

Child Care for Refugee Families: Effects on Employment, Well-Being and Integration

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Abstract

This study examines the impact of child care services on the employment, well-being and integration progress of Ukrainian refugee families in Germany. The analysis uses a new, large and representative panel data set (IAB-BiB/FReDA-BAMF-SOEP Survey) of refugees arriving in Germany after the Russian invasion in Ukraine. Our empirical approach exploits regional differences in child care availability and the age of the youngest child that generate exogenous variation in children's access to child care. Our results reveal very strong effects of child care for refugee families on their participation in language classes, employment and work intentions, as well as their time with Germans. Placebo checks using mothers with older children support a causal interpretation of our findings. Our study highlights the importance of investing in child care services to facilitate the integration of refugee mothers into the labor market and society.

Keywords: Child Care, Refugees, Forced Migration, Integration

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1. Introduction

The Russian aggression against Ukraine has caused the largest displacement of people in Europe since the end of World War II. As of December 2022, 7.9 million sought refuge abroad (UNHCR, 2023). Among the countries of the European Union, Germany emerged as the second most important destination country for Ukrainian refugees, with approximately one million individuals settling there. This refugee population disproportionately includes women and children, making access to childcare and education services a pressing policy priority. The effects of early education and care services on maternal employment has been a long-standing theme in the economic literature, which has documented the effects on children's development and on mothers' labour market outcomes. However, evidence on refugee populations is scarce, so little is known about the potential of early childhood education and care in supporting mothers' employment, integration and well-being in the context of forced migration.

There are a number of reasons why we should expect childcare to affect refugee mother's employment, social integration and well-being. The main direct effect of childcare provision is that it frees up time by alleviating childcare responsibilities. Mothers can thus engage in paid work, with the opportunity costs of doing so depending on wages and the costs of childcare. Time freed up by childcare provision can also be invested in activities that enhance mothers' employment or employability in the host labour market. In the context of migration, skills acquisition (Becker, 1993) often entails participating in language and integration courses. But time is also crucial to gain some orientation in a unfamiliar labour market, and specifically to search for jobs that are a good fit with mothers' skills, ultimately increasing their productivity (Diamond, 2011). Besides the direct effect of time, childcare provision can support maternal employment and integration in indirect ways. Childcare services help creates bridging ties, providing the opportunity to meet other families. With a child enrolled in childcare, mothers are also likely to become more familiar with the host country culture and customs and develop a sense of community (Borjas, 1995). Finally, the provision of child care can reduce refugee mothers' stress by easing caring demands placed on them. Better mental health is a critical component of individual well-being (Stiglitz et al., 2009).

Our study estimates the causal effects of child care services to the integration of Ukrainian refugee families during their first year in Germany. Our analysis draws on a

unique, representative panel data set of Ukrainian refugees arriving in Germany following the Russian invasion, the IAB-BiB/FReDA-BAMF-SOEP Survey of Ukrainian refugees (Brücker et al., 2023). The empirical approach is based on evidence that Ukrainian refugees relied on personal networks to find accommodation and moved to areas where Ukrainians were already settled, with little regard to other local economic or social factors. The resulting geographic dispersion creates substantial regional differences in the availability of early education and care services, which also varies by child's age, with considerably fewer places for children younger than three. We exploit these geographical variations and variations in the age of the youngest child in a family and use an instrumental variable (IV) strategy to estimate the effects of early education and care services on mothers' employment-related behaviour, social integration and well-being.

Our results reveal a strong, significant effect of regional child care availability on children's child care attendance. A higher availability increases the take-up with an elasticity of about 0.4 percentage points higher attendance for each percentage point more availability. In a second step, we find that child care attendance of children, triggered through a higher regional availability, effectively increases refugee mothers' participation in language classes, their activities in the labour market or in education, as well as their endeavour to search for a job. We also find positive effects on the time refugees spend with Germans. By contrast, early education and care do not appear to have any impact on mothers' well-being or their feeling welcome.

We test the validity of our instrument and the robustness of our results in a number of ways. We extensively investigate the residential choices of our sample of mothers, and find no indication that they selectively moved into areas with higher availability of services of preschool children. Moreover, when restricting the analytical sample to those mothers subject to dispersal policy, results remain similar. To rule out that the availability early education and care services does not reflect unobserved characteristics of the local context that support Ukrainian refugees' integration, we conduct a placebo test on mothers of older children who do not directly benefit from this type of service and find no effect.

Our paper contributes to at least three different strands of the literature. First, we add to the small literature on the consequences of forced migration (Becker and Ferrara, 2019). It is now widely recognized that those fleeing war and persecution have poorer integration

outcomes than other migrants. They often have little or no time to prepare for migration and have higher exposure to traumatic events, worse mental and physical health, and more limited social networks than other migrants in the same destination countries (e.g. Brell et al., 2020, Dustmann et al., 2017, Kosyakova and Kogan, 2022). While refugees tend to be among the most vulnerable migrants, their characteristics and especially their demographic composition varies substantially depending on the events and circumstances triggering their migration. In the case of Ukrainian refugees, the general mobilization in Ukraine and the travel ban for men of military age have resulted in a refugee population that is made primarily of women, children and adolescents. It is therefore a population that is not comparable to that of Syrians refugees who arrived in Germany in 2015 and 2016, who included only a small minority of refugees separated from other nuclear family members (Gambaro et al., 2018). For Ukrainian mothers, whose majority is living in Germany without a partner, childcare services are likely to be especially crucial (Brücker et al., 2022) (OECD, 2023). Our paper provides new empirical evidence supporting this hypothesis, enriching our knowledge on the specific challenges faced by different groups of refugees.

Second, we offer new findings on the role of child care for the integration of migrant families, contributing to the literature on conditions in the host country that can favor successful integration of migrants. While a substantial body of research studied the effects of child care on migrant *children*, little attention has been dedicated to the benefits of child care for migrant *parents*. Exceptions are two studies, one for migrant families in Norway (Drange and Telle, 2015) and one on refugees in Germany (Gambaro et al., 2021). Drange and Telle (2015) find no effects of immigrant children’s child care attendance on their parents’ integration, measured by employment and education. By contrast, Gambaro et al. (2021) find that childcare improves mothers’, but not fathers’, outlook towards their own integration. Given that the evidence is still fairly small and that the composition of migrants, including refugees, groups is highly varied, novel findings based on causal identification strategies can help understand the potential role of early childhood education and care services for migrant families. Evidence on who benefits can also guide policies that design access, regulation and funding of these services.

Third, our study contributes novel empirical evidence on the societal returns from public investments in child care services. Research has firmly established that early

educational investments have a significant impact on various dimensions, including the labor market participation of mothers (e.g. Baker et al., 2008, Bauernschuster and Schlotter, 2015, Müller and Wrohlich, 2020), and children’s developmental outcomes (e.g. van Huizen and Plantenga, 2018, Cornelissen et al., 2018, Felfe and Lalive, 2018, Gupta et al., 2023). Yet, the specific role and implications of child care services for refugee families remain under-researched. The potential benefits pertaining to the social integration and labor market participation of refugees add an unexplored facet to the cost-effectiveness analyses of public investments in child care.

Our findings underscore that the provision of child care services is instrumental for the labour market participation of refugee mothers with young children. It enables them to acquire necessary skills for workforce participation in the host country and facilitates their labor market engagement. The uptake of child care services among this group is considerably high, and the lack of such services emerges as a primary barrier to participation in integration classes and in the labor market.

The remainder of the paper is organized as follows. Section 2 describes the political and institutional background for the set-up of our study. In Section 3, we describe the novel Survey of Ukrainian refugees and our main analysis sample. Section 4 outlines the empirical approach. We summarize the main results in Section 5 and conclude in Section 6.

2. Background

2.1. Ukrainians in Germany

The institutional framework for the reception of Ukrainian refugees in Germany as in the rest of Europe differs fundamentally from that of previous refugees. The European Union (EU) “Temporary Protection Directive” (2001/55/EC) has provided immediate legal security by waiving the asylum procedure and issuing a temporary residence permit, initially set until 5 March 2024 and currently extended for an additional year. This legal framework has allowed faster employment and integration opportunities. Moreover, unlike other refugees, Ukrainians in Germany were not required to initially stay in reception facilities and were not generally subject to dispersion policies, which were implemented at a later stage and limited to those who require housing support. Finally, Ukrainian refugees were integrated into the basic security system under the Code of Social Law

II instead of the Asylum Seekers Benefits Act, which resulted higher benefit rates and immediate integration into the support structure of the job centers as well as access to language classes. In short, the institutional framework regulating residency and access to welfare has been distinctively generous in the case of Ukrainian refugees compared to previous groups, raising the need to document the specific experience of Ukrainian refugees.

Historically, Ukrainian migration to Germany has been substantial well before the Russian invasion. During the wartime periods of World War I and World War II, many Ukrainians came to Germany as forced laborers or prisoners of war, with some settling in Germany after the war ended. Also during the late Soviet period (1980s) and independence (1991), many Ukrainians left the country due to political and economic problems. In the late 1990s to mid-2000s, Germany experienced a wave of immigration of Ukrainian women, mainly working in the care and domestic sectors. Russia's annexation of Crimea and the conflict in eastern Ukraine has led to another wave of immigration since 2014. Visa-free entry to Germany and the Schengen area has been in place since 2017, and the unstable economic and security situation have prompted a continuous flow since.

2.2. Child care in Germany

Child care services in Germany are accessible through a universally available and highly subsidized system (e.g. Spiess, 2008). These services are commonly provided in centres, which are run by either the local government or non-profit organizations, and serve children across different age groups, from infants to pre-schoolers. Since 1996, children from the age of three until their enrolment in primary school, typically the summer after they turn six, have had a legal right to a place in a child care centre. This legal provision was expanded in 2013 to include children aged one and two¹. Ukrainian families with habitual residence in Germany have the same legal right for a child care slot as other German citizens. In 2022, 35.5% of children under three and 91.7% of children aged three and above were attending child care services (Statistisches Bundesamt, 2022).

There are significant regional differences in attendance rates, most prominently between Eastern and Western states, and even among lower administrative jurisdictions – "counties" – within the same federal state. While the federal government maintains leg-

¹§ 24 Social Code (SGB) - Eighth Book (VIII)

islative authority, the actual responsibility for financing, regulating, and organizing child care provision is managed by states and counties. This leads to substantial geographical variations in the availability of places, admission criteria, fees charged, and quality regulation measures such as child-to-caregiver ratios (Stahl et al., 2018).

Fees are generally low and typically determined by family income and the number of children in care (Schmitz et al., 2023). However, the precise fee scales and waivers for specific groups vary locally. Provision itself is guided by the subsidiarity principle, whereby the local administration provides direct service only where no other non-governmental organization is available. The enrolment process also varies locally, with individual centres managing their admissions without local administrative oversight.²

This highly decentralized framework of child care governance with varying degrees of child care availability creates considerable geographical differences in families' ability to secure a place. Ukrainian refugees children have the same entitlement to a place as other resident children, but the practical hurdles of obtaining one are likely to depend on the local service infrastructure, and on the availability of places in particular. In order to meet childcare demand by Ukrainian families, some federal states have granted to temporarily exceed the upper limit of child care slots. Others have created additional slots through "slot sharing" or an increased endeavour to raise the the number of child care teachers. For those who could not immediately secure a child care slot, alternative forms of care such as playgroups, bridge projects, and parent-child groups were initiated.

To understand the likelihood that Ukrainian mothers will take up available early childhood education and care places, it is also useful to briefly outline the early childhood education and care infrastructure in Ukraine. In Ukraine services are organised into a two-tier system, with nurseries and nursery-kindergartens catering for children between 2 months and 3 years, and kindergartens and school-kindergartens for children up to age 6 or 7, when they enter school (Schreyer and Oberhuemer, 2017, Zharova, 2023). All children are entitled to a place, but attendance rates are lower than in Germany. According to the Ministry of Education and Science of Ukraine, about 1.3 million children attended some form of child care before the war, resulting in a coverage rate of about 65% of all

²Regarding child care costs, there are no differences and special regulations for refugee families (§ 16 ff KitaG); the contributions are based on § 17 ff. KitaG and § 90 SGB VIII. All children in the last child care year before starting school are exempt from contributions (§ 17 ff KitaG).

children of the corresponding age. Estimates reported by a recent EU-funded report are lower, indicating an attendance rate of around 30% for 3-4 year olds, and slightly lower for all other age groups.

3. Data

The basis of our study is the IAB-BiB/FReDA-BAMF-SOEP Survey on Ukrainian Refugees in Germany, a representative panel survey conducted by the Institute for Employment Research (IAB), the Federal Institute for Population Research (BiB), the Research Centre of the Federal Office for Migration and Refugees (BAMF-FZ), and the Socio-Economic Panel (SOEP) at the German Institute for Economic Research (DIW Berlin) (for more information, see Brücker et al., 2023). The aim of the survey is to investigate the institutional and legal frameworks of refugee resettlement in Germany, and their integration in society. It is worth noting that data sources on Ukrainian refugees are largely limited, often not representative, and typically comprise small sample sizes.³

The IAB-BiB/FReDA-BAMF-SOEP Survey on Ukrainian Refugees in Germany has been conducted using a random selection of Ukrainian nationals who arrived in Germany between the commencement of the Russian aggression on February 24, 2022, and the early days of June 2022.⁴ As the initial step, a total of 100 cities and counties spread across the 16 German federal states were randomly selected (see Appendix Figure A.3). In a second step, a gross sample comprising of 48,000 Ukrainian nationals aged between 18 and 70 years who registered in Germany for the first time post-February 24, 2022 was drawn.⁵ The first wave of the panel survey was completed by a total of 11,763 individuals and was conducted between August 25 and October 4, 2022. The data also comprises a second wave with interviews being conducted between January 16 and March 6, 2023.

The questionnaires covered a variety of topics, which included questions on the edu-

³Previous research has largely depended on convenience samples collected at registration or support centers in the host countries (European Union Agency for Fundamental Rights, 2023, Kohlenberger et al., 2022, Pedziwiatr et al., 2022), surveys conducted online through social media or other mediums (e.g. Panchenko, 2022, Pötzschke et al., 2022), or qualitative interviews (Kjeøy and Tyldum, 2022).

⁴The procedure for sampling was grounded in two German administrative registers in Germany, namely, the population register (*Einwohnermelderegister*) and the Central Register of Foreigners (*Ausländerzentralregister*). The use of both registers enabled the generation of a high-quality sampling base.

⁵The survey’s methodology combined a push-to-web mixed-mode design that capitalized on the merits of postal recruitment and online surveys.

cational background, employment status, individual financial condition both in Ukraine and Germany, engagement in integration activities, family circumstances and social interactions, housing arrangements, needs, and the intention to stay in Germany. Our main outcome variables are whether mothers attend language classes, are working or in education, whether they are actively looking for job, intend to work, intend to stay in Germany, how much time they spend with Germans, whether they feel welcome and their life satisfaction.

We focus on mothers with at least one child who is six or younger in the household. Table 1 presents descriptive statistics of our main sample, consisting of 2300 observations of refugee mothers from two waves. We distinguish between families with a child in child care (955 families) and those without (1345 families).

On average, mothers are around 34.6 years old and 78% have tertiary education. From geographical perspectives, 8% are from West Ukraine, 37% from Central Ukraine, 15.4% from South Ukraine, and 39% from East Ukraine. Prior to coming to Germany, 82% were employed. Roughly a third of the sample (31%) entered Germany with their parents (grandparents to the children).

Regarding our outcome variables, 39% of families attended language classes, with a significantly higher percentage among those with a child in child care (52% vs. 31%). The trend is similar for other employment and integration related measures, such as working or being in education, actively looking for a job, and planning to work as soon as possible. Interestingly, a child in child care also correlates positively with the time spent with Germans (average score of 3.8 vs. 3.5 on a scale from 1 to 6).

When looking at the characteristics of the counties where the sample respondents live, the average population density is 0.19 thousand inhabitants per square kilometer, and the average GDP per capita is 56.56 thousand euros. Counties have an average unemployment rate of 7.4%, with a female employment rate of 56.6%. Education levels vary, with 12% having a lower secondary school degree, 40% a middle secondary school degree, and 43% an upper secondary school degree. The average child care ratio at the county level is 66%, which is significantly higher among families with a child in child care (77.4% vs. 59.7%).

The last column reports statistical differences between families with and without children in daycare. What stands out is that mothers with children in child care are

very similar to mothers with children not attending daycare. There are no differences by their region of origin, the partner’s status or their employment before coming to Germany, nor by the number of children in the household. Yet, mothers with children in child care entered the country less frequently with grandparents, spent 3.8 more days in Germany, are 0.4 years older and 8.2 percentage points more likely to hold a tertiary education degree. Despite these rather small differences in pre-determined characteristics, outcomes differ substantially between the groups. This points towards the potential role of child care in refugee families’ integration into their host society.

4. Empirical Approach

Our empirical analysis starts with the following ordinary least squares (OLS) regression:

$$y_{itc} = \beta_0 + \beta_1 Childcare_{itc} + X_i' \beta_2 + Z_c' \beta_3 + \rho_i + \lambda_t + \epsilon_{itc} \quad (1)$$

where y_{itc} is the outcome of interest for refugee i at time t in county c . $Childcare_{it}$ denotes the child care attendance of the youngest child in family i at time t . X_i represents a set of pre-determined individual control variables, including age and age squared, education, Ukraine region of origin, employment before coming to Germany, boarder entry with grandparents, time since arrival, location of the partner and number of children in Germany. To account for regional differences in labour market conditions and the social and economic environment, we include federal state fixed effects, ρ_i , as well as a set of county-level control variables, Z_c , which include population density, GDP per capita, the total fertility rate in 2020, population share with migration background, the unemployment rate, female employment rate, education of the population, share of the population below age 3 and age 6 and the log number of Ukrainians in 2021. λ_t are survey wave fixed effects. The error term, ϵ_{itc} , captures all other unexplained variation of the outcome variable.

However, child care attendance ($childcare_{it}$) may be endogenous due to omitted variables, selection bias, or simultaneity. For instance, families with higher motivation or socioeconomic status might be more likely to enrol their children to child care, and these same unobserved factors might also influence their social and labour market integration.

To address these concerns, we use an instrumental variable (IV) approach in a two-stage least squares (2SLS) framework. We instrument child care attendance with the

availability of child care services at the county level. The IV approach attempts to remove the endogeneity concerns by isolating the variation in $childcare_{it}$ that is purely due to the counties' child care availability for children of the specific ages.

Our first-stage regression is:

$$Childcare_{itc} = \gamma_0 + \gamma_1 CareShare_c + X_i' \gamma_2 + Z_c' \gamma_3 + \phi_i + \kappa_t + u_{itc} \quad (2)$$

Here, $CareShare_c$ denotes the child care availability in county c in 2021 before the influx of Ukrainian refugees for children of the specific age. X_i and Z_c refer to the individual and county level control variables, ϕ_i to federal state fixed effects, κ_t to survey wave fixed effects. The error term u_{it} captures idiosyncratic variation in the outcomes.

We then substitute the predicted values of $Childcare_{it}$ from eq. 2 into eq. 1 for the second-stage regression:

$$y_{itc} = \delta_0 + \delta_1 \widehat{Childcare}_{it} + X_i' \delta_2 + Z_c' \delta_3 + \theta_i + \mu_t \varepsilon_{itc} \quad (3)$$

The coefficient δ_1 is of main interest. To interpret the coefficient as the causal effect of child care on refugee mothers' outcomes, several assumptions have to be made. First, we need to assume that the availability of child care services at the county level for children of the given age ($CareShare_c$), is as good as random conditional on the set of control variables. This assumption could be violated if Ukrainian refugees with strong preferences for labour market integration choose to live in counties with more child care availability. The same characteristics determining care needs and location choice affect refugees' outcomes.

To assess this concern, it is important to understand the location choice of Ukrainian refugees. We collected register data on the number of Ukrainian refugees in each county in April 2023, more than one year after the Russian invasion. Their location choice within Germany is illustrated in Appendix Figure A.2, Panel A. When we compare the distribution to the presence of Ukrainians in Germany before the Russian invasion (Panel B), we already note a strong link. For a systematic analysis, we regress the number of refugees in a county on different county characteristics. Results are reported in Appendix Table A.1. Ukrainian refugees were more likely to settle in denser populated areas with a lower unemployment rate (column 1). When we include the number of Ukrainians in

the county in 2021 before the invasion (column 2), we can explain an additional 30% of the location of refugees. A 1% higher number of Ukrainians increases the number of refugees in the county by 0.6% (column 2). Most importantly, the location choice is not related to the availability of child care in the county. When we focus on the location of female refugees (column 3), or of refugee children below the age of 6 (column 4), the same patterns emerge: The county child care rate is unrelated to the location choice, but existing social networks and the presence of other Ukrainians are one of the most important factors to explain the location choice. We illustrate the strong link to the presence of similar foreigners in Appendix Figure A.1, Panel A. On the other side, there is no link between the number of refugees and the availability of child care in the county (Panels B and C).

Although the location choice is not related to the counties' availability of child care at the aggregate level, Ukrainians' individual characteristics could be related to the availability of child care. Those with a strong preference for child care might select into counties with a higher availability. Based on our main analysis sample, we take the county's child care ratio as the dependent variable and regress it on individual characteristics (Appendix Table A.2. We cannot find a link to individuals' age, marital status, education or time in Germany, nor with the number of children in the household (tested jointly), their employment status before coming to Germany, or to the region of origin in Ukraine that might relate to different norms toward maternal employment. Only women arriving with the grandparents in Germany live in counties with marginally less child care. What determines a higher availability of child care in the county is the population density, a higher GDP per capita, a lower migration background and a lower unemployment rate, but not the presence of Ukrainians in 2021 or refugees from Ukraine arriving after February 2022 (see Appendix Table A.3).

The second main assumption for a causal interpretation of the IV results is that the county child care availability is predictive for refugee children's child care attendance. Figure 1 shows that child care attendance of refugee children is higher in counties with a higher child care availability. We demonstrate a strong first stage with an F-statistic > 81 for our main estimates of eq. 2. Our results are robust to different sets of control variables, including models with individual and county controls, as well as a county fixed-effects model.

Finally, we need to assume that the availability of child care affects outcomes only through child care attendance. Yet, counties with a higher availability of child care might also provide better community services or stronger regional labor market conditions that might facilitate the integration of refugees. To address this concern, we conduct a falsification test by showing that child care availability does not affect outcomes for families with older children or refugees without children in the household.

Throughout the analysis, we cluster standard errors at the county level (96 clusters).

5. Results

5.1. Main Results

We first present OLS results on the correlation between child care attendance and mothers' outcomes in Table 2. Results for each outcome are presented in a separate row.

Column 1 presents the coefficient on child care from regressions federal state fixed effects and wave fixed effects, without further control variables. We find a significant positive correlation between child care attendance and language class attendance. When children attend child care, refugee mothers are also more likely to being employed or in education, actively looking for a job, planning to work as soon as possible, spending time with Germans, and feeling very welcome. However, mothers with children attending child care report similar levels of life satisfaction compared to mothers whose children do not attend child care.

The relationships mainly remain significant and of similar magnitude when individual and county controls are added to the OLS model (column 2). Only the link between child care attendance on mothers' work intentions turns insignificant. As other regional characteristics could be related to child care attendance and mothers' outcomes, we include county-fixed effects in column 3 to flexibly account for regional characteristics. Reassuringly, the results are very similar to the previous models, suggesting that regional sorting of refugees based on their child care preferences and outcomes is not biasing OLS results.

Yet, there might be other factors beyond the regional context that are related to child care and mothers' labour market and social integration. For example, women with a strong preference for labour market participation might be more willing to enrol the child in child care. To overcome concerns of endogeneity in the attendance of child care and concerns related to reversed causality, we use the availability of child care in the

county as an instrumental variable for child care attendance. Figure 1 demonstrates the strong link between individuals' child care attendance and the availability of child care in the county. Based on model 2, we use the county and age-specific availability of daycare to predict refugee children's attendance of daycare. Panel A of Table 3 shows that a one percentage points higher availability of child care in the county increases refugee's child care attendance by 0.4 percentage points. The F-statistic of the first stage is 81 and well above the critical value of 10 to circumvent problems related to weak instruments.

Panel B of Table 3 reports the second stage IV results. Attending day care has a significant and positive effect on participating in language classes, on working and being in education, on mothers' endeavour to look for a job and on their plan to start working soon and on the time they spend with Germans. Yet, child care has no impact on the general intention to work, probably because these intentions are already very high in the population. We also cannot find an effect on refugees' feeling welcome or on their life satisfaction.

The IV-results are much larger than the OLS results. We attribute this finding to the very high intentions of mothers to participate in the labour market. About 75% of mothers express their intention to work definitely. This number is higher than the number of children in care, pointing to severe excess demand for child care. Moreover, without other modes of external care, mothers depend on formal child care to participate in the labour market. The IV estimates identify a local average treatment effect (LATE) of compliers, i.e. of mothers that just receive access to childcare due to a higher regional availability. It suggests that effects on refugee mothers are particularly strong if they are admitted access to child care.

In summary, our results suggest that child care attendance has a positive impact on important measures of labour market and social integration of Ukrainian mothers, yet no effect on their well-being.

5.2. Robustness Checks

In Table 4, we show results to several robustness checks. One concern is that other regional characteristics but the child care availability might drive the effects on refugees. To address this concern, we include county fixed effects in our main model which for all general county characteristics. We draw identification from variation in the age of the child in the household and the variation in counties child care availability by child age.

We reach the same conclusions.

As another robustness check, we remove individuals from the sample located in Berlin and Hanover. These cities served as registration hubs and are prone to a misassignment of refugees place of residence if they haven't re-registered after relocation. While we drop about 10% of the sample, the results are almost identical.

In our main specification, we use the age-specific child care rate at the county as an instrument for child care attendance. However, it is possible that the availability of child care slots for older children might spill-over to the availability of slots for younger refugee children, or vice versa. In column (3), we use the age-specific child care rates at the county level, interacted with children's age, as multiple instruments, and draw the same conclusions.

Finally, we conduct a falsification test in which we relate outcomes for families with older children or refugees without children to the counties' child care availability (column 4). We cannot find any statistical link for women with older children or refugees without children in the household. Only the coefficient on "planing to work" is significant, but with the opposite sign. Therefore, we render it unlikely that other regional characteristics that are just correlated with child care availability are driving our results. This finding also supports the exclusion restriction, requiring the child care rate to affect outcomes only through its effect on children's child care attendance.

6. Conclusion

The forced migration of Ukrainians to Germany triggered by the Russian invasion has set in motion a series of changes with lasting impacts. Our study sheds light on the role of child care services in the integration and employment trajectories of refugee mothers in Germany, a population that has been disproportionately represented among Ukrainian refugees. Our analysis builds on a large and representative dataset drawn from the IAB-BiB/FReDA-BAMF-SOEP Survey of Ukrainian refugees.

We highlight that the demographic composition and legal framework of the Ukrainian refugee population in Germany is distinct from previous refugee influxes. This demographic shift coupled with the different legal status and benefits accorded to Ukrainian refugees creates a new scenario requiring a comprehensive understanding of the experiences of these refugees. Next to the recognition of qualifications, access to child care have

emerged as pivotal barriers to labour market integration, stressing the need for policy attention in these areas. Yet, we lack empirical evidence on the causal effects of child care availability on the employment, integration and well-being of refugees.

Based on the regional availability of child care, serving as an instrument for children's actual child care attendance, we find a significant effect of child care on mothers' participation in language classes, their employment and work intentions. We cannot find effects on intentions to stay in Germany or on their well-being which we attribute to the short time frame since arrival. Our findings supports the long-held view in the economic literature about the significant effects of child care services on mothers' labour market trajectories. Our findings suggest that investing in these services can effectively facilitate the integration of refugee mothers into the labour market and society.

Our work contributes to the growing literature on the long-term effects of forced migration due to wars and other crises, highlighting the unique experiences and potential benefits for migrant parents through child care, a subject that has so far received limited attention. Compared to prior research which focused on the counterfactual of not migrating, our study offers new insights by focusing on the environment in the host country that can facilitate the integration of refugees.

In conclusion, our study underscores the transformative potential of child care services in fostering successful integration in the labour market and society. The insights derived from this study inform policy-makers on the crucial role of accessible early education and care services.

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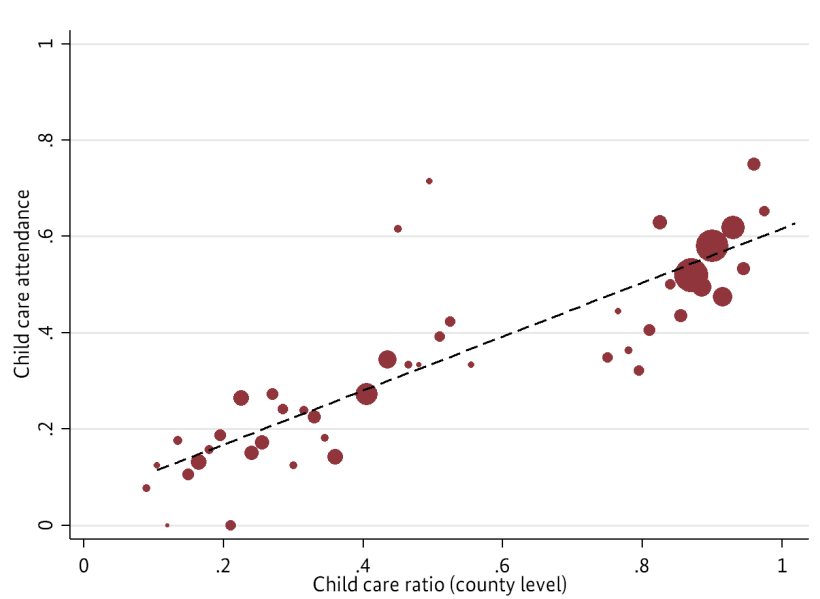
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Figures

Figure 1: Correlation between age-specific child care rates at county level and individual attendance



Note: binned means (bin width of 0,02) from 96 counties, size of dots corresponds to number of observations within bin, n = 2300

Source: IAB-BiB/FReDA-BAMF-SOEP survey, Destatis (2022), own calculation

Tables

Table 1: Descriptive statistics

	Overall	Child in child care		Diff
	mean	Yes	No	
	(1)	(2)	(3)	(2) - (3)
Outcomes				
Language class participation (%)	38.77	51.53	31.40	20.13***
Working or in education (%)	9.18	13.31	6.79	6.52***
Actively looking for job (%)	24.56	27.79	22.68	5.11*
Intention to work, definitely (%)	71.40	75.24	69.33	5.91**
Planing to work, as soon as possible (%)	16.91	23.24	13.50	9.74***
Intention to stay, for ever (%)	22.57	25.06	21.14	3.92
Time with Germans (never 1 - daily 6)	3.61	3.83	3.49	0.34***
Feeling very welcome	33.52	36.98	31.52	5.45*
Life satisfaction (0-10)	6.06	6.05	6.07	-0.02
Individual controls				
Age (years)	34.64	34.92	34.48	0.44
Tertiary education (%)	78.27	83.47	75.26	8.21***
From West Ukraine (%)	7.93	9.74	6.88	2.86
From Central Ukraine (%)	37.43	37.01	37.67	-0.66
From South Ukraine (%)	15.35	14.68	15.73	-1.05
From East Ukraine (%)	39.29	38.57	39.71	-1.14
Ever employed before coming to Germany (%)	82.18	81.94	82.31	-0.37
Boarder entry with grandparents (%)	31.02	27.32	33.16	-5.84**
Time since arrival (in days)	158.97	161.37	157.58	3.79
Partner in Germany (%)	35.02	35.32	34.84	0.48
Partner abroad (%)	48.16	50.61	46.74	3.87
No partner (%)	16.82	14.07	18.42	-4.35**
Number of children in Germany	1.73	1.72	1.73	-0.01
County level controls				
Population Density (1,000 inh./km ²)	0.19	0.18	0.19	-0.01*
GDP per capita (1,000 euro)	56.56	54.60	57.70	-3.1**
2020 fertility	1.45	1.44	1.46	-0.02*
Migration Background (%)	17.46	16.12	18.23	-2.11***
Unemployment rate (%)	7.36	7.28	7.41	-0.13
Female employment rate (%)	56.55	57.21	56.17	1.04***
Lower sec. school degree (%)	12.14	11.63	12.44	-0.81**
Middle sec. school degree (%)	39.87	39.30	40.19	-0.89
Upper sec. school degree (%)	42.65	43.83	41.96	1.87***
Share children below 3 (% of population)	2.92	2.91	2.93	-0.02
Share children3 to 6 (% of population)	5.80	5.79	5.80	-0.01
# Ukrainians in 2021 (log)	6.84	6.90	6.81	-0.09***
Instrumental variable				
Child care ratio (county level, %)	66.16	77.39	59.67	17.72***
Observations	2298	955	1343	2298

Notes: The sample includes all women with at least one child up to age 6. *Source:* IAB-BiB/FReDA-BAMF-SOEP; Federal Statistical Office and Central Register for Foreigners, own calculations.

Table 2: OLS results: correlation between child care attendance and outcomes

<i>Dep. var.</i>	(1)	(2)	(3)
Language class participation	0.200*** (0.027)	0.211*** (0.028)	0.201*** (0.029)
Working or in education	0.065*** (0.018)	0.049** (0.020)	0.054** (0.021)
Actively looking for job	0.052* (0.026)	0.056** (0.027)	0.053* (0.029)
Intention to work, definitely	0.059** (0.029)	0.045 (0.031)	0.041 (0.033)
Planing to work, as soon as possible	0.098*** (0.020)	0.109*** (0.020)	0.115*** (0.020)
Intention to stay, for ever	0.040 (0.025)	0.063** (0.026)	0.071** (0.029)
Time with Germans	0.339*** (0.111)	0.355*** (0.117)	0.350*** (0.117)
Feeling very welcome	0.056** (0.026)	0.072** (0.028)	0.090*** (0.030)
Life satisfaction	-0.020 (0.103)	0.020 (0.104)	0.083 (0.113)
ind. controls		✓	✓
county controls		✓	-
state FE		✓	-
county FE			✓
<i>Nbr. observations</i>	2300	2298	2298

Notes: The sample includes all women with a youngest child up to age 6. All regression control for wave fixed effects. For set of individual and regional controls see Table 1. Robust standard errors clustered at the county level in parathesis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: IAB-BiB/FReDA-BAMF-SOEP; Federal Statistical Office and Central Register for Foreigners, own calculations.

Table 3: IV results on the effect of child care on mothers' outcomes

	(1)	(2)	(3)
<i>Dep. var.</i>	b	se	N
Panel A: First-stage			
Child Care Attendance	0.407***	(0.045)	2298
F-stat first stage		81.01	
Panel B: Second-stage			
Language class participation	0.697***	(5.88)	2297
Working or in education	0.152**	(2.15)	2298
Actively looking for job	0.313***	(3.42)	2298
Intention to work, definitely	0.009	(0.08)	2089
Planing to work, as soon as possible	0.426***	(3.85)	2089
Intention to stay, for ever	-0.017	(-0.15)	2297
Time with Germans	1.143***	(3.03)	2298
Feeling very welcome	-0.042	(-0.33)	2298
Life satisfaction	0.239	(0.61)	2298

Notes: The sample includes all women with a youngest child up to age 6. All regression control for a rich set of individual and regional controls as well as wave and state fixed effects. For set of individual and regional controls see Table 1. Robust standard errors clustered at the county level in Column (2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: IAB-BiB/FReDA-BAMF-SOEP; Federal Statistical Office and Central Register for Foreigners, own calculations.

Table 4: Robustness checks of IV results

	(1)	(2)	(3)	(4)
<i>Dep. var.</i>	county FE	w/o Berlin & Hanover	child-care ratio both age groups	Placebo with older/no children
Language class participation	0.739*** (5.61)	0.671*** (5.63)	0.619*** (5.40)	-0.025 (-0.71)
Working or in education	0.185** (2.44)	0.174** (2.42)	0.139** (2.00)	-0.002 (-0.10)
Actively looking for job	0.319*** (3.20)	0.297*** (3.21)	0.284*** (3.02)	0.003 (0.13)
Intention to work, definitely	-0.0147 (-0.12)	0.005 (0.04)	0.00500 (0.04)	0.00345 (0.12)
Planing to work, as soon as possible	0.404*** (3.57)	0.429*** (3.66)	0.418*** (4.03)	-0.070*** (-2.86)
Intention to stay, for ever	0.012 (0.10)	0.019 (0.18)	0.006 (0.06)	-0.033 (-1.35)
Time with Germans	1.261*** (3.07)	1.051*** (2.79)	1.080*** (2.98)	-0.095 (-1.04)
Feeling very welcome	0.005 (0.04)	0.007 (0.06)	-0.060 (-0.49)	-0.021 (-0.83)
Life satisfaction	0.382 (0.93)	0.238 (0.59)	0.242 (0.63)	0.017 (0.13)
ind. controls	✓	✓	✓	✓
county controls		✓	✓	✓
state FE		✓	✓	✓
county FE	✓			
<i>Nbr. observations</i>	2298	1994	2298	6973

Notes: Column (2) runs specification 3 excluding observations in Berlin and Hanover. These cities served as the main reception hubs at first arrival. Column (3) uses child care rates at the county level of both age groups interacted with child' age. Column (4) shows reduced form coefficients based on a sample that includes all women without a child up to age 6. Age-group specific child care rates at county level are assigned randomly.

Source: IAB-BiB/FReDA-BAMF-SOEP; Federal Statistical Office and Central Register for Foreigners, own calculations.

Appendix

Table A.1: Where did Ukrainian refugees settle?

	<i>Dep. Variable: log # UKR refugees (April 2023) ...</i>			
	All		Females	Children below 6
	(1)	(2)	(3)	(4)
Day Care Attendance < age 3	-0.002 (0.005)	-0.004 (0.004)	-0.004 (0.004)	-0.004 (0.004)
Day Care Attendance ≥ age 3	0.001 (0.009)	-0.005 (0.006)	-0.005 (0.006)	-0.012 (0.007)
Population Density (1,000 inh./km ²)	3.552*** (0.944)	0.305 (0.595)	0.336 (0.591)	0.087 (0.696)
GDP per capita (1,000 euro)	0.000 (0.002)	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.001)
Migration Background (%)	0.008 (0.013)	-0.022*** (0.007)	-0.021*** (0.007)	-0.031*** (0.008)
Unemployment rate (%)	-0.125*** (0.023)	-0.068*** (0.018)	-0.068*** (0.018)	-0.071*** (0.020)
Female employment rate (%)	0.003 (0.011)	0.002 (0.007)	0.003 (0.007)	0.001 (0.007)
Lower sec. school degree (%)	-0.027 (0.017)	-0.005 (0.012)	-0.004 (0.012)	-0.004 (0.014)
Middle sec. school degree (%)	-0.024 (0.015)	-0.007 (0.011)	-0.008 (0.010)	-0.006 (0.012)
Upper sec. school degree (%)	-0.021 (0.014)	-0.012 (0.010)	-0.011 (0.010)	-0.013 (0.012)
# Ukrainians in 2021 (log)		0.599*** (0.030)	0.607*** (0.029)	0.554*** (0.031)
Adjusted R ²	0.51	0.81	0.82	0.75
N	388	388	388	388

Notes: OLS regressions based on county level. All models include federal state fixed effects. Standard errors clustered at county level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Federal Statistical Office and Central Register for Foreigners, own calculations.

Table A.2: How does county child care availability relate to individual characteristics?

	<i>Dep. var.: Share in Child Care ...</i>	
	Below Age 3 (1)	Age 3-6 (2)
Age	0.000 (0.000)	-0.000 (0.000)
Married (baseline: single)	0.001 (0.003)	0.003 (0.003)
Divorced	-0.003 (0.005)	0.003 (0.005)
Widowed	0.001 (0.015)	0.009 (0.013)
Tertiary education (baseline sec. educ or less)	0.004 (0.004)	0.004 (0.003)
Time in Germany	-0.000 (0.000)	-0.000 (0.000)
Arrived with grandparents	-0.008*** (0.003)	-0.008*** (0.002)
From West UKR (baseline: East)	-0.006 (0.005)	-0.001 (0.005)
From Central UKR	-0.001 (0.003)	-0.004 (0.003)
From South UKR	0.003 (0.003)	0.003 (0.003)
Ever employed before coming to Germany	0.002 (0.004)	-0.001 (0.003)
Two children (baseline: one child)	-0.001 (0.003)	-0.005** (0.002)
Three children	0.001 (0.005)	-0.003 (0.004)
More than three children	0.003 (0.007)	-0.003 (0.008)
N	2297	2297

Notes: OLS regressions include federal state fixed effects. Standard errors clustered at county level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: IAB-BiB/FReDA-BAMF-SOEP Survey, own calculations.

Table A.3: How does county child care availability depend on other county characteristics?

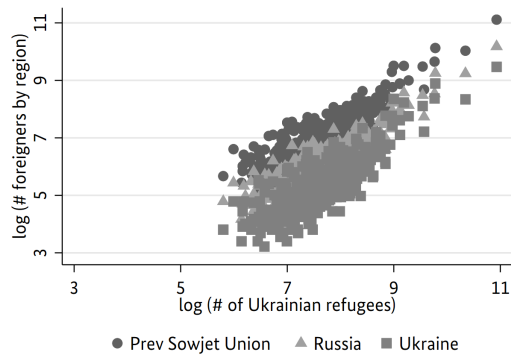
	<i>Dep. var.: Share in Child Care ...</i>	
	Below Age 3 (1)	Age 3-6 (2)
# UKR refugee children 0-5 (Apr 2023, log)	1.001 (1.612)	-0.932 (1.357)
# Ukrainians in 2021 (log)	0.010 (1.085)	1.066 (0.918)
Population Density (1,000 inh./km ²)	20.175* (11.012)	-0.230 (9.330)
GDP per capita (1,000 euro)	0.113*** (0.030)	0.063** (0.031)
Migration Background (%)	-0.796*** (0.193)	-0.498*** (0.150)
Unemployment rate (%)	-0.327 (0.424)	-0.923*** (0.305)
Female employment rate (%)	-0.033 (0.170)	0.037 (0.160)
Lower sec. school degree (%)	0.367 (0.517)	0.005 (0.400)
Middle sec. school degree (%)	0.347 (0.441)	0.133 (0.321)
Upper sec. school degree (%)	0.347 (0.415)	0.128 (0.302)
Adjusted R ²	0.85	0.56
N	97	97
Federal State FE (#16)	✓	✓

Notes: OLS regressions using counties in the Ukraine survey.

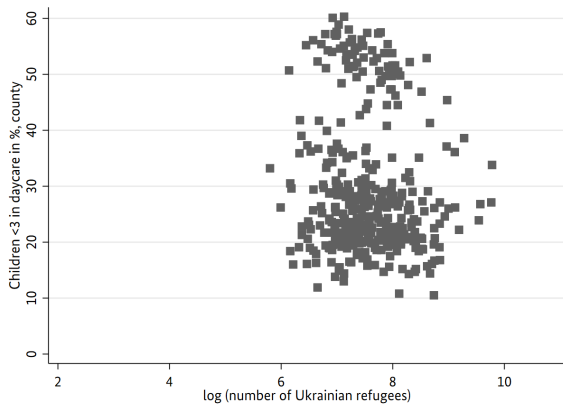
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Federal Statistical Office and Central Register for Foreigners, own calculations.

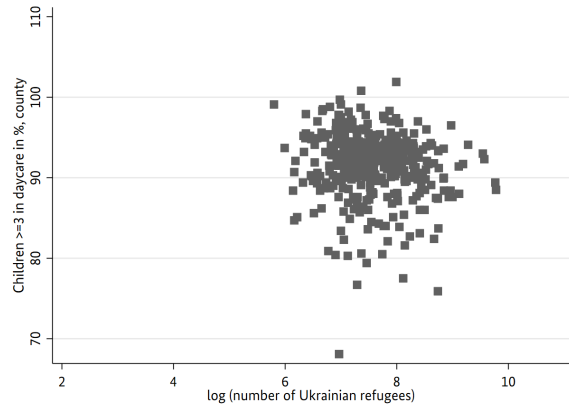
Figure A.1: Location choice of Ukrainian refugees



A: Previous foreigners by country of origin



B: Availability of child care below age 3

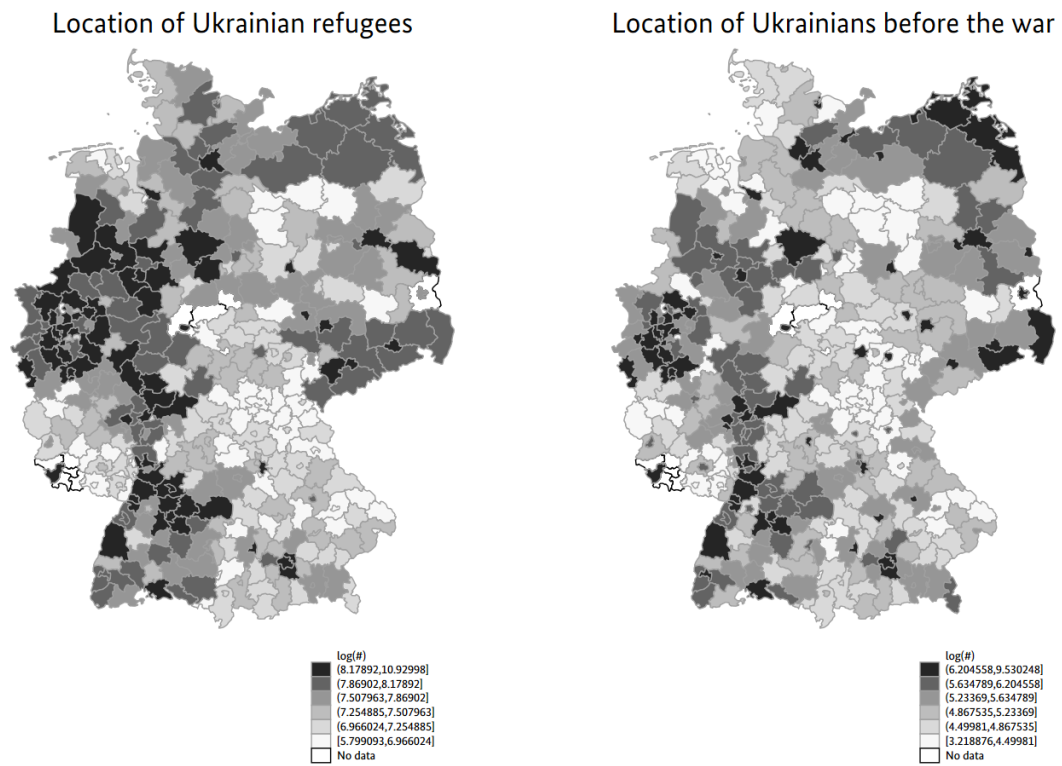


C: Availability of child care above age 3

Notes: The figures show scatter plots of the number of Ukrainian refugees by county and the number of Ukrainians in 2021 (Panel A), and the link between the number of Ukrainian refugees and the availability of child care for children below and above the age of three (Panels B and C).

Source: Federal Statistical Office and Central Register for Foreigners, own calculations.

Figure A.2: Location of Ukrainians across German counties



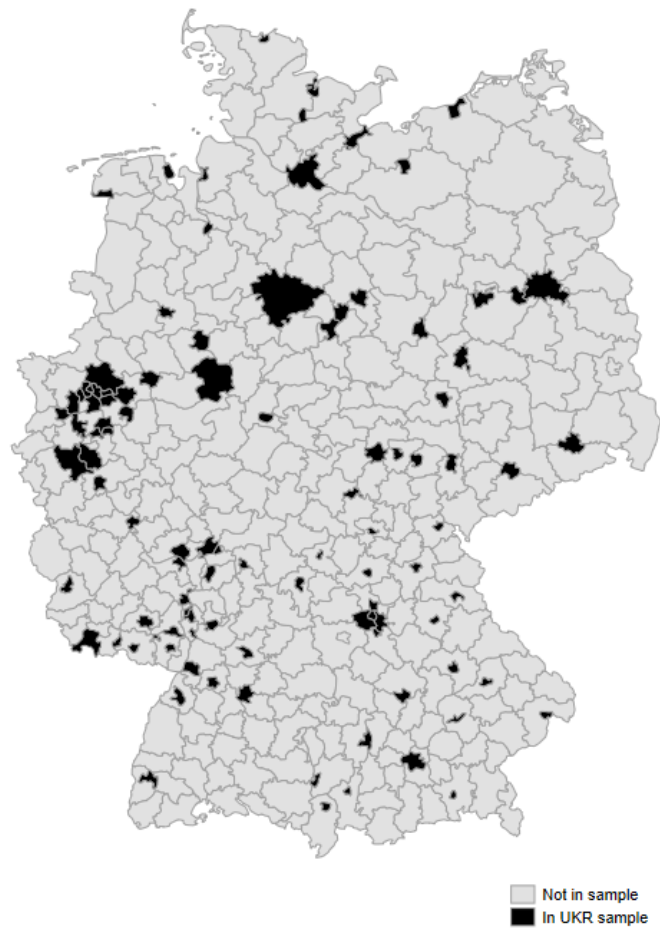
A: Ukrainian refugees in April 2023 (log number)

B: Ukrainians in 2021 (log number)

Notes: The maps plot the location of Ukrainians across German counties in April 2023 for refugees arriving after February 2022 (after the invasion, see Panel A) and in 2021 (Ukrainians arriving before the Russian invasion, Panel B).

Source: Federal Statistical Office and Central Register for Foreigners, own calculations.

Figure A.3: Counties in IAB-BiB/FReDA-BAMF-SOEP survey



Notes: The map plots the counties included in the IAB-BiB/FReDA-BAMF-SOEP survey.
Source: IAB-BiB/FReDA-BAMF-SOEP survey, own illustration.