

DISCUSSION PAPER SERIES

IZA DP No. 17181

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Childcare Services and Refugees'  
Integration, Employment and Well-Being**

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## ABSTRACT

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# Unlocking Potential: Childcare Services and Refugees' Integration, Employment and Well-Being\*

In armed conflicts, it is common for women, children, and the elderly to flee, leaving the men behind. While refugee women face particular challenges in caring for children in host countries, there is only limited evidence on the impact of childcare services on their integration. This paper examines the role of childcare services in the integration, employment, and well-being of refugee mothers. We focus on the displacement caused by the Russian invasion in Ukraine. Our analysis is based on a unique, large, and representative panel data set of Ukrainian refugees in Germany. We find a strong correlation between childcare attendance and the participation of refugee mothers in language courses, labour market activity, and social interaction. To establish causality, we leverage exogenous regional differences in childcare availability and excess demand. Our results reveal significant positive effects of childcare services on the participation of refugee mothers in language and integration programs, as well as employment and their interactions with Germans. However, we find no effects on maternal well-being. Our findings emphasize the importance of providing childcare services to refugee mothers to facilitate their integration.

**JEL Classification:** I26, J13, J15

**Keywords:** childcare services, refugees, forced migration, integration, employment, Ukraine

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## 1. Introduction

Refugees fleeing conflict zones have significantly impacted global demographics (e.g. UNHCR, 2023). This large-scale migration poses challenges for host countries and raises important questions about how to accommodate and support those seeking protection. The human services infrastructure of receiving countries—including healthcare, education, and social services—plays a crucial role in addressing these challenges. However, one area that has received limited attention in the context of refugees’ integration is the role of childcare services (Vandekerckhove and Aarssen, 2020, Tissot and Zimmer, 2021).

In many armed conflicts, women flee with their dependent children, leaving their partners behind. The lack of access to childcare services can create significant barriers to integration, preventing mothers from participating in language courses or entering the labour market in the host country. This might exacerbate several disadvantages that refugee women already face (e.g. Brücker et al., 2016, Brell et al., 2020), including worse mental or physical health, limited social networks, language barriers, and often being single parents. The extent to which childcare services can support these refugees is an important question in its own right, but it is also highly relevant for aging Western societies with a declining labour force that often accommodate refugees. However, there is very little empirical evidence on this question.

This paper studies the effects of providing childcare services to refugees, focusing on the displacement caused by the Russian invasion in Ukraine—the largest refugee stream in Europe since World War II. As of December 2022, 7.9 million people from Ukraine sought refuge abroad (UNHCR, 2023). Among the European Union countries, Germany has emerged as one of the most important destinations, accommodating over one million Ukrainian refugees. 47 % of the women have minor children with them, highlighting the relevance of considering integration processes through the lens of motherhood (Brücker et al., 2023b). While the economic literature has long documented the effects of childcare services on maternal employment and children’s development of resident populations, evidence on refugee populations remains scarce.<sup>1</sup> Consequently, little is known about the potential of childcare services in supporting mothers’ labour market and social integration, as well as their well-being in the context of forced migration.

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<sup>1</sup>For a summary concerning the effects for Germany, see Spieß (2022).

In the context of refugees, childcare services can support integration beyond freeing up time for, e.g., language training, education, or employment (Gambaro et al., 2021). Childcare services also provide opportunities for mothers to connect with other parents and engage with service providers, which helps broaden their social networks and foster familiarity with the German system. During drop-off or pick-up times, as well as on festive occasions, mothers can engage in conversations with other parents and childcare staff, allowing them to become more exposed to the German language, culture, and customs. A third mechanism by which childcare services can support refugee mothers is by instilling a sense of welcome and belonging in Germany. Observing their children acquire the language and flourish within a community setting, such as a childcare center, can enhance mothers' feelings of inclusivity.

Our study examines the role of childcare services for Ukrainian refugee women during their first year in Germany. We analyse a unique and representative panel data set of Ukrainian refugees who arrived in Germany after the Russian invasion until June 2022, specifically the IAB-BiB/FReDA-BAMF-SOEP Ukrainian Survey (Brücker et al., 2023a). One of the main concerns in our analysis is the potential endogeneity of childcare service attendance, as it could be influenced by unobserved factors that also affect integration outcomes. A related concern is reversed causality. To address these concerns, we employ two complementary approaches: a selection-on-observables approach together with an assessment of the role of unobservables (Oster, 2019), and an instrumental variable (IV) approach that takes advantage of regional differences in the availability of childcare services for refugees.

Our findings indicate that women who utilise childcare services are 80 % more likely to participate in language and integration courses, and 88 % more likely to be employed or in training. They are also approximately 40 % more likely to have some proficiency in German and spend more time with Germans. However, there is no significant difference in terms of feeling welcome or self-reported general life satisfaction between women who use childcare and those who do not.

The IV approach builds on the observation that Ukrainian refugees often relied on personal networks to secure accommodation. In light of the urgency of their situation, they frequently settled in areas where other Ukrainians were already residing before the war. As a result, they paid less attention to local economic or social factors, or

the availability of childcare services in the region. Based on their initial placement, we examine the arguably exogenous availability of childcare services for children of different ages in their region. We leverage these variations to estimate the effects of childcare services on mothers' employment-related behaviour, social integration, and well-being. The IV results reveal a strong and statistically significant effect of regional childcare service availability on children's childcare attendance: a one percentage point increase in the local provision of childcare services increases the enrollment of Ukrainian children by about 0.5 percentage points. We find that childcare attendance effectively increases refugee mothers' participation in language courses, their employment, or involvement in training programs. We also observe positive effects on their German language skills and time spent with Germans. However, childcare attendance does not have an impact on mothers' well-being or their feeling of being welcome in the short term.

We test the validity of our instrument and the robustness of our IV results in different ways. First, we investigate the residential choices of our sample of mothers and find no evidence that our results are influenced by regional (unobserved) heterogeneity or regional sorting. Specifically, we demonstrate that county-level economic and social factors that potentially support Ukrainian refugees' integration, including childcare provision, are not correlated with the settlement patterns of Ukrainian refugees. Second, we show that the individual characteristics of refugees are not related to the availability of childcare services, i.e., there is no evidence of self-selection into areas with a higher availability of childcare services. Lastly, we analyzed mothers of older children and childless women who do not directly benefit from this type of service and conducted placebo-type regressions, yielding no significant effects. This supports the assumption that the availability of childcare services does not reflect unobserved characteristics of the region that might also promote the integration of Ukrainian refugees.

Our paper contributes to at least three strands of the literature. First, we add new insights to the literature on the consequences of forced migration (e.g. Becker and Ferrara, 2019). It is now widely recognised 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). Employment rates of this group are significantly lower than those of other foreign populations, and even lower than the employment rates of the native-born population in each respective host country (e.g. Brell et al., 2020, Dustmann et al., 2017). Importantly, refugee characteristics and especially their demographic composition vary substantially depending on the events and circumstances triggering their migration. In the case of Ukrainian refugees, the general mobilization and the travel ban for men of military age have resulted in a refugee population that is primarily made up of women, adolescents, and children. The majority of women are living in Germany without a partner (Brücker et al., 2022, OECD, 2023). The literature on service infrastructure of receiving countries supporting refugees lacks an explicit focus on refugee mothers, though they are a very common phenomenon. Our findings show that childcare services are instrumental to their integration, empirically underpinning the attention host countries' policymakers need to pay to the specific challenges faced by different groups of refugees.

Second, we contribute to the literature on the integration of migrant families and the role of childcare services therein. Previous studies have mainly examined the impact of childcare on migrant *children* (e.g. Buchmüller et al., 2020, Stevens et al., 2023). Limited attention has been given to the benefits of childcare for migrant *parents*. However, there are two notable exceptions: one study focused on migrant families in Norway (Drange and Telle, 2015), and another examined refugees arriving in Germany in 2015 and 2016 (Gambaro et al., 2021). The study by Drange and Telle (2015) found no significant effects of immigrant children's attendance at childcare on their parents' integration, as measured by employment and education. In contrast, Gambaro et al. (2021) found that childcare services improved mothers' outlook towards their own integration, although there was no significant impact on fathers. A major difference between our study and the existing literature is that Ukrainian women essentially function as single parents, making the provision of childcare services crucial. Since the available evidence is still limited and the composition of migrant groups, including refugees, varies widely, it is essential to obtain new evidence to form a more comprehensive understanding of the role of childcare services for migrant families.

Third, our study contributes novel evidence on the societal returns to public investments in childcare services. Research has firmly established that such investments have a significant impact on the labour market outcomes of mothers (e.g. Baker et al., 2008,

Bauernschuster and Schlotter, 2015, Müller and Wrohlich, 2020, Olivetti and Petrongolo, 2017, Hermes et al., 2022), children’s development and long-term outcomes (e.g. van Huizen and Plantenga, 2018, Cornelissen et al., 2018, Felfe and Lalive, 2018, Gupta et al., 2023), child maltreatment (Sandner et al., 2024), and they also support fertility (Bauernschuster et al., 2016). Benefits of childcare services for refugee families add another, under-researched dimension to understanding the societal returns to public investments in childcare services. The benefits pertaining to the social integration and labour market participation of refugees add an unexplored facet to the cost-effectiveness analyses of public investments in childcare.<sup>2</sup>

The paper is organised as follows. Section 2 describes the political and institutional background for the setup 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 summarise the main results in Section 5 and conclude in Section 6.

## 2. Background

This section provides a comprehensive overview of the Ukrainian refugee situation in Germany and the institutional framework governing childcare services, highlighting the unique challenges and opportunities faced by Ukrainian refugees.

### *2.1. Ukrainian Refugees in Germany*

The large-scale migration of Ukrainians across Europe followed the Russian invasion of Ukraine that started on February 24, 2022. The invasion escalated the Russian-Ukrainian war that had been simmering since 2014. As of December 2022, 7.9 million people sought refuge abroad (UNHCR, 2023), totaling almost one fifth of the population. Given the general mobilization and a travel ban for men aged eighteen to 60, a substantial portion of the displaced population comprises women, children, and the elderly. This mass displacement has posed considerable challenges for neighboring European countries, particularly in accommodating and supporting the influx of refugees. Among the European Union

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<sup>2</sup>Providing public benefits to refugees can have a lasting impact on integration outcomes. The benefits extend beyond just improvements in the labour market. A study by Dustmann et al. (2017) reveals that when benefits were reduced for refugees, it resulted in significant changes in criminal behaviour. Another study by Heckman (2006) demonstrates that participation in the Perry Preschool program also reduced criminal behaviour among children in the long term. This finding greatly enhanced the cost-benefit ratio of the program.

countries, Germany has emerged as the second most important destination, accommodating more than one million Ukrainian refugees by December 2022 (Brücker et al., 2023a). The population of Ukrainian citizens residing in Germany made up 1.4 % of the total resident population in Germany.

The institutional framework for the reception of Ukrainian refugees in Germany, as in the rest of Europe, differs significantly from 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, this permit was set until March 5, 2024, but it was later extended for an additional year. This legal framework has allowed for faster employment opportunities, resulting in enhanced conditions for labour market integration (Fasani et al., 2021). Furthermore, Ukrainian refugees in Germany were not initially required to stay in reception facilities like other refugees, and they were not generally subject to dispersion policies. The avoidance of dispersion policies has also been found to improve potential integration outcomes (Fasani et al., 2022). Dispersion policies were only implemented at a later stage and were limited to refugees who needed housing support. Eventually, Ukrainian refugees were integrated into the basic security system under the Code of Social Law II instead of the Asylum Seekers Benefits Act. This change led to higher benefit rates and immediate inclusion in the support structure of job placement centres, as well as access to language and integration courses.

Already before the Russian invasion, Germany experienced significant migration from Ukraine. During the wartime periods of World War I and World War II, many Ukrainians came to Germany as forced labourers 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 the 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 have 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 has prompted a continuous flow since. Compared to the Ukrainian population in Germany before the Russian invasion in February 2022, the number of Ukrainian citizens residing in Germany has increased sevenfold by December

2022. The historical connections and the presence of Ukrainian migrants before the 2022 invasion are an important explanation for settling patterns observed for Ukrainian refugees arriving after the war started (Sauer et al., 2023).

Overall, the institutional framework regulating residency and access to welfare has been distinctly generous in the case of Ukrainian refugees compared to other groups of refugees, raising the need to document the specific experience of Ukrainian refugees.

## *2.2. Childcare Services in Germany*

Childcare services can play a pivotal role in shaping the integration outcomes for Ukrainian refugees, particularly for mothers seeking to balance child-rearing with language acquisition and employment. Childcare services in Germany are accessible through a universally available and highly subsidised 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 preschoolers. In 2022, 35.5 % of children under three and 91.7 % of children aged three and above were attending childcare services (Statistisches Bundesamt, 2022). However, there are significant regional differences in attendance rates, most prominently between Eastern and Western states, but also among lower administrative jurisdictions within the same federal state. The regional supply is, however, not an equilibrium outcome between supply and demand for childcare. Instead, there exists substantial excess demand for childcare which amounts to about 50 % above availability for children below age three (Jessen et al., 2020).

While the federal government maintains legislative authority, the actual responsibility for financing, regulating, and organizing childcare services is with the federal states and counties. This leads to substantial geographical variation in the availability of places, fees charged, and quality regulations such as child-to-caregiver ratios (Stahl et al., 2018).

Childcare fees paid by parents are generally low and are typically based on family income and the number of children in care (Schmitz et al., 2017, Huebener et al., 2020). Overall, there are no special regulations for refugee families.<sup>3</sup> While the exact fee scales and exemptions for specific groups may vary locally, recipients of social benefits are usually exempted from paying childcare fees. In our sample of Ukrainian mothers,

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<sup>3</sup>The contributions are uniformly regulated based on § 17 ff. KitaG and § 90 SGB VIII.

approximately 90 % live in households receiving social benefits and would not be required to pay childcare fees.

Regarding the choice of the childcare facility, families have the freedom to choose their preferred childcare centre. Nevertheless, the prevalence of significant shortages in childcare services often results in a considerably higher number of applications compared to the limited available spots. The allocation of limited slots and the enrolment process in general also varies locally, with individual centres managing their admissions without local administrative oversight.

This highly decentralised framework of childcare governance, with varying degrees of childcare availability, creates considerable geographical differences in families' ability to secure a place. Since 2013, children from the age of one until they enter primary school have a legal right to claim a place in a childcare centre.<sup>4</sup> Given their legal status, Ukrainian families with habitual residence in Germany have the same legal right for a childcare slot as other German citizens. The practical hurdles of obtaining a childcare slot likely depend on the local service infrastructure and the availability of places in particular. In order to respond to the childcare demand of Ukrainian families, some federal states have granted temporary permission to exceed the upper limit of childcare slots per childcare centre. Others have created additional slots through "slot sharing" or increased efforts to raise the number of childcare teachers. For those who could not immediately secure a childcare slot, alternative forms of care, such as family day care, playgroups, bridge projects, and parent-child groups were initiated. Generally, it was noted that according to the legal claim, there is neither any preferential treatment nor any kind of subordinate fulfillment of legal claims compared to other children who are entitled to childcare services. In general, refugee children must be treated like German children, and the allocation of childcare places must be carried out according to the typical priorities applied if available places are scarce.<sup>5</sup>

To understand if Ukrainian mothers would take up available childcare services, it is useful to outline the childcare service infrastructure in Ukraine. In Ukraine, childcare

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<sup>4</sup>§ 24 Social Code (SGB) - Eighth Book (VIII)

<sup>5</sup>Examples of information letters from the relevant state ministries and youth offices include, e.g., Ministerium für Bildung, Jugend und Sport (2022), Bayerisches Staatsministerium für Familie, Arbeit und Soziales (2022), Kommunalverband für Jugend und Soziales Baden-Württemberg (2023), Landesjugendamt Sachsen-Anhalt (2022). Further details on the institutional setup and challenges related to Ukrainian refugees in the German childcare system are provided in German by Boll et al. (2023).

services are organised as a two-tier system. There are nurseries for children aged 2 months to 3 years, and kindergartens and school-kindergartens for children up to age 6 or 7, before they enter school (Schreyer and Oberhuemer, 2017, Zharova, 2023). All children have the right to a place, but attendance rates are lower compared to Germany. According to the Ministry of Education and Science of Ukraine, about 65 % of children attended some form of childcare service before the war. Estimates reported by a recent EU-funded report are lower, indicating an attendance rate of around 30 % for 3 to 4-year-olds and slightly lower for other age groups. However, it is worth noting that the group of refugees arriving in Germany is generally more educated than the average population in Ukraine (Brücker et al., 2023b). It is plausible that this group had higher rates of childcare enrolment in Ukraine prior to relocating to Germany, as there exists a positive correlation between education and childcare attendance.

### 3. Data and Sample

#### 3.1. Data

Research on refugees can be very challenging as data sources on this population are often not representative and typically comprise small sample sizes.<sup>6</sup> The basis of our study on Ukrainian refugees in Germany is a representative panel survey, the IAB-BiB/FReDA-BAMF-SOEP Ukrainian 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). Further details are provided in Brücker et al. (2023a). The aim of the survey is to investigate the institutional and legal frameworks of Ukrainian refugee resettlement in Germany and their integration in society.

The IAB-BiB/FReDA-BAMF-SOEP Ukrainian Survey has been conducted using a random selection of Ukrainian nationals who arrived in Germany between the commence-

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<sup>6</sup>Previous research has largely depended on convenience samples collected at registration or support centres 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, Boll et al., 2023), or qualitative interviews (Kjeøy and Tyldum, 2022).

ment of the Russian invasion on February 24, 2022, and the early days of June 2022.<sup>7</sup> 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.1). In a second step, a gross sample comprising 48,000 Ukrainian nationals aged between 18 and 70 years who registered in Germany for the first time after February 24, 2022, was drawn.<sup>8</sup> 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 second wave of interviews was conducted between January 16 and March 6, 2023.

The questionnaires covered a variety of topics, which included questions on educational 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.

### *3.2. Sample and Descriptive Statistics*

This study focuses on mothers with at least one child aged six years or younger in the household. Table 1 presents descriptive statistics for our main sample, which consists of 2,288 observations of refugee mothers from two waves. Of these, 955 women report having at least one child in childcare, while 1,345 families do not. We examine three sets of outcomes. To assess employment integration, we study participation in language and integration courses and whether individuals are employed or participating in professional training. Column 1 indicates that 39 % of mothers attend language and integration classes, and 12 % of the women in our sample are either working or in training.

Social integration is characterised by individuals' self-assessed German language skills, specifically whether they speak at least some German (56 %). Additionally, we measure the time individuals spend with Germans, rated on a scale from 1 (never) to 6 (daily), with a mean of 3.5 in our sample. Well-being is captured by asking whether individuals feel very welcome (27 %) and their self-rated general life satisfaction. Respondents rate their satisfaction on an 11-point Likert scale, ranging from 0 (not satisfied at all) to 10

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<sup>7</sup>The 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.

<sup>8</sup>The survey's methodology combined a push-to-web mixed-mode design that capitalised on the merits of postal recruitment and online surveys.

(very satisfied). The mean life satisfaction score is 6.1 and comparably low if compared to the resident population.<sup>9</sup>

Regarding individual characteristics of mothers in our sample, they are on average 34.7 years old, and 79 % have tertiary education. From a geographical perspective, 8 % are from West Ukraine, 39 % from Central Ukraine, 15 % from South Ukraine, and 38 % from East Ukraine. Prior to coming to Germany, 83 % were employed. 31 % of the sample entered Germany with the grandparents of the children. At the time of the interview, they had been in Germany for an average of 211 days, with only 39 % having a partner in Germany and 45 % having one child.

Analyzing the characteristics of the counties where the respondents settled, the average population density is 0.21 thousand inhabitants per square kilometer, and the GDP per capita is on average 55.5 thousand euros. The total fertility rate in 2020 was 1.45 children per woman, with 17.8 % having a migration background. The unemployment rate was 7.6 %, and the female employment rate was 56.6 %. Regarding the education level of the county population, 12 % have a lower secondary school degree, 38 % have a middle secondary school degree, and 44 % have an upper secondary school degree. Children below age 3 account for 3 % of the population, and children between 3 and 6 years for 5.9 %. The log number of Ukrainians in 2021 before the Russian invasion was 7.12.

Columns 2 and 3 report the descriptive statistics based on whether the youngest child attends childcare.<sup>10</sup> Differences in outcomes and background characteristics between these groups are reported in column 4. We first note that mothers with children in childcare are quite similar to those with children not attending childcare. There are no differences in their region of origin, partner's status, or employment before coming to Germany, nor in the number of children in the household. Individuals with a child in childcare live in counties with, on average, a lower GDP per capita, a lower migration background, a higher female employment rate, and higher levels of education in the

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<sup>9</sup>While Bond and Lang (2019) criticise the use of subjective ordinal scales for measuring well-being, Kaiser and Oswald (2022) demonstrate that a single integer for well-being predicts outcomes more accurately than combined economic and social variables. Furthermore, there is an inverse relationship between well-being integers and subsequent life actions, such as changing neighborhoods, partners, or jobs. This relationship between well-being and action is generic, replicable, and almost linear, suggesting that an integer scale effectively operationalises feelings despite the absence of a true scale.

<sup>10</sup>In the first wave, respondents were asked whether any child attends childcare. In families with more than one child, we assume that the information applies to the youngest child. This might introduce measurement error in childcare attendance in the first wave.

general population. Additionally, the number of Ukrainians prior to the invasion was slightly higher. However, mothers with children in childcare entered the country less frequently with grandparents, spent 23.9 more days in Germany, are 0.8 years older, and 6.9 percentage points more likely to hold a tertiary education degree. However, outcomes differ substantially between the groups, highlighting the potential role of childcare in refugee families' integration into their host society. There are large and statistically significant differences in language/integration course participation and employment, as well as in German language proficiency and time spent with Germans. However, there are no differences in the feeling of being welcome or overall life satisfaction between women with and without children in childcare.

Overall, we note that despite rather small differences in individual characteristics, refugees' outcomes differ substantially between the groups, highlighting the potential role of childcare for their integration into their host society and labour market.

## 4. Empirical Strategy

In this section, we outline our empirical strategy to investigate the impact of childcare on the integration and well-being of refugee families. A key challenge is the potential endogeneity in childcare attendance, which could be influenced by unobserved factors affecting both childcare participation and integration outcomes. For instance, families with higher motivation or intentions to stay might be more likely to enrol their children in childcare, and these same factors might also influence their social and labour market integration. To address this, we employ two complementary approaches: a selection-on-observables approach together with an assessment of the role of unobservables, as well as an instrumental variable (IV) approach.

### 4.1. Ordinary Least Squares (OLS)

We begin our analysis with the following OLS regression model:

$$y_{itc} = \beta_0 + \beta_1 \text{Childcare}_{itc} + X_i' \beta_2 + \rho_c + \lambda_t + \epsilon_{itc} \quad (1)$$

where  $y_{itc}$  represents the outcome of interest for refugee  $i$  at time  $t$  in county  $c$ .  $\text{Childcare}_{itc}$  denotes the childcare service attendance of the youngest child in family  $i$ .  $X_i$  represents a set of predetermined individual control variables, including age and

Table 1: Descriptive statistics

|  | (1)     | (2)                | (3)    | (4)        |
|--|---------|--------------------|--------|------------|
|  | Overall | Child in childcare |        | Difference |
|  | mean    | Yes                | No     | (2) - (3)  |
| <b>Outcomes</b>                                  |         |                    |        |            |
| In language/integration course (%)               | 44.16   | 59.79              | 33.16  | 26.63***   |
| Working or in training (%)                       | 11.63   | 16.07              | 8.49   | 7.57***    |
| Speak at least some German (%)                   | 55.90   | 67.12              | 47.99  | 19.14***   |
| Time with Germans (daily 6 - never 1)            | 3.45    | 3.63               | 3.33   | 0.30***    |
| Feeling very welcome (%)                         | 27.23   | 27.48              | 27.05  | 0.43       |
| Life satisfaction (0-10)                         | 6.08    | 6.08               | 6.08   | -0.00      |
| <b>Individual characteristics</b>                |         |                    |        |            |
| Age (in years)                                   | 34.72   | 35.17              | 34.41  | 0.76**     |
| Tertiary education (%)                           | 78.93   | 82.98              | 76.08  | 6.90***    |
| From West Ukraine (%)                            | 7.65    | 8.67               | 6.93   | 1.74       |
| From Central Ukraine (%)                         | 39.03   | 39.85              | 38.45  | 1.40       |
| From South Ukraine (%)                           | 15.34   | 14.27              | 16.10  | -1.82      |
| From East Ukraine (%)                            | 37.98   | 37.21              | 38.52  | -1.32      |
| Ever employed before coming to Germany (%)       | 82.95   | 83.30              | 82.71  | 0.59       |
| Border entry with grandparents (%)               | 31.42   | 27.38              | 34.28  | -6.90***   |
| Time since arrival (in days)                     | 210.85  | 224.87             | 200.96 | 23.91***   |
| Partner in Germany (%)                           | 38.51   | 37.84              | 38.97  | -1.13      |
| One child (%)                                    | 45.37   | 44.08              | 46.27  | -2.19      |
| <b>County characteristics</b>                    |         |                    |        |            |
| Population Density (1,000 inh./km <sup>2</sup> ) | 0.21    | 0.21               | 0.21   | -0.00      |
| GDP per capita (1,000 euro)                      | 55.49   | 53.75              | 56.72  | -2.97**    |
| 2020 total fertility rate                        | 1.45    | 1.44               | 1.46   | -0.01      |
| Migration Background (%)                         | 17.77   | 16.89              | 18.39  | -1.49***   |
| Unemployment rate (%)                            | 7.59    | 7.61               | 7.58   | 0.03       |
| Female employment rate (%)                       | 56.63   | 57.01              | 56.35  | 0.66***    |
| Lower sec. school degree (%)                     | 12.29   | 12.02              | 12.48  | -0.47**    |
| Middle sec. school degree (%)                    | 38.07   | 37.36              | 38.56  | -1.20**    |
| Upper sec. school degree (%)                     | 44.35   | 45.34              | 43.66  | 1.68***    |
| Share children below 3 (% of population)         | 2.96    | 2.96               | 2.96   | -0.01      |
| Share children 3 to 6 (% of population)          | 5.87    | 5.88               | 5.86   | 0.01       |
| # Ukrainians in 2021 (log)                       | 7.12    | 7.24               | 7.03   | 0.21***    |
| Observations                                     | 2288    | 946                | 1342   | 2288       |

*Notes:* The table provides descriptive statistics for the main sample, and differentiates by whether the youngest child attends childcare. The sample includes all women with at least one child up to age 6 in the household. Column 4 reports the difference between the groups, estimated with OLS regressions on a childcare dummy. Robust standard errors are clustered at the county level.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . *Source:* IAB-BiB/FReDA-BAMF-SOEP Ukrainian Survey, Federal Statistical Office, Central Register for Foreigners, own calculations.

age squared, education, region of origin in Ukraine, employment status before arrival in Germany, border entry with grandparents, time since arrival, place of residence of the partner, age of the youngest child in the household, and number of children in Germany.

County fixed effects ( $\rho_c$ ) account for regional differences in labour market conditions and the social and economic environment. Furthermore,  $\lambda_t$  denotes survey wave fixed effects. The error term  $\epsilon_{itc}$  captures unexplained variation of the outcome variables.

We are interested in estimates of  $\beta_1$ , which capture differences in outcomes for refugee women who use childcare for their youngest child. For a causal interpretation of the resulting estimates, the conditional independence assumption must hold, meaning that potential outcomes are independent of childcare attendance given the set of observable characteristics. To assess the plausibility of the conditional independence assumption, we first run the above-mentioned model with and without control variables. We then formally assess coefficient stability and the scope for omitted variable bias in our estimates using an approach introduced by Oster (2019). This method compares the  $\beta_1$  coefficient estimates and  $R^2$  values from the baseline regressions without controls to those from regressions with the extended set of control variables. The idea is that if we assume that selection on unobservable factors is equally as important as selection on observable factors, we can use the differences in coefficients and  $R^2$  to estimate the changes in the coefficient that would occur if we included controls for the remaining unobservables. This bias-adjusted coefficient provides an upper bound on the magnitude of selection on unobservables.<sup>11</sup>

In a second closely related approach proposed by Oster (2019), we examine the degree of proportionality, represented by  $\delta$ , to assess how much more important unobserved variables would have to be compared to the extended set of observable characteristics in order to nullify the estimated treatment effects. Accordingly, results are considered robust if the impact of unobservables would have to be at least as strong as that of the extended set of observable characteristics.

#### 4.2. Instrumental Variables (IV)

An alternative empirical approach to account for potential selection into childcare is to use an instrumental variable (IV) for childcare attendance. The IV approach attempts

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<sup>11</sup>The bias adjusted coefficient is defined as:

$$\beta^* = \beta_{\text{ext}} - (\beta_{\text{without}} - \beta_{\text{ext}}) \frac{R_{\text{max}}^2 - R_{\text{ext}}^2}{R_{\text{ext}}^2 - R_{\text{without}}^2}$$

where  $\beta$  is the bias-adjusted coefficient,  $\beta_{\text{ext}}$  and  $R_{\text{ext}}^2$  are the coefficient and  $R_{\text{ext}}^2$  from the regression with the main set of controls,  $\beta_{\text{without}}$  and  $R_{\text{without}}^2$  are the coefficient and  $R^2$  from the regression without controls, and  $R_{\text{max}}^2 = \max\{1.3 \times R_{\text{ext}}^2; 1\}$  (Oster, 2019).

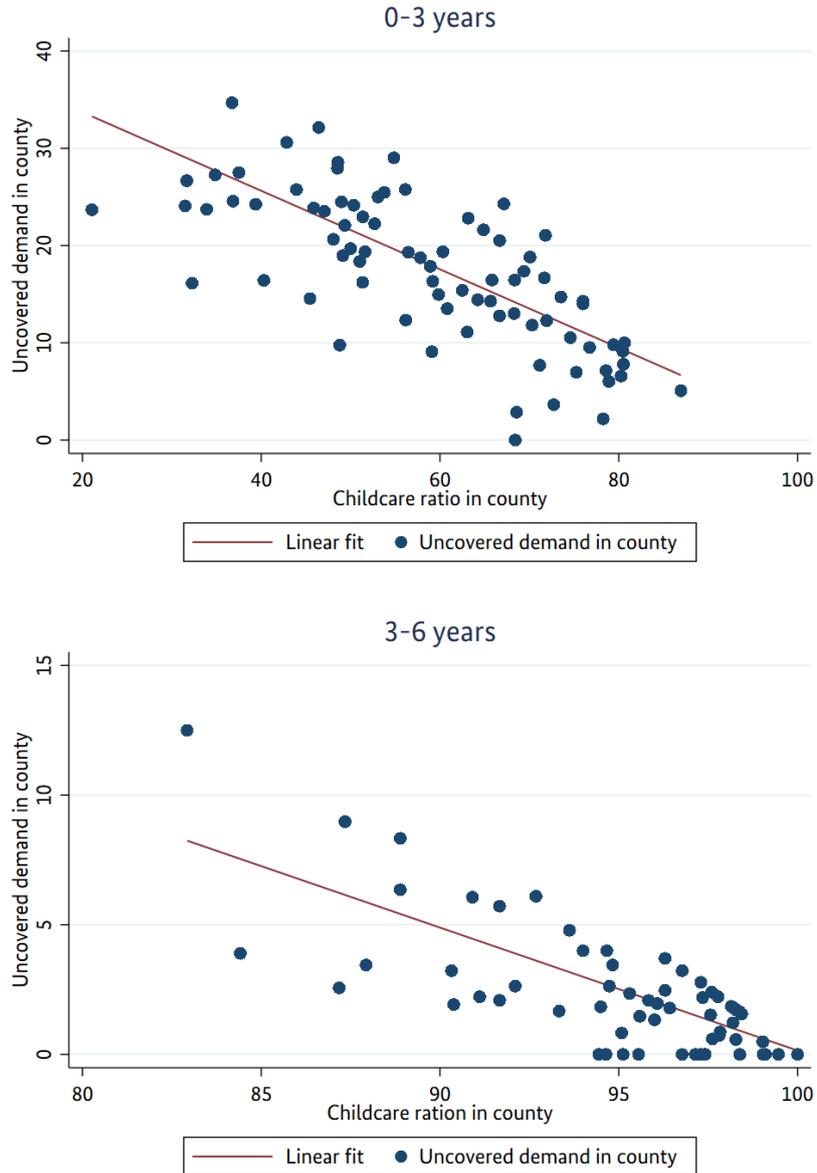
to remove endogeneity concerns by isolating the variation in  $childcare_{it}$  that is solely due to factors outside the control of refugee families.

The instrument we are proposing is the availability of childcare services at the county level in 2021 before the influx of Ukrainian refugees. Based on the idea of matching in the market for childcare services, the matching function would depend on the number of families seeking childcare, the number of available childcare slots, and the efficiency of the matching process. Families, both refugee and non-refugee families, search for suitable childcare options that fit their needs (e.g., location, quality, cultural sensitivity), while childcare providers are looking for children to fill their available slots and match their criteria. This matching process happens in a market with frictions: Refugee families might not have complete information about available childcare options or the process to access them. Moreover, the constant excess demand for childcare indicates supply shortages. This imbalance is a crucial aspect of our IV approach. Increasing the supply of childcare slots in a region should reduce this excess demand, making it easier for families, including those of refugees, to find a suitable childcare slot. Regions with greater childcare supply should theoretically show a better matching rate, i.e., a higher proportion of refugee families securing childcare slots. This is illustrated in Figure 1. It plots the excess demand for childcare at the county level and the county's childcare rate. The lower the regional availability, the higher is excess demand and the higher are the search costs to obtain a childcare slot. For families for whom German is not the main language, excess demand is even higher. The intuition for using the county childcare rate as an instrument is that it serves as a proxy for regional rationing and childcare slot scarcity. It is already established in the literature that the higher regional supply of childcare services increases the take-up of childcare (Bauernschuster and Schlotter, 2015, Cornelissen et al., 2018, Felfe and Lalive, 2018), and also experimental evidence shows that lowering application barriers for families with low socio-economic status increases their take-up of childcare services (Hermes et al., 2021).

Our instrument has to satisfy two main conditions to be valid. First, it has to be relevant for refugee children's childcare attendance. Second, the county childcare rate has to be the exclusive factor determining outcomes through childcare attendance, conditional on the set of controls. We discuss these assumptions in the following.

Whether the regional availability is relevant for childcare attendance of refugee families

Figure 1: Excess demand for childcare at county level and childcare availability



*Note:* The figure plots the childcare ratio by county and excess demand. Excess demand is defined as the percentage of parents who state that they have childcare needs but whose children are not currently attending childcare.

*Source:* Own calculations based on KiBS 2019 (Lippert et al., 2020)

is an empirical question, because refugees may simply not respond to childcare offers. We establish the relevance of the instrument empirically with the following first-stage regression:

$$Childcare_{itc} = \gamma_0 + \gamma_1 CareShare_c + X'_i \gamma_2 + Z'_c \gamma_3 + \phi_i + \kappa_t + u_{itc} \quad (2)$$

Here,  $CareShare_c$  denotes the childcare availability in county  $c$  in 2021 for children below the age of three and for children between the ages of three and six.  $X_i$  refers to individual characteristics, including age and age squared, education, region of origin in Ukraine, employment before arrival in Germany, border entry with grandparents, time since arrival, place of residence of the partner, and the number of children in Germany. As our instrument is related to the county childcare rate in 2021, it varies across regions and children's age. To exploit both sources of variation, we do not include county fixed effects but account for regional differences with federal state fixed effects ( $\phi_i$ ) and a set of county-level characteristics ( $Z_c$ ), including population density, GDP per capita, the total fertility rate in 2020, population share with a migration background, the unemployment rate, the female employment rate, education of the population, the share of the population below the age of 3 and the age of 6, and the log number of Ukrainians in 2021. In a robustness check, we also account for potential regional heterogeneity by including federal state fixed effects. Furthermore, we include survey wave fixed effects ( $\kappa_t$ ). 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  $\delta_1$  is of main interest for our analysis. To interpret the coefficient as the causal effect of childcare on refugee mothers' outcomes, we also need to assume that the county childcare rate affects refugee women solely through childcare attendance. This assumption could be violated, for example, if Ukrainian refugees with strong preferences for labour market and social integration choose to live in counties with more childcare availability. To assess this concern, it is important to understand the location choice of Ukrainian refugees. Unlike other groups of refugees, Ukrainians could freely choose their

place of residence. 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 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 densely populated areas with a lower unemployment rate (column 1). The location choice is also highly correlated with the presence of Ukrainians and Russians before the war started. Many refugees have built on existing, wider social networks upon their arrival (see also Sauer et al., 2023). However, their location choice is—for the purpose of our analysis probably most importantly—not related to the availability of the childcare rate in the county. When we focus on the location of female refugees (column 2), and only on counties included in our main data source (column 3), the same patterns emerge: The county childcare rate is unrelated to the location choice.

Although the choice of location is not related to the availability of childcare in the counties as a whole, Ukrainians could self-select based on their individual characteristics. Those who have a strong preference for childcare might choose counties where childcare is more readily available. In our main analysis sample, we use the county’s childcare ratio as the dependent variable and regress it on individual characteristics (see Appendix Table A.2). We focus on information from the first survey conducted after arrival. Without county control variables, we find a significant relationship between individuals with tertiary education living in counties with a higher childcare rate. Similarly, those who arrived with grandparents are in counties with slightly less childcare (0.9 percentage points). However, these relationships disappear when we include county characteristics and federal state fixed effects as control variables in column 2, which is consistent with our main specification. We do not find any connection between individuals’ age, education, region of origin in Ukraine (which might relate to different norms regarding maternal employment), their employment status before coming to Germany, their intention to stay, whether they arrived with grandparents, whether the partner is in Germany, or the number of children living in their household in Germany. The only variable that shows marginal significance is the time spent in Germany, although the direction of the

small relationship is counter-intuitive. Therefore, it is possible that this finding is due to chance. We also test for the joint significance of individual characteristics and find no statistical support for endogenous selection into higher childcare availability based on observable characteristics.

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

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

## 5. Results

### 5.1. OLS Results

We first present OLS results in Table 2. Column 1 presents the coefficient on childcare attendance from a baseline model without control variables, replicating the mean differences reported in Table 1. In column 2, we include the full set of individual control variables, county, and survey wave fixed effects to account for potential sorting into childcare. Compared to the baseline model in column 1, the relationship between childcare attendance and refugees' integration and well-being outcomes remains very stable when the set of control variables is included. When children attend childcare, Ukrainian women are 25 percentage points more likely to attend a language or integration course. They are also 6.9 percentage points more likely to be employed or in training, compared to a baseline of 8.5 %. They are 15 percentage points more likely to speak at least some German, which is a substantial increase from a baseline of 47 %. They also spend significantly more time with Germans, with the score increasing by 0.39 points, or 0.22 standard deviations.

However, in terms of well-being, the model with control variables suggests that Ukrainian women report feeling very welcome more often if their youngest child attends childcare, but their life satisfaction is similar to that of women whose child does not attend childcare.

Table 2: OLS results - Link between childcare attendance and refugee mothers' outcomes

|                                | (1)                        | (2)                        | (3)               | (4)                    | (5)             | (6)            |
|--------------------------------|----------------------------|----------------------------|-------------------|------------------------|-----------------|----------------|
|                                |                            |                            | Oster (2019)      |                        |                 |                |
|                                | Baseline model:            | Full model:                | Bounds of $\beta$ |                        | Proportionality |                |
|                                | coeff.<br>(s.e.)/[ $R^2$ ] | coeff.<br>(s.e.)/[ $R^2$ ] | Lower bound       | In 95 %<br>CI interval | $\delta$        | $ \delta  > 1$ |
| <b>A: Economic Integration</b> |                            |                            |                   |                        |                 |                |
| In language/integration course | 0.266***<br>(0.024)/[0.07] | 0.254***<br>(0.025)/[0.19] | [0.246]           | ✓                      | 5.186           | ✓              |
| Working or in training         | 0.076***<br>(0.016)/[0.01] | 0.069***<br>(0.018)/[0.10] | [0.066]           | ✓                      | 7.880           | ✓              |
| <b>B: Social Integration</b>   |                            |                            |                   |                        |                 |                |
| Speaks at least some German    | 0.191***<br>(0.029)/[0.04] | 0.151***<br>(0.029)/[0.13] | [0.131]           | ✓                      | 3.975           | ✓              |
| Time with Germans              | 0.302***<br>(0.084)/[0.01] | 0.385***<br>(0.094)/[0.11] | [0.417]           | ✓                      | -31.089         | ✓              |
| <b>C: Well-Being</b>           |                            |                            |                   |                        |                 |                |
| Feeling very welcome           | 0.004<br>(0.020)/[0.00]    | 0.052**<br>(0.020)/[0.10]  | [0.069]           | ✓                      | -3.287          | ✓              |
| Life satisfaction              | -0.004<br>(0.077)/[0.00]   | 0.056<br>(0.081)/[0.11]    | [0.078]           | ✓                      | -3.073          | ✓              |
| County FEs                     |                            | ✓                          |                   |                        |                 |                |
| Survey Wave FE                 |                            | ✓                          |                   |                        |                 |                |
| Individual controls            |                            | ✓                          |                   |                        |                 |                |

*Notes:* The first column reports the estimates of childcare attendance of a baseline specification without control variables. Our main specification in column 2 includes individual controls (see Table 1) as well as county and survey wave fixed effects. Based on Oster (2019), columns 3 and 4 show the lower bound of  $\beta$  and whether this value is within the 95 % confidence interval of the main estimates. Column 5 reports the value of proportionality,  $\delta$ , and shows how strong the influence of unobserved factors has to be compared to the observed factors to pull the treatment effect to zero. The last column checks whether  $|\delta| > 1$ . Robust standard errors clustered at county level in parentheses.

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

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

We observe that the estimates on childcare attendance are very stable between the models with and without control variables, although the  $R^2$  increases substantially with the inclusion of control variables. The stability of the coefficients already suggests that self-selection into childcare and regional sorting based on higher childcare availability do not seem to be prominent factors driving the strong associations between childcare usage by refugees and their integration outcomes.

To formally assess the stability of the coefficients and the potential for omitted variable bias in our estimates, we use an approach by Oster (2019) as outlined above. First, we aim to estimate the bias-adjusted coefficients. The idea is that if we assume that selection on unobservable factors was equally as important as selection on observable factors, we can

use the differences in coefficients and  $R^2$  to estimate the changes in the coefficient that would occur if we included controls for the remaining unobservables. This bias-adjusted coefficient provides an upper bound on the magnitude of selection on unobservables. The results are reported in column 3. All bias-adjusted coefficients fall within the 95 % confidence interval of the full model. Alternatively, we can consider how strong the impact of omitted unobservable factors would have to be to nullify the estimated treatment effects. This degree of proportionality between observed and unobserved factors is represented by  $\delta$ . Results are considered robust if the impact of unobservables would have to be at least as strong as that of the extended set of observable characteristics, meaning  $|\delta| > 1$ . Results are reported in columns 5. For example, the positive and significant coefficients of childcare usage on language course participation would require the unobserved factors to be at least five times as important as the included controls and fixed effects. Our main results appear robust when assessed using the degree of proportionality  $|\delta| > 1$  by Oster (see column 6).

## 5.2. Heterogeneity Analysis

Childcare may not be equally important for all refugee mothers who have young children. The extent to which childcare is utilised and its impact on integration may vary depending on individual circumstances. In order to examine the differences in the role of childcare attendance on our set of outcomes, we conducted heterogeneity analyses based on different characteristics of the refugee population. Appendix Table A.3 provides the percentage of children in childcare for each group (column 1), along with the effects on our outcomes of interest, i.e. language course participation, working or being in professional training, proficiency in the German language, time spent with Germans, feelings of being welcomed, and overall life satisfaction.

We first examine the impact of childcare attendance based on the intention to stay in Germany.<sup>12</sup> Refugees intending to stay long-term or permanently have a significantly higher share of children in childcare (45.2 %) compared to those with uncertain or short-term intentions (39.4 %). However, once enrolled in childcare, the results show similar positive associations for both groups on economic and social integration outcomes. None of the differences in outcomes between the groups are statistically significant.

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<sup>12</sup>Our data does not show associations between childcare attendance and refugees intention to stay, alleviating concerns about endogeneity in the heterogeneity analysis by return intentions.

Next, we consider the presence of a partner in Germany. Both groups, with and without a partner, show similar childcare attendance rates (40.4 % and 41.9 %, respectively). Again, both groups show significantly better outcomes in terms of language course participation, employment, language proficiency, and time with Germans if their child attends childcare. Differences between the groups are small and not statistically significant.

We also analyse the impact of having grandparents accompanying the refugee mothers. Those arriving with grandparents have a significantly lower childcare attendance rate (36.0 %) compared to those without (43.8 %). Significant positive effects of childcare on language course participation and language skills are observed for both groups. Those arriving without grandparents also show improved interaction with Germans and a significantly higher share feeling very welcome. Finally, we assess the role of previous employment in Ukraine. Previously employed refugees have a similar childcare attendance rate of 41.5 % compared to those previously not employed (40.5 %). Notably, previously unemployed refugees exhibit a significant improvement in language proficiency and life satisfaction with childcare attendance.

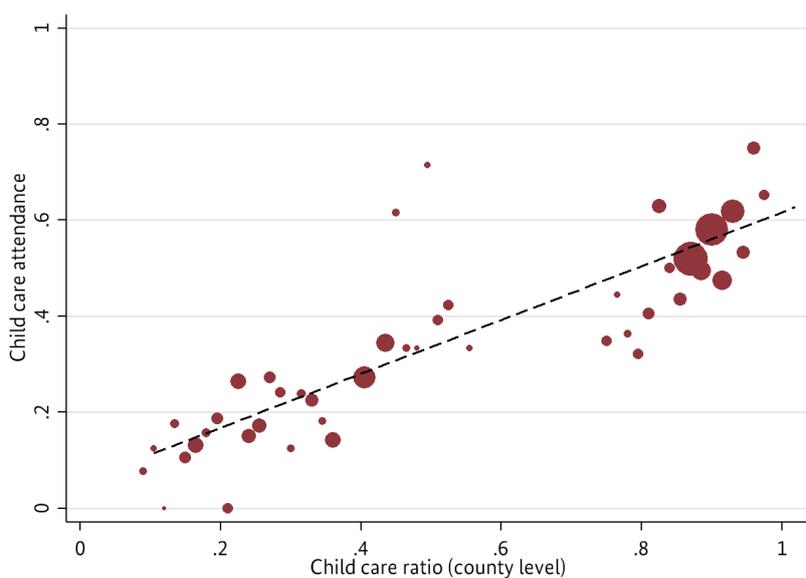
Overall, our heterogeneity analysis reveals that individual circumstances are related to the uptake of childcare. Those with intentions to stay longer and those without grandparents in Germany have significantly higher attendance rates. Once enrolled, however, childcare attendance consistently benefits refugee families in various aspects, and the magnitude of these benefits does not significantly differ across most of the analysed subgroups and outcomes.

### *5.3. IV Results*

In our second approach, we aim to address potential selection bias and concerns of endogeneity by using an instrumental variables approach. We use the availability of childcare services in the county as an instrumental variable for childcare attendance, which serves as a proxy for excess demand and the difficulty of accessing childcare in Germany.

Figure 2 illustrates the positive relationship between refugees' use of childcare services and the overall availability of childcare services in the county. Based on model 2, we use the availability of childcare specific to the county and age group to predict the attendance of refugee children in childcare. Panel A of Table 3 shows that a one percentage point increase in the availability of childcare in the county leads to a 0.5 percentage point

Figure 2: Correlation between age-specific childcare rates at the county level and individual attendance



*Note:* The figure plots age-specific childcare rates at the county level and individual attendance. Binned means (bin width of 0.02) from 96 counties, size of dots corresponds to the number of observations within the bin.

*Source:* IAB-BiB/FReDA-BAMF-SOEP Ukrainian Survey, Statistisches Bundesamt (2022), own calculation

increase in refugees' childcare attendance. This suggests that a higher regional availability of childcare increases the likelihood of refugees using childcare services. The  $F$ -statistic of the first stage, which tests the strength of the instrumental variable, is 151, well above the critical value of 10, indicating strong instruments. This finding is interesting because it shows that higher availability of publicly supported childcare is a crucial factor in determining childcare attendance for refugees. If refugee mothers have access to childcare services due to a higher supply in their region, do they utilise the additional "free time" for activities that promote integration? Panel B of Table 3 presents the results of the second stage instrumental variables estimation. Attending childcare has a significant and positive effect on participation in language classes, employment, and training. The instrumental variables results indicate that attending childcare due to lower external constraints increases the probability of attending language and integration courses by 68 percentage points. We also find positive effects on social integration: refugee women are 39 percentage points more likely to speak at least some German, and they spend significantly more time with Germans, by 0.98 points on a scale from 1-6, or about 55 % of a standard deviation. However, we do not find evidence of effects on refugees feeling welcome or on their general life satisfaction.

Overall, the IV estimates are larger than the OLS estimates. While OLS estimates provide differences between all individuals who attend and do not attend childcare, the IV method identifies a local average treatment effect (LATE). This captures the effect of childcare attendance on mothers who gain access to childcare primarily due to higher regional availability. That the group of complying mothers might show particularly strong effects is supported by the observation that Ukrainian refugee mothers generally express a strong intention to participate in the labour market, with about 75 % of them stating their definite intention to work. However, without access to childcare services, these mothers rely on it to be able to participate in the labour market. Therefore, the complying mothers in our study are particularly responsive to childcare access, as it enables their participation in the labour market and language classes, which they would otherwise be unable to do.<sup>13</sup>

In summary, our results support the idea that the provision of childcare is a crucial prerequisite for labour market and social integration. However, we do not find any effects on the general well-being of the mothers.

#### *5.4. IV-Related Robustness Checks and Placebo Tests*

In Table 4, we report results of several robustness checks compared to our main results in column 1. One concern is that other regional characteristics, besides childcare availability, might drive the effects on refugees. To address this concern, we first remove individual and county controls from our analysis and note that the results are not sensitive to the choice of control variables (column 2). Second, we substitute federal state fixed effects and county-level controls with a set of county fixed effects to account for all general, time-invariant county characteristics (column 3). We draw identification from variation in the age of the child in the household and the variation in county childcare availability by child age. Reassuringly, 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 could be prone to a misassignment of refugees' place of residence if they have not re-registered after relocation. While

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<sup>13</sup>Another reason for the larger IV estimates could be the measurement error in reporting childcare attendance. This can lead to attenuation bias in OLS estimates, causing them to be biased toward zero. The IV approach mitigates this issue by using an instrumental variable that is not subject to the same measurement error, thereby providing a clearer and larger estimate of the true effect of childcare attendance.

Table 3: IV results - Effect of childcare attendance on refugee mothers' outcomes

| <i>Dep. var.</i>               | (1)                               | (2)     | (3)  |
|--------------------------------|-----------------------------------|---------|------|
|                                | Instrument: County childcare rate |         |      |
|                                | b                                 | se      | N    |
| <b>Panel A: First-Stage</b>    |                                   |         |      |
| childcare Attendance           | 0.53***                           | (0.04)  | 2287 |
| F-stat first stage             |                                   | 151.15  |      |
| <b>Panel B: Second-Stage</b>   |                                   |         |      |
| <b>Economic Integration</b>    |                                   |         |      |
| In language/integration course | 0.681***                          | (0.076) | 2286 |
| Working or in training         | 0.175***                          | (0.049) | 2287 |
| <b>Social Integration</b>      |                                   |         |      |
| Speaks at least some German    | 0.386***                          | (0.076) | 2287 |
| Time with Germans              | 0.983***                          | (0.257) | 2287 |
| <b>Well-Being</b>              |                                   |         |      |
| Feeling very welcome           | -0.077                            | (0.071) | 2287 |
| Life satisfaction              | 0.180                             | (0.246) | 2287 |

*Notes:* The table reports IV results based on eqs. 2 and 3. The sample includes all women with a youngest child up to age 6 in the household. All regressions control for individual and county characteristics (see Table 1), federal state and wave fixed effects. 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, Central Register for Foreigners, own calculations.

we drop about 10 % of the sample, the results are almost identical.

Finally, we are concerned that the availability of childcare could affect refugee outcomes through other related county characteristics than through childcare rates. For example, counties with a higher availability of childcare might also provide better community services or stronger regional labour market conditions that might facilitate the integration of refugees on their own. To address this concern empirically, we conduct a falsification test in which we relate outcomes for families with older children or refugees without children to the counties' childcare availability (column 4). We cannot find any statistical link for women with older children or refugees without children in the household. Therefore, we render it unlikely that other regional characteristics that are just correlated with childcare availability are driving our results. This finding supports the exclusion restriction, requiring the childcare rate to affect refugee outcomes only through its effect on children's actual childcare attendance.

Table 4: IV-robustness checks and placebo test

| <i>Dep. var.</i>               | (1)                 | (2) IV approach                |                     | (3)                     | (4)   | (5) |
|--------------------------------|---------------------|--------------------------------|---------------------|-------------------------|---|-----|
|                                | Main                | No ind./<br>county<br>controls | County<br>FE        | w/o Berlin<br>& Hanover | Reduced Form<br>Placebo<br>with older/<br>no children |     |
| <b>A: Economic Integration</b> |                     |                                |                     |                         |   |     |
| In language/integration course | 0.681***<br>(0.076) | 0.667***<br>(0.075)            | 0.653***<br>(0.082) | 0.644***<br>(0.080)     | 0.008<br>(0.017)                                      |     |
| Working or in training         | 0.175***<br>(0.049) | 0.186***<br>(0.045)            | 0.184***<br>(0.051) | 0.215***<br>(0.048)     | -0.012<br>(0.012)                                     |     |
| <b>B: Social Integration</b>   |                     |                                |                     |                         |   |     |
| Speaks at least some German    | 0.386***<br>(0.076) | 0.366***<br>(0.076)            | 0.359***<br>(0.083) | 0.412***<br>(0.088)     | -0.030<br>(0.020)                                     |     |
| Time with Germans              | 0.983***<br>(0.257) | 0.909***<br>(0.253)            | 1.009***<br>(0.269) | 1.071***<br>(0.263)     | -0.038<br>(0.067)                                     |     |
| <b>C: Well-Being</b>           |                     |                                |                     |                         |   |     |
| Feeling very welcome           | -0.077<br>(0.071)   | -0.050<br>(0.066)              | -0.046<br>(0.074)   | -0.055<br>(0.078)       | -0.016<br>(0.017)                                     |     |
| Life satisfaction              | 0.180<br>(0.246)    | -0.033<br>(0.241)              | 0.187<br>(0.255)    | 0.257<br>(0.277)        | -0.086<br>(0.066)                                     |     |
| Ind. controls                  | ✓                   |                                | ✓                   | ✓                       | ✓   |     |
| County controls                | ✓                   |                                |                     | ✓                       | ✓   |     |
| State FE                       | ✓                   | ✓                              |                     | ✓                       | ✓   |     |
| Wave FE                        | ✓                   | ✓                              | ✓                   | ✓                       | ✓   |     |
| County FE                      |                     |                                | ✓                   |                         |   |     |
| N                              | 2287                | 2287                           | 2287                | 1991                    | 6968  |     |

*Notes:* The table reports robustness checks for the IV approach. Column 1 repeats the main results for comparison. Column 2 excludes individual and county level controls. Column 3 includes county fixed effect. Column 4 excludes observations in Berlin and Hanover. These cities served as the main reception hubs at first arrival. Column 5 shows reduced form estimates based on a sample that includes all women without a child up to age 6. Age-group specific childcare rates at county level are assigned randomly.

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

## 6. Conclusion

In armed conflicts, it is a common phenomenon that women, children, and the elderly are compelled to flee, leaving men behind. This situation creates multiple obstacles for the integration of fleeing women in the receiving country, determined by their gender, their lack of language skills, and the need to care for their children. This gives rise to investigating the role that childcare services play in the integration of refugees.

Our study examines the case of the forced mass migration of Ukrainians to Germany, following the Russian invasion in February 2022. Our analysis builds on a large and representative sample drawn from the IAB-BiB/FReDA-BAMF-SOEP Ukrainian Survey in Germany. We highlight that the demographic composition and legal framework of Ukrainian refugees are distinct compared to other groups of refugees previously fleeing to Germany. Despite their privileged legal status, access to childcare has emerged as a pivotal barrier to labour market integration, stressing the need for empirical evidence and policy attention in this area.

The results suggest very strong associations between childcare attendance and social and economic integration. First, we find much higher rates of language course participation and employment and training participation if children attend childcare. Also, refugees' command of German and their interaction with Germans improve. While the participation in childcare varies depending on the individual circumstances of refugees (e.g., their intention to stay and whether they arrived with grandparents), the positive associations between childcare and integration outcomes are prominent across different groups. However, we cannot find associations between childcare services and refugees' general well-being. We test the relevance of unobservable characteristics for the associations and find that their impact would have to be very strong to challenge our main conclusions.

To obtain a more causal interpretation of our findings, we employ a second empirical approach using the regional availability of childcare as a source of exogenous variation in refugees' childcare attendance. Drawing on the concept of matching in the childcare market, we argue that in markets with severe excess demand, a higher supply increases the likelihood of obtaining a childcare slot. Our evidence indicates that refugee mothers did not select their place of residence based on the availability of childcare services but rather on previous social networks. Using this empirical approach, we also find very

strong effects of childcare usage by refugees on their social and labour market integration, although not on their well-being. The lack of effects on well-being could be attributed to the short time frame since their arrival. Additionally, it may be due to the fact that in many cases, their partners and friends are still residing in Ukraine, resulting in ongoing personal involvement in the war. These results are an important addition to the existing literature on the impact of childcare on migrant families. Previous research conducted in Sweden has shown that universal childcare has no effects on the integration of migrant families (Drange and Telle, 2015). We demonstrate that for female refugees, with many of them being without their partners, access to childcare is a crucial factor in enabling their participation in integration-related activities.

Our findings contribute to the extensive body of economic literature that highlights the significant effects of childcare services on the labour market outcomes of mothers. In the case of female refugees, the marginal effects of utilising childcare services are substantial, underscoring their importance as a prerequisite for engaging in integrative activities. This perspective underscores the need to consider the unique characteristics of refugees and the potential benefits of childcare, an area that has received limited attention thus far. The findings also have implications beyond their direct effects on refugees for policymakers. Facilitating access to childcare services benefits not only the mothers but also the children being cared for. These effects provide short-, mid-, and long-term opportunities for receiving countries that often face aging and shrinking workforces.

In conclusion, our study emphasizes the fundamental role of childcare services in unlocking the potential of refugee mothers' integration into the labour market and society.

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# Appendix

Table A.1: Where did Ukrainian refugees settle?

|  | <i>Dep. var: log # UKR refugees ...</i> |                      |                     |
|--|---|----------------------|---------------------|
|  | All                                     | Females              |                     |
|  | (1)                                     | (2)                  | (3)                 |
| Day Care Attendance < age 3                      | -0.002<br>(0.003)                       | -0.003<br>(0.003)    | 0.008<br>(0.009)    |
| Day Care Attendance ≥ age 3                      | -0.007<br>(0.005)                       | -0.007<br>(0.004)    | -0.010<br>(0.009)   |
| # Ukrainians in 2021 (log)                       | 0.106***<br>(0.033)                     | 0.120***<br>(0.031)  | 0.182**<br>(0.072)  |
| # Russians in 2021 (log)                         | 0.219***<br>(0.042)                     | 0.207***<br>(0.041)  | 0.218*<br>(0.106)   |
| # population (log)                               | 0.577***<br>(0.041)                     | 0.579***<br>(0.040)  | 0.477***<br>(0.136) |
| # participating in language course (log)         | 0.067*<br>(0.039)                       | 0.088*<br>(0.043)    | 0.156<br>(0.182)    |
| # eligible for language course (log)             | -0.026<br>(0.060)                       | -0.048<br>(0.065)    | -0.041<br>(0.200)   |
| Population Density (1,000 inh./km <sup>2</sup> ) | -0.071<br>(0.268)                       | -0.032<br>(0.248)    | -0.081<br>(0.479)   |
| Age of population (mean)                         | 0.025**<br>(0.011)                      | 0.034***<br>(0.011)  | 0.061***<br>(0.021) |
| GDP per capita (1,000 euro)                      | 0.002*<br>(0.001)                       | 0.002**<br>(0.001)   | 0.000<br>(0.002)    |
| Migration Background (%)                         | -0.017***<br>(0.005)                    | -0.016***<br>(0.005) | -0.021*<br>(0.011)  |
| Unemployment rate (%)                            | 0.009<br>(0.010)                        | 0.008<br>(0.010)     | 0.002<br>(0.021)    |
| Female employment rate (%)                       | -0.005<br>(0.005)                       | -0.006<br>(0.005)    | -0.006<br>(0.011)   |
| Lower sec. school degree (%)                     | -0.017**<br>(0.007)                     | -0.016**<br>(0.007)  | 0.007<br>(0.041)    |
| Middle sec. school degree (%)                    | -0.010<br>(0.006)                       | -0.010*<br>(0.006)   | 0.002<br>(0.035)    |
| Upper sec. school degree (%)                     | -0.010*<br>(0.006)                      | -0.010<br>(0.006)    | 0.006<br>(0.034)    |
| CDU vote share Fed. Election 2021                | -0.350<br>(0.699)                       | -0.187<br>(0.677)    | -3.074<br>(2.024)   |
| Social Democrats vote share Fed. Election 2021   | -0.329<br>(0.576)                       | -0.307<br>(0.567)    | -1.745<br>(1.795)   |
| Green Party vote share Fed. Election 2021        | -1.641*<br>(0.952)                      | -1.323<br>(0.940)    | -2.330<br>(2.870)   |
| Liberals vote share Fed. Election 2021           | 0.936<br>(0.784)                        | 1.064<br>(0.672)     | 0.866<br>(2.098)    |
| AfD vote share Fed. Election 2021                | -2.190<br>(1.298)                       | -2.179*<br>(1.232)   | -0.716<br>(3.396)   |
| Adjusted R <sup>2</sup>                          | 0.92                                    | 0.92                 | 0.95                |
| Number of counties                               | 386                                     | 386                  | 97                  |
| Counties covered in the Ukraine sample           |   |                      | ✓                   |

*Notes:* OLS regressions at county level. Number of Ukrainian refugees based on measures from April 2023. All models include federal state fixed effects. Standard errors clustered at government district level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

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

Table A.2: Self-selection into counties with more childcare?

|  | <i>Dep. Variable:</i><br><i>County Day Care Rate</i> |                    |
|--|--|--------------------|
|  | (1)  | (2)                |
| <b>Individual characteristics</b>      |  |                    |
| Age                                    | -0.014<br>(0.040)                                    | 0.014<br>(0.026)   |
| Tertiary education                     | 0.936**<br>(0.443)                                   | 0.319<br>(0.260)   |
| From West UKR (Baseline: East)         | 0.169<br>(0.807)                                     | -0.123<br>(0.485)  |
| From Central UKR                       | -0.298<br>(0.508)                                    | -0.223<br>(0.252)  |
| From South UKR                         | 0.847<br>(0.620)                                     | -0.266<br>(0.312)  |
| Ever employed before coming to Germany | 0.661<br>(0.583)                                     | 0.303<br>(0.368)   |
| Intention to stay for ever             | -0.082<br>(0.616)                                    | 0.087<br>(0.355)   |
| Arrived with grandparents              | -0.859*<br>(0.504)                                   | -0.166<br>(0.372)  |
| Time in Germany                        | -0.007<br>(0.006)                                    | -0.006*<br>(0.003) |
| Partner in Germany                     | 0.196<br>(0.452)                                     | 0.029<br>(0.267)   |
| Number of children in Germany          | -0.066<br>(0.279)                                    | 0.063<br>(0.146)   |
| County-level controls                  |  | ✓                  |
| Federal State FE (#16)                 |  | ✓                  |
| N                                      | 1448   | 1448               |
| <i>p</i> -value joint significance     | 0.15   | 0.32               |

*Notes:* OLS regressions at individual level based on first survey after arrival. Column 1 reports results for regression on individual characteristics, column 2 adds county-level controls (see Table 1) and federal state fixed effects. All models control for the age of the youngest child in the household. Robust standard errors clustered at county level in parentheses.

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

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

Table A.3: Heterogeneity analysis

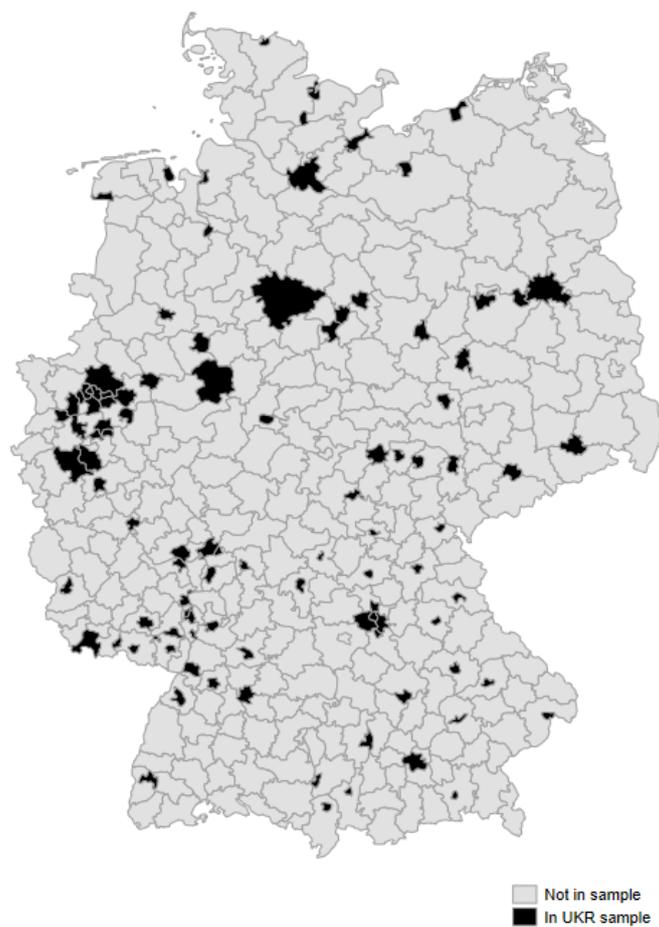
| <i>Interaction term:</i><br><i>childcare</i> × ... | <i>Outcomes:</i>  |                     |                        |                       |                      |                         |                      |
|--|-------------------|---------------------|------------------------|-----------------------|----------------------|-------------------------|----------------------|
|  | (1)               | (2)                 | (3)                    | (4)                   | (5)                  | (6)                     | (7)                  |
|  | % in<br>childcare | Language<br>course  | Working/in<br>training | Speaks<br>some German | Time with<br>Germans | Feeling<br>very welcome | Life<br>satisfaction |
| Intend to stay forever/several years               | 45.2<br>(0.043)   | 0.200***<br>(0.025) | 0.0401<br>(0.025)      | 0.104**<br>(0.052)    | 0.422***<br>(0.130)  | 0.0604<br>(0.039)       | -0.0253<br>(0.143)   |
| Intend to stay 1 year/untill war end/don't know    | 39.4              | 0.277***<br>(0.028) | 0.0804***<br>(0.025)   | 0.173***<br>(0.030)   | 0.358***<br>(0.101)  | 0.0268<br>(0.021)       | 0.00910<br>(0.099)   |
| <i>Difference</i>                                  | -5.8***<br>(2.17) | 0.0772<br>(0.051)   | 0.0403<br>(0.036)      | 0.0691<br>(0.054)     | -0.0642<br>(0.140)   | -0.0336<br>(0.046)      | 0.0344<br>(0.182)    |
| Partner in Germany                                 | 40.4              | 0.252***<br>(0.031) | 0.0706**<br>(0.029)    | 0.163***<br>(0.046)   | 0.428***<br>(0.135)  | 0.0124<br>(0.040)       | 0.0197<br>(0.146)    |
| No partner in Germany                              | 41.9              | 0.263***<br>(0.030) | 0.0642***<br>(0.020)   | 0.156***<br>(0.034)   | 0.382***<br>(0.105)  | 0.0619***<br>(0.020)    | 0.0492<br>(0.105)    |
| <i>Difference</i>                                  | 1.5<br>(2.72)     | 0.0105<br>(0.038)   | -0.00647<br>(0.031)    | -0.00742<br>(0.054)   | -0.0464<br>(0.155)   | 0.0494<br>(0.045)       | 0.0295<br>(0.190)    |
| Arrived with grandparents                          | 36.0              | 0.292***<br>(0.039) | 0.0714**<br>(0.030)    | 0.173***<br>(0.040)   | 0.233<br>(0.171)     | -0.00864<br>(0.035)     | -0.0909<br>(0.173)   |
| Arrived without grandparents                       | 43.8              | 0.246***<br>(0.027) | 0.0642***<br>(0.019)   | 0.153***<br>(0.033)   | 0.472***<br>(0.108)  | 0.0669***<br>(0.022)    | 0.0988<br>(0.096)    |
| <i>Difference</i>                                  | 7.7***<br>(2.25)  | -0.0466<br>(0.045)  | -0.00719<br>(0.031)    | -0.0201<br>(0.043)    | 0.238<br>(0.205)     | 0.0756*<br>(0.042)      | 0.190<br>(0.207)     |
| Previously employed in UKR                         | 41.5              | 0.242***<br>(0.026) | 0.0671***<br>(0.018)   | 0.129***<br>(0.032)   | 0.358***<br>(0.099)  | 0.0488**<br>(0.022)     | -0.0204<br>(0.091)   |
| Previously not employed in UKR                     | 40.5              | 0.341***<br>(0.050) | 0.0626*<br>(0.033)     | 0.300***<br>(0.048)   | 0.613***<br>(0.156)  | 0.0242<br>(0.050)       | 0.349*<br>(0.188)    |
| <i>Difference</i>                                  | 1.0<br>(2.82)     | 0.0990*<br>(0.056)  | -0.00448<br>(0.031)    | 0.171***<br>(0.056)   | 0.256<br>(0.177)     | -0.0246<br>(0.057)      | 0.370*<br>(0.215)    |

*Notes:* Column 1 presents subsample means of childcare attendance. Statistical differences tested by OLS regressions on subgroup indicators. Columns 2-7 based on OLS regressions of eq. 1. with the *childcare* indicator interacted with dummies for the respective groups. Standard errors are clustered at the county level and reported in parentheses.

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

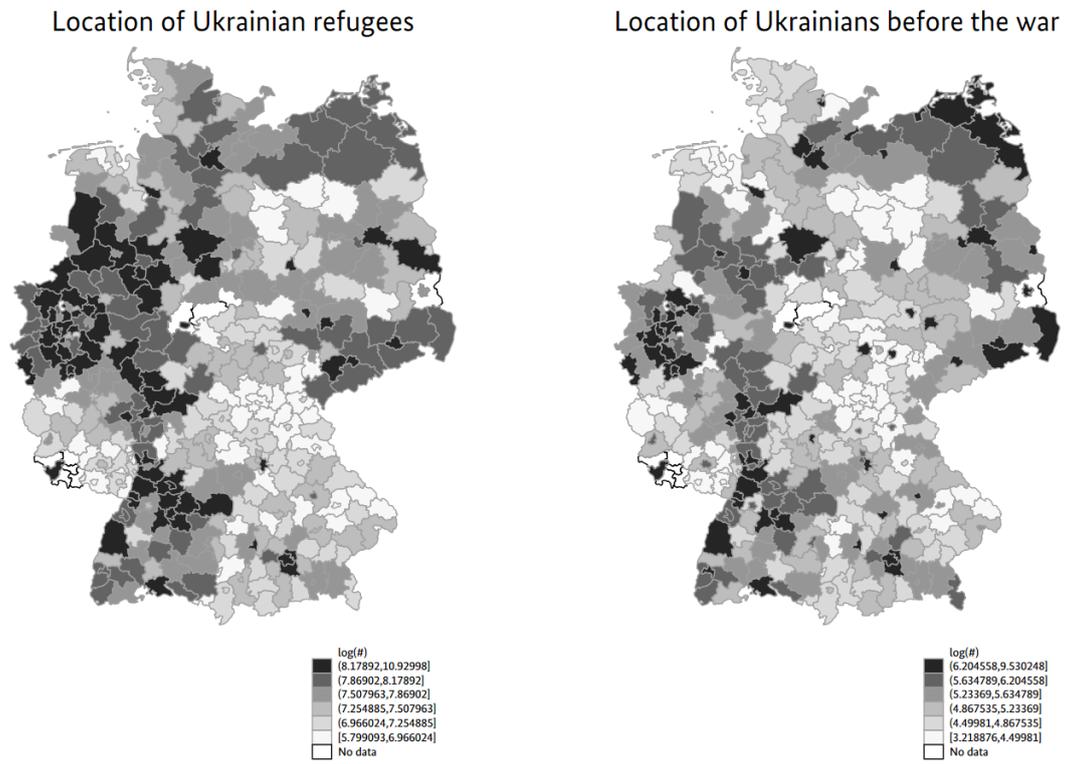
*Source:* IAB-BiB/FRDA-BAMF-SOE Ukrainian Survey, Federal Statistical Office, Central Register for Foreigners, own calculations.

Figure A.1: Counties in IAB-BiB/FReDA-BAMF-SOEP Ukrainian Survey



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

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, Central Register for Foreigners, own calculations.