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Abstract: Amidst the Ukrainian displacement crisis, private hosting of refugees in Europe has surged, yet its impact on integration remains understudied. This research investigates the effects of private hosting on Ukrainian refugee integration in Germany. Utilizing data from one of the largest non-profit matching platforms for private refugee accommodation, we compare multidimensional integration outcomes of refugees matched with private hosts with observably similar refugees who applied for private hosting but were not matched. Our findings indicate a significant improvement in the social, psychological, and navigational integration of refugees hosted privately, with no discernible effects on linguistic, economic, and political integration. This study provides causal evidence on the effectiveness of private hosting in improving refugee integration, highlighting its potential to complement traditional public asylum reception and housing systems and to leverage civil society engagement for refugee integration during humanitarian crises.

Summary: Private hosting enhances social, psychological, and navigational integration for refugees, with no discernible impact on linguistic, economic, or political integration.

Keywords: refugees | displacement | humanitarian crisis | refugee integration

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Introduction

European countries have grappled with significant humanitarian crises in recent years. In 2015, over 1.2 million individuals, predominantly from Syria, Afghanistan, and Iraq applied for asylum in Europe [1]. More recently, since 2022, over 11 million Ukrainians were displaced, with around 6 million seeking refuge across Europe following the Russian invasion [2]. The sudden arrival of a large number of refugees overwhelmed the traditional European asylum reception system, which usually relied on housing refugees and asylum seekers in public reception centers and shelters [3]. To accommodate the large number of arrivals, many European countries resorted to housing Ukrainian refugees in makeshift container camps or military facilities [4, 5].

The displacement of Ukrainians marked a significant shift in how European host countries responded to mass displacement events. For the first time in history, the Council of the European Union invoked its Temporary Protection Directive [6], immediately granting Ukrainian refugees temporary protection status and, for example, the freedom to choose their place of residence within the European Union [7]. This crisis also triggered the rapid emergence of large-scale private hosting initiatives to address the unprecedented demand for refugee housing.

While private hosting initiatives for refugees have existed in Europe for decades, they had typically operated on a small scale. There was increased interest in such initiatives during the refugee crisis in the mid-2010s, but it was only with the Ukrainian displacements that private hosting emerged on a large scale [8, 9]. In a short time span, civil society organizations, and sometimes governments, created platforms to connect refugees in need with local residents who volunteered to host them in their homes. While hosting arrangements varied across different contexts, hosts typically had no prior personal connection to the refugees. They often shared their homes with refugees and provided housing for free without a set time limit. Estimates suggest that within the first few months after the Russian invasion in February 2022, about 27 percent of Ukrainian refugees in Europe were privately hosted [10].

The swift rise of large-scale private hosting alongside the traditional public asylum system represents a significant policy innovation in responding to humanitarian protection crises. Private hosting has the potential to complement the often overwhelmed government reception systems when faced with a sudden increase in refugee arrivals. It also taps into the goodwill of civil society to assist in welcoming refugees and mobilizes the resources and solidarity of private citizens. However, despite its importance, there

is a lack of research on the private hosting of refugees. Prior work has documented the increase in private hosting and the motivations of hosts [9], examined the activities of hosts [11–13], or explored alternative models such as private refugee sponsorship and co-sponsorship [14–17]. Yet, there is a paucity of systematic quantitative research that examines the causal impacts of private hosting on the lives of refugees. This is particularly important because private hosting occurs at the crucial moment when refugees arrive in a host country, and research has shown that early interventions often have a disproportionately large impact on their long-term integration outcomes [18–21].

In this study, we aim to bridge this gap by investigating the impact of private hosting on the multidimensional integration outcomes of refugees. The effect of private hosting on refugee integration is theoretically ambiguous. On the one hand, it could improve the integration of refugees through various mechanisms. Being hosted in a private home might provide for a softer landing for refugees compared to the stress they may experience in large and often overcrowded public shelters. Hosting may also result in positive intergroup contact where native hosts and refugees interact over an extended period of time. Even though hosts have no formal responsibility to do so, they may act as brokers in facilitating the social, institutional, and cultural onboarding of refugees to the new country. Hosts may leverage their social capital and networks to help refugees find friends, jobs, or long-term housing. Hosts may also use their know-how and language skills to help refugees navigate the asylum bureaucracy and facilitate access to healthcare, education, and social services. Private hosting may also result in refugees being housed in areas that are more welcoming and diverse which can facilitate successful integration [22, 23].

On the other hand, being hosted by a private household may come with its own challenges and potentially reduce the integration success of refugees. Such arrangements may lead to conflicts between refugees and hosts, particularly if there are misaligned expectations about the roles of hosts and guests, power imbalances, lack of respect for boundaries, or if the hosts' compassion wanes over time. Furthermore, there have been concerns raised in several newspaper articles about the risks of refugees being exploited by unscrupulous hosts, and, in some cases, refugees have had to be removed from unsuitable hosting situations [24, 25]. Even when hosts have good intentions, they typically lack specialized training or prior experience in receiving refugees and may therefore be ill-equipped to adequately assist refugees in navigating complex bureaucracy and accessing necessary support, in contrast to professional case workers in public reception facilities. Finally, because private hosting is entirely based on goodwill of the host, it

may introduce a high degree of unpredictability for refugees if hosts suddenly withdraw their support [8].

To provide evidence on the impact of private hosting on refugee integration, we leverage data from #UnterkunftUkraine (UU), one of the largest platforms for private hosting of refugees in Germany and Europe [11]. UU emerged shortly after the Russian invasion of Ukraine in February 2022 and had registered over 160,000 potential hosts of whom around 30,000 completed a verification process. Through 25,400 matches between a host and a refugee household, UU matched over 60,000 Ukrainians to free private accommodations in Germany (see Supplementary Materials (SM) Appendix section 1 for details).

Drawing upon the registration data from the UU platform we conducted an original survey of refugees who had applied to be matched with a private host and measured their multidimensional integration success, including economic, social, psychological, political, and navigational integration using the IPL-12 index [26]. To identify the effect of being privately hosted, we compare refugees who were matched to a host by UU to observably similar refugees who applied but did not get matched. Since we observe and control for the same refugee characteristics that were used by UU to conduct the matching we can identify the causal effect of hosting under a credible selection-on-observables assumption [27]. In other words, once we control for the same characteristics visible to UU at the time when they conducted the matching, we minimize the possibility that matched and unmatched refugees do not systematically differ in unobserved confounding characteristics that may impact their integration outcomes. This expectation is supported by balance checks.

What we find is that being hosted by a private household improved the integration of Ukrainian refugees, but the impacts were contracted on specific dimensions of integration. When looking at the overall multidimensional integration index (IPL-12) we find that being privately hosted improves the summary index by about one fifth (intention-to-treat effect) or half (local average treatment effect) of a standard deviation. But these gains are concentrated in terms of social, psychological, and navigational integration outcomes. We find no discernible effects on economic, political and linguistic integration.

Taken together, our study contributes much-needed systematic evidence on the causal impacts of private hosting on the integration of refugees. Our results demonstrate that, at least in the context of refugees matched through the UU platform, private hosting can lead to improved integration outcomes in some important dimensions, while having

no effect on other dimensions. This information is critical for policymakers as they plan responses to humanitarian crises in Europe and beyond, demonstrating that engaging civil society can relieve the burden on the public asylum system and contribute to successful refugee integration.

Materials and Methods

Private Hosting of Refugees

In this study, we are interested in the impacts of private hosting of refugees, as was common during the Ukraine displacement crisis. Private hosting, in our context, refers to local residents of the host country offering temporary and typically cost-free lodging to refugees in need of housing. Specifically, we examine the private hosting facilitated by the non-profit matching platform #UnterkunftUkraine (UU). This platform was established in Germany shortly after the Russian invasion of Ukraine and connected refugees to local residents who were willing to host refugees. Several similar private hosting initiatives operated across European countries during the Ukrainian crisis. Examples include programs like "Homes for Ukraine" in the United Kingdom, "Register of Pledges" in Ireland, "Who Will Help Ukraine" in Slovakia, the "Familia Necesita Familia" in Spain, or "Our Choice" in Poland (see [8]).

It is worth emphasizing that while hosting arrangements varied across contexts, private hosting as facilitated by matching platforms was typically a fairly informal arrangement where locals offered their homes on short notice to refugees without prior connections and without assuming formal responsibilities for their integration. This is in contrast to private refugee sponsorship and/or co-sponsorship [14–17], a longstanding model utilized in Canada and now re-emerging in the U.S. In this model, individuals or groups formally commit to resettling a refugee family, providing comprehensive settlement support such as financial aid, housing assistance, and job placement. Sponsors apply with the government, undergo training, adhere to specific requirements and regulations, and have to commit to providing long-term support (e.g., up to two years in Canada). In addition private sponsorship often involves a naming system, where sponsors select specific refugee families abroad, often other family members or relatives. Thus, the private hosting we examine in our study differs in scope, duration, engagement, and oversight from these alternative models.

Setting

Our study relies on registration data obtained from the non-profit matching platform UU. The registration process for hosts and refugees on the platform involved providing essential information. Hosts registered by sharing details such as the location of their accommodation, the type of accommodation (e.g., shared room, shared house), the number of available beds, the presence of other family members at the accommodation, languages spoken, and the periods during which the accommodation was available.

Refugees registered by providing key information, including their name, gender, date of birth, family size, the total number of beds required, languages spoken, intended date and place of arrival in Germany, and their preferred municipality of residence. UU then employed this data to match hosts with refugees and facilitated the connection between the two parties to arrange for the refugee to move into the provided accommodation.

One aspect of the policy environment that facilitated the matching was that the European Union activated the Temporary Protection Directive for all Ukrainian refugees. This meant that Ukrainian refugees could be matched to hosts in any geographic area in Germany, since they were not subject to the geographic allocation quota that typically governs how asylum seekers are distributed after arrival in Germany.

Despite recruiting a sizable number of hosts, demand for accommodation often surpassed the available number of hosts, resulting in only 19 percent of registered refugees ultimately being matched with a host. Further information regarding the matching process and registration forms can be found in the SM Appendix section 1.

Identification Strategy

To establish the effect of being privately hosted on refugee integration, we leverage the comprehensive registration data used by UU to facilitate the matching of hosts and refugees. This unique dataset enables us to identify the impact of private hosting under a credible selection-on-observables assumption [27] by comparing refugees who were successfully matched with a host by UU with observably similar refugees who registered with UU but were not matched with a host due to host unavailability at the time. Since the matching process performed by UU was based on the same refugee characteristics that we observe in the registration data, controlling for these covariates effectively ensures that the integration potential and other unobserved characteristics of refugees who were matched do not systematically differ from those who were not matched, thereby eliminating selection bias in their comparison.

To implement this research design, we conduct regression analyses in which we regress integration outcomes on a binary indicator that distinguishes whether the refugee was successfully matched or not. We include a comprehensive set of registration characteristics used for matching as control variables. The coefficient associated with the matching indicator in this regression captures the intention-to-treat (ITT) effect of being matched with a private host by UU. Additional details concerning the full set of control variables can be found in the SM Appendix section 2.

Not all refugees who were matched with a host by UU ultimately moved in with them. To address this issue of non-compliance, we adopt a standard local average treatment effect framework [28]. Specifically, we code a binary treatment variable that indicates whether refugees moved in with their matched private host or not. We then use two-stage least squares (2SLS) to regress the integration outcomes on this treatment indicator and instrument the treatment indicator with the indicator of whether refugees were matched or not while also controlling for all relevant covariates. Consequently, the coefficient associated with the treatment variable identifies the local average treatment effect (LATE) of being privately hosted, focusing on the group of compliers who only move in with a private host if matched through the UU platform. For detailed information about our statistical models, readers are referred to the SM Appendix section 2.

To validate our identification strategy, we conducted a series of placebo balance checks using a set of refugee characteristics that we measured in our survey, but were not captured in the registration data that UU used to conduct their matching. These refugee characteristics included citizenship, education, income in Ukraine, self-identification as LGBTQ+, employment in Ukraine, region of origin in Ukraine, and relationship status. We regressed these refugee characteristics on the indicator for whether refugees were matched or not, controlling for the set of registration characteristics that were used for matching. We find that, conditional on characteristics that were used by UU for the matching, being matched is unrelated to the refugee characteristics that were not observed by UU. Across twenty-two balance checks, only one covariate had a statistically significant imbalance, but it was substantively small. This corroborates our selection-on-observables assumption and suggests that matched and unmatched refugees are unlikley to differ on unobserved confounders (see SM Appendix section 2.7).

Note that for the main impact analyses described above, we evaluate the effects of being matched to a private host by comparing refugees who were matched by UU with those who were not. Therefore, this analysis quantifies the overall impact of being matched to a private host versus all alternative housing arrangements pursued by

refugees who were not matched. This control condition includes refugees who ended up being housed in public asylum centers as well as those who rented accommodation on their own. While understanding the overall impact of private hosting against all other relevant alternatives is of key policy interest, we also later conduct subsequent analyses examining how private hosting compares specifically to the alternative of living in public refugee housing.

Sample

Our analysis sample is derived from a survey of refugees conducted using the registration data of UU as the sampling frame. On June 1st 2023, we extended online survey invitations to all refugees who had registered with UU, provided valid contact information, and were within UU's legal purview to contact (see SM Appendix section 2.2 for details). The survey questionnaire focused on refugees' integration progress and their housing arrangements subsequent to their arrival in Germany. It is worth noting that refugees' median registration date with UU was in July 2022, meaning the survey captures integration outcomes more than a year after their arrival in Germany.

To enhance the response rate, we offered to donate five Euros to a refugee charity working for each completed survey. Respondents had the option to select a charity from a list of six different options. In total, 2,811 refugees participated and 1,870 answered all survey questions. A non-response analysis revealed that the characteristics of the responding sample closely resembled those of non-responders across the covariates recorded in the registration data (as detailed in the SM Appendix section 2.4). However, refugees who had been matched to private accommodations by UU were 8.5 percentage points more likely to respond to the survey compared to refugees who had not been matched. To address potential non-response bias, we also employ entropy balancing weights [29] to adjust the composition of responders to align with the overall population across all covariates. The effect estimates obtained with and without the application of these weights remained very similar (see SM Appendix section 3.1).

Lastly, because our outcome of interest, refugee integration success, refers to integration in the host country Germany, we remove from the analyses respondents who were not living in Germany at the time of the survey. Note that, as shown in the SM Appendix section 4.3, being matched to a host by UU has no effect on the probability of living outside of Germany at the time of the survey and therefore this sample restric-

tion is unlikely to introduce bias into our estimates of the effects of private hosting on integration outcomes.

To assess the generalizability of our sample, we conducted a comparison of the demographic distribution of our respondents with data from a representative survey and population-level statistics of Ukrainian refugees in Germany, as documented in [30]. Our analysis indicates that our sample closely mirrors the overall population of Ukrainian refugees in Germany across various characteristics, including gender, state of residence in Germany, age, education, employment, marital status, parenthood, and region of origin in Ukraine. While our sample exhibits a slightly younger age distribution and a somewhat higher proportion residing in urban areas, these differences are modest in nature (see SM Appendix section 2.8).

Outcomes

To measure the integration success of refugees we utilize the multidimensional integration index IPL-12 [26]. This measure defines successful integration as the acquisition of knowledge and capabilities necessary to establish a fulfilling and prosperous life within the host society. This integration metric, validated by several studies conducted in different contexts [e.g., 22, 31], gauges integration success through two questions for each of the six dimensions: psychological, economic, political, social, linguistic, and navigational integration. For example, navigational integration evaluates the challenges immigrants face when searching for employment or accessing medical care in the host country. Further details regarding each dimension and their measurements are available in the SM Appendix section 2.2.

We investigate several outcome variables, including the overall IPL-12 index that amalgamates all six dimensions, as well as subindexes for each of the six dimensions individually. These outcomes are evaluated on a scale ranging from 0 to 1, with higher values indicating greater levels of integration success.

In theory, private hosting may yield either positive or negative effects on integration outcomes, and these effects may also vary depending on the dimension of integration. For instance, if a refugee experiences negative interactions with a low-quality private host, they may become disconnected from the host country's society, potentially resulting in diminished psychological and social integration. Conversely, a positive experience may foster a sense of belonging, thereby leading to an increase in psychological and social integration. Additionally, we may observe more pronounced effects on social,

psychological, and navigational integration in the short to medium term, while impacts on linguistic, economic, or political integration may take longer to manifest due to the time required for activities such as learning German or improving employment and income in Germany.

One specific concern pertains to the social integration dimension, which is defined as "capturing social ties and interactions with natives in the host country" [26]. Given that private hosting involves connecting refugees with native hosts, there might be apprehension regarding the possibility of observed effects being merely mechanical. However, this concern is alleviated for at least two reasons. Firstly, our survey measuring social integration was conducted several months after most refugees had already moved out, thereby capturing the sustainability of social integration beyond the period when refugees resided with their hosts. Secondly, studies have presented mixed and sometimes conflicting results regarding the impacts of social contact between different identity groups on between-group discriminatory behaviors, attitudes, and conflict [13, 32]. In fact, several studies suggest that mere exposure instead of social contact can lead to heightened inter-group tension and a desire for reduced future interactions [33, 34]. Hence, it remains theoretically ambiguous whether connecting refugees with hosts would augment or diminish future social interactions with natives.

To further mitigate this potential concern, we also utilize an overall IPL-12 index that excludes the social integration dimension and focuses solely on the other five dimensions. This analysis aims to ascertain whether the effect of private hosting extends beyond the social integration dimension.

Results

Figure 1 illustrates key statistics that provide insights into the duration of stay in the private accommodation and the level of support received by refugees who were matched with a private host through UU. On average, refugees stayed in the accommodation for approximately 4 months, with a range spanning from 1-2 months to over 12 months (Panel A). In 78 percent of cases, the host cohabited with the refugee in the same dwelling, while in 80 percent of cases, the accommodation was provided to the refugee at no cost (Panel B and C). A substantial 61 percent of refugees maintained daily contact with their host, engaging in joint activities such as sharing meals, housekeeping, and recreational pursuits (Panel D and E). Additionally, hosts frequently assisted refugees with tasks such as residency and welfare applications, translations, job searches, access-

ing medical services, and enrolling in school and childcare, among other forms of support (Panel F).

These findings collectively highlight that refugees who received private hosting experienced extensive interactions with their hosts and often received direct support in their integration journey. As we show in the SM Appendix section 3.2, we find a similar pattern regarding the interactions with hosts when comparing refugees who were matched with those not matched by UU. In particular, refugees who were matched are much more likely to live with hosts, less likely to live with other refugees, and less likely to pay rent compared to refugees who were not matched to a host.

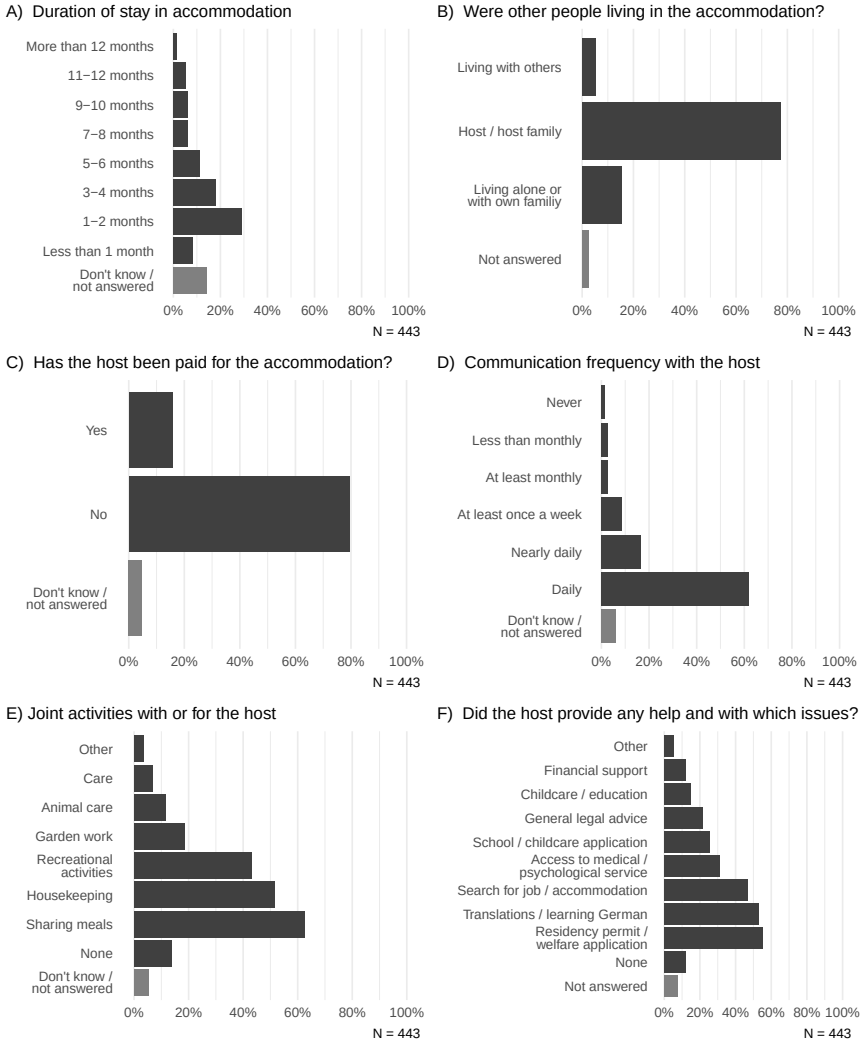

Figure 1: Reported Experiences of Survey Respondents in Private Accommodations Facilitated by the UU Platform

How does being privately hosted via the UU platform affect the integration success of refugees? Figure 2 presents the main results, including effect estimates for being matched (ITT) and being privately hosted (LATE) on the multi-dimensional integration index IPL-12, as well as each of the six dimensions of integration. Note that the partial first-stage F statistics for the LATE models range between 320 and 460 indicating that the instrument is sufficiently strong (see SM Appendix section 3.1).

The study indicates that being privately hosted resulted in significant enhancements in the overall IPL-12 index, with an increase of approximately 0.03 points (with a 95% confidence interval ranging from 0.01 to 0.05) for the ITT and 0.07 points (with a confidence interval of 0.04 to 0.10) for the LATE. These improvements are of notable magnitude. To provide context, given that the standard deviation of the IPL-12 index in the sample is 0.14, the effects of private hosting translate to an increase of about 20% of a standard deviation units for the ITT and about 50% for the LATE.

When examining the six dimensions of integration success individually, substantial gains were observed in social, psychological, and navigational integration. Specifically, based on the ITT estimates being privately hosted led to an increase of 0.07 points in social integration (equivalent to an 31% standard deviation unit increase), 0.04 points in psychological integration (a 16% standard deviation unit increase), and 0.02 points in navigational integration (a 10% standard deviation unit increase). As for linguistic, economic, and political integration, while the point estimates were positive, they did not reach statistical significance at conventional levels. Lastly, we also find sizable effects when we consider the overall IPL-12 index but excluding the social integration dimensions, with gains of 0.03 (ITT) and 0.05 (LATE), respectively. In summary, these results highlight that private hosting improves the integration success of Ukrainian refugees with the most pronounced benefits observed in the social, psychological, and navigational dimensions of integration, but no discernible gains in linguistic, economic, and political integration.

Several robustness checks support the resilience of the effect estimates. Notably, the estimates remain robust when removing the post-stratification weights, adding additional covariates (see SM Appendix section 3.1), and using double/debiased machine learning estimators (see SM Appendix section 4.2). We also conducted a formal sensitivity analysis suggesting that the results are robust to potential hidden bias; an unobserved confounder would have to be more than six times stronger than the strongest observed selection covariates (refugee reports speaking English or German) to overturn our effects (see SM Appendix section 4.1).

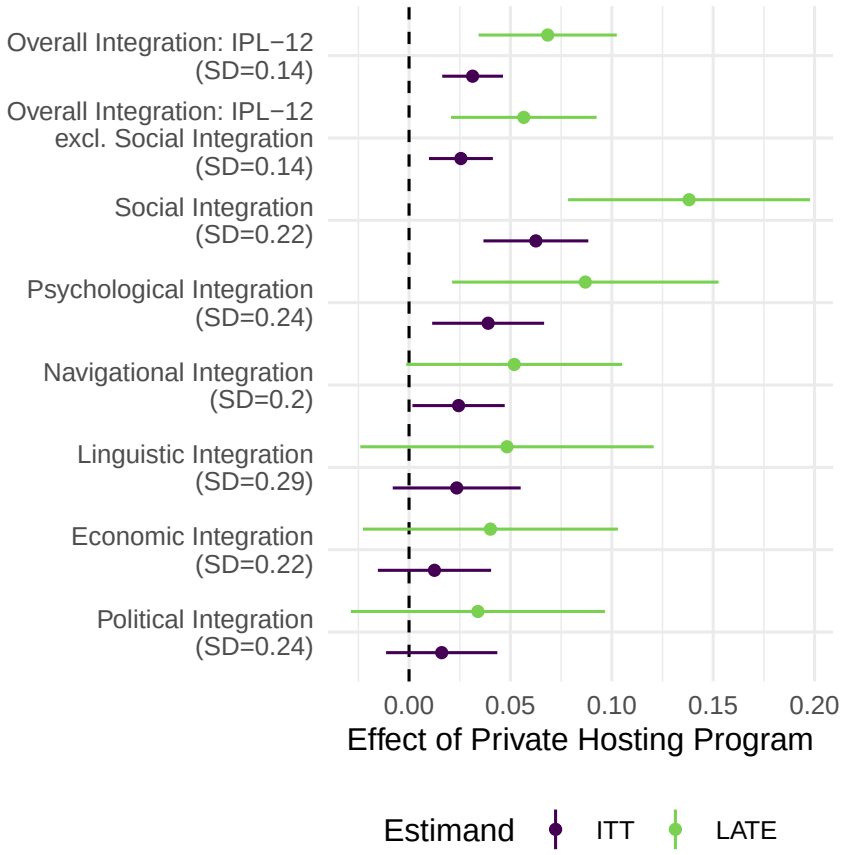

Figure 2: Private Hosting Enhances Refugee Integration: Figure Displays Estimates from OLS and 2SLS Regressions with Heteroscedasticity-robust 95% Confidence Intervals.

Effect Heterogeneity

An important question for both theory and policy pertains to whether the effects of private hosting vary among different groups of refugees. One potential concern is that due to the limited experience of hosts with refugees, the impact of private hosting may result in highly variable effects, contingent upon the quality of the host or the compatibility of the match between the refugee and the host. To delve into this inquiry, we conducted a series of analyses to examine potential treatment effect heterogeneity.

The results, shown in the left panel of Figure 3, reveal that the conditional treatment effects of private hosting remain highly consistent across subgroups of refugees, stratified by factors such as gender, age, education, and marital status. Importantly, there is no evidence to suggest that private hosting has adverse consequences for specific subgroups (see also SM Appendix section 4.4).

In terms of policy, this stability across subgroups suggests that the positive effects of private hosting are broadly shared among Ukrainian refugees and are not concentrated within specific subsets. From a theoretical perspective, the consistency in the effects suggests that the impact of private hosting operates through a common mechanism rather than mechanisms that are specific to particular refugees.

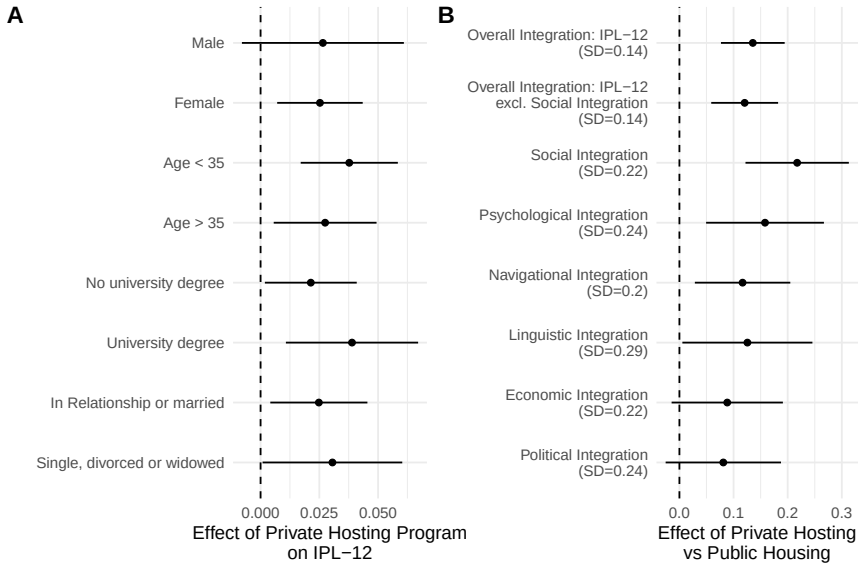

Figure 3: Panel A: Private hosting has similar effects across different demographic subgroups. Figure shows ITT estimates from subgroup-specific OLS regressions with 95% heteroscedasticity robust confidence intervals. Panel B: Private hosting facilities integration especially when compared against refugees in public accommodation. Figure shows LATE estimates from 2SLS estimates with 95% heteroscedasticity robust confidence intervals excluding all respondents that are not in private hosting accommodations or public housing.

Private Hosting versus Public Housing

So far, the effect estimates demonstrate that refugees who were privately hosted achieved higher integration success compared to those who were not. Note that this comparison quantified the overall impact of being privately hosted versus all alternative housing arrangements, including refugees housed in public asylum centers and those who rented accommodation on their own. In this analysis, we examine how private hosting compares to the specific alternative of living in public refugee housing, encompassing both asylum centers and other public accommodations. To facilitate this comparison, we focus on refugees who were either privately hosted or in public refugee housing, excluding 24%

of the estimation sample living in alternative types of accommodation, such as renting their own apartment or residing in a hotel.

The results are displayed in the right panel of Figure 3. We observe that the effect of being privately hosted versus public refugee housing is larger in magnitude compared to the main effects for the full sample presented in Fig 2. Specifically, private hosting versus public housing led to a considerable improvement in the integration success of refugees, as measured by the overall IPL-12 index, by about 92% standard deviation units. Similar improvements are also found in the IPL-12 index, excluding social integration, as well as for the social, psychological, navigational, and linguistic integration dimensions separately. The consistency of these estimates with the effects of private hosting observed in the full sample, as shown in Fig. 2, supports the interpretation that integration success is primarily influenced by whether refugees are living with private hosts compared to public refugee housing.

Mechanisms: Contact or Location

What mechanisms might explain the positive impacts of private hosting on integration? In this section, we conduct additional analyses to differentiate between two classes of mechanisms: those related to location and those associated with contact. One possible mechanism suggests that the effect of private hosting stems from the fact that matching refugees with private hosts leads to them being placed in more welcoming or diverse neighborhoods, which in turn facilitates successful integration [35, 36]. An alternative mechanism proposes that the effect of private hosting is driven by the positive contact refugees have with their hosts and the support they receive from them. Note that these mechanisms are not mutually exclusive and may even reinforce each other.

To examine the location mechanism, we replicate our models and assess the ITT effects of matching on various location characteristics where refugees settled (measured at the municipality level; for details, refer to the SM Appendix section 2.2). The results, as shown in Figure 4, Panel A, do not support the notion that the positive effects of private hosting result from refugees being directed to more hospitable areas. In fact, the estimates suggest that being privately hosted does not change the likelihood of placement in districts with higher vote shares for the far-right party *Alternative for Germany* (AfD), higher levels of unemployment, greater population density, or urban settings. If anything, being privately hosted seems to lead refugees to slightly less diverse

areas with a lower share of immigrants. Overall, these findings speak against the location mechanism.

To explore the contact mechanism, we examine whether the effects of being privately hosted intensify with more frequent contact with the host. If the effect of private hosting is driven by contact, we would expect that more frequent contact with the host would result in higher integration success. To test this we leverage a question that asked refugees how frequently they communicated with the host and the answer options were coded on a five point scale ranging from never (0) to daily (4). Respondents who are not privately hosted are coded zero on the scale. We then replicate the regression models instrumenting the variable that measures the frequency of contact with the indicator for whether refugees were matched to a host by UU. The results, shown in the right panel of Figure 4, show that a higher frequency of contact with the host is associated with larger gains in integration success. While this test does not rule out the possibility that being matched could affect integration via other mechanisms, it does at least provide suggestive evidence for the idea that the contact mechanism explains part of the integration effects of private hosting.

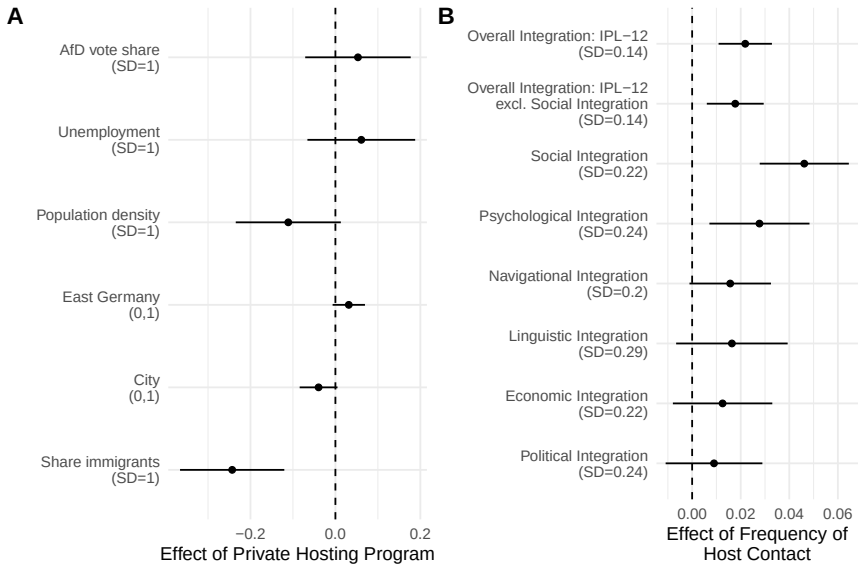

Figure 4: Panel A: Refugees in private hosting are not more likely to live in more welcoming and diverse areas. Figure shows ITT estimates from OLS regression with 95% heteroscedasticity robust confidence intervals using location characteristics where refugees settled as outcomes. Panel B: Higher frequency of contact with host is associated with larger gains in integration. Figure shows LATE estimates from 2SLS estimates with 95% heteroscedasticity robust confidence intervals.

Discussion

This study investigated the impact of private hosting on the successful integration of Ukrainian refugees in Germany. Our research approach combined registration data from Germany's largest matching platform with an original survey, enabling us to compare refugees matched with private hosts to those who were not. By controlling for the same characteristics used in the matching process, we could discern the causal effect of private hosting within a framework of selection based on observable factors.

Our findings indicated that private hosting significantly enhances refugee integration across multiple dimensions, particularly in social, psychological, and navigational integration, while showing no discernible effects on linguistic, economic, and political integration. These effects were robust across various models and stable among diverse refugee subgroups. Additionally, supplementary assessments provided suggestive evidence that the positive impact of private hosting arises from the frequency of interaction with hosts, rather than relocating to more hospitable areas.

The heterogeneity in the effects of private hosting across different dimensions of integration suggests that positive interaction with hosts may provide a welcoming environment, facilitating short to medium-term improvements in social, psychological, and navigational integration. However, gains in linguistic, economic, or political integration may be more challenging to achieve and may require more time to materialize due to the difficulties of learning German or improving employment and income in Germany.

These findings hold policy implications for host countries responding to large-scale displacement events. Our results imply that widespread private hosting of refugees can serve as a cost-effective policy tool to complement conventional public asylum reception and housing systems, which often become overwhelmed during sudden mass arrivals. In addition to alleviating pressure on the public reception system, private hosting harnesses the goodwill of civil society to support refugees and can lead to improvements in refugee integration, although not across all dimensions. However, given these results, it appears that private hosting alone is insufficient to achieve lasting gains in linguistic, economic, or political integration, and other complementary interventions are needed for the latter.

To effectively harness the potential of private hosting for future refugees, host countries would need to make regulatory changes that allow for more flexible placement of refugees in different geographic areas. This could be achieved by either activating the existing temporary protection mechanism, similar to what was done for Ukrainians, relaxing the strict allocation criteria that typically determine the geographic distribu-

tion of refugees within countries, or alternatively incorporating private hosting into the allocation criteria as a complementary approach to public reception and housing.

It is important to emphasize that our results represent just one initial step in expanding the evidence base on large-scale private hosting of refugees. They should not be interpreted to suggest that private hosting is a panacea for facilitating successful refugee integration. There are critical questions that need further investigation, including how best to regulate and monitor the safety of private hosting for both refugees and hosts, the processes for vetting, training, and supporting hosts, and which types of refugees would benefit the most from private or public accommodation. Initial data from our survey suggests that refugees' satisfaction with private hosting is consistently high, with only a handful of reports of negative experiences with hosts (see SM Appendix section 4.4). Proper oversight of hosting programs is crucial to protect refugees from potential risks associated with being matched with unscrupulous hosts (and vice versa), just as proper oversight is important to ensure the safety of refugees in public asylum centers.

Furthermore, it remains an open question whether private hosting would yield similar benefits for other refugee groups beyond Ukrainian refugees and whether it is suitable for particularly vulnerable groups, such as large families. Future research is also needed to gain a more precise understanding of the mechanisms through which private hosting enhances integration and how these effects are moderated by the quality of the host and the match between the refugee and the host.

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Author contributions: N.H., D.H., M.H., M.M. and J.H. designed research; M.H., A.O., D.H., and N.H. collected data; M.M., M.H. and A.O. analyzed data; J.H. wrote the paper with edits from M.M., M.H., A.O. N.H. and D.H.; and M.M., M.H., N.H. wrote the SI with edits from D.H., J.H., and A.O.

Competing interests: The authors declare that they have no competing interests.

Data availability: Anonymized data for the main analysis using merged survey and registration data will be made available after publication through a repository. Additional data using all registration records from UU can not be made available.

Code availability: All analysis code will be made available after publication through a repository.

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Supplemental Materials

The Impact of Private Hosting on the Integration of Ukrainian Refugees

Contents

1 Background

In this section we provide additional information about the registration of refugees and hosts by the non-profit organization #UnterkunftUkraine (UU). The registration process for hosts and refugees on the platform involved providing essential information that was then used by UU to match refugees to hosts.

1.1 Registration: Refugees

In total, more than 117,000 Ukrainian refugees registered on the platform provided by UU. A small share of refugees (less than 2%) got registered through other organizations.

In order to register, refugees had to provide several pieces of information, including their name, gender, date of birth, family size, the total number of beds required, languages spoken, intended date and place of arrival in Germany, and their preferred municipality of residence.

As of November 2023, the registration forms are no longer online. Figures 6-9 document them as screenshots.

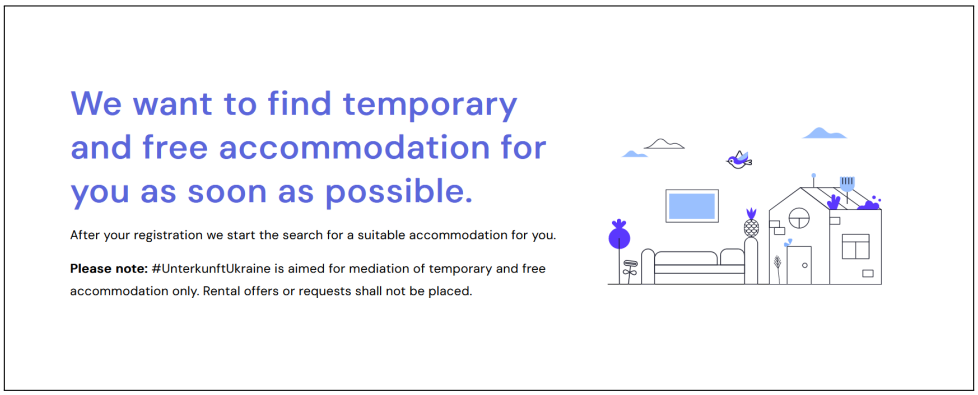

Figure 1: Registration Form for Refugees, Screenshot 1.

Figure 2: Registration Form for Refugees, Screenshot 2.

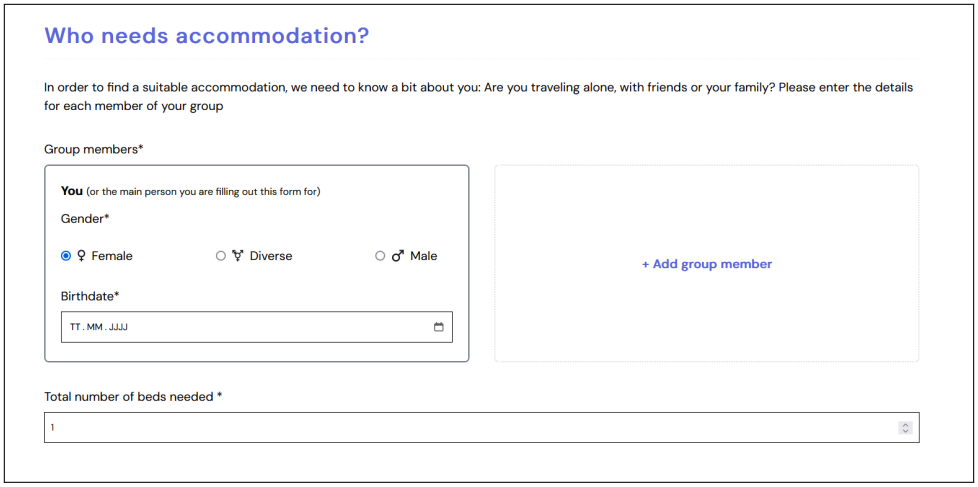

Figure 3: Registration Form for Refugees, Screenshot 3.

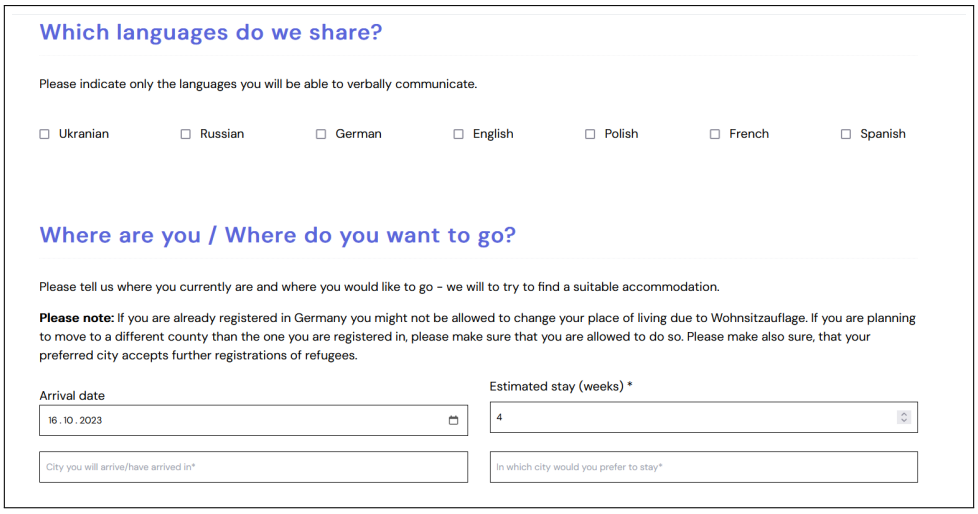

Figure 4: Registration Form for Refugees, Screenshot 4.

Figure 5: Registration Form for Refugees, Screenshot 5.

1.2 Registration: Hosts

In total, more than 150,000 individuals signed up to host on the platform provided by UU.

During the registration, host had to provide details such as the location of their accommodation, the type of accommodation (e.g., shared room, shared house), the number of available beds, the presence of other family members at the accommodation, languages spoken, and the periods during which the accommodation was available.

As of November 2023, the registration forms are no longer online. Figures 1-5 document them as screenshots.

Figure 6: Registration Form for Hosts, Screenshot 1.

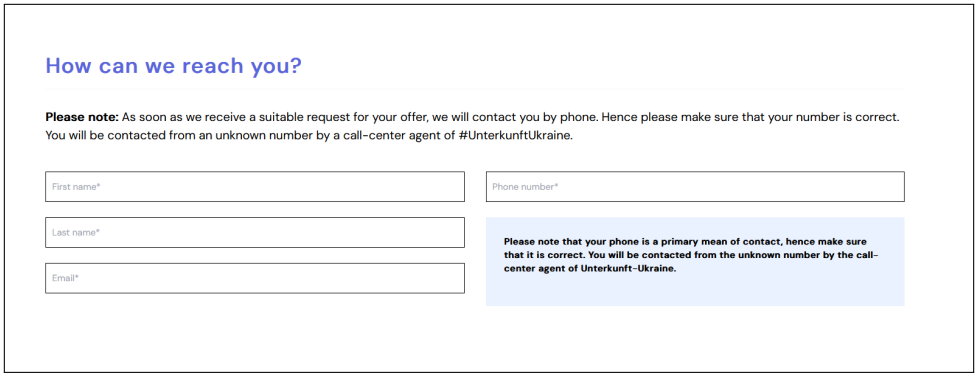

Figure 7: Registration Form for Hosts, Screenshot 2.

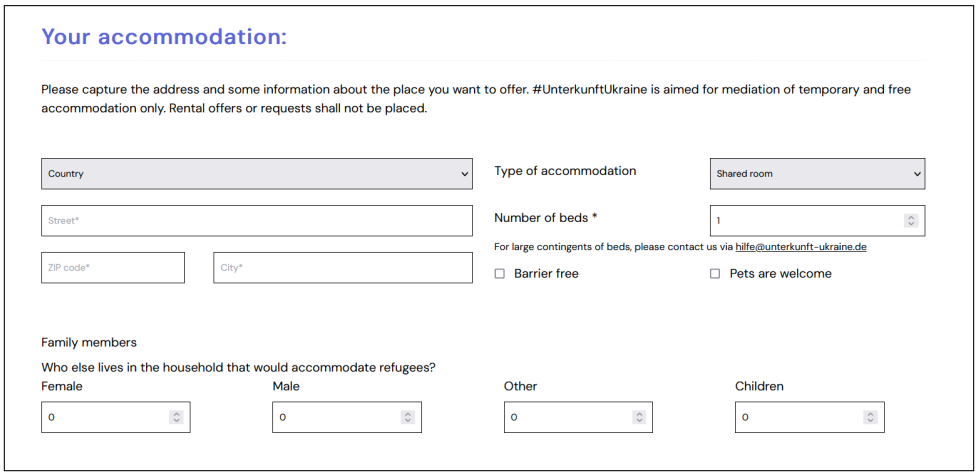

Figure 8: Registration Form for Hosts, Screenshot 3.

Figure 9: Registration Form for Hosts, Screenshot 4.

1.3 Matching Refugees with Hosts

The matching process was conducted by a professional call center contracted by UU. The number of call center agents hired by UU fluctuated between 100 in the initial months and 40 in the later months. Call center agents were responsible for two main tasks: vetting potential hosts and matching refugees with hosts.

Before a host could be matched with a refugee, they had to provide evidence that the information on their ID matched the self-registration data. Hosts could use a third-party service called "Postident" [1] or confirm their identity through a video call with the call center. In the latter case, call center agents followed procedures similar to the "Postident" service, requesting hosts to present their ID in a video call and hold it at different angles for the agent to verify holograms and other security features.

The matching process was partially automated. When a call center agent initiated the matching process, the UU software randomly assigned them a refugee registered on the platform and prevented other agents from working on that refugee's case. The agent then contacted the refugee to confirm if they still required accommodation. If so, the software proposed hosts who matched the refugee's requirements in terms of the number of beds, desired duration of stay, location preferences, and the availability of at least one common language. If there was a potential match, the agent contacted the host to confirm their availability as specified in the registration form. Upon confirmation, the agent shared the refugee's contact details with the host and informed the refugee that a host would soon contact them. It's important to note that for safety reasons, UU had a policy of exclusively considering women or heterosexual couples as hosts for female refugees. The registration data is described in section 2.3.

Our identification strategy relies on the assumption of selection-on-observable characteristics (Imbens and Rubin, 2015). It compares refugees who were successfully matched with a host by UU with observably similar refugees who registered with UU but were not matched with a host due to host unavailability at the time. We leverage the fact that the matching process performed by UU was based on the same refugee characteristics observed in the registration data. Therefore, controlling for these covariates, we expect that the integration potential and other unobserved characteristics of refugees who were matched do not differ systematically from those who were not matched.

Note that the goal of the calls with the refugee and host was to confirm that the information provided in the registration form is still up-to-date. Therefore, call center agents had no incentive and no instructions to solicit additional information that was not captured in the registration form and would therefore be unobserved to us researchers before finalizing a match. Interviews with UU staff who supervised the calls corroborate that call center agents rarely, if at all, solicited additional information to inform their match-making.

To further examine this assumption in section 2.7, we leverage additional demographic information about refugees from our survey not contained in the registration form, covering citizenship, education, employment, income, relationship status, self-identification as LGBTQ+, and region of origin. When conducting a balance test between matched and non-matched refugees, we find little evidence for differences in any of these demographic attributes once we account for the variables contained in the registration form. This supports the assumption that the matching was not driven by unobservables. In addition, in section 4.1 we also conduct a formal sensitivity analysis that probes the robustness of our results to potential hidden bias from unobserved confounders. The analysis reveals that an unobserved confounder would have to be more than six times stronger than the most predictive observed covariates (refugee speaks German or English) to overturn our main results. Together, these results corroborate the identification assumption and suggest that any remaining unobserved confounder is unlikely to change the main findings.

Figure 10 compares 22,124 matched and 95,130 unmatched registered refugees on the UU platform. The figure illustrates that matched and unmatched refugees are generally similar across the characteristics they provided during the registration process. The main difference observed is that refugees who

[1] Postident is a service offered by the German postal service that provides identity verification for various business and legal purposes. It involves checking a person's identity in person at a postal office or digitally, using an official identity document. It is commonly used for processes like opening bank accounts.

registered very early in March 2022 were less likely to be matched, primarily due to the challenge of finding a sufficient number of suitable hosts in the initial weeks after the platform's launch.

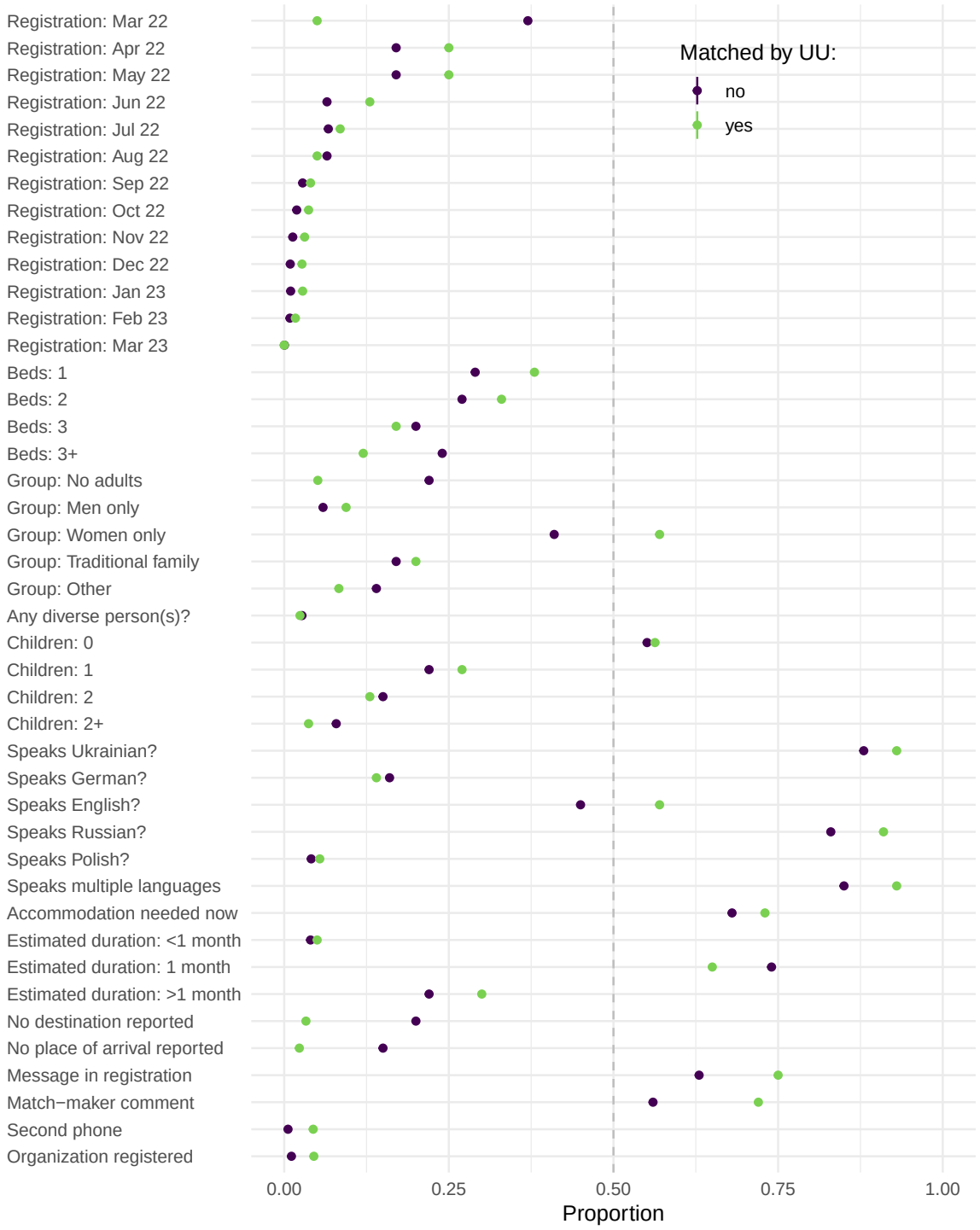

Figure 10: Comparison of Characteristics Between Matched and Unmatched Registered Accommodation Seekers (Source: Register data from UU, see Section 2.3).

1.4 Additional Information About Hosts

We lack systematic information on the characteristics of hosts beyond the data provided in the registration data (see section 2.3). However, in June and July 2022, an independent research project surveyed 3,251 individuals who had registered as hosts with UU (Haller et al., 2022). Among the respondents, 80% had privately hosted refugees at least once. More than two-thirds of the surveyed primary hosts (those who registered with UU and maintained contact) were women. The majority of primary hosts were of working age (25-64 years old) with a median age of 50. Among the respondents, 69% of the surveyed primary hosts were employed, and 10% were retired. Additionally, aside from German, 7.7% of the respondents spoke Russian as a first or second language, and 0.34% spoke Ukrainian. Among the respondents, 37% lived in two-person households with a household income substantially higher than the national median household income. Furthermore, 61% of the surveyed hosts lived in urban areas.

2 Materials and Methods

2.1 IRB

The survey and the project received IRB approval from ETH Zurich (EK-2023-N-122), the German Center for Integration and Migration Research (DeZIM, EK06/2023), and Stanford University (72870).

2.2 Survey of Refugees

Our analysis draws on two main data sources: the registration data from UU and an original survey of refugees who registered with UU.

2.2.1 Sampling

UU handled the survey invitations and hosted the survey through a Qualtrics account. UU invited all refugees who had registered with the UU platform, provided valid contact information, and whom UU was legally able to contact.[2] In total UU was able to invite 49,380 refugees.

On June 1st, 2023 a total of 41,237 refugees were contactable by UU through their MailChimp email system (contact rate: 83.5%).[3] The invitation said that UU was partnering with IPL and DeZIM researchers to evaluate and improve the service of UU. Each invitation contained a personalized link. The invitation also announced that 5 euros will be donated to a charity working in Ukraine for completing the survey. The median survey time to complete the survey was 14.8 minutes (among respondents who answered all questions).

In total 2,905 individuals participated in the survey. We define participation as someone who consented to the terms of the survey. We screen out 94 respondents who were ineligible to participate. This leaves as a total of 2,811 complete and partial responses. 1,870 respondents answered all questions.

Assuming that the proportion of ineligible non-respondents is the same as in the proportion of ineligible respondents (94/2905), the cumulative response rate as defined by the American Association for Public Opinion Research is 6.1% (RR2) and 3.9% (RR3).

2.2.2 Questionnaire

The questionnaire was composed of four main sections. After an introductory message and the request to consent to the data collection and data linkage with the UU registration data, it collected basic information about the respondents' migration experience since 2022 (i.e., if and when they came to Germany and if and when they left Germany again). The respondents remaining in Germany were then

[2]To comply with the EU General Data Protection Regulation (GDPR), UU deletes all contact information that was submitted or last changed more than a year ago every month. Furthermore, UU deletes the contact information of refugees who explicitly opted out from all further communications.

[3]The survey was tested in two pilots in May 2022. The data from these pilots are not included in the analysis.

asked the main outcome questions measuring integration outcomes using the Immigration Policy Lab Integration Index (Harder et al., 2018) (described in more detail below). Respondents who were not in Germany at the time of the survey were not asked these questions since the questions presuppose residence in Germany. In the next section, we asked respondents who were in Germany at some point since February 2022 about their living arrangements – whether they had been matched by UU, moved into the matched accommodation, or which other accommodation they moved into. Then we asked for details regarding the accommodation the respondents moved into. This section included questions about co-cohabitants and the size of the accommodation, contact and support with the host, overall satisfaction with the host and accommodation as well as the possible termination of the accommodation arrangement. In the last section of the survey, we collected additional information about the respondents including current living situation, public and non-governmental support, demographic information, as well as their childcare situation.

A key interest of the survey was to learn more about the accommodations that were brokered by UU as well as accommodations used by respondents who were not matched by UU. For this, we had to clearly define which accommodation a respondent should provide information about. To do so, we asked respondents who lived in a UU accommodation to answer questions with respect to the accommodation they got matched into by UU. If they lived in multiple UU accommodations, we asked them to consider their first UU accommodation. Respondents who did not move into a UU accommodation were asked to answer for the first accommodation they lived in two months after their registration with UU. We use two months as a reference period, since we estimated based on various data sources that this is is about the time most matched respondents would have moved into a UU accommodation. This estimate proved correct, as the survey data indicates that about 77% of those that moved into a UU accommodation lived in such an accommodation two months after registration.

The survey questionnaire was developed in English, then translated into Ukrainian and Russian by a professional translation service and into German by the authors. The Ukrainian and Russian translations were reviewed by the authors and colleagues, who are native speakers, to ensure conceptual homogeneity.

Table 1 describes the relevant survey items with question wordings and answer options.

Table 1: Relevant survey items in the order of the survey

Variable	Question texts	Answer options
Birth year	What year were you born?	Later than 2006; 2005; ...; 1921; 1920 or earlier
Arrived in Germany	Did you come to Germany in or after January 2022?	Yes; No
Date of first arrival in Germany	When did you first arrive in Germany?	January 2022; ...; June 2023; Not answered; Not applicable
Remaining in Germany	Are you still living in Germany?	Yes; No
Date of leaving Germany	When did you leave Germany?	January 2022; ...; June 2023; Not answered; Not applicable
IPL-12: Connection to host country	How connected do you feel with Germany?	I feel an extremely close connection.; I feel a very close connection.; I feel a moderately close connection.; I feel a weak connection.; I do not feel a connection at all.
IPL-12: Feeling like an outsider	How often do you feel like an outsider in Germany?	Never; Rarely; Sometimes; Often; Always
IPL-12: See doctor	In this country, how difficult or easy would it be for you to see a doctor?	Very difficult; Somewhat difficult; Neither difficult, nor easy; Somewhat easy; Very easy

Continued on next page

Table 1: Relevant survey items in the order of the survey (Continued)

Variable	Question texts	Answer options
IPL-12: Find jobs	In this country, how difficult or easy would it be for you to search for a job (find the proper listings)?	Very difficult; Somewhat difficult; Neither difficult, nor easy; Somewhat easy; Very easy
IPL-12: Household size	How many people, including yourself, live in your household? Your household includes everyone with whom you share an apartment or house and with whom you are also related by birth, marriage, partnership, or adoption.	1; ...; 14; more than 15
IPL-12: Household income	"What is your household's net monthly income (after taxes and deductions) from all sources? Please take the average over the last three months. If you don't know the exact figure, please give an estimate. If your income was not in Euros, please try to calculate it. Your household includes everyone with whom you share an apartment or house and with whom you are also related by birth, marriage, partnership, or adoption."	Under 300€; 301 to 500€; 501 to 750€; 751 to 1000€; 1001 to 1500€; 1501 to 2000€; 2001 to 2500€; 2501 to 3000€; 3001 to 3500€; 3501 to 4000€; 4001 to 4500€; 4501 to 5000€; 5001€ or above; Prefer not to say
IPL-12: Employment status	Which of these descriptions best applies to what you have been doing for the last four weeks? Please select only one.	In paid work, even if away temporarily (employee, self-employed, working for your family business); In school, even if on vacation; In language school or job training; Unemployed and actively looking for a job; Unemployed and not actively looking for a job; Permanently sick or disabled; Retired; In military service; In community service; Doing unpaid housework, looking after children or other persons (full-time); Other (please specify) [free text input]
IPL-12: Dinners with locals	In the last 12 months, how often did you eat dinner with Germans who are not part of your family?	Never; Once a year; Once a month; Once a week; Almost every day
IPL-12: Social contacts in messenger app	Please think about the Germans in your address book or your phone contacts. With how many of them did you have a conversation - either by phone, messenger chat, or text exchange - in the last 4 weeks?	0; 1 to 2; 3 to 6; 7 to 14; 15 or more
IPL-12: Reading level	Please evaluate your own skills in German. How well can you do the following when reading German? I can read and understand the main points in simple newspaper articles on familiar subjects.	Very well; Well; Moderately well; Not well; Not well at all
IPL-12: Speaking level	Please evaluate your own skills in German. How well can you do the following when speaking German? In a conversation, I can speak about familiar topics and express personal opinions.	Very well; Well; Moderately well; Not well; Not well at all
IPL-12: Subjective knowledge	How well do you understand the important political issues facing Germany?	Very well; Well; Moderately well; Not well; Not well at all
IPL-12: Political discussions	In the last 12 months, how often did you typically discuss major political issues facing Germany with others?	Never; Once a year; Once a month; Once a week; Almost every day
Month of request	When have you submitted your [first] request at #UnterkunftUkraine?	February 2022; ...; February 2023; Don't know
Requests on other platforms	Have you made requests for private accommodation through other platforms?	Yes; No; Don't know
Accommodation offer	Have you been offered an accommodation by #UnterkunftUkraine [at least once]?	Yes; No; Don't know
Moving into offered accommodation	Have you moved into [the/an] accommodation offered by #UnterkunftUkraine?	Yes; No
Type of accommodation during reference period	In what kind of accommodation did you live in [during reference period]? If you changed accommodation during that month, please think about the accommodation you lived in first.	Refugee shelter in Germany; Other public refugee housing in Germany; Private accommodation (unpaid) in Germany; A flat or a house I or my family rented in Germany; A hotel room I or my family rented in Germany; I didn't have a regular place to stay in Germany; In another country; Other (please specify) [free text input]

Continued on next page

Table 1: Relevant survey items in the order of the survey (Continued)

Variable	Question texts	Answer options
Month of moving into accommodation	When did you move into this accommodation? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	February 2022; ...; April 2023; May 2023 and later; Don't know
Postal code of accommodation during reference period	What was the postal code (Postleitzahl) of the accommodation you lived in [during refence period]?	[Numeric text input]
City of accommodation	What was the city name of the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period]?	[Free text input]
Still living in the accommodation	At the moment, are you still living in the accommodation [you found through #UnterkunftUkraine / you lived in during reference period]?	Yes; No
Number of family members in accommodation	How many members of your family, including yourself, [were living / live] in the accommodation? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	1; ...; 20; more than 20
Number of children in accommodation	How many of them [were / are] children? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	0; ...; 20; more than 20
Other people in accommodation	[Have people other than you and your family been living / Do people other than you and your family live] in this accommodation permanently? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period]. Please check all that apply.	Yes, the host / the host family; Yes, friends, roommates or (sub-)tenants of the host / the host family; Yes, my friends who came to Germany with me; Yes, refugees (other than me and my family or my friends); Yes, others (please specify) [free text input]; No [Exclusive]
Joint activities	[Did / Do] you participate in any of these activities with or for the host and/or their family? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period]. Please check all that apply.	Shared meals; Leisure and recreational activities; Routine housekeeping; Major housekeeping; Short term babysitting; Long term childcare (nanny); Care for elderly persons; Garden work; Dog walking and other animal care; Other (please specify) [free text input]; I did not participate in any of these activities [Exclusive]; Don't know [Exclusive]
Payment for the accommodation	[Did / Do] you give any money [to the host / the host family] as payment for the accommodation? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	Yes; No; Don't know
Total amount paid for accommodation	Please estimate the approximate total amount of the money you gave as payment for the accommodation. Please calculate the total amount that you gave during your stay in the accommodation and not a monthly or weekly amount. We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	Below 100 Euro; €100-200; ...; €1901-2000; €2001-2500; ...; €9501-10000; More than 10000 Euro; Don't know
Satisfaction with accommodation	How would you rate your experience with the accommodation? 1 (very bad) - 10 (very good) We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	1 (very bad); 2; ...; 9; 10 (very good)
Satisfaction with host	How would you rate your experience with the host / the host family? 1 (very bad) - 10 (very good) We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	1 (very bad); 2; ...; 9; 10 (very good)

Continued on next page

Table 1: Relevant survey items in the order of the survey (Continued)

Variable	Question texts	Answer options
Number of other people in accommodation	What was the largest number of people other than you and your family living with you in the accommodation at one point in time? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	1; ...; 20; More than 20; Don't know
Frequency of communication with host	How often [did / do] you communicate with the host of the accommodation or their family [when you lived there]? We are talking about the host / the host family from the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	Daily; Nearly daily; At least once a week; At least monthly; Less than monthly; Never; Don't know
Support from host	Have you received support for any of the following items from the host of the accommodation or their family? We are talking about the host / the host family from the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period]. Please check all that apply.	Access to medical services; Access to psychological support; General legal advice; Translations; Learning German; Financial support; Childcare; Education (e.g. help with homework); Application for residency ("Aufenthaltstitel"); Application for school/childcare; Application for social benefits; Search or application for a job; Search for a new accommodation; Other (please specify) [free text input]; No [exclusive]
Month of leaving accommodation	You said that you do not live in the accommodation anymore. When did you leave the accommodation? We are talking about the [first] accommodation [you found through #UnterkunftUkraine / you lived in during reference period].	February 2022; ...; June 2023; Don't know
Gender	What is your gender?	Female; Male; Non-binary; Prefer not to say
LGBTQ+	The experience of LGBTQ+ refugees can be different than the experience of other refugees. Do you think of yourself as lesbian, gay, bisexual, asexual, transgender, non-binary, intersex, agender or in any other way queer?	Yes; No; Prefer not to say
Education	What is your highest level of education?	Primary education; School education; Vocational education; Undergraduate education; Bachelor's degree; Specialist degree; Master's degree; Postgraduate education; Prefer not to say
Relationship status	What is your current relationship status?	Have a partner (without official marriage); Legally married; Widowed; Single / divorced; Prefer not to say
Having children	Do you have children?	Yes, one child; Yes, two children; ...; Yes, six children or more; No, I don't have children; Prefer not to say; Not answered; Not applicable
Age of children	How old is your youngest and your oldest child?	Less than 1 year old; 1-5 years old; 6-12 years old; 13-17 years old; 18 years old or older;Not answered; Not applicable
Citizenship	What citizenship or citizenships do you have? Please check all that apply.	Ukrainian; Russian; Polish; Hungarian; Romanian; Other country or countries (please specify); Don't have citizenship, stateless

Continued on next page

Table 1: Relevant survey items in the order of the survey (Continued)

Variable	Question texts	Answer options
Region of Ukraine before 2022	In which region of Ukraine did you live before February 24, 2022, or, if you left Ukraine before Feburary 24th, in which region did you live last?	Kharkiv Oblast; Kherson Oblast; Khmelnytskyi Oblast; Dnipropetrovsk Oblast; Donetsk Oblast; Ivano-Frankivsk; City Kyiv; Kyiv Oblast; Kirovohrad Oblast; Autonomous Republic of Crimea; Lviv Oblast; Luhansk Oblast; Mykolayiv Oblast; Odessa Oblast; Poltava Oblast; Rivne Oblast; Zaporizhzhya Oblast; Zhytomyr Oblast; City Sevastopol; Sumy Oblast; Ternopil Oblast; Transcarpathia Oblast; Cherkassy Oblast; Chernihiv Oblast; Chernivtsi Oblast; Volyn Oblast; Vinnytsia Oblast; Don't know
Employment status in Ukraine before 2022	Which of these descriptions best applies to what you have been doing before February 24, 2022?	In paid work, even if away temporarily (employee, self-employed, working for your family business); In school, even if on vacation; In language school or job training; Unemployed and actively looking for a job; Unemployed and not actively looking for a job; Permanently sick or disabled; Retired; In military service; In community service; Doing unpaid housework, looking after children or other persons (full-time); Other (please specify) [free text input]
Average household's net monthly income in 2021	What was your average household's net monthly income (after taxes and deductions) from all sources in 2021 in hryvnias? If you don't know the exact figure, please give an estimate. If your income was not in hryvnias, please try to calculate it. Your household includes everyone with whom you shared an apartment or house and with whom you are also related by birth, marriage, partnership, or adoption.	Below 3 000₴; 3001 to 4000₴; 4001 to 6000₴; ...; 20001 to 22000₴; 22001 to 30000₴; 30001 to 45000₴; 45001₴or above; Prefer not to say
Household size in 2021	How many people, including yourself, have lived in your household at that time? Your household includes everyone with whom you shared an apartment or house and with whom you are also related by birth, marriage, partnership, or adoption.	1; ...; 15; More than 15

2.2.3 Measuring Immigrant Integration

Following Harder et al. (2018), we define integration as "immigrants' ability to build a successful and fulfilling life in the host society." This encompasses knowledge (such as language fluency and understanding of the labor market, political, and social systems) and capacity (mental, social, and economic resources). Integration is conceptually distinct from assimilation as it emphasizes that immigrants can thrive without abandoning their cultural heritage.

The Immigration Policy Lab (IPL) Integration Index is a survey-based measure of immigrant integration that strikes a balance between construct validity, usability, and applicability (Harder et al., 2018). The survey instruments measure immigrant integration across six dimensions: psychological, economic, political, social, linguistic, and navigational (see Table 2).

We utilize the short-form IPL-12, which comprises 12 questions, with two questions for each integration dimension. Each question allows respondents to score between 1 and 5 points. Summing the questions for each dimension provides a subindex, and aggregating all six subindexes yields the IPL-12 index. Following Harder et al. (2018), we rescale the indices to a range from 0 to 1, where higher values indicate a higher level of integration.

Table 2 describes the relevant items in the IPL-12 Index.

Table 2: Items in the IPL-12 Index

Dimension	IPL-12
Psychological	Connection to host country Feeling like an outsider
Social	Dinners with locals Social contacts in messenger app
Linguistic	Reading level Speaking level
Navigational	See doctor Find jobs
Economic	Household income Employment status
Political	Subjective knowledge Political discussions

2.2.4 Measuring Location

In some of our analyses below, we compare the locations of matched and unmatched refugees. In the survey, we ask respondents about their postal code of the accommodation facilitated by UU (or the accommodation they lived in during the reference period). Respondents who indicate not knowing their postal code are asked to report the name of the city. We use the spatial centroid of the postal code polygon to assign all respondents to one of Germany's more than 11,000 municipalities. We then use the municipality identifier to match the survey data with official data about the municipalities. In particular, we measure the vote share of Germany's party Alternative for Germany in the federal election of 2017 (when they received a historically high number of votes), the number of unemployed persons per working-age capita in 2021, population density in 2021, as well as the number of immigrants per capita in the 2011 census (the latest available figures on the municipality level). We also code if the municipality is classified as a city and if it is located in East Germany. Summary statistics for these location outcomes appear in Table 4.

2.3 Registration Data

The authors had access to the anonymized registration records of all refugees and were allowed to compute summary statistics reported in this paper. The following variables were made available by UU to the authors:

- `adult_male_count` Number of adult males in group (number)
- `adult_female_count` Number of adult female in group (number)
- `adult_diverse_count` Number of adult diverse in group (number)
- `children_count` Number of children in group (number)
- `beds` Number of beds requested (number)
- `languages` Languages spoken by the refugee (list)
- `from_date` Arrival date in Germany (date)
- `weeks` Estimated stay in weeks (number)
- `place_of_arrival` Place of arrival (free text)

- `final_destination` Destination preference (free text)
- `message` Registration includes free-text message (binary indicator)

In addition, the authors had access to the following process-based variables

- `created` Timestamp of registration (timestamp)
- `comments_count` Number of comments entered by match-maker (number)
- `Match.created` Timestamp of match creation (timestamp)
- `phone_alt` Registration includes second phone number (binary indicator)
- `organization_id` Registration was done by an organization (binary indicator)

We constructed a series of binary indicator variables based on the raw data. To limit the effect of outliers, variables counting the number of adults by gender and the number of children were winsorized at the value 10 and the variable counting the estimated stay in weeks was winsorized at 48. Figure 11 reports means for each of the binary indicator variables.

Refugees' place of arrival and destination preferences were entered into a free-text field. To encode these places, the authors created a dictionary containing names of all German municipalities, the federal states as well as their Anglicized equivalents and Ukrainian and Russian transliterations. For the 300 largest cities and all federal states, the names were translated and transliterated manually. The remaining muncipalities were transliterated via the service "DeepL". The places of arrival and destination preferences in the register data were then matched with the entries in the dictionary. For places for which no match was found, partial or approximate places were searched. If the refugees had entered multiple possible arrival places or multiple destination preferences, their entries were assigned to the place with the highest population. Figure 12 summarizes the top 45 places of arrival and destination preferences as encoded based on the author's dictionary.

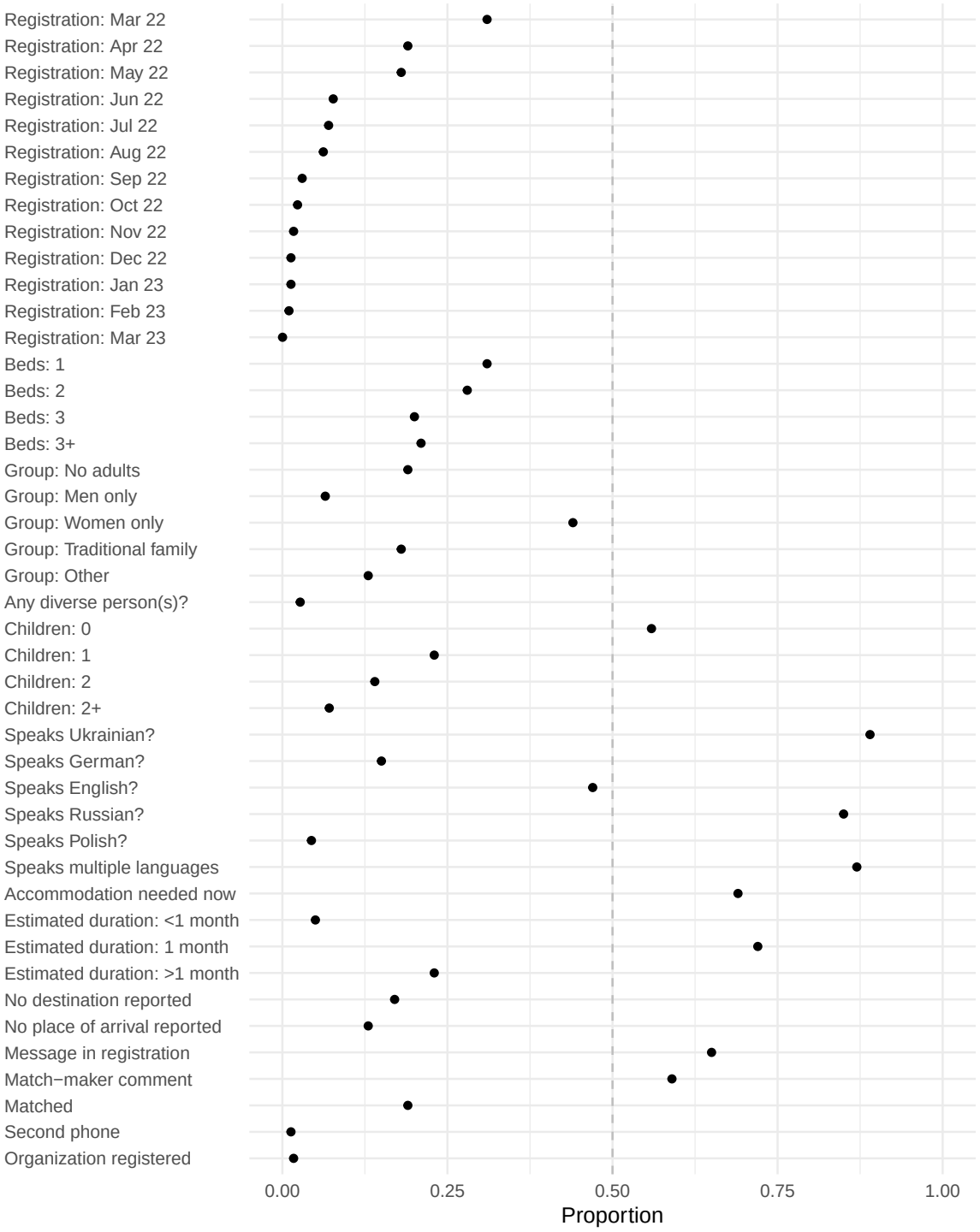

Figure 11: Characteristics of All Refugees Registered on the UU Platform (N=117,254)

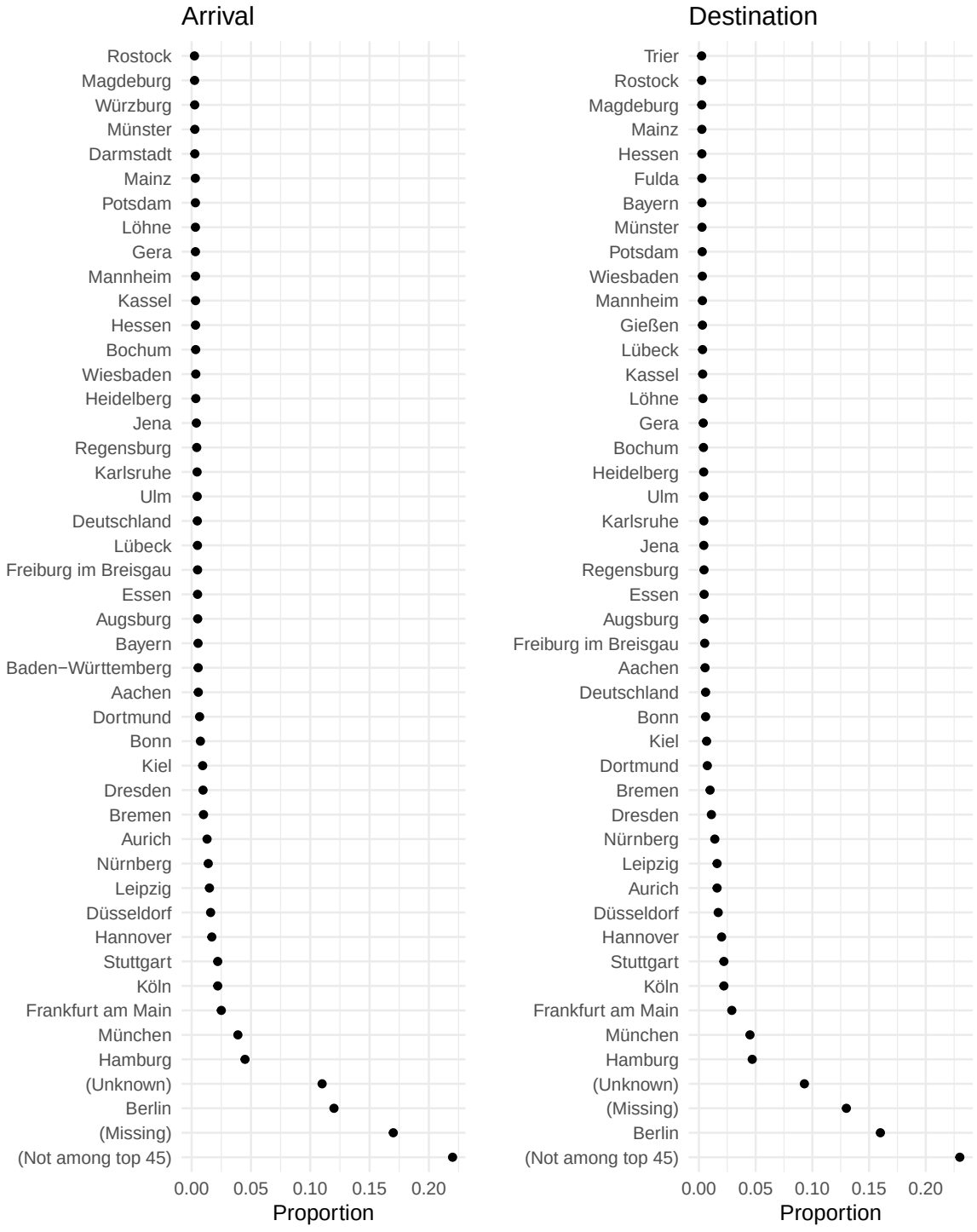

Figure 12: Top 45 places of arrival and destination among registered refugees o the UU platform. The category "Unknown" includes all places not part of the dictionary created by the authors. The category "Missing" are registrations without an entry in the respective field of the form. (N=117,254)

2.4 Non-response Weighting

Figure 13 compares respondents who received an invitation and decided to participate in the survey (respondents) with those who received an invitation but decided not to participate in the survey (non-respondents). For the purpose of this comparison, we define participants as individuals who provided consent to the terms of the survey either in the main survey or in the two pilots. Out of the 117,254 registration records, 2,920 are flagged as participating.

While respondents and non-respondents are broadly similar across all characteristics, we construct non-response weights to adjust for remaining differences. To construct these weights, we use entropy balancing (Hainmueller, 2012), which adjusts the weights of the sample units so that the weighted sample moments match population target moments. These weights are constructed based on all variables shown in Figure 13 as long as the proportion is larger than 0.02. This restriction removes the indicator for arrivals in March 2023, an indicator for a second phone number, and an indicator for an organization registering the refugee. We then winsorize weights larger than the 0.99 quartile.

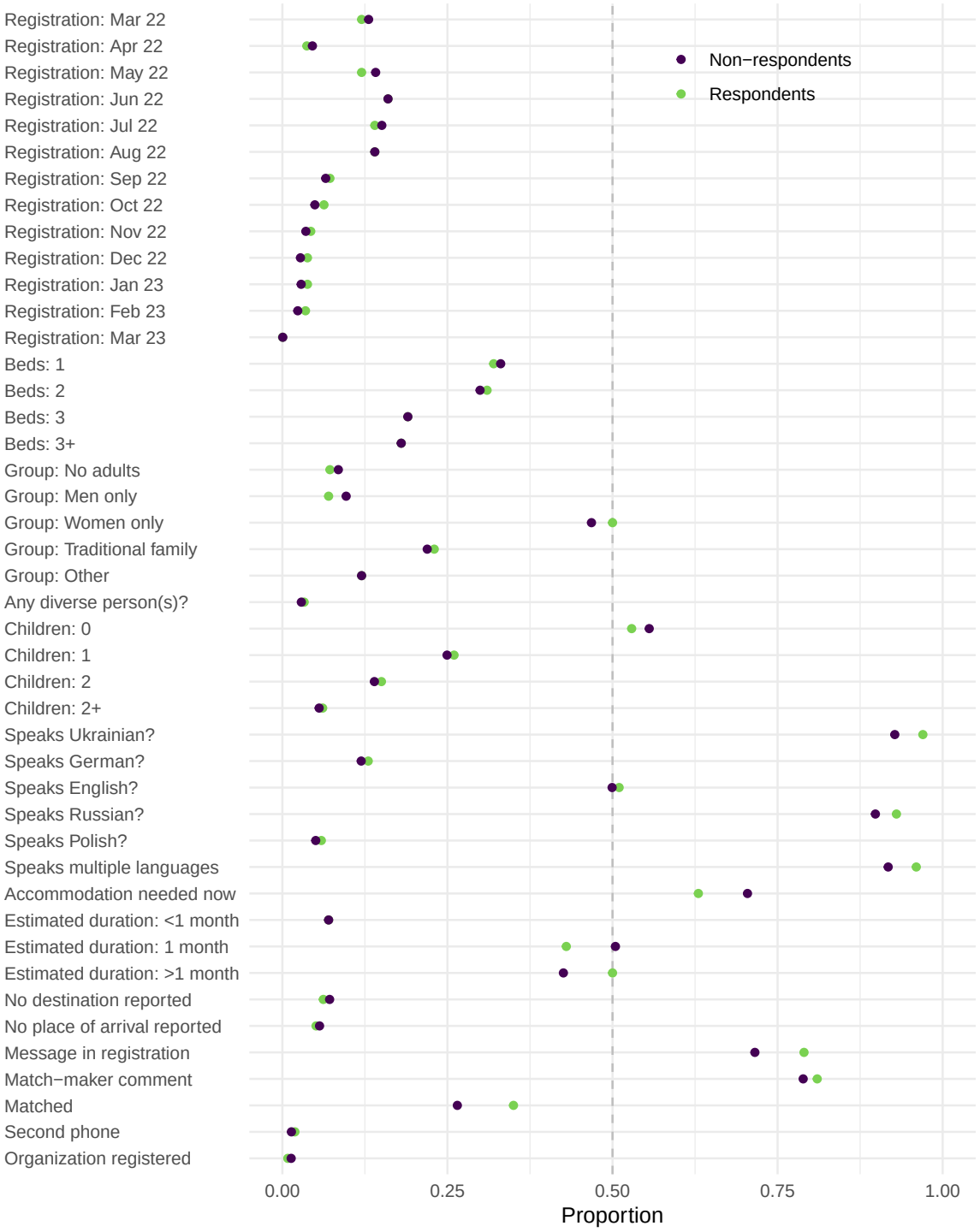

Figure 13: Differences Between Respondents and Non-Respondents Observed in the Registration Data (N=117,254)

2.5 Statistical Models

We use ordinary least square (OLS) regression to estimate the ITT as described in the main text. Our main specification takes the following form:

$$y_i = \beta_0 + \beta_1 Z_i + \boldsymbol{\gamma} \mathbf{X}_i + \epsilon_i, \tag{1}$$

where y_i measures an integration outcome for respondent i, Z_i the binary matching indicator, $\mathbf{X_i}$ a vector of covariates, and ϵ_i the error term. We use heteroskedasticity robust standard errors (HC1).

The matching indicator measures if a respondent was successfully matched by a call center agent or not. A successful match is formed after the agent verified the information from both the host and the refugee and independent of actions by the refugee or the host after the call with the agent. See Section 1.3 for details on the matching process.

In our preferred specification we include all binary indicators from the UU registration data and available to the call center agent as long as their mean is larger than 0.02. The latter restriction removes the indicator for arrivals in March 2023, an indicator a second phone number and an indicator for an organization registering the refugee. We refer to these covariates as *main covariates* when discussing the results below.

In additional specifications, we add demographic and pre-flight covariates. The set of *additional covariates* includes: respondents' age, gender, education, the Ukrainian region of residence before respondents' left, their labor market status and income before leaving as well as the size of their household before leaving. Other than the household size, all of these additional covariates are categorical. To deal with missing values in these additional covariates, we use the missing data indicator method. We trim a small number of covariate values and collapsed some sparsely populated categories.

To estimate the LATE, we use a two-stage least square (2SLS) regression. The main specification takes the same form as the OLS specification except that we regress a treatment indicator (if a respondent moved into the accommodation) on the integration outcome and we instrument this treatment indicator with the matching indicator. As in the OLS case, we use heteroskedasticity robust standard errors (HC1).

2.6 Summary Statistics

Summary statistics for all variables appear in Tables 3, 5, and 4. The main analysis sample includes everyone that arrived in Germany in or after January 2022 and remained in Germany up until the survey day (N=1,700).

Table 3: Summary statistics: main variables (N=1,700)

	Mean	SD	Min	P25	P75	Max	Missing (in %)
Matched	0.37	0.48	0	0	1	1	0
Moved in	0.25	0.43	0	0	1	1	11
Contact frequency	1.3	1.8	0	0	4	4	11
Integration Outcomes							
IPL-12	0.38	0.14	0	0.29	0.48	0.83	12
IPL-12 (ex. Social)	0.4	0.14	0	0.3	0.5	0.85	12
IPL-12 (ex. Economic)	0.38	0.15	0	0.28	0.47	0.88	10
Social	0.29	0.22	0	0.12	0.5	1	7.2
Psychological	0.5	0.24	0	0.38	0.62	1	1.5
Navigational	0.39	0.2	0	0.25	0.5	1	3.2
Linguistic	0.36	0.29	0	0.12	0.5	1	7.5
Economic	0.37	0.22	0	0.25	0.5	1	8.3
Political	0.35	0.24	0	0.12	0.5	1	8.4
Accommodation Outcomes							
Living with host	0.42	0.49	0	0	1	1	20
Living with refugees	0.21	0.41	0	0	0	1	20
Total rent (in 1k Euro)	0.57	1.7	0	0	0	10	25
Monthly rent (in Euro)	76	222	0	0	0	3750	29
Number of months	6.5	4.2	1	3	10	16	24
Private hosting	0.46	0.5	0	0	1	1	11
Public housing	0.3	0.46	0	0	1	1	11
Location Outcomes							
Vote share AfD '17	8.2	2.7	2.1	6.2	9	23	25
Unemployment	5.7	2.2	1.3	3.9	7.9	13	25
Population density	1.8	1.5	0	0.4	2.7	4.8	25
East Germany	0.098	0.3	0	0	0	1	25
City	0.85	0.36	0	1	1	1	25
Share immigrants '11	10	5.5	0	5.5	13	27	26

Table 4: Summary Statistics: Continuous Covariates (N=1,700)

	Mean	SD	Min	P25	P75	Max	Missing
Source: Registration							
Counts: Beds	2.4	1.5	1	1	3	10	0
Beds: 2	0.3	0.46	0	0	1	1	0
Beds: 3	0.19	0.39	0	0	0	1	0
Beds: 3+	0.17	0.38	0	0	0	1	0
Counts: Estimated duration (weeks)	13	15	1	4	12	48	0
Estimated duration: 4 weeks	0.45	0.5	0	0	1	1	0
Estimated duration: +4 weeks	0.49	0.5	0	0	1	1	0
Accommodation needed now	0.62	0.49	0	0	1	1	0
No destination reported	0.055	0.23	0	0	0	1	0
No place of arrival reported	0.046	0.21	0	0	0	1	0
Count: Males	0.46	0.61	0	0	1	5	0
Count: Females	1.1	0.8	0	1	1	10	0
Count: Diverse	0.034	0.21	0	0	0	3	0
Group: No adults	0.078	0.27	0	0	0	1	0
Group: Men only	0.075	0.26	0	0	0	1	0
Group: Women only	0.5	0.5	0	0	1	1	0
Group: Traditional family	0.24	0.43	0	0	0	1	0
Group: Other	0.11	0.31	0	0	0	1	0
Any diverse person(s)?	0.028	0.17	0	0	0	1	0
Count: Children	0.76	1	0	0	1	10	0
Children: 1	0.25	0.43	0	0	0	1	0
Children: 2	0.15	0.36	0	0	0	1	0
Children: 2+	0.056	0.23	0	0	0	1	0
Count: Languages	2.7	0.8	1	2	3	5	0
Speaks Ukrainian	0.97	0.17	0	1	1	1	0
Speaks German	0.15	0.36	0	0	0	1	0
Speaks English	0.061	0.24	0	0	0	1	0
Speaks Polish	0.54	0.5	0	0	1	1	0
Speaks Russian	0.94	0.23	0	1	1	1	0
Speaks multiple languages	0.96	0.19	0	1	1	1	0
Has message	0.8	0.4	0	1	1	1	0
Message: length	235	322	0	28	310	3195	0
Message: has name	0.18	0.38	0	0	0	1	0
Message: has phone num.	0.039	0.19	0	0	0	1	0
Message: has address	0.025	0.16	0	0	0	1	0
Message: has email	0.012	0.11	0	0	0	1	0
Message: has birthday	0.0024	0.048	0	0	0	1	0
Message: has link	0.0059	0.076	0	0	0	1	0
Message: has personal info.	0.26	0.6	0	0	0	4	0
Count: Match-maker comment	2.1	2.1	0	1	3	19	0
Match-maker comment	0.81	0.39	0	1	1	1	0
Source: Survey							
Age	36	11	16	28	43	89	0
Household size	2.7	1.8	1	2	3	16	0
Household size: Imputed	0.045	0.21	0	0	0	1	0

Table 5: Summary Statistics: Categorical Covariates (N=1,700)

		Percent	N
Source: Registration			
Registration	2022 April	3.8	65
	2022 Aug	13	228
	2022 Dez	3.8	64
	2022 Jul	15	254
	2022 Jun	16	274
	2022 May	13	226
	2022 Mar	11	183
	2022 Nov	3.9	67
	2022 Oct	5.8	99
	2022 Sep	7.3	124
	2023 Feb	3.3	56
	2023 Jan	3.5	59
	2023 Mar	0.059	1
Source: Survey			
Gender	Female	61	1038
	Male	17	288
	Non-binary	0.76	13
	(Missing)	21	361
Education	School education	6.4	108
	Vocational education	8.7	148
	Undergraduate education	5.3	90
	Bachelor's degree	12	199
	Specialist degree	24	407
	Master's degree	20	337
	Postgraduate education	2.6	45
	(Missing)	22	366
Labour market	Paid work	55	938
	Education	6.6	113
	Unemployed	2.4	41
	Retired/Disabled	2.9	50
	In community/military service	1	17
	Houseperson	5.9	100
	Other	4.1	70
	(Missing)	22	371
Income	<3000 hrn.	3.9	67
	3001-4000 hrn.	3	51
	4001-6000 hrn.	4.5	77
	6001-8000 hrn.	4.2	72
	8001-10000 hrn.	4.8	82
	10001-12000 hrn.	5.2	88
	12001-14000 hrn.	4	68
	14001-16000 hrn.	3.2	55
	16001-18000 hrn.	2.8	48
	18001-20000 hrn.	5.7	97
	20001-22000 hrn.	3.7	63
	22001-30000 hrn.	8.1	138
	30001-45000 hrn.	6.2	105
	>45001 hrn.	6.2	105
	(Missing)	34	584
Relationship	In relationship	14	237
	Married	33	569
	Widowed	2.2	37
	Single / divorced	26	443
	(Missing)	24	414

2.7 Balance of Demographic Attributes

To validate our identification approach, we conducted a series of placebo balance assessments using a set of refugee traits assessed in our survey, which were not captured in the registration data utilized by UU for their matching process. These traits include nationality, educational background, earnings in Ukraine, self-identification as LGBTQ+, employment status in Ukraine, region of origin within Ukraine, and marital status. We then conducted regressions where these refugee characteristics were regressed on the indicator for whether refugees were matched or not, while controlling for the registration characteristics employed by UU for matching purposes. If our assumption of selection based on observable factors holds, we would expect that conditional on the registration characteristics employed by UU for matching purposes, matched and unmatched refugees should not systematically differ in terms of the refugee traits that were unobserved by UU but measured in our survey.

The results, presented in Table 6, support this assumption. Our analysis reveals that, given the characteristics utilized by UU for matching, there is no discernible association between being matched and the refugee traits not observed by UU. Out of twenty-two balance assessments, only one covariate (Self-identification as LGBTQ+: No) exhibited a statistically significant imbalance, albeit negligible in substance (a 3.8 percentage point difference). This reinforces our assumption of selection based on observable factors.

Table 6: Balance of Demographic Attributes Between Matched and Unmatched Respondents

	Distributions in subsamples				Regression results†	
	Matched in register		Not matched in register			
	percent of valid answers (weighted)	absolute count	percent of valid answers (weighted)	absolute count	Estimated effect of being matched on probability of group membership	Robust SE
Citizenship						
Not Ukrainian	5.2	22	5.2	38	0.001	0.011
Ukrainian	94.8	777	94.8	1280	-0.001	0.011
Education						
Primary or secondary education	8.8	70	9.3	117	-0.005	0.016
Tertiary education	79.1	640	78.4	1032	-0.006	0.021
Vocational education	12.1	84	12.3	163	0.011	0.017
Income in Ukraine						
10000 hryvnia or less	35.8	210	35.3	353	-0.001	0.028
10001 to 20000 hryvnia	29.8	202	30.3	335	0.010	0.026
20001 hryvnia or more	34.4	233	34.4	372	-0.010	0.027
Self-identification as LGBTQ+						
Yes	7.9	61	4.6	59	0.020	0.013
No	86.9	706	91.0	1219	-0.038*	0.017
Prefer not to say	5.3	33	4.4	50	0.019	0.012
Labour market activity in Ukraine						
Employed	69.8	555	66.4	882	0.032	0.024
Not employed	30.2	234	33.6	408	-0.032	0.024
Region in Ukraine‡						
East	34.1	267	36.1	451	-0.026	0.026
South (including Crimea)	13.7	103	17.3	230	-0.029	0.019
Central	12.9	95	12.0	162	0.016	0.018
West	5.5	45	5.3	67	0.009	0.013
City of Kyiv	22.8	183	19.1	248	0.027	0.021
North (excluding the City of Kyiv)	11.0	88	10.1	140	0.002	0.017
Relationship status						
Have a partner (without official marriage)	21.0	151	16.8	203	0.020	0.021
Married	42.2	340	45.2	594	0.018	0.024
Not currently in a relationship	36.7	278	38.0	466	-0.038	0.025

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
† OLS models with robust standard errors, non-response weights and controlling for all main covariates. Displayed coefficients represent the effect of being matched on the probability of belonging to the indicated group.
‡ Regional categorization: Central = Khmelnytskyi Oblast, Dnipropetrovsk Oblast, Kirovohrad Oblast, Cherkassy Oblast and Vinnytsia Oblast. City of Kyiv = City of Kyiv. East = Kharkiv Oblast, Donetsk Oblast, Luhansk Oblast, Poltava Oblast and Zaporizhzhya Oblast. North = Kyiv Oblast, Zhytomyr Oblast, Sumy Oblast and Chernihiv Oblast. South = Kherson Oblast, Autonomous Republic of Crimea, Mykolayiv Oblast, Odessa Oblast and City of Sevastopol. West = Ivano-Frankivsk, Lviv Oblast, Rivne Oblast, Ternopil Oblast, Transcarpathia Oblast, Chernivtsi Oblast and Volyn Oblast.

2.8 Generalizability

To assess the generalizability, we compare our survey sample to two sources of data on Ukrainian refugees in Germany. The first source is a survey sample of Ukrainian refugees from a survey conducted by researchers from the Institute for Employment Research (IAB), the Federal Institute for Population Research (BiB), the Research Center of the Federal Office for Migration and Refugees (BAMF-FZ), and the German Institute for Economic Research (DIW) (Brücker et al., 2023). We refer to this as the IAB-BiB/FReDA-BAMF-SOEP sample. This survey covered Ukrainians aged 18-70 who fled to Germany between February 24, 2022, and early June 2022 and who were officially registered at the time of the survey. The second data source is the population register of all foreigners in Germany, the German Central Register of Foreign Nationals (AZR). Brucker et al. (2023) published the distribution of basic demographic characteristics in the full population of Ukrainian refugees as registered in the AZR.

To make the comparison more informative, we compare the two sources of data to our full sample and also a restricted version of our sample that is trimmed to those refugees who would likely have been part of the population covered by the AZR data and the population that was used to draw the IAB-BiB/FReDA-BAMF-SOEP sample. This restricted version of our data excludes respondents who did not come to Germany until June 2022 or left before August 2022, respondents who are not Ukrainian nationals, and respondents who were younger than 18 or older than 70 years.

The results are presented in Tables 7 and 8. Overall, both our restricted and full sample show high similarity to the population of Ukrainian refugees in Germany across the characteristics measured in both datasets, including gender, age, education, state, employment, marital status, parenthood, and region in Ukraine. Our sample is slightly younger and somewhat more urban than the overall population of Ukrainian refugees in Germany, but even these differences are fairly minor overall. This suggests that the types of refugees who registered for UU are fairly similar to the general population of Ukrainian refugees who arrived at that time.

Table 7: Comparing Basic Demographic Distributions: UU Survey Sample vs. IAB-BiB/FReDA-BAMF-SOEP survey sample and German Central Register of Foreign Nationals (AZR)

	Full sample		Restricted to fit representative data		AZR population data	IAB-BiB/FReDA-BAMF-SOEP survey sample
	percent of valid answers (weighted)	absolute count	percent of valid answers (weighted)	abslute count	percent	percent (weighted)
Gender						
Female	76.0	1673	81.3	722	79.8	78.4
Male	22.6	428	16.9	137	20.2	21.6
Non-binary	0.6	14	0.9	9	-	-
Prefer not to say	0.9	19	0.9	8	-	-
Age						
17 and younger	0.3	8	-	-	-	-
18-29	24.6	667	26.0	289	22.4	21.2
30-39	34.5	961	34.6	367	29.3	28.2
40-49	28.1	815	27.8	319	23.1	22.8
50-59	8.7	258	8.5	100	12.0	12.1
60-70	3.0	81	3.1	33	13.1	12.7
71 and over	0.8	21	-	-	-	-
unnkwon	-	-	-	-	-	3.1
Federal state						
Baden-Württemberg	14.4	215	11.5	97	12.5	12.2
Bayern	16.5	238	21.2	173	16.9	16.2
Berlin	15.1	211	15.8	133	5.4	3.0
Brandenburg	2.2	37	2.3	22	3.3	3.1
Bremen	1.2	19	1.5	12	0.9	0.6
Hamburg	8.2	109	7.3	59	2.6	2.8
Hessen	6.4	94	6.0	52	8.1	8.2
Mecklenburg-Vorpommern	0.8	11	1.0	7	2.5	2.5
Niedersachsen	6.1	98	5.4	47	9.6	10.1
Nordrhein-Westfalen	16.6	250	16.2	134	19.5	22.0
Rheinland-Pfalz	3.1	42	3.3	25	4.8	4.8
Saarland	1.0	16	0.7	6	0.9	1.0
Sachsen	2.6	43	3.2	29	5.3	5.6
Sachsen-Anhalt	1.9	29	1.3	10	2.9	3.0
Schleswig-Holstein	2.5	40	2.2	19	2.7	2.6
Thüringen	1.4	19	1.2	9	2.0	2.3
N (unweighted)	2811	-	1108	-	448679	11763

Table 8: Comparing Additional Demographic Distributions: UU Survey Sample and the IAB-BiB/FReDA-BAMF-SOEP Sample

	Full sample		Restricted to fit representative data		IAB-BiB/FReDA-BAMF-SOEP survey sample
	percent of valid answers (weighted)	absolute count	percent of valid answers (weighted)	absolute count	percent (weighted)
Education					
Primary or secondary education	9.1	187	8.8	77	18.0
Tertiary education	78.6	1672	80.1	696	72.0
Vocational education	12.3	247	11.1	92	11.0
Employment among those aged 18 - 64					
Employed	14.5	237	16.4	163	17.0
Not employed	85.5	1291	83.6	775	83.0
Marital status					
Married	44.4	934	42.4	357	54.0
Not married or divorced	53.0	1043	54.6	451	42.0
Widowed	2.7	55	2.9	23	5.0
Parenthood					
Has underaged children	80.4	1111	79.3	429	72.5
Has no underaged children	19.6	271	20.7	113	27.5
Region in Ukraine*					
Central	12.2	257	10.9	100	12.6
City of Kyiv	20.2	431.0	24.8	216.0	19.0
East	35.6	718	31.5	263	32.0
North (excluding the City of Kyiv)	10.4	228	10.9	96	12.5
South (including Crimea)	16.3	333	16.7	138	14.2
West	5.4	112	5.2	48	9.4
N (unweighted)	2811	-	1108	-	11763

* Regional categorization: Central = Khmelnytskyi Oblast, Dnipropetrovsk Oblast, Kirovohrad Oblast, Cherkassy Oblast and Vinnytsia Oblast. City of Kyiv = City of Kyiv. East = Kharkiv Oblast, Donetsk Oblast, Luhansk Oblast, Poltava Oblast and Zaporizhzhya Oblast. North = Kyiv Oblast, Zhytomyr Oblast, Sumy Oblast and Chernihiv Oblast. South = Kherson Oblast, Autonomous Republic of Crimea, Mykolayiv Oblast, Odessa Oblast and City of Sevastopol. West = Ivano-Frankivsk, Lviv Oblast, Rivne Oblast, Ternopil Oblast, Transcarpathia Oblast, Chernivtsi Oblast and Volyn Oblast.

3 Detailed Results

Table 9 reports the ITT from an OLS regression, the LATE from a 2SLS and the corresponding first-stage regressions. Table 10-12 report similar results for integration indices that remove the economic integration subindex, the social integration subindex or the social and psychological integration subindexes. Table 13-15 report the corresponding estimates for all subindexes separately.

Table 16 reports OLS regressions were we interact the matching indicator with indicators for various demographic subgroups. Different to the specifications reported in the main paper, we here keep observations with missing values in the demographic groups and assign them to the base category.

Table 17 reports a series of regression demonstrating differences in accommodation outcomes between matched and unmatched refugees and Table 18 reports differences in location outcomes between matched and unmatched refugees.

Note that sample sizes across the regressions differ because of non-response to survey questions for each of the regression outcomes. In addition, the samples for ITT analysis and LATE analysis differ because the treatment indicator is missing for survey respondents who decided to not answer the survey question asking if they moved into an accommodation offered by UU. Table 18 sample sizes are lower because some respondents choose to not provide information on their current place of residence and some location outcomes are missing in official data.

Across all tables, the main covariates (label "Main covs." in the tables) include all binary indicators from the UU registration data as long as their mean is larger than 0.02. The additional covariates (label "Add. covs." in the tables) include additional demographic and pre-flight covariates from the survey. For details and the list of covariates see SM section 2.5.

3.1 Main Outcomes

Table 9: Impact of Hosting on Overall Integration (IPL-12)

	(1)	(2)	(3)	(4)	(5)	(6)
OLS (ITT Analysis)						
(Intercept)	0.37***	0.32***	0.28***	0.36***	0.30***	0.29***
	(0.005)	(0.035)	(0.044)	(0.005)	(0.037)	(0.046)
Matched	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
R2 Adj.	0.01	0.15	0.17	0.01	0.14	0.16
Num.Obs.	1501	1501	1501	1501	1501	1501
2SLS (LATE Analysis)						
(Intercept)	0.36***	0.32***	0.29***	0.36***	0.30***	0.29***
	(0.005)	(0.036)	(0.045)	(0.006)	(0.037)	(0.047)
Moved in	0.06***	0.06***	0.07***	0.06***	0.07***	0.07***
	(0.015)	(0.016)	(0.016)	(0.015)	(0.017)	(0.017)
R2 Adj.	0.01	0.14	0.16	0.01	0.13	0.15
Num.Obs.	1461	1461	1461	1461	1461	1461
First-stage						
(Intercept)	0.06***	-0.01	0.03	0.06***	0.01	0.05
	(0.008)	(0.107)	(0.138)	(0.008)	(0.106)	(0.135)
Matched	0.49***	0.45***	0.45***	0.49***	0.45***	0.45***
	(0.023)	(0.024)	(0.025)	(0.025)	(0.026)	(0.026)
R2 Adj.	0.30	0.32	0.33	0.30	0.32	0.32
Num.Obs.	1461	1461	1461	1461	1461	1461
Cragg-Donald F	623	471	459	623	471	459
Kleibergen-Paap F	464	342	326	463	342	323
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10: "Impact of Hosting on Overall Integration (Excluding Social Integration from IPL-12)

	(1)	(2)	(3)	(4)	(5)	(6)
OLS (ITT Analysis)						
(Intercept)	0.39***	0.57***	0.53***	0.38***	0.55***	0.53***
	(0.005)	(0.044)	(0.051)	(0.005)	(0.047)	(0.054)
Matched	0.02**	0.02**	0.02**	0.02**	0.03**	0.03***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
R2 Adj.	0.01	0.16	0.17	0.00	0.14	0.16
Num.Obs.	1503	1503	1503	1503	1503	1503
2SLS (LATE Analysis)						
(Intercept)	0.39***	0.56***	0.52***	0.38***	0.54***	0.53***
	(0.006)	(0.045)	(0.052)	(0.006)	(0.049)	(0.055)
Moved in	0.05**	0.05**	0.05**	0.04*	0.05**	0.06**
	(0.015)	(0.017)	(0.017)	(0.016)	(0.018)	(0.018)
R2 Adj.	0.00	0.15	0.16	0.00	0.13	0.15
Num.Obs.	1463	1463	1463	1463	1463	1463
First-stage						
(Intercept)	0.06***	0.07	0.07	0.06***	0.06	0.07
	(0.008)	(0.114)	(0.138)	(0.008)	(0.111)	(0.135)
Matched	0.49***	0.45***	0.45***	0.49***	0.45***	0.45***
	(0.023)	(0.024)	(0.025)	(0.025)	(0.026)	(0.026)
R2 Adj.	0.30	0.32	0.33	0.30	0.32	0.32
Num.Obs.	1463	1463	1463	1463	1463	1463
Cragg-Donald F	623	471	459	623	471	459
Kleibergen-Paap F	465	343	327	465	343	324
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11: Impact of Hosting on Overall Integration (Excluding Social and Psychological Integration from IPL-12)

	(1)	(2)	(3)	(4)	(5)	(6)
OLS (ITT Analysis)						
(Intercept)	0.36***	0.56***	0.52***	0.36***	0.54***	0.52***
	(0.005)	(0.046)	(0.053)	(0.005)	(0.050)	(0.057)
Matched	0.02*	0.02*	0.02*	0.02*	0.02*	0.02**
	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
R2 Adj.	0.00	0.20	0.22	0.00	0.17	0.21
Num.Obs.	1503	1503	1503	1503	1503	1503
2SLS (LATE Analysis)						
(Intercept)	0.36***	0.55***	0.51***	0.36***	0.53***	0.51***
	(0.006)	(0.047)	(0.054)	(0.006)	(0.052)	(0.058)
Moved in	0.03*	0.04*	0.04*	0.03*	0.04*	0.05**
	(0.016)	(0.017)	(0.017)	(0.017)	(0.019)	(0.019)
R2 Adj.	0.00	0.19	0.22	0.00	0.16	0.19
Num.Obs.	1463	1463	1463	1463	1463	1463
First-stage						
(Intercept)	0.06***	0.07	0.07	0.06***	0.09	0.10
	(0.008)	(0.114)	(0.138)	(0.008)	(0.112)	(0.137)
Matched	0.49***	0.45***	0.45***	0.48***	0.45***	0.44***
	(0.023)	(0.024)	(0.025)	(0.025)	(0.026)	(0.026)
R2 Adj.	0.30	0.32	0.33	0.29	0.31	0.31
Num.Obs.	1463	1463	1463	1463	1463	1463
Cragg-Donald F	623	471	459	623	471	459
Kleibergen-Paap F	465	343	327	448	332	314
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12: Impact of Hosting on Overall Integration (Excluding Economic Integration from IPL-12

	(1)	(2)	(3)	(4)	(5)	(6)
OLS (ITT Analysis)						
(Intercept)	0.37***	0.31***	0.27***	0.36***	0.30***	0.28***
	(0.005)	(0.039)	(0.050)	(0.005)	(0.040)	(0.052)
Matched	0.04***	0.03***	0.03***	0.03***	0.03***	0.04***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
R2 Adj.	0.01	0.13	0.14	0.01	0.12	0.13
Num.Obs.	1525	1525	1525	1525	1525	1525
2SLS (LATE Analysis)						
(Intercept)	0.36***	0.32***	0.27***	0.36***	0.30***	0.28***
	(0.006)	(0.039)	(0.051)	(0.006)	(0.041)	(0.053)
Moved in	0.07***	0.07***	0.07***	0.06***	0.07***	0.07***
	(0.016)	(0.018)	(0.018)	(0.017)	(0.019)	(0.019)
R2 Adj.	0.01	0.12	0.13	0.00	0.11	0.12
Num.Obs.	1482	1482	1482	1482	1482	1482
First-stage						
(Intercept)	0.07***	0.01	0.07	0.07***	0.02	0.08
	(0.008)	(0.106)	(0.139)	(0.009)	(0.105)	(0.137)
Matched	0.49***	0.45***	0.45***	0.49***	0.45***	0.45***
	(0.023)	(0.024)	(0.025)	(0.025)	(0.026)	(0.026)
R2 Adj.	0.30	0.31	0.32	0.30	0.31	0.31
Num.Obs.	1482	1482	1482	1482	1482	1482
Cragg-Donald F	628	473	461	628	473	461
Kleibergen-Paap F	472	346	329	466	340	319
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 13: OLS Regression Estimates with Robust Standard Errors (Intention-to-Treat Analysis)

	(1)	(2)	(3)	(4)	(5)	(6)
Social Integration						
(Intercept)	0.26***	0.23***	0.24**	0.26***	0.22***	0.24**
	(0.007)	(0.061)	(0.074)	(0.007)	(0.064)	(0.078)
Matched	0.08***	0.07***	0.06***	0.07***	0.07***	0.07***
	(0.011)	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)
R2 Adj.	0.03	0.05	0.06	0.02	0.05	0.07
Num.Obs.	1577	1577	1577	1577	1577	1577
Psychological Integration						
(Intercept)	0.49***	0.46***	0.43***	0.49***	0.42***	0.42***
	(0.008)	(0.062)	(0.082)	(0.008)	(0.066)	(0.085)
Matched	0.04**	0.04**	0.04**	0.04**	0.04**	0.04**
	(0.012)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)
R2 Adj.	0.01	0.01	0.01	0.00	0.01	0.02
Num.Obs.	1675	1675	1675	1675	1675	1675
Navigational Integration						
(Intercept)	0.39***	0.32***	0.27***	0.38***	0.31***	0.26***
	(0.006)	(0.056)	(0.069)	(0.007)	(0.060)	(0.073)
Matched	0.01	0.02	0.01	0.01	0.02*	0.02
	(0.010)	(0.011)	(0.011)	(0.010)	(0.011)	(0.012)
R2 Adj.	0.00	0.02	0.01	0.00	0.03	0.02
Num.Obs.	1646	1646	1646	1646	1646	1646
Linguistic Integration						
(Intercept)	0.35***	0.26***	0.35***	0.34***	0.25***	0.36***
	(0.009)	(0.068)	(0.086)	(0.010)	(0.067)	(0.087)
Matched	0.03*	0.02	0.02	0.03	0.03	0.03
	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)
R2 Adj.	0.00	0.23	0.28	0.00	0.22	0.27
Num.Obs.	1572	1572	1572	1572	1572	1572
Economic Integration						
(Intercept)	0.37***	0.33***	0.32***	0.36***	0.35***	0.33***
	(0.007)	(0.062)	(0.073)	(0.007)	(0.064)	(0.075)
Matched	0.01	0.01	0.01	0.00	0.01	0.02
	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)	(0.013)
R2 Adj.	0.00	0.03	0.13	0.00	0.03	0.14
Num.Obs.	1559	1559	1559	1559	1559	1559
Political Integration						
(Intercept)	0.35***	0.33***	0.14	0.34***	0.32***	0.17*
	(0.008)	(0.060)	(0.077)	(0.008)	(0.061)	(0.078)
Matched	0.01	0.01	0.02	0.01	0.01	0.02
	(0.012)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)
R2 Adj.	0.00	0.05	0.06	0.00	0.05	0.06
Num.Obs.	1558	1558	1558	1558	1558	1558
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 14: First-Stage Regression Estimates with Robust Standard Errors

	(1)	(2)	(3)	(4)	(5)	(6)
Social Integration						
(Intercept)	0.07***	0.01	0.10	0.07***	0.03	0.12
	(0.008)	(0.105)	(0.140)	(0.009)	(0.105)	(0.137)
Matched	0.49***	0.45***	0.45***	0.48***	0.45***	0.45***
	(0.022)	(0.024)	(0.024)	(0.024)	(0.025)	(0.026)
R2 Adj.	0.29	0.31	0.32	0.29	0.31	0.31
Num.Obs.	1516	1516	1516	1516	1516	1516
Psychological Integration						
(Intercept)	0.07***	0.02	0.11	0.07***	0.03	0.12
	(0.008)	(0.105)	(0.139)	(0.009)	(0.104)	(0.136)
Matched	0.49***	0.45***	0.44***	0.49***	0.45***	0.45***
	(0.022)	(0.024)	(0.024)	(0.024)	(0.025)	(0.026)
R2 Adj.	0.29	0.31	0.32	0.30	0.31	0.31
Num.Obs.	1517	1517	1517	1517	1517	1517
Navigational Integration						
(Intercept)	0.07***	0.02	0.12	0.07***	0.03	0.13
	(0.008)	(0.105)	(0.140)	(0.009)	(0.105)	(0.138)
Matched	0.49***	0.45***	0.45***	0.49***	0.45***	0.45***
	(0.022)	(0.024)	(0.025)	(0.024)	(0.026)	(0.026)
R2 Adj.	0.30	0.31	0.32	0.29	0.31	0.31
Num.Obs.	1493	1493	1493	1493	1493	1493
Linguistic Integration						
(Intercept)	0.07***	0.02	0.11	0.07***	0.03	0.12
	(0.008)	(0.105)	(0.139)	(0.009)	(0.104)	(0.136)
Matched	0.49***	0.45***	0.45***	0.49***	0.45***	0.45***
	(0.022)	(0.024)	(0.024)	(0.024)	(0.025)	(0.026)
R2 Adj.	0.29	0.31	0.32	0.30	0.31	0.31
Num.Obs.	1518	1518	1518	1518	1518	1518
Economic Integration						
(Intercept)	0.06***	-0.01	0.07	0.06***	0.02	0.09
	(0.008)	(0.105)	(0.139)	(0.008)	(0.105)	(0.136)
Matched	0.49***	0.45***	0.44***	0.49***	0.46***	0.45***
	(0.022)	(0.024)	(0.024)	(0.024)	(0.025)	(0.026)
R2 Adj.	0.30	0.32	0.32	0.30	0.32	0.32
Num.Obs.	1497	1497	1497	1497	1497	1497
Political Integration						
(Intercept)	0.07***	0.01	0.07	0.07***	0.02	0.09
	(0.008)	(0.105)	(0.137)	(0.009)	(0.104)	(0.134)
Matched	0.49***	0.45***	0.45***	0.49***	0.46***	0.45***
	(0.022)	(0.024)	(0.024)	(0.024)	(0.025)	(0.026)
R2 Adj.	0.30	0.32	0.32	0.30	0.31	0.32
Num.Obs.	1513	1513	1513	1513	1513	1513
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15: Two-Stage Least Squares Regression Estimates with Robust Standard Errors (Local Average Treatment Effect Analysis).

	(1)	(2)	(3)	(4)	(5)	(6)
Social Integration						
(Intercept)	0.25***	0.20***	0.19**	0.25***	0.18**	0.19*
	(0.008)	(0.061)	(0.074)	(0.009)	(0.063)	(0.077)
Moved in	0.15***	0.14***	0.14***	0.14***	0.14***	0.14***
	(0.023)	(0.027)	(0.028)	(0.025)	(0.029)	(0.030)
R2 Adj.	0.05	0.07	0.08	0.03	0.06	0.09
Num.Obs.	1516	1516	1516	1516	1516	1516
Psychological Integration						
(Intercept)	0.48***	0.45***	0.42***	0.48***	0.41***	0.41***
	(0.009)	(0.065)	(0.085)	(0.010)	(0.068)	(0.088)
Moved in	0.08**	0.09**	0.09**	0.08**	0.08**	0.08*
	(0.025)	(0.030)	(0.032)	(0.027)	(0.032)	(0.033)
R2 Adj.	0.01	0.01	0.01	0.01	0.01	0.02
Num.Obs.	1517	1517	1517	1517	1517	1517
Navigational Integration						
(Intercept)	0.39***	0.33***	0.28***	0.39***	0.32***	0.28***
	(0.008)	(0.059)	(0.072)	(0.008)	(0.064)	(0.076)
Moved in	0.02	0.04	0.03	0.02	0.05	0.04
	(0.021)	(0.024)	(0.026)	(0.022)	(0.026)	(0.027)
R2 Adj.	0.00	0.02	0.01	0.00	0.02	0.02
Num.Obs.	1493	1493	1493	1493	1493	1493
Linguistic Integration						
(Intercept)	0.35***	0.26***	0.35***	0.34***	0.26***	0.36***
	(0.011)	(0.070)	(0.087)	(0.012)	(0.069)	(0.088)
Moved in	0.06	0.05	0.03	0.05	0.05	0.05
	(0.032)	(0.033)	(0.034)	(0.034)	(0.036)	(0.036)
R2 Adj.	0.00	0.22	0.28	0.00	0.20	0.26
Num.Obs.	1518	1518	1518	1518	1518	1518
Economic Integration						
(Intercept)	0.36***	0.32***	0.31***	0.36***	0.33***	0.31***
	(0.008)	(0.062)	(0.073)	(0.008)	(0.063)	(0.074)
Moved in	0.02	0.03	0.02	0.02	0.04	0.04
	(0.024)	(0.028)	(0.027)	(0.027)	(0.031)	(0.030)
R2 Adj.	0.00	0.03	0.13	0.00	0.03	0.15
Num.Obs.	1497	1497	1497	1497	1497	1497
Political Integration						
(Intercept)	0.35***	0.32***	0.13	0.34***	0.31***	0.16*
	(0.009)	(0.061)	(0.079)	(0.009)	(0.062)	(0.080)
Moved in	0.02	0.02	0.04	0.02	0.03	0.04
	(0.026)	(0.029)	(0.030)	(0.028)	(0.031)	(0.032)
R2 Adj.	0.00	0.05	0.06	0.00	0.04	0.05
Num.Obs.	1513	1513	1513	1513	1513	1513
Cragg-Donald F	645	491	476	645	491	476
Kleibergen-Paap F	484	359	338	481	357	332
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16: OLS Regression Estimates with Robust Standard Errors (Intent-to-Treat Analysis)

	(1)	(2)	(3)	(4)	(5)	(6)
IPL-12						
(Intercept)	0.37***	0.31***	0.20***	0.37***	0.30***	0.22***
	(0.008)	(0.036)	(0.053)	(0.009)	(0.038)	(0.058)
Matched	0.04***	0.04***	0.04***	0.04**	0.04***	0.05***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)
Female x Matched	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.015)	(0.014)	(0.015)	(0.016)	(0.016)	(0.016)
R2 Adj.	0.01	0.15	0.17	0.01	0.14	0.16
Num.Obs.	1501	1501	1501	1501	1501	1501
IPL-12						
(Intercept)	0.37***	0.32***	0.29***	0.36***	0.30***	0.30***
	(0.007)	(0.035)	(0.046)	(0.007)	(0.037)	(0.049)
Matched	0.04***	0.03***	0.03***	0.04***	0.04***	0.04***
	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)
Age>35 x Matched	-0.02	-0.01	-0.01	-0.02	-0.01	-0.01
	(0.014)	(0.013)	(0.013)	(0.015)	(0.014)	(0.014)
R2 Adj.	0.01	0.15	0.16	0.01	0.14	0.16
Num.Obs.	1501	1501	1501	1501	1501	1501
IPL-12						
(Intercept)	0.37***	0.32***	0.28***	0.37***	0.30***	0.29***
	(0.005)	(0.035)	(0.044)	(0.006)	(0.037)	(0.046)
Matched	0.03***	0.03**	0.03**	0.03**	0.03**	0.03***
	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)
Uni x Matched	0.01	0.01	0.01	0.01	0.01	0.01
	(0.015)	(0.014)	(0.014)	(0.016)	(0.015)	(0.015)
R2 Adj.	0.01	0.15	0.16	0.01	0.14	0.16
Num.Obs.	1501	1501	1501	1501	1501	1501
IPL-12						
(Intercept)	0.36***	0.31***	0.28***	0.36***	0.30***	0.28***
	(0.005)	(0.036)	(0.045)	(0.006)	(0.037)	(0.047)
Matched	0.04***	0.03***	0.04***	0.03***	0.03***	0.04***
	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)
Single x Matched	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02
	(0.015)	(0.014)	(0.015)	(0.016)	(0.016)	(0.016)
R2 Adj.	0.01	0.15	0.17	0.01	0.14	0.16
Num.Obs.	1501	1501	1501	1501	1501	1501
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.2 Intermediate Outcomes

Table 17: OLS Regression Estimates with Robust Standard Errors (Intent-to-Treat Analysis)

	(1)	(2)	(3)	(4)	(5)	(6)
Living with host						
(Intercept)	0.29***	0.09	0.50**	0.28***	0.12	0.55**
	(0.016)	(0.144)	(0.179)	(0.017)	(0.148)	(0.186)
Matched	0.33***	0.28***	0.28***	0.34***	0.28***	0.28***
	(0.026)	(0.029)	(0.030)	(0.028)	(0.032)	(0.032)
R2 Adj.	0.11	0.13	0.13	0.10	0.12	0.13
Num.Obs.	1360	1360	1360	1360	1360	1360
Living with refugees						
(Intercept)	0.27***	0.24*	0.09	0.27***	0.24	0.11
	(0.015)	(0.122)	(0.154)	(0.017)	(0.133)	(0.165)
Matched	-0.16***	-0.15***	-0.14***	-0.16***	-0.15***	-0.15***
	(0.021)	(0.023)	(0.024)	(0.022)	(0.025)	(0.026)
R2 Adj.	0.03	0.05	0.06	0.03	0.05	0.07
Num.Obs.	1360	1360	1360	1360	1360	1360
Total rent						
(Intercept)	0.69***	0.79	0.46	0.65***	1.16*	0.74
	(0.068)	(0.464)	(0.555)	(0.067)	(0.523)	(0.613)
Matched	-0.32***	-0.27**	-0.29**	-0.29**	-0.26*	-0.25*
	(0.090)	(0.099)	(0.104)	(0.089)	(0.101)	(0.105)
R2 Adj.	0.01	0.02	0.02	0.01	0.03	0.03
Num.Obs.	1281	1281	1281	1281	1281	1281
Monthly rent						
(Intercept)	87.65***	63.61	27.09	84.23***	124.54	42.43
	(7.985)	(73.567)	(70.176)	(8.502)	(73.930)	(76.247)
Matched	-30.63*	-25.08	-28.49*	-30.92*	-26.37	-25.25
	(13.206)	(15.010)	(13.130)	(12.292)	(14.416)	(13.902)
R2 Adj.	0.00	0.01	0.05	0.00	0.01	0.03
Num.Obs.	1214	1214	1214	1214	1214	1214
Number of month in accommodation						
(Intercept)	7.22***	8.66***	7.04***	7.09***	8.75***	7.29***
	(0.150)	(1.366)	(1.646)	(0.165)	(1.519)	(1.769)
Matched	-1.82***	-1.32***	-1.28***	-1.49***	-0.98***	-1.00***
	(0.232)	(0.250)	(0.253)	(0.264)	(0.281)	(0.276)
R2 Adj.	0.04	0.08	0.08	0.02	0.06	0.08
Num.Obs.	1297	1297	1297	1297	1297	1297
Private hosting						
(Intercept)	0.32***	0.16	0.34*	0.32***	0.15	0.34
	(0.015)	(0.133)	(0.168)	(0.016)	(0.139)	(0.177)
Matched	0.36***	0.34***	0.34***	0.35***	0.34***	0.33***
	(0.025)	(0.027)	(0.028)	(0.027)	(0.030)	(0.031)
R2 Adj.	0.12	0.13	0.13	0.11	0.11	0.12
Num.Obs.	1506	1506	1506	1506	1506	1506
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18: OLS Regression Estimates with Robust Standard Errors (Intent-to-Treat Analysis)

	(1)	(2)	(3)	(4)	(5)	(6)
AfD vote share						
(Intercept)	-0.01	0.48	0.50	-0.02	0.31	0.54
	(0.034)	(0.301)	(0.397)	(0.036)	(0.307)	(0.424)
Matched	0.03	0.06	0.08	0.03	0.05	0.07
	(0.059)	(0.063)	(0.062)	(0.059)	(0.063)	(0.064)
R2 Adj.	0.00	0.01	0.01	0.00	0.01	0.02
Num.Obs.	1279	1279	1279	1279	1279	1279
Unemployment						
(Intercept)	-0.04	0.68*	0.83*	-0.03	0.93**	1.07**
	(0.036)	(0.324)	(0.403)	(0.039)	(0.336)	(0.411)
Matched	0.11	0.07	0.06	0.11	0.06	0.06
	(0.057)	(0.062)	(0.062)	(0.061)	(0.065)	(0.065)
R2 Adj.	0.00	0.00	0.01	0.00	0.01	0.03
Num.Obs.	1273	1273	1273	1273	1273	1273
Population density						
(Intercept)	0.03	0.84**	0.87*	0.04	1.01**	0.95*
	(0.037)	(0.320)	(0.402)	(0.039)	(0.326)	(0.399)
Matched	-0.06	-0.10	-0.12	-0.07	-0.11	-0.12
	(0.057)	(0.059)	(0.060)	(0.062)	(0.063)	(0.064)
R2 Adj.	0.00	0.05	0.07	0.00	0.06	0.08
Num.Obs.	1273	1273	1273	1273	1273	1273
East Germany						
(Intercept)	0.09***	0.16	0.08	0.08***	0.13	0.08
	(0.010)	(0.093)	(0.117)	(0.010)	(0.092)	(0.120)
Matched	0.03	0.04	0.05*	0.03	0.03	0.04*
	(0.017)	(0.019)	(0.019)	(0.018)	(0.019)	(0.019)
R2 Adj.	0.00	0.02	0.04	0.00	0.02	0.04
Num.Obs.	1281	1281	1281	1281	1281	1281
City						
(Intercept)	0.85***	0.95***	0.95***	0.86***	1.00***	0.97***
	(0.013)	(0.108)	(0.140)	(0.013)	(0.102)	(0.141)
Matched	-0.01	-0.03	-0.03	-0.01	-0.04	-0.04
	(0.021)	(0.022)	(0.023)	(0.021)	(0.023)	(0.023)
R2 Adj.	0.00	0.02	0.01	0.00	0.02	0.02
Num.Obs.	1281	1281	1281	1281	1281	1281
Share immigrants						
(Intercept)	0.08*	0.07	0.23	0.08*	0.16	0.27
	(0.036)	(0.299)	(0.400)	(0.037)	(0.301)	(0.401)
Matched	-0.19***	-0.23***	-0.23***	-0.21***	-0.24***	-0.25***
	(0.057)	(0.061)	(0.063)	(0.058)	(0.063)	(0.064)
R2 Adj.	0.01	0.04	0.04	0.01	0.04	0.05
Num.Obs.	1266	1266	1266	1266	1266	1266
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4 Additional Analysis

4.1 Sensitivity Analysis

We conduct a formal sensitivity analysis following Cinelli and Hazlett (2020) to examine the sensitivity of our results to potential hidden bias from unobserved confounders. Essentially, this analysis asks how powerful an unobserved confounder would have to be, conditional on the observed covariates, in order to explain our effects. We focus on the ITT and the main model in which we regress the overall integration (IPL-12) on all covariates and include weights (reported in the last column of Table 9). The analysis reveals that an unobserved confounder would have to be unusually potent, conditional on our covariates, to explain the results we find. Only an unobserved confounder that explains more than 10.6% of the residual variance of both the treatment and the outcome in our regression would be strong enough to bring the point estimate to 0 ($RV = 10.6\%$). About half of the residual variation would be sufficient to bring the estimate to a range where it is no longer statistically different from 0 ($RV_{\alpha=0.05} = 5.7\%$).

Benchmarking against the observed main confounders, Figure 14 demonstrates that an unobserved confounder would have to be more than six times stronger than the strongest observed selection covariates (refugee reports speaking English or German). Taken together, these results suggest that our results are fairly robust to potential hidden bias. Given that we control for the covariates used by UU in the matching, it seems unreasonable that matched and unmatched refugees would still differ on such a powerful unobserved confounder needed to overturn our results.

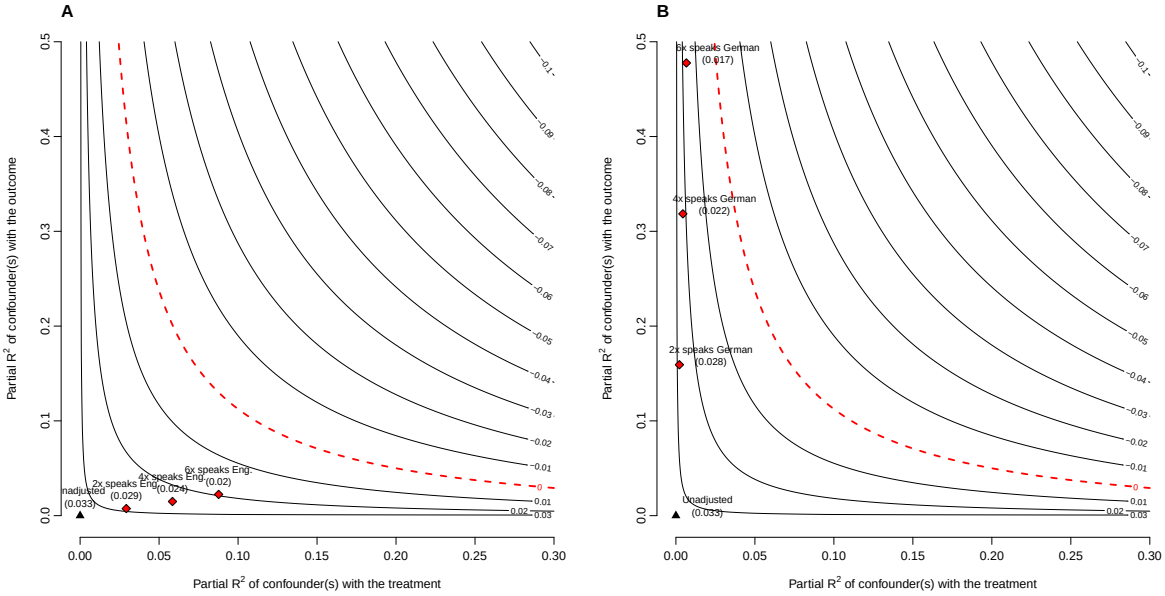

Figure 14: Sensitivity analysis to unobserved confounders following Cinelli and Hazlett (2020). Each contour line shows the departure effect we would have obtained in a regression that includes an unobserved confounder with a hypothetical strength. The strength of a confounder is a function of the residual variation of the outcome (x-axis) and the residual variation of the treatment (y-axis) explained by the hypothetical confounder. The adjusted estimates (in red) are based on adding a confounder that is 2, 4, or 6 times as strong as the covariates measuring reported language ability (Panel A: speaking English, Panel B: speaking German).

4.2 Double/Debiased Machine Learning Analysis

One concern with our analysis might be that our estimators rely on linear functional form assumptions which could introduce bias even if our identifying assumption holds. To assess the robustness of the

main estimates to a more flexible modeling approach, we use double/debiased machine learning models (DDML) (Chernozhukov et al., 2018) in combination with stacking regression (Wolpert, 1992).

In particular, we estimate the ITT and the LATE using interactive models that allow for interactions between the covariates and the treatment and instrumental variable. The interactive model takes the following form:

$$Y = g_0(Z, \mathbf{X}) + U, \tag{2}$$

where Y is the outcome measuring integration, Z is the binary matching indicator, $\mathbf{X}$ is matrix of covariates and U are unobservables. The ITT is defined as

$$ITT = E[g_0(1, \mathbf{X}) - g_0(0, \mathbf{X})]. \tag{3}$$

To estimate the LATE, we replace the matching indicator with the realized treatment indicator (D) in equation 2 and estimate:

$$LATE = E[g_0(1, \mathbf{X}) - g_0(0, \mathbf{X}) | p_0(1, \mathbf{X}) > p_0(0, \mathbf{X})], \tag{4}$$

where $p_0(Z, \mathbf{X}) = P(D|\mathbf{X}, Z)$.

DDML estimates the ITT and LATE by learning a series of conditional expectations using machine learning methods and cross-fitting. For details, refer to Chernozhukov et al. (2018).

Instead of selecting one particular machine learning method, we combine predictions from regularized linear regression and random forest using stacking regressions. Stacking regression involves combining a set of base learners using a final learner, taking a weighted average across the predictions of the base learners with weights learned from the data.

Our base learners include lasso and ridge regression (with penalty chosen by cross-validation), as well as random forest (using defaults). To combine the predictions, we use constrained least squares, forcing the stacking weights to be non-negative and sum to one.

The base learners encompass main covariates (from the registration), additional covariates (from the survey), additional continuous covariates from the registration (such as number of beds, estimated duration in weeks, number of adult males, females, children, and diverse persons, number of languages spoken, number of match-maker counts), and features of the open-ended text messages (message length, indicators for inclusion of names, phone numbers, addresses, emails, birthdays, links, and personal information). Summary statistics for these variables are provided in Table 4.

We utilize the Stata ado "ddml" (Ahrens et al., 2023) and "pystacked" (Ahrens et al., 2022) for the estimation, with the latter relying on the "scikit-learn" Python library (Pedregosa et al., 2011). We use 5 folds and 5 re-samples for the cross-fitting.

The estimates for the ITT and the LATE (with heteroskedasticity robust standard errors) are displayed in Table 19. The coefficient pattern is identical to that observed using simple OLS and 2SLS estimators. However, the magnitude of the estimates is slightly different, and the standard errors tend to be larger. For example, the ITT for the IPL-12 is 0.02 using DDML compared to 0.03 using OLS. However, the estimates for the LATE for the IPL-12 are elevated (0.06 using DDML and 0.06-0.07 using 2SLS). One notable finding is that the ITT for psychological integration is statistically insignificant, but the point is similar to the ITT based on OLS. However, the LATE for psychological integration retains statistical significance in the DDML models.

Table 19: Interactive Linear Double Debiased Machine Learning estimates with robust standard errors. .

	(1) IPL-12	(2) IPL-12 ex. Soc.	(3) Soc.	(4) Psy.	(5) Nav.	(6) Lin.	(7) Eco.	(8) Pol.
ITT								
Machted	0.02**	0.02*	0.06***	0.03	0.00	0.01	0.00	0.01
	(0.009)	(0.010)	(0.013)	(0.017)	(0.019)	(0.020)	(0.013)	(0.025)
Num. obs	1501	1503	1577	1675	1646	1572	1559	1558
LATE								
Machted	0.08***	0.06**	0.22***	0.13**	0.05	0.02	0.06	-0.03
	(0.018)	(0.019)	(0.029)	(0.047)	(0.029)	(0.034)	(0.033)	(0.029)
Num. obs	1461	1463	1516	1517	1493	1518	1497	1513

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.3 Attrition and Item Non-Response

Our main analysis sample includes everyone that arrived in Germany in or after January 2022 and remained in Germany up until the survey day (N=1,700). It could be that our main estimates are contaminated by selection bias, if their matching status increases their probability to arrive or leave in Germany. Table 20 provides evidence that this is unlikely to be an empirical concern as the rate of arrival and departure is not different between matched and unmatched refugees.

Another concern might be that not all respondents complete the survey and/or decide to not respond to some of the survey items. While only 1.5% of the respondents have not answered the question related to psychological integration, the share is notable higher when it comes to economic economic and political integration (8.3% and 8.4%), see Table 3. However, when we regress indicators of non-response for each of the six indicators of integration, we find no evidence of differential response propensities between matched and unmatched refugees (see Table 21).

Table 20: OLS Regression Estimates with Robust Standard Errors (Intent-to-Treat Analysis)

	(1)	(2)	(3)	(4)	(5)	(6)
Arrived in Germany						
(Intercept)	0.71***	0.82***	1.01***	0.71***	0.84***	1.03***
	(0.011)	(0.100)	(0.080)	(0.012)	(0.110)	(0.087)
Matched	0.05**	0.03	0.01	0.05**	0.04	0.01
	(0.017)	(0.019)	(0.013)	(0.019)	(0.020)	(0.014)
R2 Adj.	0.00	0.04	0.57	0.00	0.04	0.57
Num.Obs.	2764	2764	2764	2764	2764	2764
Remained in Germany						
(Intercept)	0.86***	0.79***	0.96***	0.85***	0.80***	0.95***
	(0.010)	(0.096)	(0.060)	(0.011)	(0.097)	(0.066)
Matched	0.01	0.00	-0.01	0.02	0.01	-0.01
	(0.016)	(0.017)	(0.009)	(0.017)	(0.018)	(0.009)
R2 Adj.	0.00	0.03	0.75	0.00	0.03	0.75
Num.Obs.	1970	1970	1970	1970	1970	1970
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 21: OLS Regression Estimates with Robust Standard Errors (Intent-to-Treat Analysis)

	(1)	(2)	(3)	(4)	(5)	(6)
Missing value: Social Integration						
(Intercept)	0.08***	0.00	-0.08	0.08***	-0.03	-0.09
	(0.008)	(0.060)	(0.067)	(0.009)	(0.055)	(0.069)
Matched	-0.01	-0.01	0.02	-0.01	-0.02	0.01
	(0.013)	(0.015)	(0.012)	(0.013)	(0.015)	(0.013)
R2 Adj.	0.00	-0.01	0.31	0.00	0.00	0.28
Num.Obs.	1700	1700	1700	1700	1700	1700
Missing value: Psychological Integration						
(Intercept)	0.02***	0.02	0.01	0.01***	0.02	0.01
	(0.004)	(0.029)	(0.031)	(0.004)	(0.026)	(0.029)
Matched	-0.01	-0.01	0.00	0.00	-0.01	0.00
	(0.006)	(0.007)	(0.006)	(0.005)	(0.006)	(0.006)
R2 Adj.	0.00	-0.01	0.22	0.00	0.00	0.20
Num.Obs.	1700	1700	1700	1700	1700	1700
Missing value: Navigational Integration						
(Intercept)	0.03***	0.03	0.02	0.03***	0.01	0.02
	(0.005)	(0.042)	(0.054)	(0.006)	(0.038)	(0.055)
Matched	0.00	0.00	0.01	0.00	0.00	0.01
	(0.009)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)
R2 Adj.	0.00	-0.01	0.17	0.00	-0.01	0.15
Num.Obs.	1700	1700	1700	1700	1700	1700
Missing value: Linguistic Integration						
(Intercept)	0.08***	0.02	-0.08	0.08***	0.00	-0.09
	(0.008)	(0.063)	(0.063)	(0.009)	(0.062)	(0.067)
Matched	-0.02	-0.02	0.01	-0.02	-0.03	0.00
	(0.013)	(0.015)	(0.012)	(0.013)	(0.016)	(0.013)
R2 Adj.	0.00	-0.01	0.33	0.00	0.00	0.31
Num.Obs.	1700	1700	1700	1700	1700	1700
Missing value: Economic Integration						
(Intercept)	0.09***	0.09	-0.02	0.09***	0.03	-0.04
	(0.009)	(0.067)	(0.072)	(0.009)	(0.061)	(0.072)
Matched	-0.01	-0.02	0.01	-0.02	-0.03	0.00
	(0.014)	(0.016)	(0.013)	(0.014)	(0.017)	(0.015)
R2 Adj.	0.00	-0.01	0.28	0.00	0.00	0.26
Num.Obs.	1700	1700	1700	1700	1700	1700
Missing value: Political Integration						
(Intercept)	0.09***	0.00	-0.08	0.09***	-0.01	-0.08
	(0.009)	(0.066)	(0.074)	(0.009)	(0.067)	(0.079)
Matched	-0.01	-0.02	0.02	-0.02	-0.03	0.01
	(0.014)	(0.016)	(0.013)	(0.014)	(0.016)	(0.013)
R2 Adj.	0.00	-0.01	0.33	0.00	0.00	0.31
Num.Obs.	1700	1700	1700	1700	1700	1700
Main covs.	No	Yes	Yes	No	Yes	Yes
Add. covs.	No	No	Yes	No	No	Yes
Weights	No	No	No	Yes	Yes	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.4 Negative Experiences Among Refugees in Private Hosting Settings

The survey asked respondents to rate their experience in the private hosting accommodation and, if applicable, with their host on a scale from one ("very bad") to ten ("very good"). Only 11 of the 423 respondents who lived in a UU accommodation and answered these questions rated either the experience with their hosts or with their accommodation as a one, and only 12 additional respondents gave a rating worse than five. This positive picture is not driven by non-response bias, as only seven respondents did not answer at least one of these questions. The survey also offered respondents the opportunity to use a free-text field to provide further information on their experiences. While we find six mentions of negative experiences like coercion into housework, accusations of theft, or disagreements over rent, these mentions are rare, and none of the messages indicate experiences of violence or similar by the host. While these data provide a favorable depiction of most refugees' experiences with their hosts, it remains a crucial question for further research how best to regulate hosting programs and protect refugees and hosts alike.

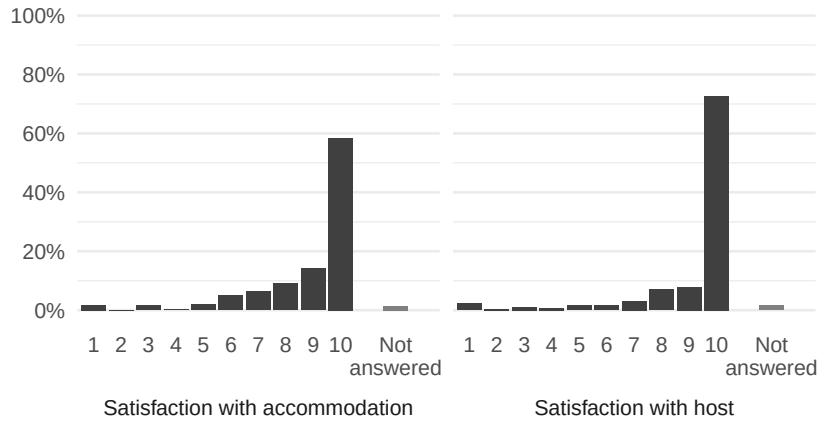

Figure 15: Ratings of Hosts and Accommodations by Survey Respondents Living in UU Accommodations (Weighted Data, N = 430)

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