



First time around: Local conditions and multi-dimensional integration of refugees[☆]

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ABSTRACT

We study the effect of local unemployment and attitudes towards immigrants at the time of arrival on refugees' multi-dimensional integration outcomes. We leverage a centralized allocation policy in Germany where refugees were centrally assigned to live in specific counties. To measure sentiments of native residents towards immigrants, we use geo-coded Twitter data, which provides our "negative sentiment index". Our results show that attitudes towards immigrants are as important as local unemployment rates in shaping refugees' integration outcomes. A one standard deviation increase in unemployment or in the negative sentiment index predicts five percentage points lower probability of refugees being employed in 2016 to 2018. In additional robustness check, we present an analysis that uses far-right vote share as an alternative measure of sentiments of native residents.

1. Introduction

Refugees often arrive in host countries with a disadvantage, having lower language proficiency and less locally applicable human capital compared to economic migrants. This typically results in lower wages and employment opportunities (Cortes, 2004; Brell et al., 2020). As a result, refugees are among the most vulnerable immigrant groups, facing significant obstacles in both their economic and social integration (Martén et al., 2019). The initial economic conditions at the time of arrival play a crucial role in successful integration and have been shown to have long-lasting effects on both refugees and economic migrants (Chiswick and Miller, 1999; Åslund and Rooth, 2007; Barsbai et al.).

We investigate how initial local unemployment rates and attitudes towards immigrants affect refugees' integration outcomes. Our key contribution lies in conducting a comprehensive analysis that uncovers the relative importance of negative attitudes and local labor market conditions in shaping the socio-economic integration of refugees. We also consider multiple dimensions such as economic, linguistic, navigational, political, psychological, and social integration as key outcomes of interest. Recognizing the pivotal role played by non-economic integration factors is crucial, as they significantly contribute to fostering a sense of belonging in the host country (Brell et al., 2020; OECD, 2017).

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Given the limited availability of survey data on local attitudes towards immigrants, we employ two methods to measure attitudes towards immigrants. Our first approach utilizes Twitter data and employs natural language processing and machine learning techniques to construct county-level attitude measures.¹ Our second method is to measure attitudes by county-level far-right party electoral vote share. The lack of focus on attitudes towards immigrants as a determinant of refugees' integration outcomes is surprising since attitudes are being recognized as an important driver of public policy (Facchini and Mayda, 1999; Matakos et al., 2020) and recent literature shows that immigration also increases anti-migrant sentiment and support for far-right parties.² It is important to note that local attitudes towards immigrants are only weakly correlated with unemployment: the correlation between the Twitter-based county-level attitudes measure and the unemployment rate is 0.38, and the correlation between county-level far-right vote share and unemployment rate is only 0.19.

The focus of our study is on refugees who arrived in Germany between 2013 and 2016 and were later interviewed as part of the IAB-BAMF-SOEP Survey of Refugees, the largest comprehensive survey of refugees in Europe. Generally, refugees become eligible to enter the German job market three months after submitting their asylum application (see Online Appendix for more information on refugees' access to education and employment). Our analysis is based on the randomly assigned placement of asylum seekers upon arrival across different counties and the fact that they are not allowed to freely choose their place of residence for at least three years. The initial location is determined by a computer system and asylum seekers do not have the option to express their preferred location (BAMF, 2022). This settlement policy provides as good as random variation, conditional on observable characteristics, to examine the impact of initial local conditions on refugees' integration (see Section 2).

To alleviate concerns regarding the validity of our identification assumption, we provide evidence that the county-level unemployment rates and attitudes towards immigrants are not related to individual-level characteristics of asylum seekers who were assigned to a particular county. In the full sample, only 2 out of 90 coefficients were found to be statistically significant at the 5 percent level.

We find that both unfavorable attitudes towards immigrants and high local unemployment rates negatively affect refugees' labor market outcomes and their economic and social integration. Both effects are sizable: *ceteris paribus*, working-age refugees who are assigned to counties with one standard deviation more negative sentiment towards immigrants or to counties with one standard deviation higher unemployment rate are five percentage points less likely to be employed a few years later. As one standard deviation of unemployment rate is 0.98 percentage points, our findings suggest that bad initial labor market conditions have a five times stronger effect on refugees, which can be explained by the possibility that they are forced to work in lower-skilled and lower-paying jobs.³ Furthermore, unfavorable attitudes towards immigrants and poor initial labor market conditions have

a strong negative impact on refugees' net monthly earnings and the Multi-dimensional Integration Index.⁴ Together, these findings help us to understand how conditions at the time of arrival affect refugees' integration. They also have implications for the design of refugee allocation policies, as gains made in the first few years have long-lasting effects (Åslund and Rooth, 2007).

We also analyzed the effects of initial conditions separately by gender. Local unemployment matters more than local attitudes for males, while local attitudes are somewhat more important than local unemployment for females.

Additional analyses, reported and discussed in the Online Appendix, document the robustness of our findings. These include: (i) addressing potential concerns about omitted variable bias (following Oster, 2019) and implementing multiple hypothesis testing (following Young, 2019); (ii) robustness to inclusion of sub-region by year fixed effects (which control for all potentially omitted variables that may vary across sub-regions and years, such as within-state policy changes on refugee accommodation or the reallocation of funds in areas where the locals have more positive attitudes towards immigrants)⁵; (iii) using alternative attitudes measure (that is, polarity index); (iv) using alternative lags of unemployment rate; (v) analyzing only states with strictest restrictions on residency; (vi) controlling for residence status or receiving help in finding employment; (vii) estimating logit models; (viii) using an alternative age-band (18-64); (ix) excluding counties with very few refugees; (x) alternative levels of clustering and correcting for spatial correlation; (xi) controlling for networks; and (xii) controlling for past unemployment rate among immigrants.

Related literature and our contributions

Our paper is closely related to a handful of studies that have examined the effect of initial location-specific conditions on refugees' integration outcomes. Godøy (2017) studies a subset of refugees in Norway, who are subject to a quasi-experimental settlement policy. She finds that assigning refugees to regions with good non-OECD immigrant labor markets increases their later labor market earnings. Martén et al. (2019) investigate the effects of a centralized placement policy implemented in Switzerland, where refugees were assigned to specific locations. Their findings reveal that refugees placed in areas with a larger presence of individuals from their own ethnic background demonstrate higher rates of employment compared to similar refugees placed in areas with fewer coethnics. Eckert et al. (2022) use an exogenous refugee placement policy in Denmark to study refugees' return to big-city experience. They find that refugees placed in Copenhagen enjoy higher wage growth with each additional year of experience. We complement these studies by providing new evidence on the effects of local attitudes towards immigrants on refugees' subsequent labor market integration outcomes in Germany.⁶ We also extend on previous literature by examining the relative importance of local unemployment and attitudes on refugees' subsequent integration outcomes.

Two recent studies focused on the impact of employment bans that prevent asylum seekers from entering the local labor market upon arrival. Fasani et al. (2021) collected data covering nearly three decades of employment restrictions across 19 European countries, alongside individual data on refugees who arrived in European countries from 1985 to 2012, to investigate the effects of geographic and temporal variation in employment bans. These bans were characterized by staggered implementation and removal, along with frequent changes at the

¹ Germany is divided into 401 counties, referred to as "Kreis" or "Landkreis" in German.

² See, for example, Otto and Steinhardt (2014), Halla et al. (2017), Dustmann et al. (2019), Edo et al. (2019), Hangartner et al. (2019), and Ajzenman et al. (2022). An additional motivation to study the effects of attitudes towards immigrants on refugees' integration outcomes comes from Card et al. (2012): they find that concerns related to compositional amenities that natives derive from their neighborhoods, schools, and workplaces are two to five times more important in explaining attitudes towards immigrants than concerns related to labor markets or public finances.

³ The effects are qualitatively similar, but somewhat weaker, if negative attitudes are measured with far-right vote share: a one standard deviation increase in far-right vote share, corresponding to 1.07 percentage points of votes, is associated with two percentage points lower probability of refugees being employed, and three percentage points lower probability of refugees being in employment or education.

⁴ Please see Section 3.2 for detailed information about the index.

⁵ Sub-regions refer to NUTS-2 statistical regions and known as Regierungsbezirke. German NUTS-2 regions usually have between 800,000 and 3 million inhabitants.

⁶ Åslund and Rooth (2007) examine the long-term effects of labor market conditions encountered upon arrival in Sweden on immigrant earnings and employment. They find that early earnings assimilation depends crucially on a favorable national labor market.

intensive margin. They find that refugees who experienced a ban upon arrival faced a 15-percent decrease in their likelihood of employment during the post-ban period. This impact primarily stemmed from reduced participation in the labor market. [Marbach et al. \(2018\)](#) leverage a natural experiment in Germany, where a court ruling prompted a reduction in the length of the employment ban. They find that longer employment bans considerably slowed down the economic integration of refugees. Our paper complements these studies by demonstrating that unfavorable conditions experienced at the initial location can have negative consequences, even in the absence of explicit restrictions on employment opportunities.

[Jaschke et al. \(2022\)](#) analyze cultural and economic assimilation of refugees in Germany, using the same IAB-BAMF-SOEP data as we do.⁷ The two papers are complementary. [Jaschke et al. \(2022\)](#) analyze how distance between refugees and locals in survey responses to questions like risk attitudes and leisure activities developed over time, and similarly how differences in average unemployment rates between refugees and locals evolved over time. Their unit of analysis are NUTS-2 regions, of which there are 38 in Germany. They conclude that refugees who are assigned to more hostile regions converge more quickly to locals in terms of positive reciprocity, interest in politics and leisure activities, but do not converge more quickly economically. Our analysis, instead, focuses on the effects of local initial conditions in terms of unemployment and attitudes towards immigrants on economic and social integration at the county level (there are 401 counties in Germany). Our results suggest that integration outcomes of refugees are unambiguously worse in less welcoming regions. The two findings need not be contradictory: even though the absolute economic and social integration outcomes that we study are worse in less welcoming regions, this does not rule out that refugees could converge there faster in terms of their replies to questions on leisure activities and interest in politics as [Jaschke et al. \(2022\)](#) find.⁸

Using anonymized data from Facebook, [Bailey et al. \(2022\)](#) examine the social integration among Syrian migrants in Germany. They construct indicators of migrants' social integration, which are based on factors such as their friendship connections with Germans, proficiency in the German language, and involvement in local social groups. They document substantial disparities in the social integration of Syrians across various German regions. Employing a movers' research design, they find that these differences are primarily influenced by the causal impact of the specific geographic location. Specifically, variations in the social integration of Syrians are determined by both the overall tendency of native Germans to form friendships with other locals and the relative frequency at which they establish connections with local Syrian migrants compared to native Germans.

Previous studies show that unfavorable initial conditions have persistent negative effects on individuals' socio-economic outcomes. For

example, a number of studies show that entering the labor market when unemployment rates are high has long-lasting scarring effects on labor market outcomes for years afterwards (see, for example, [Kahn, 2010](#), [Cockx and Ghirelli, 2016](#), and [von Schwanndt and Wachter, 2019](#)). In a similar vein, the longer refugees live in counties with unfavorable conditions, the more severe its consequences are likely to be for them.⁹ Our analysis of the short-term integration outcomes is therefore likely to be informative about the long-term integration prospects of refugees. To help the large number of refugees who have arrived in Germany and other European countries, obtaining such early insights is more valuable than waiting until the integration process has run its course. What makes it even more striking is that refugees who arrived in Germany are positively self-selected with respect to human capital ([Aksoy and Poutvaara, 2021](#)). Our results can also be informative for designing integration policies for other refugee-hosting countries.

The remainder of the paper is organized as follows: Section 2 provides information on institutional background and exogenous placement of asylum seekers. Section 3 provides details on the data sources and descriptive statistics. Section 4 describes the empirical strategy. Section 5 presents the results, after which Section 6 concludes.

2. Institutional background

The distribution of asylum seekers across Germany follows an established two-step process: (i) the central dispersal of asylum seekers across states based on a pre-defined allocation scheme, the Königstein Key; (ii) the central dispersal of asylum seekers to counties by federal states.¹⁰

Initial allocation across states

The Königstein Key determines what share of asylum seekers is received by each state based on the states' tax revenues (accounting for 2/3 of the quota) and population sizes (accounting for 1/3 of the quota), which are calculated on an annual basis and using data from the two previous years. From 2013 to 2017, the resulting shares ranged between about 1 percent in Bremen and 21 percent in North Rhine-Westphalia (Online Appendix Table A1).

This mechanism aims for an equal sharing of responsibilities and financial burden across states by ensuring a proportional distribution of asylum seekers across Germany. Online Appendix Table A1 illustrates the states' received versus assigned share of asylum seekers based on the Königstein Key between 2013 and 2017. Comparing received and assigned shares suggests that the distribution of asylum seekers has been almost perfectly in line with the quotas. As reported by [OECD \(2017\)](#), the resulting distribution of asylum seekers mirrors states' shares of the total population.

Each asylum seeker is registered upon arrival and is subsequently assigned to an initial reception center in one of Germany's 16 federal states, where they may formally apply for asylum to receive a refugee status. The assignment is determined by the computerized EASY (Initial Distribution of Asylum Seekers) system that has been in place since 1993. [BAMF \(2022\)](#) explains that the system defines which federal state will be responsible for a given asylum seeker anonymously and takes

⁷ The two papers were written independently. The first version of our paper was circulated as IZA DP No. 13914 in November 2020 and [Jaschke et al. \(2022\)](#) was circulated as IZA DP No. 14962 in December 2021.

⁸ Our paper is related to the literature on the factors that affect refugees' labor market integration, reviewed more comprehensively than space allows here by [Strang and Ager \(2010\)](#) and [Becker and Ferrara \(2019\)](#). Several studies (see, for example, [Edin et al., 2003](#), [Damm, 2009](#), and [Beaman, 2012](#)) have found that living in regions with high concentrations of co-ethnic individuals can improve refugees' labor market outcomes. [Foged et al. \(2022\)](#) analyze the impact of an expansion of language training for refugees in Denmark. They show that refugees who received more and better language training were more likely to be in employment and had higher earnings, over the subsequent eighteen years. This finding is in line with what [Sarvimäki and Hämäläinen \(2016\)](#) find for Finland: restructuring active labor market programs for unemployed immigrants increased their cumulative earnings by 47 percent over ten years. [Battisti et al. \(2019\)](#) conduct a field experiment to evaluate the impact of job search assistance on the employment of recently arrived refugees in Germany. They find that personalized job search assistance can improve labor market integration of refugees.

⁹ See, for example, [Edin et al. \(2004\)](#) for the evaluation of a Swedish immigration policy that featured the dispersion of refugee immigrants as well as a change in the approach to labor market integration.

¹⁰ For brevity, we mainly use the term "refugees" also when referring to both those recognized as refugees and asylum seekers. When needed, we explicitly use the term "asylum seekers". A refugee is a person who asked for protection and was given refugee status. An asylum-seeker is a person who has left their country and is seeking protection from persecution and serious human rights violations in another country, but who has not yet been legally recognized as a refugee and is waiting to receive a decision on their asylum claim. For further information, please see: <https://www.iom.int/key-migration-terms> (last accessed on August 20, 2022).

into account only three pieces of information: which states process applications from the asylum-seeker's country of origin, how the current share of asylum seekers allocated to each state differs from the target assignment according to the Königstein Key, as well as the applicant's family composition. Crucially for our identification, asylum seekers do not have the option of expressing a wish as to where they would like to be sent.

To reduce processing time, some regional offices of the Federal Office for Migration and Refugees have specialized on particular countries of origin. While this may cause clustering of asylum seekers from the same country, no single nationality was exclusively assigned to a single state. Importantly, since this procedure applies to all asylum seekers, they are not able to self-select into certain states and, hence, such clustering is unlikely to cause threats to our identification strategy.

Asylum seekers can be accommodated in reception facilities for up to six months.¹¹ In case there are several reception centers within the assigned state, the EASY quota system chooses the reception center located nearest to the authority where the registration took place in order to minimize commuting costs. Within each state, asylum seekers are allocated to a particular municipality, usually the place of the initial reception center at first and possibly another municipality when the obligation to live in the initial reception center ends.¹² During the allocation process, individual characteristics are not considered. Asylum seekers can be reallocated to another initial reception center in order to facilitate family reunification.¹³

Initial allocation across counties

When it comes to allocation of asylum seekers to counties, nine out of 16 federal states follow a pre-defined scheme at the county level that is directly proportional to relative population shares, North Rhine-Westphalia uses relative population shares and land area, and Brandenburg uses relative population shares and the number of employed persons (Geis and Orth, 2016). Of the five other states, four (Bavaria, Bremen, Schleswig-Holstein, and Thuringia) employ fixed population-based quotas assigned by decree (Stips and Kis-Katos, 2020). The sixteenth state, Berlin, involves non-state actors in allocation decisions (Geis and Orth, 2016), but as Berlin is one NUTS-2 region and one county, the details of its internal allocation process do not affect our analysis. Taken together, on the county level, employment opportunities and attitudes towards migrants are largely not factored in (OECD, 2017).

We formally test this argument in Table 1 (in a yearly sample between 2011 and 2017) and Online Appendix Table A2 (in a pooled sample with year fixed effects). Both tables indeed show that county-level population size is the only statistically significant predictor of the number of asylum seekers assigned to county. Importantly, we find no statistically significant association between local socio-economic characteristics (unemployment rate, population density, GDP per capita, average age, and housing space per capita, which proxies local housing conditions) and the number of asylum seekers at the county level.

¹¹ On average, asylum seekers are required to live for a period of up to six weeks, but no longer than six months, in the reception center responsible for receiving them before they are further assigned to a specific district within the federal state. For further information, please see: https://www.gesetze-im-internet.de/englisch_asylvfg/englisch_asylvfg.html#p0439.

¹² For further information, please see: <https://www.asylumineurope.org/reports/country/germany/overview-legal-framework> (last accessed on March 29, 2022).

¹³ For further information, please see: https://www.bamf.de/SharedDocs/Anlagen/EN/AsylFluechtlingsschutz/Asylverfahren/das-deutsche-asylverfahren.pdf?jsessionid=2B09C2A64D3E0E77496690BFC941C480.intranet671?_blob=publicationFile&v=18 (last accessed on March 29, 2022).

3. Data

3.1. IAB-BAMF-SOEP survey of refugees

We obtain information on refugees' demographic characteristics and labor market outcomes in Germany from the IAB-BAMF-SOEP Survey of Refugees (henceforth, the Survey), an annual survey focusing on migrants who are seeking protection from political persecution, war, and conflicts (Brücker et al., 2016; DIW, 2017; Kühne et al., 2019). The Survey is conducted as part of the German Socio-Economic Panel (SOEP, see Goebel et al., 2019) and has been carried out on an annual basis since 2016. It is a representative sample of the population of asylum seekers who arrived in Germany from 2013 to 2016 (with respect to, e.g., nationalities, demographic characteristics, and residence status, cf. Brücker et al., 2016). The interviews are conducted in different languages and gather information on refugees aged 18 and older.

The Survey provides information on refugees' location of residence histories, socio-demographic characteristics and integration outcomes in Germany. The first wave, conducted in 2016, covers 4465 adult refugees in Germany. The add-on samples added 2965 observations in the subsequent survey years. The total sample covers 7430 adult refugees, who have been part of the Survey at least once. We use the 2018 survey wave (that is, v35) and pool information on all three waves. 62 percent of the pooled sample gave their latest interview in 2018, 22 percent in 2017 and the remainder in 2016.

The survey we use is well-suited for our identification strategy as it provides information on refugees' current residency (i.e., at the time of interview) and the place of residence at the county level in which they lived the longest when they are interviewed for the survey for the very first time. The longest place of residence should coincide with refugees' first place of residence in most cases, and if so this allows us to exploit plausibly exogenous assignment of asylum seekers across German counties. This assumption is in line with other recent papers using the survey (cf. Jaschke et al., 2022). Yet we acknowledge that as the number of years a refugee has spent in Germany increases, measurement error also rises. To circumvent this limitation, we limit the sample to refugees who gave their first SOEP interview in the first two years of residence in Germany.

Table 2 illustrates precisely how we define our estimation sample: (i) we exclude observations that are inconsistent with the survey design, such as refugees who claim to have arrived in Germany before 2013 or those who report not having undergone an asylum process in Germany; (ii) we further drop survey respondents who do not provide information on their county of longest residence; (iii) we focus on young adults aged 18 (25 when analyzing being employed) to 49 (making up 91 (67) percent of the refugee population) and refugees who have been in Germany for at least two years since this age group is much more likely to be active in terms of participation in the workforce or being in education; (iv) we then limit the sample to refugees whose initial interview was during their first two years of residence in Germany. In our final sample, we study 3244 refugees who have spent at least two years in Germany (2493 for a sample of refugees aged 25–49, respectively).

Table 3 reports main labor market and education-related activities since arrival in Germany for all refugees. Similar to Brücker et al. (2020) and Brell et al. (2020), we find that the percentage of refugees not being in employment or training decreases with years of residence in Germany and that after three years of residence in Germany roughly 30 percent of refugees are employed. Other characteristics of the SOEP refugee sample are reported in Online Appendix Table A3 (socio-demographic characteristics), Online Appendix Table A4 (main activities since arrival in Germany for singles with no children), and Online Appendix Table A5 (main activities since arrival in Germany for different age groups).

It is unlikely that our sample suffers from survivorship bias (i.e., refugees allocated into the counties with worst conditions

Table 1

Determinants of asylum seeker inflows at the county level by year.

Source: Destatis (2011–2017).

	(1) 2011	(2) 2012	(3) 2013	(4) 2014	(5) 2015	(6) 2016	(7) 2017
Population size	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.009*** (0.001)	0.009*** (0.001)	0.005*** (0.001)
Unemployment rate	8.046 (6.566)	14.837 (7.816)	13.756 (8.887)	16.974 (18.344)	−3.403 (64.811)	61.011 (43.755)	24.204 (18.551)
Population density	206.158 (134.749)	139.104 (165.148)	24.435 (174.103)	−237.237 (326.104)	−409.029 (1258.511)	−963.364 (753.145)	−211.751 (440.908)
GDP per capita	−0.000 (0.001)	−0.000 (0.001)	−0.001 (0.001)	−0.003 (0.002)	−0.003 (0.006)	0.000 (0.002)	0.001 (0.002)
Average age	9.527 (7.202)	−4.243 (8.877)	1.616 (10.217)	−10.567 (23.623)	−80.756 (87.246)	−32.611 (52.252)	−9.976 (23.842)
Housing space per capita	−0.413 (4.054)	4.925 (4.455)	1.655 (5.064)	4.000 (8.112)	−3.097 (39.340)	6.537 (18.671)	1.104 (11.100)
Share tertiary education	41.808 (134.052)	132.982 (149.202)	190.745 (188.727)	598.335* (358.011)	1911.591 (1327.888)	1393.343 (920.332)	729.118* (393.449)
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.955	0.955	0.960	0.937	0.855	0.918	0.930
N	388	398	398	398	398	398	398

Note: Ordinary least squares regression estimates are shown. * significant at 10%; ** significant at 5%; *** significant at 1%. Outcome variable is *number of assigned asylum seekers*. Table 1 displays cross-sectional results for a test of random assignment conditional on the county's population size for the period 2011–2017. Population size corresponds to the total population in the respective county. Unemployment rate is the share of all unemployed persons of the labor force. Population density is mid-year population divided by land area (in square kilometers) of the county. The GDP per capita is total county GDP, divided by the population of the respective county. The average age is calculated based on the total population of the respective county. Housing space per capita is the average floor area per person (dweller) in family houses and apartment buildings. Robust standard errors clustered at the state level are in parentheses.

Table 2

Definition of the working sample.

		(1) Refugees aged 18–49	(2) Refugees aged 25–49
	Initial N	7430	7430
(i)	Drop sample inconsistencies	- 49	- 49
(ii)	Drop refugees without information on initial county of residence	- 664	- 664
(iii)	Focus on defined age range	- 1055	- 2531
(iii)	Restrict sample to refugees who have stayed in Germany for min. 2 years	- 971	- 652
(iv)	Limit sample to refugees who were first interviewed for SOEP in their first two years of residence in Germany	- 1447	- 1041
	N	3244	2493

Note: Table 2 displays the evolution of the working sample (1) for refugees aged 18–49 and (2) refugees aged 25–49. In the estimation tables (cf. Tables 7 to 9) and in the Online Appendix Tables sample sizes vary slightly depending on the definition of the working sample (refugees aged 18–49 or refugees aged 25–49), missing values (in covariates) and alternative subgroups.

leaving Germany before 2016) for three reasons: (i) 95 percent of refugees in the raw data report that they want to stay in Germany permanently, which is likely to reflect the general view of all refugees; (ii) according to data from the Federal Office for Migration and Refugees (BAMF), the number of voluntary emigration of asylum seekers and refugees from Germany is very low: 13,574 individuals departed voluntarily in 2014, 35,514 in 2015 and 54,006 in 2016;¹⁴ (iii) there was a ban on deportation for Syrian refugees from 2012 to 2020 and for Afghan refugees until 2016. The vast majority of refugees in our sample

¹⁴ These figures include individuals who no longer have a right of residence in Germany (e.g., rejected asylum applicants, persons with temporary suspension of removal), or persons entitled to remain who return voluntarily (e.g., persons entitled to protection with a residence permit for reasons of international law or for humanitarian reasons). More detailed information on voluntary departures can be found here (last accessed February 22, 2022): <https://www.bamf.de/EN/Themen/Statistik/FreiwilligerRueckkehr/freiwilligerueckkehr-node.html>. As a comparison, the number of first-time asylum applications was 173,072 in 2014, 441,899 in 2015 and 722,370 in 2016, according to (last accessed May 6, 2022): <https://www.statista.com/statistics/911527/number-first-asylum-applications-germany/>.

received their decision in and before 2015 (75 percent of the sample) or 2016 (92 percent of the sample).

Online Appendix Figures A1 and A2 show the yearly distribution of refugees across the 401 German counties, for all refugees and refugees from main source countries, based on the Survey and administrative data from Destatis, respectively. As the number of refugees per state increases with tax revenues and population size, it is not surprising that western German states receive, on average, higher shares of refugees (Online Appendix Figure A2). A comparison with Online Appendix Figure A3 shows that these are the states with lower levels of unemployment. Yet, the figures emphasize that all German states have received refugees from the main source countries: Syria, Afghanistan, and Iraq. Furthermore, these figures illustrate that the SOEP successfully sampled refugees throughout Germany and that refugees' allocation resembles administrative numbers to a great extent. There are 38 NUTS-2 subregions and 401 counties (also known as districts) in Germany. Our representative sample consists of refugees from 259 German counties (about two-thirds of German counties). On average, we observe 60 refugees per county and the median equals 40 refugees.

Table 3

Main activities by year since arrival in Germany, adults aged 18–49.

Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016–2018).

	(1) Total	(2) 1 year ago	(3) 2 years ago	(4) 3 years ago	(5) 4 years ago	(6) 5 years ago
<i>Panel A - Full sample</i>						
School or university	0.023 (0.151)	0.011 (0.105)	0.023 (0.150)	0.028 (0.166)	0.024 (0.152)	0.021 (0.145)
Vocational training	0.028 (0.164)	0.004 (0.063)	0.015 (0.122)	0.032 (0.175)	0.061 (0.240)	0.073 (0.260)
Employed full-time	0.101 (0.301)	0.015 (0.122)	0.051 (0.220)	0.136 (0.343)	0.195 (0.396)	0.141 (0.349)
Employed part-time	0.096 (0.294)	0.038 (0.192)	0.076 (0.266)	0.109 (0.312)	0.156 (0.363)	0.141 (0.349)
Not in employment or training	0.606 (0.489)	0.732 (0.443)	0.640 (0.480)	0.569 (0.495)	0.498 (0.500)	0.560 (0.497)
Not in employment or training & integration course	0.147 (0.354)	0.200 (0.400)	0.195 (0.396)	0.125 (0.331)	0.067 (0.250)	0.064 (0.245)
N	6188	996	1652	2587	719	234
<i>Panel B - Males</i>						
School or university	0.024 (0.152)	0.012 (0.110)	0.023 (0.149)	0.028 (0.164)	0.023 (0.149)	0.031 (0.173)
Vocational training	0.040 (0.195)	0.005 (0.073)	0.024 (0.152)	0.043 (0.203)	0.086 (0.281)	0.100 (0.301)
Employed full-time	0.162 (0.369)	0.026 (0.160)	0.085 (0.279)	0.210 (0.407)	0.302 (0.459)	0.238 (0.428)
Employed part-time	0.122 (0.327)	0.053 (0.224)	0.101 (0.302)	0.139 (0.346)	0.177 (0.382)	0.169 (0.376)
Not in employment or training	0.504 (0.500)	0.674 (0.469)	0.557 (0.497)	0.462 (0.499)	0.356 (0.479)	0.423 (0.496)
Not in employment or training & integration course	0.148 (0.356)	0.229 (0.420)	0.210 (0.408)	0.119 (0.324)	0.057 (0.232)	0.038 (0.193)
N	3692	568	928	1625	441	130
<i>Panel C - Females</i>						
School or university	0.023 (0.149)	0.009 (0.096)	0.023 (0.152)	0.029 (0.168)	0.025 (0.157)	0.010 (0.098)
Vocational training	0.010 (0.102)	0.002 (0.048)	0.004 (0.064)	0.012 (0.111)	0.022 (0.146)	0.038 (0.193)
Employed full-time	0.010 (0.102)	0.000 (0.000)	0.007 (0.083)	0.012 (0.111)	0.025 (0.157)	0.019 (0.138)
Employed part-time	0.056 (0.231)	0.019 (0.136)	0.044 (0.206)	0.058 (0.234)	0.122 (0.328)	0.106 (0.309)
Not in employment or training	0.756 (0.430)	0.808 (0.394)	0.746 (0.436)	0.752 (0.432)	0.723 (0.448)	0.731 (0.446)
Not in employment or training & integration course	0.144 (0.351)	0.161 (0.368)	0.175 (0.381)	0.136 (0.343)	0.083 (0.276)	0.096 (0.296)
N	2496	428	724	962	278	104

Note: Means (standard deviations).

3.2. Multi-dimensional integration index

We follow the framework outlined in Harder et al. (2018) to build a Multi-dimensional Integration Index. In particular, Harder et al. (2018) identify six crucial dimensions of integration: psychological, economic, political, social, linguistic, and navigational. The index aims to measure the degree to which immigrants have the knowledge and capacity to build a successful life in the host society and has two main components: (i) knowledge, which includes factors such as proficiency in the host country's language and ability to navigate the host country's labor market, political system, and social institutions; and (ii) capacity, which refers to the mental, social, and economic resources immigrants have to invest in their futures. See Online Appendix for a greater detail of the variable construction. Descriptive statistics of these variables are reported in Online Appendix Table A6.

3.3. Administrative data on county level variables

Administrative data on additional county-level characteristics stems from the German Federal Statistical Office (Destatis). We use the share

of foreigners of Syrian, Afghan, and Iraqi origin in refugees' counties of residence (as a proxy for pre-existing migrant networks) in 2014 – before refugees started arriving in large numbers in Germany due to the Syrian Civil War. We use 2014 county-level unemployment rate as a proxy for local economic conditions.

We further utilize county-level far-right vote shares in federal elections to measure negative attitudes towards immigrants, using shares of second votes.¹⁵ In particular, we include the following list of far-right parties: Alternative für Deutschland (AfD), Nationaldemokratische Partei Deutschland (NPD), Die Rechte, Die Republikaner, and pro Deutschland. The main far-right party, Alternative for Germany (AfD),

¹⁵ German federal elections are used to elect members of the parliament. Voters have two votes: the first vote is used to elect a candidate in the district by first-past-the-post voting, and the second vote is for the party list. The second vote is more important as it determines the share of seats each party receives in the parliament. It is also the preferable measure of county-level party support as it is unaffected by district-specific idiosyncrasies, like direct candidates each party has presented in each district and tactical voting.

was founded in 2013 to oppose Eurozone bailouts, but was gradually – and in particular after the refugee inflow in 2015 – taken over by those whose primary focus was opposing immigration. As their takeover was completed with a change in party leadership in 2015, we use far-right vote shares in 2017 federal elections as our preferred measure of negative voter attitudes towards immigrants. In Section A.5, we show the results are also robust to using county-level vote shares in the 2013 federal election to address any concerns from using a voting measure collected after most refugees had arrived. With respect to other far-right parties, the most notable is the NPD, which received 0.4 percent of votes in 2017.

3.4. Twitter data and county level measure on attitudes towards immigrants

Given the lack of data on attitudes towards immigrants at the county level in existing survey datasets, we use geo-coded Twitter data in Germany in the pre-migration year 2014 to construct two novel county-level attitudes measures. To do so, we obtained access to the Twitter API, which provides Twitter's real-time and historical public data. We proceed as follows:

1. We first identify geo-located tweets that include words or hashtags related to migrants and migration (see Online Appendix Table A7).
2. Twitter API also provides two geographic measures: the exact coordinates and a geobox area – a square in which the tweet is located. If the exact coordinate is not available, we consider the center of the geobox as the coordinates. We then plot the tweets with a map of Germany and intersect it with each county (Online Appendix Figure A4). This results in 165,757 tweets (14,705 originally in English, which we translate into German).
3. To prepare the tweets for the sentiment analysis, we remove usernames, links, and hashtags, but not the hashtagged words.

Constructing County-Level Attitudes Measures

After matching the location of the tweet, we use python packages to conduct sentiment analysis, which is essentially the process of determining the attitude or the emotion of the tweet. We build two alternative measures: the Negative sentiment index and the Polarity index.

SentimentWortschatz (or SentiWS) is a German dictionary that is trained to give each word a score. The python package SentiWS implements it for all words of a sentence (except for the articles, which do not have any sentiment, e.g., “the”). Using this package, we build an index that consists of the sum of scores of all words divided by the number of words that effectively have a score. It ranges between -1 and 1 (where higher values reflect more negative attitudes). Overall, the procedure parses and analyzes the syntactic structure of the words and calculates a total sentiment score for the whole text (which can be positive, neutral or negative).

Using the package TextBlobDE for tweets in German, we construct an index of polarity, which accounts for sentence structure and ranges between -1 and 1 (where higher values reflect more negative attitudes). This index allows us to construct a proxy for attitudes towards immigrants with a positive or negative value.

After classifying each tweet based on its sentiment and polarity and reweighting by the number of likes and retweets it received, we then take the average of each measure within each county. Finally, we rescale the variables to have a mean of zero and a standard deviation of one. Constructed measures are our treatment variables that capture local attitudes towards immigrants.

Table 4
Moving patterns in Germany.

	(1) Full sample	(2) Less restrictive states	(3) More restrictive states
Stayers	0.920 (0.272)	0.913 (0.282)	0.923 (0.267)
Moved across states	0.080 (0.272)	0.087 (0.282)	0.077 (0.267)
N	6261	2005	4256

Note: Means (standard deviations). IAB-BAMF-SOEP Survey of Refugees, v35 (2016–2018). Less restrictive states are states that apply the residence rule at the state level, more restrictive states are states that apply the residence more rigorously, i.e., at the county level. Stayers are refugees who live in their initial state of residence.

4. Identification strategy

4.1. Main features of the settlement policy

Mobility of refugees is severely restricted

Since many refugees are likely to stay in Germany for a long time, the federal government passed the Integration Act in July 2016, which severely restricts refugees' ability to choose their place of residence: unless legal exemption criteria apply, refugees with a temporary or permanent residence permit are obliged to stay in their initial county of residence for at least three years.¹⁶ To enforce this restriction, refugees who do not comply with the regulation lose the entitlement to social benefits (OECD, 2017).¹⁷

Although there is no high quality data available to show how many refugees have applied to move to another county and how often these requests are declined, it has been suggested that acceptance rates are generally low and permits are granted only in exceptional circumstances (ECRE, 2017). Furthermore, considering that the vast majority of refugees are still not in employment or education even after three years, which in turn implies that exemption criteria are not met, movements within and across states are not likely to be common among refugees in Germany. Therefore, despite the fact that procedures vary between states, they share a common feature: allocation is very rarely linked to individual wishes, economic prospects, or cultural proximity (Stips and Kis-Katos, 2020).

Table 4 provides descriptive evidence on moving patterns of refugees by showing shares of stayers and movers for the full sample, less restrictive states, and more restrictive states. We find that only about 8 percent of refugees moved to another state from their initially assigned state. This suggests that geographical mobility of refugees is limited in Germany.

Our identification assumption and balancing tests

The main objective of the settlement and mobility restriction policy is a fair distribution of refugees across counties aiming at avoiding tensions between natives and refugees, easing fiscal pressures as well as reducing the spatial co-ethnic concentration of refugees. However, a successful match between the distribution of refugees and local conditions was not the primary criterion (OECD, 2017, p. 62). Therefore, the

¹⁶ Exemptions apply, for instance, if the refugee or a close relative (spouse, domestic partner, or child) attends university/vocational training or has taken up employment with a certain number of working hours. For further information, see the Federal Ministry of Justice and Consumer Protection, 2016, Residence Act (Aufenthaltsgesetz) Section 12 a, Art. 1.

¹⁷ Seven states (Baden Württemberg, Bavaria, Hessen, North Rhine-Westphalia, Saarland, Saxony, and Saxony Anhalt) apply the residence rule rigorously by mandating refugees to live in their initial county of residence. Similar geographic immobility rules also apply to the three city states (Berlin, Bremen, and Hamburg). The residency rules are less restrictive in the remaining six states where, conditional on the approval of immigration authorities, refugees are allowed to move to a different county within their initially assigned state.

Table 5

Evidence on the validity of identification assumption - Full sample.

Source: Destatis, IAB-BAMF-SOEP Survey of Refugees, v35 (2016–2018) and Twitter data (2014).

	(1) Unemployment rate std. (2014)	(2) Unemployment rate std. (2014)	(3) Negative sentiment index std. (2014)	(4) Negative sentiment index std. (2014)	(5) Far-right voting share std. (2017)	(6) Far-right vote share std. (2017)
	b/se	b/se	b/se	b/se	b/se	b/se
Age at migration	0.006 (0.006)	−0.001 (0.003)	−0.003 (0.004)	0.000 (0.000)	−0.000 (0.001)	−0.000 (0.001)
Female	−0.104 (0.147)	−0.061 (0.067)	−0.009 (0.016)	−0.007 (0.006)	0.016 (0.038)	−0.025 (0.017)
Secondary education	0.142 (0.114)	0.051 (0.060)	−0.062 (0.048)	−0.006 (0.016)	−0.086 (0.060)	−0.006 (0.017)
Tertiary education	0.188 (0.180)	−0.029 (0.122)	−0.094 (0.065)	−0.034* (0.020)	−0.076 (0.045)	−0.012 (0.037)
Speak German before migration	−0.131 (0.496)	−0.064 (0.373)	0.112* (0.063)	0.023 (0.026)	−0.027 (0.171)	0.012 (0.063)
Write German before migration	0.190 (1.252)	0.089 (0.864)	0.444 (0.487)	−0.054 (0.081)	0.042 (0.272)	−0.062 (0.201)
Read German before migration	0.755 (1.235)	0.589 (0.880)	−0.489 (0.474)	0.037 (0.094)	−0.003 (0.329)	−0.085 (0.108)
Worked in home country	−0.186 (0.171)	−0.050 (0.152)	0.052 (0.055)	−0.014 (0.015)	0.035 (0.039)	−0.016 (0.019)
Support from family or friends	0.294 (0.177)	0.135 (0.090)	0.013 (0.042)	−0.005 (0.016)	0.011 (0.059)	−0.003 (0.030)
Afghan origin	0.208 (0.289)	0.066 (0.123)	−0.095* (0.053)	−0.012 (0.023)	0.166 (0.104)	−0.031 (0.035)
Iraqi origin	−0.001 (0.270)	0.152 (0.100)	−0.140 (0.117)	−0.005 (0.029)	−0.042 (0.100)	−0.018 (0.039)
Other origin	0.371* (0.177)	0.156 (0.177)	−0.018 (0.021)	0.019 (0.012)	0.063 (0.104)	−0.073** (0.030)
Christian confession	−0.340 (0.215)	−0.104 (0.135)	0.071 (0.076)	−0.003 (0.024)	−0.045 (0.072)	−0.017 (0.035)
Other confession	0.105 (0.344)	−0.020 (0.139)	0.158 (0.141)	−0.001 (0.015)	−0.266** (0.118)	−0.030 (0.030)
No confession	0.479* (0.230)	0.132 (0.169)	0.058 (0.068)	−0.010 (0.025)	0.133 (0.133)	−0.013 (0.044)
State FE	No	Yes	No	Yes	No	Yes
Year of arrival FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.017	0.478	0.007	0.905	0.016	0.627
N	5931	5931	6017	6017	6024	6024

Note: Ordinary least squares regression estimates are shown. * significant at 10%; ** significant at 5%; *** significant at 1%. The standard errors are clustered on the state level and are displayed in parentheses. We pool observations from survey years 2016 to 2018 keeping only the most recent survey information. Reference categories are as follows: male, primary education, Syrian origin, and Muslim confession.

policy minimizes concerns related to the endogenous residential sorting of refugees when analyzing the effects of initial local conditions. It also addresses two important potential sources of bias: (i) it is mandatory for states and counties to participate in the allocation program; (ii) it is also mandatory for refugees to participate in the allocation program. All three features (quasi-random allocation, mobility restriction, and mandatory participation) of the settlement policy are crucial for our identification strategy as they generate a quasi-random allocation of refugees to counties. In other words, we rely on a quasi-natural experiment of plausibly exogenous allocation of refugees to identify how initial local conditions effect their multi-dimensional integration outcomes.

Having said this, we acknowledge the possibility that the institutional setting may fail to create a purely exogenous variation for identifying the causal impact of initial conditions. For example, we cannot certainly guarantee that all refugees spent all of their years in their initial county of residence due to the reasons discussed above or that the assignment of refugees into counties is completely free from political influence. All of these possibilities would introduce bias to our estimates.

As discussed earlier, the exogenous allocation of asylum seekers across counties avoids the bias from endogenous sorting due to growing demand for labor (Card, 1990) or pre-existing ethnic enclaves (Edin et al., 2003). Our key identifying assumption is that the allocation of refugees is independent of county-level unemployment rates in 2014 and attitudes towards migrants (negative sentiment index in 2014

and far-right vote share in 2013 and 2017). If the distribution of refugees is indeed exogenous to local conditions, unemployment rates and attitudes towards migrants should be uncorrelated with refugees' individual-level characteristics.

To validate this argument, we provide direct evidence in Table 5 (where the sample is all refugees) and Table 6 (where the sample is refugees in their first two years in Germany) following Barsbai et al., Couttenier et al. (2019). We present balancing tests first without and then with state fixed effects, standardizing dependent variables. In both tables, Columns 1 and 2 present results for county-level unemployment rate; Columns 3 and 4 for county-level negative sentiment index; and Columns 5 and 6 for county-level far-right vote share in 2017; results for county-level far-right vote share in 2013 are in Online Appendix Table A8.

In Table 5, only two out of 90 coefficients are statistically significant at the 5-percent level and five at the 10-percent level. Columns 1, 3, and 5 in Table 6 show that when state fixed effects are not included, none of the individual-level characteristics is statistically significantly related to county-level unemployment rate, negative sentiment index or far-right voting at the 5 percent level of statistical significance, and only two variables have statistically significant relationship at 10 percent level. Once state fixed effects are included, three out of 45 coefficients are statistically significant.¹⁸ Overall, the results presented in Tables 5 and

¹⁸ Tertiary-educated refugees are somewhat more likely to be allocated into counties with less negative sentiment. While this may appear as a problem for

Table 6

Evidence on the validity of identification assumption - Refugees in their first two years in Germany.

Source: Destatis, IAB-BAMF-SOEP Survey of Refugees, v35 (2016–2018) and Twitter data (2014).

	(1) Unemployment rate std. (2014) b/se	(2) Unemployment rate std. (2014) b/se	(3) Negative sentiment index std. (2014) b/se	(4) Negative sentiment index std. (2014) b/se	(5) Far-right voting vote std. (2017) b/se	(6) Far-right vote share std. (2017) b/se
Age at migration	0.001 (0.007)	−0.004 (0.004)	−0.004 (0.005)	0.001 (0.001)	−0.002 (0.002)	0.001 (0.001)
Female	−0.113 (0.203)	0.011 (0.105)	0.020 (0.046)	−0.019 (0.011)	0.034 (0.048)	−0.041 (0.026)
Secondary education	0.044 (0.106)	0.020 (0.080)	−0.048 (0.033)	−0.017 (0.024)	−0.107 (0.069)	−0.016 (0.024)
Tertiary education	0.038 (0.212)	0.004 (0.135)	−0.024 (0.039)	−0.041** (0.017)	−0.048 (0.047)	−0.006 (0.032)
Speak German before migration	−0.455 (0.494)	−0.404 (0.282)	−0.029 (0.174)	0.049 (0.031)	0.290 (0.279)	0.042 (0.080)
Write German before migration	2.188 (2.455)	1.227 (2.420)	−0.050 (0.301)	−0.234 (0.212)	−0.437 (0.372)	−0.092 (0.150)
Read German before migration	−1.570 (2.481)	−0.609 (2.453)	0.322 (0.243)	0.250 (0.185)	0.177 (0.399)	−0.247 (0.198)
Worked in home country	−0.018 (0.230)	0.032 (0.151)	0.019 (0.034)	−0.005 (0.016)	0.082 (0.072)	−0.027 (0.029)
Support from family or friends	0.304 (0.222)	0.261** (0.122)	0.074 (0.092)	0.002 (0.014)	0.050 (0.059)	0.028 (0.035)
Afghan origin	0.213 (0.279)	0.118 (0.239)	−0.048 (0.055)	−0.025 (0.024)	0.121 (0.121)	−0.019 (0.065)
Iraqi origin	0.021 (0.368)	0.247 (0.187)	−0.109 (0.112)	0.027 (0.024)	−0.201* (0.103)	−0.030 (0.048)
Other origin	0.313 (0.259)	0.185 (0.220)	0.037 (0.028)	0.019 (0.017)	0.006 (0.095)	−0.106** (0.046)
Christian confession	−0.125 (0.202)	0.044 (0.160)	0.046 (0.054)	−0.015 (0.017)	−0.067 (0.068)	−0.024 (0.043)
Other confession	0.061 (0.429)	−0.234 (0.242)	0.183 (0.150)	−0.001 (0.029)	−0.153* (0.086)	−0.045 (0.046)
No confession	0.415 (0.263)	0.032 (0.263)	0.074 (0.098)	−0.013 (0.022)	0.291 (0.205)	0.045 (0.064)
State FE	No	Yes	No	Yes	No	Yes
Year of arrival FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.018	0.505	0.010	0.927	0.030	0.639
N	2537	2537	2560	2560	2565	2565

Note: Ordinary least squares regression estimates are shown. * significant at 10%; ** significant at 5%; *** significant at 1%. The standard errors are clustered on the state level and are displayed in parentheses. We pool observations from survey years 2016 to 2018 keeping only the most recent survey information. Reference categories are as follows: male, primary education, Syrian origin, and Muslim confession.

6 strongly suggest that refugees' individual characteristics at arrival are orthogonal to our treatment variables. We also show that our results hold for the far-right vote share in 2013 in Online Appendix Table A8: none of the individual-level characteristics is statistically significant at 5 percent level.

To test whether refugees are more likely to be located into counties that have larger pre-existing number of earlier immigrants from the same origin, we restrict the attention to refugees from Afghanistan, Iraq and Syria which are the only individual countries for which Germany publishes information on immigrants by country of birth at the county level. Results presented in Online Appendix Table A9 show that Afghans (Iraqis) were more likely to be clustered together with other Afghans (Iraqis) than reference category Syrians with other Syrians. The difference is highly significant for Iraqis but only marginally significant for Afghans. Although these results indicate that there is some clustering in counties based on nationality, it is important to note that this clustering is not correlated with education. We present in Online Appendix Table A10 and Online Appendix Table A11 evidence on the validity of identification assumptions when we add share of compatriots in 2012 as an additional control, restricting the attention to the three nationalities for which this information is available. With

identification strategy at the first sight, its effect is alleviated by us always controlling for the level of education.

state fixed effects, those with tertiary education are somewhat less likely to be placed in counties with negative sentiment based on Twitter data, but not based on far-right vote shares or unemployment. As the latter measures are more easily available than the Twitter data that we analyzed only after the asylum seekers had been interviewed, we find it unlikely that the differences would reflect endogenous sorting.

4.2. Empirical strategy

We estimate linear probability models for the dichotomous outcomes for ease of interpretation, though logistic regression models returned similar patterns. For continuous outcomes, we rely on ordinary least squares estimations (OLS). In our main specification using attitudes and unemployment measured in 2014, our models take the form:

$$Y_{ict} = \beta_1 U E_{c,2014} + \beta_2 Attitudes_{c,2014} + \gamma X_{it} + \delta X_{ct} + \eta_t + \zeta_{NUTS-2} + \epsilon_{ict}, \quad (1)$$

where Y_{ict} is the integration outcome of refugee i with the initial county of residence c in interview year t . We use several measures for refugees' social and economic integration in Germany: (i) being in employment or education; (ii) being in full- or part-time employment; (iii) the net monthly wages; and (iv) the Multi-dimensional Integration Index. Since the wage variable has a few outliers and substantial number of zeros, the natural logarithm is an unsuitable transformation. We, therefore, follow common practice and apply the inverse hyperbolic

sine transformation (see, Bellemare and Wichman, 2020 and Aksoy et al., 2021).

We focus on county level for two reasons. First, as most states use a formal allocation rule that determines the allocation of refugees between counties, while leaving the allocation into different municipalities within counties into county administration, we can be more confident on the quasi-randomness of refugee allocation at the county level than, say, at municipal level. A second advantage of focusing on county-level integration outcomes is that counties are, on the one hand, sufficiently numerous so that they allow estimating the effects with a reasonable statistical power, and, on the other hand, sufficiently big so that most of daily interactions take place within the county.

The variable $UE_{c,2014}$ measures the county-level unemployment rate in 2014 in the initial county of residence to address endogeneity of unemployment in response to mass migration (using lags relative to the survey year or year of arrival gives quantitatively similar patterns as shown in the robustness checks). $Attitudes_{c,2014}$ captures attitudes towards migrants in the refugee's initial county of residence, measured in 2014. To be able to compare the point estimates, we report the standardized coefficients throughout the paper. Importantly, raw correlation between initial unemployment rate and negative sentiment towards migrants is low (0.38), suggesting that attitudes do not covary with unemployment. This enables us to estimate the impact of local unemployment on refugee integration, holding attitudes constant and vice versa. The raw correlation between initial unemployment and far-right vote share is even lower (0.19).

In all models, we include the year of interview dummies (to control for shocks that affect outcome variables in multiple counties at the same time) and current NUTS-2 sub-region dummies (to control for time-invariant variation in the outcome variables caused by factors that vary across sub-regions).¹⁹ We also show that our results remain very similar when we include (NUTS-2) sub-region by year fixed effects, which control for all potentially omitted variables that can vary across (NUTS-2) sub-regions and years (such as, a shift in public resources or state-specific integration policies).

X_{it} is a vector of demographic variables that includes: a dummy variable for female gender; a dummy variable for the presence of children in the household (any child aged 15 or below); a dummy variable for being married/living in partnership; a dummy for the German language skills before migration;²⁰ a dummy variable for having received support from family or friends before migration; a dummy variable for having completed an integration course; a dummy variable indicating a good health status; age group dummies (25–29, 30–34, 35–39, 40–44, 45–49)²¹; education dummies (secondary education, tertiary education; acquired in the country of origin); country of origin dummies (Afghan origin, Iraqi origin, other origin) with Syrian origin as reference category; religion dummies (Christian, No confession, Other confession) with Muslim as reference category; dummy variables for years of residence in Germany (three years of residence, four years of residence) with two years of residence as reference category. One might worry that some of the individual characteristics (such as language skills) are potential “bad controls”. We report in the Online Appendix that excluding these individual characteristics does not substantively change the point estimates for our variables of interest.

¹⁹ We cannot include county-fixed effects since county-level unemployment rates and attitudes towards migrants are measured in 2014. Instead, we include current NUTS-2 sub-region fixed effects throughout.

²⁰ The respective survey questions separately asks: How well could you read/speak/write German before you moved to Germany? [Not at all; Poorly; Fairly; Good; Very good]. The dummy variable takes a value of one for refugees with at least “good” German skills in all three dimensions and zero otherwise.

²¹ For the outcome variable “Full- or part-time employed”, we restrict the age range to refugees aged 25 to 49. Hence, in this case we restrict the age dummies to 30–34, 35–39, 40–44, 44–49.

X_{ct} is a vector of county-level existing migrant networks that includes: the share of Syrians, Afghans, and Iraqis in the current county of residence in 2014, which control for the existing migrant networks.²² We cluster robust standard errors, e_{ict} , at the level of county to account for the potential correlation existing in the errors within the same county. We show in the Online Appendix that our results remain virtually the same, when standard errors are calculated using corrections for spatial correlation (Conley, 1999)²³ and clustered at the state level.

Our specification (1) can be interpreted as an intention-to-treat (ITT) estimate as it estimates the effect of the county-level unemployment rate and attitudes towards migrants in the county to which refugees were initially assigned – which we assume to be the county in which refugees who have not yet spent more than two years in Germany have spent most of their time in Germany – on labor market outcomes at the time of the interview. Given the very limited mobility of refugees in the first two years that we have discussed above, the ITT estimate should be fairly close to the average treatment effect (ATE).

5. Results

In this section, we analyze how local unemployment and attitudes towards immigrants affect refugees' labor market and social integration outcomes. Local initial conditions and outcomes are measured at the county level. We measure attitudes towards immigrants either by our Twitter-based measure, the negative sentiment index, or by far-right vote share. We then unbundle the effects on different components of the Multi-dimensional Integration Index, and investigate the heterogeneity by gender. We report various robustness checks in the Online Appendix.

5.1. Main results

We first examine the effects of local conditions (that is, unemployment rate and negative attitudes towards immigrants) on the probability of refugees being in employment or education (Column 1 of Table 7); being in full- or part-time employment (Column 2 of Table 7); their net monthly wages (Column 3 of Table 7); and the Multi-dimensional Integration Index (Column 4 of Table 7). Panel A of Table 7 presents results when we use the negative sentiment index to capture attitudes towards migrants while Panel B of Table 7 uses far-right vote shares.

We present results for refugees aged 18 to 49 in the year of the interview, apart from Column 2 in which the age restriction is 25 to 49. The sample is restricted to those with a minimum of two years of residence in Germany and standardized coefficients are reported throughout.

Unemployment, Negative Sentiment Index, and Integration Outcomes

Panel A of Table 7 shows that both the county-level unemployment rate and attitudes towards immigrants (proxied by the negative sentiment index) play a major role: working-age refugees who are assigned to counties with one standard deviation more negative sentiment towards immigrants or to counties with one standard deviation higher unemployment rate are about 5 percentage points less likely to be in employment (full- or part-time) a few years later. We also find that both unemployment rate and negative sentiment index have statistically

²² To be precise, we incorporate the stock of Syrians, Afghans or Iraqis seeking protection per county on December 31, 2014. This includes all asylum seekers, humanitarian migrants, and tolerated foreigners; cf. <https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Migration-Integration/Glossar/schutzsuchende.html> last accessed on May 3, 2022.

²³ In particular, we use statistical package, *acreg*, provided by Colella et al. (2019). The cut-off window we use is 100 km, but the results are virtually unchanged for 75 km, 125 km, and 150 km—the results with alternative distance cut-offs are not reported here but available upon request.

Table 7

Determinants of refugees' labor market and social outcomes.

Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016–2018) and Twitter data (2014).

Panel A	(1) In employment or education b/se	(2) Full or part-time b/se	(3) Net monthly wages b/se	(4) Multi-dimensional Integration Index b/se
Unemployment rate std. (2014)	−0.051*** (0.014)	−0.052*** (0.013)	−0.345*** (0.082)	−0.017*** (0.007)
Oster's δ for $\beta = 0$	9.186	55.190	5.999	−5.432
Negative sentiment index std. (2014)	−0.035 (0.028)	−0.051** (0.024)	−0.345* (0.207)	−0.025** (0.011)
Oster's δ for $\beta = 0$	−5.884	7.377	105.670	14.550
Interview year FE	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes
Mean of outcome	0.242	0.138	1.227	0.513
R-Squared	0.216	0.198	0.213	0.258
N	3030	2329	2878	2280
Panel B	(1) In employment or education b/se	(2) Full or part-time b/se	(3) Net monthly wages b/se	(4) Multi-dimensional Integration Index b/se
Unemployment rate std. (2014)	−0.047*** (0.014)	−0.049*** (0.012)	−0.327*** (0.084)	−0.016** (0.007)
Oster's δ for $\beta = 0$	4.470	9.156	3.902	−7.000
Far-right vote share std. (2017)	−0.032** (0.013)	−0.022** (0.011)	−0.144* (0.084)	−0.010** (0.005)
Oster's δ for $\beta = 0$	28.518	5.036	5.088	69.426
Interview year FE	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes
Mean of outcome	0.242	0.138	1.227	0.513
R-Squared	0.217	0.197	0.212	0.257
N	3035	2332	2883	2285

Note: Ordinary least squares regression estimates are shown. * significant at 10%; ** significant at 5%; *** significant at 1%. The standard errors are clustered on the county level and are displayed in parentheses. Oster's δ shows the degree of selection on unobservables relative to observables that would be necessary to fully explain the result by omitted-variable bias. The rule of thumb to be able to argue that unobservables cannot fully explain the treatment effect is for Oster's δ to be over the value of one. We pool observations from survey years 2016 to 2018 keeping only the most recent survey information. The sample is restricted to individuals with a minimum of two years of residence in Germany. Outcome variable "In employment or education" takes a value of one for refugees who report being in employment or education. Outcome variable "Full- or part-time employed" is one for refugees who report being in full- or part-time employment. Outcome "Net monthly wages" are net monthly wages, in inverse hyperbolic sine transformation. Table 7 includes the full set of covariates, as described in Section 4.2. For illustrative purposes, control variables are not shown. For the full set of variables, please check Online Appendix Table A12. Reference categories are as follows: male, primary education, aged 18-24 (aged 25-29 for full- or part-time employment), two years of residence in Germany, Syrian origin, and Muslim confession.

significant negative effects on net monthly wages (with the effects being quantitatively the same). Note that the estimated wages cannot go below zero as we use inverse hyperbolic sine transformation for net monthly wages. In Column 4, we find that less favorable attitudes towards immigrants and unemployment rate also negatively affect refugees' multi-dimensional integration.²⁴ Online Appendix Table A12 reports the full set of covariates.

The magnitude of the standardized coefficients suggests that attitudes towards migrants are somewhat more important than the local unemployment rate when it comes to multi-dimensional integration of refugees. It is also important to note that while local unemployment rate is a precise measure, our measures of local attitudes are likely to contain some degree of measurement error. Therefore, it is possible that local attitudes are more important than unemployment rate, but we also have more attenuation bias for attitudes.

Unemployment, Far-right Voting, and Integration Outcomes

In a democratic society, voting can reveal voters' true preferences to politicians and the general public and may be used strategically

to punish or reward politicians and parties. To what extent do the local populations' negative attitudes towards immigrants – proxied by their voting for anti-immigration parties – hamper refugees' economic and social integration? To answer this question, we turn to our second measure of negative attitudes towards immigrants: far-right vote shares. We focus on county-level electoral results in the 2017 federal election, showing results for the 2013 federal election in the robustness checks. The raw correlation between our twitter based attitudes measure (i.e., negative sentiment index) and far-right vote share in 2017 (2013) is 0.65 (0.64).

Panel B of Table 7 suggests a strong negative effect of far-right vote shares on refugees' subsequent integration outcomes. Working-age refugees who are assigned to counties with a one standard deviation increase in far-right vote share, corresponding to a 1.07 percentage point increase in their vote share, are 3.2 percentage points less likely to be in employment or education, 2.2 percentage points less likely to be in full-time or part-time employment, and earn 14.4 percent lower net monthly wages, on average. Importantly, these effects are present when local unemployment rates are also controlled for.²⁵

²⁴ Since having children affects labor supply of men and women differently, we also tested a specification with an interaction term between "Children in the household" and "Female". Our results are available upon request and are similar to the specification without an interaction term.

²⁵ In the first version of this paper, circulated as CESifo Working Paper No. 8747 in 2020, we used AfD vote share at the county level as one attitude measure, and the results were qualitatively similar. More recently, Schilling

Table 8

Unbundling the Multi-dimensional Integration Index.

Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016–2018) and Twitter data (2014).

Panel A	(1) Psychological b/se	(2) Linguistic b/se	(3) Economic b/se	(4) Political b/se	(5) Social b/se	(6) Navigational b/se
Unemployment rate std. (2014)	−0.002 (0.012)	−0.002 (0.009)	−0.040*** (0.012)	−0.002 (0.006)	−0.031** (0.015)	−0.011 (0.012)
Oster's δ for $\beta = 0$	−2.311	−2.298	−2.785	2.290	2.227	−4.477
Negative sentiment index std. (2014)	−0.023 (0.015)	−0.008 (0.014)	−0.057** (0.025)	−0.000 (0.010)	−0.041** (0.018)	0.001 (0.019)
Oster's δ for $\beta = 0$	6.640	2.689	12.232	−3.864	−6.564	−0.469
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of outcome	0.742	0.507	0.299	0.959	0.471	0.475
R-Squared	0.080	0.357	0.273	0.057	0.155	0.065
N	2280	2280	2280	2280	2280	2280
Panel B	(1) Psychological b/se	(2) Linguistic b/se	(3) Economic b/se	(4) Political b/se	(5) Social b/se	(6) Navigational b/se
Unemployment rate std. (2014)	−0.004 (0.012)	−0.006 (0.009)	−0.032*** (0.012)	−0.006 (0.006)	−0.038** (0.015)	−0.014 (0.012)
Oster's δ for $\beta = 0$	−2.246	−2.256	−2.775	3.171	3.465	−5.887
Far-right vote share std. (2017)	−0.018 (0.015)	−0.011 (0.013)	−0.049** (0.025)	−0.004 (0.010)	−0.053*** (0.011)	0.005 (0.013)
Oster's δ for $\beta = 0$	4.452	3.918	11.746	−3.928	−6.467	−1.236
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of outcome	0.742	0.507	0.299	0.959	0.471	0.475
R-Squared	0.080	0.357	0.273	0.057	0.155	0.065
N	2280	2280	2280	2280	2280	2280

Note: Ordinary least squares regression estimates are shown. * significant at 10%; ** significant at 5%; *** significant at 1%. The standard errors are clustered on the county level and are displayed in parentheses. Oster's δ shows the degree of selection on unobservables relative to observables that would be necessary to fully explain the result by omitted-variable bias. The rule of thumb to be able to argue that unobservables cannot fully explain the treatment effect is for Oster's δ to be over the value of one. We pool observations from survey years 2016 to 2018 keeping only the most recent survey information. The sample is restricted to individuals with a minimum of two years of residence in Germany. Dimensions are set similar to Harder et al. (2018). Table 8 includes the full set of covariates, as described in Section 4.2. For illustrative purposes, control variables are not shown. Reference categories are as follows: male, primary education, aged 18–24 (aged 25–29 for full- or part-time employment), two years of residence in Germany, Syrian origin, and Muslim confession.

Our results complement previous research that has shown that immigration has increased the support for far-right parties across Europe (see, for example, Otto and Steinhardt, 2014, Halla et al., 2017, Dustmann et al., 2019, Edo et al., 2019, Hangartner et al., 2019). While these papers have used exogenous distribution mechanisms or instrumented immigrant residential allocations to estimate the impact of immigration on far-right voting, we estimate to what extent negative attitudes by locals, expressed in their far-right voting, hamper integration outcomes of refugees who have been exogenously allocated to a given location.

Robustness to omitted variable bias

Although we exploit the plausibly exogenous variation generated by centralized refugee allocation policy and control for various observable characteristics and fixed effects, one still might be concerned whether our results are driven by omitted unobservable factors (such as political influence in refugees' allocation across counties). To investigate this concern formally, we perform a rigorous robustness check following the method proposed by Oster (2019).

For our main variables of interest, we separately calculate the Oster's delta in Table 7, which indicates the degree of selection on

and Stillman (2021) found similar results with AfD vote shares at the municipal level. We prefer to analyze voting at the county level as refugees are allocated by states to counties, not municipalities, and refugee allocation within counties could respond to municipal-level attitudes towards immigrants. In the current version, we switched to the vote share of all far-right parties as it is a more comprehensive measure than the AfD vote alone.

unobservables relative to observables that would be needed to fully explain our results by omitted variable bias. In particular, following Oster (2019), we use the rule of thumb for $R_{\max}$ ($1.3 \times R$ -squared), after partialling out the NUTS-2 and interview year fixed effects. We also use controls for age and gender in all regressions, and include controls for variables such as educational attainment, marital status, and children in the household, German skills, network and so on in the “controlled regression”. The latter informs on the importance of unobservables.

High delta values indicate that the unobservables have a smaller effect on our coefficient of interest than the observables. Given the plausibly exogenous variation generated by the policy and wide-range of controls we include in our models, it is extremely unlikely that there are unobserved factors that are 5 to 105 times as important as all observables. Note that the rule of thumb to be able to argue that unobservables cannot fully explain the treatment effect is for Oster's delta to be over the value of one. Therefore, we conclude that our results are unlikely to be driven by omitted-variable bias.

Robustness to NUTS-2 sub-region by year fixed effects

To further mitigate the concerns about omitted variables bias, we also saturate our main specification with NUTS-2 sub-region by year fixed effects. This is very demanding as they control for all potential omitted variables (such as within-state policy changes on refugee accommodation or reallocation of funds in areas where the locals have more positive attitudes towards immigrants) that can vary across NUTS-2 sub-regions and years. The results presented in Online Appendix Table A13 are qualitatively similar.

Comparison of our results with those in the literature

To put our results in perspective, Azlor et al. (2020) and Eckert et al. (2022) exploit the variation generated by the Danish spatial dispersal

Table 9

Determinants of refugees' labor market and social outcomes, by gender.

Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016–2018) and Twitter data (2014).

Panel A	(1) In employment or education	(2) Full or part-time	(3) Net monthly wages	(4) Multi-dimensional Integration Index
<i>Sample: Males</i>				
Unemployment rate std. (2014)	−0.066*** (0.018)	−0.070*** (0.020)	−0.442*** (0.118)	−0.024*** (0.008)
Negative sentiment index std. (2014)	−0.038 (0.038)	−0.055 (0.039)	−0.334 (0.291)	−0.018 (0.014)
Interview year FE	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes
Mean of outcome	0.380	0.260	2.162	0.565
R-Squared	0.177	0.170	0.196	0.199
N	1846	1369	1713	1402
<i>Sample: Females</i>				
Unemployment rate std. (2014)	−0.016 (0.018)	−0.020 (0.015)	−0.156** (0.072)	−0.008 (0.009)
Negative sentiment index std. (2014)	−0.025 (0.031)	−0.020 (0.020)	−0.216** (0.072)	−0.033** (0.015)
Interview year FE	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes
Mean of outcome	0.114	0.043	0.472	0.469
R-Squared	0.148	0.111	0.109	0.262
N	1184	960	1165	878
Panel B	(1) In employment or education	(2) Full or part-time	(3) Net monthly wages	(4) Multi-dimensional Integration Index
<i>Sample: Males</i>				
Unemployment rate std. (2014)	−0.061*** (0.018)	−0.066*** (0.019)	−0.423*** (0.123)	−0.023*** (0.009)
Far-right vote share std. (2017)	−0.031* (0.018)	−0.031* (0.018)	−0.111 (0.123)	−0.007 (0.005)
Interview year FE	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes
Mean of outcome	0.380	0.260	2.162	0.565
R-Squared	0.177	0.171	0.195	0.196
N	1848	1370	1715	1404
<i>Sample: Females</i>				
Unemployment rate std. (2014)	−0.015 (0.018)	−0.020 (0.015)	−0.148 (0.092)	−0.006 (0.010)
Far-right vote share std. (2017)	−0.022* (0.013)	0.000 (0.006)	−0.135* (0.072)	−0.011 (0.008)
Interview year FE	Yes	Yes	Yes	Yes
NUTS-2 FE	Yes	Yes	Yes	Yes
Mean of outcome	0.114	0.043	0.472	0.469
R-Squared	0.149	0.111	0.109	0.259
N	1187	962	1168	881

Note: Ordinary least squares regression estimates are shown. * significant at 10%; ** significant at 5%; *** significant at 1%. The standard errors are clustered on the county level and are displayed in parentheses. We pool observations from survey years 2016 to 2018 keeping only the most recent survey information. The sample is restricted to individuals with a minimum of two years of residence in Germany. Outcome variable “In employment or education” is one for refugees who report being in employment or education. Outcome variable “Full- or part-time employed” is one for refugees who report being in full- or part-time employment. Outcome “Net monthly wages” are net monthly wages, in inverse hyperbolic sine transformation. Table 9 includes the full set of covariates, as described in Section 4.2. For illustrative purposes, control variables are not shown. Reference categories are as follows: primary education, aged 18–24 (aged 25–29 for full- or part-time employment), two years of residence in Germany, Syrian origin, and Muslim confession.

policy. Azlor et al. (2020) find that assignment to a municipality with a one percentage point higher unemployment rate decreases the individual employment probability of refugees by 0.9–1.7 percentage points two to four years after asylum. Eckert et al. (2022) find that refugees placed in Copenhagen had initially similar earnings as refugees placed in the rest of Denmark, but enjoyed 35 percent faster wage growth for each additional year of experience.

On average, our estimates for Germany are larger than those estimated by Azlor et al. (2020) for Denmark. One potential explanation for why the location itself may have larger effects on the labor market in Germany than Denmark is the presence of more big cities and urban areas in Germany. As mentioned earlier, Eckert et al. (2022) identified a “big city premium” in Denmark, meaning that refugees placed in Copenhagen had initially similar earnings as refugees placed in the

rest of Denmark but enjoyed 35 percent faster wage growth for each additional year of experience. However, Copenhagen is the only big city in Denmark. On the other hand, Germany has several big cities and urban areas. Therefore, the location-based effects on the labor market may be larger in Germany than in Denmark due to the presence of more big cities and urban areas in Germany.

5.2. Unbundling the multi-dimensional integration index

This section explores how unemployment rate, the negative sentiment index, and far-right vote share affect the components of Multi-dimensional Integration Index. In Table 8, we consider six sub-indices of the Multi-dimensional Integration Index. The outcomes across the columns are as follows: Psychological Integration in Column 1; Linguistic Integration in Column 2; Economic Integration in Column 3;

Political Integration in Column 4; Social Integration in Column 5; and Navigational Integration in Column 6. Panel A of Table 8 presents results when we use the negative sentiment index to capture attitudes towards migrants, while Panel B of Table 8 uses far-right vote shares.

The results presented in Panel A suggest that both the unemployment rate and the negative sentiment index are relevant in explaining social and economic components of the index with similar point estimates. Yet, we find no evidence that the unemployment rate or the negative sentiment index affects psychological, linguistic, political, or navigational integration outcomes. When we focus on far-right vote shares in Panel B, we again find similar patterns that our treatments matter for social and economic components of the index.

Although we view this as an exploratory exercise rather than a testing of a specific hypothesis, our results suggest that attitudes towards migrants not only matter for refugees' economic integration but also affect their social integration into the host country. This finding is important as previous literature has not paid much attention to the role of attitudes towards immigrants in refugees' integration.

5.3. Gender differences

Table 9 shows the effects of unemployment rate and the negative sentiment index in Panel A and the effects of unemployment rate and the far-right vote share in Panel B. Within each panel, we present results for males and females separately.

The effects of local unemployment are considerably stronger for males. A one standard deviation higher initial local unemployment reduces males' chances of being in full- or part-time employment by about 7 percentage points, the effect being almost identical when analyzing being in employment or education, and also depresses net monthly wages and values of the Multi-dimensional Integration Index.

The negative sentiment index, in turn, predicts lower earnings and multi-dimensional integration for females. For females, the point estimate of the earnings penalty of a one standard deviation higher negative sentiment index (that is, -0.216) is larger than the point estimate of the earnings penalty of a one standard deviation higher local unemployment rate (that is, -0.156). While the far-right vote share is negatively associated with integration outcomes for both men and women, the patterns are less clear-cut.

6. Conclusion

In this paper, we analyzed how local conditions at the time of refugees' arrival affect their short-term integration outcomes. Leveraging the variation generated by the centralized allocation policy used in Germany, we find that both high local unemployment and negative attitudes towards migrants negatively affect refugees' economic and social integration. A one standard deviation increase in county-level unemployment rate leads to a decrease of 5.1 (5.2) percentage points in refugees' likelihood of being in employment or education (full- or part-time employment), and a one standard deviation increase in the negative sentiment index leads to a 3.5 (5.1) percentage points decrease in refugees' likelihood of being in employment or education (full- or part-time employment).

Our results highlight the importance of initial conditions for facilitating refugee integration. They also have implications for the design of refugee allocation policies. Although there is a strong political argument in favor of allocating refugees across the whole country, our results suggest that these policies come at a significant cost for subsequent integration outcomes for those refugees placed in worse performing and less welcoming regions. One possible way to address these concerns, while maintaining the principle of allocating refugees across the country, would be to change the weighting scheme to highlight even more the integration capacity of different states. At the European level, our findings suggest that a proposed quota system that seeks to distribute asylum seekers among EU member states could

present obstacles to effective integration. When refugees are placed in regions characterized by high unemployment rates and hostile attitudes towards immigrants, they may face challenges in attaining economic and social integration. Furthermore, political complexities may emerge, such as tensions between EU member states and reservations from countries unwilling to accommodate a greater influx of refugees.

CRedit authorship contribution statement

Cevat Giray Aksoy: Conceptualization, Methodology, Software, Writing – original draft, Writing – review & editing, Data curation. **Panu Poutvaara:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Supervision. **Felicitas Schikora:** Conceptualization, Data curation, Methodology, Software, Formal analysis, Visualization, Investigation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The IAB-BAMF-SOEP Survey of Refugees and county-level data from Destatis are available to researchers free of charge upon application.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.jue.2023.103588>.

References

- Ajzenman, Nicolas, Aksoy, Cevat Giray, Guriev, Sergei, 2022. Exposure to transit migration: Public attitudes and entrepreneurship. *J. Dev. Econ.* 158, 102899.
- Aksoy, Cevat Giray, Ozcan, Berkay, Philipp, Julia, 2021. Robots and the gender pay gap in Europe. *Eur. Econ. Rev.* 134, 103693.
- Aksoy, Cevat Giray, Poutvaara, Panu, 2021. Refugees' and irregular migrants' self-selection into Europe. *J. Dev. Econ.* 152, 102681.
- Åslund, Olof, Rooth, Dan-Olof, 2007. Do when and where matter? Initial labour market conditions and immigrant earnings. *Econ. J.* 117 (518), 422–448.
- Azlor, Luz, Damm, Anna Piil, Schultz-Nielsen, Marie Louise, 2020. Local labour demand and immigrant employment. *Labour Econ.* 63 (1), 101808.
- Bailey, Michael, Johnston, Drew M., Koenen, Martin, Kurchler, Theresa, Russel, Dominic, Stroebel, Johannes, 2022. The Social Integration of International Migrants: Evidence from the Networks of Syrians in Germany. NBER Working Papers 29925.
- BAMF, 2022. Initial distribution of asylum-seekers (EASY). <https://www.bamf.de/EN/Themen/AsylFluechtlingsschutz/AblaufAsylverfahrens/Erstverteilung/erstverteilung-node.html>. (Last Accessed on 6 May 2022).
- Barsbai, Toman, Steinmayr, Andreas, Winter, Christoph, Immigrating into a Recession: Evidence from Family Migrants to the U.S., *Journal of Labor Economics*, forthcoming.
- Battisti, Michele, Giesing, Yvonne, Laurentsyeve, Nadzeya, 2019. Can job search assistance improve the labour market integration of refugees? Evidence from a field experiment. *Labour Econ.* 61, 101745.
- Beaman, Lori A., 2012. Social networks and the dynamics of labour market outcomes: Evidence from refugees resettled in the US. *Rev. Econom. Stud.* 79 (1), 128–161.
- Becker, Sascha O., Ferrara, Andreas, 2019. Consequences of forced migration: A survey of recent findings. *Labour Econ.* 59, 1–16.
- Bellemare, Marc F., Wichman, Casey J., 2020. Elasticities and the inverse hyperbolic Sine transformation. *Oxf. Bull. Econ. Stat.* 82, 50–61.
- Brell, Courtney, Dustmann, Christian, Preston, Ian, 2020. The labor market integration of refugee migrants in high-income countries. *J. Econ. Perspect.* 34 (1), 94–121.
- Brücker, Herbert, Kosyakova, Yuliya, Schuss, Eric, 2020. Integration in arbeitsmarkt und bildungssystem macht fortschritte. IAB-Kurzbericht (4).
- Brücker, Herbert, Rother, Nina, Schupp, Jürgen, 2016. IAB-BAMF-SOEP-Befragung von Geflüchteten: überblick und erste Ergebnisse. *Politikberatung kompakt* 116.
- Card, David, 1990. The impact of the Mariel boatlift on the Miami labor market. *ILR Rev.* 43 (2), 245–257.
- Card, David, Dustmann, Christian, Preston, Ian, 2012. Immigration, wages, and compositional amenities. *J. Eur. Econom. Assoc.* 10 (1), 78–119.

- Chiswick, Barry R., Miller, Paul W., 1999. Immigrant earnings: Language skills, linguistic concentrations and the business cycle. *J. Popul. Econ.* 15 (1), 31–57.
- Cockx, Bart, Ghirelli, Corinna, 2016. Scars of recessions in a rigid labor market. *Labour Econ.* 16 (2), 162–176.
- Colella, Fabrizio, Lalive, Rafael, Sakalli, Seyhun Orcan, Thoenig, Mathias, 2019. Inference with Arbitrary Clustering. IZA Discussion Paper 12584.
- Conley, Timothy G., 1999. GMM estimation with cross sectional dependence. *J. Econometrics* 92 (1), 1–45.
- Cortes, Kalena E., 2004. Are refugees different from economic immigrants? Some empirical evidence on the heterogeneity of immigrant groups in the United States. *Rev. Econ. Stat.* 86 (2), 465–480.
- Couttenier, Mathieu, Petrencu, Veronica, Rohner, Dominic, Thoenig, Mathias, 2019. The violent legacy of conflict: Evidence on asylum seekers, crime, and public policy in Switzerland. *Amer. Econ. Rev.* 109 (12), 4378–4425.
- Damm, Anna P., 2009. Ethnic enclaves and immigrant labor market outcomes: Quasi-experimental evidence. *J. Labor Econ.* 27 (2), 281–314.
- DIW, 2017. IAB-BAMF-SOEP-Befragung Geflüchteter in Deutschland. DIW, URL https://www.diw.de/de/diw_01.c.538695.de/forschung_beratung/iab_bamf_soep_befragung_gefuechteter_in_deutschland.html, https://www.diw.de/de/diw_02.c.244287.de/ueber_uns/menschen_am_diw_berlin/mitarbeiter_innen.html?id=diw_01.c.538695.de. (Last Accessed on 30 September 2021).
- Dustmann, Christian, Vasiljeva, Kristine, Damm, Anna Piil, 2019. Refugee migration and electoral outcomes. *Rev. Econom. Stud.* 86 (5), 2035–2091.
- Eckert, Fabian, Hejlesen, Mads, Walsh, Conor, 2022. The return to big-city experience: Evidence from refugees in Denmark. *J. Urban Econ.* 130, 103454.
- ECRE, 2017. European Council on Refugees and Exiles Country Report on Germany. Tech. rep., Available at: <https://asylumineurope.org/reports/country/germany/>.
- Edin, Per-Anders, Fredriksson, Peter, Åslund, Olof, 2003. Ethnic enclaves and the economic success of immigrants—Evidence from a natural experiment. *Q. J. Econ.* 118 (1), 329–357.
- Edin, Per-Anders, Fredriksson, Peter, Åslund, Olof, 2004. Settlement policies and the economic success of immigrants. *J. Popul. Econ.* 17 (1), 133–155.
- Edo, Anthony, Giesing, Yvonne, Öztunc, Jonathan, Poutvaara, Panu, 2019. Immigration and electoral support for the far-left and the far-right. *Eur. Econ. Rev.* 115, 99–143.
- Facchini, Giovanni, Mayda, Anna Maria, 1999. From individual attitudes towards migrants to migration policy outcomes: Theory and evidence. *Econ. Policy* 23 (56), 652–713.
- Fasani, Francesco, Frattini, Tommaso, Minale, Luigi, 2021. Lift the ban? Initial employment restrictions and refugee labour market outcomes. *J. Eur. Econ. Assoc.* 19 (5), 2803–2854.
- Foged, Mette, Hasager, Linea, Peri, Giovanni, Arendt, Jacob N., Bolvig, Iben, 2022. Language training and refugees' integration. *Rev. Econ. Stat.* http://dx.doi.org/10.1162/rest_a.01216.
- Geis, W., Orth, A.K., 2016. Flüchtlinge regional besser verteilen. Ausgangslage und Ansatzpunkte für einen neuen Verteilungsmechanismus. Institut der deutschen Wirtschaft Köln.
- Godoy, Anna, 2017. Local labor markets and earnings of refugee immigrants. *Empir. Econ.* 52 (1), 31–58.
- Goebel, Jan, Grabka, Markus M., Liebig, Stefan, Kroh, Martin, Richter, David, Schröder, Carsten, Schupp, Jürgen, 2019. The German Socio-economic Panel (SOEP). *Jahrbücher für Nationalökonomie und Statistik* 239 (2), 345–360.
- Halla, Martin, Wagner, Alexander F., Zweimüller, Josef, 2017. Immigration and voting for the far right. *J. Eur. Econom. Assoc.* 15 (6), 1341–1385.
- Hangartner, Dominik, Dinas, Elias, Marbach, Moritz, Matakos, Konstantinos, Xefteris, Dimitrios, 2019. Does exposure to the refugee crisis make natives more hostile? *Am. Political Sci. Rev.* 113 (2), 442–455.
- Harder, Niklas, Figueroa, Lucila, Gillum, Rachel M., Hangartner, Dominik, Laitin, David D., Hainmueller, Jens, 2018. Multidimensional measure of immigrant integration. *Proc. Natl. Acad. Sci.* 115 (45), 11483–11488.
- Jaschke, Philipp, Sardoschau, Sulin, Tabellini, Marco, 2022. Scared Straight? Threat and Assimilation of Refugees in Germany. NBER Working Paper 30381.
- Kahn, Lisa B., 2010. The long-term labor market consequences of graduating from college in a bad economy. *Labour Econ.* 17 (2), 303–316.
- Kühne, Simon, Jacobsen, Jannes, Kroh, Martin, 2019. Sampling in times of high immigration: The survey process of the IAB-BAMF-soep survey of refugees. Survey Methods: Insights from the Field: <https://surveyinsights.org/?p=11416>.
- Marbach, Moritz, Hangartner, Dominik, Hainmueller, Jens, 2018. The long-term impact of employment bans on the economic integration of refugees. *Sci. Adv.* 4 (9), 1–6.
- Martén, Linna, Hainmueller, Jens, Hangartner, Dominik, 2019. Ethnic networks can foster the economic integration of refugees. *Proc. Natl. Acad. Sci.* 116 (33), 16280–16285.
- Matakos, Kostas, Savolainen, Riikka, Tukiainen, Janne, 2020. Refugee Migration and the Politics of Redistribution: Do Supply and Demand Meet? Abou Center for Economics Discussion Papers 132.
- OECD, 2017. Finding their Way: Labour Market Integration of Refugees in Germany. Tech. rep., Available at: <https://www.oecd.org/els/mig/Finding-their-Way-Germany.pdf>.
- Oster, Emily, 2019. Unobservable selection and coefficient stability: Theory and evidence. *J. Bus. Econom. Statist.* 37 (2), 187–204.
- Otto, Alkis H., Steinhart, Max F., 2014. Immigration and election outcomes—Evidence from city districts in Hamburg. *Reg. Sci. Urban Econ.* 45, 67–79.
- Sarvimäki, Matti, Hämäläinen, Kari, 2016. Integrating immigrants: The impact of restructuring active labor market programs. *J. Labor Econ.* 34 (2), 479–508.
- Schilling, Pia, Stillman, Steven, 2021. The Impact of Natives' Attitudes Towards Immigrants on Their Integration in the Host Country. CESifo Working Paper 9308.
- Stips, Felix, Kis-Katos, Krisztina, 2020. The impact of co-national networks on asylum seekers' employment: Quasi-experimental evidence from Germany. *PLoS One* 8.
- Strang, Alison, Ager, Alastair, 2010. Refugee integration: Emerging trends and remaining agendas. *J. Refugee Stud.* 23 (4), 589–607.
- von Schwanit, Hannes, Wachter, Till, 2019. Unlucky cohorts: estimating the long-term effects of entering the labor market in a recession in large cross-sectional data sets. *J. Labor Econ.* 37 (S1), S161–S198.
- Young, Alwyn, 2019. Channeling Fisher: Randomization tests and the statistical insignificance of seemingly significant experimental results. *Q. J. Econ.* 134 (2), 557–598.