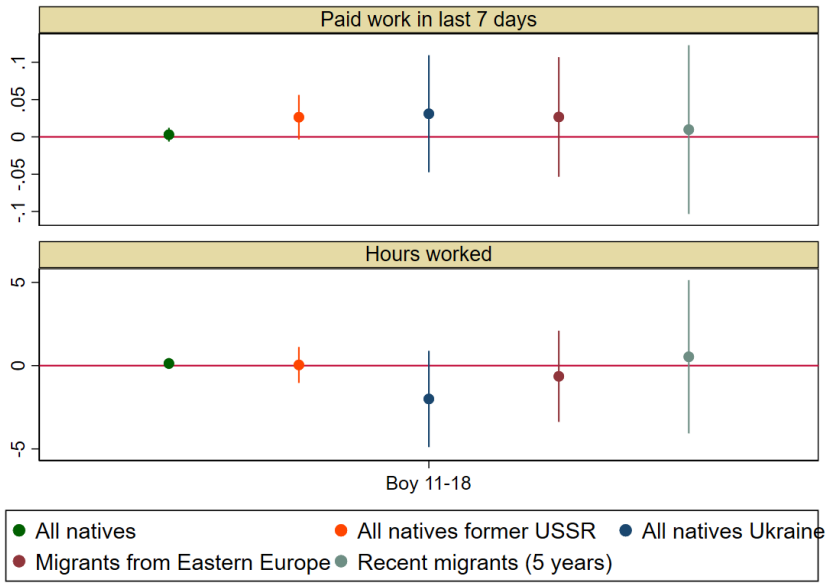
Figure 2: Intentions to stay in Germany across migrant groups



Note: Coefficient plot of group-specific regressions of a binary indicator for planning to stay in Germany on a binary indicator for whether someone has a boy aged 11-18. The sample is restricted to those aged 25-64 in the German SOEP 1984-2020. Group-s We control for sex, partnership status, levels of educational attainment and age, year, years since arrival, country or origin and number-of-children-by-age fixed effects. Shown are point estimates and 95% confidence intervals based on robust standard errors.

Economic integration The European Social Survey waves 2-11 include detailed questions on household composition, including age, sex and relationship to the household head. Moreover, it includes several questions concerning work, including one's main activity and hours worked. To test the identification assumption, we estimate the same specification as above on several subsamples. These are: natives in all countries, natives in Ukraine and natives in all former Soviet Union countries included in ESS. all migrants from Eastern Europe across Europe, and all recent migrants across Europe (residing there for less than five years). We use migrants and natives from Eastern Europe and former USSR because they are culturally similar to Ukrainians, especially in terms of gender norms. Figure 3 shows that across samples, having a boy aged between 11 and 18 does not predict the intensive and extensive margin of employment. As our sample of Ukrainian consists mostly of female household heads, we show the results only for women only in Appendix Figure A8, which confirms the results.

Figure 3: Effect of teenage boys on integration among migrant groups



Note: Coefficient plot of group-specific regressions of a binary indicator for work in the past 7 days (top) or the usual number of hours worked in a week (bottom) on a binary indicator for whether someone has a boy aged 11-18. We control for sex, whether someone has a partner, levels of educational attainment and age, year, country or birth, country of residence and number-of-children-by-age fixed effects. Shown are point estimates and 95% confidence intervals based on robust standard errors. The number of hours worked is winsorized at 80. The sample is restricted to those aged 25-64 in European Social Survey rounds 2-11. Coefficients and confidence intervals are shown for the following groups: All natives (N = 231,216), all natives in former USSR countries (Estonia, Latvia, Lithuania, Russia and Ukraine; N = 26,594), all natives in Ukraine (2005-2007, 2011, 2013 and 2022; N = 5,408), all migrants from Eastern Europe (Belarus, Bulgaria, Estonia, Latvia, Lithuania, Moldova, Poland, Romania, Russia, and Ukraine B and C N = 5,154) and all recent migrants (within 5 years after arrival; N = 3,150).

5 Parents

5.1 Mobility (intentions)

Table 1 shows the effect of having a teenage boy on a binary indicator taking value 1 if the respondent has returned to Ukraine or plans to return soon or when safe, on the pooled sample of all responses between June 2022 and May 2025. We find that regardless of specification, households with teenage boys have considerably lower return prospects. After accounting for individual characteristics and the age composition of children in column 3 (our preferred specification), we find that having a teenage boy in the household reduced return or return intention by 11 percentage points. When additionally controlling for the number of boys in column 4, which could capture the effect of boys (independent of age) in the household on return prospects, the estimates barely change. However, the standard errors increase considerably because this rules out all comparisons between a household with a teenage son and household with a teenage daughter which the same composition (keeping all other children constant). When controlling for the joint age composition of children in the household rather than only the #-of-children-by-age by fixed effects, the estimates are slightly more imprecise, but even increase slightly. When jointly controlling for the number of boys and the joint age composition, results remain statistically significant. Column 7 introduces a control for the

individuals' level of return intentions in the baseline survey, when the boy-to-girl ratio among new arrivals was less than 1.3 (see Figure 1), suggesting that the differences in prospects between boys and girls were still small. As expected, this reduces the point estimate, but it is still large and statistically significant, indicating that the effect arose over time.

Table 1: The effect of having a teenage boy on return or plans to return

	Dependent variable: Returned or plans to return						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Boy 11-18	-0.108***	-0.121***	-0.109**	-0.112*	-0.117**	-0.099	-0.093***
	(0.033)	(0.035)	(0.044)	(0.057)	(0.050)	(0.063)	(0.034)
Observations	5,173	5,173	5,173	5,173	5,173	5,173	5,173
R^2	0.008	0.149	0.159	0.160	0.269	0.269	0.367
Mean dep. var.	0.533	0.533	0.533	0.533	0.533	0.533	0.533
Controls		✓	✓	✓	✓	✓	✓
# of children × age FE			✓	✓	✓		
# of boys FE				✓		✓	
Joint child age FE					✓	✓	
Initial return intentions							✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 for different sets of controls and fixed effects. The independent variable is a binary indicator for whether a respondent has returned, plans to return soon or when safe. Controls include a binary indicator for being female, a dummy for having a partner, age fixed effects, dummies for having a partner, children, and parents back in Ukraine, having a Bachelor's degree, having a Master's degree, speaking English, fixed effects for levels of activity in Ukraine before the 24th of February (employed, self-employed, unemployed, retired, student, out of the labor force, or other) and a dummy for originating from an Urban settlement in Ukraine. It also includes fixed effects for the initial destination country and for the survey waves. All controls originate from the baseline survey from June 2022-December 2022. # of children × age fixed effects are 29 dummy indicators for each number of children for every child age 0-25. # of boys FE fixed effects include 5 dummy indicators for the number of sons an individual has. Joint child age fixed effects include 142 dummies, one for the exact joint age distribution of a family's children. Initial return intentions takes the following 5 levels: return soon, return when safe, don't know, plan to settle outside Ukraine, and prefer not to answer. The pooled sample consist of all responses in waves 2-10 of the Verian survey, for all respondents who answered the question on the number of children in wave 6 aged 25-64. We exclude the baseline wave as respondents could not have returned yet. Standard errors, clustered on the respondent level, are shown in parentheses.

Panel A of Table 2 splits the outcome in return and levels of return intentions, based on the preferred specification in Column 3 of Table 1. The effect on actual return has decreased by 3.9 percentage points (compared to a mean of 8.4 %), although it is not statistically significant (p=0.160). The decrease in plans to return soon is large and significant. This comes in equal parts at the expense of answering "don't know" and "settle outside Ukraine". The former suggest that uncertainty has increased for these individuals, the latter suggest that for some they have changes their plans and choose to settle outside Ukraine. Column 5 of Table 2 shows that having teenage boys also increased moving to another host country by 4 percentage points. The latter strongly suggests that a negative shock to return intentions causes refugees to reconsider whether the current host country is still optimal.

In some but not all survey waves, we collected information on where respondents returned, as well as whether they have gone back temporarily. Table A4 shows that having a teenage boy reduces both return to their home regions as well as to somewhere else in Ukraine by 2-3 percentage points. Moreover, those with teenage boys are less likely to have returned to Ukraine temporarily. To prevent this to be driven by 18-year old sons, we exclude those aged 18. Even those who could still return temporarily are considerably less likely to have done so. Table A5 provides suggestive evidence on other relevant intentions and behaviors related to future plans, which were collected across survey waves. Panel A shows that those with boys are

less likely to plan to return after the war, are less likely to plan a future in Ukraine and more likely to apply for citizenship in their host country. In addition, more women have reunified with their partner, but were not more likely to break up with their partner or remit to a partner in Ukraine (Panel B).

Table 2: The effect of having a teenage boy on return and levels of return intentions

	Return and return intentions				Moved to third country
	Returned to Ukraine	Plans to return	Does not know	Settle outside Ukraine	
	(1)	(2)	(3)	(4)	(5)
Boy 11-18	-0.003	-0.106**	0.054*	0.048	0.033*
	(0.026)	(0.043)	(0.030)	(0.036)	(0.019)
Observations	5,173	5,173	5,173	5,173	5,173
R^2	0.122	0.134	0.078	0.183	0.153
Mean dep. var.	0.084	0.448	0.246	0.213	0.044
Controls and FEs	✓	✓	✓	✓	✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 for different independent variables. Column 1 uses a binary indicator for whether or not a respondent returned to Ukraine, Column 2 whether a respondent plans to return soon or when safe, Column 3 whether a respondent does not know whether to return, Column 4 whether a respondent plans to settle outside Ukraine, and Column 5 whether a respondent resides in a different host country in the respective survey wave compared to the baseline wave. We use the same data and sample, and include the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

3 shows how the effect on return intentions changed over time. Compared to column 3 of Table 1, it also incorporates respondent fixed effects and interacts the indicator for a boy between 11 and 18 with the year of interview. As the individual fixed effects absorb all time-constant respondent-specific factors driving return (intentions), including those driven by the sex composition of their children, the results indicate changes within the same individuals over time. The results show that effects are larger in 2023 than in 2022 (the reference year), and get even stronger during 2024 and 2025. Combining all responses in 2024 and 2025, we find that on average 10.3% of all respondents returned. Among respondents with teenage girls (boys), the return rate is 12.8% (7.5%), in line with our regression estimates.

Given the distribution of expectations about the duration of the war, the younger the teenage children are, the more parents expect that the war will be over before their sons turn 18. Hence, the closer sons are to 18, the more strongly return prospects. We examine this in Table A6, which shows that effect is strongest among those aged 15-18, are weaker but still present among those 11-14, and are absent for those with younger boys.

We also examine heterogeneity across individual-specific factors. Table A7 shows that return (intentions) are reduced most strongly among those who had a partner who initially stayed behind in Ukraine, which is the group with highest return rates and intentions. This could suggest that many of the families who do not return because of their sons remain separated. Table A8 shows that the effects on return are strongest among those with who were initially closest to indifference about returning or not. Plans to return are lowered particularly strongly among those who did not plan to return initially, suggesting that having a boy particularly reduces positive updating of return intentions. To study the moderating role of human capital,

Table 3: Within-individual effects over time

	Returned or plans to return	Returned	Plans to return	Don't know	Settle outside Ukraine
	(1)	(2)	(3)	(4)	(5)
2023 × Boy 11-18	-0.073	-0.023	-0.049	0.079	-0.006
	(0.053)	(0.027)	(0.055)	(0.054)	(0.028)
2024 × Boy 11-18	-0.069	-0.052*	-0.017	0.071	-0.007
	(0.056)	(0.030)	(0.058)	(0.057)	(0.038)
2025 × Boy 11-18	-0.149**	-0.069**	-0.079	0.147**	-0.015
	(0.063)	(0.032)	(0.064)	(0.067)	(0.050)
Observations	5,135	5,135	5,135	5,135	5,135
R^2	0.689	0.677	0.634	0.483	0.698
Mean dep. var.	0.533	0.084	0.448	0.246	0.213
Respondent fixed effects	✓	✓	✓	✓	✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 with respondent fixed effects, interacting the binary indicator of having a boy in the household with the year of interview. Column 1 reports results using a dummy for whether a respondent returned or plans to return soon or when safe and Columns 2-5 report outcomes as shown in Table 3. We use the same data and sample, and include the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

we show heterogeneity by educational attainment and language skills of the language spoken in the host country in Table A9. We find the effect on return (intentions) is considerably stronger for those speaking the host country language. This suggest that refugees may be particularly susceptible to return prospects if they have relevant skills that enable integration in the current host country.

5.2 Robustness

In this section, we discuss the robustness of our results of Column 3 of Table 1 to alternative choices. The first set of robustness exercises, shown in Panel A of Table A10, uses more restrictive definitions of early-leavers. If we focus only on those who left Ukraine or (more restrictively) arrived in the host country at baseline in the first 2 or 3 months, results remain largely unchanged. In the first two columns of Panel B we show that results do not change once including fixed effects for the province or even municipality of origin. In the latter two columns we restrict the sample to those individuals with children or with at least one teenager in the household.

As our sample has been collected through online means and we rely on elicitation of questions of children in a later wave, one may be worried that the remaining sample is highly selective and may not be representative of either or the population of Ukrainian refugees. A7 shows that weighting regressions with inverse probability weights to reflect the demographic composition of the baseline wave or the whole Ukrainian population (in terms of host country, sex and age bin) do not change our conclusions.

As we choose the relevant age range (11-18) relatively arbitrarily, we show in Table A11 how results look like once narrowing the age range. Unsurprisingly, the results are very similar if slightly increasing the upper limit and become considerably larger for narrower age ranges closer to 18. Among those 17 and 18 the effect size more than doubles and among 18 year olds more than quadruples, highlighting that the effect really becomes strongest once the male travel ban becomes binding, or when it becomes binding very soon. This is

in line with the expectations of Ukrainians expecting the war to only last several years. Panel B of A11 also shows that results become smaller once gradually removing the contribution of older boys, but only become insignificant when discarding those aged 15-18. This is reassuring as it shows that our results are not only driven by boys close to turning 18, who could have been most likely differentially selected.

5.3 Integration

When return migration it takes place and is affected by household composition, integration outcomes are not observed for a non-random part of the sample. To examine how this could bias our estimates of the effect of return prospects on integration, we study the predictors of return. Table ? regresses return on covariates and whether or not an individual was employed in the baseline wave: being employed predicts a 3.1 percentage points lower return rate by May 2025. Returnees are thus negatively selected in attachment to the host country labor market. As fewer households with teenage boys return, one would expect that less weakly integrated individuals would have returned. Hence, if anything, this would lead to a downward bias in employment rates of households with teenage boys.

In addition, households with boys have higher onward migration rates, which could further complicate analysis. We address this pragmatically by showing an alternative specification, where we control for current host country fixed effects. This would capture differences in outcomes driven by the new host country, but also simply the effects of moving between host countries, which could have a downward impact on (short-run) employment rates and mechanically on host country language skills.

Table 4 shows that over time, parents with boys become more likely to report having work in the host country as main activity, and, if anything, less likely to be mostly in language training or inactive. They are also somewhat more likely to be privately accommodated. Table 5 shows that having a teenage boy increases the probability of working at least one hour by almost 15 percentage points, and working at least 25 hours by approximately the same. Moreover, they earn more and rely less on welfare benefits, although these results are not statistically significant. As those with teenage boys are more likely to move between countries, panel B controls for fixed effects for the current host country. The results are very similar. Table 6 shows that there is no effect on linguistic and social integration. After controlling for current host country fixed effects, the effect sizes increase somewhat, although still insignificant. As people move to another country, they may have no knowledge of the language in the new country, which could have generated a downward bias.

Table 4: Main activity and accommodation over time

	Main activity			
	Work in host country	(Language) training	Inactive	Privately accommodated
	(1)	(2)	(3)	(4)
Jul-Dec 2023 × Boy 11-18	0.038	-0.043	-0.004	0.008
	(0.031)	(0.034)	(0.026)	(0.033)
2024 × Boy 11-18	0.087**	-0.078*	-0.032	0.057
	(0.037)	(0.041)	(0.028)	(0.041)
2025 × Boy 11-18	0.096*	-0.035	-0.049	0.046
	(0.050)	(0.048)	(0.035)	(0.052)
Observations	4,704	4,704	4,704	4,704
R^2	0.729	0.616	0.630	0.717
Mean dep. var.	0.499	0.270	0.146	0.517
Respondent fixed effects	✓	✓	✓	✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 with respondent fixed effects, interacting the binary indicator of having a boy in the household with the year of interview. The independent variable in Columns 1-3 are based on a question of the main activity at the time of the survey. "Inactive" consists of two categories: being unemployed and not looking for a job or doing unpaid housework, looking after children or other persons. The other categories are: work for a Ukrainian employer, unemployed and looking for work, or other. The independent variable in Column 4 is a binary indicator for whether a respondent is living privately. The other categories are: reception center, with family or friends, with locals, separate temporary housing, or other. The data includes waves 3-10, as the main activity question has only been asked from wave 3 onward. We use the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

Table 5: Employment and earnings in July 2024

	Working	Works at least 25 hours	Monthly labor income (€)	Monthly benefits (€)	Work corresponds to qualifications
	(1)	(2)	(3)	(4)	(5)
Panel A: Baseline model					
Boy 11-18	0.147***	0.147***	112.358	-19.956	0.018
	(0.048)	(0.054)	(134.584)	(60.914)	(0.060)
Observations	1,277	1,277	411	555	987
R^2	0.268	0.270	0.492	0.395	0.260
Mean dep. var.	0.710	0.485	1068.180	237.377	0.414
Panel B: + current host country FE					
Boy 11-18	0.149***	0.153***	128.352	-36.017	0.025
	(0.049)	(0.055)	(141.120)	(64.338)	(0.060)
Observations	1,275	1,275	411	555	985
R^2	0.311	0.305	0.509	0.429	0.291
Mean dep. var.	0.711	0.485	1068.180	237.377	0.415

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 for various measures of economic integration from wave 8 (July 2024) and wave 10 (May 2025). The independent variable in Column 1 is whether someone works at least 1 hour, in Column 2 at least 25 hours, in Column 3 the monthly net labor income in Euro, in Column 4 monthly welfare benefits in Euro and in Column 5 whether one's job corresponds to formal qualifications, among those that are working. We use the same controls and fixed effects as Column 3 of Table 1 in Panel A. Panel B additionally includes fixed effects for the current host country. Standard errors, clustered on the respondent level, are shown in parentheses.

Table 6: Linguistic and social integration

	Reading (1-5)	Speaking (1-5)	Started a language course (0-1)	Feel integrated (1-5)
	(1)	(2)	(3)	(4)
Panel A: Baseline model				
Boy 11-18	-0.038	0.011	0.033	0.055
	(0.102)	(0.105)	(0.037)	(0.082)
Observations	2,148	2,151	1,634	2,568
R^2	0.310	0.262	0.205	0.132
Mean dep. var.	1.762	1.459	0.747	2.967
Panel B: + current host country FE				
Boy 11-18	-0.020	0.014	0.032	0.071
	(0.101)	(0.105)	(0.037)	(0.082)
Observations	2,147	2,150	1,633	2,566
R^2	0.348	0.292	0.233	0.154
Mean dep. var.	1.762	1.460	0.748	2.968

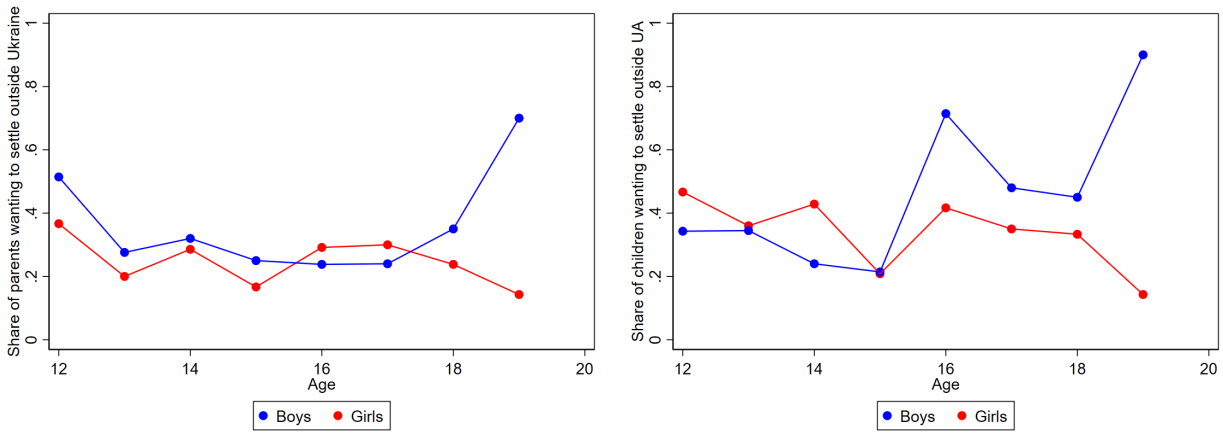
Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 for various measures of linguistic and social integration. The independent variable in Column 1 are self-reported reading skills on a scale from 1-5, in Column 2 self-reported speaking skills on a scale from 1-5, in Column 3 whether someone started a language course, and in Column 4 whether someone feels integrated on a scale of 1-5. We use the same controls and fixed effects as Column 3 of Table 1 in Panel A. Panel B additionally includes fixed effects for the current host country. Standard errors, clustered on the respondent level, are shown in parentheses.

5.4 Children

Return intentions To better understand how the shock in return prospects affected families, we examine the return intentions of children themselves. Figure 4 shows the staying intentions of a matched sample of parents and children in wave 8 (October 2024), by child sex and current age. On average, children have stronger intentions to settle outside Ukraine than parents. Moreover, boys aged 16-19 are considerably more likely to desire to settle outside Ukraine in comparison to girls. Interestingly, the boy-girl gap starts already at age 16 (13 or 14 at the time of leaving Ukraine) for children themselves, but only at age 18 for parents. Table 7 shows that older girls and younger boys have comparable return intentions than younger girls, but older teenage boys have considerably higher intentions to settle outside Ukraine, even after controlling for parental return intentions.

Integration Figure 5 shows the age-sex-specific share of children in host country schools, Ukrainian schools (in-person and online) and non-school clubs in the host country. The results show that there are no differences in school participation for teenage boys compared to girls. However, the results indicate that boys are more likely to be part of a non-school club in the host country, suggesting that older boys and their parents increase efforts to socially integrate.

Figure 4: Intentions of parents and children to settle outside Ukraine, by sex and age



(a) Parents

(b) Children

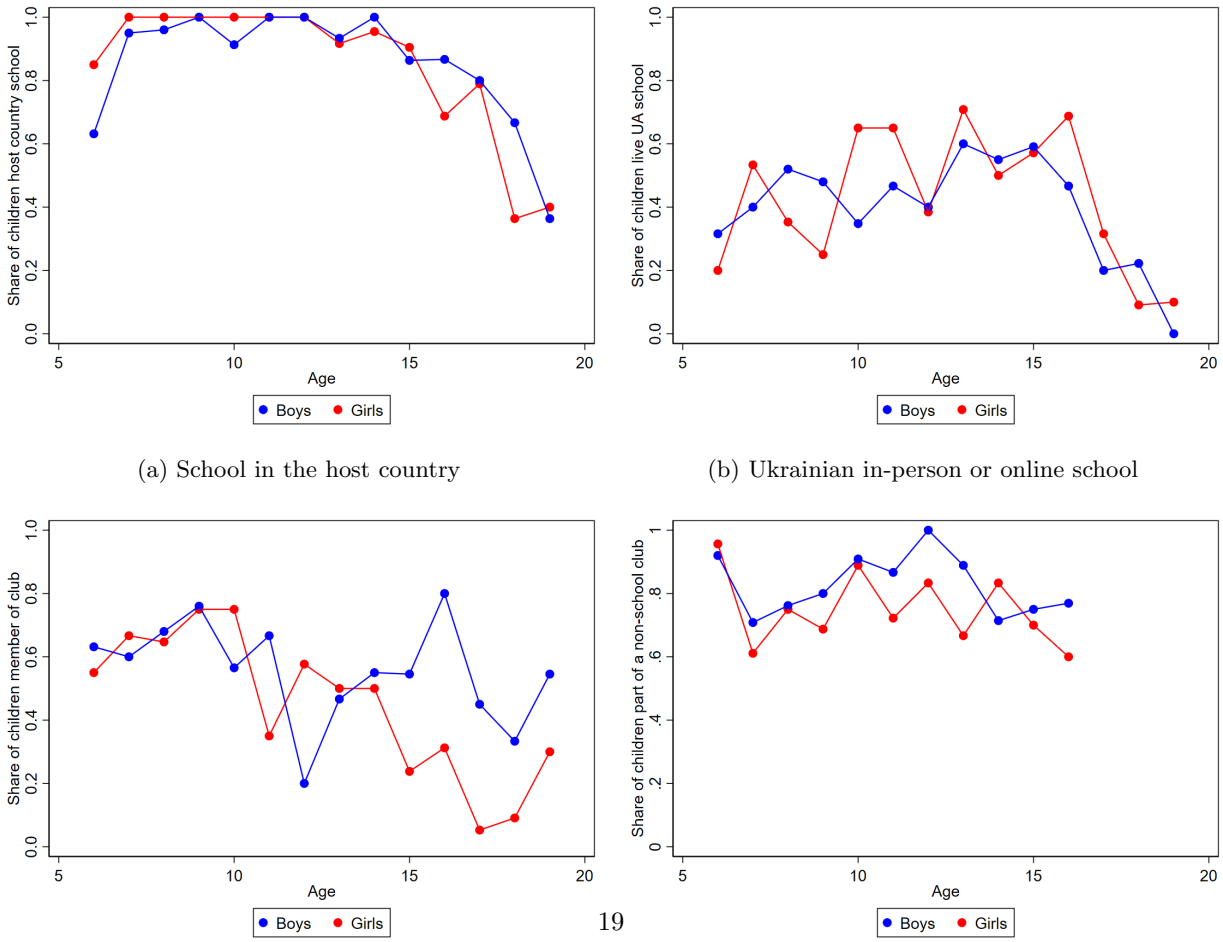
Note: Intentions to settle outside Ukraine among parents and children (as assessed by children), by child sex and age. N = 356 children from N = 287 unique parents.

Table 7: Levels of return intentions among 12-19 year old children (October 2025)

	Plans to return		Don't know		Settle outside Ukraine	
Aged 16-19	-0.003	-0.023	0.034	0.053	-0.023	-0.023
	(0.078)	(0.073)	(0.068)	(0.069)	(0.076)	(0.070)
Boy	0.060	0.066	0.035	0.068	-0.079	-0.117*
	(0.071)	(0.065)	(0.063)	(0.064)	(0.070)	(0.065)
Aged 16-19 × Boy	-0.157	-0.153	-0.167*	-0.191**	0.324***	0.340***
	(0.110)	(0.102)	(0.092)	(0.093)	(0.110)	(0.098)
Observations	365	365	365	365	365	365
R^2	0.014	0.213	0.015	0.055	0.051	0.224
Mean dep. var.	0.348	0.348	0.227	0.227	0.386	0.386
Parental return intentions		✓		✓		✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of levels of children' return intentions as assessed by their parents on a binary indicator for whether a child is aged between 16 and 19, whether the child is male, and the interaction of the two. The unit of observation is the child. The sample are interviews conducted in October and November 2024. Hence, children aged 12 were at least 9.5 and children aged 19 were at most 17.5 at the time of leaving Ukraine. Standard errors, clustered on the respondent (parent) level, are shown in parentheses.

Figure 5: School and non-school club participation of children



(a) School in the host country

(b) Ukrainian in-person or online school

(c) Club membership (Verian)

(d) (Club membership (GSOEP)

Note: School enrollment and non-school club membership by age and sex. Panel a and b , respectively. Panel c) shows

6 Human capital accumulation in Ukraine: evidence from university entrance exams

Since the full-scale invasion in February 2022, Ukraine's educational infrastructure has been severely damaged, undermining the normal functioning of schooling. Reports note that more than 3,700 educational facilities have been damaged or destroyed, with around 30% of all school buildings affected nationwide (Watch, 2023; International, 2025). In areas close to the front line, schools are often unable to reopen, forcing students either into online learning or into improvised classrooms in basements and shelters (Ukraine, 2023). UNICEF estimates that around 4.6 million children continue to face significant barriers to education, and early assessments suggest Ukrainian students have already experienced learning losses equivalent to almost two years of missed schooling (UNICEF, 2024; Bank, 2025).[5] In addition, test scores on the PISA test have also dropped considerably (OECD, 2023). The war has also severely disrupted the plans of university entrance exam test takers Zakharchenko et al. (2025). Although wars tend to hamper learning and reduce human capital on the short run, displacement could increase human capital investments of displaced individuals through increased uncertainty about staying prospects (Chiovelli et al., 2021; Becker et al., 2020). Not only can (forced) mobility effect the extent of human capital investments, it can also change the type of human capital acquired.

To study how human capital investments among Ukrainian teenagers have responded to the war, we turn to data from Ukraine's university entrance exams. The in-person External Independent Testing (EIT, until 2022) and the computer-based National Multi-Subject Test (NMT, since 2022) are conducted yearly (in June) by the Ukrainian Center for Educational Quality Assessment (UCEQA).[6] It is primarily taken by upper-secondary graduates aged 16 or 17 years after completing school, though prior-year graduates and other eligible applicants may also register. Testing is offered in 100s of locations in Ukraine and since 2022 at numerous temporary examination centers overseas to accommodate displaced students.[7]

The EIT/NMT allows takers to take several key subjects, with differing number of compulsory and elective subjects. In 2021, test takers could take up to five courses and only Ukrainian literature was compulsory.[8] In 2022, all test-takers had to take Ukrainian, History and Math and could not take any electives. In 2023, all test takers had to take Ukrainian and Math and had to take exactly one elective. In 2024 and 2025, Ukrainian, History and Math was compulsory and test takers could choose up to one elective. Ukrainian literature was newly introduced as an elective subject in 2024. Test takers obtain a score for every subject, which ranges between 100 and 200 if the student passed.

ZNO/NMT scores are used for admission to bachelor's programs across Ukrainian universities. Many Ukrainian universities use minimum grade requirements on specific subjects as a prerequisite for admission.[9] Although some universities across Europe accept NMT results for admission, it is not generally accepted as a stand-alone credential for admission across other European countries, where applicants must follow host-country requirements. As the test mostly has a domestic purpose, those taking the test from abroad are plausibly doing so in case they would return to Ukraine.

[5] Dinarte-Diaz et al. (2025) show that online tutoring strongly improves performance of Ukrainian pupils in grades 10-15, suggesting that the education during wartime can't provide sufficient support

[6] The NMT superseded the EIT in 2022, after the Russian invasion made it impossible to organize large-scale paper-based testing across the country. The NMT is designed as a streamlined, computer-based test that can be taken in safe locations both inside Ukraine and abroad.

[7] Between 2022 and 2025, there were more than 50 test centers in more than 30 countries.

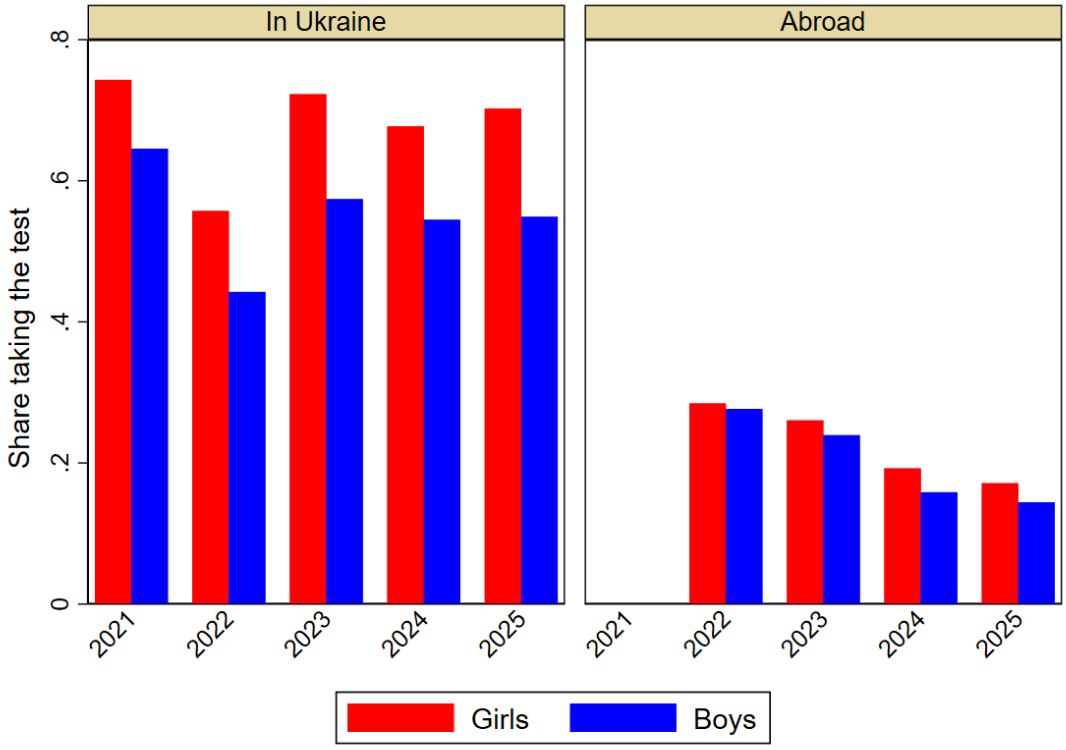
[8] Elective subjects in all years except 2022 are: English, Physics, Biology, Chemistry, French, German and Spanish

[9] Due to the many displaced children, university enrollments in Ukraine decreased considerably after the Russian invasion (Rodak, 2025).

We use microdata from UCEQA between 2021 and 2025, which includes information on year of birth, sex, school, and test location for all test takers. To focus on those 17 or younger at the time of the test, we focus on those born after the birth years 18 years relative the exam year.[10] This restriction drops 16% of observations.

6.1 Test taking during the war

Figure 6: Entrance exam participation rates over time, by sex and test location



Note: Share of the estimated 17-year old population in Ukraine and abroad. Data on the number of test takers originates from UCEQA, data on the number of births in Ukraine from and data on the number of Ukrainians aged 14-17 in other European countries from Eurostat table migr_asytpsm. To approximate the number of 17-year olds by sex outside of Ukraine, we divide the number of 14-17 year olds in June of the respective year by 4. To calculate the number of 17-year olds by sex in Ukraine, we simple subtract the number abroad from the number of births.

Figure 6 shows exam participation rates by sex and test location between 2021 and 2025.[11] In 2022, the share taking the test decreased in Ukraine, but rebounded thereafter. The share of boys taking the test has become considerably smaller. At the same time, the number of 17-year old Ukrainians moving abroad rose. However, a considerably lower and decreasing share of those abroad took the exams. The share of boys taking the NMT among those abroad has decreased stronger than the share of girls, indicating that boys

[10] Ukraine's school cohort cutoff is September 1. Hence those taking the test in year t born in year t-18 are most likely born after Sep likely

[11] Figure A3 shows the approximated cohort by sex and location between 2021 and 2025.

abroad are less eager to obtain entry credentials that benefit them if returning in Ukraine. Among those abroad, the share in 2022 was only 2.5% smaller among boys compared to girls, but is 15.5% smaller in 2025.

6.2 The sex-specific impact of the war

To study the effect of the war on human capital investments, we compare the grades of boys and girls before (2021) and during the war (2022-2025), pooling those in Ukraine and abroad. We estimate the following simple regression model:

$$y_i^s = \alpha \text{boy}_i + \beta \text{boy}_i \times \text{During war} + year_i + \epsilon_i \tag{2}$$

Here, y_i^s is the outcome of student i in subject s. boy_i is a dummy for boys, $\text{boy}_i \times$ During war is the interaction term of interest and $year_i$ are year fixed effects. To interpret these as causal, one needs to assume that there is no differential selection into the test and the subject. As the subject requirements in 2024 and 2025 remained the same, we pool observations from these two years in our analysis.

Results We show the choice of subjects in (Appendix) Table 8. We exclude 2022 as everyone had to take the same 3 courses. We do not show results for Ukrainian language, Maths and Ukrainian history, as those are compulsory subjects in some or all years.

Column 1 shows how the number of courses taken increased over time due to the changing requirements, but almost all electives were less likely to be chosen due to the reducing in the number of electives from at most 4 to at most 1 during the war. Boys started taking less courses than girls in 2024 and 2025. One potential explanation is the introduction of Ukrainian Literature in 2024, chosen by 20.4% of girls compared to only 8.0% of boys. At the same time, boys became more likely to take other foreign languages. Compared to girls, boys became even less likely to take Physics, but more likely to study Biology, Chemistry and English and foreign languages. However, the interpretation of the change in choosing sciences is obfuscated by the large pre-war sex differences and the strong reduction in taking sciences due to the much lower number of elective subjects. Nevertheless, these seem to hint at increased investments in (language) skills, particularly among boys.

Relative to the baseline mean, participation changed strongly for sciences and foreign languages other than English. As changing selection into tests could differentially affect test scores, we do not show the test scores for those subjects. Table 9 shows the impact on test scores in Ukrainian language, history, math and English. Before the war, boys scored considerably worse on Ukrainian language, history and English. After the war, boys started performing better in every subject with 0.03 to 0.07 standard deviations. Relative to the gender gap, the increase in Ukrainian language and history is relatively small. These results further suggest that boys exert more effort across subjects.

Table 8: Entrance exam subject choice before and during the war, by sex (2021, 2022-2025)

	Number of courses	Biology	Chemistry	Physics	English	French, German, Spanish
	(1)	(2)	(3)	(4)	(5)	(6)
2023		-0.171***	-0.024***	-0.020***	-0.142***	0.000
		(0.002)	(0.001)	(0.000)	(0.002)	(0.000)
2024-2025	0.559***	-0.110***	-0.026***	-0.013***	-0.032***	0.004***
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.000)
Boy	0.030***	-0.123***	-0.014***	0.121***	0.017***	-0.005***
	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)	(0.000)
Boy × During war	-0.160***	0.046***	0.009***	-0.086***	0.027***	0.002***
	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)	(0.000)
Observations	726,655	954,841	954,841	954,841	954,841	954,841
R^2	0.156	0.032	0.006	0.051	0.012	0.001
Mean dep. var.	3.628	0.192	0.017	0.038	0.405	0.011

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 2 using the number of courses and 5 subjects. The sample consists of all individuals born at most 18 years who have done the test, for the years 2021, 2022-2025. We exclude 2022 as there were only compulsory subjects. Due to the small share of test takers, we aggregate French, German and Spanish. Data originates from UCEQA. Heteroskedasticity-robust standard errors are provided in parentheses.

Table 9: Entrance exam grades before and during the war, by sex (2021-2025)

	Ukrainian language	Ukrainian History	Math	English
	(1)	(2)	(3)	(4)
Boy	-0.428***	-0.190***	0.011**	-0.127***
	(0.004)	(0.005)	(0.005)	(0.006)
Boy × During war	0.057***	0.066***	0.039***	0.031***
	(0.004)	(0.006)	(0.006)	(0.007)
Observations	1,113,252	909,964	968,479	371,436
R^2	0.037	0.005	0.001	0.003
Effect relative to gender gap [%]	13	35	346	25

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of estimating equation 2 on standardized grades in four subjects. The sample consists of all individuals born at most 18 years before the year of the test who have taken the respective subject, for the years 2021-2025. To account for differences in the grade distribution before and during the war, we standardize the grades on the yearly level. Heteroskedasticity-robust standard errors are provided in parentheses.

6.3 Sex-specific differences between refugees and stayers

The previous analysis may hide considerable heterogeneity between test takers in Ukraine and abroad. Hence, we additionally study how the different situation of boys and girls abroad versus at home changed subject choice and test scores during the war. Those abroad may have less exposure to Ukrainian language and culture, more to host country-specific languages and are often enrolled in local school systems. In addition, boys abroad face uncertainty about whether they can return without risking conscription which may be the case to a lesser extent for girls and boys in Ukraine. We estimate the following regression model:

$$y_i^s = \beta \text{boy}_i + \gamma \text{abroad}_i + \delta \text{boy}_i \times \text{abroad}_i + \phi_i + \epsilon_i \tag{3}$$

Here, y_i^s is a dummy for participation of test taker i or the grade in subject s, boy_i a dummy for being a boy and abroad_i a dummy for taking the test from abroad. ϕ_i are year-sex fixed effects, which absorb

sex-specific differences in subject choice and grades over time.

An important consideration is how selection in taking the test differs across sex among Ukrainians abroad, especially because only a smaller share of Ukrainians abroad take the exam. As Ukrainian adults are shown to be positively selected (Van Tubergen et al., 2024), it is plausible that their children are also positively selected. In addition, the relative share of boys compared to girls abroad taking the test also decreases over time (see Figure 6). However, during the 2022 test sex-specific differential selection into migration and into taking the test are probably limited. In the following years, many families with teenage boys left Ukraine, which may have been differentially selected.

Subject choice Table 10 show the number of subjects taken as well as whether specific subjects are taken. We focus on those individuals taking the test in 2023-2025, as in 2022 there were only compulsory subjects. The results indicate that those abroad take more courses. Unsurprisingly, those abroad are more likely to choose foreign languages, at the expense of Ukrainian history and Biology. In addition, we find that boys are more likely to invest in general skill subjects: English and Biology.

Table 10: Entrance exam subject choice during the war, by sex and location (2023-2025)

	Number of subjects (2024+2025) (1)	Ukrainian history (2023) (2)	Biology (3)	Chemistry (4)	Physics (5)	English (6)	French, German, Spanish (7)
Abroad	0.080***	-0.293***	-0.084***	-0.000	0.001**	0.208***	0.125***
	(0.002)	(0.005)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)
Abroad × Boy	0.078***	-0.007	0.022***	0.001	-0.005***	0.011**	-0.039***
	(0.003)	(0.006)	(0.003)	(0.001)	(0.001)	(0.005)	(0.003)
Observations	462,057	228,186	690,243	690,243	690,243	690,243	690,243
R^2	0.034	0.029	0.020	0.001	0.014	0.027	0.070
Mean dep. var.	3.805	0.523	0.163	0.011	0.022	0.390	0.011
Sex-year FE	✓	✓	✓	✓	✓	✓	✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of estimating equation 3 on participation in four subjects after the war (2023-2025). Heteroskedasticity-robust standard errors are provided in parentheses.

Test scores Table 11 shows differences in test scores by location and sex, over time. In 2022, those abroad score considerably better on Ukrainian language and Math, and worse on Ukrainian history. This confirms that also those who fled are positively selected, and less exposed to the Ukraine-specific history curriculum. Already in 2022, boys did relatively even better: they have about a 0.1 s.d. higher score in all compulsory subjects, suggesting that those abroad exerted more effort.

Over time, those abroad started doing worse in Ukrainian language and history, but improved in Math, Sciences and English. This could be driven by better schooling opportunities, but also by changing selection into the test. For example, higher educated parents with better-performing children may exert more pressure on children to take the NMT. Boys abroad continued to perform differentially better in every subject, which could capture the effort effect, but could also reflect changing selection into the test, which is plausible given the stronger decrease for boys compared to girls abroad to take the NMT as shown in Figure 6.

Foreign languages and location Table 12 shows that foreign language taking is especially strong among those residing in the country where the language is spoken. However, this effect is somewhat weaker for boys. A potential explanation is that boys are less likely to stay in the current country, as witnessed by

Table 11: Entrance exam grades during the war, by sex and location (2022-2025)

	Ukrainian language (1)	Ukrainian history (2)	Math (3)	Biology (4)	Chemistry (5)	Physics (6)	English (7)
2022 × Abroad	0.118***	-0.048***	0.213***				
	(0.009)	(0.009)	(0.009)				
2023 × Abroad	0.096***	-0.090***	0.185***	0.085***	0.123	-0.069	0.186***
	(0.009)	(0.019)	(0.010)	(0.029)	(0.085)	(0.110)	(0.013)
2024-2025 × Abroad	-0.073***	-0.092***	0.126***	0.160***	0.091	0.276***	0.217***
	(0.008)	(0.008)	(0.008)	(0.026)	(0.076)	(0.089)	(0.011)
2022 × Abroad × Boy	0.084***	0.098***	0.133***				
	(0.013)	(0.013)	(0.014)				
2023 × Abroad × Boy	0.051***	0.107***	0.060***	0.055	-0.153	0.178	0.015
	(0.013)	(0.026)	(0.014)	(0.047)	(0.131)	(0.126)	(0.019)
2024-2025 × Abroad × Boy	0.097***	0.104***	0.064***	0.031	-0.000	0.010	0.050***
	(0.010)	(0.011)	(0.012)	(0.042)	(0.117)	(0.098)	(0.015)
Observations	871,399	763,485	812,513	112,219	7,530	14,075	264,789
R^2	0.035	0.004	0.005	0.008	0.008	0.005	0.008
Sex-year FE	✓	✓	✓	✓	✓	✓	✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of estimating equation 3 on standardized grades. To account for differences in the grade distribution over time, we standardize the grades on the yearly level. Heteroskedasticity-robust standard errors are provided in parentheses.

the increased tendency of families with teenage boys to move between countries in Table X. Subject grades follow largely in line: those residing in countries where the language is spoken perform better in respective languages. Boys residing in non-English speaking countries are also more likely to take English and perform better, further indicating that boys invest more in general rather than country-specific skills.

Table 12: Subject choice and exam grades in foreign languages, by host country (2023-2025)

	Taken		Grade	
	English (1)	FR/DE/ES (2)	English (3)	FR/DE/ES (4)
Not in ...-speaking country	0.269***	0.008***	0.141***	-0.003
	(0.004)	(0.001)	(0.011)	(0.082)
In ...-speaking country	0.116***	0.300***	0.317***	0.158***
	(0.005)	(0.005)	(0.014)	(0.033)
Not in ...-speaking country × Boy	-0.009*	-0.002*	0.056***	-0.087
	(0.006)	(0.001)	(0.014)	(0.123)
In ...-speaking country × Boy	0.027***	-0.066***	0.032	-0.105*
	(0.007)	(0.006)	(0.020)	(0.058)
Observations	690,243	690,243	264,789	7,822
R^2	0.028	0.174	0.008	0.010
Mean dep. var.	0.390	0.011	-0.000	-0.000

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of estimating equation 3. Compared to Tables 10 and 11, we split out the dummy for abroad into two dummies: one for test-takers in countries where the respective course language is natively spoken and where it is not. The outcomes are either a binary indicator for whether a course is taken or the standardized grade. All models include age-by-sex fixed effects. Heteroskedasticity-robust standard errors are provided in parentheses.

7 Conclusion

Our study shows that shocks to the return prospects of refugee children strongly impact parents' return plans. Moreover, we find suggestive evidence that these reduced return intentions improved economic integration, but not linguistic and social integration. These results suggest that parents take up employment to build an attachment to the labor market, rather than invest in host country specific skills through language trainings. This may be driven by a preference for increased investments in the long-term integration of their children.

Using Ukraine's university entrance exams, we show that boys are more likely to take foreign languages and perform better during the war. These suggest two distinct channels through which human capital accumulation is altered: through increased effort and through acquiring skills that pay off abroad. Test takers outside Ukraine are more likely to take foreign languages, crowding out Ukrainian history and sciences.

These results show that uncertainty about return prospects can strongly shape decisions related to integration and human capital accumulation. This may also suggest that uncertainty driven by host country policies may also negative the integration of refugees. As most Ukrainian refugees in the EU are currently staying on the Temporary Protection Status which gets only extended with one year at a time (currently March 2027), they face uncertainty about their long-term prospects in the residence countries. Pathways to permanent residence, conditional on a certain degree on linguistic and economic integration, could provide strong incentives to further integrate in Ukrainian refugees' host societies. In addition, such pathways to permanent residence could also create incentive effect to exert more effort for integration. An unavoidable drawback of such policies is that it implies less return to Ukraine on the short run. However, better integration of Ukrainian refugees across Europe could create a diaspora that can support Ukraine on the long run through improved economic integration with the EU.

Although we find positive effects on economic integration, these are estimated relatively imprecisely. Using register data, we can more accurately study the extensive and intensive margin of employment response and study things that are hard to elicit in surveys, such as occupations, earnings, enrollment in education and internal mobility. In the future, we plan to further study the consequences of integration using register data from one or more Ukrainian-hosting countries. This would also allow us to study spillovers between siblings.

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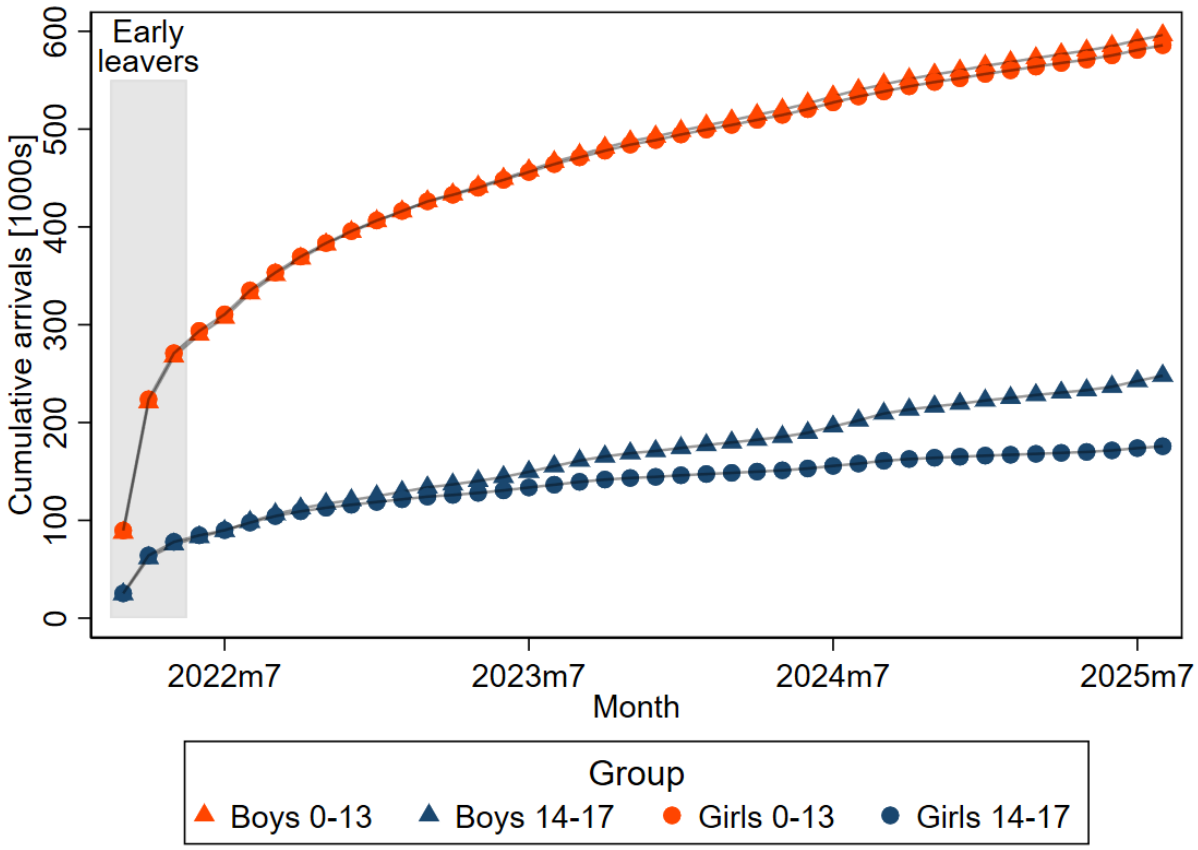
A Appendix

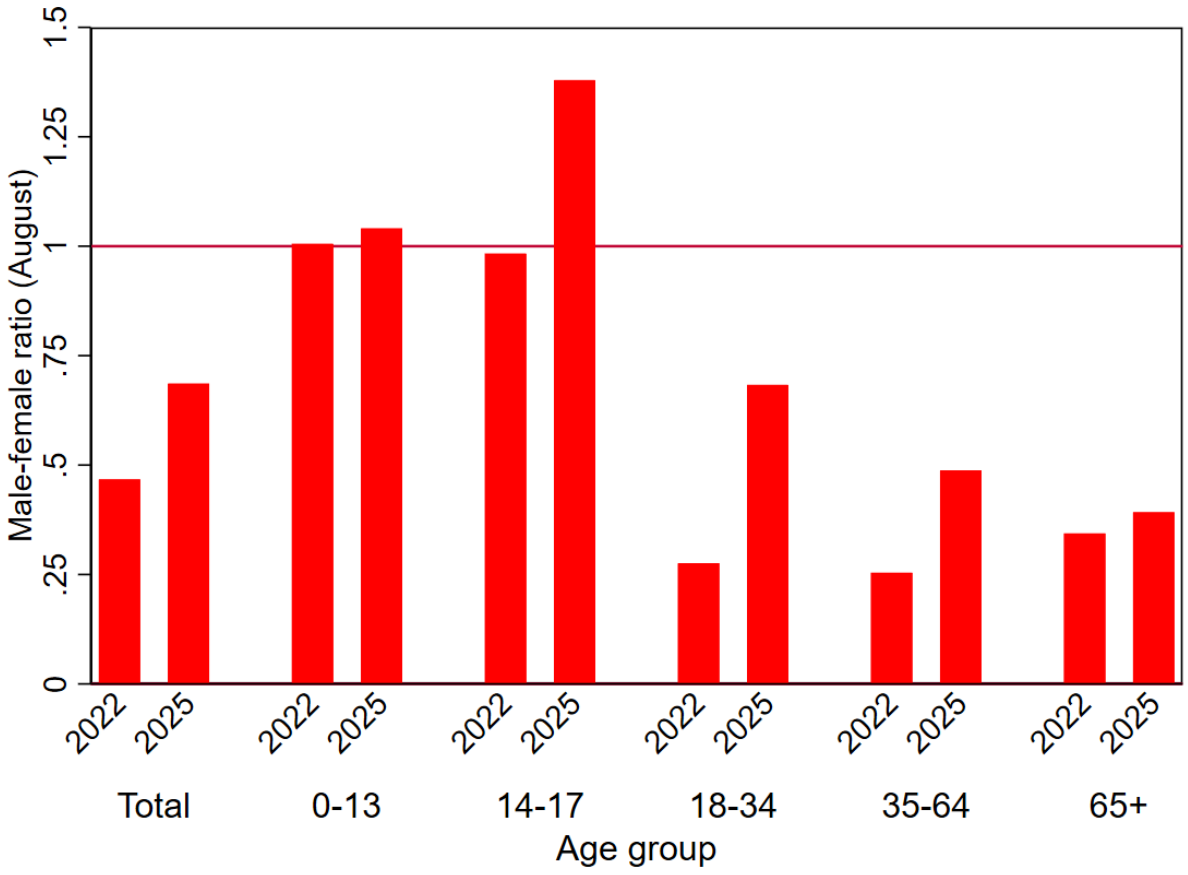
A.1 Descriptives

Figure A1: Cumulative number of children arriving by age group and sex



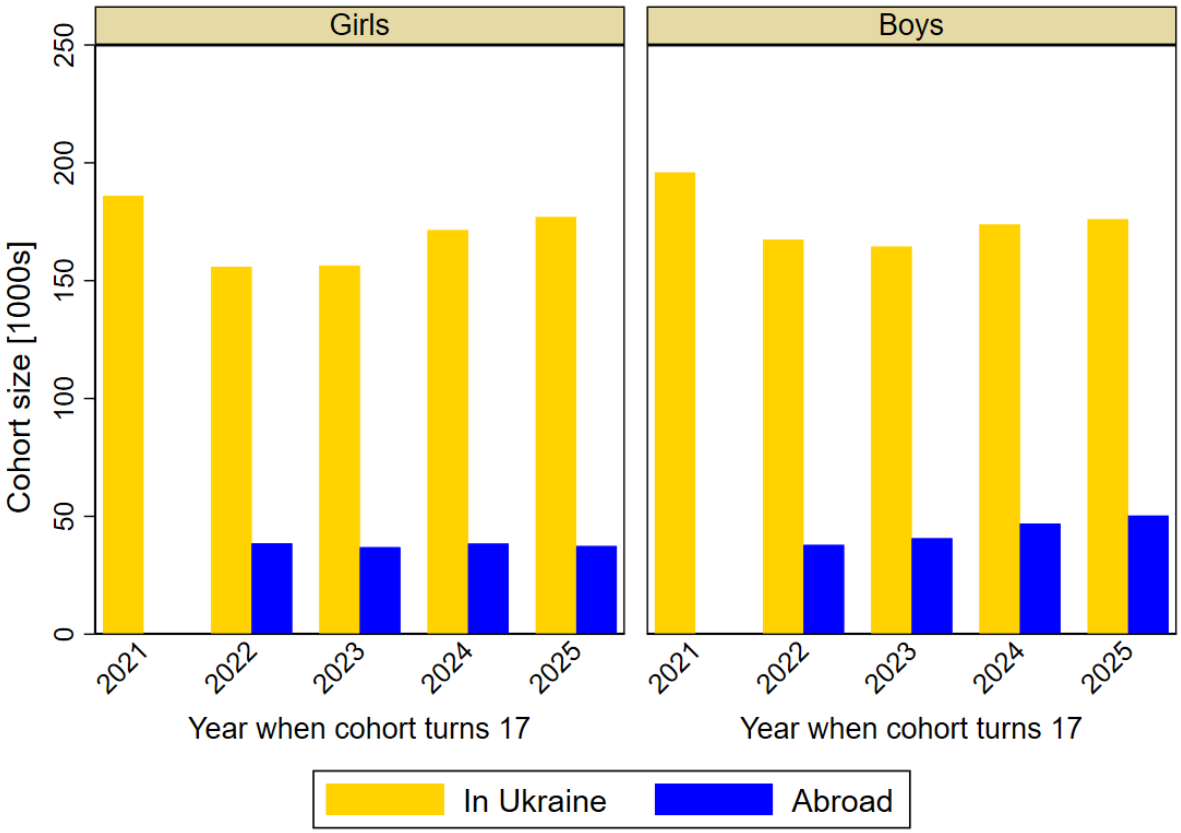
Cumulative number of registrations among boys and girls aged 0-13 and 14-17 across 30 European countries. Data from Eurostat table migr_asytpfm.

Figure A2: Male-female ratio by age category among registered Ukrainian refugees in 2022 and 2025



Male-female ratio by age category among Ukrainians registered for Temporary Protection Status registrations across 30 European countries, in August 2022 and August 2025. Data from Eurostat table migr_asytpsm.

Figure A3: Distribution of test-taking cohort, in Ukraine and abroad

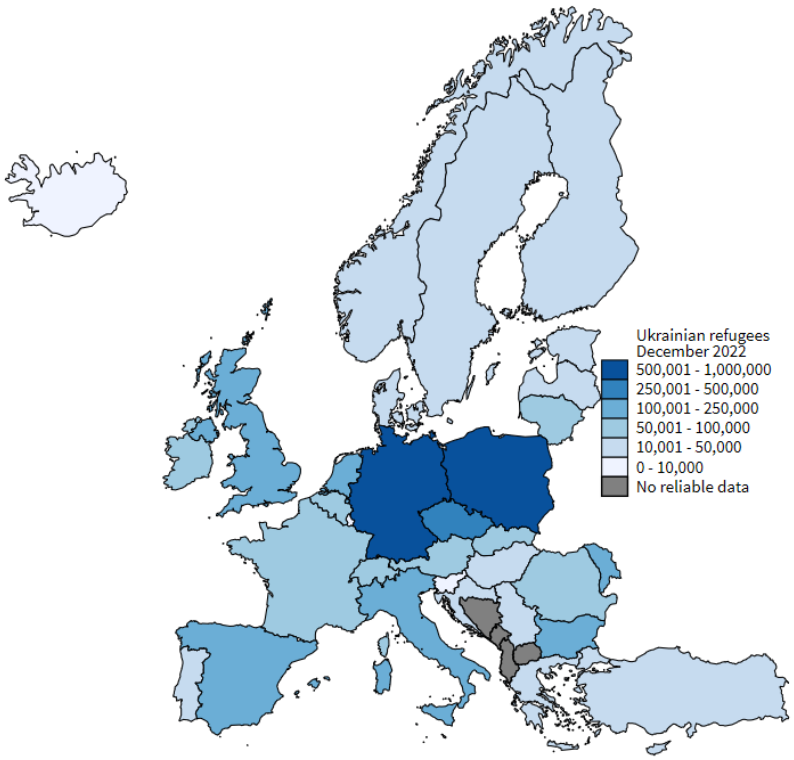


Male-female ratio among registered Ukrainians for Temporary Protection Status registrations across 30 European countries. Data from Eurostat table migr_asytpsm and Statistics Ukraine.

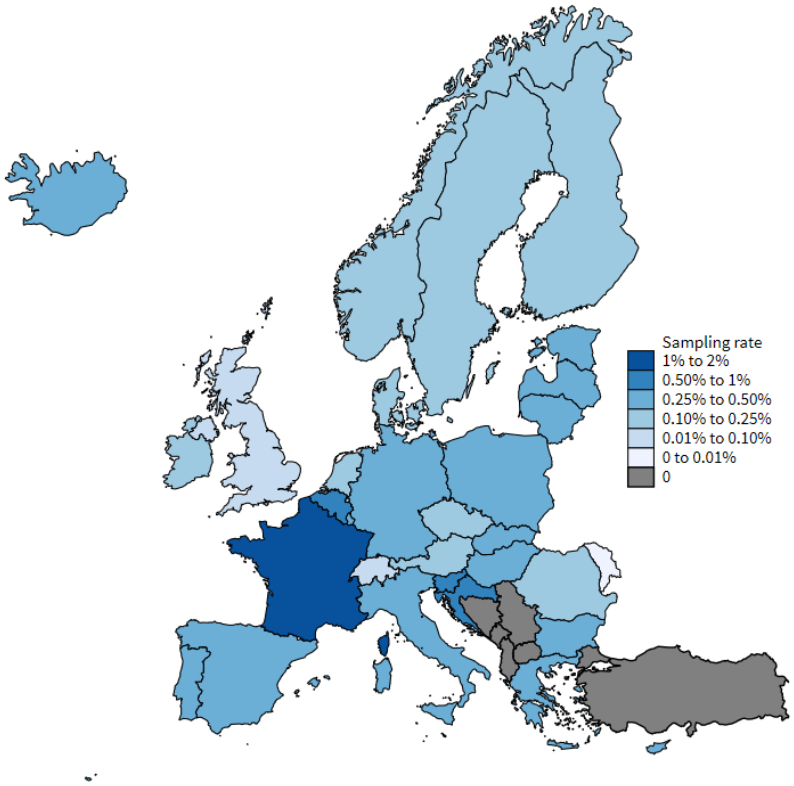
A.2 Survey

Figure A4: Number and sampling rate of Ukrainian refugees

(a) Number of Ukrainian refugees across Europe

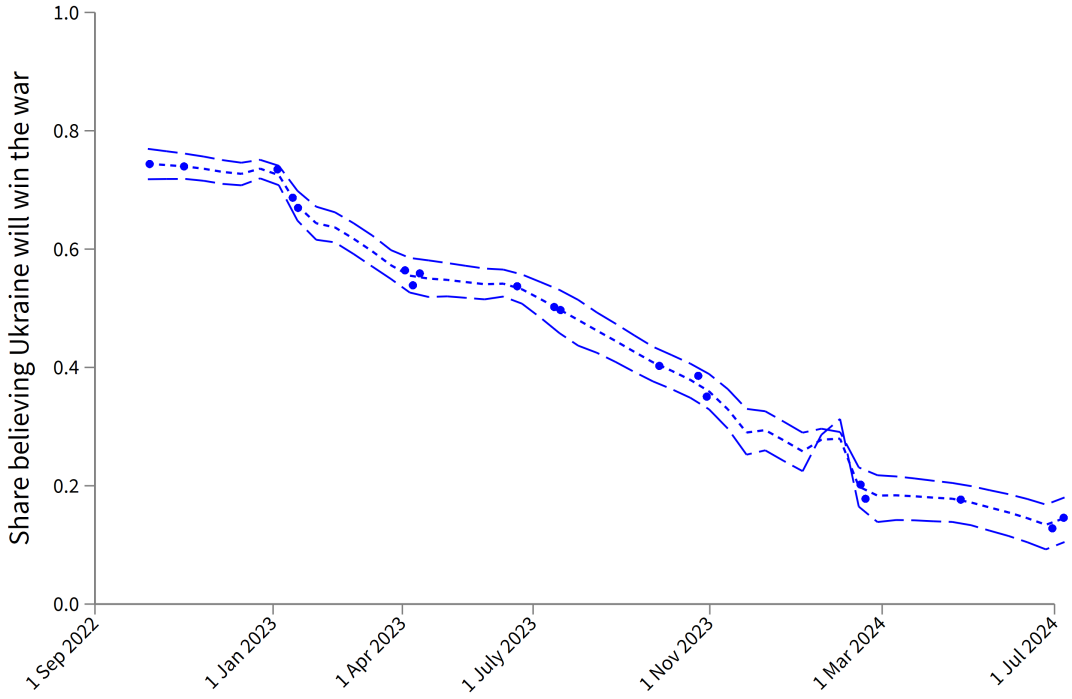


(b) Sampling rate of Ukrainian refugees across Europe



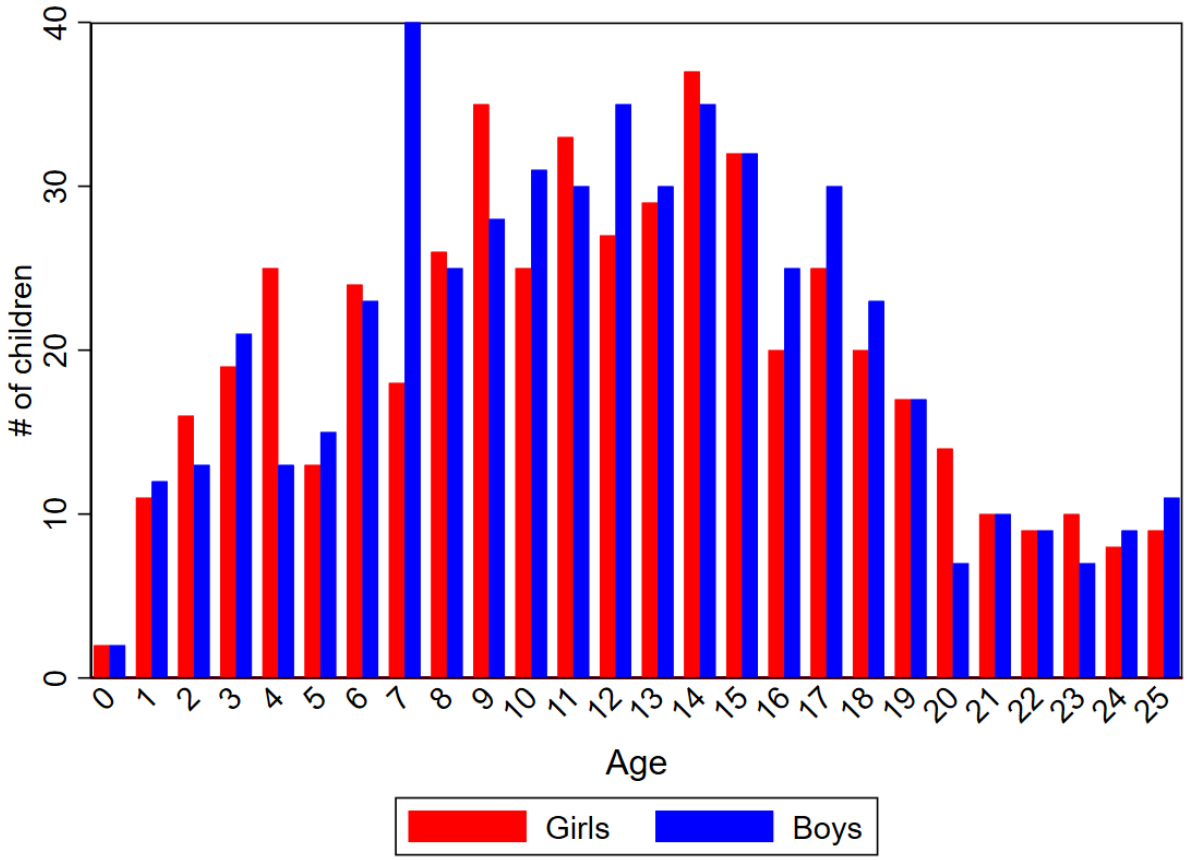
Notes: Panel (a) shows the number of Ukrainian refugees who are beneficiaries of Temporary Protection Status by December 2022, by host country. Data from the Eurostat table *migr_asytpsm*. Panel (b) shows the sampling rate of Ukrainian refugees from across European countries. Obtained by dividing the total number of respondents in the baseline wave by initial destination country by the total beneficiaries in December 2022 from the Eurostat table *migr_asytpsm*.

Figure A5: Expectations about the outcome of the war till the end of 2024



Note: Expectations of the outcome of the war by the end of 2024 from wave 2-6

Figure A6: Children by age and sex



Note: Number of children by age and sex of all respondents in wave 6 (Autumn 2023) and part of the estimation sample.

A.3 Descriptives

Table A1: Demographic characteristics of estimation sample

	Mean (1)	S.D. (2)	N (3)
# of children	0.91	0.94	5173
Boy 11-18	0.24	0.43	5173
Girl 11-18	0.21	0.41	5173
Female	0.91	0.29	5173
Age	43.10	9.84	5173
Urban settlement	0.75	0.43	5173
Left with: partner	0.20	0.40	5173
Left behind: partner	0.31	0.46	5173
Left behind: children	0.15	0.36	5173
Left behind: parents	0.53	0.50	5173
Bachelor's	0.18	0.38	5173
Masters or higher	0.58	0.49	5173
Speaks English	0.49	0.50	5173
In Ukraine: self-employed	0.20	0.40	5173
In Ukraine: employed	0.59	0.49	5173
In Ukraine: unemployed	0.02	0.15	5173
In Ukraine: retired	0.06	0.24	5173
In Ukraine: student	0.00	0.05	5173
In Ukraine: not in labor force	0.11	0.31	5173
Returned	0.08	0.28	5173
Plans to return soon or when safe	0.45	0.50	5173
Return intention: don't know	0.25	0.43	5173
Settle outside Ukraine	0.21	0.41	5173
Moved to another country	0.04	0.21	5173
Returned temporarily	0.37	0.48	1575

Notes: Descriptive statistics of the estimation sample. The upper panel shows descriptives on the number of children and the binary indicator for whether someone has a boy (girl) aged 11-18 at the time of wave 6, the middle panel shows all control variables and the bottom panel shows relevant outcome variables.

Table A2: Covariate balance table

	No boy 11-18	Boy 11-18	Difference	
			raw	residualized
	(1)	(2)	(3)	(4)
Female	0.90	0.93	0.025	0.066**
Age	43.20	43.23	0.606	1.222*
Urban settlement	0.76	0.74	-0.016	0.063
Left with: partner	0.21	0.16	-0.044	-0.071*
Left behind: partner	0.28	0.41	0.103**	0.004
Left behind: children	0.16	0.14	-0.016	0.022
Left behind: parents	0.49	0.61	0.115***	0.088
Bachelor's	0.17	0.17	-0.012	-0.020
Masters or higher	0.58	0.60	0.026	0.044
Speaks English	0.49	0.48	-0.028	-0.031
In Ukraine: self-employed	0.18	0.25	0.073**	0.028
In Ukraine: employed	0.61	0.57	-0.023	0.016
In Ukraine: unemployed	0.03	0.02	-0.016	-0.031
In Ukraine: retired	0.07	0.02	-0.055***	-0.026
In Ukraine: student	0.01	0.00	-0.004*	-0.003
In Ukraine: not in labor force	0.09	0.12	0.023	0.021
N	3,944	1,229		
Joint p-value			<0.001	0.053

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows average values of covariates for those without and with any boys aged 11-18, the raw difference and the difference after accounting for initial host country, survey wave and number-of-children by age fixed effects. The footer reports a joint F-test for the effect of all covariates on the treatment being 0, with and without including fixed effects. The sample consists of all wave 2-wave 10 responses for whom information on the sex and age composition from wave 6 is available.

Table A3: Balance table: reasons for leaving

	No boy 11-18	Boy 11-18	Difference	
			raw	residualized
	(1)	(2)	(3)	(4)
Reason of leaving: under direct attack	0.29	0.23	-0.042	0.043
Reason of leaving: fear for own life	0.32	0.13	-0.180***	0.018
Reason of leaving: fear for children's live	0.57	0.91	0.331***	0.013
Reason of leaving: life is disturbed	0.20	0.15	-0.049*	-0.020
Reason of leaving: fear of fighting	0.00	0.01	0.003	-0.003
Reason of leaving: chemical/nuclear weapons	0.09	0.07	-0.013	-0.029
Reason of leaving: uncertain future	0.06	0.06	-0.003	-0.000
Reason of leaving: forcibly displaced	0.01	0.00	-0.009*	-0.007*
Reason of leaving: for opportunity	0.02	0.01	-0.007	-0.014*
N	867	262		
Joint p-value			<0.001	0.106

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows average values of covariates for those without and with any boys aged 11-18, the raw difference and the difference after accounting for initial host country, survey wave and number-of-children by age fixed effects. The footer reports a joint F-test for the effect of all covariates on the treatment being 0, with and without including fixed effects. The sample consists of all wave 1 responses for whom information on the sex and age composition from wave 6 is available.

A.4 Additional results

Table A4: The effect of having a teenage boy on (temporary) return, by location

	Return	Return to hometown	Return to elsewhere	Went back temporarily
	(1)	(2)	(3)	(4)
Boy 11-18	-0.013	0.003	-0.016*	
	(0.028)	(0.025)	(0.009)	
Any boy 11-17				-0.096*
				(0.051)
Observations	3,608	3,608	3,608	1,573
R^2	0.137	0.127	0.102	0.224
Mean dep. var.	0.093	0.072	0.020	0.371
Sample	3, 6-10	3, 6-10	3, 6-10	3,4,10
Controls and FEs	✓	✓	✓	✓

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 with different return-related outcomes for a subset of survey waves. Columns 1-3 use information on where respondents returned to from waves 3 and 6-10, separately showing total return, return to one's hometown and return to elsewhere. The independent variable in Column 4 is a binary indicator for whether a respondent has returned. To prevent capturing a mechanical effect on not being able to return temporarily, we use whether a family has a teenage boy between 11 and 17 in wave 6 instead of between 11-18. Standard errors, clustered on the respondent level, are shown in parentheses.

Table A5: The effect of having a teenage boy on alternative measures and behaviors

	Don't plan to return after war	Don't plan to build a future in Ukraine	Plans to apply for citizenship in host country
	(1)	(2)	(3)
Boy 11-18	0.021	0.050	0.123
	(0.042)	(0.047)	(0.086)
Observations	1,359	614	406
R^2	0.180	0.237	0.241
Mean dep. var.	0.200	0.166	0.451
Sample	2, 3, 9	5	10
	Reunified with partner	Broke up with partner	Send money to partner back home
Boy 11-18	0.099	0.001	0.002
	(0.069)	(0.043)	(0.057)
Observations	482	492	401
R^2	0.329	0.228	0.309
Mean dep. var.	0.541	0.236	0.132
Sample	8	8	9

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 with different outcomes related to return intentions in Panel A and for family-related outcomes in Panel B. The independent variable in Column 1 of panel A is whether they don't plan to retun after the war ends, in Column 2 whether the respondent does not plan to build a future in Ukraine and Column 3 for whether the respondent plans to apply for citizenship in the current country of residence. The independent variable in Column 1 of panel B is a dummy for whether a partner who was left behind in Ukraine joined the household, Column 2 whether one broke up with a partner and Column 3 whether a respondent sent money to their partner back home. Standard errors, clustered on the respondent level, are shown in parentheses.

Table A6: Effects by age range

	Returned or plans to return	Returned	Plans to return	Don't know	Settle outside Ukraine
	(1)	(2)	(3)	(4)	(5)
Boy 0-6	-0.024	-0.010	-0.015	0.005	0.014
	(0.066)	(0.036)	(0.065)	(0.046)	(0.057)
Boy 7-10	-0.004	-0.011	0.007	0.037	-0.040
	(0.054)	(0.035)	(0.053)	(0.040)	(0.044)
Boy 11-14	-0.095	-0.024	-0.071	0.046	0.038
	(0.059)	(0.037)	(0.056)	(0.040)	(0.045)
Boy 15-18	-0.108*	0.013	-0.121**	0.059	0.050
	(0.061)	(0.034)	(0.058)	(0.044)	(0.050)
Observations	5,173	5,173	5,173	5,173	5,173
R^2	0.159	0.123	0.133	0.078	0.184
Mean dep. var.	0.533	0.084	0.448	0.246	0.213

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows results from OLS regressions of equation 1 using additional dummies for younger boys in the household. The independent variables are the same as in Tables 1 and 2. We use the same data and sample, and include the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

Table A7: Heterogeneity: effects by family situation

Partner:	Returned			Plans to return		
	With them	in Ukraine	None	With them	in Ukraine	None
	(1)	(2)	(3)	(4)	(5)	(6)
Boy 11-18	0.084**	-0.008	0.022	-0.063	-0.145**	-0.084
	(0.039)	(0.040)	(0.047)	(0.133)	(0.059)	(0.089)
Observations	1,027	2,011	2,133	1,027	2,011	2,133
R^2	0.382	0.264	0.226	0.432	0.223	0.241
Mean dep. var.	0.029	0.120	0.077	0.441	0.465	0.436

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows heterogeneity results from OLS regressions of equation 1 over family situation in the baseline wave. The independent variables are the same as in Tables 1 and Column 2 of 2. We use the same data and sample, and include the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

Table A8: Heterogeneity: effects by initial return intention

Initially planned to:	Returned			Plans to return		
	Return	Don't know	Settle outside Ukraine	Return	Don't know	Settle outside Ukraine
	(1)	(2)	(3)	(4)	(5)	(6)
Boy 11-18	0.038	-0.094***	-0.007	-0.096*	-0.147**	-0.264***
	(0.042)	(0.030)	(0.006)	(0.051)	(0.066)	(0.038)
Observations	3,057	1,334	661	3,102	1,334	661
R^2	0.180	0.370	0.211	0.180	0.298	0.231
Mean dep. var.	0.124	0.036	0.006	0.623	0.268	0.042

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows heterogeneity results from OLS regressions of equation 1 over initial return intentions in the baseline wave. The independent variables are the same as in Tables 1 and Column 2 of 2. We use the same data and sample, and include the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

Table A9: Heterogeneity: effects by human capital proxies

	Returned			
	Education		Host country language skills in wave 1	
	Tertiary degree	No tertiary degree	Spoke language	Did not speak language
	(1)	(2)	(3)	(4)
Boy 11-18	0.000	-0.013	-0.017	-0.001
	(0.026)	(0.048)	(0.040)	(0.034)
Observations	3,974	1,199	2,020	3,153
R^2	0.163	0.337	0.217	0.171
Mean dep. var.	0.086	0.080	0.070	0.094
	Plans to return			
Boy 11-18	-0.102**	-0.018	-0.107**	-0.111*
	(0.049)	(0.107)	(0.053)	(0.059)
Observations	3,974	1,199	2,020	3,153
R^2	0.171	0.321	0.236	0.148
Mean dep. var.	0.448	0.451	0.420	0.467

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows heterogeneity results from OLS regressions of equation 1 over levels of educational attainment and host country language skills elicited in the baseline wave. The independent variables are the same as in Tables 1 and Column 2 of 2. We use the same data and sample, and include the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

Table A10: Robustness of the effect of having a teenage boy on return intentions

	Dependent variable: Returned, or plans to return			
Alternative early-leaver definition (months)	Left F/M	Left F/M/A	Arrive F/M/A	Arrive F/M/A/M
	(1)	(2)	(3)	(4)
Boy 11-18	-0.120**	-0.098**	-0.107**	-0.084*
	(0.048)	(0.045)	(0.049)	(0.046)
Observations	4,353	4,999	3,823	4,682
R^2	0.167	0.163	0.181	0.169
Alternative choices:	Province FE	Municipality FE	At least one child	At least one child 11-18
Boy 11-18	-0.089**	-0.114**	-0.081*	-0.071
	(0.044)	(0.049)	(0.047)	(0.048)
Observations	5,173	4,842	3,146	2,113
R^2	0.180	0.260	0.205	0.216

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This Table shows robustness results from OLS regressions of equation 1 for different samples and origin location fixed effects. Columns 1-4 of Panel A narrow the definition of early leavers to those leaving in February or March (Column 1), February-April (Column 2), to those arriving in the destination country in February or March (Column 3), February-April (Column 4). Panel B include province (Oblast) and municipality (Hromada) fixed effects in Columns 1 and 2, respectively. The municipality fixed effects drop 331 observations as not all respondents indicated their municipality of origin. Column 3 reduces the sample to those with at least one child and Column 4 with those at least one child aged 11-18. The independent variables are the same as in Tables 1. We use the same data and sample, and include the same controls and fixed effects as Column 3 of Table 1. Standard errors, clustered on the respondent level, are shown in parentheses.

Table A11: Narrowing the age range

	12-18 (1)	13-18 (2)	14-18 (3)	15-18 (4)	16-18 (5)	17-18 (6)	18 (7)
Any boy in age range	-0.116**	-0.118**	-0.115**	-0.105*	-0.092	-0.170**	-0.245**
	(0.047)	(0.050)	(0.053)	(0.061)	(0.075)	(0.084)	(0.118)
Observations	5,173	5,173	5,173	5,173	5,173	5,173	5,173
R^2	0.160	0.159	0.159	0.157	0.156	0.158	0.158
Mean dep. var.	0.533	0.533	0.533	0.533	0.533	0.533	0.533
	11-17	11-16	11-15	11-14	11-13	11-12	11
Age range	-0.102**	-0.119**	-0.110**	-0.091	-0.071	-0.105	-0.127
	(0.046)	(0.051)	(0.052)	(0.059)	(0.064)	(0.075)	(0.106)
Observations	5,173	5,173	5,173	5,173	5,173	5,173	5,173
R^2	0.159	0.159	0.158	0.157	0.156	0.157	0.156
Mean dep. var.	0.533	0.533	0.533	0.533	0.533	0.533	0.533

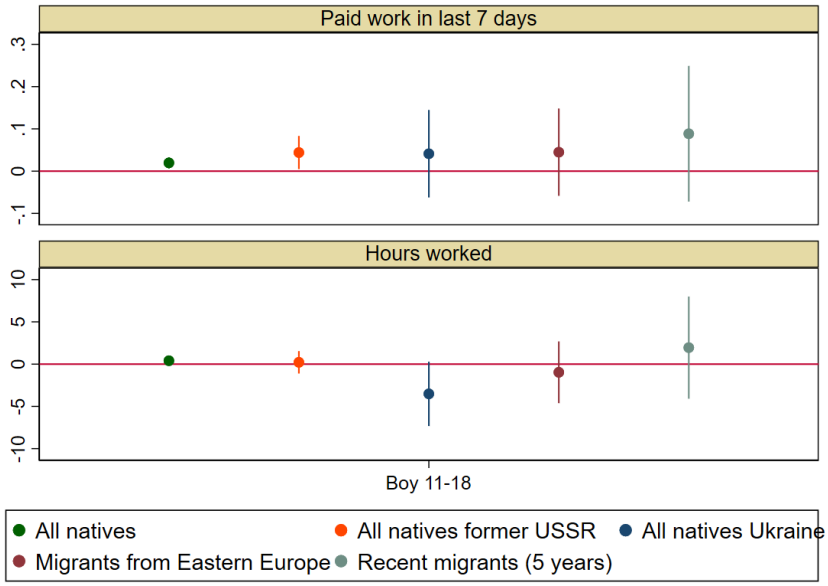
Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure A7: The impact of boys on return intentions: inverse probability weights

Note: Robustness of results on (return) intentions to different weights. Each panel shows coefficients with standard errors clustered on the respondent level from three separate regressions. Two types of weights are used: inverse probability weights to render the sample representative of the baseline survey in terms of demographic characterics and inverse probability weights that additionally weight the sample to be representative of the Ukrainian refugee population across Europe at the host country-sex-age bin level. Weights are winsorized at the 5th and 95th percentile to limit the leverage of observations with extreme weights. The dependent variable in the upper left panel is a binary indicator for whether a respondent returned, in the upper right panel for whether a respondent plans to return soon or when safe, in the lower right panel whether a respondent doesn't know and in the bottom right panel whether the respondent plans to settle outside Ukraine. The data and estimation sample is the same as in Table 1.

A.5 Additional support for identification assumptions

Figure A8: Effect of teenage boys on integration among migrant groups, for women



Note: Coefficient plot of group-specific regressions of a binary indicator for work in the past 7 days (top) or the usual number of hours worked in a week (bottom) on a binary indicator for whether someone has a boy aged 11-18. We We control for sex, whether someone has a partner, levels of educational attainment and age, year, country or birth, country of residence and number-of-children-by-age fixed effects. Shown are point estimates and 95% confidence intervals based on robust standard errors. The number of hours worked is winsorized at 80. The sample is restricted to those aged 25-64 in ESS rounds to Results are shown for the following groups: All natives (N = 231,216), all natives in former USSR countries (Estonia, Latvia, Lithuania, Russia and Ukraine; N = 26,594), all natives in Ukraine (2005-2007, 2011, 2013 and 2022; N = 5,408), all migrants from Eastern Europe (Belarus, Bulgaria, Estonia, Latvia, Lithuania, Moldova, Poland, Romania, Russia, and Ukraine B and C N = 5,154) and all recent migrants (within 5 years after arrival; N = 3,150).