

# The Economic Implications of Migration

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# The Economic Implications of Migration

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# Collaboration with Coauthors and Publications

## **Kapitel 1: Must I stay or may I go? Initial residence restrictions and refugees' language acquisition**

- Kapitel 1 basiert auf einem bisher unveröffentlichten Artikel, der in Alleinarbeit angefertigt wurde.
- Vorveröffentlichung: SOEP papers 1035 (2019)
- Schikora (2019)

## **Kapitel 2: First time around: Local conditions and multi-dimensional integration of refugees**

- Kapitel 2 basiert auf einem bisher unveröffentlichten Artikel, der zu gleichen Teilen mit Panu Poutvaara und Cevat Giray Aksoy angefertigt wurde.
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- Aksoy et al. (2020)

## **Kapitel 3: Hate is too great a burden to bear: Hate crimes and the mental health of refugees**

- Kapitel 3 basiert auf einem bisher unveröffentlichten Artikel, der zu gleichen Teilen mit Daniel Graeber angefertigt wurde.
- Graeber and Schikora (2020)

## **Kapitel 4: Migrants' Missing Votes**

- Kapitel 4 basiert auf einem bisher unveröffentlichten Artikel, der zu gleichen Teilen mit Yvonne Giesing angefertigt wurde.
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*An education is not so much as making a living, but making a person.*

Tara Westover, Educated.

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# Introduction

The number of international migrants continues to grow throughout all world regions, reaching 272 million people (3.5 percent of the global population) at the end of 2019 (UN DESA 2019). Migration flows are highly asymmetrical: While some countries are undergoing high emigration, others are experiencing mass immigration. Europe has been a major destination for migration in recent years and currently hosts the largest number of migrants worldwide (82 million). The majority of these migrants moved for economic or family reasons, benefiting from the free movement of labor within the European Union. Yet due to ongoing and violent conflicts, forced migration has almost doubled over the last decade,<sup>1</sup> and roughly 3.3 million asylum seekers entered Europe between 2015 and 2017 (Eurostat 2020).

This thesis analyzes the economic, political, and social consequences of migration in countries of destination and origin. The first three chapters focus on refugee migration to Germany and investigate the determinants of refugees' social and structural integration, i.e., language acquisition and participation in education and labor markets. The last chapter investigates the political effects of emigration in Poland, which has seen large rates of emigration since its accession to the European Union, resulting in 4.4 million Polish citizens currently living abroad (11.4 percent of the total population according to UN DESA (2019)).

The four chapters are linked by the use of identification strategies that focus on the estimation of causal effects. Decisions about migration are made based on careful consideration of costs and benefits and are thus endogenous (Borjas 1987; Sjaastad 1962). It is therefore essential to use methodologies that overcome these challenges and provide consistent estimates. In this thesis, three distinct empirical strategies are used to estimate causal effects. In the first two chapters, a centralized placement policy of refugees is used as a quasi-natural experiment. The third chapter uses temporal variation to implement a regression-discontinuity-in-time design. In the last chapter, we use distance to the border or an international airport as an instrumental variable

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<sup>1</sup>The number of displaced people has increased from 43.3 million in 2009 to 79.5 million people in 2019 (UNHCR 2020).

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to account for endogenous migration decisions. In the following, I briefly describe the content and contribution of each chapter in more detail.

### **Chapter 1: Initial residence restrictions and refugees' language acquisition**

Immigrants' decisions on where to take up residence in their destination country are generally selective, based on expected labor market outcomes (Card 1990) or pre-existing intra-ethnic networks (Edin et al. 2003). In Germany, however, a distribution mechanism known as Königsstein Key is used to ensure a proportional distribution of asylum seekers across German states based on states' tax revenues and population size. Since states and refugees are required to participate, the mechanism minimizes concerns related to endogenous sorting of refugees and ensures their random allocation across Germany.

In 2016, the German federal government introduced the so-called "residence rule", which limits refugees' ability to choose their place of residence freely after they have been granted a permanent residence permit. Unless legal exemption criteria apply, refugees who received their asylum decision after August 2016 must live in their state of first residence for a period of at least three years. The act also allowed states to pass additional and more restrictive regulations to effectively determine refugees' county of residence, and five out of 16 German states decided to do so. The first chapter of this thesis analyzes the effect of the residence rule on language learning, which may be considered a first essential step towards successful integration.

To identify a causal relationship, the chapter exploits (i) temporal variation in the timing of the asylum decision and (ii) regional variation based on refugees' assignment to states and the varying implementation of the residence rule across states in a difference-in-differences design. Using unique, representative survey data from the IAB-BAMF-SOEP Survey of Refugees, I show that the residence rule had no substantial impact on refugees' participation in integration courses or on their German language proficiency levels. While there exist small positive effects for refugees with certain characteristics (e.g., female refugees) in the medium-run, the estimated effects tend to fade out in the long-run and do not translate into higher self-assessed German language skills. This result holds when considering participation in any language course. Complementing our analyses with administrative information on the availability of integration courses at the county level, survival analyses suggest that treatment

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states failing to place refugees in counties with a sufficient supply of integration courses may at least partially explain this result.

The analysis focuses on participation in language courses and refugees' language proficiency levels, which have been established as an important predictor of integration processes in the economic literature (Bleakley and Chin 2004; Chiswick 1991; Chiswick and Miller 1995; Dustmann and Fabbri 2003; Dustmann and Soest 2001). The chapter neglects the residence rule's impact on labor market participation and individual behavior such as job search, however, which may nonetheless exist. These impacts are important to consider, on the one hand, because refugees may choose to take up employment rather than participating in an integration course. Second, being in "gainful employment" bypasses the restrictions of the residence rule. Further analysis of these issues requires more detailed information on the employment history of refugees in Germany. Linking the Survey of Refugees with administrative data from the Federal Employment Agency offers a promising avenue for future research.

The chapter's contribution to the literature is threefold. First, to the best of my knowledge, this is the first paper to investigate the effect between residence restrictions and refugees' language development. This is surprising, given the strong link between immigrants' language skills and prospective labor market outcomes. Second, the paper shows a causal effect based on the exogenous stipulation of refugees' initial place of residence based on the Königsstein Key. Third, the focus is on a recent cohort of refugees who have arrived in Germany since 2013 and who differ substantially from previous migrant and refugee groups. Against this backdrop, the chapter sheds light on early integration outcomes in a very recent context.

### **Chapter 2: Local conditions and multi-dimensional integration of refugees**

Refugees are a particularly vulnerable group in the labor market. For at least a decade after their arrival, refugees' employment rates and wages remain below those of other immigrants (Brell et al. 2020). To better understand the drivers of refugee integration, Chapter 2 investigates the effect of initial local conditions on refugees' multi-dimensional integration outcomes based on data from the IAB-BAMF-SOEP Survey of Refugees and the European Social Survey. In addition to several measures of refugees' labor market integration (such as participation in local labor markets and monthly net wages), we use the framework outlined in Harder et al. (2018) to build a Multi-dimensional Integration Index that identifies six crucial dimensions of

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integration. Similar to Chapter 1, Chapter 2 relies on the exogenous placement of refugees into states and counties and the fact that refugees are not permitted to move freely from one state or county to another within Germany.

The results highlight the important role of the initial conditions upon arrival in refugees' subsequent integration: High local unemployment rates and negative attitudes towards migrants negatively affect the economic and social dimensions of refugees' integration. It is noteworthy that attitudes towards immigrants are as important as local unemployment rates in shaping refugees' integration outcomes. The generalized random forest methodology illustrates substantial treatment heterogeneities, which emphasize that our results are driven by older people and those with secondary or tertiary education. Furthermore, our back-of-the-envelope calculations suggest that reallocating refugees to counties with more favorable conditions would have significant fiscal policy implications. For instance, a small scale reallocation of 10,000 randomly selected working-age refugees to a county with a one standard deviation lower unemployment rate would generate annual savings of more than €2 million.

This chapter offers insights into how attitudes towards immigrants at the local level affect refugees' multi-dimensional integration outcomes. This is an aspect that has not been the focus of investigation in the previous literature. To measure attitudes at the local level, we draw on data from the ad-hoc migration module of the European Social Survey in 2014 and use a principle component analysis to build the Migrant Acceptance Index. While the Migrant Acceptance Index allows us to capture several dimensions of attitudes (including economic, cultural, and social dimensions), we cannot provide this information at the county-level. This is a drawback of the analysis, because there may also be regional variation at the county level that we cannot exploit. We are, however, confident that the Migrant Acceptance Index is a valid measure of attitudes towards immigrants, and we show that our results are robust to alternative county-level measures, for instance, the percentage of the votes for the right-wing populist party "Alternative für Deutschland" in the federal elections in Germany in 2013. What is more, because the Socio-Economic Panel (SOEP) provides information on refugees' first and current place of residency within Germany only, the analysis is limited by the fact that we do not observe refugees' entire moving history in the data.

In this chapter, we make several key contributions to the literature. Building on several previous studies that have investigated the effects of initial local economic conditions on refugee integration (Fasani et al. 2020a; Godøy 2017; Marbach et al. 2018;

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(Martén et al. 2019; Åslund and Rooth 2007), we consider attitudes towards migrants as an important factor affecting refugees' integration. We expand previous research on the importance of initial conditions by using an identification strategy that allows for causal interpretation. Finally, we focus on multi-dimensional integration rather than solely on economic integration as far less attention has been devoted to non-economic outcomes.

The results from Chapters 1 and 2 call into question the principle of residence restrictions for refugees in the first years after their arrival, such as those currently in place in Germany, but also in Denmark and the Netherlands (Renner 2018). The results also have implications for the design of refugee allocation policies. Although there are strong political arguments for distributing refugees nationwide, the results suggest that too small a supply of integration and language courses and unfavorable local conditions come at a significant cost to subsequent integration outcomes. This may impair refugee integration in the long-run and therefore have negative welfare effects. One possibility to address these concerns while maintaining the principle of allocating refugees nationwide would be to alter the underlying allocation mechanism so that it incorporates unfilled job vacancies and the availability of integration courses. The findings also have implications for the refugee policies at European level. The Dublin Regulation stipulates that an application for asylum must be processed by the first Dublin country the asylum seeker enters. With the majority of refugees entering Europe by way of the Mediterranean routes (Aksoy and Poutvaara 2019), this places a substantially higher burden on countries such as Italy and Greece, which are traditionally characterized by high (youth) unemployment rates. Our findings suggest that this regulation may result in worse integration outcomes across the European Union, as refugees placed in regions with high unemployment and negative attitudes towards immigrants face a risk of worse subsequent economic and social integration.

### **Chapter 3: Hate crimes and the mental health of refugees**

The sudden inflow of refugees into Europe is associated with a shift in attitudes towards immigrants and refugees and, in turn, increasing violence against immigrants (The Council of Europe 2016). Hate crimes may be particularly detrimental to refugees in that they may also affect their long-term integration, given that refugees tend to be “permanent immigrants” whose lifetime utility is based on their initial integration success. Against the backdrop of increasing violence against immigrants and refugees,

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Chapter 3 investigates the effect of hate crimes on refugees' mental health in Germany. For this purpose, we combine two innovative datasets: administrative data on attacks against refugee shelters from the Federal Criminal Office (Bundeskriminalamt (BKA)) and data from the IAB-BAMF-SOEP Survey of Refugees in Germany. In line with previous arguments, if refugees choose their place of residence based on regional characteristics, which may jointly determine refugees' mental health and the occurrence of hate crime, estimated effects will be inconsistent. To circumvent this limitation, we rely on the exogenous timing of hate crimes and the fact that refugees in the SOEP have no influence on the timing of their interview. Using counties with at least one hate crime against a refugee shelter, we compare mental health outcomes for refugees who were interviewed immediately before and immediately after an attack occurred in their county of residence. Formally, we employ a regression-discontinuity-in-time design.

The results demonstrate that hate crime has a strong and negative effect on refugees' mental health, measured by the Mental Component Summary Score (MCS) and the Patient Health Questionnaire (PHQ-4). In contrast, we do not find an effect on refugees' life satisfaction or on their intention to stay in Germany. While the effects of hate crimes are only transitory, we argue that negative mental health shocks during the critical period after arrival have important long-term consequences. Furthermore, we show that the level of exposure to hate crime matters: Refugees living at closer geographic proximity to a focal hate crime experience stronger adverse effects on mental health than refugees living further away. This suggests that it is the direct exposure to such crimes that drives the results. Finally, our findings suggest that refugees with higher levels of country-specific human capital (e.g., higher German proficiency levels or more frequent contact with German natives) are less severely affected.

Our contribution to the literature is twofold: First, to the best of our knowledge, we are the first to analyze the effect of hate crime on refugees' mental health. This is surprising, given the stark increase in forced migration, which is expected to increase further given the economic and environmental changes worldwide (UNHCR 2019), and the fact that mental illnesses has the highest prevalence of all non-communicable diseases (Bloom et al. 2011). Our results further suggest the importance of mental health for (labor market) integration and the subsequent long-term consequences for refugees in Germany. Second, we show that human capital has the potential to protect refugees against negative external shocks, a mechanisms that has not been shown in

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previous empirical studies before. Refugee migration is increasing across Europe and we contribute by providing a new mechanism that explains heterogeneities in refugee integration outcomes.

The empirical analysis presented in Chapter 3 concentrates on the direct effects of hate crime on refugees' mental health indicators. Yet in addition to this first-order effect, there may also be second-order effects: for instance, refugees with impaired mental health may also suffer from poor structural integration outcomes, such as lower rates of labor market participation. To gain additional insights into these effects, future research could exploit the panel dimension of the SOEP data. Furthermore, the paper remains silent on the external fiscal effects of xenophobic violence on host societies. In light of the fact that the direct and indirect costs of mental health conditions were estimated at 2.5 trillion US dollars worldwide in 2010 (Bloom et al. 2011), taking fiscal effects of hate crime into consideration may serve as an interesting extension of this chapter.

The empirical results from Chapter 3 show that hate crime has substantial negative effects on refugees and host societies. As a consequence, our results point to the need for increased protection of refugee shelters as well as further attention to the mental health needs of refugees. The results are in line with our findings from Chapter 2, which emphasize the negative effects of negative attitudes towards immigrants on refugees' subsequent integration in Germany.

### **Chapter 4: Migrants' Missing Votes**

The fourth chapter shifts the focus away from refugee immigration to look at the political effects of emigration. Emigrants are a selective group of citizens, in terms of age and education, but also with respect to their political preferences (Berlinschi and Harutyunyan 2019). They are also less likely to participate in elections in their home country. High emigration rates may therefore have a systematic influence on election results.

The goal of this chapter is to causally analyze the role of emigration on election outcomes in Poland. The case of Poland is particularly interesting, as the country experienced high emigration rates after joining the European Union and subsequently introducing free labor mobility. We use detailed administrative emigration data and merge it with official election results from all elections from 2004 and 2019 at the county level. To account for endogeneity that may result, for example, from unobserved



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economic conditions, we instrument emigration with distance to the nearest “open” border or international airport. The instrument is a strong predictor of emigration, both when we measure distance in kilometers or duration in hours.

Our findings show that emigration has a positive effect on the share of votes for right-wing parties, while decreasing the share of votes for left-wing parties. The results are robust to alternative party classifications, alternative measures of distance, as well as a static version of the instrument that allows us to analyze the effect of emigration on electoral outcomes since 2001. We further find that emigration has a positive effect on pro-European behavior in the country of origin. There are several potential explanations for this surprising result, including migration intentions, reduced labor market competition, and political remittances.

To understand whether emigration affects social norms and preferences in the home country, we draw on additional data from the Life in Transition Survey. We provide suggestive evidence that trust in political authorities is lower in high-emigration counties, a mechanism that helps to explain our estimation results.

One clear limitation of the paper is the lack of individual-level data on emigrants: If we had observed data on migrants’ education level, family ties, or destinations, we would have been able to disentangle underlying mechanisms, such as strategic voting, monetary remittances, and return migration much more carefully. We therefore plan to incorporate additional individual-level data from the Polish Labor Force Survey into future research to investigate these issues.

Our contribution to the literature is threefold. First, we address the gap in research on the political effects of emigration and we show that emigration has a strong and positive effect on the share of votes for right-wing parties. As such, this paper offers a new approach that helps to explain the rise of right-wing and populist parties across Europe. Second, in contrast to previous literature, we focus on a developed and democratic country. Third, we strengthen the causal interpretation of the effect based on an established instrumental variable design (Dustmann et al. 2015) that has not been used in this context previously.

As migration increases, so does the number of citizens who are voting from abroad. Our results have important—albeit normative—policy implications that can lead to the creation of fairer election systems. Migrants who face difficulties in casting a vote in their home country and who are not yet eligible to vote in their current country of residence are effectively disenfranchised. If governments made it easier for their citizens

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to vote from abroad, for instance, by allowing postal voting or increasing the number of polling stations in emigrants' destination countries, this would ensure that migrants have equal access to the electoral process. The results further emphasize that more flexible electoral processes, such as those for the European Parliament, which guarantee citizens the right to cast a vote in their country of residence as well as in their country of origin, are a step in the right direction to increase participation in the electoral process and to foster the formation of political will.

# 1 Must I stay or may I go? Initial residence restrictions and refugees' language acquisition

*I would like to thank Charlotte Bartels, Stefan Bauernschuster, Sebastian Braun, Tommaso Frattini, Yvonne Giesing, Magdalena Krieger, Guido Neidhöfer, Carsten Schröder as well as seminar participants at the GC Summer Workshop, the BeNA Summer Workshop, the IZA Annual Migration Meeting, the IIPF, the VfS Annual Conference, the SOEP User Conference, and the 5th Workshop on the Economics of Migration for helpful suggestions and feedback.*

## 1.1 Introduction

The destabilization of the MENA region (Middle East and North Africa) has triggered a sudden inflow of foreigners into Europe in recent years. Between 2015 and 2017, roughly 3.3 million asylum seekers entered Europe (Eurostat 2020). This influx poses major challenges to national governments and raises the need for targeted policy measures fostering integration into European societies. This is particularly relevant considering that many refugees<sup>1</sup> have been granted protection and will stay in their host countries for an extended period of time, or even permanently.

Given that Germany experienced a particularly large inflow of refugees (Organization for Economic Co-operation and Development (2017), see Figure 1.5), the federal Government introduced several integration measures for beneficiaries of protection, including the residence rule (“Wohnsitzauflage”). The residence rule severely restricts refugees' ability to choose their place of residence. It aims at avoiding the clustering of refugees, thereby distributing financial burdens more evenly across counties and intend-

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<sup>1</sup>In the public debate, the term *refugee* and *migrant* are often used interchangeably. Nevertheless, it is essential to explicitly differentiate between them. A migrant describes an individual moving to another country expecting to live there for a certain period of time. A refugee is someone who fears “being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, unwilling to return to it” (United Nations High Commissioner of Refugees 1951).

ing to facilitate the planning of integration activities and language courses (Sachverständigenrat deutscher Stiftungen für Integration und Migration 2016). Considering the strong link of language skills and immigrants' subsequent labor market outcomes established in the literature (Bleakley and Chin 2004; Chiswick 1991; Chiswick and Miller 1995; Dustmann and Fabbri 2003; Dustmann and Soest 2001), completing an integration course may be considered a first essential step towards successful integration in the host country. Consequently, this paper disentangles the effects of the residence rule on participation in integration courses and refugees' language development in Germany.

From a theoretical perspective, the effect of residence restrictions on participation in integration courses and German language proficiency levels is ambiguous. If refugees face lower information and search costs as a result of restricted mobility, by this means increasing the take-up of respective integration measures, one would expect a positive effect. On the other hand, the distribution of refugees across states (and counties) in Germany is primarily based on population size and does not take the presence of integration measures and labor market tightness into account. Misallocation of refugees may thus increase the search duration of a suitable integration course, which may further impair refugees' language proficiency levels. Finally, a third feature affecting language proficiency levels are refugees' (ethnic) networks (see e.g., Battisti et al. (2016), Bertrand et al. (2000), Borjas (1998, 2000), Damm (2009), Edin et al. (2003, 2004), and Lazear (1999)).

The empirical analysis relies on a quasi-experimental setting that exploits variation in residence restrictions across German states after the reform has been introduced in 2016. As a result of the residence rule, a group of refugees that was formerly able to choose its place of residence freely, now faces severe and persistent residence restrictions.<sup>2</sup> Yet, there exists substantial variation in the implementation of the policy across states. While refugees may move freely within some states, a couple of states have decided to implement the residence rule more rigorously, such that refugees are obliged to stay in a certain county. To identify a causal effect, this paper exploits both temporal and spatial variation in a difference-in-differences (DiD) estimation design.

Overall, I find that introducing the residence rule had no substantial impacts on refugees' participation in integration courses and their German language proficiency

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<sup>2</sup>When the Integration Act was first introduced, the residence rule was established for a period of three years. In 2019, the residence restrictions have been extended for an indefinite period of time.

## *Initial residence restrictions and refugees' language acquisition*

levels. Using the longitudinal design of the IAB-BAMF-SOEP Survey of Refugees, which allows to investigate the development of refugees' language proficiency in the short-, medium-, and long-run, I find estimated effects to be bounded to a tight interval around zero. There are some exceptions to the overall pattern of null results. First, the probability to achieve intermediate language proficiency levels increases moderately by 2.6 percentage points for refugees in treatment states after the residence rule has been put in place. Yet, the effects diminish in the long-run and do not translate into higher self-assessed German language skills. Second, when I stratify the sample by refugees' characteristics, I find small positive effects for refugees without children, female refugees, and refugees with at least secondary education. Similar to preceding findings, the effects are small and tend to fade out in the long-run. This paper also provides suggestive evidence that the misallocation of refugees to counties with insufficient supply of integration courses in treatment states can at least partially explain the results: I complement the analysis with administrative data from the Federal Office for Migration and Refugees (BAMF), which supplies yearly information on the local supply of integration courses. The results from the survival analysis suggest that while the number of integration courses in all states significantly increased over time, treatment states fail to place refugees in counties with sufficient supply of integration courses. Taken in their entirety, the findings provide little reason to interpret language proficiency levels and integration course attainment arising due to causal effects of residence restrictions.

This paper is connected to three branches of research. The first studies the effect of initial residence restrictions on determinants of economic assimilation and immigrants' labor market performance. In this context, it is essential to account for selective migration patterns. If immigrants choose their place of residence in the host country based on factors such as expected labor market outcomes (Card 1990) or pre-existing ethnic enclaves (Edin et al. 2003), estimates may be seriously biased. To tackle this potential pitfall, Peri (2016) emphasizes the importance of exogenous variation in the empirical analyses and suggests to use natural experiments. In the existing literature, a number of studies have accounted for endogenous sorting of immigrants by studying reforms that are very similar to the residence rule. These "settlement policies", introduced in Sweden and Denmark in the 1980s, determined immigrants' place of residence without considering their individual preferences and, as such, exogenously. Using the size of an ethnic enclave in the year of assignment as an instrumental variable (IV), Edin et al.

(2003) show that being placed in an ethnic enclave increases immigrants' earnings significantly, in particular for immigrants in the lower tail of the skill distribution. This finding was confirmed by Damm (2009), who reports that this positive effect is primarily driven by immigrant networks. Edin et al. (2004) use a difference-in-differences design and show that policies that choose income support over reintegration measures have detrimental effects on immigrants' earnings. Additionally, Rosholm and Vejlin (2010) report that lowering public income transfers have a positive effect on the probability to find employment in a competing risk framework. Finally, Åslund and Rooth (2007) emphasize that local as well as national labor market conditions play a crucial role in determining long-term integration outcomes.

This paper is furthermore related to several studies that examine the causal relationship between intensified language training and refugees' structural integration outcomes. For instance, Sarvimäki and Hämäläinen (2016) show that tailored sequences of active labor market programs (ALMP), so called "integration plans", shifted refugees attention from regular ALMP towards more language training, which in turn increased refugee earnings by 47 percent. Likewise, Lochmann et al. (2019) evaluate the introduction of a language training program in France, which assigns non-EU migrants to language training if their score in an initial language test falls short a certain threshold. Using this cut-off in a regression discontinuity design, the authors show that intensified language training increases labor force participation by 15 to 27 percentage points. Finally, Arendt et al. (2020) use the launch of a Danish refugee integration program in the 1990s involving and improving language learning provision with a regression discontinuity design. In line with previous results, the authors find strong and positive effects on refugees earnings and employment probability in the medium- and long-run. Furthermore, with better language skills facilitating access to education, they show that the program induced substantial form of skill upgrading.

Third, this paper relates to the research on the relationship between immigrants' language skills as "an important form of human capital" (Chiswick and Miller 1995, p.248) and their labor market performance. Chiswick (1991) showed the relevance of self-reported language skills on immigrants' earnings, and concludes that reading fluency is more important than speaking fluency. Using data on Australia, the United States (U.S.), Canada, and Israel, a subsequent study provides evidence that this effect holds in an international context (Chiswick and Miller 1995). Dustmann and Soest (2001) build on the aforementioned studies by accounting for measurement errors in self-

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reported language skills and unobservable variables, which are correlated with language acquisition and respective outcome variables, such as ability: They demonstrate that simple ordinary least squares (OLS) estimates are subject to substantial biases and find that estimated effects on earnings are considerably larger once these factors are taken into account. Combining both a matching and an IV estimator, Dustmann and Fabbri (2003) find a positive effect of language skills on the probability to find employment in the UK, while the effect on earnings is less precise. Finally, Bleakley and Chin (2004) use a quasi-experimental approach and show that English language proficiency affects the wages of adults, who arrived in the US as children. Furthermore, they show that this effect is driven mainly by education.

I contribute to the literature in several ways: This paper is the first to study the effect of initial residence restrictions on language acquisition of refugees. This is surprising, given the strong link between immigrants' language skills and prospective labor market outcomes. I further show a causal effect based on an allocation scheme which determines refugees' initial place of residence exogenously. Second, I focus on a recent cohort of refugees, who have arrived in Germany since 2013 and differ substantially from other migrant and refugee groups who arrived before. As such, this paper sheds light on early integration outcomes in a very recent context. Furthermore, in contrast to previous analyses that identify refugees by country of origin<sup>3</sup>, the unique IAB-BAMF-SOEP Survey of Refugees provides precise information on the refugees' types of residence permit. This is particularly important because the residence restrictions apply only to a subset of refugees with temporary or permanent residence permit, so called "humanitarian migrants".

The remainder of this paper is structured as follows. Section 1.2 describes the institutional background and illustrates the relevant policy reform. After a short description of the dataset, Section 1.3 provides descriptive statistics. Section 1.4 outlines the empirical strategy. Section 1.5.1 reports the main results and Section 1.5.2 sheds light on the underlying mechanism. Section 1.5.3 demonstrates the implemented robustness checks. Section 1.6 concludes.

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<sup>3</sup>Notable exceptions in the recent literature include Bratsberg et al. (2017) and Schultz-Nielsen (2017).

## **1.2 Institutional Background**

### **1.2.1 The stages of the German asylum procedure**

While Germany has no distinct Immigration Act that explicitly rules immigration other than asylum requests, the stages of the asylum procedure are governed by the German Asylum Act. Individuals seeking for political asylum in Germany have to register at a state authority upon arrival (BAMF 2016b). They will then be distributed to an initial reception center, and thereby to a particular state, based on the “Königstein Key”. The Königstein Key is a distribution mechanism that allocates refugees at state level based on the state’s tax revenue and population size. Since this distribution mechanism strives to ensure a proportional distribution of refugees across states without considering individuals’ preferences, initial placement of refugees into a specific state is exogenous and as such immune to self-selection.<sup>4</sup>

After being assigned to an initial reception center, asylum seekers may formally pose their asylum request. Until a final decision has been reached, refugees face severe residence restrictions and must reside in the initially assigned state (“Residenzpflicht”). Importantly, this residence restriction for asylum seekers has remained unaffected by the residence rule. For clarification, Figure 1.6 illustrates the states of the German asylum procedure schematically.

In total, there exist four different classes of protection once a decision on an asylum claim has been reached (see Table 1.12). Following the OECD’s definition<sup>5</sup>, this paper hereinafter refers to all refugees who have been granted a protection status of category one to three as humanitarian migrants. Tolerated foreigners, who are legally required to leave Germany eventually, are discarded from the analysis, because they have not been affected by the residence rule.

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<sup>4</sup>See Appendix 1.7.1 for a more detailed description of the Königstein Key. Furthermore, Appendix 1.7.1 describes the redistribution of asylum seekers to counties within states, providing suggestive evidence that, conditional on the population size of respective county, asylum seekers are indeed randomly assigned to German counties.

<sup>5</sup>The Organization for Economic Co-operation and Development (OECD) defines people who have successfully applied for asylum as have been granted some form of protection as humanitarian migrants (Organization for Economic Co-operation and Development 2016, p.7).



### **1.2.2 The residence rule**

While moving is severely restricted until a final decision on the asylum request has been reached, humanitarian migrants could choose their place of residence freely within Germany in the past. The new regime, in contrast, enforces severe restrictions on humanitarian migrants' initial place of residence if certain criteria apply. Those who do not comply lose their social benefits.

There are only few exemptions from the residence rule, for example, if a humanitarian migrant or a close relative (such as a spouse, domestic partner, or child) attends university or vocational training or has taken up employment with a certain number of working hours.<sup>6</sup> If none of the exemption criteria applies, humanitarian migrants must stay in the state in which they formally applied for asylum, i.e., the state initially determined by the Königsstein Key, for three years after the asylum decision. Hence, the residence rule restricts mobility between states. Mobility within states, however, is only affected if states enforce additional legislation. A residence restriction at state level may be considered a marginal change only. Especially in economically less developed states, this restriction may nevertheless be effective for humanitarian migrants targeted by the reform. Even though humanitarian migrants are free to leave the state if they find employment or training conditions that satisfy the exemption rule, competing with native workers is challenging. The residence rule may therefore severely restrict freedom of movement for humanitarian migrants.

With the introduction of the Integration Act, states have further been given the possibility to impose additional regulations at the state level (Federal Ministry of Justice and Costumer Protection (2016), §12a Art. 9 AufenthG). As of now, five states have decided to apply the residence rule more rigorously, including Baden Württemberg, Bavaria, North Rhine-Westphalia, Saarland, and Saxony Anhalt (Organization for Economic Co-operation and Development 2017, p.49f). These states mandate humanitarian migrants to live in a specific district and are consequently defined as treat-

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<sup>6</sup>For detailed information, please see Federal Ministry of Justice and Costumer Protection (2016), §12a AufenthG, Art.1.

ment states.<sup>7</sup> In all other states (control group), humanitarian migrants remain free to move within the assigned state.

### **1.2.3 Integration courses**

With the vast majority of refugees lacking adequate command of the German language, language training is generally mandatory for humanitarian migrants in Germany.<sup>8</sup> 90 percent of refugees in the IAB-BAMF-SOEP Survey of Refugees report to have no German knowledge before migration (Brücker et al. 2016). Their German proficiency levels have greatly improved since their arrival, however, and 18 percent of refugees with less than two years of residence in Germany assess their German proficiency level as “good” or “very good”.

Attending an integration course is therefore considered mandatory for humanitarian migrants in Germany.<sup>9</sup> The integration course curriculum is split in two parts, a general course on life in Germany (100 hours) and a language course (600 hours). Upon completion of this mandatory schedule, participants take a final exam including a language test and a quiz relating to the orientation course.

## **1.3 Data and descriptive statistics**

The empirical analysis relies on the IAB-BAMF-SOEP Survey of Refugees (the Survey of Refugees), which is conducted as part of the German Socio-Economic Panel (SOEP, see Goebel et al. (2019)). This dataset provides information on refugees who have arrived in Germany from 2013 and 2016, and has been collected on an annual basis since 2016 (Brücker et al. 2016; DIW 2017). It collects comprehensive information on

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<sup>7</sup>Please refer to Bayerische Staatsregierung (2016), Landesregierung Nordrhein-Westfalen (2016), Ministerium für Inneres, Digitalisierung und Migration, Baden-Württemberg (2016), Ministerium für Inneres und Sport, Sachsen-Anhalt (2017), and Staatskanzlei Saarland (2016), the respective regulations are available in German only. Furthermore, Hessen and Saxony implemented additional regulations in September 2017 and April 2018, respectively. This is not relevant for the underlying analyses, because only few observations in the IAB-BAMF-SOEP Sample received their asylum decision in this time period.

<sup>8</sup>Gesetz zur Steuerung und Begrenzung der Zuwanderung und zur Regelung des Aufenthalts und der Integration von Unionsbürgern und Ausländern (Zuwanderungsgesetz, §44 ZuWG & §44a ZuWG).

<sup>9</sup>Giesecke and Schuss (2019, p.6) highlight that “until today, a considerable share of immigrants effectively does not participate in language training”, the reason for this is supply falling behind demand in some regions creating substantial excess demand.

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individual refugees' migration, education, and employment histories as well as detailed information on their participation in language courses and overall living conditions in Germany. To date, the Survey of Refugees is the only dataset that allows for quantitative and empirical social research on refugees who were part of the most recent arrival cohort in Europe.

Using this data source has several distinct advantages: First, the Survey of Refugees maintains detailed information on residence status and the exact date of receiving a residence permit.<sup>10</sup> It is also possible to extract information on the current place of residence at the county level. Consequently, I can identify treatment and control group in the pre- and post-treatment period. Secondly, the Survey of Refugees surveys individuals on a household level. Hence, it is possible to deduce information on respondent's family characteristics, such as children's educational or vocational training status, and to identify spouses living in the same household.

The first survey wave in 2016 (samples M3, M4), which covered approximately 4,500 adult refugees in Germany, has been augmented by roughly 3,000 observations in 2017 (sample M5). The relevant samples feature an excellent overall response rate (49 percent, Kroh et al. (2017, p.14)). For this paper's empirical analysis, we pool all SOEP refugee observations in 2016, 2017, and 2018 and use the respondent's latest valid interview information. Given that the residence rule applies to humanitarian migrants, who are not exempt from the residence rule, this accumulates to a total of 3,795 observations.

I define a working sample that is subject to several restrictions (Table 1.1). Since the reform is applicable to first-time asylum seekers only, I drop observations who pose a repeated asylum request. I further drop observations who report missing information on the timing of the asylum decision. This reduces the sample size by 16 percent, whereby the majority of humanitarian migrants reports a missing value for both the year and the month of asylum decision (72 percent). Furthermore, I restrict the working sample to have non-missing values for all exploratory variables employed

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<sup>10</sup>The exact wording and answer categories of the relevant survey questions are as follows. When was the decision regarding your application for asylum made? [Year, Month, No details]. Which residence title do you currently hold? If you are not sure which residence title you hold, please check the Immigration Authority's label in your passport. [Asylum seeker, Person entitled to asylum, Person with refugee status, A settlement permit according to Section 26 sub-section 3 of the German Residence Act, A temporary suspension of deportation according to section 60a of the German Residence Act, Admission on humanitarian grounds, Admission on other humanitarian grounds, Another residence title, No details].

Table 1.1: Definition of the working sample

Relevant sample of survey respondents: M3, M4, M5	3795
Missing: timing of decision	-634
Repeated asylum request	-33
Missing information on spouse	-38
Missing values in explanatory variables	-383
N	2707

*Note:* Table 1.1 illustrates the necessary sample restrictions resulting in the construction of the working sample. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

in the difference-in-differences analysis. Finally, humanitarian migrants may be exempt from the residence rule based on his or her spouse's characteristics. Considering that I cannot identify these cases of exemption for humanitarian migrants who are married, but whose spouse is living in a different household in Germany, I drop these observations from the working sample. Taking these considerations into account, the defined working sample consists of 2,707 observations: 1,444 treated and 1,263 control individuals.

Table 1.2 presents descriptive statistics. Column 1 provides information on the full sample, columns 2 and 3 then add information on the treatment and control group respectively. Differences between individuals in treatment and comparison states are reported in column 4. The table indicates that treatment and control group are very similar in socio-economic characteristics. Overall, I find very little differences with respect to observable characteristics, such as gender, age, years of schooling, and their family status. For instance, while 43.4 percent of observations are female in the treatment group, the share of females equals 43.0 percent in the control group. The table suggests only small differences in the presence of children and the share of single individuals. What is more, descriptive statistics suggest that the overall asylum procedure is similar in treatment and control states. For instance, there exist no differences in the distribution of asylum classes or the number of months since the asylum decision.

Finally, Table 1.2 underlines that there exists some variation with respect to the country of origin.<sup>11</sup> For example, while 59 percent of the treatment group stem from

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<sup>11</sup>We explicitly differentiate between Syria, Afghanistan, and Iraq, which correspond to the main countries of origin in Germany. All other origin countries are subsumed under the category "other origin".

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Table 1.2: Descriptive statistics

	(1)	(2)	(3)	(4)
	Full sample	Treatment group	Control group	Diff.
	mean/sd/b	mean/sd/b	mean/sd/b	mean/sd/b
Female	0.432 (0.495)	0.434 (0.496)	0.430 (0.495)	0.004
Age in years	34.929 (10.835)	34.679 (10.819)	35.148 (10.848)	-0.469
Single	0.251 (0.434)	0.267 (0.442)	0.238 (0.426)	0.029*
Divorced	0.034 (0.180)	0.037 (0.189)	0.030 (0.172)	0.007
Widowed	0.027 (0.162)	0.028 (0.164)	0.026 (0.160)	0.001
Children	0.647 (0.478)	0.625 (0.484)	0.666 (0.472)	-0.042**
Years of schooling	8.349 (4.430)	8.374 (4.502)	8.328 (4.368)	0.046
Some German before emigration	0.018 (0.134)	0.019 (0.137)	0.017 (0.131)	0.002
Want to stay in Germany	0.950 (0.218)	0.952 (0.214)	0.948 (0.222)	0.004
Entitled to asylum	0.070 (0.255)	0.074 (0.263)	0.066 (0.248)	0.009
Refugee status	0.881 (0.323)	0.873 (0.333)	0.889 (0.315)	-0.015
Admission on humanitarian grounds	0.049 (0.215)	0.052 (0.223)	0.046 (0.209)	0.007
Months since arrival	31.381 (11.437)	31.653 (11.516)	31.144 (11.366)	0.509
Months since asylum decision	21.565 (11.875)	21.457 (11.966)	21.660 (11.797)	-0.203
Syrian origin	0.644 (0.479)	0.589 (0.492)	0.691 (0.462)	-0.102***
Afghan origin	0.099 (0.298)	0.139 (0.346)	0.063 (0.243)	0.076***
Iraqi origin	0.141 (0.348)	0.133 (0.340)	0.148 (0.355)	-0.015
Other origin	0.117 (0.321)	0.139 (0.346)	0.098 (0.297)	0.041***
<i>N</i>	2707	1263	1444	2707

*Note:* Table 1.2 presents descriptive statistics for the full sample (column 1), and disaggregated by treatment status (columns 2 and 3, respectively). Means (standard deviation). Treated states include Baden-Württemberg, Bavaria, North Rhein-Westphalia, Saarland, and Saxony. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

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Syria, 69 percent in the control group report Syria as their country of origin. Similar patterns arise for Afghanistan and Iraq as well as for other countries of origin. One reason for this disparity is that in order to reduce processing times, some regional offices of the BAMF have specialized on particular countries of origin. While this may indeed cause clustering of nationalities to a certain extent, none of the countries of origin are processed in treatment or control states exclusively. Consider, nevertheless, that refugees have no say in where to be placed during their asylum procedure, but are assigned to a particular state based on the Königstein Key (Section 1.7.1). What is more, the difference-in-differences estimator may explicitly control for these differences as long as they remain constant over time.

Table 1.3 provides descriptive statistics on participation and average duration time of integration courses in Germany based on the Survey of Refugees. To be precise, Table 1.3 differentiates between the full sample (column 1) as well as individuals who live in states with stricter and less strict residence restrictions (columns 2 and 3 respectively). Column 4 illustrates the difference between respective characteristics in treatment and comparison states. 52 percent of humanitarian migrants in the Survey of Refugees do either still participate or have participated in an integration course, while 36 percent have completed the course in the past. On average, humanitarian migrants take eight months to complete an integration course with a standard deviation of five months. The large standard deviation implies that course participation and completion is heterogeneous and subject to individual constraints. A comparison of individuals living in stricter versus less strict states suggests that humanitarian migrants subject to the residence rule complete an integration course slightly faster than humanitarian migrants in less restrictive states (8.1 versus 8.4 months). It has to be emphasized though that none of the differences is statistically significant at conventional levels.

Table 1.3: Descriptive statistics on integration courses and German proficiency levels

	(1)	(2)	(3)	(4)
	Full sample	Treatment group	Control group	Diff.
	mean/sd/b	mean/sd/b	mean/sd/b	mean/sd/b
Participates in an integration course	0.518 (0.500)	0.510 (0.500)	0.527 (0.499)	0.017
Completed an integration course	0.362 (0.481)	0.357 (0.479)	0.367 (0.482)	0.011
Duration of integration course	8.268 (4.982)	8.124 (4.724)	8.428 (5.258)	0.304
Duration between decision and take-up	9.880 (11.398)	9.911 (11.215)	9.847 (11.601)	-0.064
Average German language proficiency levels	2.902 (0.940)	2.919 (0.950)	2.883 (0.929)	-0.036
Speaking German language proficiency levels	2.877 (0.925)	2.895 (0.936)	2.855 (0.911)	-0.040
Reading German language proficiency levels	2.962 (1.053)	2.976 (1.046)	2.945 (1.061)	-0.031
Writing German language proficiency levels	2.869 (0.992)	2.886 (1.007)	2.849 (0.974)	-0.036
<i>N</i>	2707	1444	1263	2707

*Note:* Table 1.3 presents descriptive statistics for the full sample (column 1), and disaggregated by treatment status (column 2 and 3, respectively). Means (standard deviation). Outcome “Participates in an integration course” equals one if 1) a refugee completed an integration course in the past or 2) a refugee is still enrolled in an integration course at the timing of the interview, zero else. Outcome “Completed an integration course” equals one for refugees, who completed an integration course already, zero else. Duration of integration course measures the duration of an integration course from start to end, in months. Duration between decision and take-up measures the duration between asylum decision and take-up of an integration course in months. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

## 1.4 Empirical Strategy

### 1.4.1 Difference-in-differences estimation

To estimate the effect of strict statutory requirements regarding place of residence on language outcomes of humanitarian migrants, I employ a difference-in-differences design, taking advantage of legal variation across states as well as the fact that humanitarian migrants may not influence their place of initial residence. Considering that this estimate compares the changes in the outcome variables of treated and control units over time (“double differences”, Lechner (2011, p.168)), this quasi-experimental

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method controls for existing time trends as well as for differences between treatment and control group that exist permanently (cf. Bertrand et al. (2004), Abadie (2005) or Imbens and Wooldridge (2009)).

The residence rule was introduced as part of the Integration Act in July 2016. On this basis, the pre-treatment period consists of all survey respondents who received a positive asylum decisions until this legally defined cut-off date. Observations with a positive decision thereafter are considered to be post-treatment observations (see Figure 1.7).

To define treatment and comparison group, I exploit regional variation in residence restrictions across states. Based on §12a of the Integration Act, states may impose further requirements on humanitarian migrants' initial placement. In this case, humanitarian migrants will face residence restrictions within states, in addition to being unable to move between states. Baden Wurttemberg, Bavaria, North Rhine-Westphalia, Saarland, and Saxony Anhalt have passed additional decrees which provide severe limitations on residence decisions of humanitarian migrants. Consequently, I consider observational units in more restrictive states to be treated and others to be comparison units.

Figure 1.8 illustrates which states impose stricter statutory regulations on initial place of residence as well as the launch of the residence rule in each state. I use these sources of exogenous variation to estimate a difference-in-differences model<sup>12</sup> that can be defined as in the following equation:

$$Y_{it} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 Post_t + \alpha_3 Treat_i * Post_t + X_{it}\gamma + \epsilon_{it} \quad (1.1)$$

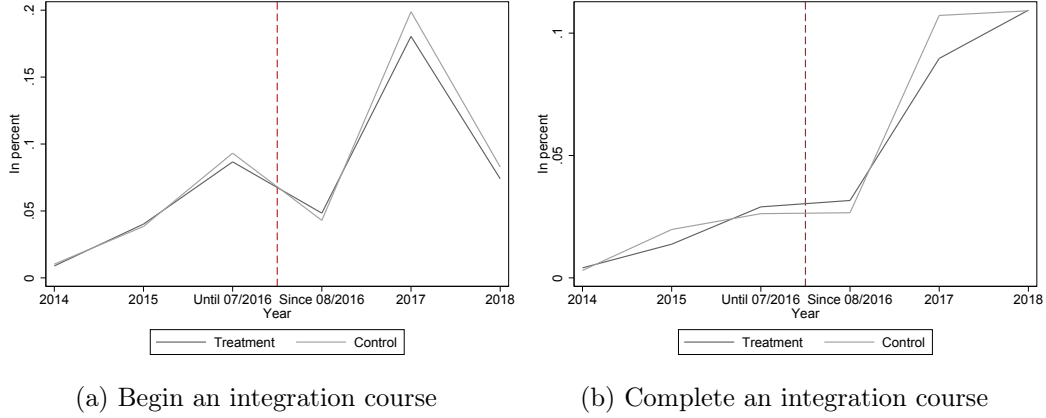
where  $Y_{it}$  is the outcome of interest measured for individual  $i$  in survey year  $t$ . I use several measures for refugees' language acquisition: (i) the probability to begin an integration course; (ii) the probability to complete an integration course; (iii) the probability to achieve intermediate German proficiency levels; and (iv) refugees' self-assessed German language skills. I provide two alternative estimation specifications: while the first specification abstains from including control variables, the second specification includes a rich set of individual and region specific covariates, including country of origin, year of arrival, and state fixed effects (see Table 1.14). The dummy variable  $Treat_i \in (0,1)$  is equal to one if an individual lives in a treated state, zero else.

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<sup>12</sup>The respective estimations are based on an ordinary least square (OLS) estimation.



Figure 1.1: Visualization of the common trend assumption



*Note:* Panel a (b) in Figure 1.1 displays the share of humanitarian migrants beginning (completing) an integration course each year disaggregated by treatment status. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

$Post_t \in (0,1)$  equals one if the respondent's asylum decision has been made in the post-treatment period, zero else.  $\epsilon_{it}$  is a mean zero term. Standard errors are clustered at the state level to allow for serial auto-correlation within federal states. Since the small number of clusters ( $G=16$ ), may bias standard errors down, I also review the results using wild cluster bootstrap t-procedures (Cameron et al. (2008), see Section 1.5.3). In this setting,  $\alpha_3$  captures the causal effect of interest. Since the regression model provides reduced form estimates of stricter requirements on all humanitarian migrants who reside in the treatment area, one may interpret  $\alpha_3$  as intention-to-treat effect (ITT).

To investigate the common trend assumption, Figure 1.1 compares the share of humanitarian migrants participating in an integration course in treatment and comparison states disaggregated at the yearly level.<sup>13</sup> The figure illustrates that both graphs develop similarly prior to the reform suggesting that individuals in treatment and comparison states are indeed equally likely to begin or complete an integration course before the residence rule was introduced. Consequently, this provides graphical evidence that the common trend assumption is met. What is more, Figure 1.11 illustrates that the average number of integration courses in treatment versus control states begun and completed behave very similarly between 2013 to 2018.

<sup>13</sup>With the residence rule being introduced in August 2016, I further split the sample in 2016.

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To examine the treatment effect over time, I furthermore include both time leads and lags. This modified specification of Equation 1.1 incorporates treatment indicators for individuals receiving their asylum decision in 2013, 2014, 2015, and up to July 2016 (pre-treatment period), and from August 2016 to 2017 for individuals who received a decision on their asylum claim in the post-treatment period. The revised estimation equation is defined as follows:

$$Y_{it} = \beta_0 + \zeta_i + \eta_t + \sum_{j=2013}^{2017} \beta_j \text{Treat}_i \text{Post}_j + X_{it} \gamma + \epsilon_{it}, \quad (1.2)$$

where  $\zeta_i$  represents the individual treatment status,  $\eta_t$  represents year of asylum decision fixed effects, and the interaction term  $\sum_{j=2013}^{2017} \beta_j \text{Treat}_i \text{Post}_j$  provides an estimate for each year of asylum decision in the Survey of Refugees specifically. The rationale behind this is two-fold: First, treatment leads simulate a pseudo treatment before the residence rule was introduced and, therefore, provide further evidence that the common trend assumption is met (Autor 2003). Figure 1.9 consistently reports zero-effects in the period absent of treatment (until July 2016). Second, treatment lags demonstrates changes in treatment effects over time. For instance, treatment states may take some time to introduce integration courses in relevant counties, which could result in a delayed treatment effect.

### **1.4.2 Potential threats to identification**

Besides introducing the residence rule, policy makers also suspended the so-called “priority review” in summer 2016. The priority review is a check mechanism by the Federal Employment Agency that states that an asylum seeker in Germany can take up employment only if there was no German or EU citizen who would be available for a specific job. One might therefore worry about confounding the estimated effects with other reforms or changes taking place at the same time. Yet, since the two reforms target different groups of refugees (asylum seekers vs humanitarian migrants), it is unlikely that the overlap in time will bias estimation results. I have not found any other significant reforms or policy changes that could be of concern for the results.

Due to the controversial discussion about immigration in Germany at the time of the policy change, a second source of bias could arise if individuals have anticipated the reform. Even if this was the case, asylum seekers generally have no possibility

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to influence the timing of their asylum decision. What is more, due to the sudden influx of refugees into Germany in 2015 and 2016, many asylum seekers had to wait for a prolonged period of time until they received a final decision.<sup>14</sup> Ergo, anticipation effects are largely negligible.

Similarly, a potential threat to our identification could be manipulation across the cutoff: if decision makers strategically move the decision on asylum based on expected gains to take place before (or after) the residence rule has been installed, our estimate may be inconsistent. I use information on the date of the asylum decision to compute the distance to the introduction of the residence rule in months and compare the density of asylum decisions around the cutoff (McCrary 2008). Figure 1.10 illustrates that there is no discontinuity, suggesting that institutional decision makers did not engage in manipulations of asylum dates.<sup>15</sup>

Finally, one might be concerned about selection into treatment. If treatment and control states exhibit different geographic, economic or political patterns, such differences may have led treatment states to impose additional regulations at the state level. Qualitative investigations show that treatment states justify additional legislation at the state level based on §12a Art. 9 AufenthG: residence restrictions at the county level may help humanitarian migrants to acquire suitable accommodations, to gain sufficient command of spoken German language proficiency, and to enter paid employment.<sup>16</sup>

Table 1.13 provides additional and quantitative evidence that treatment and control states share similar political and labor market characteristics in 2013.<sup>17</sup> The table contrasts county level information on several regional level characteristics (disaggregating between counties in treated and control states), including, for instance, the average population size, the average age of the population, and regional unemployment rates. On average, there exist only marginal differences in treatment and control

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<sup>14</sup>Due to the massive inflow of foreigners in Germany, waiting times on asylum decision (measured in months from arriving in Germany) have increased steadily from 2015 to 2018. While asylum seekers in the working sample had to wait on average 5.6 months (SD=5.6) in 2015, this increased to 9.3 months (SD=5.8) in 2016, 16.6 months (SD=7.1) in 2017, and 22.5 months (SD=14.1) in 2018.

<sup>15</sup>Figure 1.10 shows the results for the full sample. The results hold, however, if I differentiate between asylum decisions in treatment and control states.

<sup>16</sup>See, for instance, Minister of the Interior in Baden Wurttemberg Thomas Strobel's interview: <https://www.baden-wuerttemberg.de/de/service/presse/pressemitteilung/pid/wohnsitzaufgabe-wird-konsequent-umgesetzt-1/>, last accessed 03.12.2020.

<sup>17</sup>To avoid potential biases, I use information as of 2013 to compare regional characteristics at the county level, which corresponds to a period before the refugee inflow. This year also coincides with a parliamentary elections, which allows to compare the political dimension as well.

states. While treatment states tend to be slightly more economically successful, these differences are rarely statistical significant. Using electoral data from the parliamentary elections in 2013 reinforces this impression: For example, while turnout amounts to 71.1 percent in treatment states, control states feature an average voter turnout of 71.4 percent. What is more, the choice to apply additional legislation at the state level did not depend on the political party in office. Table 1.13 hence suggests that treatment and control states share similar political and labor market characteristics rebutting the assumption of selection into treatment.

## **1.5 Results and sensitivity analyses**

### **1.5.1 Main results**

The Integration Act aims at improving access to integration measures and language courses in particular. Hence, this paper investigates if strict residence restrictions have an effect on the probability to begin an integration course, the probability to complete an integration course, and certified language levels.<sup>18</sup> Since an integration course aims to supply refugees with intermediate German language proficiency levels (Level B1), I redefine this variable to take a value of one if the respective level has been achieved in the final exam, zero else. Furthermore, I explicitly differentiate between integration outcomes in the short-, medium-, and long-run. Short-run outcomes correspond to integration outcomes in the year of the asylum decision, medium-term outcomes evaluate integration outcomes 12 months after the decision on the asylum claim has been reached, and long-run integration outcomes correspond to integration outcomes at the time of the latest survey interview.<sup>19</sup> Finally, I also consider humanitarian migrants' self-assessed German language proficiency levels at the time of the latest survey interview, which are reported on a 5-point likert scale from 1 "not at all" to 5 "very good". While this allows for a differentiated view on refugees' abilities to read, speak, and write the German language, self-assessed language proficiency may be prone to measurement error (Dustmann and Soest 2001). Similarly to the variable "Intermediate German proficiency levels", I build an indicator variable which takes a value of one

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<sup>18</sup>Language proficiency levels are measured on a scale from 0 to 3 (0 "No certified level", 1 "Level A1", 2 "Level A2", 3 "Level B1").

<sup>19</sup>On average, humanitarian migrants in the sample have reached a decision on their asylum claim some two years ago (mean 22 months, SD 12 months).

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for humanitarian migrants who report at least “good” current German language skills, zero else.

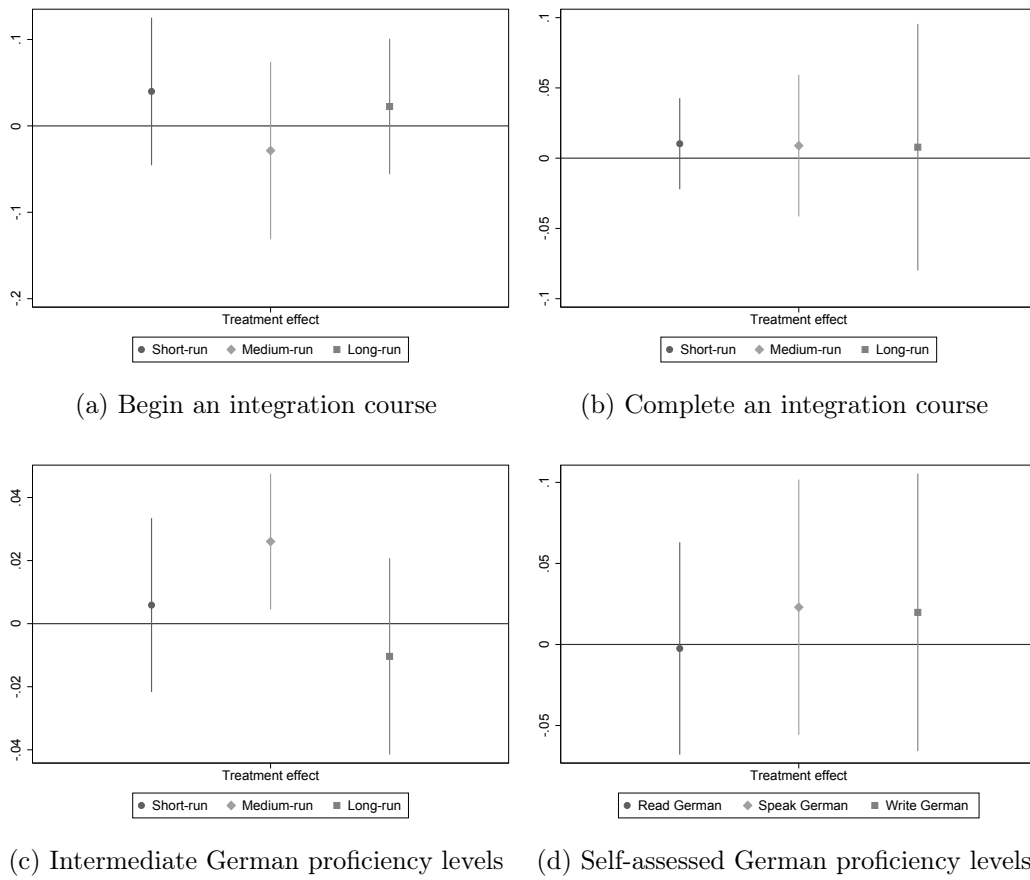
The average number of integration courses in treatment and control states over the period from 2013 to 2018 is shown in Figure 1.11: Panel a displays the average number of integration courses begun each year and Panel b displays the average number of integration courses completed. Three points are noteworthy. First, there is no difference between treatment and control states before the introduction of the residence rule in 2016. Second, the large number of foreigners entering Germany in 2015 induced a sharp increase in the average number of integration courses per state. Third, while the graph suggests treatment states performed slightly better than control states in 2017, these differences have diminished in 2018 already.

Figure 1.2 reports estimation results based on Equation 1.1 for the outcome variables in the short-, medium-, and long-run. Tables 1.15 to 1.18 report the main estimation results in detail. Somewhat surprisingly, I find that the residence rule has had no impact on the the probability to begin or complete an integration course (Panel a and b in Figure 1.2). For instance, effects on the probability to complete an integration course range between 0.010 percentage points in the short and 0.008 percentage points in the long-run. These zero effects are precisely estimated with small standard errors such as 0.015 and 0.041 respectively. The results consequently suggest that the residence rule has failed in increasing refugees' attendance in integration measures including integration courses.

A closer look at humanitarian migrants' language skills indicates that humanitarian migrants in treatment states are somewhat more likely to complete intermediate German language proficiency levels in the medium-run (12 months after their asylum decision). To be precise, the residence rule increased the probability to achieve intermediate German proficiency levels by 2.6 percentage points for humanitarian migrants in treatment states, relative to a mean of 8 percent (Column 2 in Table 1.17). This translates into an increase of 32.5 percent. Yet, the effect seems to fade out over time and does not translate into higher self-assessed German proficiency levels, including humanitarian migrants' ability to read, write, and speak German in the long-run (Figure 1.3d).

To conclude, stricter residence restrictions as a result of the so-called residence rule have consistently small, and non-significant effects on humanitarian migrants' attendance in integration courses and their German language proficiency levels. While

Figure 1.2: Visualization of results



*Note:* Panels a to d in Figure 1.2 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represents the effect of strict residence restrictions on humanitarian migrants' participation in integration courses and their German proficiency levels. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

small positive effects exist in the medium-run, the effects are not prevailing over a longer period, and do not translate in higher self-assessed German language proficiency levels. It thus seems that strict placement policies failed in reaching their goal to improve access to integration measures and courses.

## **1.5.2 Misallocation of humanitarian migrants as potential mechanism**

While the effect of strict residence restrictions on humanitarian migrants is a priori ambiguous (cf. Section 1.1), with most policy interventions there is no reason that the expected input would be zero. This section provides suggestive evidence that the misallocation of refugees to counties with insufficient supply of integration courses (and other integration measures) provides an underlying mechanism driving the regression results.

Section 1.5.1 shows that the introduction of strict residence restrictions as a result of the residence rule has only limited impact on humanitarian migrants' participation in integration and their German language proficiency levels. This finding holds if I investigate participation in any language course (see Section 1.5.3). While the average number of integration courses per state develops similarly over time (see Figure 1.11), this states little on the local accessibility of German language courses and other integration measures. If counties in treatment states fail to offer a sufficient number of integration courses, this may play a crucial role in explaining our results ("spatial mismatch", see Kain (1968)).

To test this hypothesis, I draw on administrative data from the BAMF, which provides yearly information on the supply of integration courses at county level ("Integrationskursgeschäftsstatistik"). To be precise, the dataset lists the number of courses begun and completed per county in a given year. Thus, this external data base provides exact information on the local access to integration courses. I use information on humanitarian migrants' county of residence and their year of asylum decision, to merge this information to the IAB-BAMF-SOEP Survey of Refugees. Table 1.4 then compares the local supply of integration courses per county in treatment and control states.

A comparison of the local supply of integration courses in treatment and control states shows that control states offer a significantly higher amount of integration

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Table 1.4: Local supply of integration courses in treatment and control states

	Mean(Treated)	Mean(Control)	Diff.	Std. Error	Obs.
# begun	83.2	211.6	128.4***	11.408	2616
# completed	54.3	118.7	64.4***	6.481	2616

	Mean(Treated)	Mean(Control)	Diff.	Std. Error	Obs.
# begun, per 1000 foreigners	2.0	2.6	0.6***	0.077	2613
# completed, per 1000 foreigners	1.3	1.4	0.1**	0.052	2613

*Note:* Table 1.4 compares the local supply of integration courses in treatment and control states using a t-test. \* significant at 10%; \*\* significant at 5; \*\*\* significant at 1%. Source: IAB-BAMF-SOEP Survey of Refugees, v35, BAMF Integrationskursgeschäftsstatistik (2013-2018), and Regionaldatenbank Destatis.

courses per district. This holds for the number of courses begun and the number of courses completed. Germany has 16 federal states in total, including three so called city states (Bremen, Berlin, and Hamburg), which encompass the city and its surrounding areas. All city states have decided to forgo stricter residence restrictions, and are therefore considered part of the control group. Likewise, city states experience higher numbers of immigration. A simple control of the number of integration courses is therefore insufficient. Consequently, I compare the number of integration courses per 1,000 foreigners in a second step.<sup>20</sup> As such, I can relate the number of integration courses to the size of the relevant population in each county. The second Panel of Table 1.4 illustrates that the adjusted number of integration courses is still higher in control than in treatment states. For example, the number of integration courses begun per 1,000 foreigners equals 2.0 per county in treatment states and 2.6 in control states. This difference is statistically significant at the one percent level. The mean comparison therefore suggests that misallocation of humanitarian migrants plays an important role in explaining the results.

Since the Survey of Refugees provides precise information on the date of asylum decision and the start date of the integration course, I may investigate the underlying mechanism even further. The Kaplan-Meier estimator in Figure 1.3 illustrates the probability to begin an integration course after the asylum decision has been reached,

<sup>20</sup>The number of foreigners by county and year is provided by the German Federal Statistical Office (Regionaldatenbank Destatis). The variable is defined as the number of integration courses begun or completed divided by the number of foreigners in thousands.



i.e., the duration between asylum decision and the take-up of an integration course for humanitarian migrants in months. To be precise, Panel a in Figure 1.3 shows the overall pattern and Panel b in Figure 1.3 disaggregates the duration by treatment status. In line with previous arguments, I find that it takes humanitarian migrants equally long to begin an integration course in treatment and control states.

Table 1.5 presents the effect of receiving the asylum decision in the post-treatment period, the effect of living in a treatment state, and the respective interaction term on the time to an integration course after the asylum decision. The latter can be interpreted as the treatment effect for those humanitarian migrants, who received their asylum decision in a treatment state after the residence rule was put in place.<sup>21</sup> The coefficients are displayed as hazard ratios. Table 1.5 illustrates that the duration to take-up has substantially decreased over time. The hazard ratio for the coefficient **Post** is 2.1, i.e., humanitarian migrants in the post-treatment period have twice the chance of taking-up an integration course at a particular time than humanitarian migrants in the pre-treatment period. This corresponds to an extended offer of integration courses over time (Figure 1.11). The results suggest, however, no statistically significant between humanitarian migrants in treatment and control states or a significant interaction effect. Overall, the results indicate that treatment states failed to place humanitarian migrants in counties with sufficient supply of integration courses, which translates in zero effects after the residence rule was installed.

### **1.5.3 Heterogeneity analyses and robustness checks**

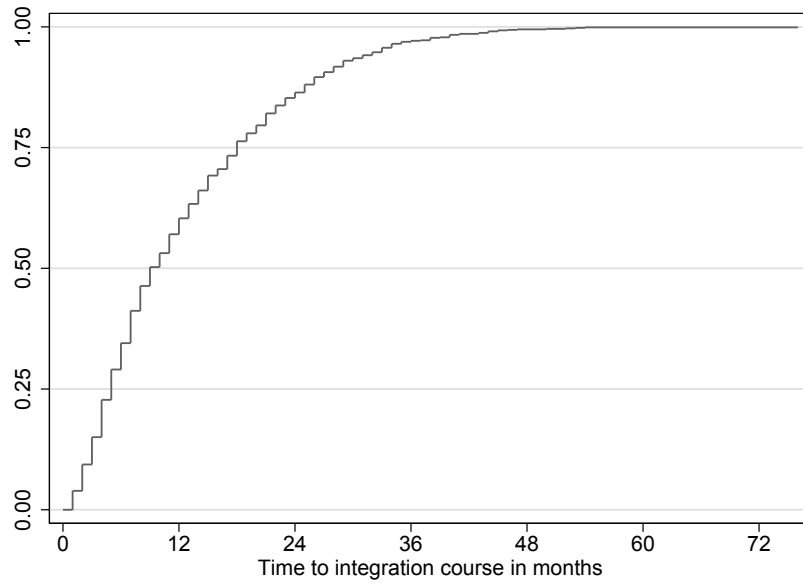
Tables 1.15 to 1.19 suggest that some parameters have substantial influence on the participation in integration courses and German language proficiency levels, including for example gender, the presence of children in the household, and humanitarian migrants' level of education. Following these main results, I do several heterogeneity analyses to gain further insights. Female refugees are significantly less likely to participate in integration courses in Germany. Figure 1.12 consequently investigates if treatment effects differ by gender. In line with the main results, Panels a and b in Figure 1.12 indicate that there are no gender differences in humanitarian migrants'

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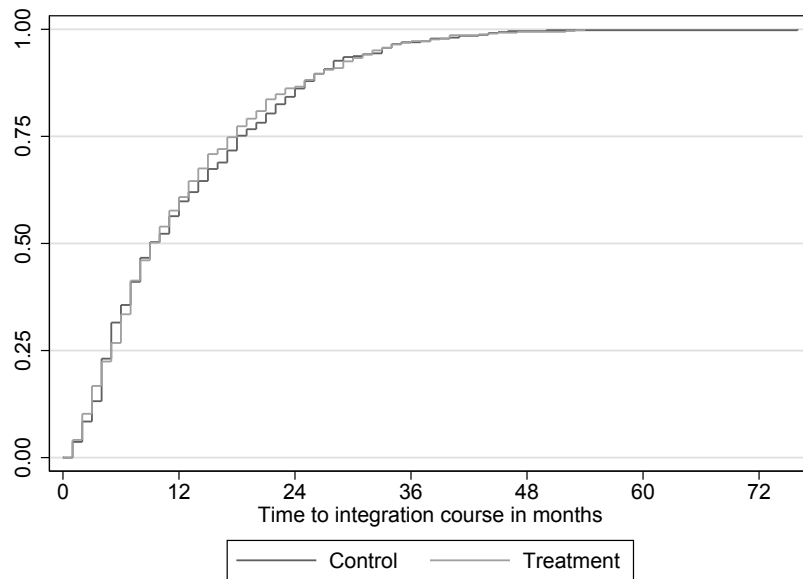
<sup>21</sup>The Cox regression model considers only observations with "positive" duration, i.e. observations who started an integration course after receiving their asylum decision. This reduces the number of observations by 10 percent. Furthermore, I lose observations who do not provide information on the month in which they begin an integration course. The number of observations therefore drops to 971.

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Figure 1.3: Transition into an integration course after asylum decision



(a) Full sample



(b) By treatment status

*Note:* Panels a and b in Figure 1.3 display the duration between asylum decision and the take-up of an integration course in months for the full sample and disaggregated by treatment status. Source: IAB-BAMF-SOEP Survey of Refugees, v35.



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likelihood to begin or complete an integration course. Likewise, the figures show zero effects. Panel c in Figure 1.12 illustrates that—in contrast to males—living in a state that enforces the residence rule more strictly increases female humanitarian migrants' probability to achieve intermediate German proficiency levels in the medium-run. The effect is substantial in size and statistically significant: the probability increases by 6 percentage points, relative to a mean of 6 percent. In line with the main results, however, I find no statistically significant differences between treatment and control states in the long-run. Comparing households with and without children present, Figure 1.13 illustrates little differences with respect to the probability to complete an integration course and humanitarian migrants' ability to reach intermediate German proficiency levels. In the long-run, I find a small effect for the probability to begin an integration course. This may, in turn, translate into improved integration outcomes in the future. Finally, education can be considered an essential asset in immigrants' integration process (cf. Ichou (2014) and Spörlein and Kristen (2019a,b)). Figure 1.14 therefore investigates if estimation results differ between humanitarian migrants with primary education (low education) and humanitarian migrants with secondary or tertiary education (medium and high education). Panel b in Figure 1.14 illustrates that while humanitarian migrants with medium and high education have a higher probability to attend integration courses, better educated humanitarian migrants who live in a federal state that applies stricter residence rule are more likely to complete an integration course and achieve higher German proficiency language levels. Yet, in the long-run, none of these effects prevail.

There exists extensive literature on the importance of social networks. The effect of existing ethnic enclaves is theoretically ambiguous though. For instance, while a smaller network of compatriots in the location of residence may increase an immigrant's incentives to participate in a language course in order to learn the host country language (Lazear 1999), immigrants may be less informed about potential course offerings (Bertrand et al. 2000). Similar, yet opposing, arguments hold for a network of natives. Hence, the effect of network size in humanitarian migrants' language proficiency levels are not clear a priori. Table 1.20 highlights the importance of both inter-ethnic and intra-ethnic networks with respect to the probability to participate in integration courses and German proficiency levels. For example, frequent contact with German natives increases the probability to complete an integration course in the short-run by 0.018 percentage points. The table further emphasizes that frequent contact with

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Germans is positively correlated with the probability to achieve intermediate German proficiency levels and self-assessed German language skills. Interestingly, frequent contact with compatriots is positively correlated with humanitarian migrants' probability to achieve intermediate German proficiency levels, too. In general, however, including network variables does not significantly alter the main results. Furthermore, for humanitarian migrants with frequent or irregular contact with German natives, I find that the respective estimates consistently report null results, which leads me to the conclusion that there is little difference across the two groups. Similar findings hold for networks with humanitarian migrants. However, humanitarian migrants with irregular contact with compatriots seem to be more successful in achieving intermediate German proficiency levels in the medium-term and long-run.

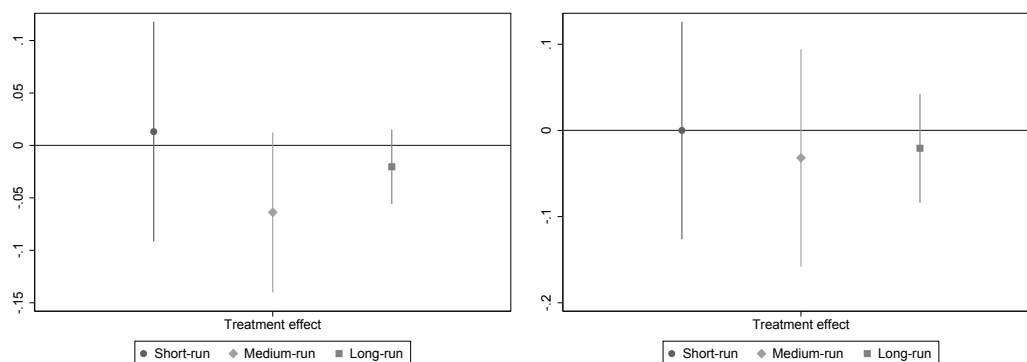
Based on its historical background, Germany changed to a federal system after the second world war, where individual states have great freedom in their legislative and executive powers. Considering that city states much smaller than territorial states, residence restrictions may be less severe. Consequently, Figure 1.17 displays estimation results for a restricted sample without humanitarian migrants living in city states as an additional robustness test. Throughout, the effects resemble the main specification in Figure 1.2 to a great extent, which implies that differences between city and territorial states do not drive estimation results.

Besides integration courses, there exist many other possibilities to participate in a language course in Germany, for example so called ESF-BAMF courses, entry courses for German language skills, and other language courses. While I find limited evidence of stricter residence restrictions on participation in integration courses, humanitarian migrants in treatment states may be more likely to select in other integration measures and language courses. This is why, I further analyze the effect of stricter residence restrictions on participation in any language course.<sup>22</sup> The results are presented in Figure 1.4. In line with the main results, I do not find an effect of strict residence restrictions on the probability to begin (or complete) a language course in Germany in the short-, medium-, and long-run. Thus, I conclude that treatment states did not succeed in improving access to language courses after the residence rule was put in place.

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<sup>22</sup>Unfortunately, the SOEP changed its questionnaire content and does not provide certified language levels for courses other than integration courses after 2016. Due to this limitation, it is impossible to analyze German language proficiency levels for all language courses.

Figure 1.4: Effect of strict residence restrictions on the probability to participate in any language course



(a) Begin a language course

(b) Complete a language course

*Note:* Panels a and b in Figure 1.4 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represents the treatment effect of strict residence restrictions on humanitarian migrants' participation in language courses. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

Cluster-robust inference is based on the assumption that the number of clusters goes to infinity. Cameron et al. (2008, p.414, ed. notes) show that “[with] a small number of clusters, the cluster-robust standard errors are downward biased.” To account for the limited number of clusters in the German context ( $G=16$  states), I follow the authors' recommendation and apply wild cluster bootstrap as a robustness check, which provides asymptotic refinement in a two-step procedure. First, I generate pseudo-samples of the original regression's residuals using so called “Rademacher weights”. Second, I reestimate the regression equation based on the generated pseudo-samples, while keeping the vector of control variables constant. Results gained from this estimation exercise confirm the findings provided in previous sections (Table 1.21). In a setting of 999 replications, the wild-cluster bootstrap procedure usually returns p-values that are slightly larger than the ones from original cluster-robust inference. For instance, the wild-cluster bootstrap procedure returns a p-value of  $p = 0.72$  for the probability to complete an integration course in the medium-run (12 months after asylum decision), compared to a p-value of  $p = 0.71$  in the baseline estimates. Similar findings hold for all relevant outcome variables.

Finally, to further validate the assumption that treatment and control units would have followed similar paths in absence of the reform, I perform placebo test simulating

that the reform took effect in August 2015, one year before the reform was actually implemented. Figure 1.18 illustrates that - similar to the main results - this placebo test yields insignificant estimates for all of the respective outcome variables. Throughout, the coefficients are small and close to zero.

## **1.6 Conclusion**

There is currently a controversial debate about how to integrate immigrants successfully into their host countries. This dispute, fueled by the increased inflow of refugees into Europe in recent years, prompted several European countries to change their legislation in order to enhance integration measures and allow for targeted integration of immigrants into local labor markets. Similarly, Germany has introduced the so called residence rule.

This paper uses the varying degree of the Act's implementation across states to analyze the causal effect of tight residence restrictions on humanitarian migrants' language acquisition and their participation in language courses. Despite the overall number of integration courses increasing over time, for most outcomes, I report estimates that are statistically indistinguishable from zero but are often precise enough to bound the parameter estimated to a tight range around the point estimate. The results are robust to several robustness checks and specifications. Thus, it appears that the residence rule has been ineffective in reaching its goal to improve access to integration courses and thereby improve humanitarian migrants' language proficiency levels and foster labor market integration. The results suggest that the misallocation of humanitarian migrants to counties with insufficient offerings of integration courses plays a crucial role in explaining our findings. The results are particularly important considering that the residence rule, which has initially been introduced for a period of three years in 2016, has recently been extended for an indefinite period of time.

Besides first-order effects on humanitarian migrants' participation in language courses and their language proficiency levels, the residence rule's impact on labor market participation and individual behavior such as job search is an important topic for future research. Given that being employed is an important alternative to participating in integration courses and the fact that gainful employment bypasses the restrictions of the residence rule, there are likely to be large returns to future employ-

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ment on this topic. Respective analyses, however, require more detailed information on the employment history of refugees in Germany. Linking the IAB-BAMF-SOEP data with administrative data from the Federal Employment Agency offers a promising avenue for future research.

The residence rule led to a trade-off between humanitarian migrants' freedom of movement and their future integration. The paper's insights are directly relevant to policy debates around the world. With migration increasing world wide, many countries experience similar immigration shocks and related challenges. One clear policy implication is that the local accessibility of integration measures and language courses should be explicitly considered in the distribution mechanisms of refugees across states and counties. As immigrants' language proficiency levels are inherently linked to their prospective integration outcomes, they should have easy access to participate in language courses directly after arrival. The results further suggest that tight (residence) restrictions, which can also affect humanitarian migrants' sense of well-being and, in turn, future integration (e.g., Kao and Tienda (1995) and Leitner et al. (2019)), need to be tailored to provide the best possible support for immigrants and refugees (World Bank 2018) and facilitate prompt access to employment (Edin et al. 2004; Organization for Economic Co-operation and Development 2018; Rosholm and Vejlin 2010).



## 1.7 Appendix

### 1.7.1 The Königsstein Key and redistribution to German counties

The Königsstein Key is a distribution mechanism that allocates refugees at state level based on the state's tax revenue and population size to ensure a proportional distribution of refugees across German states. The respective formula incorporates tax revenues by two thirds and population size by one third.<sup>23</sup> In case there exist several reception centers within the assigned state, the EASY quota system ("Erstverteilung der Asylbegehrenden", engl. Initial distribution of asylum seekers) chooses the reception center located nearest to the authority where the registration took place in order to minimize commuting costs. In practice, there is only one exception: In compliance with basic constitutional law (Art. 6 GG), state authorities intend to place parents and minor children in the same state if family members arrive at different points of time. Because family members generally apply for so called "family asylum", this influences less than 10 percent of the placement decisions.

Table 1.6 illustrates the exact allocation scheme from 2010 to 2018. Table 1.7 then compares a state's received versus assigned percentage share of asylum seekers (determined by the Königsstein Key) for German states from 2013 to 2018. The table demonstrates that asylum seekers are indeed allocated to states according to the Königsstein Key.

While the 16 German states individually determine the further distribution of asylum seekers to a given county, most states use population size as the main distribution criterion (Table 1.8). Few states decided to employ a quota, that incorporates other measures, including for example unemployment rate or area in square meters.

One implication of the institutional setting is that, conditional on the population size of the county, the number of asylum seekers should be orthogonal to observed and unobserved county characteristics. While this is not directly testable, it is possible to provide suggestive evidence on the respective hypothesis.

Table 1.9 illustrates the cross-sectional regression results using the number of asylum seekers per county as the independent variable conditional on population size, unemployment rate, the share of settlement areas, GDP per capita, and the popula-

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<sup>23</sup>For further information, please refer to <https://www.bamf.de/DE/Themen/AsylFluechtlingsschutz/AblaufAsylverfahrens/Erstverteilung/erstverteilung-node.html>, accessed 03.12.2020.

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Table 1.6: Assigned percentage share of asylum seekers determined by the Königsgstein Key

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Baden Wurtemberg	12.8	12.8	12.9	13.0	13.0	12.9	13.0	13.0	13.0
Bavaria	15.1	15.2	15.2	15.3	15.3	15.5	15.5	15.6	15.6
Berlin	5.0	5.0	5.1	5.0	5.0	5.0	5.1	5.1	5.1
Brandenburg	3.1	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0
Bremen	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0
Hamburg	2.6	2.5	2.6	2.5	2.5	2.5	2.6	2.6	2.6
Hessen	7.2	7.2	7.3	7.3	7.3	7.4	7.4	7.4	7.4
Lower Saxony	9.3	9.3	9.4	9.4	9.4	9.3	9.3	9.4	9.4
Mecklenburg-West Pomerania	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0
North Rhein-Westphalia	21.3	21.4	21.2	21.2	21.2	21.2	21.1	21.1	21.1
Rhineland Palatine	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Saarland	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Saxony	5.2	5.2	5.1	5.1	5.1	5.1	5.1	5.0	5.0
Saxony-Anhalt	3.0	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.8
Schleswig Holstein	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Thuringia	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.7

*Note:* Table 1.6 lists the percentage share of refugees that is assigned to the German states disaggregated by states and years for the period of 2010 to 2018. Figures in percent. Source: <https://www.gwk-bonn.de/themen/finanzierung-von-wissenschaft-und-forschung/koenigsteiner-schluesse1/>, last downloaded on June 8, 2020.

tion's average age. If the assumption of random assignment holds, we would expect the coefficients on county characteristics other than population size to be statistically insignificant from zero. The table shows that population size is a highly significant predictor for the number of asylum seekers. The remaining variables, on the other hand, have little predictive power and are statistically insignificant. This holds true if we include state as well as state and year fixed effects in a longitudinal context (Table 1.10 & Table 1.11). Hence, conditional on population size, asylum seekers are randomly allocated across German counties.

Table 1.7: Received versus assigned percentage share of asylum seekers per state

	2013		2014		2015		2016		2017		2018	
	%	Königsstein	%	Königsstein	%	Königsstein	%	Königsstein	%	Königsstein	%	Königsstein
Baden Württemberg	12.2	13.0	9.5	13.0	12.9	11.7	13.0	10.8	13.0	9.9	13.0	
Bavaria	15.2	15.3	14.9	15.3	15.5	11.4	15.5	12.2	15.6	13.5	15.6	
Berlin	5.6	5.0	6.0	5.0	5.0	3.8	5.1	4.7	5.1	5.1	5.1	
Brandenburg	2.8	3.1	2.8	3.1	3.1	2.5	3.0	2.8	3.0	2.9	3.0	
Bremen	1.0	0.9	1.3	0.9	1.1	1.2	1.0	1.3	1.0	1.3	2.0	
Hamburg	2.9	2.5	3.3	2.5	2.8	2.4	2.6	2.4	2.6	2.6	2.6	
Hessen	7.4	7.3	7.2	7.3	7.4	9.1	7.4	7.4	7.4	8.0	7.4	
Lower Saxony	9.3	9.4	8.9	9.4	9.3	11.5	9.3	9.5	9.4	10.4	9.4	
Mecklenburg-West Pomerania	2.1	2.1	2.6	2.0	2.0	1.0	2.0	2.0	2.0	1.7	2.0	
North Rhine-Westphalia	21.6	21.2	23.1	21.2	21.2	27.2	21.1	26.9	21.1	24.4	21.1	
Rhineland Palatine	5.0	4.8	5.0	4.8	4.8	5.1	4.8	6.5	4.8	4.7	4.8	
Saarland	1.1	1.2	1.5	1.2	1.2	1.0	1.2	1.6	1.2	1.7	1.2	
Saxony	4.6	5.1	3.5	5.1	5.1	3.3	5.1	3.7	5.0	4.7	5.0	
Saxony-Anhalt	2.9	2.9	3.5	2.9	2.8	2.7	2.8	2.6	2.8	2.6	2.8	
Schleswig Holstein	3.4	3.4	4.1	3.4	3.4	4.0	3.4	3.1	3.4	4.0	3.4	
Thuringia	2.5	2.8	2.8	2.7	2.7	2.1	2.7	2.5	2.7	2.6	2.7	
Unknown	0.2	.	0.1	.	.	0.0	.	0.1	.	0.1	.	

Note: For the years 2013 to 2018, Table 1.7 tabulates the actual share of refugees assigned to a particular state (%) and the percentage share determined by the Königsstein key (Königsstein). Figures in percent. Source: BAMF (2014, 2015a,b, 2016a, 2017a, 2019b).

Table 1.8: Distribution of refugees within states

State	Responsible unit	Legal basis	Basis of the quota
Baden Württemberg	Municipalities	§18 Abs. 1 FlüAG	Population
Bavaria	Administrative Districts in coop. with municipalities	§§6 and 7 DVAsyl	Statutory order (fixed allocation key)
Berlin	Federal government		Involves non-governmental actors.
Brandenburg	Municipalities	§6 Abs. 4 LAufnG	Population
Bremen	Bremen and Bremerhaven	§3 Abs. 3 AufnG Bremen	Statutory order (fixed allocation key)
Hamburg	Federal government		Behörde für Inneres und Sport
Hessen	Municipalities	§2 Abs. 1 LAufnG	Population
Mecklenburg-West Pomerania	Municipalities	§6 Abs. 1 ZuwFLAGDlVO M-V	Population
Lower Saxony	Municipalities	§1 Abs. 1 Satz 2 i. V. m. §2 Abs. 1 AufnG	Population
North Rhine-Westphalia	Municipalities	§1 Abs. 1 i. V. m. §3 Abs. 1 FlüAG	Population and area
Rhineland Palatine	Municipalities	§2 Abs. 1 Nr. 2 i. V. m. §6 Abs. 1 AufnG RP	Population
Saarland	Municipalities	§§1 and 2 LAG	Population
Saxony	Municipalities	§2 Abs. 1 u. 2 i.V.m. §6 Abs. 3 SächsFlüAG	Population
Saxony-Anhalt	Municipalities	§1 Abs. 1 u. 3 AufnG ST	Population
Schleswig Holstein	Municipalities	§1 Abs. 2 LAufnG i.V.m. §7 Abs. 1 AuslAufnVO	Population
Thuringia	Municipalities	§2 Abs. 1 Thür-FlüVertVO	Statutory order (fixed allocation key)

*Note:* Presentation based on respective state regulations.

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Table 1.9: Random assignment conditional on county population

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2011	2012	2013	2014	2015	2016	2017
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Population size	0.003*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.006*** (0.001)	0.012*** (0.001)	0.010*** (0.001)	0.007*** (0.000)
Unemployment rate	11.335* (6.841)	12.385 (9.005)	12.024 (10.354)	20.490 (18.153)	69.035 (45.136)	51.835 (35.736)	27.506 (22.008)
Share of settlement areas	277.719 (168.553)	208.298 (196.450)	115.237 (226.502)	-104.051 (375.762)	-428.590 (979.726)	-423.812 (724.539)	60.694 (438.338)
GDP per capita	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.005 (0.003)	-0.005 (0.006)	-0.003 (0.003)	-0.000 (0.002)
Average age	12.666 (11.631)	9.437 (14.811)	10.752 (16.664)	6.122 (28.734)	-89.096 (87.542)	-85.199 (52.098)	-18.479 (26.056)
r2	0.867	0.865	0.887	0.878	0.826	0.888	0.909
N	390	400	400	400	400	401	400

*Note:* Table 1.9 displays cross-sectional results for a test of random assignment conditional on the county's population size for the period 2011 - 2017.  $*p < 0.1, **p < 0.05, ***p < 0.01$ . Population size corresponds to the total population in the respective county. The unemployment is the share of all unemployment persons of the labor force. The share of settlement areas is calculated as the are devoted to settlements and traffic over the total area 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. Robust standard errors clustered on the state level are in parentheses. Source: Destatis.

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Table 1.10: Random assignment conditional on county population exploiting within state variation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2011	2012	2013	2014	2015	2016	2017
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
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	8.033 (6.389)	13.127* (7.503)	12.737 (8.492)	13.627 (17.521)	-6.998 (59.884)	53.753 (38.525)	20.300 (18.190)
Share of settlement areas	219.648* (113.683)	115.992 (129.748)	47.757 (145.672)	-136.384 (296.477)	62.762 (1145.283)	-707.254 (654.160)	-50.916 (348.268)
GDP per capita	-0.000 (0.001)	-0.000 (0.001)	-0.001 (0.001)	-0.002 (0.002)	0.000 (0.005)	0.002 (0.002)	0.002 (0.002)
Average age	9.402 (7.198)	-0.291 (9.124)	2.610 (10.014)	-9.135 (22.572)	-92.631 (95.482)	-33.896 (48.726)	-11.905 (27.088)
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.955	0.955	0.960	0.937	0.853	0.917	0.929
N	390	400	400	400	400	401	400

*Note:* Table 1.10 displays cross-sectional results for a test of random assignment conditional on the county's population size for the period 2011 - 2017. Each regression includes a full set of state indicators.  $*p < 0.1$ ,  $**p < 0.05$ ,  $***p < 0.01$ . Population size corresponds to the total population in the respective county. The unemployment is the share of all unemployment persons of the labor force. The share of settlement areas is calculated as the are devoted to settlements and traffic over the total area 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. Robust standard errors clustered on the state level are in parentheses. Source: Destatis.

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Table 1.11: Random assignment conditional on county population exploiting within state variation and yearly fixed effects

	(1)
	2011
	b/se
Population size	0.005*** (0.001)
Unemployment rate	18.339 (18.916)
Share of settlement areas	-141.061 (309.559)
GDP per capita	0.000 (0.002)
Average age	-33.807 (28.176)
State FE	Yes
Year FE	Yes
R-Squared	0.751
N	2791

*Note:* Table 1.11 displays cross-sectional results for a test of random assignment conditional on the county's population size for the period 2011 - 2017. The regression includes a full set of state and year indicators. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Population size corresponds to the total population in the respective county. The unemployment is the share of all unemployment persons of the labor force. The share of settlement areas is calculated as the are devoted to settlements and traffic over the total area 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. Robust standard errors clustered on the state level are in parentheses. Source: Destatis.

## 1.7.2 Tables

Table 1.12: Categories of Protection in Germany

Category	Rate of Protection in %	Legal basis	Duration of residence permit	Details
1 Political asylum	0.70	<i>Grundgesetz</i> Art. 16a	3 years	Reexamination of protection grounds after 3 years; permanent residence permit after 5 years ( <i>Niederlassungserlaubnis</i> ).
2 Geneva Refugee Convention (GFK)	20.50	GFK 1951, § 3 AsylG	3 years	Reexamination of protection grounds after 3 years; permanent residence permit after 5 years ( <i>Niederlassungserlaubnis</i> ).
3 Subsidiary protection status	16.30	§4 AsylG	1 year	Protection status can be extended several times.
4 Foreigners with tolerated status	6.60	§60 AufenthG	1 year	Deportation restriction can be renewed several times; still, <i>foreigners with tolerated status</i> have to leave Germany eventually.
Rejections	55.90			If the asylum claim has been ultimately rejected, the individual is obliged to leave Germany.

*Note:* Table 1.12 describes the four different classes of protection that may be granted to a refugee in Germany, once a decision on an asylum claim has been reached. The table also provides evidence on the underlying legal basis, duration of residence permit, as well as some details on further procedure. Source: Sachverständigenrat deutscher Stiftungen für Integration und Migration (2017b, p.4) and BAMF (2018, p.10).



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Table 1.13: Descriptive statistics in treated and comparison states, as of 2013

	(1) Treated states mean/sd	(2) Control states mean/sd
Population	206773.113 (164642.655)	194311.058 (288142.134)
Share asylum seekers	0.002 (0.001)	0.003 (0.001)
Average age	44.092 (1.555)	45.259 (1.921)
Settlement area	0.229 (0.167)	0.193 (0.139)
GDP	35529.638 (14842.122)	29722.358 (12776.591)
Unemployment rate	6.151 (3.202)	8.370 (2.985)
Voter turnout	71.062 (2.927)	71.444 (2.462)
Share votes: CDU/CSU	0.453 (0.042)	0.401 (0.029)
Share votes: SPD	0.233 (0.053)	0.264 (0.065)
Share votes: Green party	0.085 (0.017)	0.075 (0.021)
Share votes: FDP	0.051 (0.008)	0.042 (0.013)
Share votes: Die Linke	0.061 (0.049)	0.110 (0.079)
Share votes: AFD	0.044 (0.005)	0.051 (0.010)
Share votes: Other parties	0.073 (0.018)	0.057 (0.014)
<i>N</i>	213	189

*Note:* Table 1.13 compares descriptive statistics at county level for treatment and comparison states. Means (standard deviations). Population size corresponds to the total population in the respective county. Share asylum corresponds to the number of asylum seekers receiving asylum seeker benefits divided by the county's respective population. The unemployment rate is the share of all unemployment persons of the labor force. The share of settlement areas is calculated as the are devoted to settlements and traffic over the total area 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. Source: Destatis.

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Table 1.14: List of control variables

Variable name	Description
female	Female gender
children	Having children in the household
edu2	Secondary education, reference category: primary education
edu3	Tertiary education, reference category: primary education
dummy_age2	Aged 25-34, reference category: aged 18-24
dummy_age3	Aged 35-44, reference category: aged 18-24
dummy_age4	Aged 45-54, reference category: aged 18-24
dummy_age5	Aged 55+, reference category: aged 18-24
family_dummy1	Single, reference category: married
family_dummy2	Divorced, reference category: married
family_dummy3	Widowed, reference category: married
stat2	Entitled to asylum, reference category: refugee status
stat6	Admission on humanitarian grounds, reference category: refugee status
alq_year	Unemployment rate at county level in given survey year
pop_year	Population size at county level in given survey year
vac_year	Number of vacancies at county level in given survey year
year_arr_*	Year of arrival fixed effects, reference category: 2013
countrydummy*	Country of origin fixed effects, reference category: Syria
dummy_bula*	State fixed effects, reference category: North Rhine-Westphalia

*Note:* Table 1.14 provides an overview of individual and regional level covariates of humanitarian migrants from the IAB-BAMF-SOEP Survey of Refugees, which have been used throughout the empirical analyses.

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Table 1.15: Effect of strict placement restrictions on the probability to begin an integration course

	(1)	(2)	(3)
	Short-run	Medium-run	Long-run
	b/se	b/se	b/se
DiD	0.040 (0.040)	-0.029 (0.048)	0.022 (0.037)
Post	0.079*** (0.020)	0.175*** (0.029)	0.009 (0.030)
Treated	-0.135*** (0.028)	-0.237*** (0.038)	-0.067** (0.029)
Female	-0.065*** (0.012)	-0.126*** (0.015)	-0.173*** (0.016)
Children	-0.087*** (0.025)	-0.089*** (0.028)	-0.085*** (0.028)
Secondary education	0.053*** (0.012)	0.105*** (0.018)	0.089*** (0.019)
Tertiary education	0.089*** (0.024)	0.088*** (0.024)	0.036 (0.026)
Single	0.055** (0.025)	0.025 (0.031)	-0.004 (0.029)
Divorced	0.042 (0.058)	0.025 (0.039)	0.041 (0.035)
Widowed	-0.034* (0.017)	0.007 (0.035)	-0.009 (0.043)
Afghan origin	-0.008 (0.030)	-0.024 (0.031)	0.066** (0.028)
Iraqi origin	-0.015 (0.017)	-0.011 (0.020)	-0.005 (0.023)
Other origin	0.010 (0.045)	-0.005 (0.056)	0.018 (0.039)
Unemployment rate	0.002 (0.003)	0.007* (0.004)	0.005 (0.003)
Population size	-0.000* (0.000)	0.000 (0.000)	-0.000** (0.000)
Number of vacancies	0.000** (0.000)	-0.000 (0.000)	0.000* (0.000)
State FE	Yes	Yes	Yes
Year of arrival FE	Yes	Yes	Yes
R-Squared	0.088	0.104	0.069
N	2707	2508	2707

*Note:* Standard errors are clustered at the state level and are given in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the probability to begin an integration course. Reference categories are as follows: male, primary education, year of arrival = 2013, Syrian refugee, and North-Rhine Westphalia. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

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Table 1.16: Effect of strict placement restrictions on the probability to complete an integration course

	(1)	(2)	(3)
	Short-run	Medium-run	Long-run
	b/se	b/se	b/se
DiD	0.010 (0.015)	0.009 (0.024)	0.008 (0.041)
Post	0.030** (0.012)	0.067*** (0.018)	0.037 (0.023)
Treated	-0.049*** (0.009)	-0.086*** (0.013)	-0.178*** (0.026)
Female	0.001 (0.013)	-0.020 (0.014)	-0.107*** (0.013)
Children	-0.029*** (0.008)	-0.075*** (0.014)	-0.067** (0.023)
Secondary education	0.034*** (0.006)	0.086*** (0.012)	0.131*** (0.023)
Tertiary education	0.045*** (0.009)	0.092*** (0.018)	0.111*** (0.028)
Single	0.023 (0.017)	0.024 (0.029)	0.053** (0.023)
Divorced	0.017 (0.020)	0.042 (0.047)	0.066 (0.042)
Widowed	-0.024* (0.012)	0.026 (0.025)	-0.035 (0.039)
Afghan origin	0.006 (0.018)	-0.015 (0.025)	-0.010 (0.031)
Iraqi origin	-0.010 (0.016)	-0.005 (0.025)	-0.015 (0.023)
Other origin	-0.034* (0.017)	-0.039 (0.029)	-0.054 (0.034)
Unemployment rate	-0.000 (0.003)	-0.002 (0.006)	-0.003 (0.003)
Population size	-0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)
Number of vacancies	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)
State FE	Yes	Yes	Yes
Year of arrival FE	Yes	Yes	Yes
R-Squared	0.045	0.079	0.079
N	2707	2391	2707

*Note:* Standard errors are clustered at the state level and are given in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the probability to complete an integration course. Reference categories are as follows: male, primary education, year of arrival = 2013, Syrian refugee, and North-Rhine Westphalia. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

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Table 1.17: Effect of strict placement restrictions on the probability to achieve intermediate German language proficiency (Level B1)

	(1)	(2)	(3)
	Short-run	Medium-run	Long-run
	b/se	b/se	b/se
DiD	0.006 (0.013)	0.026** (0.010)	-0.010 (0.015)
Post	0.016* (0.009)	0.009 (0.013)	-0.014 (0.016)
Treated	-0.051*** (0.007)	-0.174*** (0.010)	-0.148*** (0.010)
Female	0.005 (0.009)	-0.008 (0.010)	-0.023 (0.014)
Children	-0.009* (0.004)	-0.059*** (0.015)	-0.041** (0.019)
Secondary education	0.022*** (0.005)	0.066*** (0.007)	0.106*** (0.008)
Tertiary education	0.045*** (0.011)	0.127*** (0.020)	0.179*** (0.025)
Single	0.033** (0.013)	0.044 (0.026)	0.066** (0.030)
Divorced	0.009 (0.016)	0.014 (0.020)	0.002 (0.029)
Widowed	-0.006 (0.008)	-0.004 (0.019)	-0.008 (0.022)
Afghan origin	-0.013 (0.012)	-0.010 (0.022)	-0.027 (0.022)
Iraqi origin	-0.016* (0.009)	-0.014 (0.010)	-0.024 (0.015)
Other origin	-0.030*** (0.008)	-0.049*** (0.016)	-0.052*** (0.015)
Unemployment rate	-0.003** (0.001)	-0.002 (0.003)	-0.003 (0.003)
Population size	-0.000 (0.000)	-0.000* (0.000)	-0.000** (0.000)
Number of vacancies	0.000 (0.000)	0.000* (0.000)	0.000*** (0.000)
State FE	Yes	Yes	Yes
Year of arrival FE	Yes	Yes	Yes
R-Squared	0.048	0.084	0.097
N	2707	2707	2707

*Note:* Standard errors are clustered at the state level and are given in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the probability to achieve intermediate German language proficiency (Level B1). Reference categories are as follows: male, primary education, year of arrival = 2013, Syrian refugee, and North-Rhine Westphalia. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

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Table 1.18: Effect of strict placement restrictions on self-assessed German proficiency levels

	(1) Read b/se	(2) Speak b/se	(3) Write b/se
DiD	-0.002 (0.031)	0.023 (0.037)	0.020 (0.040)
Post	-0.018 (0.024)	-0.016 (0.026)	-0.026 (0.031)
Treated	-0.226*** (0.021)	-0.189*** (0.021)	-0.166*** (0.022)
Female	-0.044* (0.022)	-0.069** (0.024)	-0.067*** (0.021)
Children	-0.030 (0.026)	-0.026 (0.016)	-0.026 (0.016)
Secondary education	0.213*** (0.020)	0.147*** (0.017)	0.164*** (0.019)
Tertiary education	0.399*** (0.024)	0.312*** (0.036)	0.344*** (0.021)
Single	0.138*** (0.028)	0.148*** (0.040)	0.163*** (0.037)
Divorced	0.024 (0.045)	0.011 (0.036)	0.027 (0.036)
Widowed	0.006 (0.039)	0.044 (0.041)	0.040 (0.041)
Afghan origin	-0.011 (0.044)	0.013 (0.032)	0.009 (0.034)
Iraqi origin	-0.008 (0.020)	-0.028* (0.015)	-0.039** (0.017)
Other origin	-0.026 (0.023)	-0.068** (0.026)	-0.072** (0.029)
Unemployment rate	-0.003 (0.003)	-0.005 (0.003)	-0.001 (0.003)
Population size	-0.000* (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Number of vacancies	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)
State FE	Yes	Yes	Yes
Year of arrival FE	Yes	Yes	Yes
R-Squared	0.210	0.205	0.224
N	2706	2706	2706

*Note:* Standard errors are clustered at the state level and are given in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Language proficiency levels (speaking, writing, reading) are measured on a scale from 1 “not at all” to 5 “very well”. Outcome variable is the probability to read (speak, write) German at least well. Reference categories are as follows: male, primary education, year of arrival = 2013, Syrian refugee, and North-Rhine Westphalia. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

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Table 1.19: Effect of strict placement restrictions, without covariates

	(1)	(2)	(3)
	Short-run	Medium-run	Long-run
	b/se	b/se	b/se
<i>Panel A - Begin an integration course</i>			
DiD	0.062 (0.042)	0.010 (0.046)	0.045 (0.032)
Post	0.081*** (0.017)	0.151*** (0.026)	0.013 (0.022)
Treated	-0.016 (0.024)	-0.002 (0.028)	-0.035 (0.027)
R-Squared	0.021	0.028	0.002
N	2707	2508	2707
<i>Panel B - Complete an integration course</i>			
DiD	0.020 (0.013)	0.037 (0.023)	0.061 (0.045)
Post	0.015* (0.008)	0.030** (0.013)	-0.013 (0.028)
Treated	-0.018 (0.011)	-0.024 (0.017)	-0.038 (0.035)
R-Squared	0.004	0.007	0.002
N	2707	2391	2707
<i>Panel C - Intermediate German proficiency levels</i>			
DiD	0.014 (0.017)	0.031* (0.017)	0.011 (0.017)
Post	0.006 (0.006)	-0.007 (0.010)	-0.045*** (0.014)
Treated	-0.006 (0.006)	-0.021 (0.014)	-0.002 (0.022)
R-Squared	0.002	0.001	0.004
N	2707	2707	2707
<i>Panel D - Self-assessed German proficiency levels</i>			
	(1)	(2)	(3)
	Read	Speak	Write
DiD	0.039 (0.024)	0.054 (0.034)	0.049 (0.038)
Post	-0.093*** (0.017)	-0.086*** (0.024)	-0.095*** (0.028)
Treated	-0.005 (0.037)	0.001 (0.033)	0.001 (0.032)
R-Squared	0.007	0.006	0.008
N	2706	2706	2706

*Note:* Standard errors are clustered at the state level and are given in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Reference categories are as follows: male, primary education, year of arrival = 2013, Syrian refugee, and North-Rhine Westphalia. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

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Table 1.20: Effect of strict placement restrictions, including network variables

	(1) Short-run b/se	(2) Medium-run b/se	(3) Long-run b/se
<i>Panel A - Begin an integration course</i>			
DiD	0.041 (0.040)	-0.028 (0.048)	0.020 (0.035)
Post	0.079*** (0.021)	0.175*** (0.029)	0.010 (0.029)
Treated	-0.134*** (0.029)	-0.236*** (0.039)	-0.066** (0.029)
Frequent contact with Germans	0.019 (0.015)	-0.001 (0.021)	0.003 (0.019)
Frequent contact with compatriots	0.001 (0.011)	0.007 (0.012)	0.036*** (0.011)
R-Squared	0.089	0.104	0.070
N	2699	2501	2699
<i>Panel B - Complete an integration course</i>			
DiD	0.010 (0.015)	0.009 (0.024)	0.008 (0.040)
Post	0.030** (0.011)	0.068*** (0.019)	0.037 (0.022)
Treated	-0.048*** (0.008)	-0.084*** (0.013)	-0.177*** (0.026)
Frequent contact with Germans	0.018** (0.007)	0.024* (0.012)	0.014 (0.016)
Frequent contact with compatriots	0.002 (0.007)	-0.014 (0.013)	0.025 (0.016)
R-Squared	0.046	0.080	0.080
N	2699	2384	2699
<i>Panel C - Intermediate German proficiency levels</i>			
DiD	0.006 (0.013)	0.024* (0.011)	-0.012 (0.015)
Post	0.016* (0.009)	0.009 (0.013)	-0.014 (0.017)
Treated	-0.050*** (0.006)	-0.171*** (0.011)	-0.146*** (0.011)
Frequent contact with Germans	0.016** (0.006)	0.029*** (0.008)	0.026** (0.011)
Frequent contact with compatriots	0.014*** (0.003)	0.004 (0.007)	0.018* (0.010)
R-Squared	0.052	0.087	0.100
N	2699	2699	2699
<i>Panel D - Self-assessed German proficiency levels</i>			
	(1) Read	(2) Speak	(3) Write
DiD	-0.000 (0.032)	0.025 (0.038)	0.022 (0.041)
Post	-0.018 (0.025)	-0.016 (0.027)	-0.025 (0.032)
Treated	-0.220*** (0.022)	-0.182*** (0.022)	-0.160*** (0.022)
Frequent contact with Germans	0.104*** (0.017)	0.122*** (0.014)	0.110*** (0.012)
Frequent contact with compatriots	-0.012 (0.017)	-0.011 (0.013)	-0.024 (0.014)
R-Squared	0.220	0.222	0.237
N	2699	2699	2699

*Note:* Standard errors are clustered at the state level and are given in parenthesis. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Table 1.20 includes the full set of covariates as described in Table 1.14. For illustrative purposes, some control variables are not shown. Reference categories are as follows: male, primary education, year of arrival = 2013, Syrian refugee, and North-Rhine Westphalia. Survey respondents indicate the frequency of contact with German natives and compatriots on a scale from 1 “never” to 6 “very day”. Frequent contact is defined as indicating a value above 3 “every week”. Source: IAB-BAMF-SOEP Survey of Refugees, v35.



*Initial residence restrictions and refugees' language acquisition*

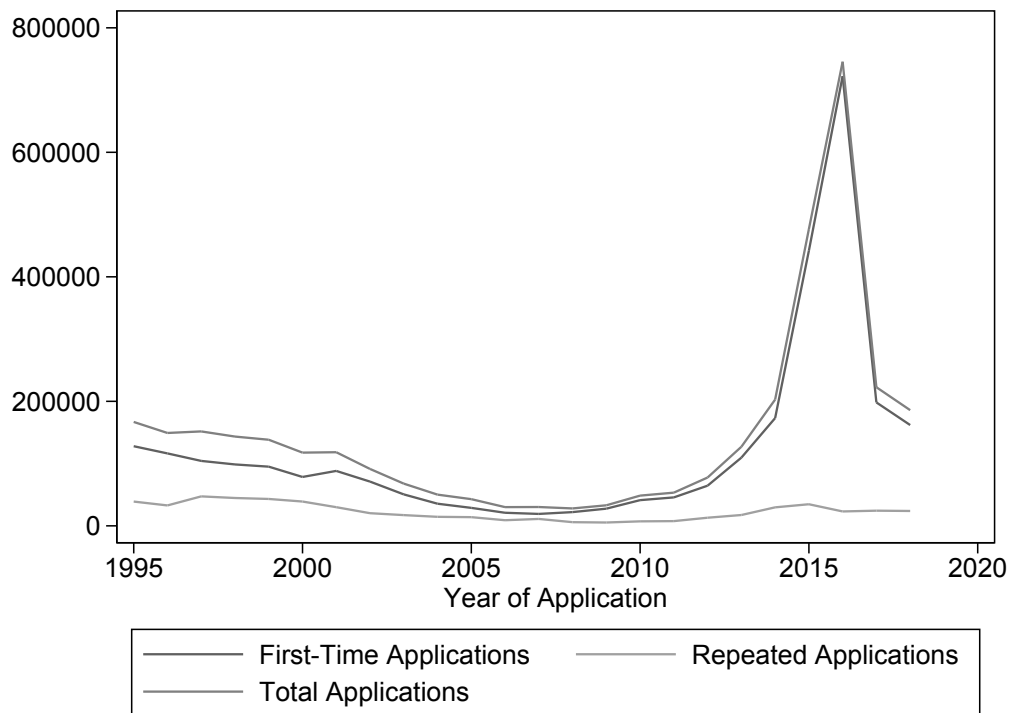
Table 1.21: Inference from wild-cluster bootstrap procedure

		Clustered s.e.	Wild cluster bootstrap
Begin an integration course	Short-run	0.33	0.54
	Medium-run	0.56	0.58
	Long-run	0.55	0.62
End an integration course	Short-run	0.51	0.53
	Medium-run	0.71	0.72
	Long-run	0.85	0.86
Intermediate German proficiency levels	Short-run	0.66	0.71
	Medium-run	0.02	0.04
	Long-run	0.49	0.51
Self-assessed German proficiency levels	Read German	0.94	0.90
	Speak German	0.54	0.59
	Write German	0.63	0.67

*Note:* Table 1.21 compares p-values from cluster-robust inference with p-values from wild cluster bootstrap procedure (Cameron et al. (2008)). Outcome variable begin an integration course describes the probability to take-up in an integration course in the short-, medium-, and long-run. Outcome variable complete an integration course captures the probability to end an integration course in the short-, medium-, and long-run. Certified language proficiency levels are measured on a four point likert scale from 0 “No certified level”, 1 “Level A1”, 2 “Level A2”, to 3 “Level B1”. Outcome variable is the probability to achieve intermediate German language proficiency (Level B1). Language proficiency levels (reading, writing, speaking) are measured on a five point likert scale from 1 “not very well” to 5 “very well”. Outcome variable is the probability to read (speak, write) German at least well. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

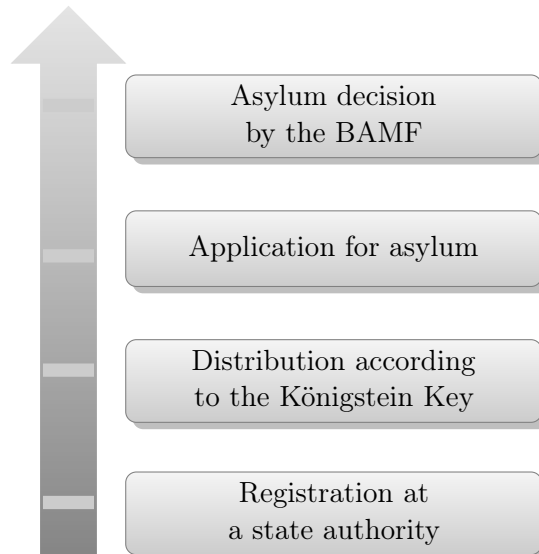
### 1.7.3 Figures

Figure 1.5: Number of asylum applications in Germany



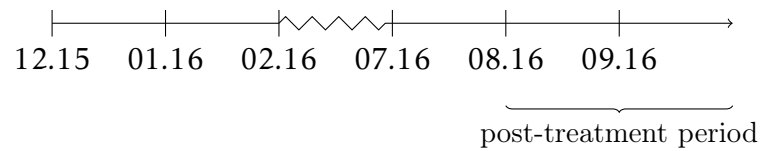
*Note:* Figure 1.5 provides the number of asylum applications in Germany from 1995 to 2018. Source: BAMF (2019a). Own calculations.

Figure 1.6: Stages of the asylum procedure



*Note:* Figure 1.6 describes the stages of the German asylum procedure schematically. Source: BAMF 2016b.

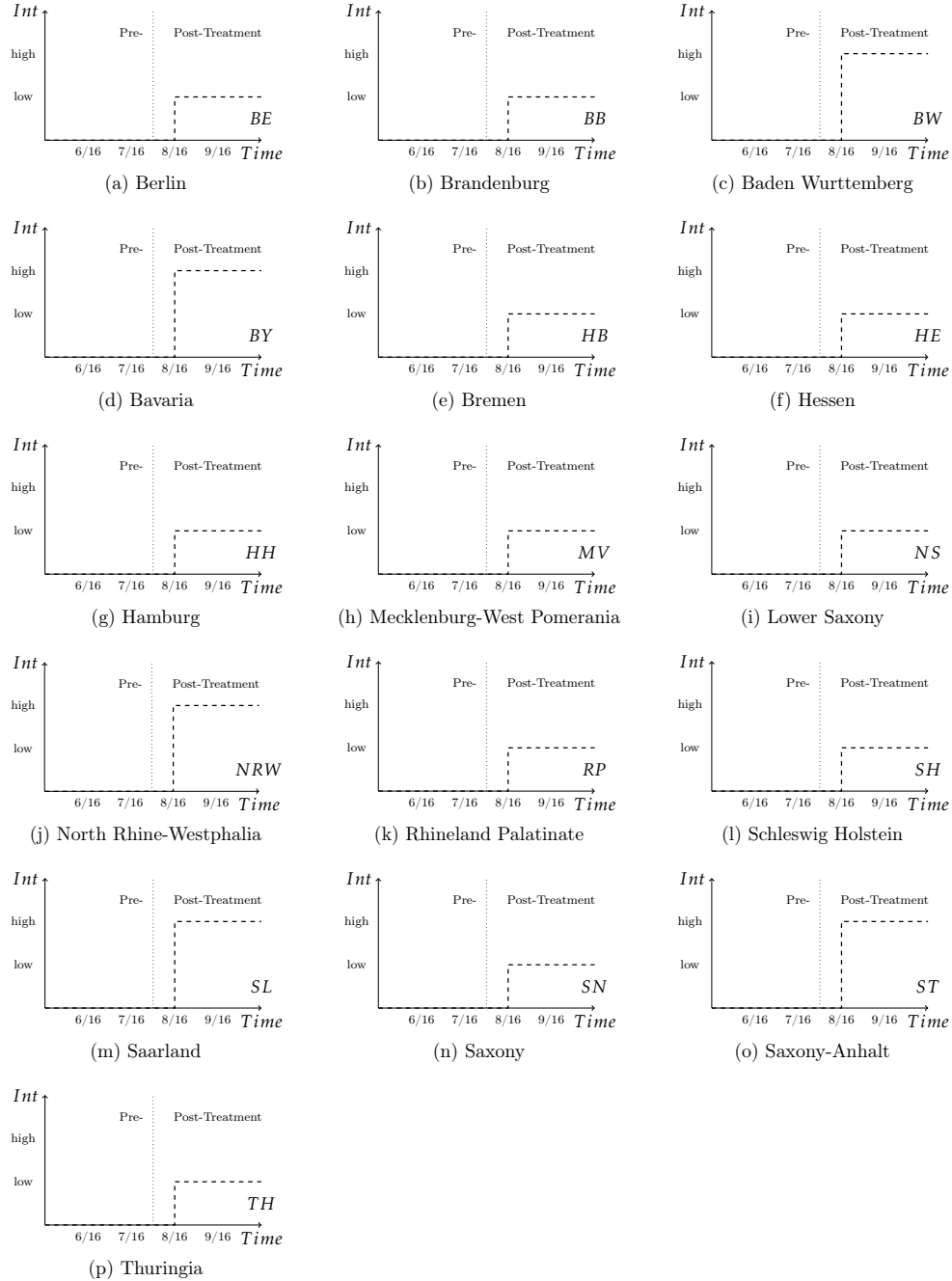
Figure 1.7: Timeline of the residence rule



*Note:* Figure 1.7 illustrates the timing of the residence rule.

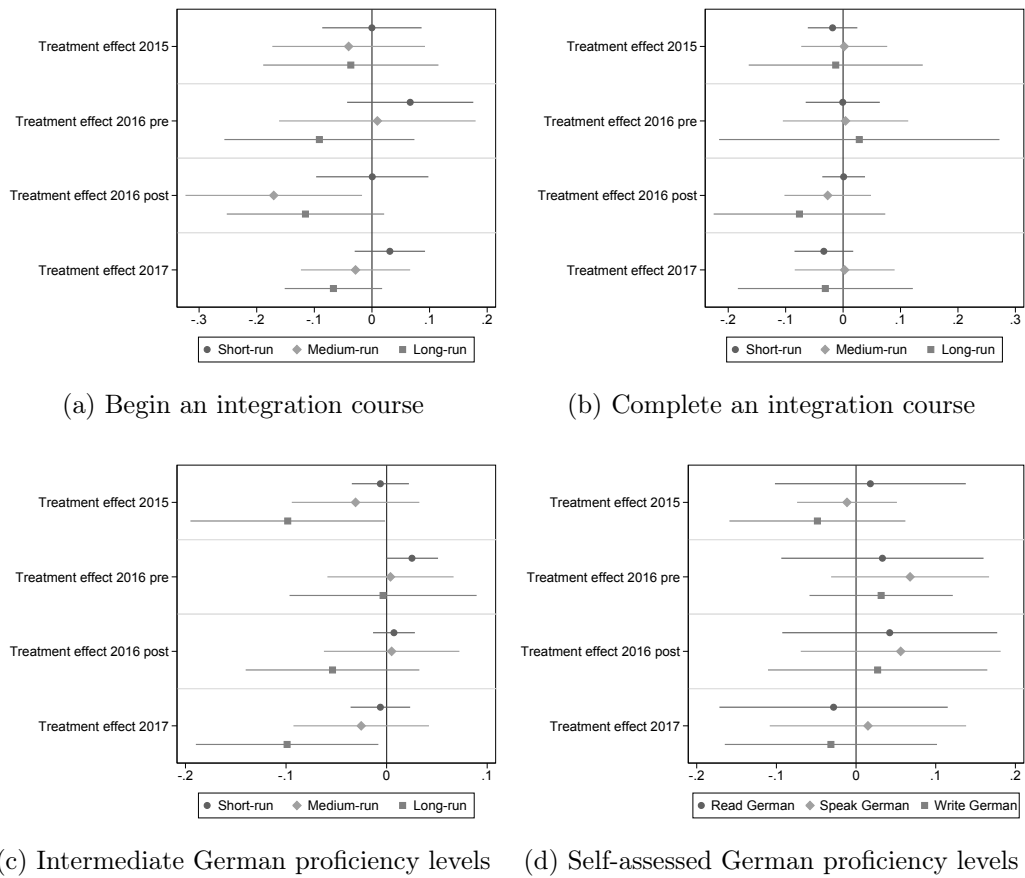
Initial residence restrictions and refugees' language acquisition

Figure 1.8: Treatment intensity across states



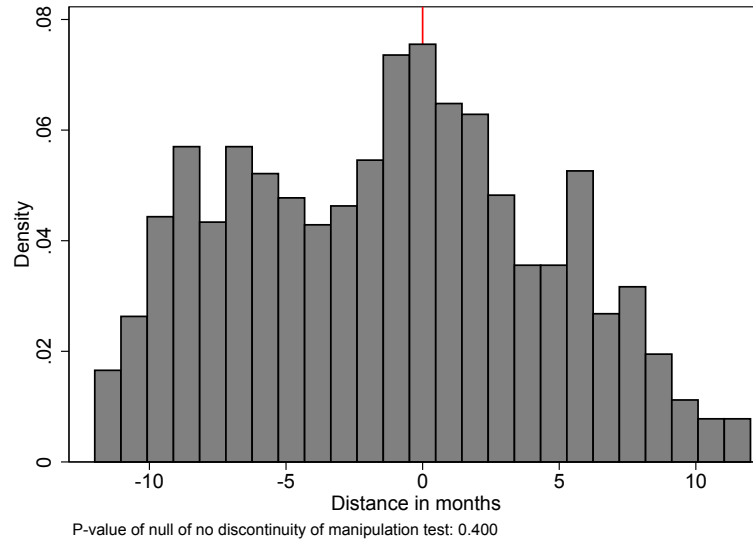
Note: Figure 1.8 demonstrates which states impose stricter statutory regulations on initial place of residence as well as the exact launch of the residence rule. Source: Bayerische Staatsregierung (2016), Landesregierung Nordrhein-Westphalen (2016), Ministerium für Inneres, Digitalisierung und Migration, Baden-Württemberg (2016), Ministerium für Inneres und Sport, Sachsen-Anhalt (2017), and Staatskanzlei Saarland (2016), own illustration.

Figure 1.9: Visualization of the results with leads and lags



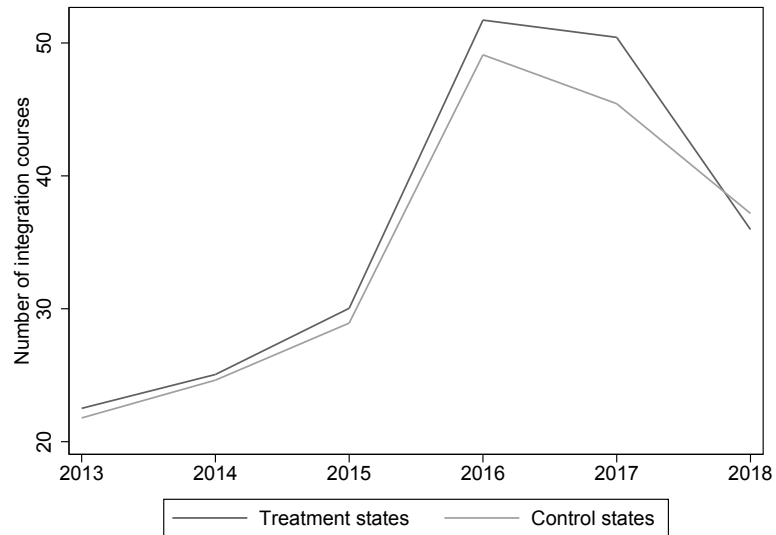
*Note:* Panels a to d in Figure 1.9 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represent the effect of strict placement restrictions on refugees' participation in integration courses and their language proficiency levels for specification 1.2 including leads and lags. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

Figure 1.10: Manipulation around the cutoff

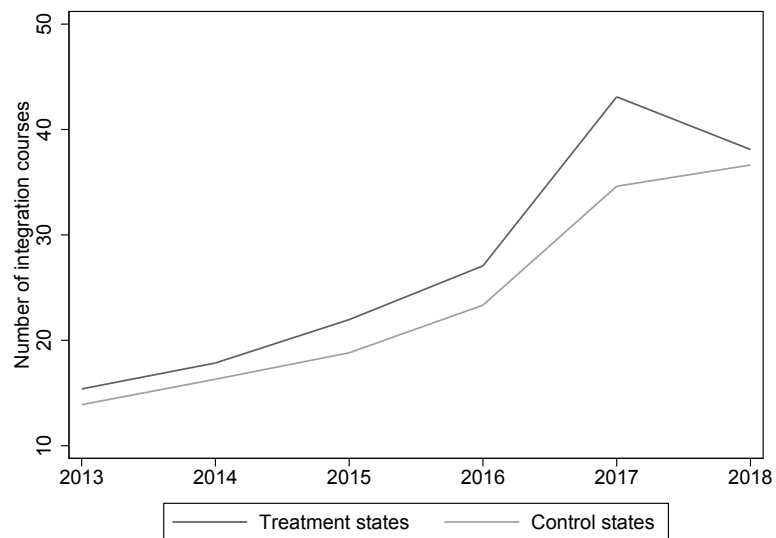


*Note:* Figure 1.10 displays the empirical pdf around the introduction of the residence rule. Each bin corresponds to one month. Each bar corresponds to the density of asylum decisions each month. The vertical line indicates the introduction of the residence rule. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

Figure 1.11: Supply of integration courses in treatment and comparison sates



(a) Average number of integration courses begun

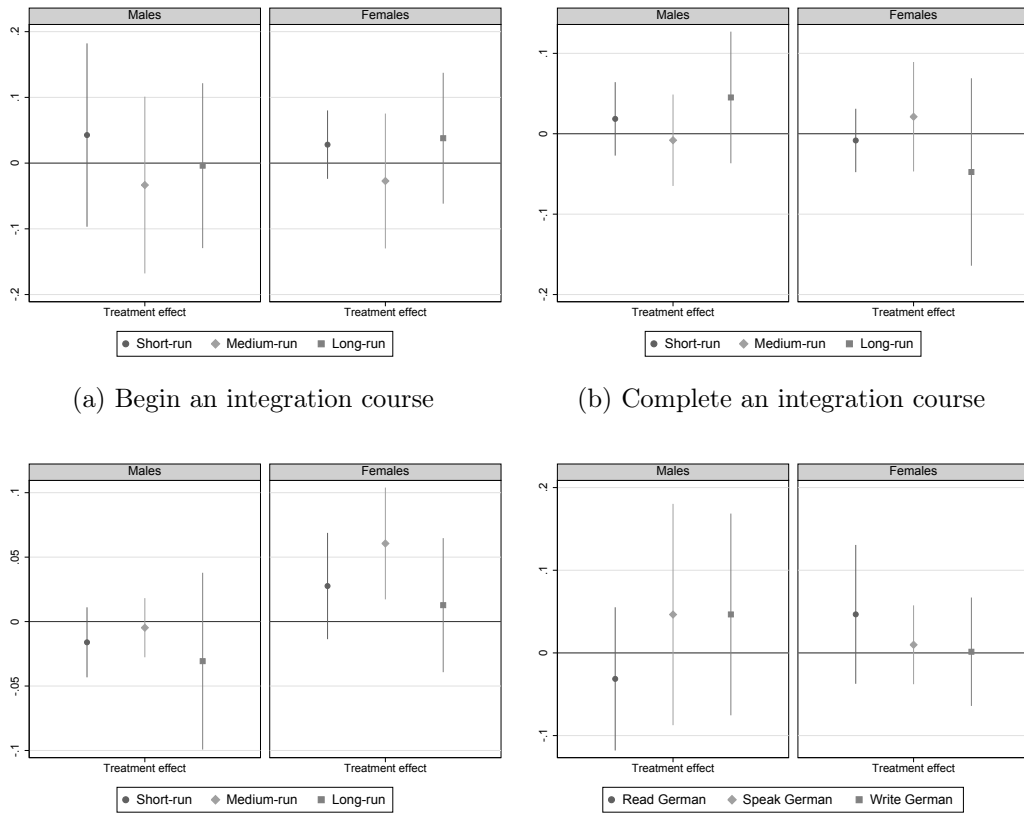


(b) Average number of integration courses completed

*Note:* Panels a and b in Figure 1.11 displays the average number of integration courses begun (completed) in treatment and comparison states from 2013 to 2018. Source: Integrationskurs-geschäftsstatistik.

*Initial residence restrictions and refugees' language acquisition*

Figure 1.12: Effect of placement restrictions on participation in integration courses and German language proficiency levels, disaggregated by gender

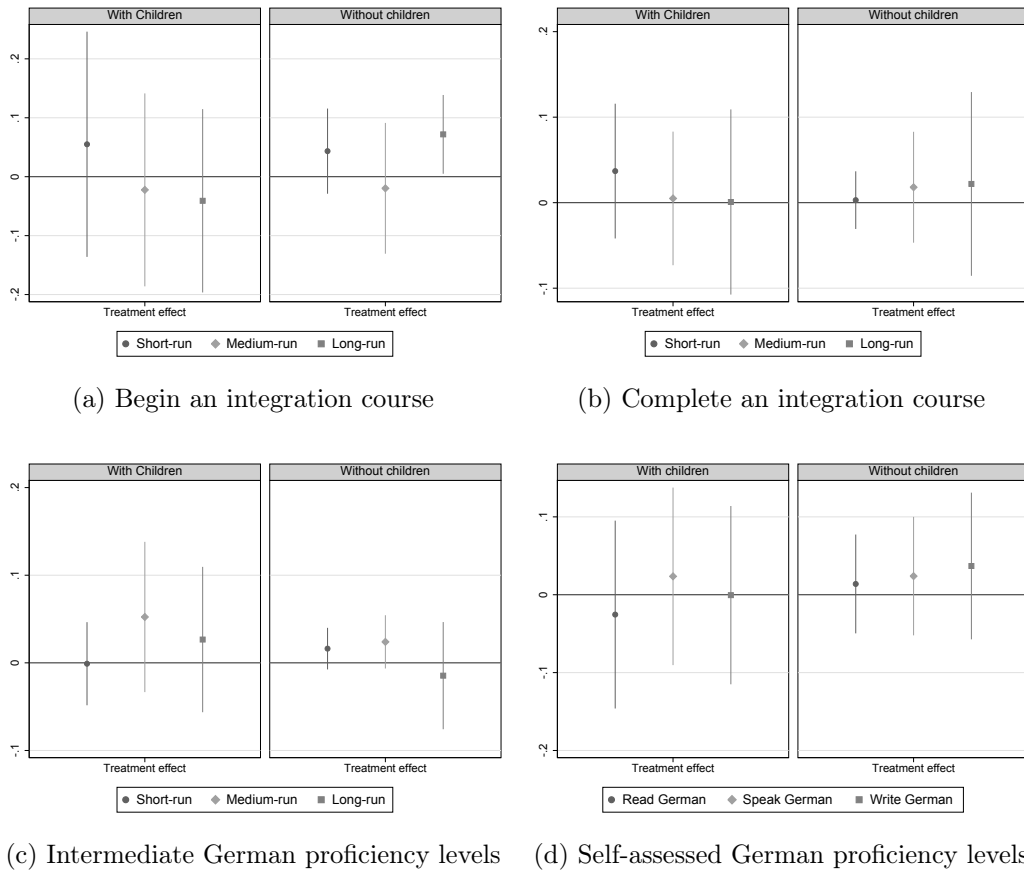


*Note:* Panels a to d in Figure 1.12 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represents the effect of strict placement restrictions on refugees' participation in integration courses and their German proficiency levels, disaggregated by gender. Source: IAB-BAMF-SOEP Survey of Refugees, v35.



*Initial residence restrictions and refugees' language acquisition*

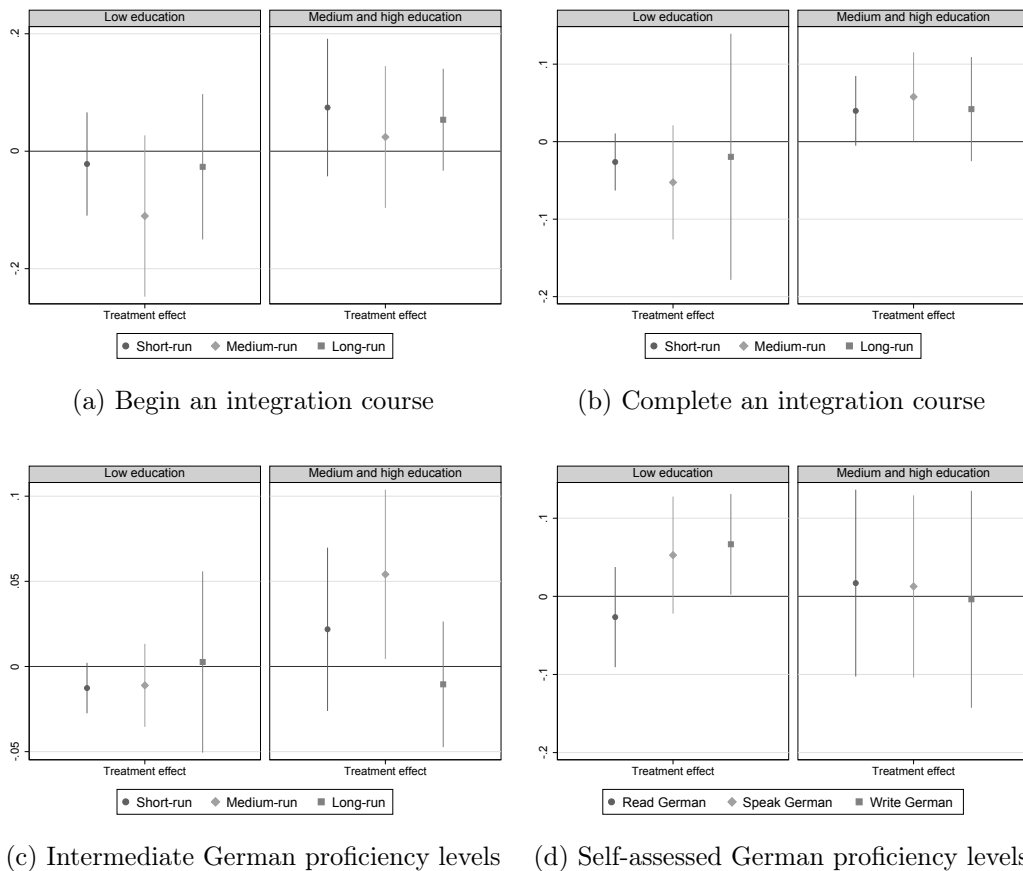
Figure 1.13: Effect of placement restrictions on participation in integration courses and German language proficiency levels, disaggregated by children



*Note:* Panels a to d in Figure 1.13 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represent the effect of strict placement restrictions on refugees' participation in integration courses and their German proficiency levels, disaggregated by the presence of children in the household. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

*Initial residence restrictions and refugees' language acquisition*

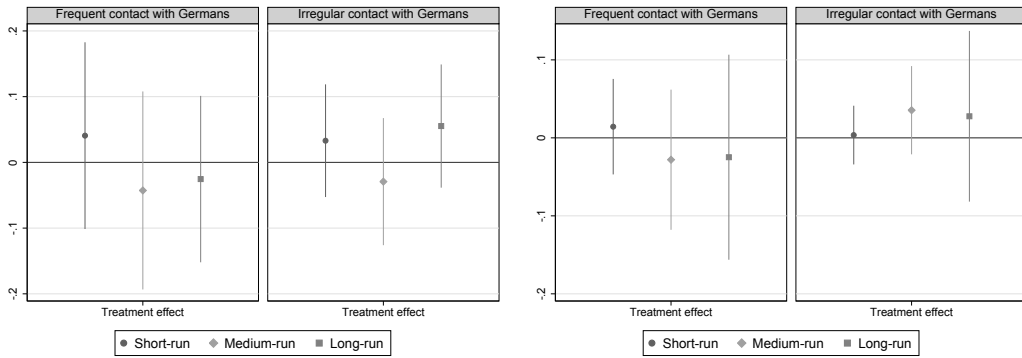
Figure 1.14: Effect of placement restrictions on participation in integration courses and German language proficiency levels, disaggregated by education



*Note:* Panels a to d in Figure 1.14 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represent the effect of strict placement restrictions on refugees' participation in integration courses and their German proficiency levels, disaggregated by gender. Low education corresponds to refugees with primary education. Medium and high education corresponds to refugees with at least secondary education. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

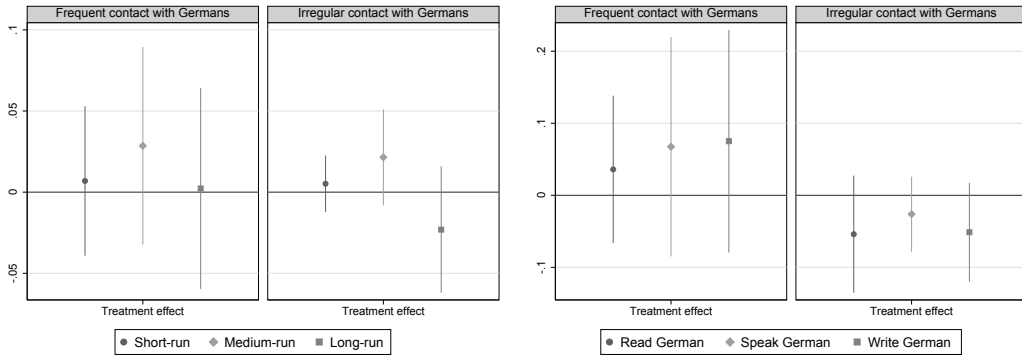
*Initial residence restrictions and refugees' language acquisition*

Figure 1.15: Effect of placement restrictions on participation in integration courses and German language proficiency levels, disaggregated by frequency of contact with German natives



(a) Begin an integration course

(b) Complete an integration course



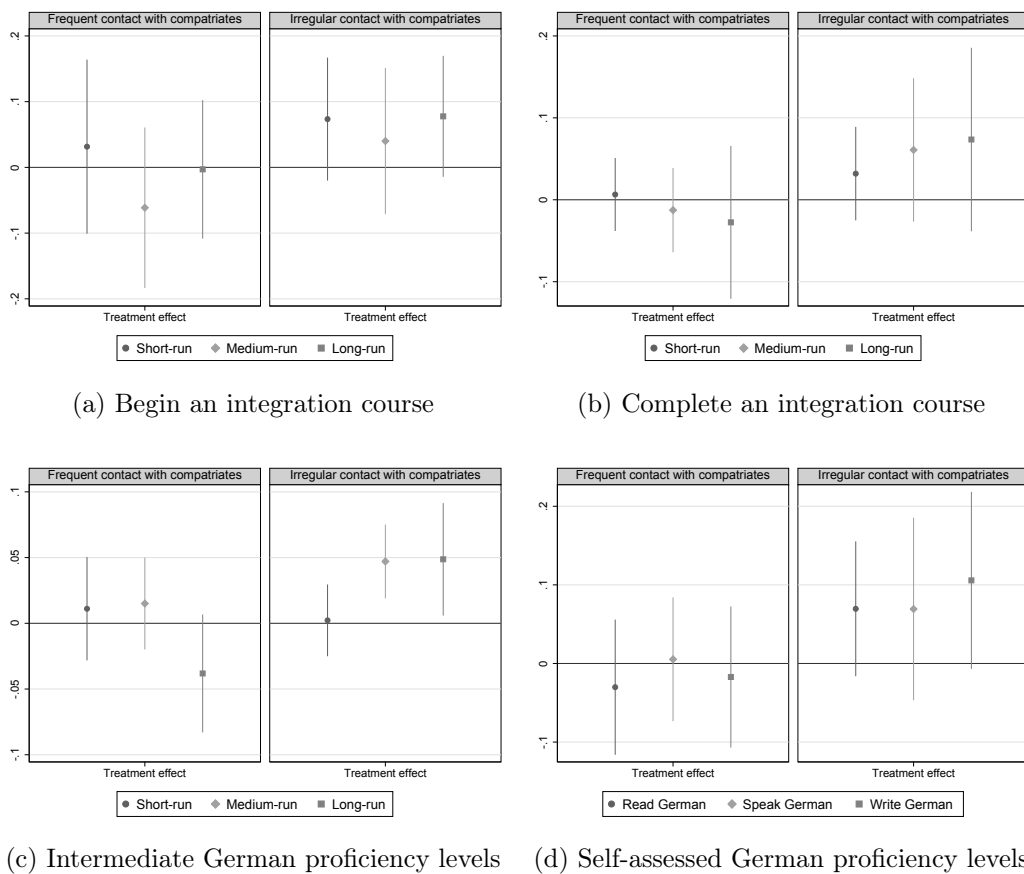
(c) Intermediate German proficiency levels

(d) Self-assessed German proficiency levels

*Note:* Panels a to d in Figure 1.15 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represent the effect of strict placement restrictions on refugees' participation in integration courses and their German proficiency levels, disaggregated by frequency of contact to German natives. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

*Initial residence restrictions and refugees' language acquisition*

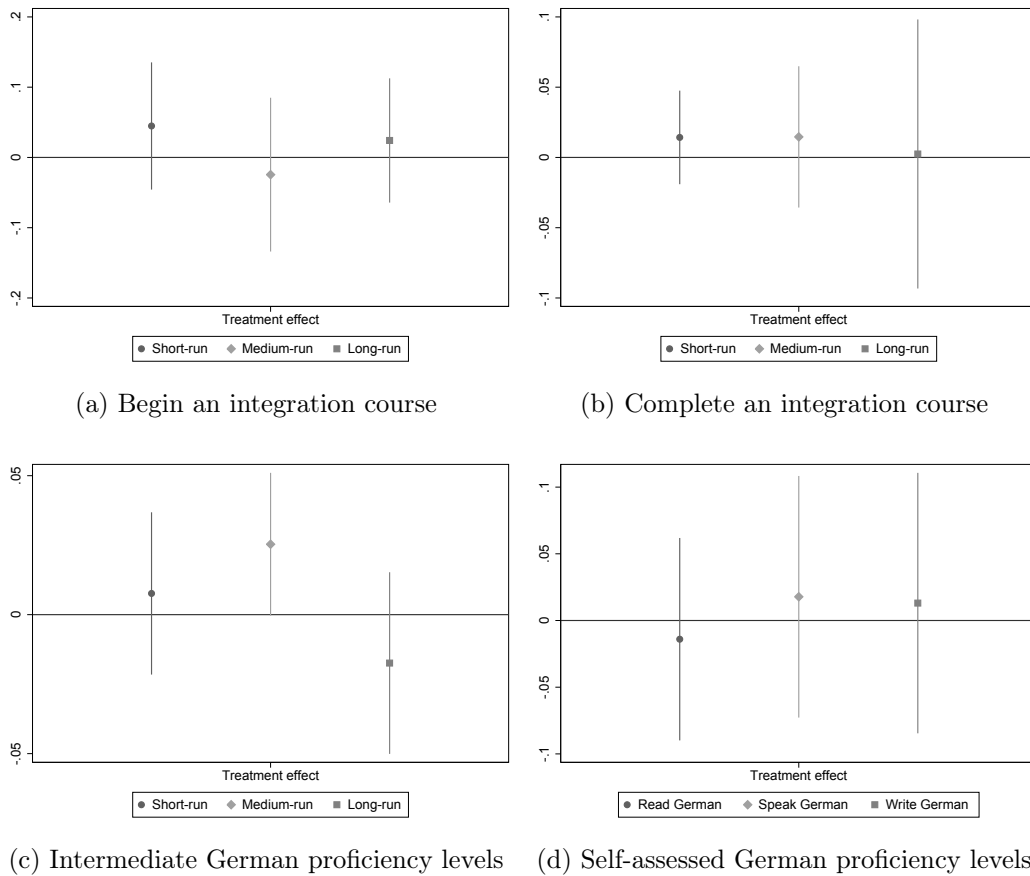
Figure 1.16: Effect of placement restrictions on participation in integration courses and German language proficiency levels, disaggregated by frequency of contact with compatriots



*Note:* Panels a to d in Figure 1.16 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represent the effect of strict placement restrictions on refugees' participation in integration courses and their German proficiency levels, disaggregated by frequency of contact with compatriots. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

*Initial residence restrictions and refugees' language acquisition*

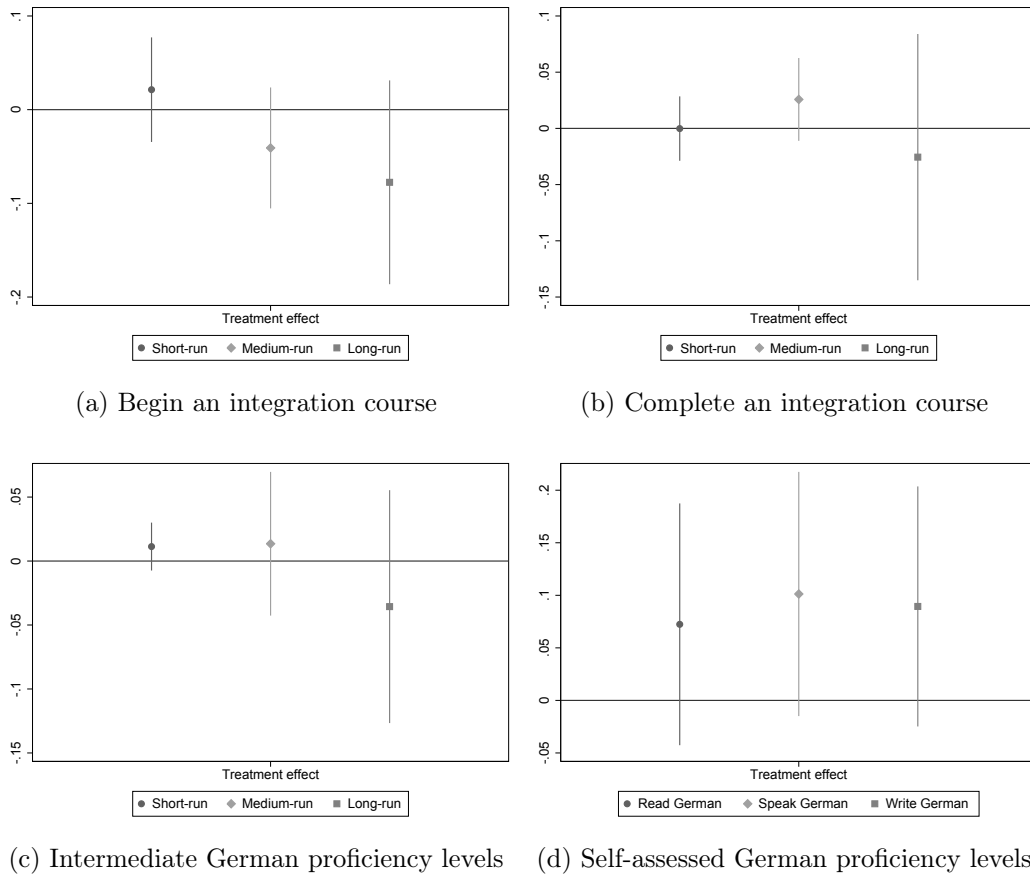
Figure 1.17: Effect of placement restrictions on participation in integration courses and German language proficiency levels, without city states



*Note:* Panels a to d in Figure 1.17 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represent the effect of strict placement restrictions on refugees' participation in integration courses and their German proficiency levels for a sample without city states. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

*Initial residence restrictions and refugees' language acquisition*

Figure 1.18: Effect of placement restrictions on participation in integration courses and German language proficiency levels, placebo reform



*Note:* Panels a to d in Figure 1.18 displays the interaction effects and 95 percent confidence bands of the difference-in-differences estimator, which represent the effect of strict placement restrictions on refugees' participation in integration courses and their German proficiency levels for a placebo reform simulating the reform took place on August 2015. Source: IAB-BAMF-SOEP Survey of Refugees, v35.

## 2 First time around: Local Conditions and Multi-dimensional Integration of Refugees

*We thank Patrick Burauel, Ralph De Haas, Katia Gallegos, Yvonne Giesing, Martin Lange, Nadzeya Laurentsyeva, Karen Macours, Seyhun Orcan Sakalli, Katrin Sommerfeld, and participants at the Jahrestagung Verein für Socialpolitik, the CEMIR Junior Economist Workshop on Migration Research, and ZEW Research Seminar for their valuable feedback.*

### 2.1 Introduction

Refugees typically arrive in a host country with worse language skills and less locally applicable human capital than economic migrants, and consequently are likely to start at significantly lower levels of wages and employability (Brell et al. 2020). Therefore, refugees are often among the most vulnerable immigrant groups, facing the steepest barriers to economic and social integration (Martén et al. 2019). At the same time, initial conditions at the time of arrival matter for successful integration and have been shown to have long-lasting effects for refugees and economic migrants (Chiswick and Miller (1999), Åslund and Rooth (2007), Barsbai et al. (2019)).

In this paper, we provide the first systematic evidence on how initial local unemployment shapes the multi-dimensional integration of refugees in the context of the European refugee crisis. We focus on refugees who arrived in Germany between 2013 and 2016 and have been subsequently interviewed in the IAB-BAMF-SOEP Survey of Refugees, the largest representative survey of refugees in Europe. Refugees are eligible to enter the German labor market three months after submitting their asylum request.<sup>1</sup> Our identification relies on the exogenous placement of refugees upon arrival across counties and the fact that they cannot freely choose their place of residence for a period of at least three years. This settlement policy provides an almost ideal exogenous

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<sup>1</sup>See Section 2 for detailed information about the institutional setting and refugees' access to education and labor market.

variation to study the causal effect of initial local conditions on refugees' integration, and is one of the factors that differentiates our work from previous studies.<sup>2</sup>

A further distinguishing feature of our work is the fact that we consider attitudes towards immigrants<sup>3</sup>, which have not previously received much attention in the literature, as an important factor in shaping refugees' integration.<sup>4</sup> This lack of focus is surprising since attitudes towards immigrants 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 (see, for example, Otto and Steinhardt (2014), Edo et al. (2019), Hangartner et al. (2019), and Ajzenman et al. (2020)). Moreover, we focus on multi-dimensional (economic, linguistic, navigational, political, psychological, and social) integration of refugees as opposed to simply economic integration. This is important as far less attention has been devoted to non-economic outcomes, despite the fact that they are crucial for encouraging a sense of belonging in the host country. We fill these gaps in our paper.

Our main findings are twofold. First, we find that refugees assigned to counties with high unemployment rates are less likely to be in employment or education and less likely to be in full- or part-time employment. Furthermore, poor initial labor market conditions have a strong negative impact on refugees' net monthly earnings and the Multi-dimensional Integration Index. Second, we find that favorable attitudes towards immigrants positively affect refugees' labor market outcomes and their economic and social integration. 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-

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<sup>2</sup>An important exception is Martén et al. (2019).

<sup>3</sup>It is important to emphasize early on that local attitudes towards immigrants do not co-move with unemployment: the correlation between the Migrant Acceptance Index and unemployment rate is very weak (-0.19). See Section 4 for more details on the identification strategy.

<sup>4</sup>There are two related experimental studies. Bansak et al. (2016) conducted a conjoint experiment in which voters in 15 European countries were asked to evaluate hypothetical asylum seekers that randomly varied on nine attributes. They found that applications by asylum seekers who have better employment potential and more credible claim for asylum are more likely to be supported, while applications by Muslims receive lower support, *ceteris paribus*. In a related study, Getmansky et al. (2020) field a conjoint survey experiment in Turkey to examine whether Turkish citizens reduce anti-refugee attitudes if they know that Syrian refugees have made proactive effort to integrate by forging social ties with the locals and learning the local language. They find a significant bias against Arabs and Kurds compared to Turkomans, and against former pro-regime fighters.



lasting effects. In terms of fiscal cost, our back-of-the-envelope calculations suggest that allocating 10,000 randomly selected working-age refugees to a county with a one standard deviation lower unemployment rate would generate an annual saving of more than €2 million.

To look beyond average effects, we use a machine learning classifier algorithm (in this case, causal forest) and investigate treatment heterogeneity. We find that our results are driven by older people and those with secondary or tertiary education. We also conduct several additional robustness checks and address potential concerns about omitted variable bias (following Oster (2019)) as well as multiple hypothesis testing (following Young (2019)).

Our paper is closely related to a handful of studies that have examined the effect of initial conditions on refugees' integration outcomes. Among those, 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. (2020a) show that exposure to a ban at arrival reduces refugee employment probability in subsequent years by about 15 percent, an impact driven primarily by lower labor market participation. 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. To the best of our knowledge, only three papers have explored the effect of local initial conditions, all of which focused only on refugees' economic integration. Martén et al. (2019) study the role of ethnic networks on refugee integration by leveraging the allocation policy in Switzerland, where some refugees are assigned to live in a specific location upon arrival and are not permitted to relocate during the first five years. They find that refugees assigned to locations with many co-nationals are more likely to enter the labor market. 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. Exposure to high local unemployment rates also affects individuals for a decade. 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. We complement these studies by providing new evidence on the short-term integration outcomes for refugees using a representative sample from Germany.

We also contribute to the growing literature on the social integration of refugees. Ager and Strang (2008) develop a conceptual framework that specifies ten core factors (ranging from housing, education, and health to social connection in the community) that affect refugee integration. Harder et al. (2018) also propose a survey-based measure that identifies six dimensions (psychological, economic, political, social, linguistic, and navigational) of immigrant integration. In this paper, we use the definitions provided by Harder et al. (2018) and formally test how initial local conditions shape the various integration dimensions.<sup>5</sup>

Our paper is related to the literature on the factors that affect refugees' labor market integration.<sup>6</sup> 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. Arendt et al. (2020) analyze the impact of an expansion of language training for refugees in Denmark. They show that, after eighteen years refugees who received more and better language training were more likely to be in employment and had higher earnings. Furthermore, children of refugees who received enhanced language classes were more likely to complete lower secondary school and less likely to commit crime. 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.

Finally, there is a growing body of work on how refugees' labor market outcomes compare to those of other migrant groups and natives in high-income host countries. Brell et al. (2020) provide a comprehensive review of refugees' economic integration in several OECD countries and find that refugees have substantially lower employment rates than other immigrants, for at least the first decade after arrival. Those refugees who do find work also receive much lower wages than other immigrants.<sup>7</sup> Similarly,

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<sup>5</sup>Braun and Dwenger (2020) show that settlement location strongly affected the economic and social integration of millions of Germans who were expelled from Eastern Europe into West Germany after the Second World War, with integration proceeding worse in agrarian regions and in regions with high inflows of migrants. Bauer et al. (2013) show that in 1971, expellees still fared worse economically than other Germans.

<sup>6</sup>For more comprehensive review of this literature, see Strang and Ager (2010) and Becker and Ferrara (2019).

<sup>7</sup>Bratsberg et al. (2017), Sarvimäki (2017), Schultz-Nielsen (2017), and Joyce (2019) find that persistent employment gaps between refugees and economic migrants or natives remain in Scandinavian countries. In the UK, employment and work hour gaps between asylum seekers and other migrants

using data from 19 European countries, Fasani et al. (2020b) document that labor market outcomes for refugees are consistently worse than those for other comparable migrants. Using data from Germany, Brücker et al. (2020) show that 50 percent of the refugees have a job after five years. Although the labor market integration of refugees is making slower progress than that of economic migrants in Germany, refugees who have arrived since 2013 fare better than previous refugee cohorts. We find that among refugees aged 18 to 49, 54 percent of men and 17 percent of women who have been in Germany five years are in employment or education. Refugees' low labor force participation constitutes a major loss both to refugees themselves and to the receiving country. 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 2019).

It is also important to highlight that we analyze the integration process of refugees at an early stage. About 85 percent of refugees in our study have been in Germany for three years or less at the time of the interview, with some 15 percent having stayed four or five years. This means that current employment rates are lower than those expected in a few years' time. Yet, having information on the short-term integration outcomes provides important insights on how well or poorly the integration process is progressing. From the policy perspective, obtaining such early insights is more valuable than waiting until the integration process has run its course in order to help the large number of refugees who have arrived in Germany in the meantime. Furthermore, comparing early outcomes for men and women, for refugees from various origin countries, and refugees with differing levels of education provides valuable insights on which groups face the most severe challenges. Finally, our results can 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 refugees. 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.

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take more than 25 years of residence in the country to close, but earnings and salary gaps persist (Ruiz and Vargas-Silva 2018).

## **2.2 Institutional Background**

### **2.2.1 Refugee settlement policy and exogenous placement**

The distribution of refugees across Germany follows an established process including a pre-defined allocation scheme, the Königstein Key. Each refugee is registered upon arrival and subsequently assigned to an initial reception center in one of Germany's 16 federal states, where the refugee may formally apply for political asylum.<sup>8</sup>

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.<sup>9</sup> This mechanism ensures a proportional distribution of asylum seekers across states. Appendix Table 2.9 illustrates the states' received versus assigned share of asylum seekers based on the Königstein Key between 2013 and 2018. The reported shares suggest that the distribution of asylum seekers has been mostly in line with the quotas (i.e., Königstein Key). Small deviations from the quota can be explained by the fact that the distribution of applicants takes into account additional criteria (such as health-care related reasons and family reunification).

Since many refugees are likely to stay in Germany for a long time, the federal government passed the Integration Act in July 2016. This law 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.<sup>10</sup> Therefore, mobility across counties

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<sup>8</sup>Asylum seekers can be accommodated in reception facilities for up to six months, or until their application is decided on. They can, however, also be allocated to another facility during this period under certain circumstances, for instance for family reunification.

<sup>9</sup>In case there are several reception centers within the assigned state, the EASY (Initial Distribution of Asylum Seekers) 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. For further information, please see <https://www.asylumineurope.org/reports/country/germany/overview-legal-framework>, last accessed on November 24, 2020.

<sup>10</sup>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 12a, Art. 1. Considering that the vast majority of refugees are still not in employment or education (Table 2.2), residence restrictions are still widely common for refugees in Germany.

is severely restricted for the vast majority of refugees in Germany. This minimizes concerns related to the endogenous residential sorting of refugees when analyzing the effects of initial local conditions. The settlement policy 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 (exogenous allocation, mobility restriction, and mandatory participation) of the settlement policy are crucial for our identification strategy as they generate a random allocation of refugees to counties. In other words, we rely on a quasi-natural experiment of exogenous allocation of refugees to identify the causal effect of initial local conditions on their multi-dimensional integration outcomes.

## **2.2.2 Access to Education and the Labor Market**

Schooling is compulsory for all children in Germany and children's right to education is protected by the United Nations (Massumi et al. 2015). This implies that children who have arrived in Germany as asylum seekers have to attend school after three to six months, irrespective of their type of residence permit. Adult refugees' right to education, on the other hand, is expressed in the Geneva Refugee Convention, whereby refugees should be treated as favorably as possible, and in any event, not less favorably than foreigners in the same circumstances.<sup>11</sup>

Refugees' access to the German labor market has been greatly facilitated in recent years (Sachverständigenrat deutscher Stiftungen für Integration und Migration 2017a). In 2014, the employment ban for asylum seekers was reduced from nine to three months, so that asylum seekers are generally eligible to enter the German labor market three months after submitting their asylum request.<sup>12</sup> This excludes asylum seekers from Germany's list of "safe countries" (that is, all EU member states, Albania, Bosnia-Herzegovina, Ghana, Kosovo, Montenegro, North Macedonia, Senegal, and Serbia), who are very unlikely to be granted a permanent residence permit. The "priority

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<sup>11</sup>See UNHCR, Convention Relating to the Status of Refugees of 28 July 1951, Article 22 (1951) (available online).

<sup>12</sup>The period is extended to six months for asylum seekers with minor children and nine months for asylum seekers who are required to live in an initial reception center (<https://www.bmas.de/DE/Themen/Arbeitsmarkt/Infos-fuer-Asylsuchende/arbeitsmarktzugang-asylbewerber-geduldete.html>), last accessed 09.09.2020.

check” also has been abolished. With the “priority check” in place, asylum seekers in Germany could take up employment only if the Federal Employment Agency concluded that there was no German or EU citizen who would be available for that specific job. Refugees with a permanent residence permit have unrestricted access to the German labor market.

### **2.2.3 Cross-state Variation in Germany**

Germany adopted a federal system after the Second World War and individual states have legislative and executive powers in many important policy areas, including education. This causes large variations in policies across German states. Furthermore, states differ in their demographic and industrial structure and in their income levels. The differences are especially pronounced between eastern and western German states, still reflecting differences from before the German reunification in 1989. On average, eastern German states are less densely populated, their populations tend to be older, and they have lower per capita income.

These structural differences may go together with variations in preferences and values. To compare differences in attitudes and values across German states, we rely on information from the European Social Survey (ESS), a cross-sectional, nationally representative attitudinal survey.

Table 2.1 provides descriptive evidence on preferences and values for Germany as a whole (column 1), western German states (column 2), and eastern German states (column 3). The table illustrates the large cross-state variation in attitudes towards migrants, trust, and various satisfaction measures: people in western German states are more likely to be in favor of immigration, more likely to trust people and institutions, and more likely to be satisfied with life. Overall, we make sure that our empirical strategy accounts for systemic differences across states.

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Table 2.1: Attitudinal differences across Germany

	(1) Full sample mean/sd	(2) West Germany mean/sd	(3) East Germany mean/sd
Allow immigration from ethnic majority	0.285 (0.887)	0.385 (0.812)	0.096 (0.986)
Allow immigration from ethnic minority	0.271 (0.942)	0.397 (0.888)	0.033 (0.994)
Allow immigration from poorer countries	0.143 (0.992)	0.265 (0.953)	-0.089 (1.022)
Immigrants put more in than they take out	0.246 (0.966)	0.352 (0.894)	0.042 (1.063)
Immigrants do not worsen crime problems	0.163 (0.977)	0.233 (0.915)	0.028 (1.073)
Immigration good for cultural life	0.094 (0.982)	0.176 (0.929)	-0.062 (1.060)
Immigrants make Germany a better place to live	0.143 (1.013)	0.241 (0.940)	-0.043 (1.116)
Immigration good for economy	0.179 (0.966)	0.269 (0.919)	0.008 (1.029)
Trust in people	0.081 (0.949)	0.153 (0.912)	-0.056 (1.002)
Trust in legal system	0.016 (1.007)	0.142 (0.955)	-0.223 (1.059)
Trust in politicians	0.122 (1.003)	0.213 (0.966)	-0.051 (1.049)
Trust in parties	0.132 (1.000)	0.222 (0.972)	-0.039 (1.029)
Trust in European Parliament	-0.097 (1.029)	-0.017 (1.009)	-0.251 (1.050)
Satisfaction with life	0.133 (0.929)	0.237 (0.873)	-0.065 (0.998)
Satisfaction with economy	0.474 (0.840)	0.563 (0.802)	0.305 (0.884)
Satisfaction with government	0.384 (0.954)	0.496 (0.899)	0.171 (1.017)
Satisfaction with democracy	0.150 (0.978)	0.324 (0.915)	-0.182 (1.006)
<i>N</i>	3045	1993	1052

*Note:* Means (standard deviations). Berlin is assigned to Eastern Germany. Questions in favor of immigration (the first three questions in the table above) are measured on a 4-point likert scale from 1 “Allow many” to 4 “Allow few”. Preferences on immigration are measured on an 11-point likert scale from 0 “bad” to 10 “good”. Questions on trust are measured on an 11-point likert scale from 0 “you can’t be to careful” to 10 “most people can be trusted”. Questions on satisfaction are measured on an 11-point likert scale from 0 “extremely dissatisfied” to 10 “extremely satisfied”. For consistency reasons, the scale is reversed in “allow immigration” questions, so that higher values indicate more favorable attitudes towards immigrants. All variables are standardized with mean zero and standard deviation one. Source: European Social Survey (2014).

## **2.3 Data**

### **2.3.1 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 (the Survey), an annual survey focusing on migrants who are seeking protection from political persecution, war, and conflicts (Brücker et al. (2016) and DIW (2017)). The Survey is collected 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 representative of the nationalities and demographic characteristics of refugees who arrived in Germany from 2013 to 2016. The surveys are conducted in different languages and gather information from 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 4,465 adult refugees in Germany. The add-on samples added 2,965 observations in the subsequent survey years. The total sample covers 7,430 adult refugees, who have been part of the Survey at least once. We use the latest survey wave available (that is, v35, 2018) and pool information on all three waves.<sup>13</sup>

The Survey is well-suited for our identification strategy as it provides information on refugees' residency at the time of interview and their initial place of residence.<sup>14</sup> This information allows us to exploit the exogenous assignment of refugees across German counties. In particular, we define our estimation sample as follows: (i) we drop respondents who do not provide information on their county of first residence; (ii) we then further limit the sample to refugees whose initial interview was during their first two years of residence in Germany. By doing so, we ensure that our sample only includes refugees who are exogenously allocated to counties and have not sorted themselves into another county for socio-economic reasons (see Section 2.2.1); (iii) we

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<sup>13</sup>Two thirds of the sample were interviewed in 2018 (62 percent). 22 percent of the refugees were last interviewed in 2017 and the remainder of refugees provided information only in the first survey wave in 2016.

<sup>14</sup>In their first SOEP interview, refugees are asked: "Now, please think of the accommodation in which you were housed the longest in Germany before your current accommodation. Where was this accommodation?" While information on the longest place of residence in the first interview should coincide with refugees' first place of residence in most cases, measurement error increases with numbers of years in Germany. 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.



focus on young adults aged 18 to 49 (making up 91 percent of the refugee population) since this age group is much more likely to be active in terms of participation in the workforce or being in education. In our final sample, we study about 3,000 refugees aged 18 to 49 who have spent at least two years in Germany.

Figures 2.2 and 2.3 show the 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 (Figure 2.3). A comparison with Figure 2.4 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 sub-regions 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.

### **2.3.2 Multi-dimensional Integration Index**

We broadly 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.<sup>15</sup>

Based on the questions and definitions proposed in Harder et al. (2018), we construct a Multi-dimensional Integration Index, which consists of 12 survey questions scaled from 1 to 5. The final index scores are calculated at the individual record level

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<sup>15</sup>See Harder et al. (2018) for a greater detail of the methodology.

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by taking the sum of responses and dividing it by 12. We then rescale it to range from 0 to 1, with higher values indicating better integration.

In addition, we calculate six sub-indices for each dimension of integration. The respective dimensions are constructed using the following survey items:

1. Psychological integration (aims to capture respondents' feeling of connection with the host country): do you feel welcome in Germany? (1 not at all, 5 totally); how often do you feel like an outsider? (1 very often, 5 never);
2. Economic dimension (aims to capture respondents' economic activity in the host country): what were your gross net earnings last month? (1 lowest quintile, 5 highest quintile); information on work status (1 unemployed, 3 in education or training, 5 in paid work);
3. Political integration (aims to capture understanding of the political issues in the host country): do you think the following things should happen in a democracy or not? The people choose their government in free elections (1 should definitely not happen, 5 should definitely happen); civil rights protect the people from government oppression (1 should definitely not happen, 5 should definitely happen);
4. Social integration (aims to capture social ties and interactions with natives and non-natives in the host country): how often do you spend time with German people (1 never, 5 every day); how often do you spend time with people from other countries (1 never, 5 every day);
5. Linguistic integration (aims to capture respondents' assessment of their ability to read and speak the language of their host country): how well can you speak German (1 not at all, 5 very well); how well can you read German (1 not at all, 5 very well);
6. Navigational integration (aims to capture respondents' ability to manage basic needs in the host country): have you received help to look for employment (1 no, 5 yes); did you receive help to look for health care (1 no, 5 yes);

### **2.3.3 County level variables**

Administrative data on additional county-level characteristics come from the German Federal Statistical Office (Destatis). We use the share of foreigners of Syrian origin, Afghan origin, and Iraqi origin in refugees' county of residence (as a proxy for pre-existing migrant networks) at the county level from 2014—before refugees started arriving in large numbers in Germany. We use two-year lagged county-level unemployment rate as a proxy for local economic conditions.

Figure 2.4 illustrates unemployment patterns among counties. A couple of patterns emerge: (i) unemployment rate varies substantially across counties; (ii) unemployment rates tend to be higher in eastern Germany, and generally lower in Baden-Wurttemberg and Bavaria.

### **2.3.4 Migrant Acceptance Index from European Social Survey**

We use European Social Surveys (ESS) conducted in Germany in 2014 to construct our Migrant Acceptance Index (MAI). The ESS sample includes roughly 3,000 respondents aged 18 and older from all 16 states.

The index variables we use come from questions asked to all ESS respondents in an ad-hoc migration module: (i) to what extent do you think Germany should allow people of the same race or ethnic group as most German people to come and live here?; (ii) how about people of a different race or ethnic group from most German people?; (iii) how about people from the poorer countries outside Europe?; (iv) would you say that Germany's cultural life is generally undermined or enriched by people coming to live here from other countries?; (v) is Germany made a worse or a better place to live by people coming to live here from other countries?; (vi) would you say it is generally bad or good for Germany's economy that people come to live here from other countries?; (vii) are Germany's crime problems made worse or better by people coming to live here from other countries?; (viii) do you think people who come here take out more than they put in or put in more than they take out? For questions (i), (ii) and (iii), responses were coded on a 4-point scale, ranging from "allow many to come and live here" to "allow none". For questions (iv) to (viii), responses were coded on a 11-point scale, ranging from 0 "negative attitudes towards immigrants" to 10 "positive attitudes towards immigrants". Using principle component analysis (PCA), we construct the MAI, in which the higher index score reflects more favorable attitudes

toward immigration. The MAI is standardized (with mean zero and standard deviation one) and ranges from -1 to 1. Higher values indicate more positive attitudes toward migrants. Figure 2.5 plots the eigenvalues of principal components used in the PCA.

Figure 2.1 provides a visual summary of the index at the state level. Attitudes towards migrants are most favorable (that is, the MAI is highest), in the three city states (Berlin, Bremen, and Hamburg) and in the northernmost state Schleswig Holstein, followed by other western German states. The index has lowest values in the former East Germany, outside of Berlin. The Migrant Acceptance Index is therefore in line with recent media coverage, which suggests that attitudes towards immigrants are less favorable in eastern Germany.<sup>16</sup> Furthermore, several studies have shown that migrants and refugees are more likely to experience xenophobic violence in eastern German states (Entorf and Lange 2019; Falk et al. 2011; Graeber and Schikora 2020; Krueger and Pischke 1997). Throughout the analysis, we include the MAI as one of our main variables of interest as attitudes towards refugees in their initial place of residence are likely to affect their integration outcomes.

### **Evidence that the Migrant Acceptance Index conveys meaningful information**

An issue that is key to the interpretation is whether our Migrant Acceptance Index conveys meaningful information. To provide evidence on this, we check the correlation between the MAI and four alternative measures: (i) the Gallup Diversity Index (see Section 2.3.5); (ii) the share of respondents who reported some worries about immigration in 2014;<sup>17</sup> (iii) the share of respondents who reported big worries about immigration in 2014; and (iv) the vote share of the right-wing populist party “Alternative für Deutschland (AfD)” in the federal elections in 2013.

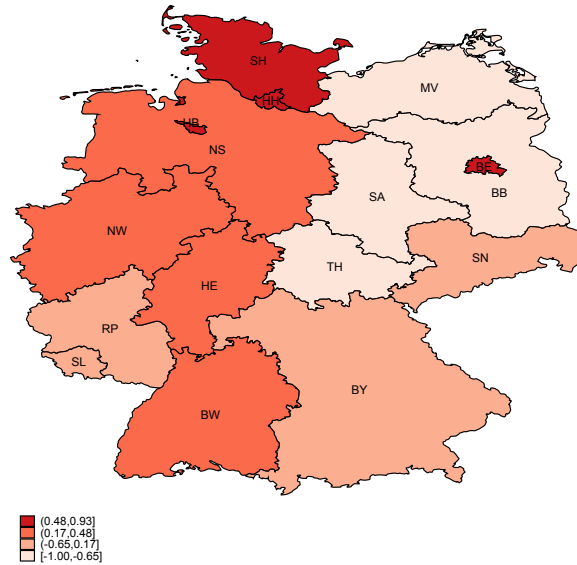
We present this evidence in Figure 2.6, which confirms that the alternative measures we identify are strongly associated with the MAI and with the expected pairwise comparisons. For example, we find that the correlation between our MAI and Gallup

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<sup>16</sup>For instance, see <https://www.latimes.com/world/la-fg-east-west-germany-refugees-20180917-story.html> or <https://www.spiegel.de/international/germany/xenophobia-in-eastern-germany-a-legacy-from-the-past-a-1115163.html>, last downloaded on 16.09.2020.

<sup>17</sup>Information on worries about immigration come from the SOEP, where respondents are asked on worries about immigration each year. The question states “How is it with the following topic—immigration to Germany—do you have worries about that?” [1 “Big worries”, 2 “Some worries”, 3 “No worries”]. Following Poutvaara and Steinhardt (2018), we restrict the sample to German natives aged 18-64. We define an indicator “big worries” equals 1 if respondents state to have big worries, zero otherwise. The indicator “some worries” takes a value of 1 if respondents state to have at least some worries about immigration, zero otherwise.

Figure 2.1: Migrant Acceptance Index



*Note:* Figure 2.1 plots the Migrant Acceptance Index at state level. Source: European Social Survey (2014). Abbreviations are as follows: SH – Schleswig Holstein; HH – Hamburg; NS - Lower Saxony; HB – Bremen; NW – North Rhine-Westphalia; HE – Hessen; RP – Rhineland Palatine ; BW – Baden Wurttemberg; BY – Bavaria; SL – Saarland; BE – Berlin; BB – Brandenburg; MV – Mecklenburg-West Pomerania; SN – Saxony; SA – Saxony Anhalt; TH – Thuringia.

Diversity Index (some worries about immigration) is 0.79 (0.78). The raw correlation between MAI and AfD vote is 0.53. Overall, these patterns suggest that the Migrant Acceptance Index is strongly associated with other measures and the index is very likely to capture the meaningful differences in migrant attitudes.

### 2.3.5 Diversity Index from Gallup World Polls

We also use readily available “Diversity Index” from Gallup World Polls to check the robustness of our Migrant Acceptance Index. The Diversity Index measures a community’s acceptance of people from different racial, ethnic, or cultural groups. We again use data from 2014 at the state level.

The index is constructed using the following questions: (i) is the city or area where you live a good place or not a good place to live for racial and ethnic minorities?; (ii) is the city or area where you live a good place or not a good place to live for gay or lesbian people?; (iii) is the city or area where you live a good place or not a good place

to live for immigrants from other countries?; (iv) is the city or area where you live a good place or not a good place to live for people with intellectual disabilities?

Index scores are calculated at the individual record level. For each individual record the following procedure applies: The four items are recoded so that positive answers are scored as a “1” and all other answers (including don’t know and refused) are assigned a score of “0”. If a record has no answer for an item then that item is not eligible for inclusion in the calculations. An individual record has an index calculated if it has valid scores for at least three items. A record’s final index score is the mean of valid items multiplied by 100. To ensure comparability, we again standardize the index (with mean zero and standard deviation one) and it ranges from -1 to 1. Higher values indicate more positive attitudes. Similar to the Migrant Acceptance Index, Figure 2.7 indicates that the Diversity Index is more favorable in western Germany and Germany’s city states.

### **2.3.6 Descriptive Statistics**

Table 2.2 presents descriptive statistics for our working sample from the IAB-BAMF-SOEP Survey of Refugees. For the full sample, we find that a majority of survey respondents are male (about 60 percent). On average, they have been in Germany for about 2.7 years. In terms of human capital, nearly 12 (48) percent of refugees have tertiary (secondary) education as their highest level of education. When it comes to language skills, respondents are asked to assess their German proficiency (reading, writing, and speaking) on a 5-point likert scale from 1 “not at all” to 5 “very good”. We find that refugees’ average language skill score is about 3. As expected, Syrians (about 50 percent), Afghanis (about 13 percent), and Iraqis (about 14 percent) are the most common nationalities we have in our sample. This is also in line with a recent report from the Federal Office of Migration and Refugees (BAMF 2017b), which reports these to be the main origin countries in 2016, and, hence, suggests good representativeness of our sample in terms of nationalities.<sup>18</sup>

Table 2.10 presents refugees’ main activities separately for both genders, and for men and women separately by the number of years since arrival. Similar to Brücker et al. (2020) and Brell et al. (2020), we find that the percentage of refugees not being

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<sup>18</sup>For 2016, the BAMF reports Syria, Afghanistan, and Iraq to be the main origin countries with 37, 17, and 13 percent respectively.

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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.<sup>19</sup>

There are also major gender differences: less than 7 percent of women are employed full- or part-time, while 28 percent of men are. While men and women are about equally likely to go to school or university, the share of women taking part in vocational training or apprenticeship is much lower than among men. Irrespective of the duration of stay in Germany, the share of women who are employed or in education or training is considerably lower than among men. While the share of those employed and the share of those studying or participating in vocational training increase over time, a majority of female refugees remains unemployed even after five years in Germany. Part of this gender gap is related to the presence of children: 72 of female refugees report to have a minor child in the household, in contrast to 43 percent of male refugees. However, Table 2.11 shows that major gender differences remain even if attention is restricted to singles without children.

Analyzing the main activities for different age groups demonstrates that a considerable number of respondents in their early adulthood are studying (about 13 percent attend school, university or vocational training—see Appendix Table 2.12). For refugees younger than 50, the probability of not being in employment or education decreases with residence duration in Germany. Refugees aged 25-49 are most likely to be employed full- or part-time. Older refugees struggle to participate in local labor markets: 73 percent of refugees aged 50+ are not in employment or education and even after 4 years of residence in Germany their labor market participation remains low. Only about 20 percent are employed full- or part-time.

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<sup>19</sup>These numbers further correspond to administrative records from August 2018, which show that three years after the refugee influx into Germany 28 percent of people from countries at war (including Afghanistan, Eritrea, Iraq, Iran, Nigeria, Pakistan, Somalia, and Syria) are employed.

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Table 2.2: Descriptive statistics from the IAB-BAMF-SOEP Survey of Refugees

	(1) Full sample mean/sd	(2) Males mean/sd	(3) Females mean/sd
Female gender	0.387 (0.487)	0.000 (0.000)	1.000 (0.000)
Age in years	32.163 (8.269)	31.879 (8.371)	32.614 (8.087)
Married	0.638 (0.481)	0.562 (0.496)	0.758 (0.428)
Children in household	0.541 (0.498)	0.429 (0.495)	0.719 (0.450)
Years of schooling	8.497 (4.387)	8.750 (4.228)	8.096 (4.601)
Secondary education	0.477 (0.500)	0.494 (0.500)	0.450 (0.498)
Tertiary education	0.121 (0.326)	0.120 (0.325)	0.122 (0.328)
Worked in home country	0.656 (0.475)	0.838 (0.369)	0.368 (0.483)
Average language skills	3.105 (0.965)	3.268 (0.926)	2.848 (0.970)
Years since arrival	2.681 (0.719)	2.730 (0.718)	2.604 (0.713)
In education or employment	0.277 (0.448)	0.380 (0.485)	0.114 (0.318)
Syrian	0.525 (0.499)	0.519 (0.500)	0.535 (0.499)
Afghan	0.130 (0.336)	0.128 (0.334)	0.133 (0.339)
Iraqi	0.136 (0.343)	0.138 (0.345)	0.134 (0.341)
<i>N</i>	3524	2159	1365

*Note:* Means (standard deviations). Secondary education refers to 9 to 15 years of education and tertiary education refers to completed four years of education beyond “secondary education”. Average German language proficiency levels (speaking, writing, reading) are measured on a scale from 1 “not at all” to 5 “very good”. Years since arrival is defined as the difference between year of the interview and year of arrival. Being in employment or education is equal to one for IAB-BAMF-SOEP survey respondents in employment or education. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018).



## 2.4 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 squared estimations (OLS). Our models take the form:

$$Y_{ict} = \beta_1 UE_{c,t-2} + \beta_2 MAI_{s_0,2014} + \gamma X_{it} + \delta X_{ct} + \eta_t + \zeta_{nuts2} + \epsilon_{ict}, \quad (2.1)$$

where  $Y_{ict}$  is the integration outcome of refugee  $i$  in county  $c$  and 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. (2020)).

Following Åslund and Rooth (2007), the variable  $UE_{c,t-2}$  measures the county-level unemployment rate in year  $t-2$  ( $t$  being the year of the interview) in the initial county of residence to address endogeneity of unemployment in response to mass migration.  $MAI_{s_0,2014}$  is the Migrant Acceptance Index in the refugee's initial state of residence, measured in 2014.<sup>20</sup> To be able to compare the point estimates, we report the standardized coefficients throughout the paper. Importantly, raw correlation between initial unemployment rate and the Migrant Acceptance Index is very low (-0.19), suggesting that attitudes do not co-move with unemployment. This enables us to estimate the impact of local unemployment on refugee integration, holding attitudes constant and vice versa.

In all models, we include year of interview dummies (to capture the impact of county-level shocks that affect all counties simultaneously) and NUTS-2 sub-region dummies (to control for time-invariant variation in the outcome variables caused by

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<sup>20</sup>Due to data limitations we can only construct the Migrant Acceptance Index at the state level instead of county-level. While there may be some within-state variation in attitudes towards migrants, it is worth noting that cross-state differences in attitudes are much larger in the context of Germany. In robustness section, we also use alternative measures (that is, the AfD vote share in 2013 and the share of respondents who reported some or big worries about immigration in 2014) to capture attitudes towards migrants at the county level and find qualitatively similar results.

factors that vary across sub-regions).<sup>21</sup> In the robustness section, we also show that our results do not change qualitatively when we include NUTS-2\*year fixed effects, which control for all potentially omitted variables that can vary across NUTS-2 regions and years.

$X_{it}$  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 for the German language skills before migration;<sup>22</sup> a dummy variable for having received help in finding employment; a dummy variable for having received support from family or friends before migration; age group dummies (25-29, 30-34, 35-39, 40-44, 45-49); education dummies (secondary education, tertiary education); country of origin dummies (Afghan origin, Iraqi origin, other origin); dummy variables for years of residence in Germany (three years of residence, four years of residence); a dummy variable indicating residence in western Germany.  $X_{ct}$  is a vector of county-level control variables that includes: the share of Syrians, Afghans, and Iraqis in the county of residence in 2014—these covariates control for the existing migrant networks.

We cluster robust standard errors,  $\epsilon_{ict}$ , at the level of county to account for the potential correlation existing in the errors within the same county. Our results remain virtually the same, when standard errors are calculated using corrections for spatial correlation (Conley 1999)<sup>23</sup> and clustered at the state level.<sup>24</sup>

### **Identification assumption**

Our identification strategy exploits the German refugee settlement policy as a quasi-natural experiment to identify the causal effect of local conditions (in terms of economic conditions and attitudes towards immigrants) on refugees' socio-economic integration. As discussed in Section 2.2.1, the exogenous allocation of refugees across counties addresses the bias from endogenous sorting due to growing demand for labor

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<sup>21</sup>We cannot include county-fixed effects since county-level unemployment rates are strongly correlated over time and migration across counties is restricted. Regressions with county-level unemployment rates thereby underestimate the effect of initial unemployment. Instead, we include NUTS-2 sub-region fixed effects throughout.

<sup>22</sup>The respective survey question asks: How well could you speak 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 and zero otherwise.

<sup>23</sup>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.

<sup>24</sup>These results are reported in Appendix.

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(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 and state-level migrant attitudes in Germany in the year of arrival.

To further validate this argument, we provide an indirect test following Barsbai et al. (2019). If the distribution of refugees is indeed exogenous to local conditions, unemployment rates and state-level attitudes towards migrants should be uncorrelated with refugees' individual-level characteristics. Table 2.3 shows the results, whereby column (1) and (2) restrict the sample to refugees who were interviewed in the first two years after arrival and column (3) and (4) use the full sample. In line with our identification assumption, for the sample of recent arrivals, none of the estimates is statistically significant. For the full sample, we find a small positive correlation of female gender with the Migrant Acceptance Index, but the effect is far from being economically significant. Overall, the results presented in Table 2.3 support our argument that the allocation of refugees is an exogenous process.

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Table 2.3: Evidence on the validity of identification assumption

	(1)	(2)	(3)	(4)
	First two years	First two years	Full sample	Full sample
	b/se	b/se	b/se	b/se
<i>Panel A - State-level Unemployment rate</i>				
Age at migration	0.008 (0.005)	0.000 (0.000)	0.009** (0.004)	0.000 (0.000)
Female	-0.054 (0.082)	-0.002 (0.006)	0.039 (0.072)	0.003 (0.004)
Secondary education	-0.037 (0.079)	0.001 (0.005)	0.054 (0.081)	0.004 (0.004)
Tertiary education	0.017 (0.161)	0.007 (0.012)	0.227** (0.105)	0.009 (0.006)
State FE	No	Yes	No	Yes
Year of arrival FE	Yes	Yes	Yes	Yes
Country of origin FE	Yes	Yes	Yes	Yes
R-Squared	0.020	0.995	0.016	0.995
N	2963	2963	6859	6859
<i>Panel B - County-level Unemployment rate</i>				
Age at migration	0.002 (0.007)	-0.004 (0.005)	0.004 (0.005)	-0.002 (0.002)
Female	-0.070 (0.113)	0.001 (0.070)	-0.006 (0.095)	-0.032 (0.064)
Secondary education	-0.008 (0.089)	0.029 (0.072)	0.144 (0.107)	0.073 (0.072)
Tertiary education	0.062 (0.190)	0.072 (0.121)	0.188 (0.154)	-0.006 (0.113)
State FE	No	Yes	No	Yes
Year of arrival FE	Yes	Yes	Yes	Yes
Country of origin FE	Yes	Yes	Yes	Yes
R-Squared	0.014	0.505	0.012	0.480
N	2641	2641	6182	6182
<i>Panel C - Migrant Acceptance Index</i>				
Age at migration	0.001 (0.001)	-0.000 (0.000)	0.001 (0.001)	0.000 (0.000)
Female	0.006 (0.012)	0.006 (0.008)	0.023** (0.011)	0.007* (0.004)
Secondary education	0.029 (0.022)	-0.004 (0.009)	0.035** (0.014)	-0.007 (0.005)
Tertiary education	-0.005 (0.028)	-0.010 (0.009)	0.007 (0.021)	-0.017 (0.012)
State FE	No	Yes	No	Yes
Year of arrival FE	Yes	Yes	Yes	Yes
Country of origin FE	Yes	Yes	Yes	Yes
R-Squared	0.023	0.847	0.017	0.799
N	2963	2963	6859	6859

Note: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard errors are clustered on the state and year of arrival level and are displayed in parentheses. We pool observations from survey years 2016 to 2018 keeping only the most recent survey information. Reference category is primary education. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

## **2.5 Results**

In this section, we start by analyzing how local labor market conditions and attitudes towards immigrants at the time of arrival affect refugees' multi-dimensional integration outcomes. We then investigate the heterogeneity using causal forest methodology and present robustness checks.

### **2.5.1 Multi-dimensional Integration Outcomes**

We first examine the effects of local conditions at the time of arrival (that is, unemployment rate and attitudes towards immigrants) on the probability of being in employment or education (Column 1 of Table 2.4); being in full- or part-time employment (Column 2 of Table 2.4); net monthly wages (Column 3 of Table 2.4); and Multi-dimensional Integration Index (Column 4 of Table 2.4). We present results for refugees aged 18 to 49 in the year of the interview and, as noted above, the sample is restricted to those with a minimum of two years of residence in Germany.

Table 2.4 shows that both the county-level unemployment rate in year  $t-2$  ( $t$  being the year of the interview) and MAI play a major role: one standard deviation (0.98) increase in county-level unemployment rate leads to a -4.3 (-4.2) percentage points change in the likelihood of being in employment or education (full- or part-time employment). The point estimates on MAI (that is, more favorable attitudes towards migrants) suggest that a one standard deviation increase in the Migrant Acceptance Index leads to a 5.0 (4.7) percentage points increase in the likelihood of being in employment or education (full- or part-time employment).

We also find that both unemployment rate and MAI have statistically significant effects on net monthly wages—with effects going in opposite directions (as expected) and the effect of unemployment being about twice as large as the effect of the MAI. In Column 4, we find that more favorable attitudes towards migrants positively affect their multi-dimensional integration, while unemployment has the opposite effect. The magnitude of the standardized coefficients suggests that attitudes towards migrants are as important as the local unemployment rate when it comes to multi-dimensional integration of refugees.<sup>25</sup>

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<sup>25</sup>Since help finding a job is part of the navigational index, hence, part of the Multi-dimensional Integration Index, we don't control for it in Column 4.

Looking at other covariates, we find that those who received help to find a job, those with tertiary education and those with satisfactory health status consistently exhibit better integration outcomes.

## **2.5.2 Fiscal Implications of our Results**

Refugees with a valid residence status who are not in employment or education are entitled to the same social benefits as natives in Germany.<sup>26</sup> Since few refugees have been employed for a period of 12 months, this means that refugees who are unemployed receive on average €400 of monthly unemployment benefits II (“Hartz IV”), corresponding to €4800 per year. This is an underestimate of the actual cost to the state of refugees’ unemployment, as it excludes government spending on housing and health care, social benefits, as well as lost tax revenues.

Our estimations suggest that placing a working-age refugee aged 25 to 49 in a county with a one standard deviation lower county-level unemployment rate increases the probability of them being in full- or part-time employment after two years by 4.2 percentage points. Clearly, it would not be possible to place all refugees in more desirable locations without general equilibrium effects through higher labor supply which would negate part of the gains. Still, already a smaller-scale relocation of, say, 10,000 randomly selected working-age refugees to a county with a one standard deviation lower unemployment rate would generate an annual saving of more than €2 million ( $0.042 \cdot 10,000 \cdot 4800 = 2,016,000$ ). Increasing the scope of reallocation would mean that part of the savings would be lost due to general equilibrium effects, but as we also exclude public finance benefits from taxes and social insurance contributions that employed refugees pay, overall public finance benefits could be higher even once general equilibrium effects were accounted for. Furthermore, it is important to note that this calculation takes into account the effect after only two to four years in Germany. To the extent that earlier integration into the labor market would also boost subsequent employment outcomes, dynamic gains over refugees’ remaining working life in Germany could be substantial. Reallocation to states with one standard deviation higher Migrant Acceptance Index would generate public finance benefits of the same order of magnitude.

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<sup>26</sup>See <https://www.asylumineurope.org/reports/country/germany/content-international-protection/social-welfare> (last downloaded 02.11.2020).

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Table 2.4: Determinants of refugees' labor market and social outcomes

	(1)	(2)	(3)	(4)
	In employment or education b/se	Full or part-time b/se	Net monthly wages b/se	Multi-dimensional Integration Index b/se
Unemployment rate t-2 std.	-0.043*** (0.013)	-0.042*** (0.012)	-0.341*** (0.084)	-0.014** (0.007)
Migrant Acceptance Index std.	0.050*** (0.016)	0.047*** (0.013)	0.178* (0.092)	0.011* (0.006)
Female	-0.196*** (0.014)	-0.174*** (0.013)	-1.286*** (0.093)	-0.081*** (0.005)
Secondary education	0.039** (0.015)	0.021 (0.015)	0.114 (0.107)	0.040*** (0.007)
Tertiary education	0.061*** (0.021)	0.049** (0.021)	0.391** (0.152)	0.065*** (0.010)
Participated in integration course	0.002 (0.018)	-0.007 (0.016)	-0.004 (0.112)	0.041*** (0.006)
German skills before emigration	0.051 (0.048)	-0.009 (0.041)	0.200 (0.370)	0.072*** (0.017)
Help finding a job	0.179*** (0.023)	0.133*** (0.022)	1.357*** (0.180)	
Support from family & friends before emigration	-0.028 (0.018)	-0.018 (0.018)	-0.271** (0.127)	0.002 (0.007)
Children in household	-0.074*** (0.019)	-0.075*** (0.019)	-0.604*** (0.138)	0.003 (0.009)
Married/ In partnership	-0.044** (0.021)	0.017 (0.023)	0.051 (0.151)	-0.024*** (0.008)
Satisfactory health status	0.061*** (0.021)	0.053*** (0.017)	0.277** (0.129)	0.044*** (0.010)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.229	0.205	0.228	0.253
N	3170	2434	3013	2477

*Note:* \* 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” 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 2.4 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some control variables are not shown. For the full set of variables, please check Table 2.13. 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

### **2.5.3 Unbundling the Multi-dimensional Integration Index**

This section explores how unemployment rate and the MAI affect the components of Multi-dimensional Integration Index.

In Table 2.5, 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.

The results suggest that both the unemployment rate and the MAI 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 MAI affects psychological, linguistic, political, or navigational integration outcomes.

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 do 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.

### **2.5.4 Gender Differences**

As shown already in Table 2.2, there is a major gender difference in refugees' integration outcomes, with 38 percent of men, but only 11 percent of women, being in education or employment. Therefore, we next analyze the effects of initial conditions on refugees' labor market and social outcomes separately by gender.

Table 2.6 shows the effects of initial unemployment and the Migrant Acceptance Index in Panel A for males and in Panel B for females. The effects are considerably stronger for males. Higher initial local unemployment reduces males' chances of being in employment or education, the effect being almost identical when analyzing full- or part-time employment, and also depresses net monthly wages and values of the Multi-dimensional Integration Index. For females, only the effect on net monthly wages is statistically significant. The Migrant Acceptance Index, in turn, predicts a higher probability of males being in employment or education and being in full or part-time employment. For females, the Migrant Acceptance Index has a somewhat smaller effect



Table 2.5: Effect of unemployment and attitudes towards immigrants on the dimensions of the Multi-dimensional Integration Index

	(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 t-2 std.	-0.001 (0.012)	-0.002 (0.009)	-0.036*** (0.012)	0.001 (0.006)	-0.025* (0.015)	-0.010 (0.012)
Migrant Acceptance Index std.	0.016 (0.012)	-0.005 (0.008)	0.033** (0.013)	-0.013 (0.008)	0.027** (0.014)	-0.003 (0.012)
Female	0.006 (0.008)	-0.071*** (0.010)	-0.213*** (0.012)	-0.007 (0.006)	-0.093*** (0.012)	-0.045*** (0.011)
Secondary education	-0.010 (0.010)	0.122*** (0.009)	0.024* (0.014)	0.006 (0.006)	0.059*** (0.012)	0.004 (0.013)
Tertiary education	-0.032** (0.016)	0.240*** (0.013)	0.061*** (0.019)	0.011 (0.008)	0.042** (0.018)	0.026 (0.023)
Participated in integration course	0.038*** (0.009)	0.072*** (0.009)	0.121*** (0.015)	-0.001 (0.006)	0.013 (0.013)	-0.018 (0.012)
German skills before emigration	-0.007 (0.024)	0.109*** (0.025)	0.077* (0.042)	0.016 (0.010)	0.111*** (0.030)	0.062 (0.042)
Support from family & friends before emigration	0.024** (0.011)	-0.012 (0.010)	-0.011 (0.016)	0.004 (0.005)	-0.011 (0.016)	0.020 (0.014)
Children in household	0.053*** (0.013)	0.007 (0.011)	-0.071*** (0.018)	0.001 (0.008)	0.001 (0.018)	0.023 (0.017)
Married/ In partnership	-0.003 (0.013)	-0.045*** (0.012)	-0.012 (0.019)	0.005 (0.008)	-0.046** (0.018)	-0.020 (0.016)
Satisfactory health status	0.059*** (0.015)	0.052*** (0.013)	0.051*** (0.019)	0.020 (0.012)	0.062*** (0.020)	-0.017 (0.018)
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.078	0.356	0.266	0.056	0.157	0.065
N	2477	2477	2477	2477	2477	2477

*Note:* \* 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. Dimensions are set similar to Harder et al. (2018). Table 2.5 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some control variables are not shown. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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than on males on the probability of being in employment or education, but no effect on full- or part-time employment.

Higher education is associated with better multi-dimensional integration outcomes for both males and females, and those with secondary education are more likely to be in employment or education. Tertiary education increases the likelihood of being in employment or education, as well as likelihood of being employed and net monthly wages for males, but has no statistically significant effect on employment outcomes for females. Both males and females with children in household are less likely to be in employment or education, and earn less.

In Table 2.14, we analyze the effects of initial unemployment and the Migrant Acceptance Index on different dimensions of the Multi-dimensional Integration Index. Initial unemployment strongly reduces males' economic integration, and is also associated with worse navigational outcomes, although the effect is weaker. For females, the only effect is a counter-intuitive marginally statistically significant positive effect on navigational outcomes. The Migrant Acceptance Index is related to better economic integration for both genders, but the effect is statistically significant only for females. Its other effects are statistically insignificant.

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Table 2.6: Determinants of refugees' labor market and social outcomes, by gender

	(1)	(2)	(3)	(4)
	In employment or education	Full or part-time	Net monthly wages	Multi-dimensional Integration Index
<i>Panel A - Males</i>				
Unemployment rate t-2 std.	-0.057*** (0.016)	-0.056*** (0.017)	-0.401*** (0.121)	-0.022*** (0.008)
Migrant Acceptance Index std.	0.051** (0.022)	0.065*** (0.020)	0.176 (0.130)	0.009 (0.007)
Secondary education	0.043* (0.023)	0.027 (0.024)	0.150 (0.172)	0.040*** (0.009)
Tertiary education	0.068** (0.033)	0.070** (0.034)	0.619** (0.253)	0.065*** (0.013)
Help finding a job	0.186*** (0.027)	0.142*** (0.028)	1.402*** (0.217)	
Children in household	-0.064** (0.031)	-0.093*** (0.031)	-0.646*** (0.235)	0.012 (0.013)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.199	0.183	0.214	0.193
N	1947 (1)	1454 (2)	1808 (3)	1527 (4)
<i>Panel B - Females</i>				
Unemployment rate t-2 std.	-0.012 (0.014)	-0.015 (0.012)	-0.200*** (0.076)	-0.006 (0.009)
Migrant Acceptance Index std.	0.034** (0.014)	0.008 (0.010)	0.119 (0.077)	0.010 (0.010)
Secondary education	0.035* (0.019)	0.007 (0.015)	0.091 (0.107)	0.034*** (0.009)
Tertiary education	0.045 (0.028)	0.005 (0.018)	0.099 (0.157)	0.061*** (0.015)
Help finding a job	0.119*** (0.043)	0.070** (0.030)	0.980*** (0.279)	
Children in household	-0.080*** (0.025)	-0.039** (0.020)	-0.440*** (0.149)	-0.001 (0.012)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.143	0.100	0.119	0.245
N	1223	980	1205	950

*Note:* \* 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 2.6 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

### **2.5.5 Heterogeneity Analysis using Causal Forest**

We also look beyond the average effects to understand how the causal effects vary with observable characteristics. Unlike previous literature, we don't rely on the estimation of models by subgroups or the interaction effects as both approaches suffer from the selective choice of covariates and a lack of statistical power when a high number of parameters is included in linear regression models. Instead, to identify heterogeneous treatment effects (that is, variation in the direction and magnitude of treatment effects for individuals within a population), we use Causal Forests methodology, which provides a data-driven, less selective framework for heterogeneous treatment estimation (Athey and Imbens 2016; Athey et al. 2019).

This alternative statistical framework is based on a regression tree that systematically splits the control variable space into increasingly smaller subsets. Regression trees aim to predict an outcome variable building on the mean outcome of observations with similar characteristics. A parameter that penalizes high-dimensionality reduces model complexity. The causal forest estimation combines a magnitude of regression trees to identify treatment effects, whereby each tree is defined by different orders and subsets of covariates. Similar to bootstrapping processes, variance is based on the diversity of regression trees.

Since we have two treatment variables, namely the unemployment rate and the Migrant Acceptance Index, we feed the causal forest algorithm the full set of control variables defined in Section 2.4 and one of the treatment variables at a time (while controlling for the other) to estimate heterogeneous treatment effects. For instance, when we consider local economic conditions as the treatment variable, the model takes the following form:

$$\widetilde{Y}_{ict} = \alpha_i(X'_{it}) + \tau_i(X'_{it})UE_{c,t-2} + u_{ict} \quad (2.2)$$

where  $\widetilde{Y}_{ict}$  is the one of the four respective integration outcomes of refugee  $i$  in county  $c$  and interview year  $t$ , and  $X'_{it}$  is the full set of covariates and the Migrant Acceptance Index in the first state of residence.

We first present conditional treatment effects based on 20,000 regression trees in Figure 2.8 where each regression tree draws a random sample of the working sample and estimates the treatment effect. We only present the results for the outcome variable being in "employment or education" for illustrative purposes but find similar patterns

for the other outcome variables.<sup>27</sup> In the absence of treatment heterogeneity, we would expect treatment effect to be clustered around the mean. However, we find the opposite, suggesting that there is considerable treatment heterogeneity. Encouragingly, the arithmetic mean is very close to the treatment effect we identified in the main analysis.

Figure 2.9 presents the result for the variable importance, where we set our threshold as 0.05 and above. In both panels, we find that age, country of origin, education and the number of years since arrival are the important factors for treatment heterogeneity. Therefore, we only focus on these dimensions in Tables 2.7 and 2.8. The results broadly suggest that the effects of unemployment and attitudes towards immigrants are stronger for older people (that is, age 40 and above) and those with higher levels of education. The effects of the Migrant Acceptance Index are most pronounced for those with tertiary education. With respect to initial unemployment, the effects are of similar magnitude for those with secondary and tertiary education, but close to zero for refugees with primary education.

## **2.5.6 Robustness Checks**

In this subsection, we provide additional checks that underline the robustness of the main results.

### **Robustness to omitted variables bias**

Although we exploit the 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).

In both panels of Appendix Table 2.15, we first reprint the baseline estimates for our main outcomes in the top rows for comparison purposes. The second rows present the estimation bounds where we define  $R_{max}$  upper bound as 1.3 times the R-squared in specifications that control for observables following Oster (2019).<sup>28</sup> The bottom row

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<sup>27</sup>The figures for the other outcome variables are available upon request.

<sup>28</sup>Estimation bounds on the treatment effect range between the coefficient from the main specification and the coefficient estimated under the assumption that observables are as important as

Table 2.7: Heterogenous treatment effects–Unemployment rate

	In employment or education		Full or part-time employment		Net monthly wages		Multi-dimensional Integration Index	
	TE	s.e.	TE	s.e.	TE	s.e.	TE	s.e.
Aged 25-29	0.024	0.033	0.013	0.030	0.384	0.276	0.018	0.012
Aged 30-34	-0.018	0.035	-0.036	0.034	-0.292	0.240	-0.020	0.013
Aged 35-39	0.008	0.045	-0.012	0.029	0.068	0.320	-0.016	0.012
Aged 40-44	-0.110	0.033	-0.081	0.028	-0.686	0.222	-0.014	0.012
Aged 45-49	-0.067	0.038	-0.034	0.033	-0.410	0.258	-0.023	0.014
Primary education	-0.010	0.023	0.001	0.021	-0.280	0.146	0.001	0.009
Secondary education	-0.041	0.024	-0.048	0.024	-0.270	0.190	-0.018	0.007
Tertiary education	-0.050	0.043	-0.031	0.036	-0.294	0.286	-0.017	0.013
Syria	-0.013	0.024	-0.012	0.023	-0.151	0.185	-0.017	0.007
Afghanistan	-0.012	0.036	-0.015	0.035	-0.356	0.231	-0.012	0.013
Iraq	0.001	0.035	-0.012	0.032	0.052	0.239	0.007	0.013
Rest of World	-0.087	0.033	-0.066	0.029	-0.549	0.223	-0.014	0.011
2 years since arrival	0.001	0.018	0.003	0.014	-0.153	0.114	-0.003	0.007
3 years since arrival	-0.059	0.033	-0.047	0.028	-0.392	0.253	-0.018	0.010
4 years since arrival	-0.049	0.045	-0.050	0.048	-0.373	0.334	-0.019	0.017

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The table provides information on treatment effects (TE) and standard errors (s.e.). 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. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

Table 2.8: Heterogenous treatment effects–Migrant Acceptance Index

	In employment or education		Full or part-time employment		Net monthly wages		Multi-dimensional Integration Index	
	TE	s.e.	TE	s.e.	TE	s.e.	TE	s.e.
Aged 25-29	0.021	0.042	0.026	0.033	0.243	0.235	0.008	0.018
Aged 30-34	-0.007	0.039	-0.035	0.037	-0.291	0.258	-0.012	0.023
Aged 35-39	0.055	0.045	0.021	0.032	0.264	0.353	0.021	0.011
Aged 40-44	0.057	0.056	0.027	0.047	0.307	0.329	0.015	0.016
Aged 45-49	0.120	0.065	0.091	0.051	0.502	0.452	0.007	0.024
Primary education	0.055	0.031	0.002	0.025	0.194	0.201	0.001	0.019
Secondary education	0.063	0.037	0.020	0.028	0.312	0.258	0.004	0.010
Tertiary education	0.124	0.043	0.087	0.051	0.392	0.323	0.030	0.013
Syria	0.072	0.030	0.018	0.025	0.334	0.212	0.016	0.007
Afghanistan	-0.102	0.092	-0.069	0.082	-0.381	0.465	0.046	0.019
Iraq	0.148	0.083	0.129	0.084	1.015	0.708	0.054	0.032
Rest of World	0.042	0.052	0.035	0.032	0.222	0.318	-0.038	0.027
2 years since arrival	-0.019	0.054	0.016	0.025	0.319	0.215	0.025	0.014
3 years since arrival	0.049	0.038	-0.016	0.033	0.123	0.250	0.006	0.010
4 years since arrival	0.084	0.043	0.061	0.034	0.388	0.306	-0.004	0.012

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The table provides information on treatment effects (TE) and standard errors (s.e.). 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. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

presents the Oster’s delta, which indicates the degree of selection on unobservables relative to observables that would be needed to fully explain our results by omitted variable bias. The results presented point to a very limited movement in coefficients. High delta values also indicate that the unobservables have less effect on our coefficient of interest than the observables. Given the 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 8 to 124 times as important as all observables. Therefore, the estimates suggest that our results are unlikely to be driven by omitted-variable bias.

### **Robustness to NUTS-2\*year fixed effects**

We also saturate our main specification with NUTS-2\*year fixed-effects, which helps us to control for all potential omitted variables (such as within-state policy change on the length of the employment ban) that can vary across NUTS-2 regions and years. The results presented in Appendix Tables 2.16 and 2.17 show that our results remain robust.

### **Multiple hypothesis testing**

To rule out any problem related to the simultaneous inference of multiple hypotheses, we re-estimate our main results using the randomization inference technique suggested by Young (2019). This method helps us to establish the robustness of our results both for individual treatment coefficients in separate estimations and also for the null hypothesis that all treatment effects reported together are zero. The results presented in Appendix Table 2.18 show that our findings remain robust both for the individual coefficients and the joint tests of treatment significance.

### **Robustness to using alternative measures of unemployment rate at the county level**

To capture the initial local economic conditions, we use county-level unemployment rate in year t-2 in our main analysis. In Appendix Figure 2.10, we show that our results are robust to using alternative measures of unemployment rate: one or three years before the year of interview, or one, two, or three years before the year of arrival.

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unobservables for the level of  $R_{max}$ .  $R_{max}$  specifies the maximum R-squared that can be achieved if all unobservables were included in the regression. Oster (2019) uses a sample of 65 RCT papers to estimate an upper bound of the R-squared such that 90 percent of the results would be robust to omitted variables bias. This estimation strategy yields an upper bound for the R-squared,  $R_{max}$ , that is 1.3 times the R-squared in specifications that control for observables.



**Robustness to using alternative measures of attitudes towards immigrants at the county level**

As explained before, due to the lack of data availability we can only measure attitudes towards migrants at the state level.

To further validate the robustness of our results, we use alternative county-level measures: the AfD vote share in 2013 and the share of respondents who reported some or big worries about immigration in 2014. Although these measures only partially capture attitudes towards migrants, the results presented in Appendix Figure 2.11 show that our findings remain robust.

**Robustness to using alternative measure of attitudes towards immigrants at the state level**

Our main specification uses information on attitudes towards immigrants at state level based on the European Social Survey data. To check if our results are sensitive to how we define the Migrant Acceptance Index, we use the readily available Diversity Index from the Gallup World Polls as an alternative measure. Similar to our main results, Appendix Table 2.19 suggests that both higher unemployment rate and negative attitudes towards immigrants (as measured in Gallup’s Diversity Index) in the initial state of residence have a negative effect on refugees’ labor market and social integration. While the estimates for the effect of county-level unemployment rate are quantitatively similar, point estimates for the effect of the Diversity Index are larger.

Overall, we find robust evidence that attitudes towards immigrants—irrespective of how we measure them—matter for refugees’ social and economic integration.

**Robustness to logit models**

In Section 2.5.1, we estimate linear probability models for the dichotomous outcome variables for ease of interpretation. Appendix Table 2.20, which reports odd ratios, illustrates that our results are qualitatively similar when we use logistic regression models.

**Robustness to alternative age band, 18-64**

Table 2.12 underlines that refugees aged 50+ have substantially lower labor market participation rates. In our main analyses, we therefore restrict the working sample to refugees aged 18 to 49 years old in order to capture refugees most likely to be active

in the labor market.<sup>29</sup> The results presented in Appendix Table 2.21 show that our results remain robust when we include all adults aged 18 to 64.

### **Robustness to excluding counties with very few refugees**

While the representative sampling design of the SOEP maps the distribution of refugees across Germany very closely (see Section 2.3.1), the number of observations per county is small for some counties. As a robustness check, we calculate the number of refugees per county and exclude the least populated counties from the estimation (lowest decile;  $N < 15$ ). Appendix Table 2.22 shows that our results are robust to excluding counties with small number of observations.

### **Robustness to alternative levels of clustering and correcting for spatial correlation**

In our main specification, we cluster the standard errors at the county level. We establish robustness of our results using alternative assumptions about the variance-covariance matrix: the results are robust to clustering at gender-education-state level (assuming that residuals co-move within these units) (see Appendix Tables 2.23 and 2.24), clustering standard errors at the state level—due to small number of clusters (that is, 16 states) we also bootstrap standard errors—(see Appendix Tables 2.25 and 2.26) as well as correcting for spatial correlation following Conley (1999) (see Appendix Tables 2.27 and 2.28).

### **Robustness to excluding potentially “bad controls”**

We also checked for “bad controls” (Angrist and Pischke, 2008). One might worry that some of the individual characteristics (such as participation in an integration course) are themselves affected by initial local conditions. However, as shown in Appendix Table 2.29, excluding them completely does not substantively change the point estimates for our variables of interest. We keep these controls in our baseline specification to avoid omitted variable bias.

### **Robustness to controlling for residence status**

Table 2.30 adds a control for residence status, using those with positive asylum decision as baseline category. We find that controlling for residence status does not affect our main results.

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<sup>29</sup>We restrict the sample to refugees aged 25 to 49 when we consider being “in full- or part-time employment”.

**Robustness to not controlling for NUTS-2 fixed effects**

Table 2.31 shows that our main results are robust to not controlling for NUTS-2 fixed effects (only exception is that Migrant Acceptance Index has no impact on multi-dimensional integration of refugees).

**Robustness to analyzing only states with strictest restrictions on residency**

Table 2.32 shows that our results remain robust if we restrict our sample to refugees living in states where residency requirement applies at the county-level, unless a refugee finds employment. This strict residency requirement applies in Bavaria, Baden-Wuerttemberg, North Rhine-Westphalia, Saxony Anhalt and Saarland. The results provide additional evidence that initial conditions shape refugees' integration outcomes.

## **2.6 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 found 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 4.3 percentage points in refugees' likelihood of being in employment or education, and a one standard deviation increase in the Migrant Acceptance Index leads to a 5.0 (4.7) percentage points increase in refugees' likelihood of being in employment or education (full- or part-time employment). Initial local unemployment has a negative, and favorable attitudes towards migrants has a positive, impact on the multi-dimensional integration of refugees. These effects are particularly driven by economic and social components, with effects of psychological, linguistic, political, and navigational components being statistically insignificant. In all cases, the results are stronger for male refugees.

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

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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. One possibility for Germany would be to replace the component that is related to state population with a component related to unfilled job vacancies.

Our findings have also implications on refugee policy at the European level. Many EU member states, notably Germany, have called for a system in which asylum seekers would be reallocated across EU member states. Our findings suggest that, in addition to political difficulties (inflaming tensions between EU member states and potentially resulting in a populist backlash in those countries that are unwilling to host a larger number of asylum seekers), such a quota system could result in worse integration outcomes across the EU, as refugees placed in regions with high unemployment and negative attitudes towards immigrants would face a risk of worse subsequent economic and social integration.

## **2.7 Appendix**

### **2.7.1 Tables**

Table 2.9: Received versus assigned percentage share of asylum seekers per state

	2013		2014		2015		2016		2017		2018	
	REC	ASG	REC	ASG	REC	ASG	REC	ASG	REC	ASG	REC	ASG
Baden Württemberg	12.2	13.0	9.5	13.0	13.0	12.9	11.7	13.0	10.8	13.0	9.9	13.0
Bavaria	15.2	15.3	14.9	15.3	15.3	15.5	11.4	15.5	12.2	15.6	13.5	15.6
Berlin	5.6	5.0	6.0	5.0	7.5	5.0	3.8	5.1	4.7	5.1	5.1	5.1
Brandenburg	2.8	3.1	2.8	3.1	4.2	3.1	2.5	3.0	2.8	3.0	2.9	3.0
Bremen	1.0	0.9	1.3	0.9	1.1	1.0	1.2	1.0	1.3	1.0	1.3	2.0
Hamburg	2.9	2.5	3.3	2.5	2.8	2.5	2.4	2.6	2.4	2.6	2.6	2.6
Hessen	7.4	7.3	7.2	7.3	6.2	7.4	9.1	7.4	7.4	7.4	8.0	7.4
Lower Saxony	9.3	9.4	8.9	9.4	7.8	9.3	11.5	9.3	9.5	9.4	10.4	9.4
Mecklenburg-West Pomerania	2.1	2.1	2.6	2.0	4.3	2.0	1.0	2.0	2.0	2.0	1.7	2.0
North Rhine-Westphalia	21.6	21.2	23.1	21.2	15.1	21.2	27.2	21.1	26.9	21.1	24.4	21.1
Rhineland Palatine	5.0	4.8	5.0	4.8	4.0	4.8	5.1	4.8	6.5	4.8	4.7	4.8
Saarland	1.1	1.2	1.5	1.2	2.3	1.2	1.0	1.2	1.6	1.2	1.7	1.2
Saxony	4.6	5.1	3.5	5.1	6.2	5.1	3.3	5.1	3.7	5.0	4.7	5.0
Saxony Anhalt	2.9	2.9	3.5	2.9	3.7	2.8	2.7	2.8	2.6	2.8	2.6	2.8
Schleswig Holstein	3.4	3.4	4.1	3.4	3.5	3.4	4.0	3.4	3.1	3.4	4.0	3.4
Thuringia	2.5	2.8	2.8	2.7	3.0	2.7	2.1	2.7	2.5	2.7	2.6	2.7
Unknown	0.2	.	0.1	.	0.0	.	0.0	.	0.1	.	0.1	.

*Note:* Table 2.9 tabulates the actual share of refugees received by a particular state (REC) and the percentage share determined by the Königsstein Key (ASG). Figures in percent. Source: BAMF (2014-2019).

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Table 2.10: Main activities by year since arrival in Germany, adults aged 18-49

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

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Table 2.11: Main activities by year since arrival in Germany, single refugees without children aged 18-49

	(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 - Males</i>						
School or university	0.048 (0.215)	0.023 (0.149)	0.048 (0.213)	0.057 (0.232)	0.051 (0.220)	0.077 (0.269)
Vocational training	0.068 (0.251)	0.010 (0.098)	0.041 (0.198)	0.077 (0.267)	0.169 (0.376)	0.154 (0.364)
Employed full-time	0.164 (0.370)	0.016 (0.127)	0.084 (0.277)	0.235 (0.424)	0.311 (0.464)	0.231 (0.425)
Employed part-time	0.124 (0.330)	0.055 (0.229)	0.117 (0.322)	0.156 (0.363)	0.136 (0.343)	0.135 (0.345)
Not in employment or training	0.491 (0.500)	0.672 (0.470)	0.575 (0.495)	0.415 (0.493)	0.299 (0.459)	0.404 (0.495)
Unemployed & integration course	0.105 (0.307)	0.224 (0.418)	0.136 (0.343)	0.060 (0.238)	0.034 (0.181)	0.000 (0.000)
N	1655	308	419	699	177	52
<i>Panel B - Females</i>						
School or university	0.097 (0.296)	0.038 (0.192)	0.105 (0.307)	0.141 (0.349)	0.057 (0.233)	0.000 (0.000)
Vocational training	0.033 (0.179)	0.013 (0.113)	0.007 (0.084)	0.031 (0.173)	0.075 (0.267)	0.267 (0.458)
Employed full-time	0.026 (0.161)	0.000 (0.000)	0.000 (0.000)	0.049 (0.217)	0.057 (0.233)	0.067 (0.258)
Employed part-time	0.099 (0.299)	0.051 (0.221)	0.063 (0.244)	0.110 (0.314)	0.226 (0.423)	0.133 (0.352)
Not in employment or training	0.618 (0.486)	0.633 (0.485)	0.671 (0.471)	0.595 (0.492)	0.547 (0.503)	0.533 (0.516)
Unemployed & integration course	0.126 (0.332)	0.266 (0.445)	0.154 (0.362)	0.074 (0.262)	0.038 (0.192)	0.000 (0.000)
N	453	79	143	163	53	15

*Note:* Means (standard deviations). Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018).



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Table 2.12: Main activities by year since arrival in Germany for different age groups

	(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 - Aged 18-24</i>						
School or university	0.070 (0.255)	0.028 (0.164)	0.070 (0.256)	0.091 (0.288)	0.070 (0.256)	0.100 (0.304)
Vocational training	0.059 (0.235)	0.009 (0.096)	0.031 (0.173)	0.071 (0.257)	0.154 (0.362)	0.275 (0.452)
Employed full-time	0.085 (0.278)	0.015 (0.123)	0.041 (0.199)	0.137 (0.345)	0.168 (0.375)	0.075 (0.267)
Employed part-time	0.099 (0.299)	0.034 (0.181)	0.085 (0.279)	0.134 (0.341)	0.140 (0.348)	0.125 (0.335)
Not in employment or training	0.576 (0.494)	0.715 (0.452)	0.626 (0.484)	0.508 (0.500)	0.420 (0.495)	0.425 (0.501)
Unemployed & integration course	0.111 (0.315)	0.199 (0.400)	0.147 (0.354)	0.058 (0.234)	0.049 (0.217)	0.000 (0.000)
N	1597	326	484	604	143	40
<i>Panel B - Aged 25-49</i>						
School or university	0.007 (0.083)	0.003 (0.055)	0.003 (0.058)	0.009 (0.095)	0.012 (0.110)	0.005 (0.072)
Vocational training	0.017 (0.129)	0.001 (0.039)	0.009 (0.092)	0.020 (0.139)	0.038 (0.192)	0.031 (0.174)
Employed full-time	0.107 (0.309)	0.015 (0.121)	0.055 (0.228)	0.136 (0.343)	0.201 (0.401)	0.155 (0.362)
Employed part-time	0.094 (0.292)	0.040 (0.197)	0.073 (0.260)	0.101 (0.302)	0.160 (0.367)	0.144 (0.352)
Not in employment or training	0.616 (0.486)	0.740 (0.439)	0.646 (0.479)	0.588 (0.492)	0.517 (0.500)	0.588 (0.494)
Unemployed & integration course	0.159 (0.366)	0.200 (0.400)	0.215 (0.411)	0.146 (0.353)	0.071 (0.257)	0.077 (0.268)
N	4591	670	1168	1983	576	194
<i>Panel C - Aged 50+</i>						
School or university	0.002 (0.041)	0.000 (0.000)	0.000 (0.000)	0.004 (0.063)	0.000 (0.000)	0.000 (0.000)
Vocational training	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Employed full-time	0.022 (0.145)	0.011 (0.104)	0.007 (0.082)	0.016 (0.125)	0.071 (0.259)	0.038 (0.196)
Employed part-time	0.065 (0.246)	0.011 (0.104)	0.027 (0.163)	0.063 (0.243)	0.119 (0.326)	0.308 (0.471)
Not in employment or training	0.733 (0.443)	0.761 (0.429)	0.755 (0.431)	0.740 (0.439)	0.690 (0.465)	0.577 (0.504)
Unemployed & integration course	0.179 (0.384)	0.217 (0.415)	0.211 (0.409)	0.177 (0.383)	0.119 (0.326)	0.077 (0.272)
N	603	92	147	254	84	26

*Note:* Means (standard deviations). Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018).

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Table 2.13: Determinants of refugees' labor market outcomes, including the full set of covariates

	(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 t-2 std.	-0.043*** (0.013)	-0.042*** (0.012)	-0.341*** (0.084)	-0.014** (0.007)
Migrant Acceptance Index std.	0.050** (0.016)	0.047*** (0.013)	0.178* (0.092)	0.011* (0.006)
Female	-0.196*** (0.014)	-0.174*** (0.013)	-1.286*** (0.093)	-0.081*** (0.005)
Secondary education	0.039** (0.015)	0.021 (0.015)	0.114 (0.107)	0.040*** (0.007)
Tertiary education	0.061*** (0.021)	0.049** (0.021)	0.391** (0.152)	0.065*** (0.010)
Participated in integration course	0.002 (0.018)	-0.007 (0.016)	-0.004 (0.112)	0.041*** (0.006)
German skills before emigration	0.051 (0.048)	-0.009 (0.041)	0.200 (0.370)	0.072*** (0.017)
Help finding a job	0.179** (0.023)	0.133*** (0.022)	1.357*** (0.180)	
Support from family & friends before emigration	-0.028 (0.018)	-0.018 (0.018)	-0.271** (0.127)	0.002 (0.007)
Children in household	-0.074*** (0.019)	-0.075*** (0.019)	-0.604*** (0.138)	0.003 (0.009)
Afghan origin	-0.015 (0.023)	-0.014 (0.024)	-0.256 (0.157)	-0.008 (0.009)
Iraqi origin	-0.107*** (0.022)	-0.072*** (0.021)	-0.575*** (0.145)	-0.022** (0.010)
Other origin	-0.006 (0.024)	-0.009 (0.021)	0.101 (0.172)	-0.018* (0.010)
3 years of residence in Germany	0.121*** (0.018)	0.087*** (0.017)	0.779*** (0.130)	0.034*** (0.008)
4 years of residence in Germany	0.227*** (0.027)	0.169*** (0.028)	1.495*** (0.202)	0.070*** (0.011)
Living in West Germany	-0.085*** (0.007)	-0.068*** (0.008)	-0.890*** (0.044)	-0.008** (0.003)
Married/ In partnership	-0.044** (0.021)	0.017 (0.023)	0.051 (0.151)	-0.024*** (0.008)
Satisfactory health status	0.061** (0.021)	0.053*** (0.017)	0.277** (0.129)	0.044*** (0.010)
Share of Syrians at county level in 2014	4.744 (11.972)	5.462 (11.157)	46.154 (82.288)	-4.692 (6.463)
Share of Afghans at county level in 2014	5.952 (20.956)	40.448** (19.295)	313.214** (132.821)	27.655** (11.155)
Share of Iraqis at county level in 2014	10.621 (7.793)	8.326 (7.254)	21.187 (51.307)	-0.477 (4.680)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
Age group FE	Yes	Yes	Yes	Yes
Religion FE	Yes	Yes	Yes	Yes
R-Squared	0.229	0.205	0.228	0.253
N	3170	2434	3013	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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. 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.14: Effect of unemployment and attitudes towards immigrants on the dimensions of the Multi-dimensional Integration Index, by gender

	(1)	(2)	(3)	(4)	(5)	(6)
	Psychological b/se	Linguistic b/se	Economic b/se	Political b/se	Social b/se	Navigational b/se
<i>Panel A - Male</i>						
Unemployment rate t-2 std.	-0.005 (0.015)	0.000 (0.011)	-0.052*** (0.016)	-0.002 (0.007)	-0.023 (0.016)	-0.032* (0.017)
Migrant Acceptance Index std.	0.017 (0.012)	-0.008 (0.009)	0.028 (0.018)	-0.005 (0.004)	0.020 (0.017)	-0.009 (0.015)
Secondary education	-0.013 (0.013)	0.126*** (0.011)	0.034 (0.021)	0.003 (0.007)	0.048*** (0.016)	0.010 (0.018)
Tertiary education	-0.043** (0.020)	0.259*** (0.016)	0.066** (0.030)	0.002 (0.011)	0.039* (0.022)	0.025 (0.031)
Participated in integration course	0.028** (0.012)	0.035*** (0.010)	0.073*** (0.020)	0.006 (0.006)	0.004 (0.016)	-0.025 (0.016)
German skills before emigration	0.002 (0.031)	0.116*** (0.029)	0.090 (0.055)	0.030*** (0.007)	0.116*** (0.039)	0.025 (0.050)
Support from family & friends before emigration	0.023* (0.014)	-0.005 (0.011)	-0.030 (0.026)	0.000 (0.007)	0.013 (0.019)	0.023 (0.021)
Children in household	0.077*** (0.017)	0.027* (0.015)	-0.072** (0.029)	0.004 (0.010)	-0.017 (0.026)	0.049** (0.020)
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.090	0.375	0.203	0.070	0.138	0.082
N	1527	1527	1527	1527	1527	1527
<i>Panel B - Females</i>						
Unemployment rate t-2 std.	0.004 (0.014)	-0.013 (0.015)	-0.011 (0.014)	0.005 (0.010)	-0.039 (0.024)	0.029* (0.016)
Migrant Acceptance Index std.	0.014 (0.020)	-0.012 (0.017)	0.028** (0.012)	-0.027 (0.021)	0.033 (0.021)	0.013 (0.020)
Secondary education	-0.013 (0.015)	0.111*** (0.015)	0.004 (0.016)	0.011 (0.012)	0.072*** (0.020)	-0.016 (0.017)
Tertiary education	-0.027 (0.024)	0.206*** (0.023)	0.055** (0.025)	0.022 (0.014)	0.044 (0.029)	0.024 (0.029)
Participated in integration course	0.059*** (0.014)	0.124*** (0.015)	0.209*** (0.018)	-0.010 (0.011)	0.040* (0.024)	-0.002 (0.019)
German skills before emigration	-0.050 (0.035)	0.078 (0.048)	0.004 (0.055)	-0.029 (0.032)	0.109* (0.056)	0.132* (0.069)
Support from family & friends before emigration	0.024 (0.016)	-0.023 (0.019)	0.021 (0.019)	0.011 (0.009)	-0.040* (0.021)	0.009 (0.020)
Children in household	0.020 (0.018)	-0.017 (0.019)	-0.040* (0.021)	-0.002 (0.013)	0.032 (0.024)	-0.004 (0.027)
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.111	0.335	0.271	0.099	0.169	0.090
N	950	950	950	950	950	950

*Note:* \* 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. Dimensions are set similar to Harder et al. (2018). Table 2.14 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some control variables are not shown. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.15: Robustness to omitted variable bias, Oster test

	(1)	(2)	(3)	(4)
	In employment or education	Full- or part- time employed	Net monthly wages	Multi-dimensional Integration Index
Unemployment rate	-0.043*** (0.013)	-0.042*** (0.012)	-0.341*** (0.084)	-0.014** (0.007)
Bounds on the treatment effect	(-0.033, -0.043)	(-0.033, -0.047)	(-0.258, -0.341)	(-0.009, -0.144)
Treatment excludes 0	Yes	Yes	Yes	Yes
Delta (Rmax = 1.3*R)	8.015	25.162	10.129	-17.435
Migrant Acceptance Index	0.050*** (0.016)	0.047*** (0.013)	0.178* (0.092)	0.011* (0.006)
Bounds on the treatment effect	(0.049, 0.050)	(0.026, 0.024)	(0.187, 0.178)	(0.009, 0.011)
Treatment excludes 0	Yes	Yes	Yes	Yes
Delta (Rmax = 1.3*R)	-123.684	14.899	20.879	-12.107

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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. The sample is restricted to individuals with a minimum of two years of residence in Germany. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, Syrian refugee. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.16: Determinants of refugees' labor market and social outcomes, including NUTS-2\*year fixed effects

	(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 t-2 std.	-0.048*** (0.013)	-0.049*** (0.012)	-0.367*** (0.085)	-0.014** (0.007)
Migrant Acceptance Index std.	0.054*** (0.016)	0.044*** (0.014)	0.185* (0.094)	0.014** (0.006)
Female	-0.198*** (0.015)	-0.178*** (0.014)	-1.292*** (0.095)	-0.082*** (0.006)
Secondary education	0.039** (0.016)	0.020 (0.016)	0.106 (0.110)	0.040*** (0.007)
Tertiary education	0.065*** (0.022)	0.049** (0.021)	0.416*** (0.156)	0.067*** (0.010)
Participated in integration course	-0.002 (0.018)	-0.009 (0.017)	-0.038 (0.114)	0.039*** (0.006)
German skills before emigration	0.053 (0.047)	-0.011 (0.042)	0.139 (0.367)	0.071*** (0.017)
Help finding a job	0.182*** (0.024)	0.139*** (0.023)	1.371*** (0.181)	
Support from family & friends before emigration	-0.029 (0.018)	-0.020 (0.018)	-0.288** (0.129)	0.000 (0.007)
Children in household	-0.069*** (0.020)	-0.074*** (0.019)	-0.572*** (0.140)	0.004 (0.009)
Married/ In partnership	-0.046** (0.022)	0.017 (0.023)	0.030 (0.154)	-0.025*** (0.008)
Satisfactory health status	0.062*** (0.021)	0.048*** (0.017)	0.266** (0.134)	0.042*** (0.010)
Nuts-2 * Year FE	Yes	Yes	Yes	Yes
R-Squared	0.248	0.226	0.246	0.274
N	3170	2434	3013	2477

*Note:* \* 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 2.16 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

Table 2.17: Effect of unemployment and attitudes towards immigrants on the dimensions of the Multi-dimensional Integration Index, including NUTS-2\*year fixed effects

	(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 t-2 std.	0.001 (0.012)	-0.005 (0.009)	-0.038*** (0.012)	0.005 (0.006)	-0.026* (0.015)	-0.009 (0.012)
Migrant Acceptance Index std.	0.018 (0.012)	-0.004 (0.008)	0.037*** (0.013)	-0.013 (0.008)	0.029** (0.013)	0.001 (0.012)
Female	0.005 (0.008)	-0.074*** (0.010)	-0.215*** (0.013)	-0.008 (0.006)	-0.093*** (0.012)	-0.044*** (0.011)
Secondary education	-0.009 (0.010)	0.124*** (0.009)	0.022 (0.014)	0.007 (0.006)	0.057*** (0.013)	0.003 (0.014)
Tertiary education	-0.032* (0.017)	0.240*** (0.014)	0.063*** (0.020)	0.014* (0.008)	0.045** (0.019)	0.030 (0.023)
Participated in integration course	0.037*** (0.010)	0.071*** (0.009)	0.117*** (0.015)	-0.002 (0.006)	0.008 (0.013)	-0.016 (0.012)
German skills before emigration	-0.007 (0.025)	0.104*** (0.025)	0.081* (0.043)	0.015 (0.011)	0.108*** (0.031)	0.063 (0.041)
Support from family & friends before emigration	0.021** (0.011)	-0.012 (0.010)	-0.012 (0.016)	0.002 (0.006)	-0.015 (0.016)	0.020 (0.014)
Children in household	0.053*** (0.013)	0.004 (0.012)	-0.066*** (0.019)	0.003 (0.008)	0.002 (0.018)	0.027 (0.017)
Married/ In partnership	-0.003 (0.013)	-0.044*** (0.012)	-0.016 (0.019)	0.001 (0.008)	-0.045** (0.018)	-0.021 (0.017)
Satisfactory health status	0.057*** (0.015)	0.051*** (0.014)	0.050** (0.019)	0.015 (0.012)	0.060*** (0.021)	-0.018 (0.018)
Nuts-2 * Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.106	0.375	0.282	0.095	0.196	0.100
N	2477	2477	2477	2477	2477	2477

Note: \* 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. Dimensions are set similar to Harder et al. (2018). Table 2.17 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some control variables are not shown. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.18: Multiple hypothesis testing - Main results

	(1)	(2)	(3)	(4)
	In employment or education	Full- or part- time employed	Net monthly wages	Multi-dimensional Integration Index
Unemployment rate	-0.048*** (0.013)	-0.049*** (0.012)	-0.367*** (0.85)	-0.014** (0.007)
N	3,170	2,434	3,013	2,477
Randomization-t p-values	0.004***	0.004***	0.002***	0.052*
Randomization-t p-values				
Westfall-Young multiple testing of treatment significance				0.006**
Migrant Acceptance Index	0.054*** (0.016)	0.044*** (0.014)	0.185* (0.094)	0.014** (0.006)
N	3,170	2,434	3,013	2,477
Randomization-t p-values	0.004***	0.004***	0.018**	0.094*
Randomization-t p-values				
Westfall-Young multiple testing of treatment significance				0.012**

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels are clustered on the county and year of interview level and are displayed in parenthesis. 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. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, Syrian refugee. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.19: Determinants of refugees' labor market and social outcomes

	(1)	(2)	(3)	(4)
	In employment or education b/se	Full or part-time b/se	Net monthly wages b/se	Multi-dimensional Integration Index b/se
Unemployment rate t-2 std.	-0.044*** (0.013)	-0.042*** (0.012)	-0.339*** (0.085)	-0.014** (0.007)
Diversity Index std.	0.213*** (0.072)	0.178** (0.069)	1.021** (0.498)	0.059* (0.034)
Female	-0.197*** (0.015)	-0.174*** (0.013)	-1.289*** (0.093)	-0.081*** (0.005)
Secondary education	0.040*** (0.015)	0.021 (0.015)	0.118 (0.107)	0.040*** (0.007)
Tertiary education	0.060*** (0.021)	0.048** (0.021)	0.390** (0.152)	0.065*** (0.010)
Participated in integration course	0.002 (0.018)	-0.007 (0.016)	-0.004 (0.112)	0.042*** (0.006)
German skills before emigration	0.052 (0.048)	-0.008 (0.041)	0.209 (0.370)	0.072*** (0.017)
Help finding a job	0.178*** (0.023)	0.133*** (0.023)	1.354*** (0.180)	
Support from family & friends before emigration	-0.027 (0.018)	-0.017 (0.018)	-0.266** (0.127)	0.002 (0.007)
Children in household	-0.074*** (0.020)	-0.074*** (0.019)	-0.603*** (0.139)	0.003 (0.009)
Married/ In partnership	-0.043** (0.021)	0.018 (0.023)	0.052 (0.151)	-0.024*** (0.008)
Satisfactory health status	0.063*** (0.020)	0.055*** (0.017)	0.287** (0.128)	0.045*** (0.010)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.228	0.203	0.228	0.253
N	3170	2434	3013	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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 2.19 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on the diversity index stems from the Gallup World Polls. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and Gallup World Polls (2014).



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Table 2.20: Logistic regression: Determinants of refugees' labor market outcomes

	(1) In employment or education b/se	(2) Full or part-time b/se
Unemployment rate t-2 std.	-0.292*** (0.083)	-0.431*** (0.115)
Migrant Acceptance Index std.	0.330*** (0.109)	0.436*** (0.134)
Female	-1.400*** (0.111)	-2.041*** (0.184)
Secondary education	0.264*** (0.097)	0.185 (0.139)
Tertiary education	0.389*** (0.130)	0.419** (0.167)
Participated in integration course	0.072 (0.113)	0.086 (0.146)
German skills before emigration	0.350 (0.253)	0.028 (0.304)
Help finding a job	0.945*** (0.121)	0.853*** (0.144)
Support from family & friends before emigration	-0.183 (0.123)	-0.121 (0.184)
Children in household	-0.477*** (0.122)	-0.596*** (0.159)
Married/ In partnership	-0.217 (0.135)	0.204 (0.211)
Satisfactory health status	0.664*** (0.211)	0.977*** (0.290)
Interview year FE	Yes	Yes
Nuts-2 FE	Yes	Yes
Pseudo R-Squared	0.218	0.255
N	3170	2434

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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. Estimates are reported as odd ratios. Table 2.20 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.21: Determinants of refugees' labor market and social outcomes, adults aged 18-64

	(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 t-2 std.	-0.039*** (0.012)	-0.037*** (0.011)	-0.302*** (0.081)	-0.015** (0.006)
Migrant Acceptance Index std.	0.041** (0.017)	0.035** (0.014)	0.160* (0.089)	0.011* (0.006)
Female	-0.182*** (0.013)	-0.159*** (0.012)	-1.196*** (0.084)	-0.076*** (0.005)
Secondary education	0.040*** (0.014)	0.022 (0.014)	0.111 (0.097)	0.039*** (0.006)
Tertiary education	0.060*** (0.018)	0.044** (0.018)	0.355*** (0.130)	0.065*** (0.009)
Participated in integration course	0.000 (0.017)	-0.011 (0.015)	-0.048 (0.104)	0.040*** (0.005)
German skills before emigration	0.014 (0.043)	-0.032 (0.036)	-0.011 (0.332)	0.068*** (0.015)
Help finding a job	0.176*** (0.023)	0.131*** (0.022)	1.328*** (0.175)	
Support from family & friends before emigration	-0.028* (0.016)	-0.021 (0.016)	-0.265** (0.118)	0.003 (0.006)
Children in household	-0.073*** (0.018)	-0.068*** (0.017)	-0.574*** (0.124)	0.002 (0.008)
Married/ In partnership	-0.050** (0.019)	0.003 (0.020)	-0.024 (0.136)	-0.025*** (0.007)
Satisfactory health status	0.056*** (0.018)	0.048*** (0.015)	0.244** (0.109)	0.045*** (0.008)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.230	0.199	0.227	0.261
N	3484	2748	3315	2727

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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 2.21 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.22: Determinants of refugees' labor market and social outcomes, robustness to excluding counties with very few refugees

	(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 t-2 std.	-0.046*** (0.013)	-0.053*** (0.014)	-0.415*** (0.096)	-0.025*** (0.008)
Migrant Acceptance Index std.	0.051*** (0.018)	0.051*** (0.015)	0.181* (0.094)	0.009 (0.007)
Female	-0.197*** (0.015)	-0.174*** (0.014)	-1.261*** (0.097)	-0.080*** (0.006)
Secondary education	0.032** (0.016)	0.018 (0.016)	0.132 (0.112)	0.039*** (0.007)
Tertiary education	0.047** (0.021)	0.043* (0.022)	0.368** (0.161)	0.063*** (0.011)
Participated in integration course	-0.006 (0.019)	-0.011 (0.017)	-0.061 (0.118)	0.043*** (0.006)
German skills before emigration	0.046 (0.051)	-0.015 (0.043)	0.108 (0.392)	0.062*** (0.017)
Help finding a job	0.187*** (0.025)	0.132*** (0.023)	1.341*** (0.192)	
Support from family & friends before emigration	-0.027 (0.019)	-0.017 (0.019)	-0.270** (0.135)	0.004 (0.007)
Children in household	-0.073*** (0.020)	-0.075*** (0.020)	-0.587*** (0.144)	0.002 (0.010)
Married/ In partnership	-0.042* (0.023)	0.015 (0.025)	0.040 (0.163)	-0.023*** (0.009)
Satisfactory health status	0.050** (0.021)	0.041** (0.017)	0.180 (0.133)	0.039*** (0.010)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.229	0.209	0.232	0.250
N	2808	2140	2670	2191

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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 2.22 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.23: Determinants of refugees' labor market and social outcomes, clustering standard errors on the gender, education, and state level

	(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 t-2 std.	-0.043*** (0.013)	-0.042*** (0.012)	-0.341*** (0.103)	-0.014** (0.006)
Migrant Acceptance Index std.	0.050*** (0.015)	0.047*** (0.012)	0.178** (0.083)	0.011 (0.007)
Female	-0.196*** (0.016)	-0.174*** (0.015)	-1.286*** (0.118)	-0.081*** (0.006)
Secondary education	0.039*** (0.008)	0.021*** (0.007)	0.114 (0.073)	0.040*** (0.006)
Tertiary education	0.061*** (0.017)	0.049*** (0.014)	0.391** (0.171)	0.065*** (0.013)
Participated in integration course	0.002 (0.021)	-0.007 (0.019)	-0.004 (0.139)	0.041*** (0.007)
German skills before emigration	0.051 (0.060)	-0.009 (0.052)	0.200 (0.440)	0.072*** (0.018)
Help finding a job	0.179*** (0.024)	0.133*** (0.020)	1.357*** (0.179)	
Support from family & friends before emigration	-0.028** (0.014)	-0.018 (0.015)	-0.271*** (0.100)	0.002 (0.005)
Children in household	-0.074*** (0.021)	-0.075*** (0.018)	-0.604*** (0.149)	0.003 (0.009)
Married/ In partnership	-0.044* (0.024)	0.017 (0.022)	0.051 (0.159)	-0.024** (0.009)
Satisfactory health status	0.061*** (0.017)	0.053*** (0.014)	0.277** (0.120)	0.044*** (0.009)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.229	0.205	0.228	0.253
N	3170	2434	3013	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels are clustered on the gender, education, and state level (G=96 clusters) 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 2.23 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.24: Effect of unemployment and attitudes towards immigrants on the dimensions of the Multi-dimensional Integration Index, clustering standard errors on the gender, education, and state level

	(1)	(2)	(3)	(4)	(5)	(6)
	Psychological	Linguistic	Economic	Political	Social	Navigational
	b/se	b/se	b/se	b/se	b/se	b/se
Unemployment rate t-2 std.	-0.001 (0.018)	-0.002 (0.005)	-0.036** (0.017)	0.001 (0.006)	-0.025* (0.014)	-0.010 (0.014)
Migrant Acceptance Index std.	0.016 (0.015)	-0.005 (0.007)	0.033*** (0.011)	-0.013 (0.008)	0.027* (0.015)	-0.003 (0.013)
Female	0.006 (0.007)	-0.071*** (0.010)	-0.213*** (0.020)	-0.007 (0.005)	-0.093*** (0.011)	-0.045*** (0.011)
Secondary education	-0.010 (0.011)	0.122*** (0.006)	0.024*** (0.009)	0.006 (0.005)	0.059*** (0.011)	0.004 (0.012)
Tertiary education	-0.032** (0.016)	0.240*** (0.014)	0.061*** (0.022)	0.011 (0.007)	0.042** (0.016)	0.026 (0.021)
Participated in integration course	0.038*** (0.010)	0.072*** (0.010)	0.121*** (0.017)	-0.001 (0.006)	0.013 (0.013)	-0.018 (0.012)
German skills before emigration	-0.007 (0.027)	0.109*** (0.025)	0.077 (0.049)	0.016 (0.013)	0.111*** (0.032)	0.062 (0.043)
Support from family & friends before emigration	0.024** (0.011)	-0.012 (0.009)	-0.011 (0.015)	0.004 (0.005)	-0.011 (0.012)	0.020 (0.015)
Children in household	0.053*** (0.011)	0.007 (0.014)	-0.071*** (0.020)	0.001 (0.008)	0.001 (0.016)	0.023 (0.017)
Married/ In partnership	-0.003 (0.012)	-0.045*** (0.012)	-0.012 (0.015)	0.005 (0.009)	-0.046** (0.017)	-0.020 (0.018)
Satisfactory health status	0.059*** (0.013)	0.052*** (0.011)	0.051** (0.020)	0.020* (0.011)	0.062*** (0.020)	-0.017 (0.018)
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.078	0.356	0.266	0.056	0.157	0.065
N	2477	2477	2477	2477	2477	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels are clustered on the gender, education, and state level (G=96 clusters) 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. Dimensions are set similar to Harder et al. (2018). Table 2.24 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some control variables are not shown. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.25: Determinants of refugees' labor market and social outcomes, bootstrapped standard errors at the state level

	(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 t-2 std.	-0.043*** (0.015)	-0.042*** (0.015)	-0.341*** (0.107)	-0.014** (0.006)
Migrant Acceptance Index std.	0.050*** (0.014)	0.047*** (0.013)	0.178* (0.097)	0.011** (0.005)
Female	-0.196*** (0.015)	-0.174*** (0.015)	-1.286*** (0.094)	-0.081*** (0.006)
Secondary education	0.039** (0.017)	0.021 (0.015)	0.114 (0.115)	0.040*** (0.007)
Tertiary education	0.061** (0.026)	0.049* (0.027)	0.391** (0.182)	0.065*** (0.009)
Participated in integration course	0.002 (0.018)	-0.007 (0.019)	-0.004 (0.096)	0.041*** (0.005)
German skills before emigration	0.051 (0.042)	-0.009 (0.040)	0.200 (0.384)	0.072*** (0.019)
Help finding a job	0.179*** (0.022)	0.133*** (0.023)	1.357*** (0.180)	
Support from family & friends before emigration	-0.028 (0.018)	-0.018 (0.018)	-0.271** (0.120)	0.002 (0.007)
Children in household	-0.074*** (0.021)	-0.075*** (0.018)	-0.604*** (0.146)	0.003 (0.009)
Married/ In partnership	-0.044** (0.021)	0.017 (0.021)	0.051 (0.155)	-0.024*** (0.009)
Satisfactory health status	0.061*** (0.023)	0.053*** (0.018)	0.277** (0.136)	0.044*** (0.011)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.229	0.205	0.228	0.253
N	3170	2434	3013	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels are bootstrapped 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 2.25 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

Table 2.26: Effect of unemployment and attitudes towards immigrants on the dimensions of the Multi-dimensional Integration Index, bootstrapped standard errors at the state level

	(1)	(2)	(3)	(4)	(5)	(6)
	Psychological	Linguistic	Economic	Political	Social	Navigational
	b/se	b/se	b/se	b/se	b/se	b/se
Unemployment rate t-2 std.	-0.001 (0.010)	-0.002 (0.009)	-0.036*** (0.013)	0.001 (0.005)	-0.025** (0.012)	-0.010 (0.011)
Migrant Acceptance Index std.	0.016 (0.010)	-0.005 (0.008)	0.033*** (0.012)	-0.013* (0.007)	0.027*** (0.010)	-0.003 (0.012)
Female	0.006 (0.009)	-0.071*** (0.009)	-0.213*** (0.013)	-0.007 (0.006)	-0.093*** (0.013)	-0.045*** (0.011)
Secondary education	-0.010 (0.010)	0.122*** (0.009)	0.024 (0.016)	0.006 (0.005)	0.059*** (0.014)	0.004 (0.012)
Tertiary education	-0.032** (0.014)	0.240*** (0.013)	0.061*** (0.023)	0.011 (0.007)	0.042** (0.017)	0.026 (0.018)
Participated in integration course	0.038*** (0.009)	0.072*** (0.009)	0.121*** (0.012)	-0.001 (0.005)	0.013 (0.011)	-0.018 (0.013)
German skills before emigration	-0.007 (0.027)	0.109*** (0.025)	0.077* (0.043)	0.016 (0.011)	0.111*** (0.029)	0.062* (0.037)
Support from family & friends before emigration	0.024** (0.010)	-0.012 (0.010)	-0.011 (0.017)	0.004 (0.006)	-0.011 (0.015)	0.020 (0.015)
Children in household	0.053*** (0.012)	0.007 (0.013)	-0.071*** (0.017)	0.001 (0.007)	0.001 (0.018)	0.023 (0.015)
Married/ In partnership	-0.003 (0.012)	-0.045*** (0.013)	-0.012 (0.020)	0.005 (0.008)	-0.046*** (0.017)	-0.020 (0.016)
Satisfactory health status	0.059*** (0.015)	0.052*** (0.017)	0.051** (0.021)	0.020* (0.012)	0.062*** (0.023)	-0.017 (0.021)
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.078	0.356	0.266	0.056	0.157	0.065
N	2477	2477	2477	2477	2477	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels are bootstrapped 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. Dimensions are set similar to Harder et al. (2018). Table 2.26 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some control variables are not shown. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.27: Determinants of refugees' labor market and social outcomes, Conley standard errors

	(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 t-2 std.	-0.043*** (0.011)	-0.042*** (0.009)	-0.341*** (0.086)	-0.014* (0.008)
Migrant Acceptance Index std.	0.050*** (0.013)	0.047*** (0.012)	0.178** (0.069)	0.011** (0.005)
Female	-0.196*** (0.017)	-0.174*** (0.010)	-1.286*** (0.099)	-0.081*** (0.007)
Secondary education	0.039*** (0.012)	0.021* (0.012)	0.114 (0.121)	0.040*** (0.006)
Tertiary education	0.061*** (0.019)	0.049*** (0.017)	0.391** (0.157)	0.065*** (0.012)
Participated in integration course	0.002 (0.017)	-0.007 (0.015)	-0.004 (0.108)	0.041*** (0.005)
German skills before emigration	0.051 (0.064)	-0.009 (0.045)	0.200 (0.514)	0.072*** (0.017)
Help finding a job	0.179*** (0.016)	0.133*** (0.017)	1.357*** (0.159)	
Support from family & friends before emigration	-0.028* (0.016)	-0.018 (0.013)	-0.271** (0.117)	0.002 (0.004)
Children in household	-0.074*** (0.019)	-0.075*** (0.015)	-0.604*** (0.130)	0.003 (0.008)
Married/ In partnership	-0.044* (0.022)	0.017 (0.021)	0.051 (0.126)	-0.024*** (0.008)
Satisfactory health status	0.061*** (0.013)	0.053*** (0.012)	0.277*** (0.107)	0.044*** (0.011)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.229	0.205	0.228	0.253
N	3170	2434	3013	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels are corrected for arbitrary cluster correlation in spatial settings (acreg) 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 2.27 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).



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Table 2.28: Effect of unemployment and attitudes towards immigrants on the dimensions of the Multi-dimensional Integration Index, Conley standard errors

	(1)	(2)	(3)	(4)	(5)	(6)
	Psychological	Linguistic	Economic	Political	Social	Navigational
	b/se	b/se	b/se	b/se	b/se	b/se
Unemployment rate t-2 std.	-0.001 (0.015)	-0.002 (0.007)	-0.036** (0.015)	0.001 (0.005)	-0.025 (0.016)	-0.010 (0.013)
Migrant Acceptance Index std.	0.016 (0.013)	-0.005 (0.005)	0.033*** (0.010)	-0.013 (0.008)	0.027** (0.013)	-0.003 (0.011)
Female	0.006 (0.009)	-0.071*** (0.008)	-0.213*** (0.016)	-0.007 (0.005)	-0.093*** (0.010)	-0.045*** (0.011)
Secondary education	-0.010 (0.013)	0.122*** (0.007)	0.024** (0.011)	0.006 (0.006)	0.059*** (0.013)	0.004 (0.017)
Tertiary education	-0.032* (0.018)	0.240*** (0.011)	0.061*** (0.019)	0.011** (0.005)	0.042** (0.017)	0.026 (0.020)
Participated in integration course	0.038*** (0.012)	0.072*** (0.009)	0.121*** (0.014)	-0.001 (0.007)	0.013 (0.011)	-0.018 (0.012)
German skills before emigration	-0.007 (0.028)	0.109*** (0.020)	0.077 (0.052)	0.016 (0.010)	0.111*** (0.028)	0.062 (0.045)
Support from family & friends before emigration	0.024** (0.009)	-0.012 (0.010)	-0.011 (0.018)	0.004 (0.007)	-0.011 (0.014)	0.020 (0.014)
Children in household	0.053*** (0.008)	0.007 (0.014)	-0.071*** (0.016)	0.001 (0.008)	0.001 (0.020)	0.023 (0.019)
Married/ In partnership	-0.003 (0.015)	-0.045*** (0.010)	-0.012 (0.010)	0.005 (0.010)	-0.046*** (0.017)	-0.020 (0.018)
Satisfactory health status	0.059*** (0.015)	0.052*** (0.012)	0.051*** (0.018)	0.020** (0.008)	0.062*** (0.023)	-0.017 (0.023)
Interview year FE	Yes	Yes	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.078	0.356	0.266	0.056	0.157	0.065
N	2477	2477	2477	2477	2477	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels are corrected for arbitrary cluster correlation in spatial settings (acreg) 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. Dimensions are set similar to Harder et al. (2018). Table 2.28 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some control variables are not shown. Reference categories are as follows: primary education, aged 18-24, two years of residence in Germany, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.29: Determinants of refugees' labor market outcomes, dropping potentially "bad controls"

	(1)	(2)	(3)	(4)
	In employment or education b/se	Full or part-time b/se	Net monthly wages b/se	Multi-dimensional Integration Index b/se
Unemployment rate t-2 std.	-0.047*** (0.013)	-0.045*** (0.012)	-0.373*** (0.090)	-0.013** (0.007)
Migrant Acceptance Index std.	0.050*** (0.017)	0.047*** (0.013)	0.188* (0.097)	0.011* (0.006)
Female	-0.234*** (0.015)	-0.206*** (0.014)	-1.562*** (0.095)	-0.087*** (0.005)
Secondary education	0.046*** (0.015)	0.025 (0.015)	0.166 (0.105)	0.047*** (0.007)
Tertiary education	0.086*** (0.021)	0.069*** (0.022)	0.595*** (0.163)	0.076*** (0.010)
Married/ In partnership	-0.095*** (0.018)	-0.031 (0.021)	-0.350** (0.135)	-0.025*** (0.008)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.201	0.177	0.192	0.223
N	3170	2434	3013	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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. Table 2.29 includes a minimum of control variables, including information on gender, education, country of origin, age, years of residence in Germany, and family status. 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. 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, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

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Table 2.30: Determinants of refugees' labor market outcomes, including control variables for type of residence status

	(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 t-2 std.	-0.048*** (0.013)	-0.043*** (0.012)	-0.360*** (0.086)	-0.014** (0.007)
Migrant Acceptance Index std.	0.051*** (0.017)	0.048*** (0.013)	0.190** (0.094)	0.012* (0.006)
Female	-0.200*** (0.015)	-0.176*** (0.013)	-1.299*** (0.094)	-0.082*** (0.005)
Secondary education	0.039** (0.015)	0.020 (0.015)	0.114 (0.107)	0.040*** (0.007)
Tertiary education	0.058*** (0.022)	0.043** (0.021)	0.365** (0.156)	0.064*** (0.010)
Participated in integration course	0.003 (0.018)	-0.007 (0.016)	-0.003 (0.111)	0.039*** (0.006)
German skills before emigration	0.056 (0.048)	-0.004 (0.042)	0.224 (0.371)	0.073*** (0.017)
Help finding a job	0.176*** (0.023)	0.131*** (0.023)	1.359*** (0.181)	
Support from family & friends before emigration	-0.022 (0.018)	-0.015 (0.018)	-0.242* (0.127)	0.003 (0.007)
Children in household	-0.076*** (0.019)	-0.075*** (0.019)	-0.619*** (0.139)	0.002 (0.009)
Married/ In partnership	-0.037* (0.021)	0.020 (0.023)	0.084 (0.153)	-0.025*** (0.008)
Satisfactory health status	0.057*** (0.021)	0.049*** (0.016)	0.248* (0.128)	0.042*** (0.009)
Asylum seeker	-0.028 (0.021)	-0.036* (0.021)	-0.170 (0.152)	-0.013 (0.009)
Tolerated foreigner	-0.006 (0.020)	-0.037* (0.021)	-0.195 (0.131)	-0.016* (0.009)
Other residence status	-0.014 (0.024)	-0.021 (0.024)	-0.105 (0.170)	-0.019* (0.010)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.232	0.207	0.231	0.256
N	3121	2398	2966	2445

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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 2.30 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, positive asylum decision, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

*Local conditions and multi-dimensional integration of refugees*

Table 2.31: Determinants of refugees' labor market outcomes, without regional fixed effects

	(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 t-2 std.	-0.033*** (0.008)	-0.034*** (0.008)	-0.339*** (0.068)	-0.021*** (0.005)
Migrant Acceptance Index std.	0.030*** (0.007)	0.007 (0.007)	0.083* (0.049)	0.005 (0.006)
Female	-0.195*** (0.014)	-0.177*** (0.013)	-1.281*** (0.089)	-0.080*** (0.005)
Secondary education	0.043*** (0.015)	0.026* (0.015)	0.140 (0.108)	0.038*** (0.007)
Tertiary education	0.064*** (0.021)	0.052** (0.021)	0.431*** (0.156)	0.068*** (0.010)
Participated in integration course	0.003 (0.017)	-0.004 (0.016)	0.002 (0.109)	0.043*** (0.006)
German skills before emigration	0.051 (0.049)	-0.006 (0.045)	0.207 (0.379)	0.066*** (0.018)
Help finding a job	0.178*** (0.023)	0.133*** (0.022)	1.355*** (0.179)	
Support from family & friends before emigration	-0.031* (0.018)	-0.023 (0.018)	-0.299** (0.126)	-0.000 (0.007)
Children in household	-0.071*** (0.019)	-0.072*** (0.018)	-0.561*** (0.134)	0.005 (0.009)
Married/ In partnership	-0.043** (0.021)	0.020 (0.023)	0.063 (0.150)	-0.026*** (0.008)
Satisfactory health status	0.063*** (0.021)	0.055*** (0.018)	0.293** (0.128)	0.046*** (0.010)
Interview year FE	Yes	Yes	Yes	Yes
R-Squared	0.218	0.183	0.215	0.219
N	3170	2434	3013	2477

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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 2.31 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, positive asylum decision, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

*Local conditions and multi-dimensional integration of refugees*

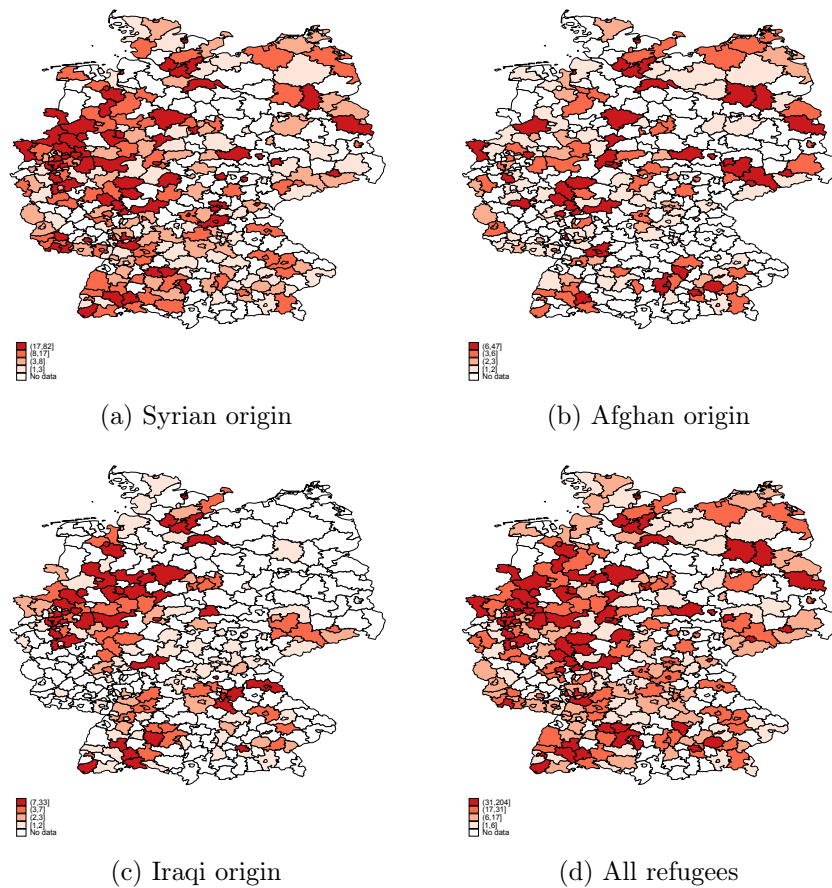
Table 2.32: Determinants of refugees' labor market outcomes in states with strict residency requirements

	(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 t-2 std.	-0.031* (0.017)	-0.044*** (0.017)	-0.188* (0.103)	-0.010 (0.008)
Migrant Acceptance Index std.	0.062*** (0.019)	0.063*** (0.019)	0.268** (0.114)	0.017** (0.008)
Female	-0.211*** (0.018)	-0.185*** (0.018)	-1.318*** (0.117)	-0.086*** (0.007)
Secondary education	0.032* (0.019)	0.023 (0.019)	0.037 (0.129)	0.037*** (0.009)
Tertiary education	0.045* (0.026)	0.033 (0.026)	0.199 (0.184)	0.045*** (0.012)
Participated in integration course	-0.015 (0.023)	-0.017 (0.023)	-0.052 (0.154)	0.042*** (0.008)
German skills before emigration	0.167** (0.066)	0.048 (0.059)	0.879 (0.552)	0.075*** (0.024)
Help finding a job	0.199*** (0.026)	0.156*** (0.029)	1.671*** (0.219)	
Support from family & friends before emigration	-0.018 (0.024)	-0.001 (0.023)	-0.195 (0.164)	0.009 (0.009)
Children in household	-0.060** (0.026)	-0.080*** (0.027)	-0.650*** (0.181)	0.003 (0.011)
Married/ In partnership	-0.062** (0.029)	-0.019 (0.028)	-0.139 (0.209)	-0.037*** (0.011)
Satisfactory health status	0.054* (0.028)	0.066*** (0.024)	0.285* (0.170)	0.029** (0.014)
Interview year FE	Yes	Yes	Yes	Yes
Nuts-2 FE	Yes	Yes	Yes	Yes
R-Squared	0.242	0.228	0.247	0.243
N	1889	1476	1792	1496

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. The standard levels 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 2.32 includes the full set of covariates, as described in Section 2.4. For illustrative purposes, some 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, positive asylum decision, and Syrian origin. Information on attitudes stems from the European Social Survey. We merge natives' mean values on attitudes towards immigrants based on refugees' year of arrival and first state of residence in Germany. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

## 2.7.2 Figures

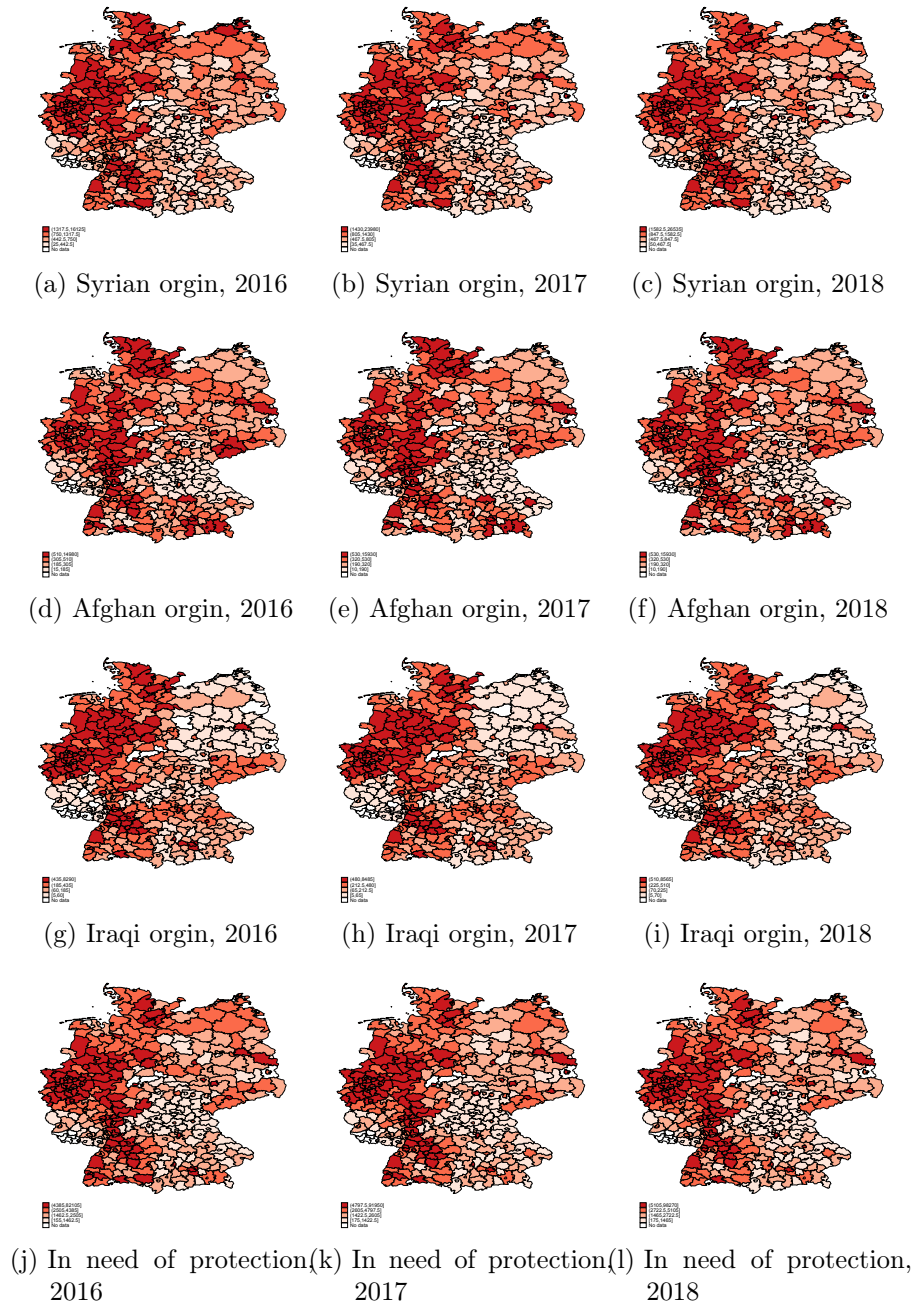
Figure 2.2: Number of refugees per county, disaggregated by country of origin



*Note:* Panels a to d in Figure 2.2 display the number of refugees per county, disaggregated by country of origin. Similarly to our main analysis, we pool observations over years to increase the sample size. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018).

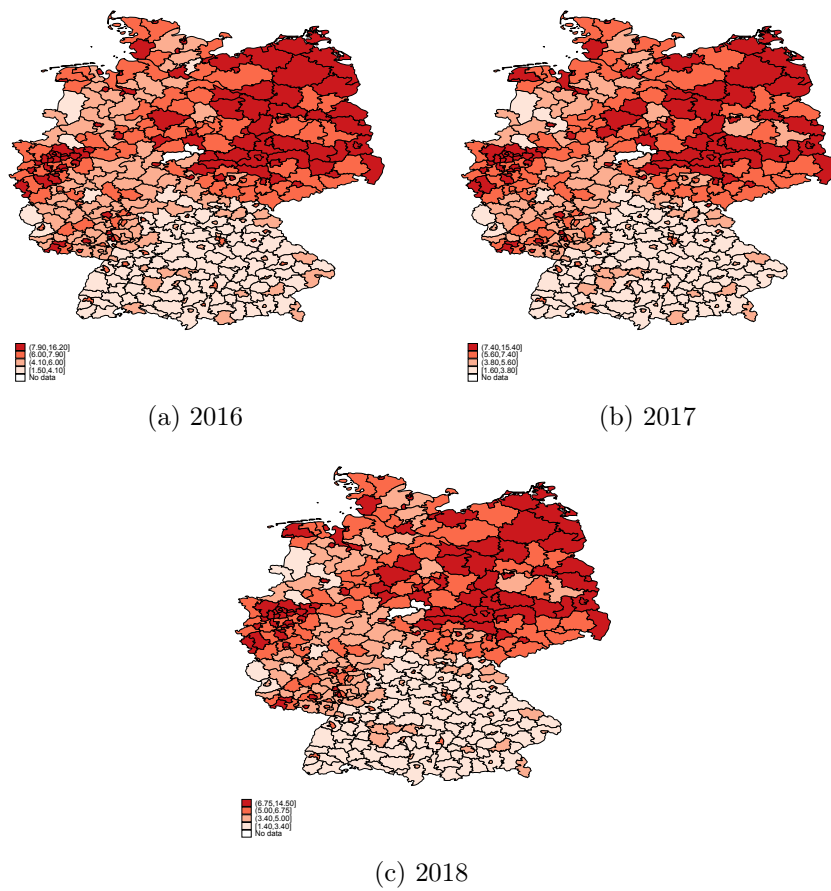
*Local conditions and multi-dimensional integration of refugees*

Figure 2.3: Number of refugees per county, disaggregated by country of origin



*Note:* Panels a to l in Figure 2.3 display the number of refugees per county, disaggregated by country of origin and year. Some counties do not publish the number of people in protection. These are classified as “No data”. Source: Destatis (2016-2018).

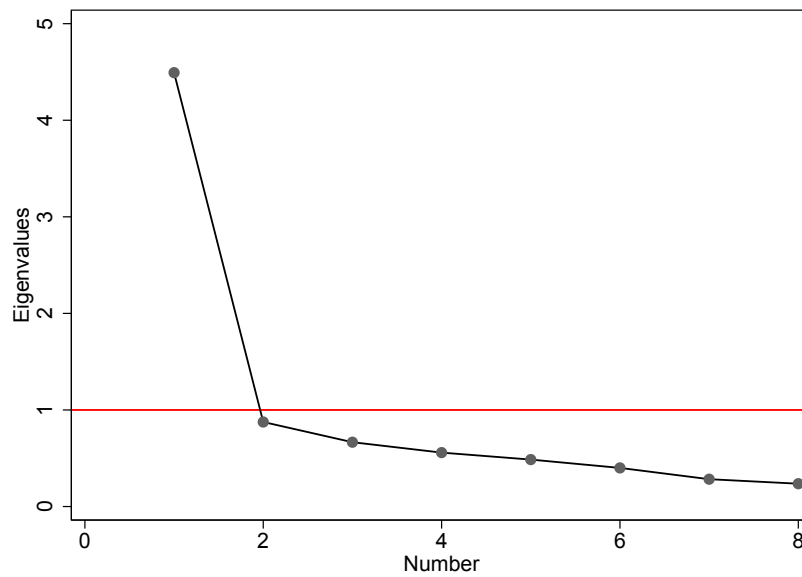
Figure 2.4: County-level unemployment rate, disaggregated by year



*Note:* Panels a to c in Figure 2.4 displays the county-level unemployment rates from 2016 to 2018.  
Source: Destatis (2016-2018).

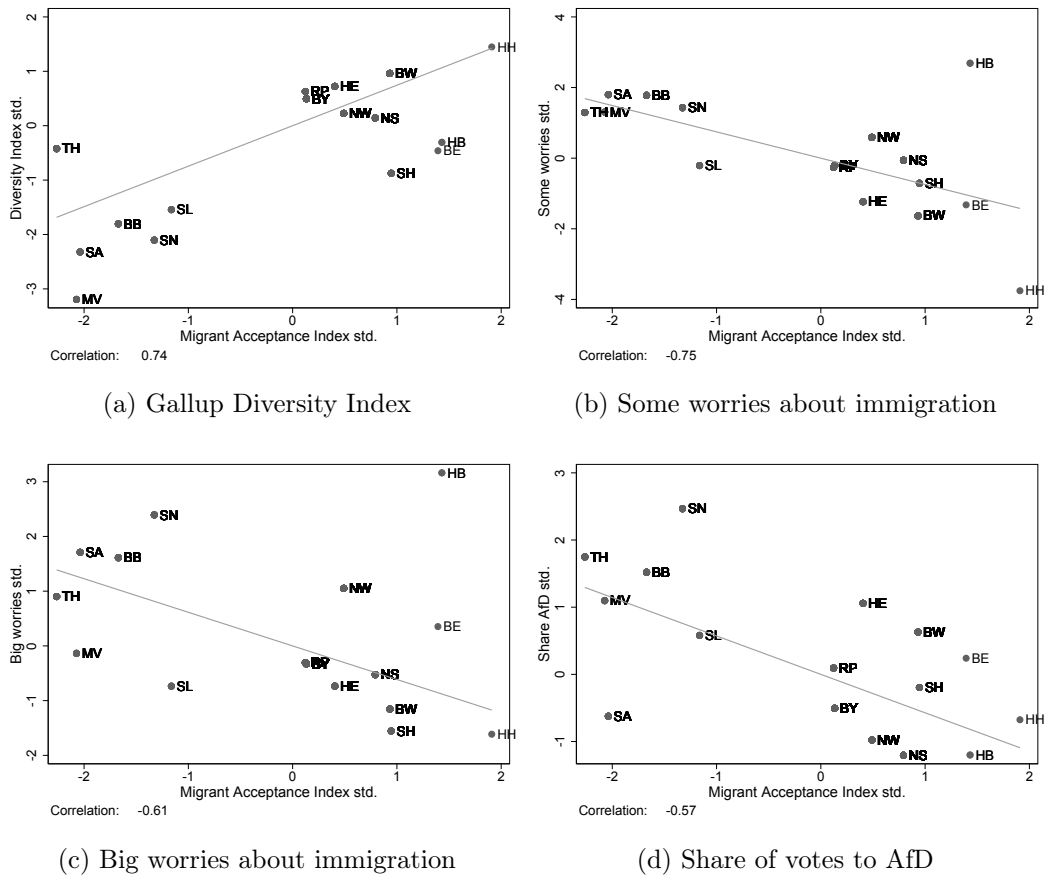


Figure 2.5: Scree plot for principle component analyses of the migrant subscales from the ESS data



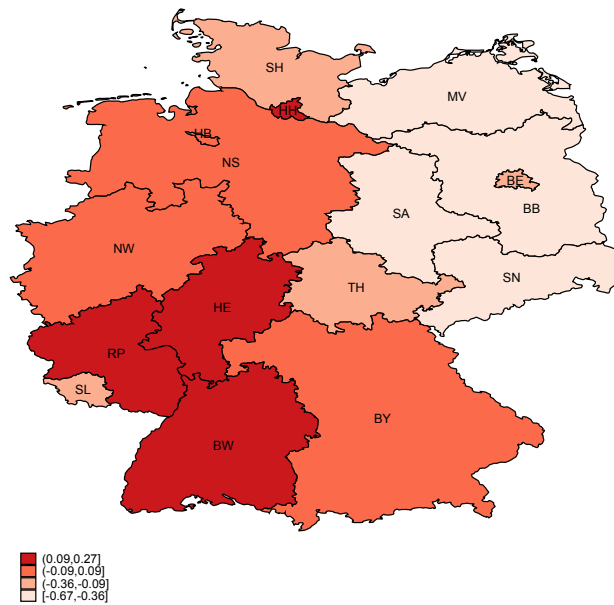
*Note:* Figure 2.5 plots the factors and the corresponding eigenvalues after a principle component analysis of the eight migrant subscales, which are used to build the Migrant Acceptance Index. The red horizontal line corresponds to Eigenvalues of one. Figure 2.5 shows that the first factor (MAI) has the highest predictive power. Source: European Social Survey (2014).

Figure 2.6: Correlation of the Migrant Acceptance Index and alternative measures of attitudes towards immigrants



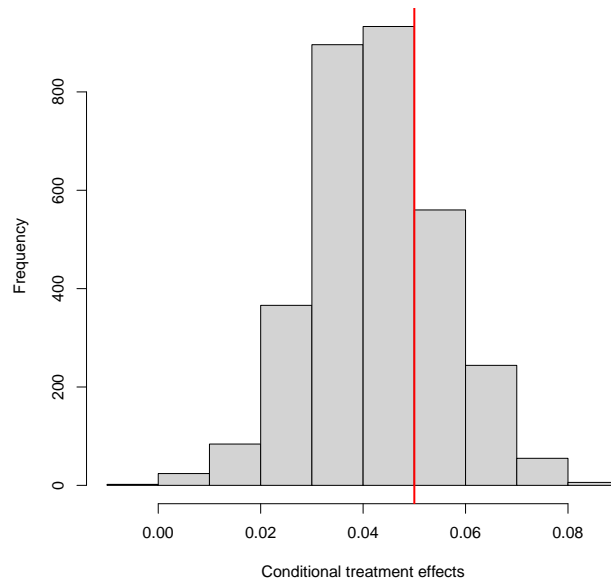
*Note:* Panels a to d in Figure 2.6 displays the correlation between the Migrant Acceptance Index and alternative measures of attitudes towards immigration at the state-level. Correlations are based on the Pearson's correlation coefficient. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018), Gallup World Polls (2014) and European Social Survey (2014).

Figure 2.7: Gallup diversity index

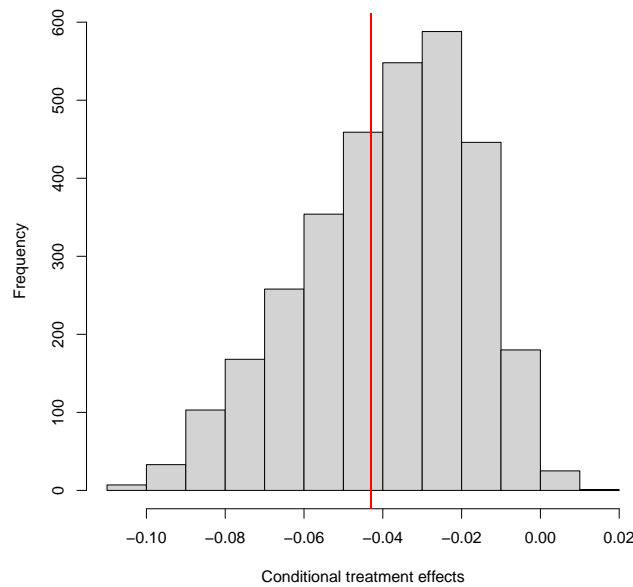


*Note:* Figure 2.7 plots the Gallup diversity index at state level. Source: Gallup World Polls (2014). Abbreviations are as follows: SH – Schleswig Holstein; HH – Hamburg; NS – Lower Saxony; HB – Bremen; NW – North Rhine-Westphalia; HE – Hessen; RP – Rhineland Palatine; BW – Baden Wurttemberg; BY – Bavaria; SL – Saarland; BE – Berlin; BB – Brandenburg; MV – Mecklenburg-West Pomerania; SN – Saxony; SA – Saxony Anhalt; TH – Thuringia. .

Figure 2.8: Histogram of conditional treatment effects



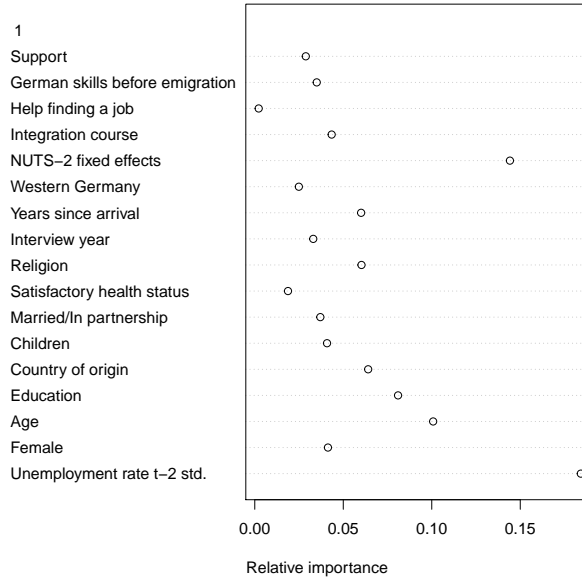
(a) Treatment: Migrant Acceptance Index



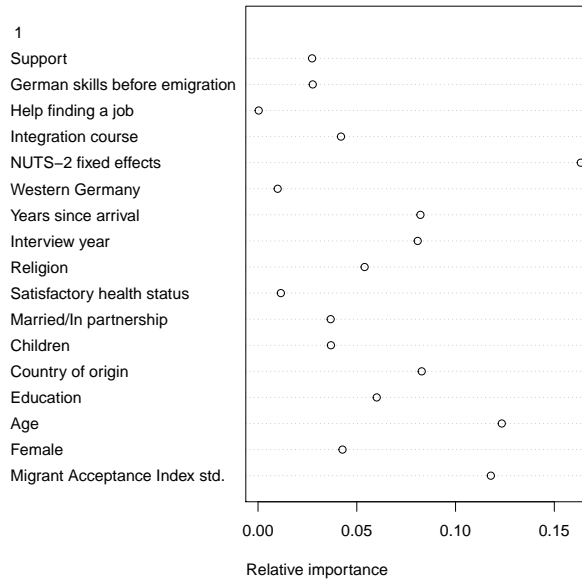
(b) Treatment: Unemployment rate t-2 std.

*Note:* Panels a and b in Figure 2.8 display the conditional treatment effects for “being in employment or education” based on generalized random forest estimation ( $N=20,000$  trees). The red vertical line indicates the level of the treatment effect in the baseline model. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

Figure 2.9: Variable Importance



(a) Treatment: Migrant Acceptance Index

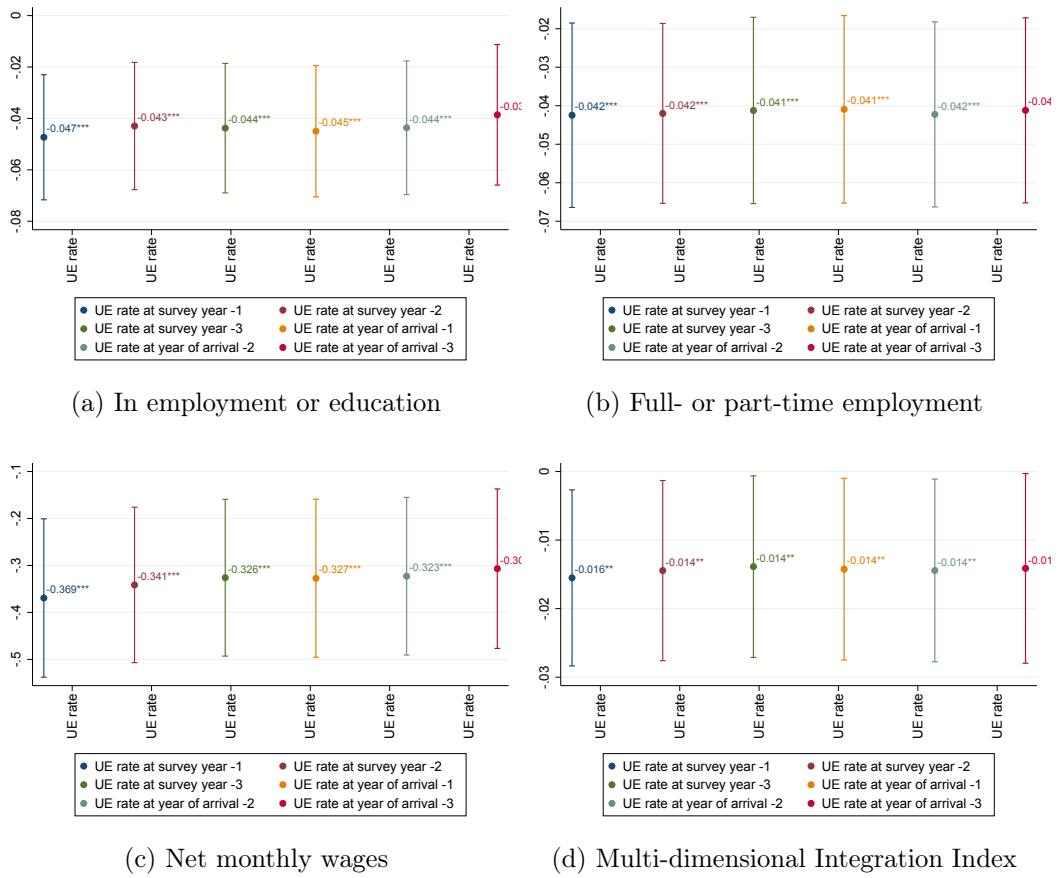


(b) Treatment: Unemployment rate t-2 std.

*Note:* Panels a and b in Figure 2.9 illustrate the variable importance for “being in employment or education” in a generalized random forest framework (N=20,000 trees). The variable importance plot provides a simple weighted sum of how many times a feature was split at each depth in the forest. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

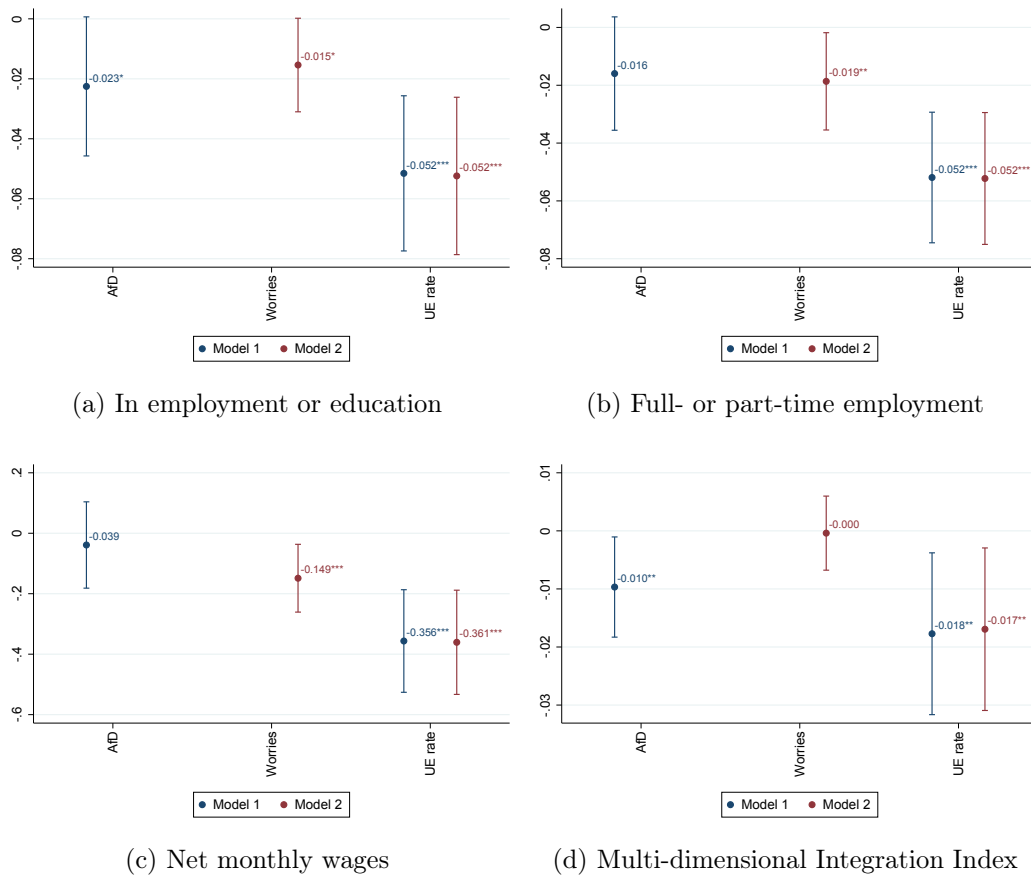
Local conditions and multi-dimensional integration of refugees

Figure 2.10: Robustness of alternative lags of unemployment



Note: Panels a to d in Figure 2.10 display the robustness of our estimation results to alternative lags of unemployment. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

Figure 2.11: Robustness to using alternative measures of attitudes towards immigrants at the county level



Note: Panels a to d in Figure 2.11 display the robustness of our estimation results to alternative measures of attitudes towards immigrants at the county level. Source: IAB-BAMF-SOEP Survey of Refugees, v35 (2016-2018) and European Social Survey (2014).

# 3 Hate is too great a burden to bear: Hate crimes and the mental health of refugees

*We are grateful for valuable feedback from Eli Berman, Gordon Dahl, Katrine Løken as well as the audience of presentations at the BENA Workshop 2019, the DIW Berlin, the DIW Graduate Center Workshop 2019, the Essen Health Conference 2020, UC San Diego, and the ZEW Workshop on Immigration, Integration and Attitudes. We are also very thankful for Tobias Scheckel's valuable research assistance.*

## 3.1 Introduction

In the 2010s, the world witnessed two global phenomena: First, forced migration increased dramatically. The number of displaced persons almost doubled from about 42 million in 2008 to 75 million in 2018 (UNHCR 2019). Second, the prevalence of hate crimes increased markedly. For example, the Center for the Study of Hate and Extremism (2018) reports that hate crime rose by 22 percent in the United States' six largest cities between 2016 and 2017.<sup>1</sup> This marks the third consecutive annual increase for the U.S., a pattern that has not been observed since 2004. We further observe an immense acceleration of violence against immigrants in Europe (The Council of Europe 2016). The arrival of about 800,000 refugees in Germany in 2015 was accompanied by a sudden increase in hate crimes against refugees.<sup>2</sup>

In the economic literature on migration, refugees are considered “permanent” migrants. They remain in their destination country for a long period of time, unable or unwilling to return to their home country, where they are at risk of persecution or conflict. Given that permanent migrants can expect to accrue the returns to integration over longer time horizons than temporary migrants (Dustmann and Glitz 2011), their lifetime utility strongly depends on their initial integration success. For this reason, the potential consequences of adverse experiences due to hate crime are particularly

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<sup>1</sup>The increase for all thirteen surveyed cities was 19.9 percent for the period under consideration.

<sup>2</sup>A hate crime is defined as a crime against a specific group of individuals. Typically, hate crimes are committed because of the victim's race, gender, sexuality, color or ancestry (Gale et al. 2002).



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consequential for refugees. Therefore, we answer the important question, what are the mental health costs of hate crimes for refugees?

To the best of our knowledge, this question is not answered in the existing literature. There are two reasons for this short-coming: First, we need data that combines both representative information on refugees' mental health and their place of residence as well as information on a wide range of individual characteristics. Second, unobservable variables potentially bias the relationship between the occurrence of a hate crime and refugees' mental health. For instance, refugees may choose their place of residence endogenously based on regional characteristics, such as favorable economic conditions or existing ethnic networks, which may jointly determine both refugees' mental health and the occurrence of hate crime. Thus, it is essential to rely on an identification strategy that allows for the consistent estimation of the effect of hate crime on refugees' mental health. We advance the literature by solving these two problems.

To estimate the effect of hate crime on refugees' mental health, we rely on a regression-discontinuity-in-time design (Hausman and Rapson 2018). Using German counties that experience at least one hate crime against a refugee shelter, we assign each refugee the closest hate crime in the respective county measured in days elapsed since this focal hate crime. We then compare refugees' mental health immediately before and after an attack on the county level. Thus, the identification of our effect relies on the assumption that refugees' mental health is a continuous function of the number of elapsed days since the focal hate crime. We find strong support for this assumption, emphasizing the credibility of our research design.

Our empirical analysis relies on the unique IAB-BAMF-SOEP Survey of Refugees in Germany as well as geo-referenced administrative data on hate crimes from the Federal Criminal Office (BKA). The IAB-BAMF-SOEP Survey of Refugees is a representative survey of refugees who arrived in Germany between 2013 and 2016.<sup>3</sup> The data provides information on refugees' migration histories, background characteristics as well as overall living conditions and integration outcomes. Most importantly, it includes information on the exact interview date, the place of residence, and high quality information on refugees' mental health. Our two mental health measures included in the IAB-BAMF-SOEP Survey of Refugees are the Mental Component Summary (MCS) score and the Patient Health Questionnaire-4 (PHQ-4) score. In order to link

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<sup>3</sup>The IAB-BAMF-SOEP Sample of Refugees in Germany is part of the German Socio-Economic Panel (SOEP). We use version 34 of the SOEP. DOI: 10.5684/soep.v34.

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our analysis to related studies, including Deole (2019) and Steinhardt (2018), we also investigate the effect of hate crime on refugees' life satisfaction or intention to stay at the extensive margin.

Our second source of information is the BKA data, which reports hate crimes against refugee shelters. The BKA data contains time, place, the type of crime, and the crime's political motivation. This allows us to geo-reference the information and combine the administrative data on hate crimes with the IAB-BAMF-SOEP Survey of Refugees. The advantage of the administrative BKA data is that it contains information on hate crime directed toward refugees' shelters, which unambiguously represent hate crimes. This is an advantage over other data sources that do not differentiate between hate crime directed toward refugees or other residents with a migration background. Thus, we focus on refugee shelters since these are very salient forms of hate crime. In addition, data from non-administrative sources, such as newspapers, could suffer from endogenous coverage (Entorf and Lange 2019).

Our results indicate that the experience of a hate crime reduces refugees' MCS score by 37 percent of a standard deviation. Similarly, hate crimes reduce refugees' PHQ-4 score by 28 percent of a standard deviation. In contrast to existing studies that focus on economic migrants in Germany, such as Deole (2019) and Steinhardt (2018), we find no effect on refugees' life satisfaction. A potential reason for this may be the fact that refugees draw from different segments of the population in their home country than do economic migrants.<sup>4</sup> For instance, Deole (2019) and Steinhardt (2018) focus on the population of migrants who moved to Germany in the late 1960s to meet the shortage of labor that was prevalent in Germany at that time. These migrants were actively recruited, either by the German government or the sending countries' government. Furthermore, we find no effect on refugees' intention to stay (ITS) in Germany at the extensive margin. This is an important result. Existing research shows that the time horizon over which migrants can accrue returns to investments in country-specific human capital is positively associated with the gradient in their age-earnings profile (Dustmann 1993, 1997, 2000). With hate crimes having little effect on the refugees' ITS, we conclude that a change in the ITS can be ruled out as a mediator between hate crime and the accumulation of country-specific human capital.

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<sup>4</sup>Economic migrants normally leave their country of origin because of pull rather than push factors.

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We also find strong suggestive evidence that our effects are mostly driven by refugees living in close proximity to the focal hate crime. Our data allows us to calculate geographical distances between the location of the focal hate crime, e.g., city, town or municipality, and the refugees' place of residence. We then perform a median split distinguishing between refugees who live close to the hate crime and refugees who live further away. We find that refugees living closer to the respective hate crime have also stronger adverse mental health effects, while the effects are considerably smaller and insignificant for refugees living further away. Thus, this finding shows that the mental health effects reflect a response to a more direct exposure to hate crime.

In a second part, we show that refugees who are better integrated within their host country's society—e.g., those who have frequent contact with German natives or possess higher language proficiency levels—are less severely affected if they experienced a hate crime. This effect is most prevalent for the PHQ-4 score: While the estimated effect amounts to roughly 45 percent of a standard deviation for respondents who report low levels of German language proficiency, the effect size is halved for refugees with high country-specific human capital and statistically insignificant. Hence, we conclude that country-specific human capital has the potential to protect refugees against external negative shocks.

Moreover, while our empirical results indicate that the effect dissipates after approximately three months, we argue that those shocks have considerable long-term consequences. For instance, research on the psychological foundations of poverty stresses that reduced mental bandwidth increases the likelihood of worse economic choices. In turn, these worse economic choices also reduce mental bandwidth, resulting in a downward spiral (Schilbach et al. 2016). Similarly, we propose that hate crimes cause mental stress, which in turn may reduce refugees' mental bandwidth. This reduction in their mental bandwidth could impair the refugees' economic decision-making ability. This could be particularly detrimental for refugees who fled severe conditions and are at the start of a life in a new country. In addition, a broad literature shows the adverse consequences of childhood exposure to stress and adverse conditions, including in-utero exposure, on an individual's long-term life outcomes (Almond and Currie 2011; Almond et al. 2018). This possibly impairs the life-trajectories of the next generation.<sup>5</sup>

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<sup>5</sup>For instance, Persson and Rossin-Slater (2018) show that prenatal exposure to stress increases take-up of ADHD medications during childhood and take up of depression medication later in life. Further, the infants' indirect in utero exposure to the 9/11 attacks in the U.S. caused their birth

## *Hate crimes and the mental health of refugees*

Our paper relates to five branches of the literature. Abstaining from immigration, previous papers unanimously conclude that terrorist attacks have substantial negative effects on individuals' life satisfaction that persist, albeit, only temporarily (Akay et al. 2020; Clark et al. 2020). Using the 9/11 terrorist attacks as a quasi-experiment, Metcalfe et al. (2011) further shows that there are spillover effects to other countries such as the United Kingdom (U.K.).

Second, we also contribute to the literature on the effect of hate crimes on immigrants' health and integration within the host society. For the U.S., Gould and Klor (2014) show that the 9/11 attacks induced a backlash against Muslim immigrants, which in turn increased the opportunity costs of assimilation. For instance, in response to the 9/11 attack, Muslim immigrants in the U.S. were more likely to marry someone with the same ethnic background than before. Further, they also experienced lower rates of labor force participation (Gould and Klor 2014). For Germany, there is evidence that hate crimes reduce integration outcomes as well as life and health satisfaction for immigrants with a Turkish background. Steinhardt (2018) shows that macro exposure to anti-immigrant attacks in the early 1990s in West Germany reduces the Turkish migrants' life satisfaction, increases their return intentions, and slows language acquisition. Further, Deole (2019) studies the revelation crimes directed toward Turkish residents in Germany in 2011. Deole (2019) finds that these revelations reduced the Turkish immigrants' life satisfaction.

We also relate to the literature focusing on the causes of hate crime. For Germany, Krueger and Pischke (1997), Falk et al. (2011) and Entorf and Lange (2019) analyze which socio-demographic characteristics predict hate crimes on the county level. Moreover, the literature is investigating how social media can predict hate crime (Bursztyrn et al. 2019; Müller and Schwarz 2018a; Müller and Schwarz 2018b). We add to this literature by turning to the effect of hate crime on the most vulnerable group among those targeted: refugees. Lastly, we also contribute to a larger more general literature about the socio-economic determinants of mental health (Adhvaryu et al. 2019; Fruewirth et al. 2019).

Our contribution to the literature is twofold: First, to the best of our knowledge, we are the first to analyze the effect of hate crime on refugees' mental health. This is

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weight to decrease by 15 grams, the likelihood of being born weighting less than 1,500 grams by 14 percent, and the likelihood of being born at less than 37 gestational weeks by 9 percent (Brown 2020).

surprising, given the stark increase in forced migration, which is expected to increase further given the economic and environmental changes worldwide (UNHCR 2019), and the fact that mental illnesses has the highest prevalence of all non-communicable diseases (Bloom et al. 2011). Our results further suggest the importance of mental health for (labor market) integration and the subsequent long-term consequences for refugees in Germany. Second, we show that human capital has the potential to protect refugees against negative external shocks. Refugee migration is increasing across Europe and we contribute by providing a new mechanism that explains heterogeneities in refugee integration outcomes.

### **3.2 Forced migration and hate crime**

In the 2010s, environmental deterioration and political upheavals in many African and Asian countries caused a stark increase in the number of refugees worldwide. Figure 3.1 shows that the trend accelerated starting in 2013, following the outbreak of the Arab spring. Among refugees, the vast majority typically migrates either within their country of origin or settles down in a neighboring country (UNHCR 2019). However, as the supply conditions deteriorated rapidly in the neighboring countries' refugee camps and intermediary states like Libya collapsed, large numbers of refugees began to migrate to Central Europe in 2014 and 2015 (Luft 2016).

In Europe, the Dublin-regulation stipulates that an application for asylum must be processed by the first Dublin country the asylum seeker enters. This is why, European Union (EU) members closest to the refugees' countries of origin—normally at the edge of the EU—were disproportionately affected by the number of refugees migrating to Europe. As the number of refugees increased in these countries, the local conditions deteriorated quickly. Initially, the European countries tried to negotiate a new scheme to distribute refugees across the European Union's member countries. However, these negotiations were unsuccessful and, finally, in light of the inhumane situation of the refugees in some of the EU's host countries, the German government suspended the Dublin regulation in fall 2015 (BAMF 2015a). This triggered a large influx of refugees to Germany. Consequently, in 2015 Germany received the largest number of refugees in absolute terms, ranking third after Austria and Sweden in relative terms (Organization

for Economic Co-operation and Development 2017, p.17ff). Subsequently, however, the number of refugees in Germany decreased to pre-2015 levels (Figure 3.2).

Turning to the refugees' demographics, the majority of refugees in Germany originate from Syria, Afghanistan, and Iraq. In 2016, the Federal Office for Migration and Refugees (BAMF) reported the share of first-time asylum applications was 36.9 percent Syrian, 17.6 percent Afghan, and 13.3 percent Iraqi (BAMF 2016b). In addition, these refugees tend to be very young with 73.8 percent of these refugees younger than 30 (BAMF 2016b).

Associated with the stark increase in the number of refugees, Germany experienced a strong increase in xenophobic sentiments directed against immigrants and refugees. For instance, using data from the Federal Criminal Office, we observe a strong increase in hate crimes against refugee shelters around the time when large number of refugees entered Germany (Figure 3.3). The number of attacks increased strongly from 2014 to 2015, remained on an elevated level in 2016, and then returned to initial levels as the number of foreigners arriving in Germany fell. For instance, while our data shows 971 hate crimes in 2016, it declines to 303 hate crimes in 2017 and 170 in 2018.

Figure 3.4 provides a more detailed picture, displaying the number of attacks on refugee shelters per 100,000 residents at county-level per year.<sup>6</sup> We make two observations from this figure. First, as described before, the intensity of hate crimes declines over time. Second, although hate crime is always more prevalent in Eastern German states, it is dispersed across Germany.

### **3.3 Data**

We use two datasets to estimate the effect of hate crime on refugees' mental health: The first dataset incorporates administrative information on hate crime against refugee shelters. The second dataset is the IAB-BAMF-SOEP Survey of Refugees in Germany, which provides us with detailed information on refugees' mental health as well as a wide range of socio-economic characteristics. In what follows, we describe these two datasets in detail.

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<sup>6</sup>We resort to hate crimes per capita in these figures since the initial distribution of refugees within states relies on the counties' share of the population within each state. Consequently, a cross-sectional regression of the counties' share of the states' intake of refugees on the counties population share within the respective state and state fixed effects results in an estimated OLS coefficient of one. Results are available on request.

### **3.3.1 Administrative data on hate crime against refugee shelters**

Our comprehensive data on hate crime against refugee shelters stems from the German Federal Criminal Police Office (“Bundeskriminalamt”).<sup>7</sup> Each entry includes information on the date of the attack, the state, the locality, the type of crime, and the crime’s political motivation. For illustrative purposes, Table 3.4 illustrates an excerpt of the data for January 1, 2016. The major advantage of this dataset is that it reports hate crimes that target refugees specifically rather than an aggregate measure of hate crimes that would have precluded the ability to distinguish between crimes targeting economic migrants and those targeting refugees. Second, hate crime against refugee shelters are much more salient than individual incidents like refugees being attacked on the street. Finally, the BKA data is less likely to suffer from endogenous coverage, which could be, for instance, the case for newspaper data (Entorf and Lange 2019). As such, it is an ideal source of information on hate crime against refugees for this analysis.

In a first step, we collected all information on hate crime against refugee shelters from the small inquiries and digitized the BKA information accordingly. In a second step, we geo-referenced the data based on information on the state and the exact location, e.g., the name of the city or municipality.<sup>8</sup> Overall, our data records 1,444 events between 2016 and 2018. As displayed in Section 3.2, the incidence of hate crimes against refugee shelters substantially decreased over time.

### **3.3.2 IAB-BAMF-SOEP Survey of Refugees**

The IAB-BAMF-SOEP Survey of Refugees comprises information on refugees’ mental health and their socio-economic characteristics. The IAB-BAMF-SOEP Survey of Refugees was introduced in 2016, in response to the major influx of migrants to Germany in 2015 (Brücker et al. 2016; DIW 2017). This novel survey is part of the Socio-Economic Panel (SOEP, Goebel et al. (2019)) and, hitherto, is the only database that allows for quantitative and empirical social research on refugees in Germany over this time frame. In addition to information on refugees’ migration histories, back-

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<sup>7</sup>The information was compiled by the German Federal Government in response to small inquiries (“kleine Anfrage”) by the parliamentary group “DIE LINKE” and is published on a quarterly basis.

<sup>8</sup>In less than five cases, we were not able to determine the exact GPS location since the respective location existed several times in the respective state.

ground characteristics, overall living conditions, and integration outcomes in Germany, the IAB-BAMF-SOEP Survey of Refugees provides detailed information on refugees' mental health and their exact place of residence.

In our analysis, we use a single cross-section from 2016 due to two reasons: First, 2016 is the year when hate crimes were most prevalent in Germany during the 2010s. Second, information on the PHQ-4 score is only available in 2016. The interviews in the IAB-BAMF-SOEP Survey of Refugees typically take place from June to December in each year. Consequently, our period of observation is the second half of 2016. We merge each observation in the IAB-BAMF-SOEP Survey of Refugees to the respective hate crimes, based on the information on the exact interview date and the location. For each survey respondent, we then calculate the number of elapsed days since the most recent hate crime—the focal hate crime—in the county of residence. This running variable then governs the treatment status. The running variable is negative for refugees who were interviewed before a hate crime occurred. If, on the other hand, the focal hate crime took place before the refugee was interviewed, the running variable is positive thereby marking the respondent as a treated individual.

### **3.3.3 Measuring refugees' mental health**

We measure the refugees' mental health using the two mental health measures available in the IAB-BAMF-SOEP Survey of Refugees: the MCS and the PHQ-4 score. The MCS score is based on the Short-Form 12 questionnaire (SF-12), which contains twelve health-related items inferring the respondent's physical and mental health over the 30 days preceding the interview (Andersen et al. 2007). The MCS score is shown to be highly predictive for mental illnesses in the European population (Vilagut et al. 2013) and is an established measure of mental health in the economic literature (Eibich 2015; Hofmann and Mühlenweg 2018; Marcus 2013).<sup>9</sup>

For the principal component analysis, we combine the twelve health items in eight subscales and normalize these subscales to have mean zero and a standard deviation of one. Subsequently, we perform a principal component analysis of these eight subscales for all first-time respondents in 2016 and 2017. The eight subscales of the SF-12

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<sup>9</sup>We apply the algorithm of Andersen et al. (2007) to the IAB-BAMF-SOEP Survey of Refugees. The number of factors as well as the factor loadings are very similar to those of the SOEP norm population in Andersen et al. (2007).



questionnaire load exactly on two factors. Figure 3.5, which plots the factors against the respective Eigenvalues, shows that the first two factors have Eigenvalues greater than or equal to one. We conclude that the first two factors are the only significant factors. In a last step, we perform a varimax rotation. The resulting factor loadings are displayed in Table 3.5.

Clearly, the factor loadings of the second factor in column (2) of Table 3.5 load very high on the subscales that are associated with mental health. The respective factor loadings for the mental health subscales range from 0.577 to 0.823, whereas the remainder factor loadings range from 0.084 to 0.313. In what follows, we refer to this factor as the MCS score.

Along with the MCS score, we also employ a mental health measure based on the PHQ-4 inventory (Kroenke et al. 2009). The scores based on the PHQ-4 inventory are shown to have high reliability and validity (Kroenke et al. 2009; Loewe et al. 2010) as well as, importantly, to have good psychometric properties in a representative survey of Arab refugees (Kliem et al. 2016). The PHQ-4 inventory consists of four items, including the frequency of feeling little interest or pleasure in one’s activities, melancholy, anxiety, and the inability to stop worrying. Responses to the four items are given on a four-point Likert-scale, ranging from one “Not at all” to four “(Almost) every day”. In what follows, we proceed similarly to the construction of the MCS score and perform a principal component analysis of the PHQ-4 inventory.<sup>10</sup> Figure 3.6 shows that the Eigenvalue of the first factor is 2.40. In contrast, the second eigenvalue is 0.76. Consequently, we use the first factor as the only significant factor. Additionally, the factor loadings of the first and only factor, depicted in Table 3.6, range from 0.598 to 0.845. We label this factor PHQ-4 score. Initially, higher scores indicate worse mental health. However, to ease interpretation, we inverted the scale. In this study, higher values are indicative of better mental health.

### **3.3.4 Additional outcomes and covariates**

Additional outcome variables are life satisfaction and the respondents’ intention to stay in Germany. Life satisfaction is inferred by the answer to the question “How satisfied

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<sup>10</sup>Often, researchers just use the sum of the four items, implying equal weighting of each factor. However, we decided to use an equal procedure as with the SF-12 questionnaire to remain consistent across mental health measurements.

### *Hate crimes and the mental health of refugees*

are you with your life, all things considered?”. The answer to this question is given on an eleven-point Likert-scale, ranging from zero, “Completely dissatisfied,” to ten, “Completely satisfied.” The respondents’ intention to stay is inferred from the answer to the question “Do you want to stay in Germany forever?”. Based on responses to this item, we construct an indicator that is equal to one if a respondent wants to stay in Germany forever and zero otherwise.

Additionally, we use the command of the German language as well as the number of contacts with Germans as proxies for country-specific human capital. The respondents are asked how well they can speak, read, or write in German. Answers are given on a five-point Likert-scale ranging from one “Very well” to five “Not at all”. We construct an indicator that is equal to one if respondents state that they can speak, read, or write German at least averagely. The number of contacts with Germans is inferred by the question “How many German people have you met since your arrival in Germany with whom you have regular contact?” Here, we construct an indicator that is equal to one if the respondents’ answer is above the median number. The final summary characteristics, together with further predetermined characteristics, of our working sample are displayed in Table 3.1.

Table 3.1: Summary statistics

	Mean	S.D.	Min.	Max.	N
	(1)	(2)	(3)	(4)	(5)
<i>Outcomes:</i>					
MCS score	49.357	10.471	15.075	74.147	1215
PHQ-4 score	0.010	1.031	-1.098	3.150	1215
Life satisfaction	7.280	2.326	0.000	10.000	1215
Intention to stay	0.947	0.225	0.000	1.000	1215
<i>Refugee's characteristics:</i>					
Female	0.388	0.488	0.000	1.000	1215
Year of birth	1981.821	10.376	1940.000	1998.000	1215
MENA origin	0.769	0.422	0.000	1.000	1215
Child present	0.674	0.469	0.000	1.000	1215
Married	0.686	0.464	0.000	1.000	1215
<i>Characteristics of counties (2014):</i>					
GDP per capita (in 1000)	35.939	12.876	20.373	93.773	1215
Average age	44.644	1.801	41.100	49.700	1215
Share of foreigners	0.085	0.050	0.013	0.240	1215

*Note:* Table 3.1 displays summary statistics for the outcome variables, individual level characteristics and county level characteristics in 2014. Column (1) displays means. Column (2) displays the corresponding standard deviations. Columns (3) and (4) display the minimum and the maximum; column (5) displays the number of observations. The sample is restricted to a bandwidth of 90 days around the cutoff. Source: SOEP, v34.

### 3.4 Empirical Method

We estimate the effect of hate crime on refugees' mental health using a regression discontinuity design that compares refugees who were interviewed shortly before and after the occurrence of a hate crime in their county of residence. Thus, we estimate the following weighted local linear regression:

$$Y_{icmd} = \alpha + \beta D_{icmd} + \gamma Days_{icmd} + \delta D_{icmd} \times Days_{icmd} + \zeta month_i + \theta dow_i + \epsilon_{icmd}. \quad (3.1)$$

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In Equation 3.1,  $Y_{icmd}$  is the mental health outcome of interest, i.e. the MCS or the PHQ-4 score for respondent  $i$  in county  $c$ , in month  $m$  and day of week  $d$ . The indicator  $D_{icmd}$  is equal to one if the refugee was interviewed after a hate crime happened in their county of residence and zero otherwise. The running variable  $Days_{icmd}$  captures the number of days elapsed since the focal hate crime occurred. We allow for differential linear trends before and after the focal hate crime.<sup>11</sup> Consequently, we include the interaction term  $D_{icmd} \times Days_{icmd}$  in Equation 3.1.<sup>12</sup> In addition, we account for potential seasonality in the mental health outcomes by including indicators for the month when respondents were interviewed  $month_i$ . Further, we account for potential discontinuities in mental health and the likelihood that a hate crime takes place, which are associated with the day of week,  $dow_i$ . For instance, perpetrators could be more active on weekends than on weekdays. At the same time, refugees' mental health could be better on weekends compared to weekdays. In this case, we potentially underestimate the true effect of hate crimes. We use a triangular kernel and cluster the standard errors on the running variable level, because our running variable is discrete (Lee and Card 2010).<sup>13</sup>

It is notable that in some counties, hate crimes are clustered in time. Thus, it could be the case that refugees in the control group are treated as if they were subject to a hate crime that took place before the focal hate crime, e.g., the actual relative distance plus one day. Similarly, treated refugees could have been subject to an additional hate crime before the focal hate crime. If this happens randomly, e.g., if these confounding attacks are independent and identically distributed, this would result in an attenuation bias. This attenuation bias potentially causes our estimates to be attenuated toward zero. Therefore, in the robustness section, we carry out a careful test gauging the relevance of this bias. We carefully drop observations that are multiply treated within various bandwidths and observe that the estimates tend to increase as we drop observations that are treated multiple times. Indeed, we find evidence for our conjecture. Thus, as precautionary measure and to optimally utilize the number of observations, we drop refugees who experienced a hate crime within 30 days before the focal hate crime.

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<sup>11</sup>We also allow for more flexible trends in the robustness section.

<sup>12</sup>In the robustness section, we also allow for quadratic trends in the running variable. Our conclusions remain unaltered.

<sup>13</sup>We also base our inference on standard errors clustered on the county level in the robustness section. Our conclusions remain unchanged.

Based on this empirical specification, we choose the bandwidth to be  $\pm 90$  days.<sup>14</sup>

### **Continuity assumption**

Our identification assumption is based on the premise that, in absence of the treatment, the population mean in mental health is a continuous function of the running variable (Hahn et al. 2001). Another way to think about this is by means of selection on observables (Lee and Lemieux 2010). In our case, the number of days elapsed since the focal hate crime governs the treatment assignment. Refugees who were interviewed before the focal hate crime are part of the control and refugees interviewed after the focal hate crime are considered part of the treatment group. Strictly speaking, the common support in the running variable is not guaranteed in this setting. This is why we require the continuity assumption to finally ensure the overlap condition.

Under this assumption, the estimate of  $\gamma$  can be interpreted as the causal effect of hate crime on refugees' mental health. However, we cannot directly test the continuity assumption because it involves a counterfactual situation, i.e., we would be able to observe the population mean through the cutoff in absence of the treatment. Yet, we provide evidence that the continuity assumption holds. If predetermined individual and county level characteristics evolve continuously around the focal hate crime, we may interpret this as empirical evidence that the continuity assumption is valid. Any significant discontinuity in the mental health outcomes around the focal hate crime can then be fully attributed to the focal hate crime. To test this, we apply our empirical specification to various predetermined characteristics on the individual and county levels.

Our estimates reveal no discontinuity in the predetermined individual and county level characteristics around the focal hate crime. Figure 3.7 displays regression discontinuity plots for various predetermined individual and county characteristics. Overall, we find little visual evidence for discontinuities around the focal hate crime. Table 3.2 summarizes the results formally. Column (1) displays the point estimates, column (2) displays the corresponding standard errors, and column (3) displays the p-values associated with the coefficient estimates. Throughout, the majority of the estimates are

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<sup>14</sup>Following Calonico et al. (2014), we find that the asymptotically MSE-optimal bandwidths for the PHQ-4 and MCS score as well as life satisfaction are 113.1, 77.0, and 103.8, respectively. For expositional clarity, we choose a bandwidth of 90 days or 3 months, which is close to the average of the three respective bandwidths. However, we show that our results are robust to a wide range of bandwidth choices in Section 3.5.3.

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small in relative terms. Further, all estimates are statistically insignificant. Thus, this test provides suggestive evidence that the continuity assumption is warranted.

Table 3.2: Testing the continuity assumption

	Point estimate (1)	Standard error (2)	P-value (3)
Child present	-0.081	0.059	0.168
MENA origin	0.050	0.052	0.328
Female	0.007	0.042	0.874
Married	0.033	0.065	0.606
Year of birth	-0.560	1.021	0.583
Average age in county	0.105	0.255	0.679
GDP per capita in county	0.243	1.886	0.897
Share of foreigners in county	-0.004	0.008	0.612

*Note:* Table 3.2 displays the results for a test of the continuity assumption for predetermined individual and county level characteristics. Column (1) displays point estimates. Column (2) displays standard errors corresponding to point estimates. Column (3) displays p-values. The results are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Source: SOEP, v34.

### Precise manipulation around the cutoff

A potential threat to our regression discontinuity design could be the precise manipulation around the cutoff (Lee and Card 2010; McCrary 2008). If selection into or out of the treatment would be possible based on expected gains, our estimate of  $\gamma$  would suffer from selection bias and may be inconsistent. In our context, individuals would want to select out of treatment. The more vulnerable the refugees are, the more likely they desire to select out of the treatment group. This would bias our estimate of the effect downwards.

Since our data on hate crimes is based on official crime statistics, we assert that strategic manipulation around the cutoff is difficult, if not impossible. This conjecture is based on the assumption that these hate crimes are typically not known to the public beforehand. In addition, the SOEP interviews are usually scheduled well in advance. The reason is that the interviews usually take some time, especially if a household consists of multiple individuals. Thus, it is very unlikely that selection based on expected gains is prevalent.

However, if exposure to hate crimes decreases the likelihood that respondents thoroughly reply to all questions in an interview, our estimates would be biased downward since only the most robust respondents would reply. However, this results in a testable assumption. If exposure to a hate crime is associated with a lower likelihood that refugees provide information in their SOEP-interviews, we would observe a discontinuity in the empirical distribution of observations around the cutoff.

A density test around the cutoff, proposed by McCrary (2008), suggests that neither of two phenomena are relevant in our case. If individuals were able to select into or out of the treatment or if fewer respondents provided information about their mental health in response to the hate crime, we would detect a discontinuity in the empirical probability density function of interviews around the focal hate crime. Figure 3.8 displays the empirical distribution of observations against the running variable. The vertical line indicates the day of the focal hate crime. Based on the inspection of the empirical distribution function, we find no evidence of a discontinuity around the focal hate crime. A p-value of 0.660 of a formal manipulation test, based on local polynomial regressions of order two (Cattaneo et al. 2019), indicates that there exists no discontinuity around the focal hate crime. Thus, we confidently rule out manipulation or differential response behavior around the cutoff.

## **3.5 Results**

In this section, we report our estimation results as well as additional robustness checks. Thereafter, we report heterogeneity analysis with respect to the refugees' country-specific human capital and the geographic proximity to the focal hate crime.

### **3.5.1 The effect of hate crime on mental health**

Panels a and b in Figure 3.9 illustrate the main results for the refugees' MCS and PHQ-4 score, whereby each figure displays a local linear fit on either side of the cutoff, with bandwidths of 90 and triangular kernels. In both figures, the dots correspond to binned scatterplots, with the number of bins being equal to ten on each side of the cutoff (the focal hate crime). Both mental health outcomes are standardized to have mean zero and standard deviation one.

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We find a strong discontinuity around the cutoff in both figures suggesting that being a victim to a hate crime reduces the refugees' mental health outcomes. Table 3.3 displays effect sizes corresponding to Equation 3.1. Columns (1) and (2) display the point estimates for the MCS and PHQ-4 score along with the standard errors, respectively. Based on these results, the effect sizes correspond to 37 percent of a standard deviation for the MCS score and 28 percent of a standard deviation for the PHQ-4 score. As a comparison, Clark et al. (2020) finds that the Boston marathon bombing reduced the nearby resident's subjective well-being by a third of a standard deviation. In addition, Metcalfe et al. (2011) find that the 9/11 attack in the U.S. decreases mental distress in the U.K. population by about 7 to 14 percent of a standard deviation. Thus, our estimates are of comparable size of studies such as (Clark et al. 2020).

Table 3.3: The effect of hate crime on refugees' mental health, life satisfaction and intention to stay

	MCS	PHQ-4	LS	ITS
	(1)	(2)	(3)	(4)
Effect of hate crime	-0.368***	-0.284***	-0.040	0.023
	(0.118)	(0.104)	(0.103)	(0.022)
Number of observations	1215	1215	1215	1215

*Note:* Table 3.3 displays the effect of hate crimes on refugees' mental health, life satisfaction and intention to stay. Columns (1), (2), (3), and (4) display point estimates and corresponding standard errors for the MCS score, the PHQ-4 score as well as life satisfaction and refugees' intention to stay, respectively. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Source: SOEP, v34.

While the estimated effects are sizable, the fact that mental health outcomes trending toward pre-treatment level indicates that the effect is transitory. The mental health outcomes reach their pre-treatment level after three months. Yet, the literature shows that such shocks can impair decision making and alter long-term outcomes, especially for the refugees' children. Thus, negative health shocks have the potential to negatively affect the trajectory of refugees, especially since they must navigate through many uncertainties shortly after arrival.



### **3.5.2 The effect of hate crime on life satisfaction and ITS**

Panels c and d in Figure 3.9 illustrate the main results for refugees' life satisfaction and ITS. The corresponding estimation results are displayed in columns (3) and (4) of Table 3.3. In contrast to mental health, hate crime has no effect on refugees' life satisfaction and their intention to stay in Germany. These are remarkable results, which stand in clear contrast to the findings of Deole (2019) and Steinhardt (2018).

It must be emphasized that life satisfaction is a multi-dimensional concept that measures the overall quality of life. As such, measures of life satisfaction are clearly distinct but associated with measures of symptoms of common mental disorders, e.g., depression (Keyes 2006). To put it differently, having impaired mental health is not a sufficient condition for decreased life satisfaction. Furthermore, we argue that this emphasizes the difference in the perception of hate crime between refugees and economic migrants. Refugees are typically unable or unwilling to return to their home countries for fear of violent conflict or persecution. This is particularly true for the refugee population in our sample, who were mainly displaced because of civil wars. Thus, strong push factors caused these refugees to search refuge in Europe. In contrast to refugees, the composition of economic migrants is the result of an interaction of pull and push factors (Lazear 2020). Consequently, a hypothesis consistent with our empirical observations is that the threshold that causes economic migrants to reconsider their time horizon in the host country is lower. In addition, Steinhardt (2018) focuses on the intention to return within the next five years. Therefore, our study and that of Steinhardt (2018) compare the return intentions at different margins, e.g., extensive versus intensive margin.

The observation that hate crimes do not alter the refugees' intention to stay has an additional implication: With hate crimes not altering the time horizon over which refugees accrue returns to country-specific human capital, this cannot be considered an important mediator in our analyses.

### **3.5.3 Additional robustness checks**

The previous section shows that hate crime has a strong negative effect on refugees' mental health, i.e., the MCS and the PHQ-4 score, and no effect on the refugees' life satisfaction and ITS. In this section, we provide additional robustness checks supporting the credibility of our estimates.

### **Choice of bandwidth**

Our results are robust to a wide range of bandwidth choices. Panels a to d in Figure 3.10 display the coefficient estimates of equation 3.1 and associated the 95 percent confidence intervals as a function of the bandwidth for the MCS and PHQ-4 score as well as life satisfaction and ITS. Varying the bandwidth from 10 to 150 days in increments of 10 days, we see that the coefficient estimates for the MCS and the PHQ-4 score are similar to the main results and statistically significant for a wide range of bandwidths surrounding the respective MSE-optimal bandwidth. In contrast, for all bandwidths, point estimates for life satisfaction and the refugees' ITS are close to zero and statistically insignificant.

### **Inclusion of covariates**

The results are also robust to the inclusion of a wide set of predetermined covariates on the individual and county levels. In Section 3.4, we argue that identification stems from the assumption that—in absence of the focal hate crime—the population mean of our outcome is a continuous function of the running variable. Alternatively, one can also think of the identification stemming from local randomization around the focal hate crime (Hausman and Rapson 2018; Lee and Lemieux 2010). We provide evidence for this by including predetermined individual and county level characteristics in Equation 3.1. The results are displayed in Table 3.7, where each row displays coefficients and standard errors for another outcome. We subsequently add different covariates to the regression: Column (1) adds individuals characteristics, column (2) includes only county level characteristics, and column (3) includes both. Throughout, we observe that the coefficients remain remarkable stable and significant. We consider this as evidence that the local randomization was indeed successful.

### **Clustering of hate crimes in time**

In Section 3.4, we argue that the clustering of hate crimes within counties in time may bias our results downwards. If individuals are multiply treated, i.e., if they experience several hate crimes preceding the interview, refugees' mental health may decrease and our estimates would be attenuated. Therefore, we exclude those individuals who experience a second hate crime within a thirty day window before the interview. One may, however, argue that this is a selective choice. Hence, as a robustness check, we subsequently exclude different time frames and estimate our treatment effect. Table 3.8 illustrates estimation results. Overall, we find hate crimes to substantially impair

refugees' mental health. In line with our argument, the estimates increase in size the more strictly we ban multiple treated. For instance, while the MCS score decreases by 37 percent of a standard deviation in our baseline specification, this value increases to 71 percent of a standard deviation if we exclude observations who experience a second hate crime in a ninety day window before the interview.

### **More flexible specification**

Furthermore, our results are robust to alternative and more flexible specifications. The main specification in Equation 3.1 is linear. In general, there is no reason to believe that the true model is indeed linear. If we misspecify our model, our estimate could be potentially biased. Therefore, we also allow for a quadratic trend in the running variable following the recommendation of Gelman and Imbens (2019). Table 3.9 displays the results for specifications with a quadratic trend. For each outcome, we separately calculated asymptotically MSE-optimal bandwidths (Calonico et al. 2014). Again, the effects point toward a sizable negative effect of hate crimes on refugees' mental health. While the effect size for the MCS score remains relatively stable, the effect size for the PHQ-4 score increases from about 28 percent of a standard deviation to 32 percent of a standard deviation.

### **Inference**

In our main specification, we followed the literature and clustered on the level of the running variable. However, we show that our results are robust to clustering on the county level instead. This implies serial correlation of the regressor or error term within the cluster. The results are displayed in Table 3.10. Table 3.10 displays the respective coefficient estimates with the standard errors, clustered on the county level.

### **Placebo estimates**

If we assume that the event happened either thirty days before or after the focal hate crime our estimation results become null. Figure 3.11 shows coefficient estimates for each of these specifications along with the accompanying 95 percent confidence intervals. Throughout, the coefficients are small and close to zero. Further, the confidence intervals suggest that we cannot reject the absence of any effect.

### **3.5.4 Interaction with geographical distance**

The previous results rely on the county of residence as the relevant geographical unit. We chose this in order to avoid *ad hoc* assumptions about the relevant distance in, for instance, radius matching. However, a natural question that arises is, whether it is actual hearsay or the fact that the refugees are directly affected by the respective hate crime. To further characterize our estimates, we calculate the actual geographic distance between the place where the actual hate crime took place and the refugees' place of residence. For the IAB-BAMF-SOEP Survey of Refugees, the exact geolocation is available within a specialized secure setting at the Research Data Center of the SOEP. Unfortunately, we do not have the exact GPS data of the refugee shelters that were attacked. We only have the location, e.g., city or municipality. We assign each attack the centroid of the respective location. However, in some cases, it is the district of a city. Thus, some measurement error is associated with the distance calculation. To minimize concerns, we distinguish between refugees living close by and further away by means of a median split.

The results clearly indicate that those refugees living closer to the focal hate crime show greater effects than those living further away. Figure 3.12 and Figure 3.13 visualize the results. The left column displays the results for those refugees living nearby. The right column for those living further away. Clearly, for the mental health outcomes, the discontinuity is larger for refugees living closer to the focal hate crime. We see no such differences for life satisfaction or the refugees' ITS. Table 3.11 shows the exact point estimates. For those refugees closer to the hate crime, the effect sizes are more than twice as large as for those living further away. In addition, the estimate becomes insignificant for refugees living further away. However, our estimates are not precise enough to formally reject the null hypothesis of no difference. Overall, our conclusions are similar to the conclusions drawn by Clark et al. (2020), who also find that residents who live more closely to the Boston Marathon Bombing are more severely affected.

### **3.5.5 Country-specific human capital as a mediator**

In the following section, we provide suggestive evidence that country-specific human capital is a potential mediator between hate crimes and the refugees' mental health. We consider the refugees' command of German and their social capital, measured by the frequency of contact with German natives, as proxies for country-specific human

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capital. We distinguish between refugees who speak, read, and write German at least averagely from those who report lower levels of language proficiency. With respect to social capital, we distinguish between refugees who have at least weekly contact with German natives and those who have less contact.<sup>15</sup> Additionally, we distinguish between human capital that is difficult–more costly–to acquire and low cost human capital. We argue that reading German and having frequent contact with Germans are easier to acquire (low cost) dimensions of country-specific human capital than writing and speaking German (high cost).

Table 3.12 and Table 3.13 display the results for the stock of low and high cost country-specific human capital, respectively. In Table 3.12, columns (1) and (2) show the results for having at least weekly contact with Germans versus less frequent contact. Columns (3) and (4) display the results for being able to read German at least averagely versus worse than averagely. The results in Table 3.12 suggest a lower effect of hate crime on the mental health of refugees who have frequent contact with Germans and are better able to read German. In effect sizes, the difference between refugees with low versus high country-specific human capital is 6.6 percentage points of a standard deviation for the MCS score. This corresponds to a difference of 15.9 percent relative to the effect size for those who have less frequent contact with Germans. On the other hand, the difference is 15.1 percentage points for between those who read German at least averagely and those who read German below averagely for the PHQ-4 score. This is equivalent to 42.5 percent relative to the effect size for those who read less than averagely German. However, the difference between those who read German at least averagely and those who read German less than the average is smaller and points in the opposite direction.

In Table 3.13, columns (1) and (2) display results for individuals who write German at least averagely and less than averagely, while columns (3) and (4) display the results for individuals who speak German at least averagely and less than averagely. Here, the pattern is even more pronounced. The differences uniformly suggest that effect sizes are considerably smaller for refugees with high levels of country-specific human capital. For the PHQ-4 score, results suggest that we can not reject the absence of an effect of hate crime on the refugees' mental health for those who write and speak

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<sup>15</sup>Note that the frequency of having contact with German natives may change as a result of the hate crimes. However, we theorize that this may not be the case regarding the command over the German language.

German at least averagely. Moreover, the difference in effect sizes amounts to 30.8 percentage points of a standard deviation for the PHQ-4 score between those who speak German at least averagely and those who speak German less than averagely. This corresponds to 69 percent relative to the effect size for those who speak German less than averagely. On the other hand, the difference in effect sizes is 14.7 percentage points for the MCS score between those who speak German at least averagely and those who speak German less than averagely. This is equal to 34.2 percent relative to the baseline.

### **3.6 Conclusion**

This paper shows that hate crimes have a strong and negative effect on refugees' mental health, as measured by the MCS and PHQ-4 score. Effects are stronger for refugees living in close geographic proximity to the focal hate crime and refugees with low levels of country-specific human capital: Refugees who are better integrated are less prone to the adverse effects of hate crime on mental health. This moderating effect is stronger, the higher the opportunity costs of acquiring country-specific human capital. The results are robust to various robustness checks and specifications, for instance alternative choices of bandwidth or the inclusion of individual and regional level control variables.

In contrast to mental health, we find no effect of hate crime on refugees' life satisfaction or intention to stay in Germany. This result stands in clear contrast to the previous literature, which considers the effect of hate crime on economic immigrants' integration (Deole 2019; Steinhardt 2018). The contrasting results may be explained by the inherent differences between refugees and economic migrants, thus reinforcing the importance of distinguishing between these groups.

While the negative effects of hate crime on refugee mental health are transitory, we argue that hate crimes happening to refugees during a critical stage, for example right after arriving in the host society, may impair decision making and alter life-time trajectories in the host society in the long-run.

The results have very important policy implications. Mental health is a central determinant of individual's well-being, and physical integrity is a basic constitutional right. Impaired mental health as a result of perceived hate crimes may therefore

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have substantial negative effects for refugees that may harm integration in the host country in the long-run. Besides this first-order effect, slow integration of refugees creates substantial negative externalities and fiscal costs for the host societies. As a consequence, our results ask for increased attention towards the mental health needs of refugees being victims of hate crime. In addition, refugees' integration success depends on the host societies' attitudes towards refugees (Ther 2017) and hate crimes are the most severe form of refusal. If host countries wish to integrate refugees, they should make every effort to create equal opportunities and social cohesion.

## 3.7 Appendix

### 3.7.1 Tables

Table 3.4: Attacks against refugee shelters

No.	Date	Place	State	Type of crime	Right-wing
1	01.01.2016	Nienburg/Saale	ST	Insult §185 StGB	x
2	01.01.2016	Merseburg/Saale	ST	Sedition §130 StGB	x
3	01.01.2016	Wernigerode	ST	Property damage §304 StGB	x
4	01.01.2016	Assamstadt	BW	Grievous bodily harm §224 StGB	x
5	01.01.2016	Werbach	BW	Use of symbols of uncon- stitutional organizations §86a StGB	x
6	01.01.2016	Ruppertshofen	BW	Use of symbols of uncon- stitutional organizations §86a StGB	
7	01.01.2016	Zeven	NI	Grievous bodily harm §224 StGB	
8	01.01.2016	Leverkusen	NW	Grievous bodily harm §224 StGB	x

*Notes:* This table is based on administrative data on hate crimes against refugee shelters (all entries for January 1, 2016), which is published by the German federal government on a quarterly basis. Source: BKA data (2016-2018).



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Table 3.5: Factors of a principal component analysis on the subscales of the Short-Form 12 questionnaire

	PCS	MCS
	(1)	(2)
Physical Fitness	0.791	0.084
General Health	0.740	0.281
Bodily Pain	0.831	0.194
Role Physical	0.823	0.313
Mental Health	0.155	0.823
Role Emotional	0.544	0.605
Social Functioning	0.494	0.577
Vitality	0.108	0.700

*Note:* Table 3.5 displays the factor loadings of a principal component analysis on the subscales of the Short-Form 12 questionnaire. The factor analysis has been performed on all first-time respondents of the IAB-BAMF-SOEP Refugee Survey in 2016 and 2017. Column (1) displays the corresponding factor loadings for the first factor, the Physical Component Summary score. Column (2) displays the factor loadings of the second factor, the MCS. Source: SOEP, v34.

Table 3.6: Factors of a principal component analysis on items of the PHQ-4 inventory

	PHQ-4
	(1)
Little Interest	0.598
Melancholy	0.845
Anxiety	0.844
Worrying	0.786

*Note:* Table 3.6 displays the factor loadings of a principal component analysis on the items of the PHQ-4 inventory. The factor analysis has been performed on the first-time respondents of the IAB-SOEP-BAMF Refugee Survey in 2016. Column (1) displays the corresponding factor loadings for the first factor. Source: SOEP, v34.

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Table 3.7: The effect of hate crime on refugees' mental health, life satisfaction and intention to stay

	(1)	(2)	(3)
MCS	-0.337*** (0.118)	-0.361*** (0.119)	-0.329*** (0.119)
PHQ-4	-0.291*** (0.107)	-0.284*** (0.102)	-0.290*** (0.105)
Life satisfaction	-0.030 (0.097)	-0.031 (0.103)	-0.023 (0.097)
Intention to stay	0.029 (0.022)	0.023 (0.023)	0.030 (0.022)
Refugees' predetermined characteristics	✓		✓
Regional predetermined characteristics		✓	✓
Number of observations	1215	1215	1215

*Note:* Table 3.7 displays the effect of hate crime on refugees' mental health, life satisfaction and intention to stay, controlling for individual or county level characteristics. Columns (1), (2), (3), and (4) display point estimates and corresponding standard errors for estimations including predetermined individual, regional as well as individual and regional characteristics, respectively. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Source: SOEP, v34.

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Table 3.8: The effect of xenophobic attacks on refugees' mental health, accounting for multiply treated

	(1)	(2)	(3)	(4)	(5)
	14 days	30 days	45 days	60 days	90 days
MCS	-0.280*** (0.099)	-0.369*** (0.118)	-0.422*** (0.143)	-0.636*** (0.131)	-0.713*** (0.145)
PHQ-4	-0.268*** (0.100)	-0.285*** (0.104)	-0.331*** (0.125)	-0.483*** (0.110)	-0.550*** (0.121)
Life satisfaction	-0.153* (0.086)	-0.040 (0.102)	-0.081 (0.127)	-0.063 (0.129)	-0.078 (0.142)
Intention to stay	0.011 (0.023)	0.023 (0.022)	0.037 (0.028)	0.041 (0.033)	0.030 (0.026)
Number of observations	1133	1215	1098	982	770

*Note:* Table 3.8 displays the effect of xenophobic attacks on refugees' mental health. We argue that estimates may be downward biased if gate crimes are clustered in time. Therefore, we drop observations who experienced a second hate crime shortly before the focal hate crime for different time periods. Column (1) drops observations who experience a second hate crime in a fourteen day period preceding the focal hate crime. Columns (2), (3), (4), and (5) display the results for a thirty (baseline estimation), forty-five, sixty, and ninety day period, respectively. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Source: SOEP, v34.

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Table 3.9: The effect of hate crime on refugees' mental health, allowing for a quadratic trend in the running variable

	MCS	PHQ-4	LS	ITS
	(1)	(2)	(3)	(4)
Effect of hate crime	-0.363**	-0.324**	0.082	0.028
	(0.157)	(0.132)	(0.153)	(0.030)
Number of observations	1383	1371	1215	1390
MSERD optimal bandwidth	111.860	109.559	89.686	113.941

*Note:* Table 3.9 displays the effect of hate crime on refugees' mental health, life satisfaction and intention to stay allowing for a quadratic trend. Columns (1), (2), (3), and (4) display point estimates and corresponding standard errors for the MCS score, the PHQ-4 score as well as life satisfaction and refugees' intention to stay, respectively. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01. Source: SOEP, v34.

Table 3.10: Different level of clustering

	MCS	PHQ-4	LS	ITS
	(1)	(2)	(3)	(4)
Effect of hate crime	-0.368*	-0.284**	-0.040	0.023
	(0.192)	(0.130)	(0.116)	(0.023)
Number of observations	1215	1215	1215	1215

*Note:* Table 3.10 displays the effect of hate crime on refugees' mental health, life satisfaction and intention to stay, clustering the standard errors on the level of the county. Columns (1), (2), (3), and (4) display point estimates and corresponding standard errors for the MCS score, the PHQ-4 score as well as life satisfaction and refugees' intention to stay, respectively. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the county level and are displayed in parenthesis. \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01. Source: SOEP, v34.

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Table 3.11: The effect of xenophobic attacks on refugees' mental health, accounting for geographic distance to hate crime

	(1)	(2)
	Low distance	High distance
MCS	-0.569*** (0.165)	-0.281 (0.196)
PHQ-4	-0.435** (0.178)	-0.206 (0.143)
Life satisfaction	-0.109 (0.140)	0.021 (0.148)
Intention to stay	0.035 (0.038)	0.015 (0.028)
Number of observations	585	620

*Note:* Table 3.11 displays the effect of xenophobic attacks on refugees' mental health, disaggregated by geographic distance to the focal hate crime. Column (1) displays point estimates for refugees with low geographic distance to the focal hate crime, while column (2) displays results for refugees with high geographic distance. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Source: SOEP, v34.

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Table 3.12: The effect of hate crime on refugees' mental health, conditioning on low cost country-specific human capital

	Contact with Germans		Reading German	
	Yes	No	Yes	No
	(1)	(2)	(3)	(4)
MCS	-0.349** (0.169)	-0.415*** (0.152)	-0.410*** (0.135)	-0.369** (0.164)
PHQ-4	-0.250* (0.149)	-0.344** (0.168)	-0.204* (0.116)	-0.355* (0.186)
Number of observations	654	550	622	582

*Note:* Table 3.12 displays the effect of hate crime on refugees' mental for refugees commanding over low-cost country-specific human capital. We conjecture that "Contact with Germans" and "Reading German" are low cost country-specific human capital. We distinguish between refugees that command over the country specific human capital ("Yes") or not ("No"). Refugees have contact with frequent contact Germans if they have contact with Germans on a weekly basis. Refugees command about the skill "Reading German" if they read German at least averagely. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Source: SOEP, v34.

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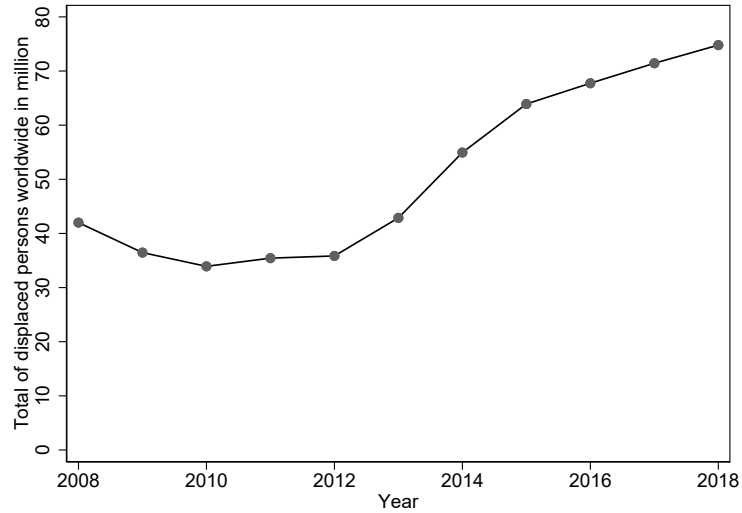
Table 3.13: The effect of hate crime on refugees' mental health, conditioning on high cost country-specific human capital

	Writing German		Speaking German	
	Yes (5)	No (6)	Yes (7)	No (8)
MCS	-0.277** (0.123)	-0.449*** (0.169)	-0.283** (0.121)	-0.430** (0.175)
PHQ-4	-0.133 (0.121)	-0.420** (0.187)	-0.139 (0.113)	-0.447** (0.188)
Number of observations	603	601	647	557

*Note:* Table 3.13 displays the effect of hate crime on refugees' mental for refugees commanding over high-cost country-specific human capital. We conjecture that "Speaking German" and "Writing German" are high cost country-specific human capital. We distinguish between refugees that command over the country specific human capital ("Yes") or not ("No"). Refugees command about the skill "Reading German" or "Writing German" if they reply that they speak or read German at least averagely. The coefficients are based on a local linear regression, using triangular kernels and a bandwidth of 90 days. The outcomes are standardized to have mean zero and a standard deviation of one. Standard errors are clustered on the running variable level (e.g., distance in days to the focal hate crime) and are displayed in parenthesis. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Source: SOEP, v34.

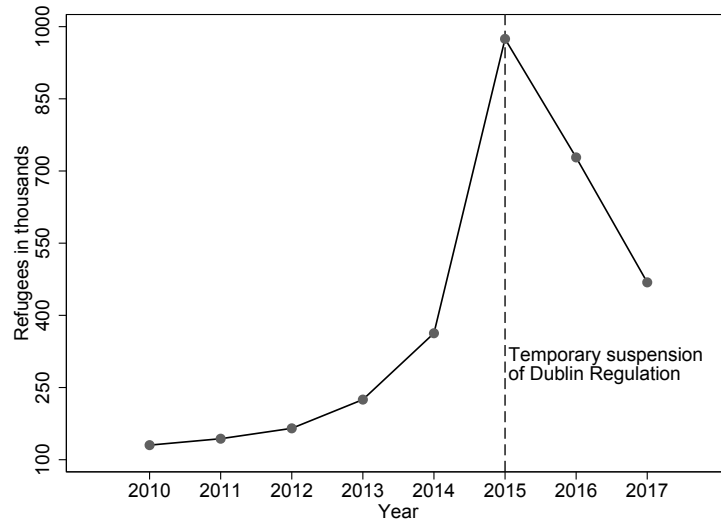
### 3.7.2 Figures

Figure 3.1: Time trend in the number of displaced persons



*Note:* Figure 3.1 plots the number of displaced persons worldwide from 2008 to 2018. Source: UNHCR 2009 to UNHCR 2019.

Figure 3.2: Number of asylum seekers in Germany

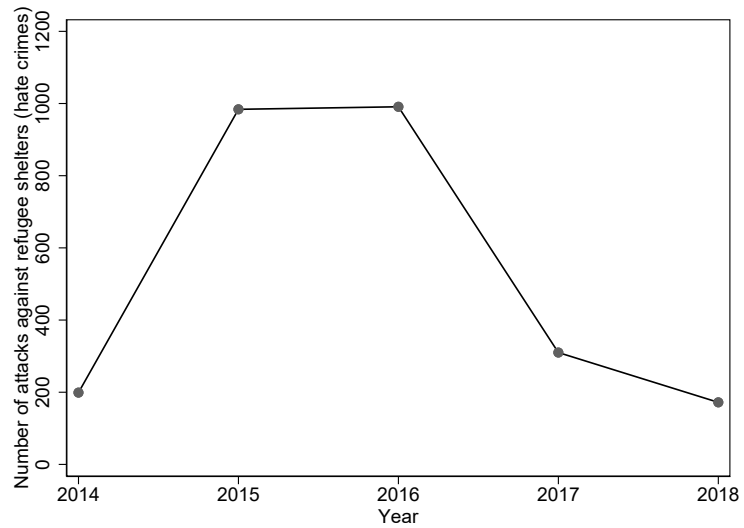


*Note:* Figure 3.2 plots the number asylum seekers from 2010 to 2017. Source: Destatis 2019.



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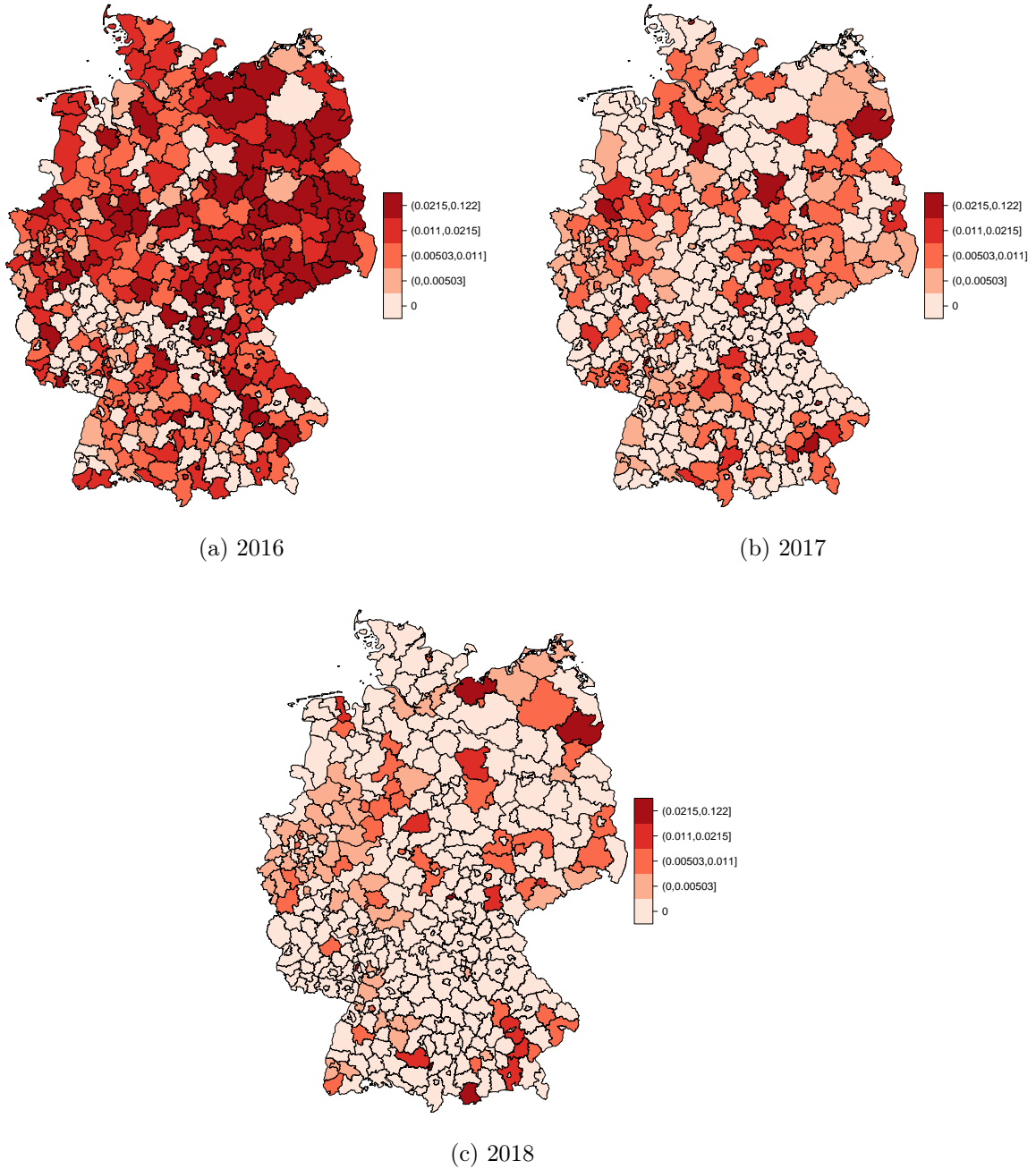
Figure 3.3: Number of attacks against refugee shelters over time



*Note:* Figure 3.3 plots the number of attacks against refugee shelters. Source: Bundestag 2016.

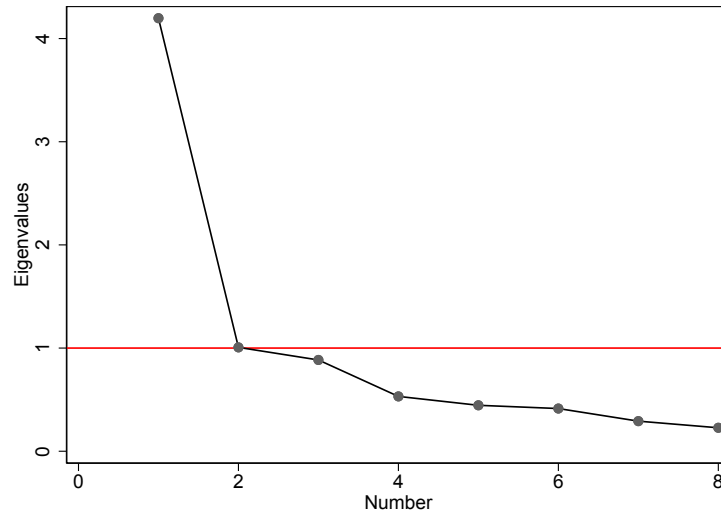
*Hate crimes and the mental health of refugees*

Figure 3.4: Number of attacks on refugee shelters per 100,000 inhabitants and counties



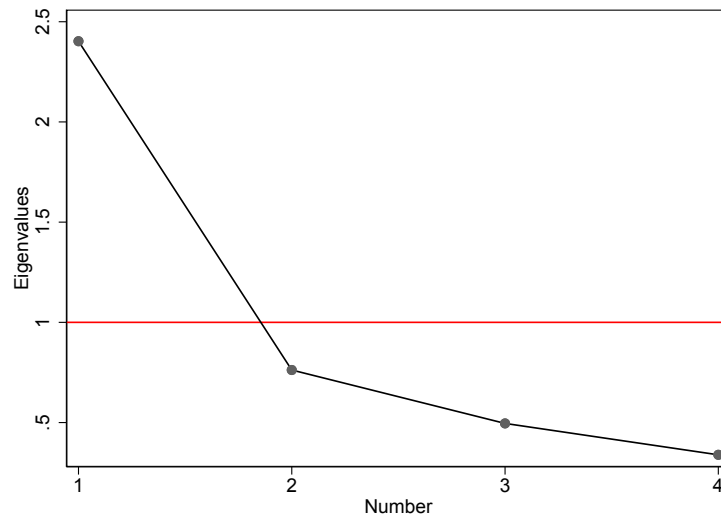
*Note:* Panels a to c in Figure 3.4 display the number of attacks on refugee shelters per 100,000 inhabitants and county from 2016 until 2018, respectively. Source: BKA data.

Figure 3.5: Scree plot for principal component analysis of the Short-Form 12 subscales



*Note:* Figure 3.5 plots the factors and the corresponding Eigenvalues after a principal component analysis of the Short-Form 12 questionnaire. The horizontal red line corresponds to Eigenvalues of one. Source: SOEP, v34.

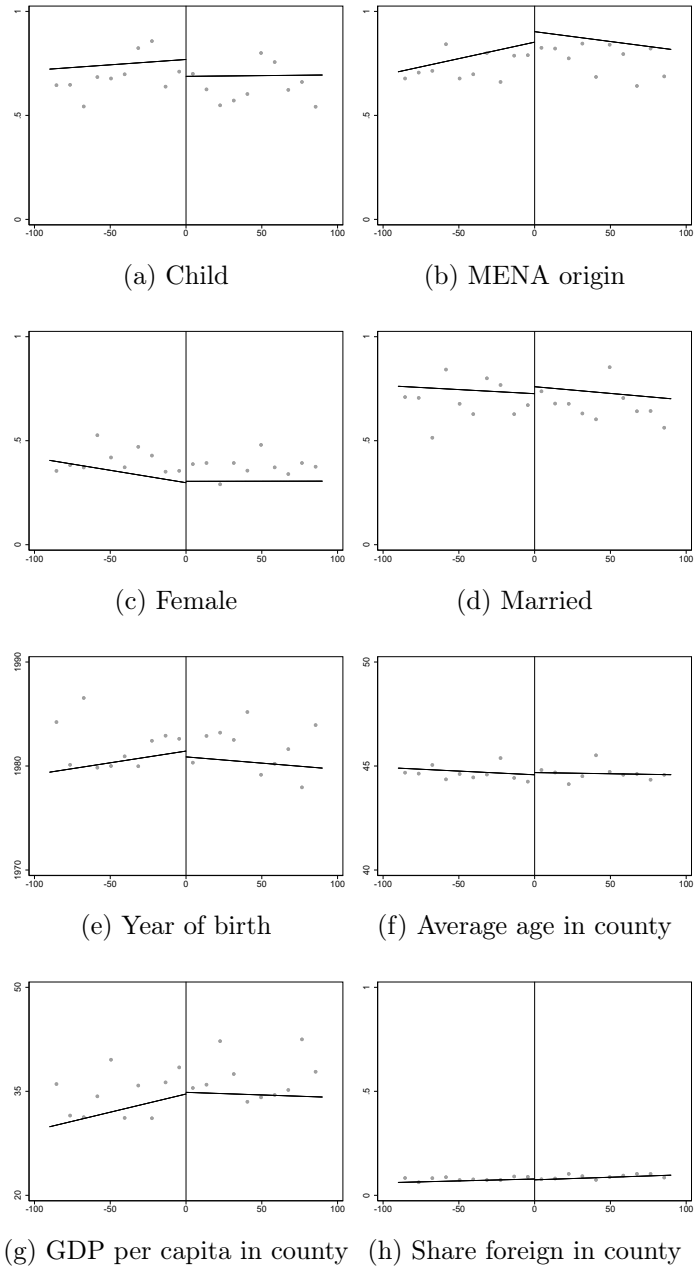
Figure 3.6: Scree plot for principal component analysis of the items of the PHQ-4 inventory



*Note:* Figure 3.6 plots the factors and the corresponding Eigenvalues after a principal component analysis of items of the PHQ-4 inventory. The horizontal red line corresponds to Eigenvalues of one. Source: SOEP, v34.

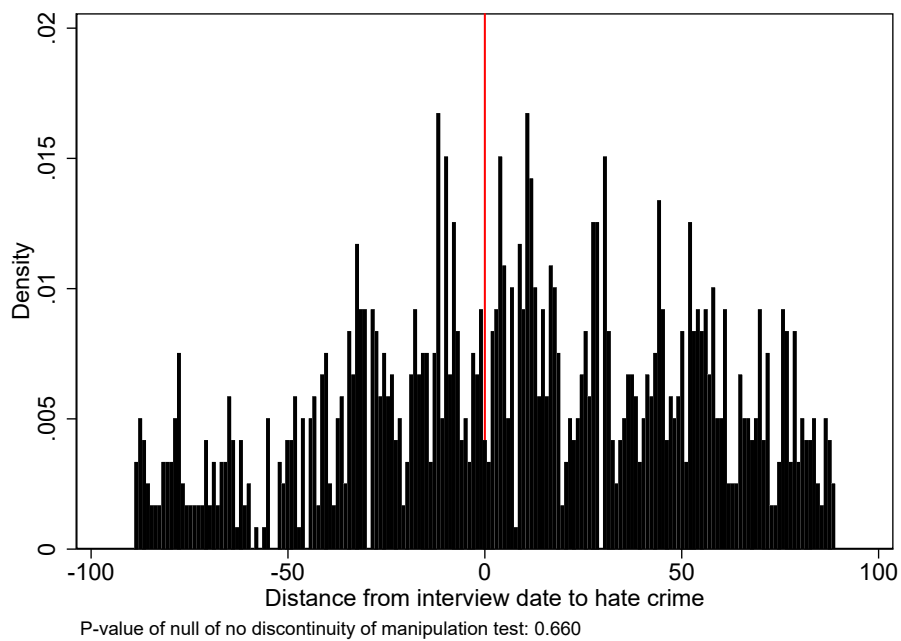
*Hate crimes and the mental health of refugees*

Figure 3.7: Covariate balance



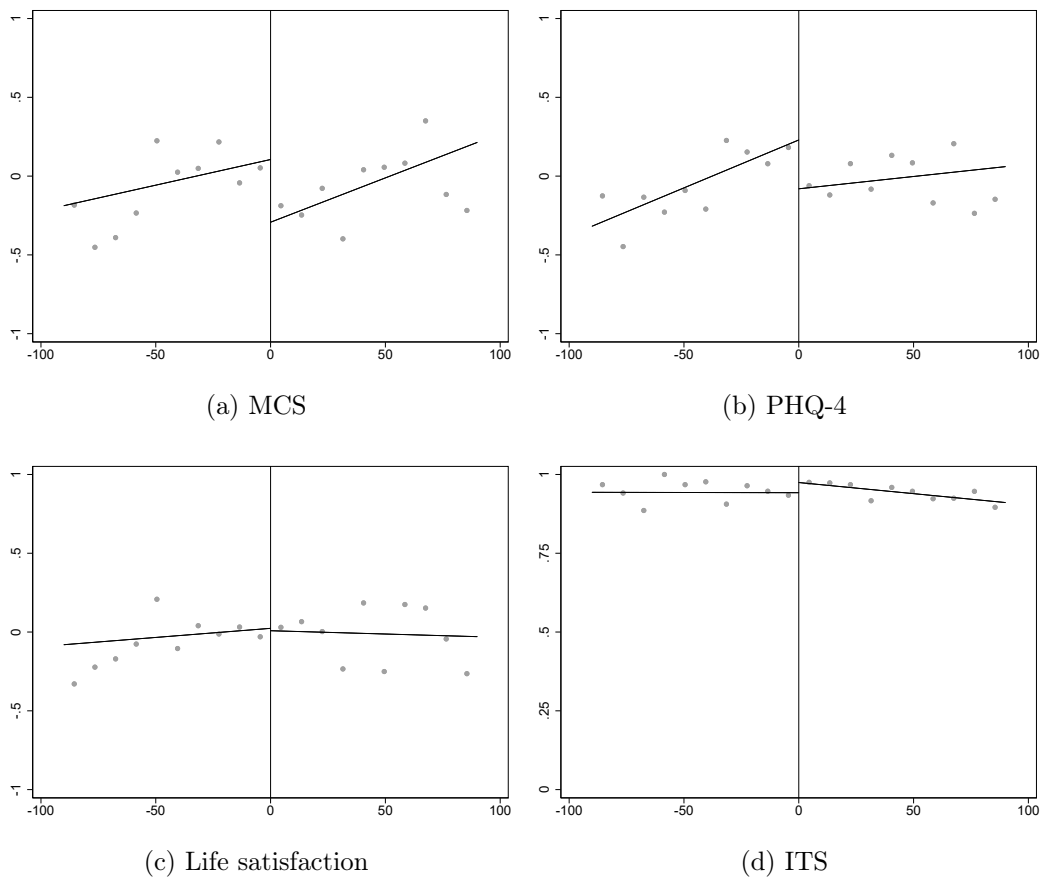
*Note:* Panels a to h in Figure 3.7 display visual results for covariate balance across the cutoff.

Figure 3.8: Checking for precise manipulation around the cutoff



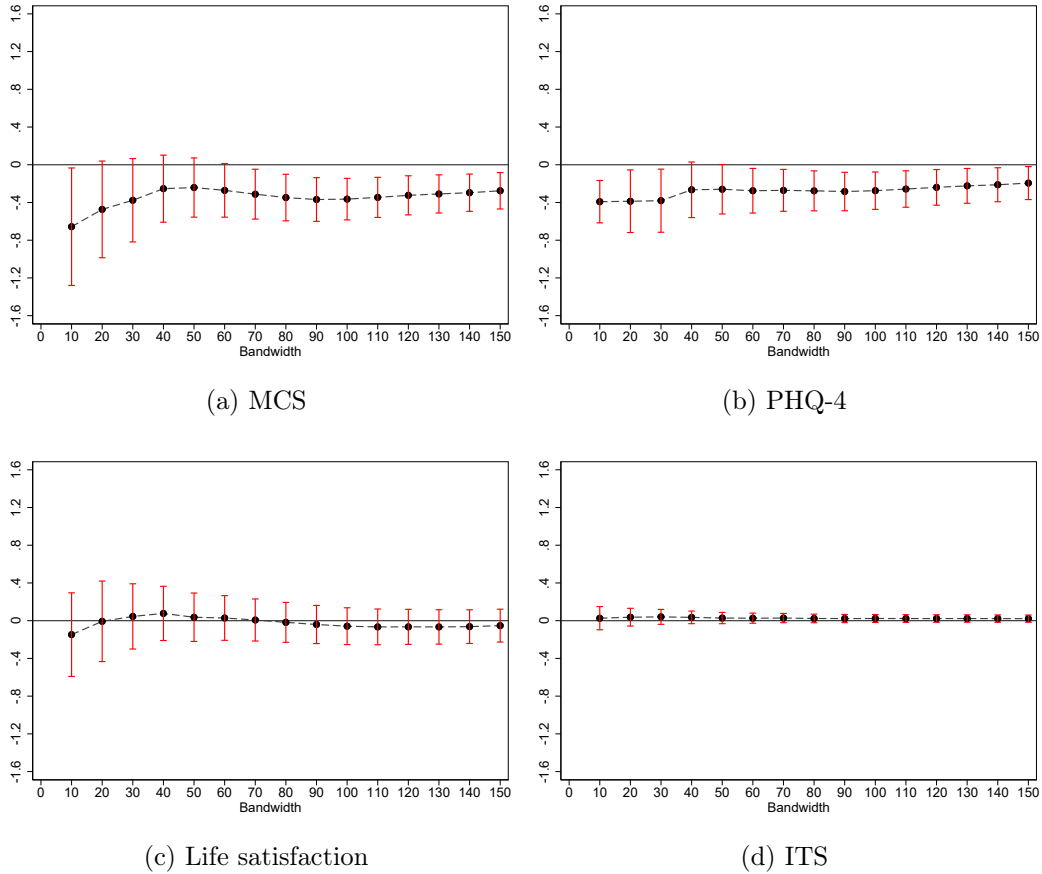
*Note:* Figure 3.8 displays the empirical pdf of observations around the cutoff. A bandwidth of 90 days is chosen. Each bin corresponds to one day. Each bar corresponds to the density of observations at each day. The vertical bar indicates the day of the xenophobic attack. The p-value corresponds to a p-value of a manipulation test based on local polynomial regressions of order two. Source: SOEP, v34.

Figure 3.9: Visualization of results



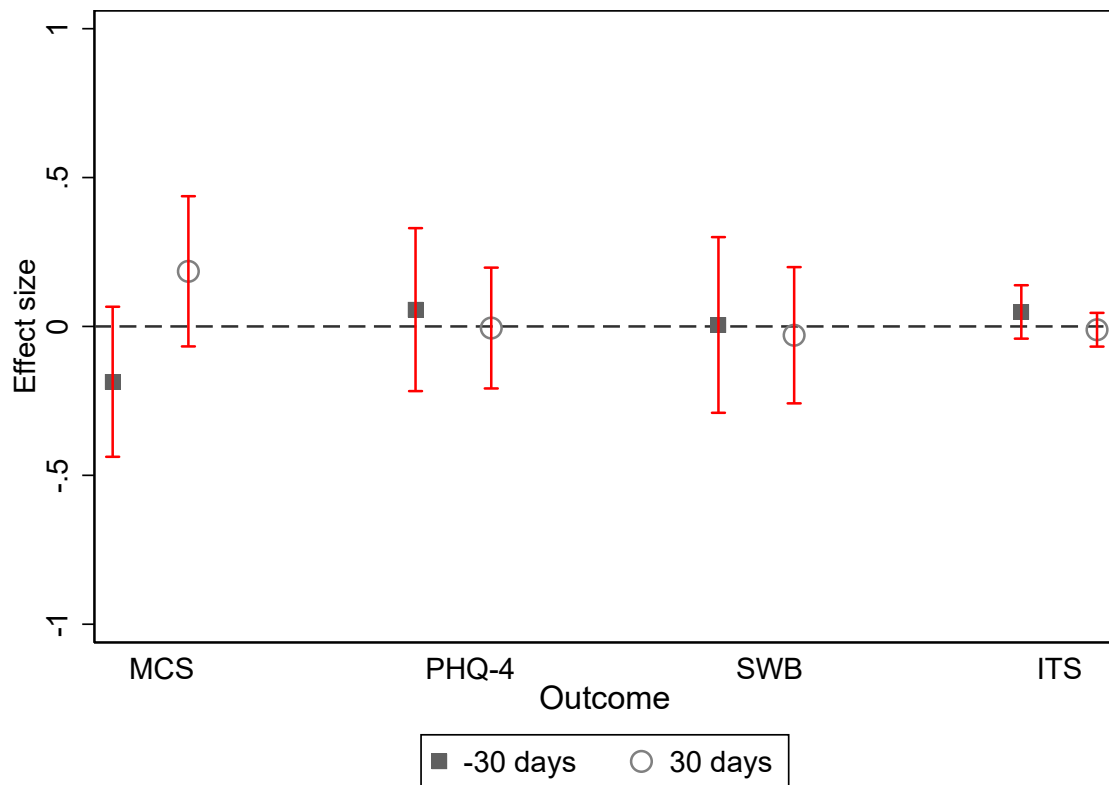
*Note:* Panels a to d in Figure 3.9 display the effect of xenophobic attacks on migrants' mental health. Source: SOEP, v34.

Figure 3.10: Sensitivity of the estimates to the bandwidth choice



*Note:* Panels a to d in Figure 3.10 display the effect of xenophobic attacks on the MCS and PHQ-4 score, life satisfaction as well as intention to stay conditional on the bandwidth choice, respectively. In each figure, a dot corresponds to a point estimate corresponding to bandwidth choice each. The estimates correspond stem from a local linear regression of the respective mental health outcome on an indicator for xenophobic attacks and a linear trend in the running variable, which is allowed to vary before and after the cutoff. We used triangular kernels. The red bars display 95% confidence bands. Throughout, we clustered standard errors on the relative distance to the xenophobic attack. Source: SOEP, v34.

Figure 3.11: Placebo estimates

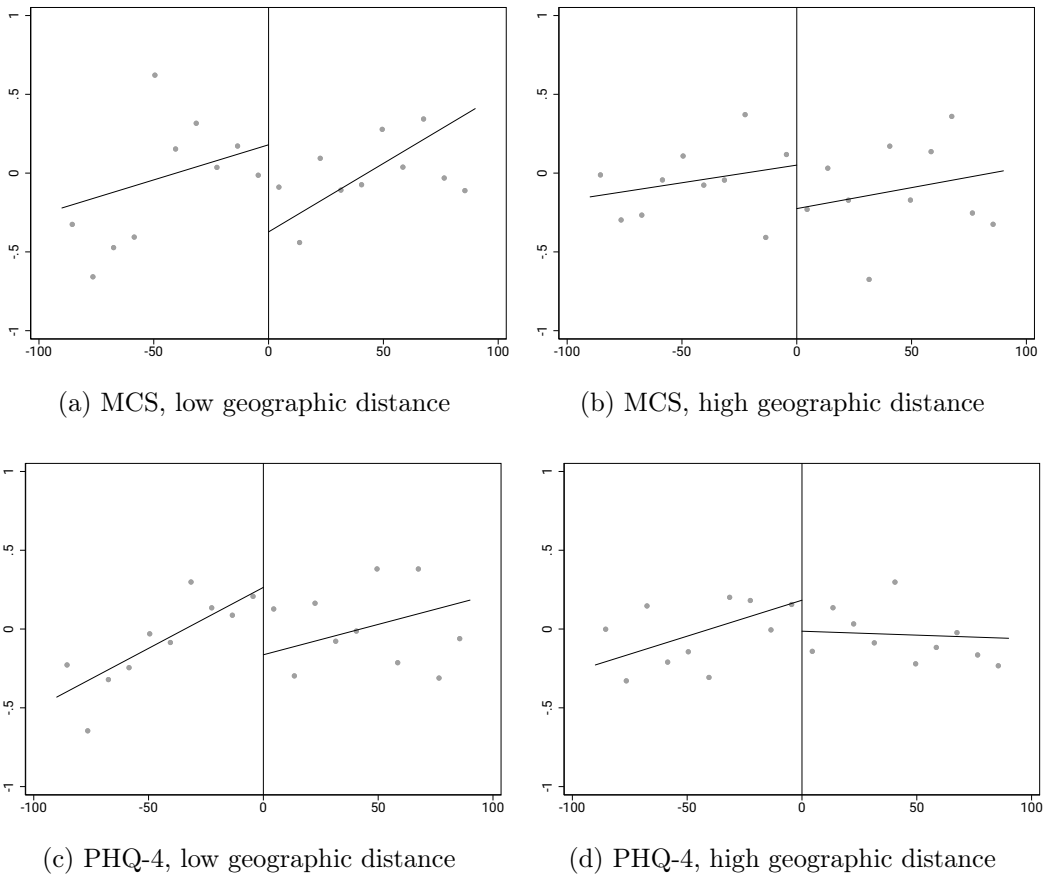


*Note:* Figure 3.11 displays the point estimates and 95% confidence intervals of placebo tests. For each mental health outcome, the left estimates correspond to point estimates of placebo regressions, pretending the xenophobic attack happened 30 days before the actual xenophobic attack. The right estimates display the respective estimates pretending the xenophobic attack happened 30 days after the actual xenophobic attack. Source: SOEP, v34.



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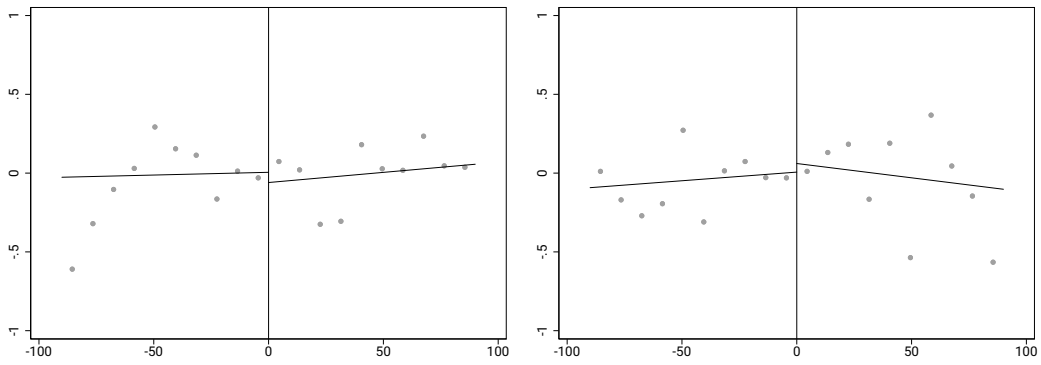
Figure 3.12: Geographical distance to hate crime and the effect on MCS and PHQ-4



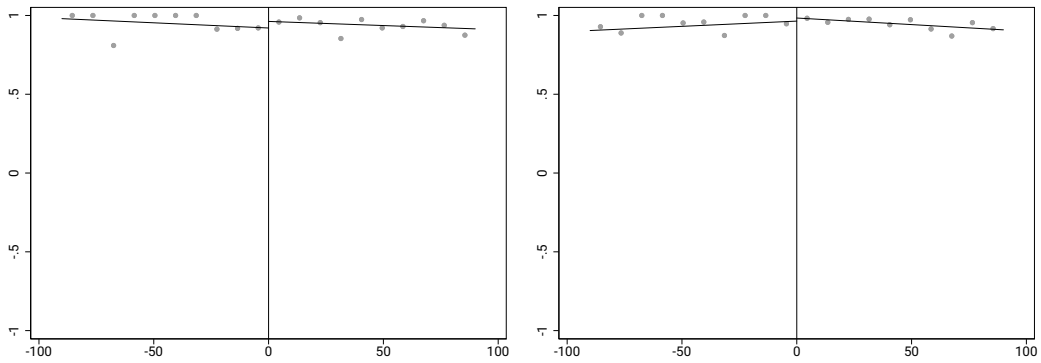
*Note:* Panels a to d in Figure 3.12 display visual results for households with low versus high geographic distance to the focal hate crime. Source: SOEP, v34.

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Figure 3.13: Geographical distance to hate crime and the effect on LS and ITS



(a) Life satisfaction, low geographic distance (b) Life satisfaction, high geographic distance



(c) ITS, low geographic distance (d) ITS, high geographic distance

*Note:* Panels a to d in Figure 3.13 display visual results for households with low versus high geographic distance to the focal hate crime. Source: SOEP, v34.

## 4 Migrants' Missing Votes

*The authors are grateful for valuable feedback from Michal Burzynski, Nadzeya Laurentsyeva, Marion Mercier, Anna Maria Mayda, Panu Poutvaara, Carsten Schröder, Andreas Steinmayr and seminar participants of the SOEP Brown Bag, the SOEP Departmental meeting, the LMU Junior Faculty Retreat, the Cesifo CEMIR conference, the Innsbruck eecon research seminar, the EBRD and King's College Workshop on the Economics, and Politics of Migration and the BeNA Labor Economics Workshop. Furthermore, we thank Adam Gendźwill for granting us access to Polish electoral results at the county level and Bennet Niederhöfer for excellent research assistance.*

### 4.1 Introduction

Migration is a global phenomenon that is continuously increasing and has reached 272 million people or 3.5 percent of the world's population (UN DESA 2019). Migration flows are highly asymmetric and certain countries, including China, India, and many Central and Eastern European countries, experience large outflows. There is a substantial economic literature focusing on the effects of emigration on origin countries, mostly focusing on brain drain versus brain gain concerns and remittances. Political effects, especially the effects on voting, have received less attention. High emigration rates can, however, have a substantial impact on election results in the origin country if emigrants are a selected group and are less likely to cast their votes from abroad.

For governments facing a close race for reelection, the votes from abroad can be decisive. Many governments have therefore started to run election campaigns in countries that have a large diaspora, a controversial example being the Turkish president Erdogan campaigning in Germany in 2018. Depending on the political preferences of the diaspora, governments can also strategically facilitate or complicate voting from abroad, therefore receiving more or less votes from abroad. For instance, there exists anecdotal evidence from the Polish diaspora that the recent government has made voting from abroad more difficult as the diaspora is more likely to vote for the opposition. The goal of this paper is to causally analyze the role of emigration on election outcomes.

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The case of Poland is an interesting setting to study the effects of emigration on election results. Especially after the accession to the European Union (EU) and the subsequent introduction of free labor mobility to other EU countries, Poland has seen large emigration rates, resulting in 4.4 million Polish citizens currently living abroad (11.4 percent of the total population according to UN DESA, 2019). This is not surprising, given the huge wage differentials within the EU. Polish citizens who are living abroad, are much less likely to participate in elections in Poland. Across different destinations and years, turnout of Polish citizens abroad is rarely larger than 10 percent, as opposed to an average of 50 percent in Poland. In addition, Polish citizens residing abroad also vote very differently. They are a selected group of citizens, distinct in education and age, and they also differ in political preferences (Berlinski and Harutyunyan 2019). Emigration thus changes the structure of the population remaining in the home country, which has important consequences for voting.

This paper analyzes the causal effects of emigration on election outcomes in Poland. We use detailed administrative emigration data and merge it with official election results of all elections between 2000 and 2019 at the county level. To account for endogeneity, for instance resulting from unobserved economic conditions, we instrument emigration with distance to the closest EU border and add time variation by exploiting the gradual opening of different EU labor markets. The instrument is a strong predictor of emigration, both when we measure distance in kilometers and when we use travel time. Our results consistently show that larger emigration rates increase the vote share for the right-wing party (PiS, PO or earlier existing right-wing parties and coalitions), while decreasing the vote share for left-wing parties. These findings hold when using either an Ordinary Least Squares regression (OLS) or relying on the instrumental variable (IV) approach outlined above. In general, the effects of emigration on voters' preferences are stronger using an IV approach.

The results are robust to including county-level controls such as the number of unemployed, GDP per capita, average incomes, the industry, age or education structure as well as time and region fixed effects. Moreover, our findings remain robust to using an alternative party classification system as well as alternative specifications of the instrument. In a second step, we provide suggestive evidence that social norms and preferences, in particular trust, can at least partially explain our results. We complement our analysis with the Life in Transition Survey, conducted by the European Bank for Reconstruction and Development (EBRD) and the World Bank in 2006, 2010 and

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2016 in Poland. It provides information on values and attitudes for Polish citizens at the county-level, and shows that emigrants have less trust in right-wing parties than stayers.

As it is the case in many European countries, populist parties of the right-wing spectrum have increased their vote share in Poland in recent years. In particular, the PiS is gaining in importance and forms the government since 2015. While it is hard to find a consistent classification of “populist parties”, there exist also left-wing populist parties. Overall, our results are more robust if we differentiate between right- and left-wing parties than if we analyze populist parties.

As additional outcomes, we analyze voting for parties with pro-European positions and voting for the incumbent. We find that emigration increases voting for parties with pro-European positions. Given that emigrants are more likely to be pro-European, one could have expected that those left-behind are less likely to vote pro-European. There are several potential explanations for this counter-intuitive result, including increased incentives and intentions to migrate in the future, reduced labor market competition, and remittances. Furthermore, we do not find any robust and significant effects for vote shares for the incumbent parties.<sup>1</sup>

There are different reasons why emigration affects voting outcomes at the origin. The first reason is the direct effect of a selected group of voters being absent. If Polish emigrants are more likely to vote for a specific type of party and are less likely to vote from abroad, then this party is missing votes due to emigration. In addition, emigration can have effects on the economy that result in different voting patterns. Dustmann et al. (2015) reveal that wages in Poland increased as a result of increasing emigration and Giesing and Laurensyeva (2017) show that emigration led to a decline in total factor productivity in new EU member states. Furthermore, emigrants interact with their countrymen back home and remit money, knowledge and social norms to their origin. Fackler et al. (2020), for instance, find that emigration increases knowledge transfer and thus innovation in the home country. Sardoschau et al. (2020) show that migrants disseminate cultural values and norms from destination to origin countries. All the above mentioned reasons can have different implications for voting. Due to

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<sup>1</sup>One may expect that those who disagree with the current government are more likely to emigrate, leading to increased vote shares for the incumbent. This effect seems to be prevalent in developing country dictatorships (Lodigiani 2016), but we cannot find any evidence for this in a developed democratic country.

## *Migrants' Missing Votes*

data limitations, we are not able to disentangle the effects but provide estimates of the overall effect.

The most closely related paper is by Anelli and Peri (2017). Similar to us, they find evidence for the so-called “exit effect”, i.e., the departure of liberal-minded voters decreases their influence on politics at home (Hirschman 1993). Anelli and Peri (2017) show that emigration from Italy in the aftermath of the financial crisis hindered political change as local elected officials were less likely to be young, college-educated, and female. To the best of our knowledge, this is the only other paper that analyzes the causal effects of emigration on election outcomes for a democratic country. In contrast to us, their main outcomes of interest are characteristics of local elected politicians. We instead focus on national parliamentary election outcomes, use a different instrumental variable and the emigrants in our context are not fleeing from a recession, which might make them being differently self-selected.

There is a larger economic literature that analyzes the effects of emigration on democratization.<sup>2</sup> This literature typically highlights the existence of political remittances, i.e., the spillover of political norms and values that emigrants to democratic countries transfer to their network in the home country. Cross-country comparisons show that emigration can promote democracy and advances political quality at the origin for a large set of countries (Docquier et al. 2016; Spilimbergo 2009). Mercier (2016) studies the migration experience of political leaders across different countries between 1960 and 2004 and concludes that leaders who studied abroad and come to power in autocratic settings have a positive influence on democratic development in their home country. This strand of research is complemented by specific country studies that focus on the precise mechanism that links emigration to democracy. Barsbai et al. (2017) illustrate that Moldovan emigrants to democratic countries had political norm spillovers to their network and inspired them to vote more democratic. Pfutze (2012) shows that the larger the proportion of migrant households in Mexican municipalities, the larger the vote share for the opposition party in 2000-2002. Karadja and Prawitz (2019) analyze historical Swedish data and find that the mass emigration to the U.S. in the nineteenth century increased labor movement membership, strike participation and voting for left-wing parties. Batista and Vicente (2011) and Chauvet and Mercier

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<sup>2</sup>Lodigiani (2016) provides an informative overview of this literature.

(2014) study the effects of return migrants and show that return migrants promote political accountability in Cape Verde and political participation in Mali, respectively.

Our contribution to the literature is threefold. First, to the best of our knowledge, we are the first to document an increase in right-wing voting resulting from emigration. Populist right-wing parties are on the rise all over Europe and we contribute by providing a new reason that can explain their increasing importance.<sup>3</sup> Second, we look at a developed and democratic EU member state. The results from most of the previous literature are based on autocratic countries and highlight progress in democratization. In a country that is already democratic, expected results will be different. We show that there is no effect on the incumbent government. Therefore, we contribute by showing that the effect between emigration and democratization is non-existent for a developed country such as Poland. Third, we show a causal effect based on an instrumental variable strategy that has not been used before in this literature. We thus contribute by strengthening the causal interpretation of the effect.

The paper has important implications beyond elections in Poland. Several other Central and Eastern European countries that have joined the EU since 2004 are experiencing similar emigration rates and a rise in right-wing governments. The paper also has implications for the creation of fair voting systems in the context of globalization. As migration is increasing, so is the number of citizens that are casting their vote from abroad. The rules for citizens residing abroad vary over time and by country of origin but in general voting from abroad is more costly in terms of effort and time. In many cases one needs to travel to the closest embassy or consulate, which might be several hours away. Voting by letter from abroad has only recently been introduced in most countries. In addition, one typically needs to pre-register, which is an additional administrative burden. These difficulties lead to very low turnout rates of migrants, effectively disenfranchising parts of the population. Governments should therefore ensure that citizens with foreign residence can cast their vote in an easy way. Voting by letter and increasing the locations where one can cast a vote are simple measures. One has to keep in mind, however, that the incumbent does not always have incentives to facilitate voting from abroad. Typically, governments know if citizens residing abroad

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<sup>3</sup>There is a large literature that explains right-wing voting with increasing *immigration* (for example, Barone et al. (2016), Edo et al. (2019), and Halla et al. (2017)) but so far no one has linked right-wing voting to *emigration*.

are voting in their favor or not and can therefore strategically facilitate or hinder the voting process abroad.

This paper is structured as follows. The next section describes Poland's institutional background. In Section 4.3, we introduce the datasets and provide descriptive statistics. Section 4.4 outlines the empirical strategy, including the construction of the instrumental variable. Section 4.5 presents the main results and Section 4.6 provides guidance on the underlying mechanisms. Section 4.7 shows the implemented robustness checks. Section 4.8 concludes with policy implications.

## **4.2 Institutional Background**

### **4.2.1 Background on the electoral system**

With the collapse of the Soviet Union, the so-called "Third Polish Republic" organized the first partially free elections in 1989 (Kancelaria Sejmu (2020), Polish National Electoral Office (2020)). Since then the Polish government consists of two chambers, the parliament (sejm) and the senate, which jointly take the responsibility for Poland's legislative power: the parliament drafts legislative proposals, whereby the senate has consulting competencies and may propose changes before sending a proposal to the Polish president.

Both chambers are elected with a system of proportional representation in a four year cycle, in which every Polish citizen aged 18 or above is eligible to cast a vote. In total, 460 deputies to the parliament and 100 senators are elected. To lower the risk of fragmentation and increase the work ability of the parliament, parties that reach a vote share below five percent are not represented in the parliament. Likewise, coalitions of parties have to reach a minimum vote share of eight percent. National minorities are excluded from this rule and therefore the German minority party (MN) is represented in the parliament.

After the eastward enlargement of the European Union in 2004, Polish citizens are further allowed to vote for representatives in the European parliament. The first European parliament (EP) election took place in 2004, three consecutive EP elections followed in 2009, 2014 and 2019. Similarly to national parliamentary elections, national parties (coalition of parties) have to reach a minimum vote share of five (eight) percent in order to be represented in the EP (Bundeszentrale für politische Bildung 2020).



## *Migrants' Missing Votes*

If Polish citizens who reside abroad want to cast their vote, they need to register as voters at a Polish consulate or embassy before the election. This registration can be made online, by e-mail, post, fax, telephone or in person. Until 2013, voters needed to cast their vote in person on election day. The number of embassies and consulates that were available for voting has increased over time. For instance, in 2007 there were 20 polling stations in the U.K., 21 in the U.S. and six in Germany. In 2015 there were 40 in the U.K., 31 in the U.S. and 17 in Germany. In 2019 there were 52 in the U.K., 48 in the U.S. and 23 polling places in Germany.<sup>4</sup> Since 2014, it was no longer necessary to appear in person at the polling station. One could also apply for a postal vote at the consulate or embassy. In 2018, this right was withdrawn by the Polish government and postal voting is now only available to people with a qualified disability (Korzek and Pudzianowska 2018). According to Korzek and Pudzianowska (2018), it remains unclear why the option of postal voting was abolished in 2018. However, the question arises whether one goal was to reduce votes for the opposition. In the first round of 2015 presidential elections, the PiS candidate Duda won only 24.6 percent of all votes coming from abroad, less than if the Polish mainland is included (34.8 percent). Postal voting has been shown to increase participation in voting from abroad (Ciornei and Østergaard-Nielsen 2015). Since the distance to the nearest polling station is typically much greater for Poles abroad than at home, the abolition of postal voting is particularly detrimental to these voters, who predominantly support the opposition.

### **4.2.2 Background on the political party landscape**

Poland has experienced substantial changes in the lead of government in recent decades. Following its communist legacy, the government was composed of left-wing and socialist parties after the collapse of the Soviet Union until the early 2000s. Starting with the national parliamentary elections in 2005 the government shifted to a center, more conservative position, and since 2015, the government is primarily formed by the right-wing populist Law and Justice (PiS) party. The following gives a brief chronological overview of the respective governments.

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<sup>4</sup>Source: National Electoral Commission, Polling District Search Engine Abroad, Retrieved July 25, 2020, from Government of Poland, National Electoral Office.  
Website: [https://sejmsenat2019.pkw.gov.pl/sejmsenat2019/en/organy\\_wyborcze/obwodowe/pow/149900](https://sejmsenat2019.pkw.gov.pl/sejmsenat2019/en/organy_wyborcze/obwodowe/pow/149900).

### *Migrants' Missing Votes*

The Democratic Left Alliance (SLD) has been the dominant player in the Polish party landscape for many years. In 2001, the largest left-wing party in Poland formed a coalition with the smaller social-democratic Union of Labour (UP) and won the 2001 parliamentary elections by a large majority. SLD promotes equal opportunities, e.g., through free education, and fights for employees' rights to reduce unemployment (Materska-Sosnowska 2010). However, some of SLD's very own issues are now also represented by PiS or Civic Platform (PO). The dominance of the Democratic Left Alliance ended in 2007, when SLD won only about a quarter of the seats that the party had won in the 2005 parliamentary elections. Finally, in 2015 SLD was without parliamentary representation for the first time.

The Law and Justice (PiS) party can be classified as populist right-wing. On the one hand, the party stands for a strong welfare state that seeks to distribute the national product more evenly among the population (Pankowski 2010). Exemplary of this are the reduction of the retirement age and the increase in the tax-free income limit (Markowski 2019). On the other hand, the party stands for a pronounced euroscepticism, especially as an opponent of the admission quota for Syrian refugees demanded by the EU Commission, and a culturally anti-liberal policy. Fomina and Kucharczyk (2016) therefore classify the PiS, which began as a center-right party in 2001, as an authoritarian-populist party of the right political spectrum. Following their election victory in 2005, Law and Justice formed a coalition with the Eurosceptic party League of Polish Families (LPR) and the right-wing Self-Defense of the Polish Republic (SRP). After eight years of opposition (2007-2015), PiS has been in a majority government since 2015.

The PO, meanwhile, positions itself as an alternative to PiS. PO represents the mainstream of European politics (Fomina and Kucharczyk 2016), is economically more liberal and pursues a more future-oriented course (Harper 2010). Nevertheless, its social values are close to Catholic conservatism and are therefore no alternative to the PiS in this respect. Accordingly, PO voters are typically better educated winners of the post-communist era, while PiS attracts voters from the poorer and less successful part of society (Dzięciołowski 2017).

Table 4.8 shows all Polish elections taking place from 1997 to 2019, including both national parliament and European parliament elections. For each election, the table lists all parties elected to parliament and those parties who formed a government succeeding parliamentary elections.

## 4.3 Data and descriptive statistics

### 4.3.1 Migration data

The migration data in our analysis stems from administrative records by Statistics Poland, which are published annually for all years since 1995. It is based on official registrations of permanent emigrants and immigrants, i.e., persons registering for permanent departure (or residence in Poland respectively) for a minimum duration of 12 months.<sup>5</sup> We focus on the years 1997 up to 2019, which corresponds to the time frame in our electoral data. Unfortunately, Statistics Poland does not provide information for 2015. To circumvent this limitation, we therefore take the average values for county-level migration between 2014 and 2016. Considering that migration is relatively stable across both years, we consider this a suitable proxy.

The great advantage of this dataset is that it captures the aggregate number of permanent international migrants per county (powiat) over an extensive time period. Each county (total of 380 counties) is assigned a unique numeric identifier using the official teryt-classification. As such, it is an ideal source of information to address our research question.

### 4.3.2 Voting data

To capture voters' preferences, we use information on official electoral results at the county level for all parliamentary elections from 2001 to 2019 and the European parliament elections in 2004, 2009, and 2014 (see Table 4.8). For each county, these include the number of valid votes per electoral committee in absolute numbers and the electoral district of the county. Because, similar to the migration data, this dataset contains 3- or 4-digit teryt codes, we merge information of the two datasets using official district

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<sup>5</sup>Statistics Poland defines a permanent emigrant as a person registering for permanent departure to abroad in the PESEL register (migration for a minimum duration of 12 months). An immigrant is a person registering for permanent residence in Poland from abroad. Information on permanent migration is therefore based on administrative data. Data on temporary migration (migration < 12 months) is available at the state level based on a statistical survey conducted by the Statistics Poland as of December 31 each year. Throughout the observation period, permanent emigration accounts only for a small fraction of overall emigration in Poland, which is not surprising given the magnitude of seasonal workers and nursing staff leaving Poland on a three to six months basis (Figure 4.5). In principle, it is possible that permanent emigrants have become naturalized in their country of destination. Since Polish emigrants with a double nationality may still cast their vote in Polish elections, this is no important limitation in our setting.

## Migrants' Missing Votes

codes. For this purpose, we collapse the migration data based on legislative periods in a first step, using the total number of emigrants per county in year  $t$  of the preceding election up to year  $t-1$  of the respective election. We then merge both datasets using information on county and election year.

Given the minimum voting shares outlined above, we consider only parties or coalitions of parties who pass this threshold and classify them into a right-middle-left scheme based on the Comparative Political Data Set (Armingeon et al. 2020) for our main results. Table 4.1 lists all parties or coalitions of parties who pass the respective threshold in at least one of the relevant national parliament and European parliament elections. Subsequently, we calculate the share of votes for right-wing (left-wing) parties in each county and election year.

Table 4.1: List of Polish Parties

Name	Abbreviation	Type	Classification
Left and Democrats	LiD	coalition	left
Coalition of the Democratic Left Alliance and the Union of Labour	SLD-UP	coalition	left
Law and Justice	PiS	party	right
League of Polish Families	LPR	party	right
Civic Platform	PO	party	right
Polish Peasants' Party	PSL	party	center
Self-Defence of the Polish Republic	SRP	party	left
Palikot Movement Election Committee/Twój Ruch	RP	party	left
Democratic Left Alliance	SLD	party	left
German Minority	MN	party	center
Electoral Committee of Voters of Kukiz 15	Kukiz	party	right
The Ryszard Petru's Election Committee	Modern	party	center
KORWiN Electoral Committee	KORwin	party	right
European Coalition	KE	coalition	center
Spring	Wiosna	party	left
The New Right Election Committee	KNP	party	right
Social Democracy of Poland	SDPL	party	left
Freedom Union	UW	party	right

*Note:* Table 4.1 lists all parties and coalitions of parties who were elected into the national or the European parliament during the observation period (2001-2019). Party classification is based on the Comparative Political Data Set by Armingeon et al. (2020). Source: Polish National Electoral Commission (PKW).

### 4.3.3 Data on party classification

To ensure a consistent classification of political parties in Poland and to emphasize the robustness of our results, we rely on three alternative party classifications, which have been developed by political scientist and have been used in the empirical literature before (De Sio et al. 2016; Döring and Hellström 2013; Döring and Manow 2017; Huysmans 2019; Medeiros et al. 2019; Potrafke 2017; Whitefield et al. 2007).

For our main results, we rely on the Comparative Political Data Set (Armingeon et al. 2020). It consists of annual data for 36 democratic countries for the period of 1960 to 2018 and classifies political parties into left-wing, center, and right-wing (cf. Table 4.1). Second, the Parliament and Government Composition Database (ParlGov)<sup>6</sup> contains data on party positions for all EU and most OECD members for the entire post-war period and provides information on political parties' position on the right-center-left scheme<sup>7</sup> and party families (Döring and Manow 2011). These include, for example, conservative, liberal, agrarian, and socio-democratic parties and may serve as an alternative classification scheme. Third, to estimate the effect of emigration on party positioning on European integration, we rely on the Chapel Hill expert surveys (CHES) from 2002 to 2019 (Polk et al. 2017). To make the results comparable across years and survey items, we rescale expert opinions such that higher values indicate pro-European attitudes, standardize variables, and compute means for each item and party. We use these means to build weighted averages of party positions in each county and election year.

Most party classifications are straightforward. However, there is some controversy about the classification of the PO. The Comparative Political Data Set classifies PO as right-wing party. In the provided context this classification may be considered controversial. Yet, ParlGov classifies PO as a conservative party as well. The Chapel

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<sup>6</sup>The ParlGov database classifies parties, which received a minimal voting share of 1.0 percent, and electoral committees with minimum two election results. While it is impossible to classify the universe of parties in our electoral data, it covers all parties (coalitions of parties) that reached the required minimal threshold (cf. Section 4.2) and are therefore included in our initial estimations.

<sup>7</sup>The ParlGov dataset classifies parties' position in the left-right position on a scale from 0 "left" to 10 "right" with data from Castles and Mair (1983), Huber and Inglehart (1995), Benoit and Laver (2006), and CHES (2010). To utilize this scale, we generate the average position in each county using weighted averages. Considering a county with three parties in a given election, we compute county  $i$ 's stand in election year  $t$  on the left-right position as  $LR_{it} = ShareParty1_{it} * PositionParty1 + ShareParty2_{it} * PositionParty2 + ShareParty3_{it} * PositionParty3$ . The higher the weighted average of the left-right dimension, the higher the support for right-wing parties.

Hill Expert Survey further assigns the PO a mean value of 6 on the left-right ideological stance scale (PiS 8), while center parties are assigned values well below 6. For the sake of consistency across party classifications, we consequently subsume the PO as a right-wing party.

#### **4.3.4 Data on values and attitudes**

To compare differences in attitudes and values across Polish counties, we rely on information from the Life in Transition Survey (LiTS). Under the lead of the European Bank for Reconstruction and Development (EBRD) and the World Bank, the LiTS focuses on transition countries in central and eastern Europe to foster the transition to an open market-oriented economy after the collapse of the Soviet Union in 1989. As of now, there exist three repeated cross sections in 2006, 2010, and 2016. Each survey wave contains roughly 1,000 observations per country.

The LiTS is a repeated cross-sectional, nationally representative household and attitudinal survey. Besides information on respondents' demographic and socio-economic characteristics, it collects a wide range of additional variables, including preferences, attitudes, and values. In contrast to similar survey datasets, such as the European Values Study or the European Social Survey, the LiTS provides geographically disaggregated information that can be related to the county level.<sup>8</sup> Considering that the administrative data provide migration and voting data at the county level as well, this is a great advantage in our setting.

#### **4.3.5 Descriptive statistics**

Figure 4.1 displays that emigration increased strongly in Poland in the last thirty years, and in particular after Poland's accession to the EU in 2004. While on average 50 Polish citizens per county registered their emigration in 2004, this number almost tripled to 124 emigrants per county in 2006 (Panel b in Figure 4.1). Nevertheless, average emigration rates differ greatly across counties in Poland (see Figure 4.2). Moreover, Figure 4.1 underlines that emigration per county is more prevalent in some years than in others. This pattern may be partly explained by the transitional provisions, which

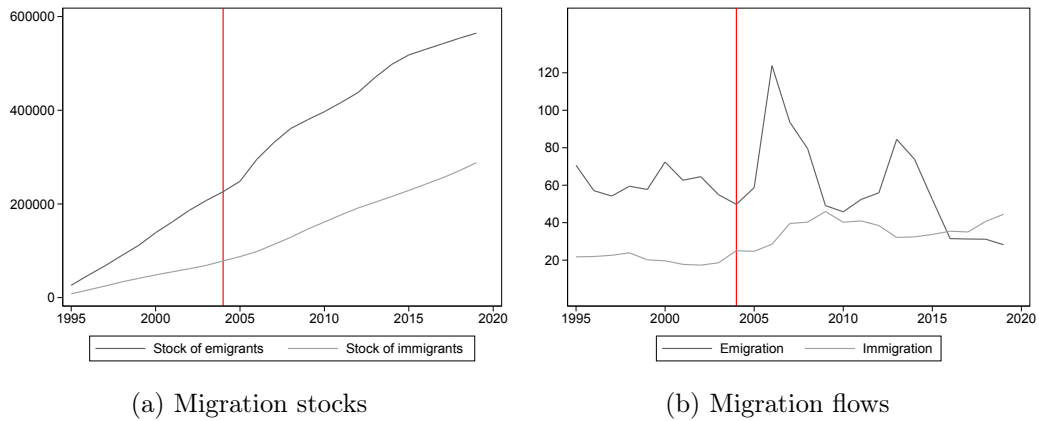
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<sup>8</sup>The LiTS dataset samples roughly 1,000 observations per country and wave. While the data allows us to investigate preferences at county level, it does not contain observations in all Polish counties.

## Migrants' Missing Votes

allowed pre-2004 EU member states to unilaterally restrict labor market access for a limited period of time (Kahanec et al. 2014). For instance, while the U.K., Ireland, and Sweden opened their labor markets in 2004, Germany and Austria kept these restrictions for immigrants from Poland until 2011. In contrast to emigration, the average immigration rate per county has increased by roughly 10 additional immigrants from 2004 to 2017.<sup>9</sup> In addition, Panels a and b in Figure 4.4 show the education levels of residents in Poland and Polish emigrants respectively, highlighting positive selection in terms of education.

Figure 4.1: Migration patterns in Poland



*Note:* Figure 4.1 displays migration patterns of emigrants and immigrants from 1995 to 2018. Panel a in Figure 4.1 sums the stock of emigrants/immigrants in Poland since 1995 and Panel b in Figure 4.1 displays the average number of emigrants and immigrants per county each year. The red line marks the year of Poland's accession to the EU (2004). Source: Statistics PL.

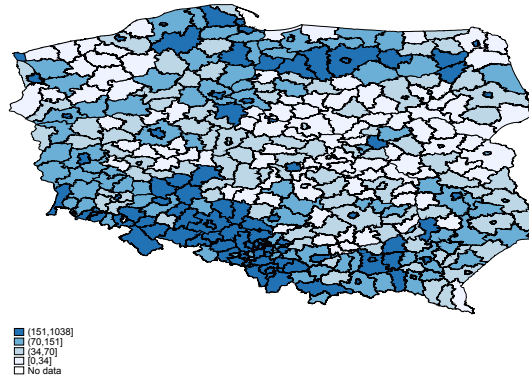
Turning to electoral results, Figure 4.6 illustrates that voting patterns changed considerably over the respective observation period. This is true in particular with regard to the share of right-wing votes in national parliament elections: While approximately 17 percent of citizens voted for right-wing parties in 2001, their share rose to roughly 50 percent in recent elections. On the other hand, the share of left-wing votes has almost continuously decreased from 51 percent in 2001 to 8 percent in 2015.

The aforementioned patterns, including increasing emigration rates per county and rising voting shares for right-wing parties, are validated in Table 4.2, which demon-

<sup>9</sup>This can be explained by a large influx of Ukrainians, following the conflict between Russia and Ukraine.

## Migrants' Missing Votes

Figure 4.2: Average emigration across counties in 2006



*Note:* Figure 4.2 displays emigration per county in 2006, which is characterized by a particularly large outflow of emigrants after accession to the EU in 2004. Yet, the overall emigration patterns are stable over the observation period. Emigration is defined as the number of persons registering their departure to abroad. Source: Statistics PL.

strates regional characteristics including all years (column 1), for years preceding the eastward enlargement of the EU (column 2), and post-2004 (column 3). This table further suggests that Poland has benefited from its EU-membership in economic terms: the average number of registered unemployed persons per county has decreased from 6,130 to 5,765. Likewise, average annual gross domestic product per capita in current prices has increased by 76 percent from 19,031 to 33,570 Złoty per state (voivodship).<sup>10</sup> Furthermore, educational outcomes, such as the number of graduates of higher education institutions, have increased over time.

Correlations between voting patterns and emigration rates are shown in Figure 4.7. It plots the relationship between the share of right-wing votes per county and the number of emigrants in a county. The graph shows a strong positive correlation, indicating that over all years counties that experience higher rates of emigration, are also prone to a higher share of right-wing votes. Figure 4.8 further demonstrates that this pattern holds for all election years separately. Likewise, emigration is somewhat negatively correlated with the share of left-wing votes (Figure 4.9).

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<sup>10</sup>Złoty represents the current local currency in Poland. This finding holds if we compare the average gross domestic product per capita in constant prices (base year: 2010; increase from 25,000 to 29,500 Złoty).



*Migrants' Missing Votes*

Table 4.2: Descriptive statistics

	(1)	(2)	(3)
	Total	Pre	Post
	mean/sd	EU-enlargement	EU-enlargement
	mean/sd	mean/sd	mean/sd
Share right-wing votes	0.635 (0.174)	0.279 (0.104)	0.678 (0.124)
Share left-wing votes	0.202 (0.175)	0.585 (0.107)	0.155 (0.113)
Share of incumbent parties	0.381 (0.226)	. (.)	0.381 (0.226)
Mean emigration per county	63.322 (110.893)	59.542 (163.876)	63.785 (102.586)
Mean immigration per county	30.935 (60.892)	19.759 (30.369)	32.302 (63.495)
Mean net migration per county	32.387 (95.438)	39.783 (153.078)	31.483 (85.773)
Mean population per county	100791.807 (113796.798)	99152.434 (84216.096)	100992.204 (116909.893)
Registered unemployed persons	5804.860 (4636.503)	6130.366 (3792.782)	5765.070 (4728.321)
GDP per capita	31955.385 (13039.581)	19030.684 (4468.770)	33570.973 (12856.990)
Average monthly per capita income	995.144 (335.650)	578.563 (65.465)	1047.217 (319.064)
Share of female residents	0.511 (0.009)	0.510 (0.008)	0.511 (0.009)
Percentage working in agricultural sector	15.120 (8.354)	18.195 (8.874)	14.735 (8.207)
Percentage working in industrial sector	30.466 (5.558)	31.139 (6.272)	30.382 (5.458)
Share of respondents aged 15-29	0.226 (0.024)	0.234 (0.012)	0.225 (0.025)
Share of respondents aged 30-49	0.283 (0.014)	0.291 (0.018)	0.282 (0.013)
Share of respondents aged 50-64	0.187 (0.029)	0.140 (0.014)	0.192 (0.025)
Graduates of higher education institutions	28911.405 (18651.956)	17533.029 (10973.578)	30333.702 (18925.290)
<i>N</i>	3420	380	3040

*Note:* This table displays descriptive statistics on voting and migration patterns, and regional covariates. Voting data has limitations for electoral results in 2001 and does not report voting shares for parties below the 5 percent threshold, including information on AWS and UW, that formed the government in 1997. Hence, it is only possible to compute the share of incumbent votes for elections from 2001 onward. Source: Statistics PL.

Figure 4.10 provides descriptive evidence that emigrants participate less in elections. As outlined above, this can be due to a lack of interest or to larger hurdles. While turnout of voters in Poland averages around 50 percent, Polish citizens residing abroad have turnout rates below 5 percent. We can therefore claim that the votes of emigrants are “missing”. This is important because Polish citizens residing abroad are voting differently. Figure 4.11 shows the voting results for Polish citizens that cast their vote in Poland versus those that cast their vote abroad. Votes casted abroad are less likely to support right-wing parties.

## 4.4 Empirical Strategy

### 4.4.1 Estimated regressions

To quantify how emigration alters electoral outcomes in Poland, we estimate the following equation,

$$Y_{t,i} = \alpha + \beta \sum_{k=1}^4 emig_{t-k,i} + \gamma X_{t-1,i} + \delta_t + \tau_s + \epsilon_{t,i} \quad (4.1)$$

In Equation 4.1,  $Y_{t,i}$  is the outcome variable for county  $i$  in year  $t$ . We have three different outcome variables, measured in logs: the share of votes for right-wing parties, the share of left-wing votes, and the share of votes for the incumbent parties.  $\sum_{k=1}^4 emig_{t-k,i}$  measures the number of emigrants per county for all years since the preceding election up to the current election in logs.<sup>11</sup>  $X_{t,i}$  is a vector of regional characteristics in county  $i$  in year  $t$ , including the number of unemployed persons, GDP per capita and average monthly per capita income (measured at the state rather than the county level), the share of female residents, the share of people working in the agricultural and industrial sector, the share of residents aged 15-29, 30-49, and 50-64 years old, and the number of graduates from higher education institutions. To avoid capturing effects of current emigration in period  $t$  on those control variables, we lag all control variables one period.<sup>12</sup>  $\delta_t$  and  $\tau_s$  are time and state fixed effects. The term

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<sup>11</sup>For instance, if we consider the parliament elections in 2019, emigration in this parliamentary term includes the years 2015, 2016, 2017 and 2018. In most cases, these are four consecutive years.

<sup>12</sup>Results are robust to using a two-year lag or fixing all control variables to the year 2000. In this way, we avoid the problem of including “bad controls” in the regression.

$\epsilon_{t,i}$  is the residual picking up other time-varying factors affecting electoral outcomes across counties.

The coefficient of interest is  $\beta$ , which measures the effect of a one percent increase in emigrants per parliamentary term  $t$  on political preferences in county  $i$ . If emigration is uncorrelated with the error term  $\epsilon_{t,i}$ , Equation 4.1 provides a consistent estimate. Considering the presence of potential omitted variables, which may jointly determine both emigration and political preferences, OLS regressions will be biased. Furthermore, reverse causation is a potential problem: Changes in political outcomes at the county level can affect emigration rates. This is why we use an instrumental variable approach, which addresses both of these issues and enables us to estimate the causal effect of emigration on voting outcomes in Poland.

#### **4.4.2 Construction of the IV**

The main reason why we cannot run simple OLS regressions is that there exist economic, political, and demographic changes that influence both emigration rates and voting patterns. For instance, declining economic conditions may increase emigration and likewise change political preferences. If this is the case,  $\epsilon_{t,i}$  and  $emig_{t-k,i}$  are correlated and the OLS estimates are biased. To address these concerns, we are implementing an IV estimation strategy. We extend an instrument for emigration that has already been validated in the economic literature (e.g., Dustmann et al. (2016)): distance to border. The main idea is that the closer a county is to an open border, the more likely it is that emigration is taking place. We expand this instrument in two dimensions to increase its exogeneity and relevance. First, we introduce a time dimension by only considering those borders to countries that allowed free labor mobility with Poland. This implies that borders to EU countries are closed before Poland's accession to the EU in 2004. Starting in 2004 the borders to Sweden (sea ports in the North), Lithuania, Czech Republic, and Slovakia are open and from 2011, we also consider the German-Polish border. Thus, the different timing for the introduction of free labor mobility adds time variation to the instrument. Second, we add distance to an international airport in Poland.<sup>13</sup> For airport openings, we use 2004, which is when

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<sup>13</sup>The opening of airports after Poland's accession to the EU could be endogenous to migration decisions. We therefore exclude international airports that have been opened after 2004 to account for this kind of endogeneity (N=3, opening dates in 2012 and 2014).

## Migrants' Missing Votes

Poland first had access to several EU labor markets, most notably, Ireland, Sweden and the U.K.

The instrument needs to meet two conditions. First, it needs to be relevant, i.e., there needs to be a significant correlation between distance to open border or airport and emigration at the county level. Distance can be measured in travel time (duration in hours) or in geographical distance (measured in kilometers). Figure 4.12 illustrates the relationship between the travel distance in hours to the closest border crossing point or airport and the number of emigrants in a county, while Figure 4.13 shows the same when we measure distance in kilometers. In both graphs, one can see a clear negative relationship, showing that emigration is highest for counties that have a short distance or duration to the next border crossing of airport. Table 4.3 shows the corresponding first stage regressions. The F-Statistic is well above 10. Therefore we conclude that the instrument is relevant.

Table 4.3: First stage: County-level emigration and distance to border or airport

	(1)	(2)	(3)
	b/se	b/se	b/se
Distance in km, in logs	-0.094*** (0.030)		0.201* (0.103)
Duration in hours, in logs		-0.143*** (0.035)	-0.365*** (0.119)
Constant	-2.793 (23.229)	-1.522 (23.149)	-2.322 (23.003)
Regional characteristics	✓	✓	✓
State*Time FE	Yes	Yes	Yes
N	2955	2955	2955
R-Squared	0.702	0.703	0.703
F-Stat	32.112	51.527	30.612

*Note:* Table 4.3 reports the coefficients from the first stage regression of the number of emigrants per county, measured in logs, on distance to the next border crossing or airport, measured as the duration in hours or the distance in kilometer, respectively. Source: Statistics Poland.

In addition, the instrument needs to satisfy the exclusion restriction. In our context this means that, once we control for emigration and our other control variables, there is no direct influence of distance to border or airport on voting outcomes. Given that we control for the number of unemployed persons, GDP per capita, average monthly per capita income, the share of female residents, sector structure, age, and the number

of graduates from higher education institutions, we do not see any connection between distance and election outcomes. We also conduct a large number of robustness checks to corroborate the validity of the exclusion restriction, such as adding immigration or temporary emigration as additional control variables.

The distance instrument has been successfully used by several other papers in the literature. Card (1993) and Kane and Rouse (1995) made this approach popular by estimating the returns to schooling by using the distance to a college as an instrument for choosing education levels. While they were not the first to use this type of distance instrument (e.g., Mallar 1979), the distance instrument is being introduced in a growing number of studies not only in the context of education economics but also in other fields such as migration economics. The IV approach is particularly prevalent in studies that estimate the effect of migration on the labor market in the host country. Del Carpio and Wagner (2015) use distance from border as an instrument for the inflow of Syrian refugees to Turkey, Peri (2012) use it for the immigration status of Mexicans to the U.S., and Ruiz and Vargas-Silva (2015) measure the proximity of the borders to Rwanda and Burundi to instrument for the intensity of the forced migration shock. In a comparative approach, McKenzie et al. (2010) contrast the results of a natural experiment with estimates using distance to the immigration office as an instrument for migration of Tongans to New Zealand. They find that the IV estimates are within 1% of the experimental estimates which they assume to be unbiased.

## **4.5 Results**

### **4.5.1 Main results**

This section examines the effect of emigration from Poland on voters' support for right-wing and left-wing parties using both an OLS and an IV estimation strategy. Table 4.9 indicates that an increase in the county-level emigration rate is positively correlated with the vote share for right-wing parties, such as PiS. The relationship is robust to including different types of fixed effects and is statistically significant at the one percent level. The most conservative specification in column (5) (including state\*time fixed effects) indicates that a one percent increase in the county-level emigration rate increases the share of right-wing parties by 0.030 percent.

*Migrants' Missing Votes*

Table 4.4: Effect of emigration on the share of right-wing votes

	(1)	(2)	(3)	(4)	(5)
	Share	Share	Share	Share	Share
	right-	right-	right-	right-	right-
	wing	wing	wing	wing	wing
	b/se	b/se	b/se	b/se	b/se
Log emigration per county	0.294*** (0.042)	0.313*** (0.041)	0.206*** (0.051)	0.228*** (0.053)	0.249*** (0.061)
Registered unemployed persons	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
GPD per capita	0.000 (0.000)	0.000* (0.000)	-0.000* (0.000)	-0.000 (0.000)	0.000 (0.000)
Per capita average income	0.000 (0.000)	-0.000*** (0.000)	0.001*** (0.000)	0.000 (0.000)	0.002 (0.002)
Share of female residents	-6.793*** (1.912)	-6.545*** (1.978)	-2.328 (1.871)	-2.573 (1.947)	-3.460 (2.314)
Percentage working in agricultural sector	-0.005*** (0.002)	-0.006*** (0.002)	-0.021*** (0.004)	-0.011*** (0.004)	0.063*** (0.024)
Percentage working in industrial sector	-0.024*** (0.004)	-0.026*** (0.004)	-0.051*** (0.009)	-0.011** (0.005)	0.093* (0.052)
Share of respondents aged 15-29	-0.662 (0.703)	1.708*** (0.522)	2.158*** (0.628)	2.630*** (0.483)	2.361*** (0.541)
Share of respondents aged 30-49	-5.006*** (1.250)	-8.301*** (1.552)	-2.792** (1.194)	-4.105*** (1.537)	-4.633*** (1.716)
Share of respondents aged 50-64	-0.708 (0.503)	1.214** (0.504)	0.305 (0.563)	0.664* (0.357)	0.524 (0.371)
Graduates from tertiary education	0.000*** (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
Net internal migration	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Constant	4.380*** (1.449)	4.860*** (1.369)	2.203 (1.621)	1.236 (1.390)	-6.392** (3.020)
Time FE	No	Yes	No	Yes	No
State FE	No	No	Yes	Yes	No
State*Time FE	No	No	No	No	Yes
Mean	0.635	0.635	0.635	0.635	0.635
N	2955	2955	2955	2955	2955

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

### *Migrants' Missing Votes*

In contrast to the OLS results, we may interpret IV estimation results in Table 4.4 causally. The results consistently show that increasing emigration leads to rising vote shares for right-wing parties. We can interpret the coefficient in the following way: A one percent increase in the number of emigrants in a given county increases the vote share for the right-wing parties by 0.249 percent. Control variables go in the intuitive direction.

With respect to voters' preferences to left-wing parties, the OLS regressions in Table 4.10 illustrate that a higher level of county-level emigration is correlated with a statistically significant decline in votes to the left-wing parties, whereby estimates range from 0.049 to 0.154 percentage points. Similarly to previous results, estimates increase substantially if we use the IV approach. A one percent increase in the number of emigrants in a given county decreases the vote share for the left-wing parties by 0.569 percent. These results are in line with the arguments of missing votes due to the emigration of a selected group of citizens. If emigrants are more likely to be left-wing voters, then their emigration would create this pattern.

There are at least three reasons why the IV estimates are larger than the OLS estimates. First, there might be omitted variable bias. As the OLS seems to be biased towards zero, we need the omitted variable to be negatively (positively) correlated with emigration and positively (negatively) with voting for right-wing parties. One example could be expectations for an economic boom, which would reduce emigration and could increase voting for right-wing parties. Similarly, an expected economic downturn could lead to increasing emigration and lower voting for right-wing parties as people hope for safety nets and employment protection provided by left-wing parties. Another potentially important omitted variable in this setting is re-immigration. Second, reverse causality could explain the differences between OLS and IV estimation results. This could be the case if people who are not satisfied with election results decide to emigrate. We think this is unlikely to drive the difference in the results due to the time structure of our data (emigration is measured in the years preceding the election). Third, we could have measurement error in the emigration data, for instance unrecorded emigration, that could bias the OLS estimator towards zero. This could also be caused by temporary migration that is not recorded in our variable of permanent migration.

The relatively long time period is a major advantage of the data under investigation. Despite its benefits, Poland has undergone substantial changes over time that

*Migrants' Missing Votes*

Table 4.5: Effect of emigration on the share of left-wing votes

	(1)	(2)	(3)	(4)	(5)
	Share	Share	Share	Share	Share
	left-	left-	left-	left-	left-
	wing	wing	wing	wing	wing
	b/se	b/se	b/se	b/se	b/se
Log emigration per county	-0.614*** (0.087)	-0.586*** (0.084)	-0.527*** (0.126)	-0.533*** (0.132)	-0.569*** (0.143)
Registered unemployed persons	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
GPD per capita	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.000 (0.000)
Per capita average income	-0.001*** (0.000)	0.000 (0.000)	-0.002*** (0.000)	-0.001*** (0.000)	-0.007 (0.005)
Share of female residents	23.165*** (3.426)	15.807*** (4.047)	16.569*** (3.489)	12.965*** (4.659)	14.667*** (5.225)
Percentage working in agricultural sector	-0.013*** (0.003)	0.001 (0.003)	0.078*** (0.008)	0.053*** (0.008)	-0.179*** (0.057)
Percentage working in industrial sector	0.041*** (0.009)	0.052*** (0.008)	0.137*** (0.020)	0.043*** (0.013)	-0.295** (0.125)
Share of respondents aged 15-29	1.673 (1.418)	-1.461 (1.142)	-2.730** (1.254)	-3.003** (1.283)	-2.520* (1.375)
Share of respondents aged 30-49	16.829*** (2.838)	20.843*** (3.093)	15.310*** (3.302)	16.571*** (3.696)	17.834*** (3.970)
Share of respondents aged 50-64	5.886*** (1.365)	7.339*** (1.088)	6.250*** (1.857)	8.457*** (1.012)	8.428*** (1.048)
Graduates from tertiary education	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)
Net internal migration	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Constant	-17.591*** (2.709)	-17.464*** (2.742)	-17.645*** (3.363)	-14.154*** (3.384)	7.580 (7.201)
Time FE	No	Yes	No	Yes	No
State FE	No	No	Yes	Yes	No
State*Time FE	No	No	No	No	Yes
Mean	0.202	0.202	0.202	0.202	0.202
N	2546	2546	2546	2546	2546

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of left-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).



may have influenced both migration patterns and voters' preferences. For instance, casting a vote from abroad has been facilitated in 2014, which may in turn influence electoral outcomes (see Section 4.2). Tables 4.11 and 4.12 indicate that the results are heterogeneous over time. Overall, estimates suggest that the results are driven by earlier periods. This is what we would expect once voting from abroad by letter was permitted. For instance, a one percent increase in the number of emigrants per county, decreases the share of right-wing votes by 0.269 percent for elections until 2014. For the 2014-2019 period, the estimate drops to 0.095 percent. This pattern holds for the share of left-wing votes, too.

### **4.5.2 Voting for pro-European parties**

Besides analyzing votes for certain parties, it is also interesting to analyze whether emigration causes voters to prefer parties with certain positions. One particularly interesting party position in this context is the party stance toward the European Union and further European integration. It is important to note that there is no clear left-right divide on this position in Poland. Moderate conservative parties, for instance the PO, are classified as pro-European and right-wing.<sup>14</sup> Table 4.6 shows that emigration causes voters to elect parties with positive attitudes towards the European Union. This is very robust to using different indicators and different datasets. Columns (1) to (4) use different EU-related indicators from the CHES dataset and column (5) uses an EU indicator from the ParlGov dataset. The results show that emigration causes voters left behind to favor further European integration, EU cohesion and an internal market. Emigration also increases voting for parties that attach higher importance to topics of EU integration.

This result can seem counter-intuitive at first. One could have expected that pro-European voters are those that are more likely to emigrate, leaving behind those voters that are more pessimistic about European integration. However, there are a number of different reasons, why emigration could lead to increased voting for parties with pro-EU stances. First, it could increase migration intentions of those left behind (Bertoli and Ruysen 2018; Piracha and Saraogi 2017). Voters with migration intentions are likely

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<sup>14</sup>The respective variable is defined on a scale from 0 “anti EU” to 10 “pro EU”. For parties that are elected to the Polish parliament the mean value is 6.6, the median value is 7.8. The PO ranges at 9.4, the PiS—a populist right-wing party—ranges at 5.4.

*Migrants' Missing Votes*

Table 4.6: Effect of emigration on attitudes towards Europe

	(1)	(2)	(3)	(4)	(5)
	Favoring Eur. integration b/se	Importance of Eur. integration b/se	Favoring Eur. cohesion b/se	Favoring internal market b/se	Pro EU b/se
Log emigration per county	0.109*** (0.039)	0.161*** (0.044)	0.077*** (0.024)	0.173*** (0.050)	0.094*** (0.029)
Registered unemployed persons	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
GPD per capita	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Per capita average income	-0.003*** (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.002 (0.001)	-0.001 (0.001)
Share of female residents	0.065 (1.472)	-1.303 (1.668)	-0.947 (0.901)	-1.240 (1.911)	-0.285 (1.093)
Percentage working in agricultural sector	-0.048*** (0.013)	-0.018 (0.016)	-0.008 (0.008)	-0.018 (0.018)	-0.011 (0.010)
Percentage working in industrial sector	-0.076*** (0.029)	-0.017 (0.034)	0.003 (0.018)	-0.035 (0.039)	-0.020 (0.021)
Share of respondents aged 15-29	-0.183 (0.360)	-0.201 (0.402)	0.567** (0.227)	0.868* (0.467)	0.795*** (0.264)
Share of respondents aged 30-49	0.179 (1.082)	-1.898 (1.220)	-0.919 (0.672)	-0.973 (1.409)	-0.567 (0.818)
Share of respondents aged 50-64	3.300*** (0.243)	1.132*** (0.261)	1.463*** (0.146)	3.431*** (0.306)	2.055*** (0.177)
Graduates from tertiary education	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Net internal migration	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Constant	5.062*** (1.670)	2.520 (2.055)	0.925 (1.108)	2.201 (2.316)	2.761** (1.258)
State*Time FE	Yes	Yes	Yes	Yes	Yes
Mean	0.046	-0.149	0.145	0.008	1.837
N	2955	2955	2955	2955	2955

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable “Favoring European integration” is measured on a scale from 1 “strongly opposes” to 7 “strongly favors”. Outcome variable “Importance European integration” is measured on a scale from 1 “no importance” to 4 “great importance”. Outcome variable “Favoring EU cohesion” is measured on a scale from 1 “strongly opposes” to 7 “strongly favors”. Outcome variable “Favoring internal market” is measured on a scale from 1 “strongly opposes” to 7 “strongly favors”. Outcome variables in column (1) to (4) were standardized. Outcome variable “Favoring EU” is measured on a scale from 0 “anti EU” to 10 “pro EU”. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL, ParlGov, and CHES (2002-2019).

to vote pro-European and especially in favor of the internal market, so that their intentions can be realized easier.<sup>15</sup> Second, municipalities experiencing large permanent emigration are also likely to experience large temporary emigration and those temporary emigrants are likely to vote pro-European as they benefit from EU integration at least temporarily. Third, those left behind benefit from remittances and increasing wages due to reduced labor market competition (Dustmann et al. 2015). These arguments can explain the surprising finding that emigration causes non-emigrants to vote pro-European.

### **4.5.3 Incumbent votes**

Another interesting voting outcome is the vote share that goes to the incumbent. We define incumbent as those parties that formed the government in the preceding national parliament election. In most election years, this is a coalition of different parties. There are two different hypothesis about how emigration can affect the vote share of the incumbent. First, if citizens who disagree with the government are more likely to emigrate, we would expect that those that stay behind are more supportive of the government and therefore expect a positive effect of emigration on voting for the incumbent. This would be in line with Anelli and Peri (2017). Second, voters could be influenced by changing economic conditions that result from emigration. Previous papers have shown that emigration affects wages (Dustmann et al. 2015), productivity (Giesing and Laurentsyeva 2017), innovation (Fackler et al. 2020), and education (Beine et al. 2008). These economic implications of emigration are complex and the direction depends on the circumstances, so it is not possible to derive a clear prediction of the direction for the effect. According to Table 4.7, the effect of emigration on vote shares for the incumbent is small and not significantly different from zero. This could either mean that there is no effect of emigration on voting outcomes or that there are different effects that cancel each other out. This is contradicting a result in the previous literature for Mexico (Pfütze 2012) who found that increasing emigration leads to more voting for the opposition and thus less voting for the incumbent.

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<sup>15</sup>This argumentation is similar to the brain gain hypothesis, that finds that the education level of non-emigrants increases as a result of high-skilled emigration due to increased incentives to invest in education for everyone (Beine et al. 2001; Mountford 1997; Vidal 1998). Similarly, in our case, the incentives and intentions of those left behind are changed.

*Migrants' Missing Votes*

Table 4.7: Effect of emigration on the share of incumbent parties

	(1)	(2)	(3)	(4)	(5)
	Share	Share	Share	Share	Share
	incum-	incum-	incum-	incum-	incum-
	bent	bent	bent	bent	bent
	b/se	b/se	b/se	b/se	b/se
Log emigration per county	-0.111 (0.744)	0.015 (0.029)	0.059 (1.092)	0.046 (0.049)	0.055 (0.043)
Registered unemployed persons	-0.000*** (0.000)	-0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)
GPD per capita	-0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Per capita average income	0.026*** (0.002)	-0.000 (0.000)	0.017*** (0.002)	0.000** (0.000)	0.005*** (0.001)
Share of female residents	185.741*** (34.767)	-1.928 (1.250)	172.687*** (40.336)	-3.295* (1.749)	-4.006** (1.605)
Percentage working in agricultural sector	0.202*** (0.021)	0.000 (0.001)	0.220** (0.086)	-0.017*** (0.003)	0.108*** (0.015)
Percentage working in industrial sector	0.401*** (0.070)	-0.002 (0.003)	1.919*** (0.221)	0.010** (0.004)	0.154*** (0.036)
Share of respondents aged 15-29	74.455*** (9.107)	2.654*** (0.347)	60.615*** (9.637)	2.338*** (0.470)	1.965*** (0.397)
Share of respondents aged 30-49	-87.120*** (22.169)	-1.627 (0.998)	-63.106** (27.904)	-2.261* (1.355)	-2.236* (1.174)
Share of respondents aged 50-64	-45.357*** (7.526)	1.663*** (0.339)	-62.234*** (9.373)	1.830*** (0.377)	1.628*** (0.314)
Graduates from tertiary education	-0.000** (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Net internal migration	0.001*** (0.000)	0.000 (0.000)	0.001*** (0.000)	0.000 (0.000)	0.000 (0.000)
Constant	-118.621*** (24.585)	-0.101 (0.922)	-151.398*** (34.749)	-0.147 (1.208)	-11.794*** (1.815)
Time FE	No	Yes	No	Yes	No
State FE	No	No	Yes	Yes	No
State*Time FE	No	No	No	No	Yes
Mean	0.216	0.216	0.216	0.216	0.216
N	1841	1841	1841	1841	1841

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of votes for the incumbent parties per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

## 4.6 Channels

In this section we show that emigration also affects social norms and preferences, which could provide an underlying mechanism driving our regression results.

To test this hypothesis, we analyze whether increasing emigration affects socio-political views and attitudes, in addition to electoral preferences. Considering that trust is one of the most essential indicators of social preferences (Fehr 2009), we mainly focus on LiTS survey questions on trust in people and political institutions. For the respective analysis, we draw information from the LiTS survey data, which provides information on values and attitudes over the entire observation period (cf. Section 4.3). Importantly, its repeated cross-sectional design covers the different periods in the lead of government.

We regress individuals' social preferences, including for example trust in people or trust in government, on an indicator variable that takes a value of one for high-emigration counties, zero else.<sup>16</sup> Moreover, we control for an individual's sex, age, and education, as well as the same set of regional-level covariates including regional fixed effects. If social preferences work as an underlying mechanism, we would expect that high levels of emigration have a changing effect for values and attitudes across government periods: In 2006, when left-wing and center parties formed the government, we expect emigration to decrease overall levels of trust in government/parties, considering that individuals who support left-wing parties and are hence more likely to trust the reigning authorities are leaving Poland. In 2016, when the PiS formed the government and obtained the majority of deputies in the parliament, the effect should be reversed, because individuals with contrasting positions to the government are leaving their country of residence.

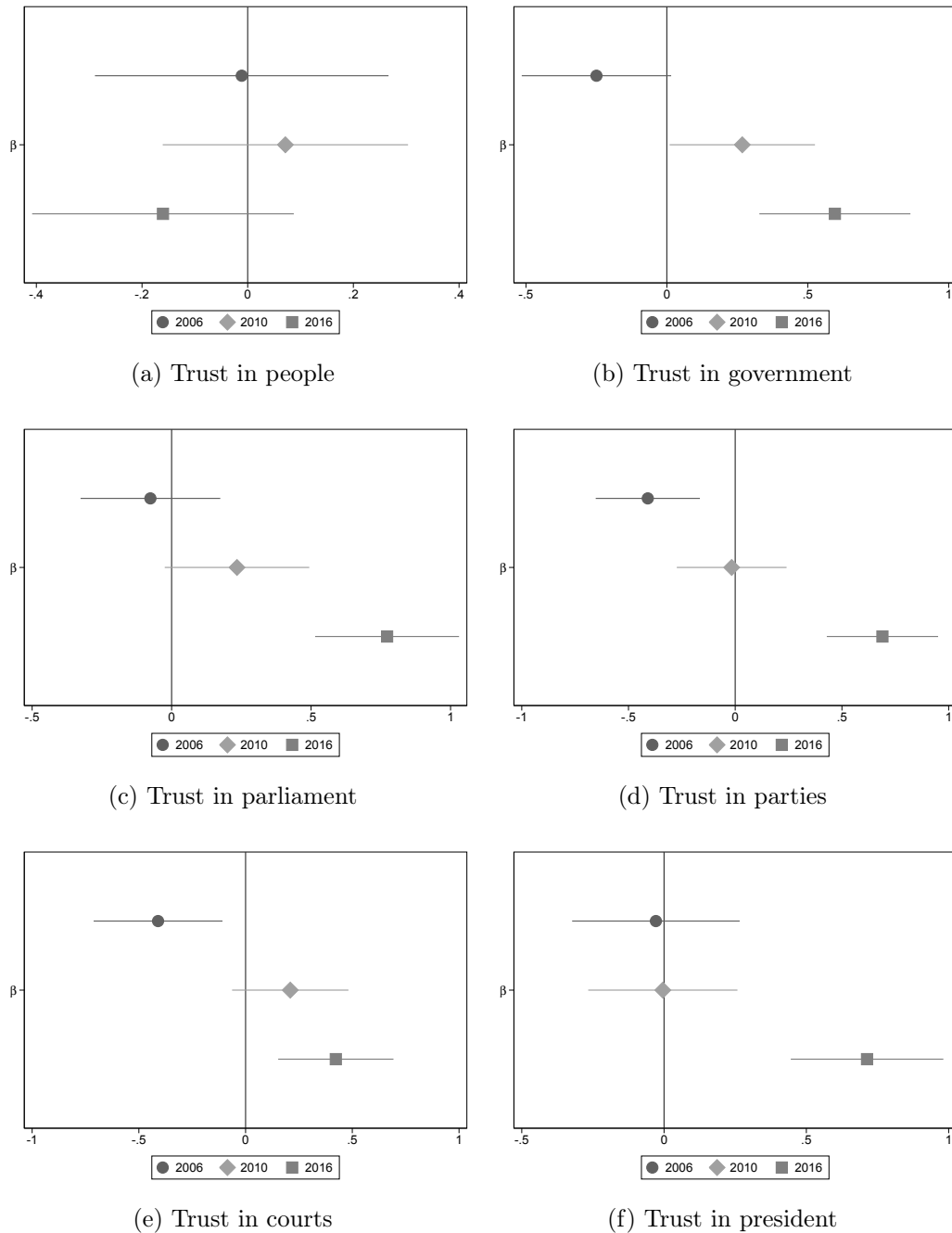
Figure 4.3 strongly supports our hypothesis. The respective figure illustrates the effect of increasing emigration on trust in people, trust in government, trust in parliament, trust in parties, trust in courts, and trust in president. For all variables capturing trust in authorities, we consistently find a change in trust levels over time periods (Panels b to f in Figure 4.3). For instance, while high levels of emigration decrease trust in government by 0.2 units in 2006, the estimate is positive and statis-

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<sup>16</sup>An individual's county of residence is marked as a high-emigration county if the number of emigrants exceeds average emigration flows per county in a given year. Trust is measured on a 5-point likert scale from 1 "strongly disagree" to 5 "strongly agree". For the linear probability model, we form a dichotomous version, where the outcome variable is equal to one if trust  $\geq 4$ .

Migrants' Missing Votes

Figure 4.3: The effect of emigration on social preferences



*Note:* Panels a to f in Figure 4.3 display visual results for transmission channels. Trust is measured on a 5-point likert scale from 1 “you can’t be too careful” to 5 “most people can be trusted”. Source: Life in Transition Survey (2006, 2010, 2016).

tically significant (+ 0.6 units) in 2016.<sup>17</sup> In contrast to this, the effect of emigration on trust in people is close to zero and statistically insignificant for all periods, emphasizing that the effect is not driven by overall changes in trust levels in the Polish population, but in trust towards the authorities only. Hence, the findings suggest that social preferences, in particular trust in political institutions, serve as an underlying mechanism driving our results.

There exist several alternative transmission channels. For instance, if family members benefit from financial remittances from a related emigrant, they may be more likely to cast their vote to right-wing parties, if they are less likely to support redistribution policies. Stayers may therefore engage in strategic voting. However, in Poland, the right-wing parties are in favor of increasing redistribution. Therefore the remittance channel seems unlikely to drive our results. Another alternative transmission channel could be return migration. Further research is needed to disentangle the precise mechanisms. While there is literature that shows the existence of each individual mechanism in a given context, we currently lack individual-level migration data, which may provide further evidence on the relative importance of these channels.

## 4.7 Robustness checks

Our results show that a higher county-level emigration rate has a strong and positive effect on the share of right-wing parties, while the share of left-wing votes is negatively affected by emigration. These effects are robust to the inclusion of time and state-level fixed effects and their interaction (cf. Tables 4.4 and 4.5). In this section, we provide additional robustness checks to support the respective results.

Our instrument relies on the assumption that the closer a county is to the Polish border or an international airport, the more likely emigration is taking place. For the main specifications, we chose duration in hours as the instrument, because it provides the largest F-Statistic. Similarly, however, we may also instrument emigration by distance in kilometers or by using an over-identified instrument (see Table 4.3). Tables 4.15 and 4.16 demonstrate that estimation results are indeed relatively robust to the usage of alternative instruments. Compared to our baseline estimation, estimates tend to increase in size if we instrument distance by geographical distance and de-

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<sup>17</sup>The results are robust to using a linear probability model as well (Tables 4.13, 4.14).

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crease in the over-identified case. For the share of right-wing votes, the over-identified instrument returns a statistically insignificant estimate.

We further show that our results are robust to using a “static” version of the instrument. In contrast to our main results, this neglects the temporal variation in free labor mobility, but allows us to include the parliamentary election in 2001, which took place before Poland becoming an EU-member state. The results, which are demonstrated in Table 4.17, are very robust to our main specification.

The estimation results in Section 5 use information on migration flows, capturing the number of emigrants per county in a given year. As such, we can understand migration patterns at a local level over the course of a specific time interval. However, the overall quantity of emigrants may differ across counties as well: To check if our results are robust to using information on the stock rather than the flow of emigrants, we compute the stock of emigrants as the overall sum of emigrants per county since 1997, which represents the first year in our migration data. Table 4.18 shows respective estimation results, whereby column (1) reports estimates for the log share of right-wing parties and column (2) reports estimates for the log share of left-wing votes. Our results are consistent to previous estimates: a one percent increase in the number of emigrants increases the log share to right-wing parties by 0.187 percent. Alternatively, we define emigration as log shares of emigrants (number of emigrants as percent of the population in logs, cf. Table 4.19). In line with our main results, a one percent increase in the share of emigrants increases the share of votes for right-wing parties by 0.318 percent. The effects of emigration on the share of votes for left-wing parties are slightly smaller compared to the main results. Furthermore, Table 4.20 shows that the results are robust to controlling for additional types of migration, including net internal migration (migration across counties), temporary emigration, and permanent immigration.

The identification assumption of our instrument relies on the assumption that the lower the opportunity costs of emigration (e.g., travel time and effort), the more likely are individuals to emigrate from Poland. Therefore, we adapt an existing instrumental variable method by Dustmann et al. (2016) by including travel distance to the nearest international airport. The rationale behind this is two-fold: First, Dustmann et al. (2016) investigate the effects of travel bans on commuting behavior across borders, which primarily takes place by car. Second, the importance of international travel by plane has increased significantly over the years. To analyze the instrument’s sensitiv-



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ity to using distance to the nearest border versus distance to the nearest international airport, we therefore provide estimates differentiated across type of exit points. Table 4.21 shows the respective estimates, whereby columns (1) and (2) explicitly use distance to nearest border crossing point, and columns (3) and (4) consider an individual's distance to the nearest international airport. The table demonstrates that both specifications are in line with previous specifications: larger emigration rates increase the share of votes for right wing parties, while decreasing the vote share for left-wing parties.

Poland has a common border with several non-European countries, including Belarus, Russia, and Ukraine. The accession to the EU in 2004 greatly facilitated migration to the EU member states, but did not change emigration conditions to any other states. This suggest that the effect should be more prevalent if we consider the distance to fellow EU member countries only. In line with our expectations, Table 4.22 illustrates that our results are robust to an alternative distance measure, which includes border crossing points to non-European neighbors.

To account for the issue of “bad controls” in our regression, the main specification lags all control variables by one period. One may, however, argue that this is a selective choice. This is why, in a third specification we fix respective covariates to a pre-EU-accession level, using information from the baseline year 2000.<sup>18</sup> In this specification we may argue that control variables are exogenous. Table 4.23 illustrates that a one percent increase in the number of emigrants per country increases the vote share for right-wing parties, while decreasing the vote share to left-wing parties at the same time.

Our main specification classifies parties into a right-center-left scheme based on the Comparative Political Data Set (Armingeon et al. 2020). Similarly to the previous argument, one may review whether this is a selective choice. Therefore, we use an alternative party classification, the Parliament and Government Composition Database (ParlGov, see Döring and Manow (2011)). Similar to our main results, Table 4.24 demonstrates a strong and consistent effect of emigration on the support towards right-wing parties. A one percent increase in the number of emigrants per county

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<sup>18</sup>Note that because GDP per capita and per capita average monthly income are measured at the state level, including state fixed effects results in a collinearity problem once we fix control variables to the baseline year 2000. To circumvent this problem, we use information on the NUTS1 level rather than states to account for region fixed effects.

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increases the position on the left-right dimension by 0.129 percent (column 5, Table 4.24). Furthermore, Table 4.25 shows the respective regression results based on party families. In line with our previous estimations, we find a strong negative effect of emigration on the share of votes for conservative parties (column 1). Considering that both socio-democratic and agrarian parties are classified as left-wing parties, we further expect a negative and statistically significant effect for these two party families. Columns 3 and 4 confirm our expectations. While increasing emigration decreases the share of votes for socio-democratic parties by 0.399 percent, the effect is even stronger for parties from the agrarian party family (-1.001 percent). For the share of votes for liberal parties, however, we find no statistically significant effects.

To ensure that our results are not driven by economic, political, or demographic patterns, we control for a variety of regional-level characteristics as well as state and time fixed effects. As such, we account for both time-variant and time-constant characteristics at the county level. Yet, Table 4.26 shows that there exist differences between counties with low (control group) and counties with high emigration rates (treatment group). High emigration counties are characterized by more densely populated areas that are economically deprived and indicate lower levels of education. To prove that estimation results are not driven by regional-level differences, we employ a matching mechanism similar to Dustmann et al. (2016) and match treated and control counties on a set of regional control variables (measured in 2000). Column (3) in Table 4.26 demonstrates that matched treatment counties are indeed much more comparable to control counties in a broad range of regional-level covariates, in particular with respect to economy and education. Subsequently, we re-estimate equation (1) using Polish counties with common support only. Estimated results are displayed in Table 4.27. The estimates are remarkably similar to our baseline specification proving the robustness of our results.

The instrumental variable approach may suffer from bias in case of a weak instrument or on the over-identified case (Poi 2006). Although none of these conditions is met, we estimate Equation 4.1 using the jackknife re-sampling technique to strengthen the robustness of our findings. The jackknife estimator is obtained by systematically dropping one observation from the dataset, calculating the estimate, and finally build the average of these calculations. Table 4.28 demonstrates that the results resemble our main specification to a great extent.

Finally, we show that our results are robust to an alternative definition of the parliamentary term (see Section 4.4) including information on emigration up to the year of the current election. For instance, if we consider the parliamentary election in 2007, we now use information on emigration in years 2006 and 2007 rather than 2005 and 2006. Estimation results are depicted in Table 4.29. For both outcomes, including the share of votes for right-wing and left-wing parties, we find that results are very similar to previous estimates strengthening the robustness of our estimation results.

## 4.8 Conclusion

This paper highlights that voting for right-wing parties increases as a result of emigration. Emigrants are selected on political preferences and typically vote less for right-wing parties. Emigrants also participate much less in the electoral process, which can be due to lower interest or higher hurdles to cast a vote. Therefore Polish municipalities with larger emigration rates experience stronger voting for the right-wing parties. We find that social preferences, in particular trust in political institutions, serve as an underlying mechanism driving our results. Results are robust to estimating the regression equation using first differences and including different controls that capture changes in the industry, age, gender or education structure.

These insights are important beyond Poland. As migration is increasing worldwide, more and more countries experience large emigration waves. These can be due to economic recessions, a lack of economic opportunities, political oppression, conflict or climate change. We highlight that this influences election outcomes and can contribute to increasing votes for right-wing parties. Paradoxically, migrants seem to increase voting for right-wing parties both in their origin and their destination country.<sup>19</sup> While the effect at the origin is mostly due to a changing composition of the voting population at the origin, the effect at the destination is due to cultural, labor market or public finance concerns of the hosting population.

More detailed data and further research is needed to analyze the role of cultural change and return migration as a transmission mechanism. How do indirect effects

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<sup>19</sup>Papers that show that immigration leads to increasing voting for right-wing parties are, for instance, Barone et al. (2016), Edo et al. (2019), and Halla et al. (2017). There are, however, also papers that show opposite effects in the special case of refugees (Steinmayr 2020) or when immigrants can vote (Mayda et al. 2020).

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resulting from the transfer of money, knowledge, and social norms interact with our results?

One clear policy implication from this work is that voting of emigrants from abroad should be facilitated so that all citizens have a fair chance to cast their vote. As long as emigrants have the citizenship of their home country and are not eligible to vote in their destination, they should have easy access to participate in elections in their home country. There have already been efforts that go in this direction such as the introduction of voting by post. However, this is often not possible for all kind of elections and for all destination and origin countries.

In the second round of the 2020 Polish presidential elections, the populist right-wing candidate Andrzej Duda won with only 51.0 percent to the opposition candidate Rafal Trzaskowski. The difference was just 422,385 votes. Among the Polish diaspora, however, the opposition had a much stronger result and won 74 percent of votes. However, turnout abroad was much lower and only 415,951 votes from abroad were counted (there are approximately 4 million Polish citizens living abroad, see UN DESA, 2019). This corresponds to a turnout of 10.4 percent. Had the turnout among the diaspora been close to the one of Polish citizens (68 percent), the opposition would have won. After the election there have been numerous complaints filed with the courts from citizens abroad that their voting documents have not arrived or arrived too late. They accused the government of suppressing voting from abroad.<sup>20</sup> This anecdote illustrates that migrants matter for election outcomes and can represent the tipping point.

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<sup>20</sup>See <https://www.nytimes.com/2020/07/16/world/europe/poland-election.html>, last accessed 03.12.2020.

## 4.9 Appendix

### 4.9.1 Tables

Table 4.8: Elections in Poland, 1997-2019

No	Year	Type	Elected parties	Government
0	1997	SJM	AWS, MN, PSL, ROP, SLD, UW	AWS, UW
1	2001	SJM	LPR, MN, PiS, PO, PSL, SLD-UP, SRP	SLD-UP
2	2004	PUE	LPR, PiS, PO, PSL, SLD, SRP, SDPL, UW	.
3	2005	SJM	LPR, MN, PiS, PO, PSL, SLD, SRP	LPR, PiS, SRP
4	2007	SJM	LiD, MN, PiS, PO, PSL	PO, PSL
5	2009	PUE	SLD-UP, PiS, PO, PSL	.
6	2011	SJM	MN, PiS, PO, PSL, RP, SLD	PO, PSL
7	2014	PUE	KNP, PiS, PO, PSL, SLD	.
8	2015	SJM	Kukiz, MN, Modern, PiS, PO, PSL	PiS
9	2019	PUE	European Coalition*, PiS, Wiosna	.
10	2019	SJM	KORWin, MN, PiS, PO, PSL, SLD	PiS

*Note:* Table 4.8 chronologically lists all parliamentary and European parliament elections from 1997 to 2019, including the election's year, the type of election (European parliament, sejm), a list of parties elected into parliament, and the governing parties. Incumbent parties are parties, who were forming the government in the preceding parliamentary election (t-1).

\*The coalition *European Coalition* comprises the parties Modern, PO, PSL, SLD, and ZL. Source: Polish National Electoral Commission (PKW).

AWS	Solidarity Electoral Action
KORWin	Coalition for the Renewal of the Republic – Liberty and Hope
KNP	The New Right Election Committee
Kukiz	Electoral Committee of Voters of Kukiz'15
LiD	Left and Democrats
LPR	League of Polish Families
MN	German Minority
Modern	The Ryszard Petru's Election Committee
PiS	Law and Justice
PO	Civic Platform
PSL	Polish Peasants' Party
ROP	Movement for the Reconstruction of Poland
RP	Palikot Movement Election Committee/Twoj Ruch
SDPL	Social Democracy of Poland
SLD	Democratic Left Alliance
SLD-UP	Coalition of the Democratic Left Alliance and the Union of Labour
SRP	Self-Defence of the Polish Republic
UW	The Freedom Union
Wiosna	Spring

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Table 4.9: OLS: Relation between emigration and the share of right-wing votes

	(1)	(2)	(3)	(4)	(5)
	Voting	Voting	Voting	Voting	Voting
	share	share	share	share	share
	b/se	b/se	b/se	b/se	b/se
Log emigration per county	0.041*** (0.004)	0.049*** (0.003)	0.030*** (0.004)	0.035*** (0.003)	0.030*** (0.003)
Time FE	No	Yes	No	Yes	No
State FE	No	No	Yes	Yes	No
State*Time FE	No	No	No	No	Yes
N	3312	3312	3312	3312	3312

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Table 4.9 includes the full set of covariates, as described in Section 4.4. For illustrative purposes, the control variables are excluded. Source: Statistics PL and National Electoral Commission (PKW).

Table 4.10: OLS: Relation between emigration and the share of left-wing votes

	(1)	(2)	(3)	(4)	(5)
	Voting	Voting	Voting	Voting	Voting
	share	share	share	share	share
	b/se	b/se	b/se	b/se	b/se
Log emigration per county	-0.154*** (0.007)	-0.082*** (0.005)	-0.132*** (0.007)	-0.050*** (0.005)	-0.049*** (0.005)
Time FE	No	Yes	No	Yes	No
State FE	No	No	Yes	Yes	No
State*Time FE	No	No	No	No	Yes
N	2903	2903	2903	2903	2903

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of left-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Table 4.10 includes the full set of covariates, as described in Section 4.4. For illustrative purposes, the control variables are excluded. Source: Statistics PL and National Electoral Commission (PKW).

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Table 4.11: Effect of emigration on the share of right-wing votes in different time periods

	(1) Baseline b/se	(2) Pre 2014 b/se	(3) 2014 - 2019 b/se
Log emigration per county	0.249*** (0.061)	0.269*** (0.072)	0.095* (0.052)
Registered unemployed persons	-0.000*** (0.000)	-0.000*** (0.000)	-0.000* (0.000)
GPD per capita	0.000 (0.000)	0.001** (0.001)	-0.000 (0.000)
Per capita average income	0.002 (0.002)	-0.034** (0.015)	0.003*** (0.001)
Share of female residents	-3.460 (2.314)	-2.634 (2.642)	-2.522 (2.151)
Percentage working in agricultural sector	0.063*** (0.024)	-0.227** (0.103)	0.045*** (0.010)
Percentage working in industrial sector	0.093* (0.052)	0.303** (0.130)	0.040 (0.025)
Share of respondents aged 15-29	2.361*** (0.541)	1.672** (0.663)	0.315 (0.620)
Share of respondents aged 30-49	-4.633*** (1.716)	-4.881** (2.102)	-2.097 (1.328)
Share of respondents aged 50-64	0.524 (0.371)	-0.190 (0.482)	-1.028*** (0.358)
Graduates from tertiary education	-0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)
Net internal migration	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)
Constant	-6.392** (3.020)	3.243 (3.849)	-3.786** (1.494)
State*Time FE	Yes	Yes	Yes
Mean	0.635	0.635	0.635
N	2955	2199	756

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

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Table 4.12: Effect of emigration on the share of left-wing votes in different time periods

	(1)	(2)	(3)
	Baseline	Pre 2014	2014 - 2019
	b/se	b/se	b/se
Log emigration per county	-0.569*** (0.143)	-0.651*** (0.179)	-0.034 (0.112)
Registered unemployed persons	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)
GPD per capita	-0.000 (0.000)	-0.003** (0.001)	0.000 (0.000)
Per capita average income	-0.007 (0.005)	0.078** (0.038)	-0.011*** (0.002)
Share of female residents	14.667*** (5.225)	12.737** (6.445)	5.883 (4.126)
Percentage working in agricultural sector	-0.179*** (0.057)	0.464* (0.254)	-0.175*** (0.024)
Percentage working in industrial sector	-0.295** (0.125)	-0.876*** (0.319)	-0.210*** (0.057)
Share of respondents aged 15-29	-2.520* (1.375)	0.887 (1.680)	-8.274*** (1.886)
Share of respondents aged 30-49	17.834*** (3.970)	19.686*** (5.161)	5.146** (2.579)
Share of respondents aged 50-64	8.428*** (1.048)	11.184*** (1.301)	8.373*** (1.422)
Graduates from tertiary education	0.000 (0.000)	0.001** (0.001)	0.000 (0.000)
Net internal migration	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)
Constant	7.580 (7.201)	-10.206 (9.418)	14.638*** (3.578)
State*Time FE	Yes	Yes	Yes
Mean	0.202	0.202	0.202
N	2546	2168	378

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of left-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).



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Table 4.13: Migration patterns and trust in political institutions

	(1)	(2)	(3)	(4)	(5)	(6)
	Trust in people 2006	Trust in people 2010	Trust in people 2016	Trust in gov 2006	Trust in gov 2010	Trust in gov 2016
	b/se	b/se	b/se	b/se	b/se	b/se
Above mean emigration	0.002	0.071	-0.160	-0.185	0.268**	0.596***
	(0.147)	(0.118)	(0.126)	(0.140)	(0.131)	(0.137)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
N	950	967	972	945	957	970
R-Squared	0.082	0.175	0.191	0.135	0.274	0.129

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Trust is measured on a 5-point likert scale from 1 “you can’t be too careful” to 5 “most people can be trusted”. Source: Life in Transition Survey (2006, 2010, 2016).

Table 4.14: Migration patterns and trust in political institutions

	(1)	(2)	(3)	(4)	(5)	(6)
	Trust in people 2006	Trust in people 2010	Trust in people 2016	Trust in gov 2006	Trust in gov 2010	Trust in gov 2016
	b/se	b/se	b/se	b/se	b/se	b/se
Above mean emigration	0.023	-0.027	-0.108*	-0.088**	-0.009	0.169***
	(0.060)	(0.067)	(0.064)	(0.043)	(0.061)	(0.060)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
N	950	967	972	945	957	970
R-Squared	0.079	0.110	0.193	0.123	0.186	0.099

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Trust is measured on a 5-point likert scale from 1 “you can’t be too careful” to 5 “most people can be trusted”. Outcome variable, trustworthy, is equal to one if trust  $\geq 4$ . Source: Life in Transition Survey (2006, 2010, 2016).

*Migrants' Missing Votes*

Table 4.15: Effect of emigration on the share of right-wing votes using alternative instruments

	(1) Duration in h b/se	(2) Distance in km b/se	(3) Over-identified IV b/se
Log emigration per county	0.249*** (0.061)	0.343*** (0.108)	0.012 (0.014)
Registered unemployed persons	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)
GPD per capita	0.000 (0.000)	0.000 (0.000)	-0.000*** (0.000)
Per capita average income	0.002 (0.002)	0.002 (0.003)	0.004*** (0.000)
Share of female residents	-3.460 (2.314)	-6.825* (4.030)	5.004*** (0.594)
Percentage working in agricultural sector	0.063*** (0.024)	0.068** (0.033)	0.050*** (0.006)
Percentage working in industrial sector	0.093* (0.052)	0.120 (0.073)	0.026** (0.012)
Share of respondents aged 15-29	2.361*** (0.541)	1.723* (0.881)	3.966*** (0.216)
Share of respondents aged 30-49	-4.633*** (1.716)	-7.229** (2.978)	1.897*** (0.461)
Share of respondents aged 50-64	0.524 (0.371)	0.378 (0.502)	0.892*** (0.183)
Graduates from tertiary education	-0.000 (0.000)	-0.000 (0.000)	0.000* (0.000)
Net internal migration	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Constant	-6.392** (3.020)	-5.005 (4.280)	-9.880*** (0.764)
State*Time FE	Yes	Yes	Yes
Mean	0.635	0.635	0.635
N	2955	2955	2955

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

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Table 4.16: Effect of emigration on the share of left-wing votes using alternative instruments

	(1) Duration in h b/se	(2) Distance in km b/se	(3) Over-identified IV b/se
Log emigration per county	-0.569*** (0.143)	-0.654*** (0.204)	-0.148*** (0.046)
Registered unemployed persons	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
GPD per capita	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Per capita average income	-0.007 (0.005)	-0.006 (0.005)	-0.009*** (0.002)
Share of female residents	14.667*** (5.225)	17.551** (7.297)	0.242 (1.926)
Percentage working in agricultural sector	-0.179*** (0.057)	-0.184*** (0.064)	-0.157*** (0.026)
Percentage working in industrial sector	-0.295** (0.125)	-0.319** (0.145)	-0.176*** (0.053)
Share of respondents aged 15-29	-2.520* (1.375)	-1.925 (1.791)	-5.495*** (0.713)
Share of respondents aged 30-49	17.834*** (3.970)	20.125*** (5.571)	6.376*** (1.576)
Share of respondents aged 50-64	8.428*** (1.048)	8.614*** (1.191)	7.499*** (0.632)
Graduates from tertiary education	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Net internal migration	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Constant	7.580 (7.201)	6.370 (8.370)	13.633*** (3.137)
State*Time FE	Yes	Yes	Yes
Mean	0.202	0.202	0.202
N	2546	2546	2546

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of left-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

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Table 4.17: Effect of emigration on the share of right-wing votes, static instrument

	(1) Share right-wing b/se	(2) Share left-wing b/se	(3) Share incumbent b/se
Log emigration per county	0.242** (0.075)	-0.276** (0.103)	0.071 (0.062)
Registered unemployed persons	-0.000** (0.000)	0.000** (0.000)	-0.000 (0.000)
GPD per capita	0.000 (0.000)	-0.000 (0.000)	-0.001*** (0.000)
Per capita average income	-0.001 (0.002)	0.001 (0.002)	0.023*** (0.001)
Share of female residents	-2.644 (2.954)	5.870 (3.873)	-4.240 (2.348)
Percentage working in agricultural sector	0.040*** (0.007)	-0.096*** (0.009)	0.240*** (0.005)
Percentage working in industrial sector	0.195 (0.107)	-0.464** (0.151)	-0.408*** (0.079)
Share of respondents aged 15-29	2.587** (0.794)	-3.428** (1.216)	1.383* (0.664)
Share of respondents aged 30-49	-4.107* (2.016)	10.131*** (2.787)	-0.561 (1.688)
Share of respondents aged 50-64	0.000 (0.480)	7.862*** (0.858)	2.596*** (0.446)
Graduates from tertiary education	-0.000 (0.000)	0.000* (0.000)	0.000*** (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)
Constant	-7.962* (3.734)	12.209* (5.161)	-7.083** (2.720)
State*Time FE	Yes	Yes	Yes
Mean	0.635	0.202	0.216
N	3312	2903	3312

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.18: Effect of stock emigration on voters' preferences

	(1) Share right-wing b/se	(2) Share left-wing b/se
Stock of emigrants since 1997 in logs	0.187*** (0.032)	-0.451*** (0.085)
Registered unemployed persons	-0.000*** (0.000)	0.000*** (0.000)
GPD per capita	0.000*** (0.000)	-0.000** (0.000)
Per capita average income	-0.001 (0.001)	0.002 (0.004)
Share of female residents	-2.347 (1.462)	13.776*** (3.759)
Percentage working in agricultural sector	0.019 (0.014)	-0.076* (0.043)
Percentage working in industrial sector	0.119*** (0.037)	-0.364*** (0.101)
Share of respondents aged 15-29	2.980*** (0.337)	-3.789*** (0.923)
Share of respondents aged 30-49	-3.437*** (1.071)	16.371*** (2.816)
Share of respondents aged 50-64	0.795*** (0.273)	7.522*** (0.821)
Graduates from tertiary education	-0.000*** (0.000)	0.000*** (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)
Constant	-5.433*** (1.905)	4.305 (5.332)
State*Time FE	Yes	Yes
Mean	0.635	0.202
N	3016	2605

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the stock of emigrants per county since 1997. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.19: Effect of the share of emigrants on voters' preferences

	(1) Share right-wing b/se	(2) Share left-wing b/se
Share of emigrants in logs	0.318*** (0.064)	-0.219** (0.093)
Registered unemployed persons	-0.000 (0.000)	0.000*** (0.000)
GPD per capita	-0.000 (0.000)	0.000** (0.000)
Per capita average income	0.005** (0.002)	-0.011*** (0.003)
Percentage working in agricultural sector	0.104*** (0.032)	-0.180*** (0.041)
Percentage working in industrial sector	0.074 (0.061)	-0.006 (0.083)
Graduates from tertiary education	-0.000 (0.000)	-0.000 (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)
Constant	-7.853** (3.475)	8.930** (4.198)
State*Time FE	Yes	Yes
Mean	0.635	0.202
N	2955	2546

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the number of emigrants as percent of the population in logs. We abstain from using a full set of covariates and forgo control variates which relate to the size of the population per county (the share of female residents, the share of respondents aged 15-29, the share of respondents aged 30-49, and the share of respondents aged 50-64) to avoid over-identification. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.20: Effect of emigration on voters' preferences, controlling for migration

	(1) Share right-wing b/se	(2) Share left-wing b/se
Log emigration per county	0.347*** (0.108)	-0.747*** (0.232)
Registered unemployed persons	-0.000*** (0.000)	0.000*** (0.000)
GPD per capita	0.000 (0.000)	-0.000 (0.000)
Per capita average income	0.003* (0.002)	-0.008** (0.003)
Share of female residents	-4.037 (3.199)	15.003** (6.465)
Percentage working in agricultural sector	0.072*** (0.028)	-0.205*** (0.062)
Percentage working in industrial sector	0.083* (0.046)	-0.225** (0.103)
Share of respondents aged 15-29	1.231 (0.974)	-0.245 (2.270)
Share of respondents aged 30-49	-7.716** (3.114)	23.230*** (6.532)
Share of respondents aged 50-64	-0.368 (0.601)	10.257*** (1.572)
Graduates from tertiary education	-0.000* (0.000)	0.000 (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)
Permanent immigration	-0.001*** (0.000)	0.003*** (0.001)
Temporary emigration	0.000 (0.000)	-0.000 (0.000)
Constant	-5.330 (4.353)	5.185 (9.576)
State*Time FE	Yes	Yes
Mean	0.635	0.202
N	2955	2546

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.21: Effect of emigration on voters' preferences, distance to border vs distance to international airport

	(1)	(2)	(3)	(4)
	Share right-wing Border b/se	Share left-wing Border b/se	Share right-wing Airport b/se	Share left-wing Airport b/se
Log emigration per county	0.110*** (0.017)	-0.288*** (0.052)	0.439* (0.228)	-1.425* (0.736)
Registered unemployed persons	-0.000*** (0.000)	0.000*** (0.000)	-0.000* (0.000)	0.000* (0.000)
GPD per capita	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Per capita average income	0.003*** (0.001)	-0.008*** (0.003)	0.001 (0.003)	-0.002 (0.011)
Share of female residents	1.511** (0.750)	5.026** (2.127)	-10.250 (8.239)	43.974* (25.639)
Percentage working in agricultural sector	0.055*** (0.011)	-0.165*** (0.034)	0.073* (0.043)	-0.224 (0.139)
Percentage working in industrial sector	0.054** (0.024)	-0.216*** (0.072)	0.147 (0.107)	-0.536 (0.347)
Share of respondents aged 15-29	3.304*** (0.250)	-4.508*** (0.767)	1.074 (1.640)	3.526 (5.586)
Share of respondents aged 30-49	-0.798 (0.546)	10.176*** (1.643)	-9.871 (6.347)	41.112** (20.226)
Share of respondents aged 50-64	0.740*** (0.214)	7.807*** (0.711)	0.230 (0.697)	10.316*** (2.701)
Graduates from tertiary education	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)	0.000** (0.000)	-0.000** (0.000)
Constant	-8.441*** (1.391)	11.625*** (4.136)	-3.593 (6.062)	-4.718 (19.753)
State*Time FE	Yes	Yes	Yes	Yes
Mean	0.635	0.202	0.635	0.202
N	2955	2546	2955	2546

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Columns (1) and (2) instrument emigration with duration to the nearest border in hours (main specification). Columns (3) and (4) instrument emigration with an over-identified instrument (distance in hours, duration in km) to reach a sufficient F-Statistics. Source: Statistics PL and National Electoral Commission (PKW).



*Migrants' Missing Votes*

Table 4.22: Effect of emigration on voters' preferences, including non-European border crossing points

	(1) Share right-wing b/se	(2) Share left-wing b/se	(3) Share incumbent b/se
Log emigration per county	0.219** (0.097)	-0.441** (0.193)	0.116 (0.103)
Registered unemployed persons	-0.000** (0.000)	0.000** (0.000)	-0.000 (0.000)
GPD per capita	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Per capita average income	0.003 (0.002)	-0.007* (0.004)	0.005*** (0.002)
Share of female residents	-2.406 (3.539)	10.264 (6.764)	-5.484 (3.666)
Percentage working in agricultural sector	0.061*** (0.021)	-0.173*** (0.046)	0.116*** (0.021)
Percentage working in industrial sector	0.085* (0.051)	-0.259** (0.110)	0.149*** (0.053)
Share of respondents aged 15-29	2.561*** (0.731)	-3.428** (1.603)	1.625** (0.784)
Share of respondents aged 30-49	-3.820 (2.689)	14.337*** (5.336)	-1.370 (2.882)
Share of respondents aged 50-64	0.570 (0.355)	8.145*** (0.946)	3.021*** (0.426)
Graduates from tertiary education	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)
Constant	-6.826** (2.962)	9.427 (6.198)	-11.824*** (2.770)
State*Time FE	Yes	Yes	Yes
Mean	0.635	0.202	0.216
N	2955	2546	2955

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.23: Effect of emigration on voters' preferences, covariates as of 2000

	(1) Share right-wing b/se	(2) Share left-wing b/se
Log emigration per county	0.799** (0.371)	-1.236** (0.493)
Registered unemployed persons	-0.000** (0.000)	0.000** (0.000)
GPD per capita	-0.000 (0.000)	0.000 (0.000)
Per capita average income	-0.002** (0.001)	0.002** (0.001)
Share of female residents	-27.544* (16.266)	44.441** (21.051)
Percentage working in agricultural sector	0.000 (0.007)	-0.008 (0.011)
Percentage working in industrial sector	-0.033** (0.013)	0.048*** (0.018)
Share of respondents aged 15-29	-2.838 (3.628)	2.927 (5.071)
Share of respondents aged 30-49	-23.222** (11.793)	40.553** (15.849)
Share of respondents aged 50-64	2.770* (1.656)	4.863** (2.347)
Graduates from tertiary education	0.000* (0.000)	-0.000** (0.000)
Net internal migration	0.000** (0.000)	-0.000*** (0.000)
Constant	20.518* (11.797)	-37.842** (15.401)
NUTS-1*Time FE	Yes	Yes
Mean	0.635	0.202
N	2956	2547

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Covariates are fixed as of 2000, before EU accession. Regional fixed effects capture NUTS-1 level, because otherwise we lose covariates due to collinearity. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.24: Effect of emigration on voters' support to the left-right dimension

	(1)	(2)	(3)	(4)	(5)
	Left-right dimension b/se	Left-right dimension b/se	Left-right dimension b/se	Left-right dimension b/se	Left-right dimension b/se
Log emigration per county	0.124*** (0.026)	0.168*** (0.029)	0.076** (0.035)	0.117*** (0.038)	0.129*** (0.044)
Registered unemployed persons	-0.000*** (0.000)	-0.000*** (0.000)	-0.000** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
GPD per capita	0.000 (0.000)	0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Per capita average income	0.000 (0.000)	-0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.001 (0.001)
Share of female residents	-2.619** (1.188)	-5.575*** (1.333)	-0.351 (1.262)	-2.935** (1.389)	-3.390** (1.694)
Percentage working in agricultural sector	-0.001 (0.001)	-0.001 (0.001)	-0.009*** (0.002)	-0.004* (0.002)	0.032*** (0.012)
Percentage working in industrial sector	-0.010*** (0.003)	-0.015*** (0.003)	-0.020*** (0.006)	-0.005 (0.003)	0.061** (0.028)
Share of respondents aged 15-29	-1.365*** (0.426)	-0.286 (0.320)	0.465 (0.413)	0.409 (0.334)	0.307 (0.393)
Share of respondents aged 30-49	-3.171*** (0.723)	-5.129*** (0.911)	-1.913** (0.762)	-2.936*** (0.950)	-3.154*** (1.074)
Share of respondents aged 50-64	-2.334*** (0.294)	-0.331 (0.276)	-1.662*** (0.371)	-0.744*** (0.214)	-0.856*** (0.217)
Graduates from tertiary education	0.000** (0.000)	0.000** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
Constant	4.488*** (0.895)	6.317*** (0.918)	3.205*** (1.087)	4.001*** (0.969)	-0.142 (1.642)
Time FE	No	Yes	No	Yes	No
State FE	No	No	Yes	Yes	No
State*Time FE	No	No	No	No	Yes
Mean	1.738	1.738	1.738	1.738	1.738
N	2955	2955	2955	2955	2955

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Party classifications follow the Parliament and Government Composition Database (ParlGov, <http://www.parl.gov.org/>). The ParlGov dataset classifies parties position in the left-right position on a scale from 0 “left” to 10 “right” with data from Castles and Mair (1983), Huber and Inglehart (1995), Benoit and Laver (2006), and CHES (2010). To utilize this scale, we generate the average position in each county using weighted averages. Considering a county with three parties in a given election, we compute county  $i$ 's stand on the left-right position as  $LR_i = ShareParty1_i * PositionParty1 + ShareParty2_i * PositionParty2 + ShareParty3_i * PositionParty3$ . The higher the weighted average of the left-right dimension, the higher the support for right-wing parties. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.25: Effect of emigration on voters' preferences, alternative party classification

	(1)	(2)	(3)	(4)
	Conservative	Liberal	Agrarian	Socio-demographic
	b/se	b/se	b/se	b/se
Log emigration per county	0.258*** (0.063)	-0.049 (0.120)	-1.001*** (0.329)	-0.399*** (0.127)
Registered unemployed persons	-0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)
GPD per capita	0.001* (0.000)	0.000*** (0.000)	-0.003** (0.001)	-0.002*** (0.001)
Per capita average income	-0.018* (0.010)	-0.002*** (0.000)	0.083** (0.039)	0.045*** (0.016)
Share of female residents	-3.824 (2.393)	16.660*** (4.363)	7.331 (11.660)	17.382*** (4.478)
Percentage working in agricultural sector	-0.088 (0.061)	-0.031*** (0.006)	0.458* (0.239)	0.224** (0.099)
Percentage working in industrial sector	0.722** (0.366)	-0.015 (0.027)	-3.177** (1.458)	-1.830*** (0.603)
Share of respondents aged 15-29	1.967*** (0.562)	5.527*** (1.180)	2.087 (2.666)	-0.549 (1.332)
Share of respondents aged 30-49	-4.926*** (1.779)	9.043** (3.521)	17.127* (8.871)	18.883*** (3.406)
Share of respondents aged 50-64	0.238 (0.384)	8.961*** (1.148)	1.204 (1.777)	9.328*** (1.144)
Graduates from tertiary education	-0.001* (0.000)	-0.000 (0.000)	0.002** (0.001)	0.001*** (0.000)
Net internal migration	0.000*** (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Constant	-11.259* (5.760)	-16.116*** (3.423)	44.516** (22.607)	15.420 (9.503)
State*Time FE	Yes	Yes	Yes	Yes
Mean	-0.421	-2.817	-1.849	-2.109
N	2955	1093	2638	1101

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of votes for conservative (1), liberal (2), agrarian (3), and socio-demographic parties (4) per county and election year. Party classifications follow the Parliament and Government Composition Database (ParlGov, <http://www.parl.gov.org/>). Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.26: Descriptive statistics in matched counties

	(1) Control districts mean/sd	(2) Treated districts mean/sd	(3) Matched treated districts mean/sd
Emigration per 10,000 inhabitants	3.100 (3.558)	13.393 (14.563)	15.175 (15.993)
Immigration per 10,000 inhabitants	2.213 (1.897)	4.352 (2.900)	4.523 (2.944)
Population per county	77059.649 (38842.786)	174869.210 (197913.583)	127415.333 (89672.101)
Registered unemployed persons	4806.045 (3189.093)	7490.022 (7097.900)	6141.520 (4216.503)
GDP per capita	34479.726 (14939.569)	33507.652 (11623.707)	33313.948 (11344.745)
Average monthly per capita income	1077.169 (397.048)	1075.901 (376.765)	1076.326 (375.318)
Share of female residents	0.509 (0.007)	0.518 (0.010)	0.515 (0.008)
Percentage working in agricultural sector	16.458 (8.338)	10.390 (7.463)	10.311 (7.012)
Percentage working in industrial sector	29.503 (5.145)	34.740 (5.351)	34.575 (4.958)
Share of respondents aged 15-29	0.223 (0.025)	0.218 (0.034)	0.219 (0.030)
Share of respondents aged 30-49	0.283 (0.015)	0.293 (0.015)	0.292 (0.013)
Share of respondents aged 50-64	0.182 (0.031)	0.193 (0.031)	0.189 (0.031)
Graduates of higher education institutions	29426.354 (19832.684)	26835.057 (14730.978)	25809.118 (13750.866)
Net internal migration	13.103 (509.925)	-46.385 (830.277)	-50.963 (399.529)
<i>N</i>	6647	2093	1518

*Note:* Means (standard deviations). Source: Statistics PL.

*Migrants' Missing Votes*

Table 4.27: Effect of migration on voting outcomes in matched counties

	(1) Share right-wing b/se	(2) Share left-wing b/se
Log emigration per county	0.285*** (0.076)	-0.635*** (0.166)
Registered unemployed persons	-0.000*** (0.000)	0.000*** (0.000)
GPD per capita	0.000 (0.000)	-0.000 (0.000)
Per capita average income	0.004* (0.002)	-0.010** (0.005)
Share of female residents	-3.053 (2.706)	13.473** (5.582)
Percentage working in agricultural sector	0.086*** (0.029)	-0.232*** (0.066)
Percentage working in industrial sector	0.106* (0.059)	-0.322** (0.138)
Share of respondents aged 15-29	2.422*** (0.693)	-1.413 (1.708)
Share of respondents aged 30-49	-5.744*** (2.046)	19.284*** (4.417)
Share of respondents aged 50-64	-0.123 (0.540)	10.516*** (1.495)
Graduates from tertiary education	-0.000 (0.000)	0.000 (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)
Constant	-8.736*** (3.300)	12.587 (7.793)
State*Time FE	Yes	Yes
Mean	0.635	0.202
N	2699	2323

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.28: Effect of emigration on voters' preferences, jackknife estimation

	(1) Share right-wing b/se	(2) Share left-wing b/se
Log emigration per county	0.249*** (0.065)	-0.569*** (0.152)
Registered unemployed persons	-0.000*** (0.000)	0.000*** (0.000)
GPD per capita	0.000 (0.000)	-0.000 (0.000)
Per capita average income	0.002 (0.002)	-0.007 (0.005)
Share of female residents	-3.460 (2.449)	14.667*** (5.537)
Percentage working in agricultural sector	0.063** (0.025)	-0.179*** (0.060)
Percentage working in industrial sector	0.093* (0.054)	-0.295** (0.132)
Share of respondents aged 15-29	2.361*** (0.572)	-2.520* (1.455)
Share of respondents aged 30-49	-4.633** (1.816)	17.834*** (4.202)
Share of respondents aged 50-64	0.524 (0.389)	8.428*** (1.102)
Graduates from tertiary education	-0.000 (0.000)	0.000 (0.000)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)
Constant	-6.392** (3.189)	7.580 (7.608)
State*Time FE	Yes	Yes
Mean	0.635	0.202
N	2955	2546

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

Table 4.29: Effect of emigration on voters' preferences, alternative delta

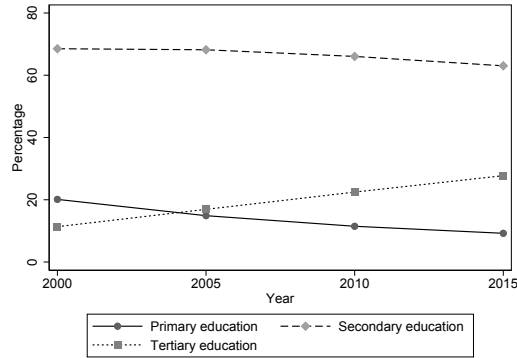
	(1) Share right-wing b/se	(2) Share left-wing b/se
Log emigration per county	0.250*** (0.045)	-0.442*** (0.090)
Registered unemployed persons	-0.000*** (0.000)	0.000*** (0.000)
GPD per capita	-0.001* (0.001)	0.003*** (0.001)
Per capita average income	0.030** (0.015)	-0.078*** (0.028)
Share of female residents	-2.910 (1.928)	12.781*** (3.721)
Percentage working in agricultural sector	0.123*** (0.044)	-0.316*** (0.082)
Percentage working in industrial sector	-1.859* (1.011)	4.876** (1.899)
Share of respondents aged 15-29	2.405*** (0.581)	-1.855 (1.200)
Share of respondents aged 30-49	-4.388*** (1.303)	14.615*** (2.593)
Share of respondents aged 50-64	0.193 (0.418)	8.209*** (0.965)
Graduates from tertiary education	0.001* (0.001)	-0.003*** (0.001)
Net internal migration	0.000*** (0.000)	-0.000*** (0.000)
Constant	48.800* (27.582)	-139.200*** (51.872)
State*Time FE	Yes	Yes
Mean	0.635	0.202
N	3312	2903

*Note:* \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Outcome variable is the share of right-wing (left-wing) votes per county and election year. Emigration is measured as the number of emigrants per county in logs. Source: Statistics PL and National Electoral Commission (PKW).

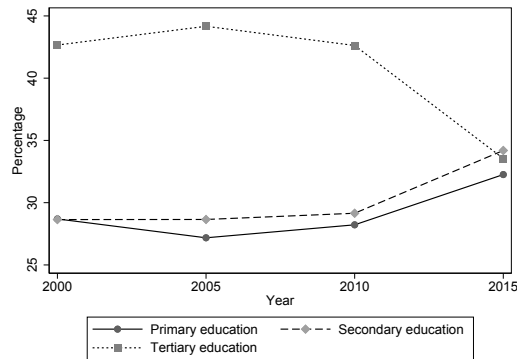


## 4.9.2 Figures

Figure 4.4: Educational levels in Poland



(a) Educational attainment of Polish natives



(b) Educational level as a percentage of all Polish emigrants over time

*Note:* Panel a in Figure 4.4 displays the share of population aged 15 and above attaining primary, secondary, and tertiary education in Poland over the period from 2000 to 2015. Panel b in Figure 4.4 illustrates the educational level as a percentage of all Polish emigrants over time. Sources: OECD (2020), Education at a Glance 2020 and Database on Immigrants in OECD Countries (DIOC), 2000 - 2015.

## Migrants' Missing Votes

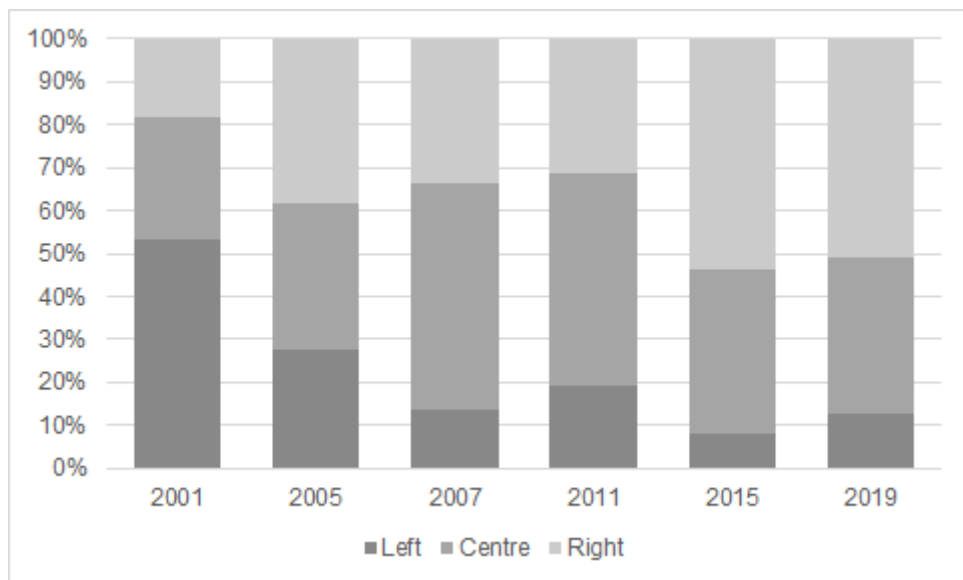
Figure 4.5: Permanent versus temporary migration over time



*Note:* Figure 4.5 illustrates the number of permanent versus temporary emigrants in Poland from 1995 to 2019. Data on temporary migration is only available from 1999 to 2018. Source: Statistics PL.

*Migrants' Missing Votes*

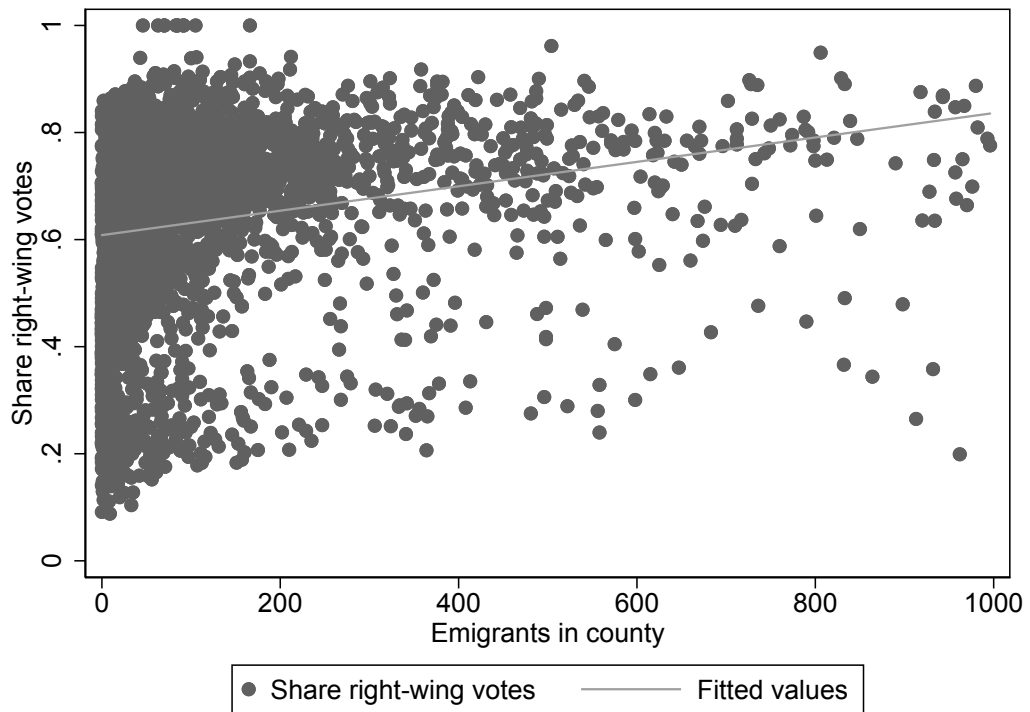
Figure 4.6: Election results in Poland, 2001-2019



*Note:* Figure 4.6 illustrates the share of right-wing, center, and left-wing votes in Poland across election years from 2001 to 2019. Source: Statistics PL.

*Migrants' Missing Votes*

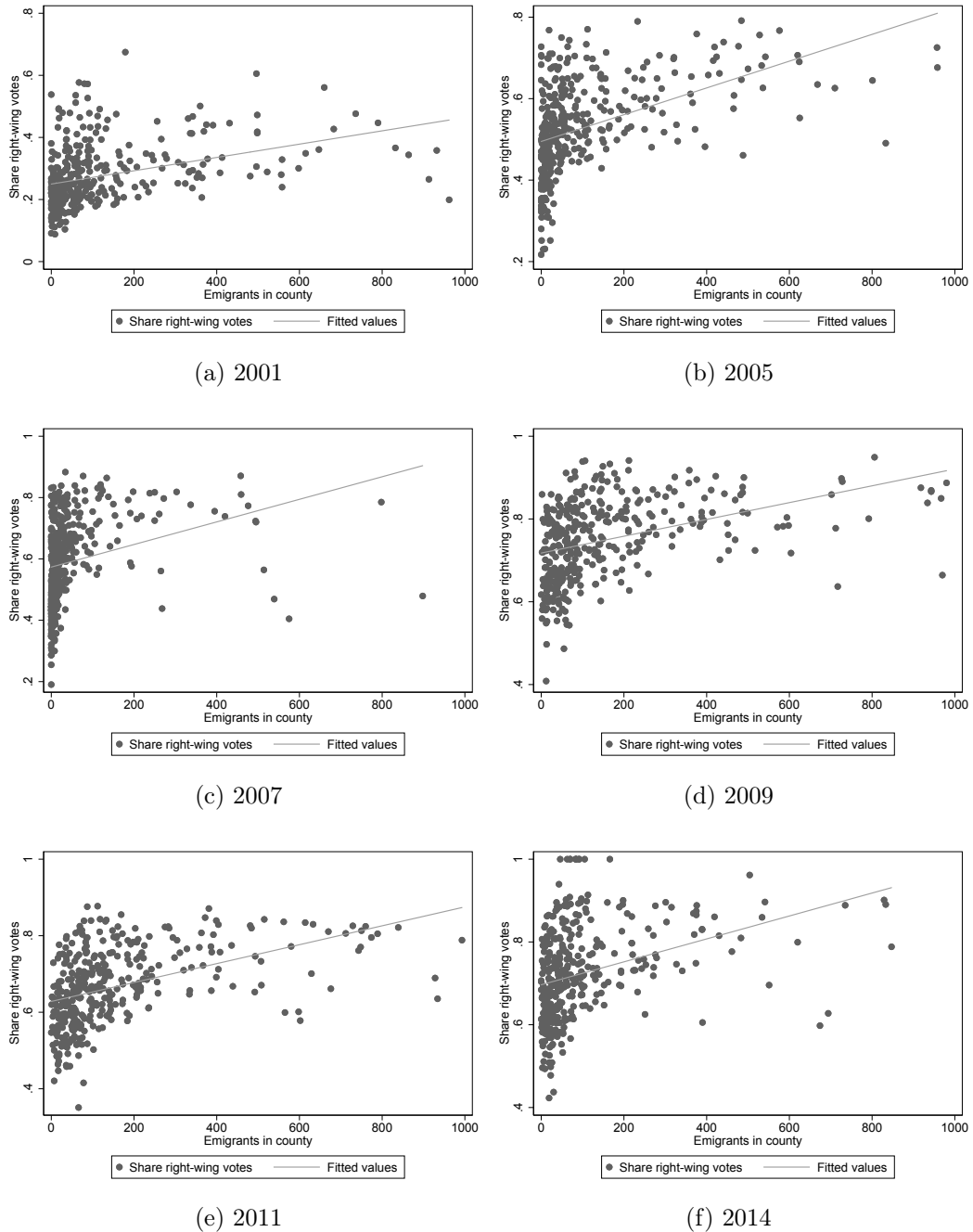
Figure 4.7: Share of right-wing populist votes in counties with different emigration rates



*Note:* Figure 4.7 illustrates the relationship between emigration per year and county and the share of right-wing populist votes. Source: Statistics PL and National Electoral Commission (PKW).

## Migrants' Missing Votes

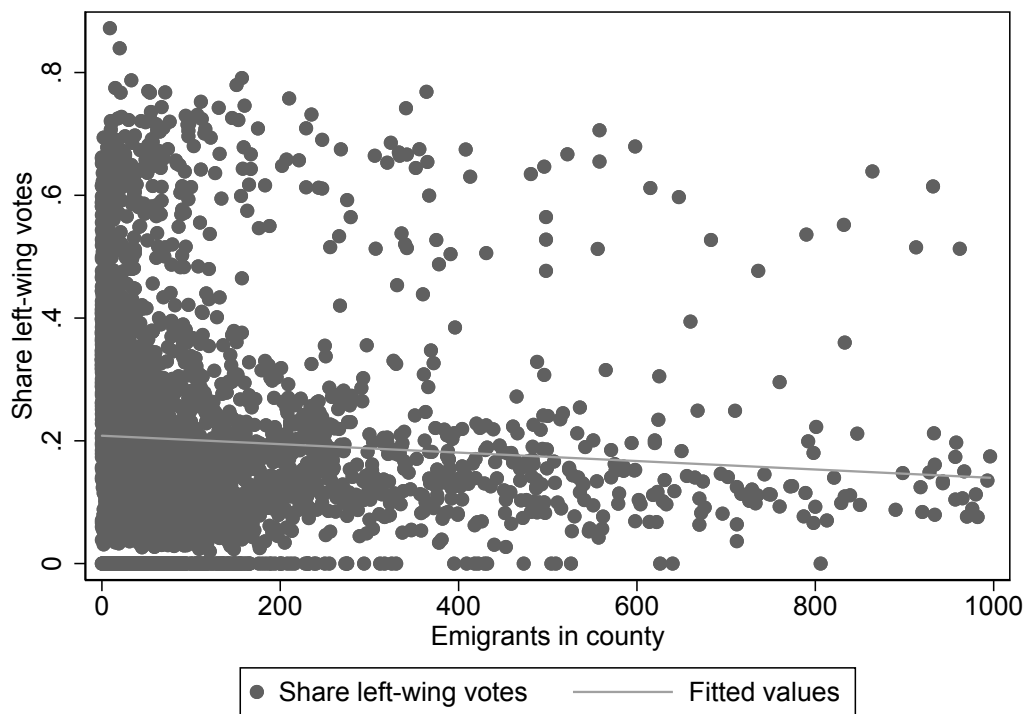
Figure 4.8: Share of right-wing populist votes in counties with different emigration rates, disaggregated by election years



*Note:* Panels a to f in Figure 4.8 illustrates the relationship between emigration per year and county and the share of right-wing populist votes from 2001 to 2014. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

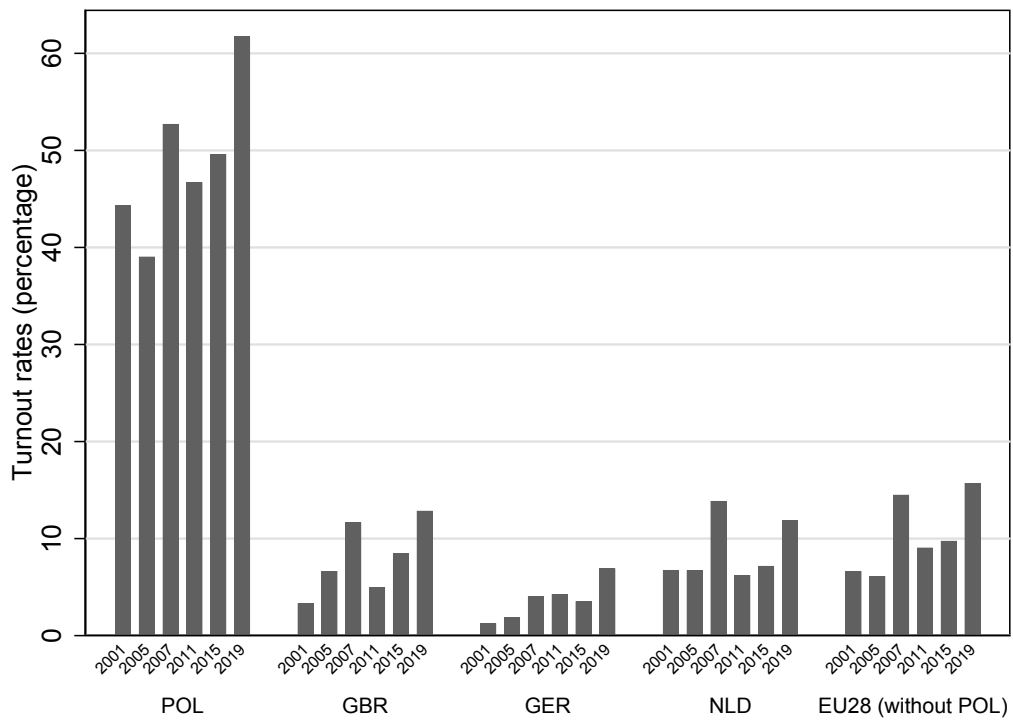
Figure 4.9: Share of left-wing votes in counties with different emigration rates



*Note:* Figure 4.9 illustrates the relationship between emigration per year and county and the share of right-wing votes. Source: Statistics PL and National Electoral Commission (PKW).

*Migrants' Missing Votes*

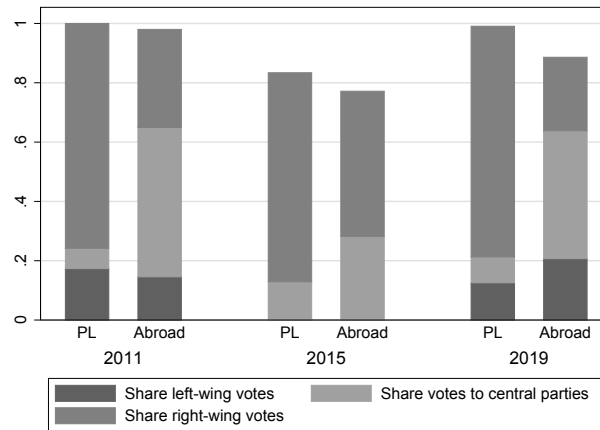
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*Note:* Figure 4.10 illustrates the percentage of eligible voters who cast their vote for those residing in Poland and for Polish citizens in the United Kingdom, Germany, the Netherlands and the EU28 countries excluding Poland (2001-2019). It is important to note that official statistics often report extremely high participation rates from abroad. This is due to the fact that they base eligible voters on those that registered to vote and not on the entire eligible population of Polish citizens residing abroad. Therefore, the numbers of eligible voters are estimated for the observed countries using Eurostat data on population by age group and citizenship. Source: National Electoral Commission (PKW) and Eurostat.

## Migrants' Missing Votes

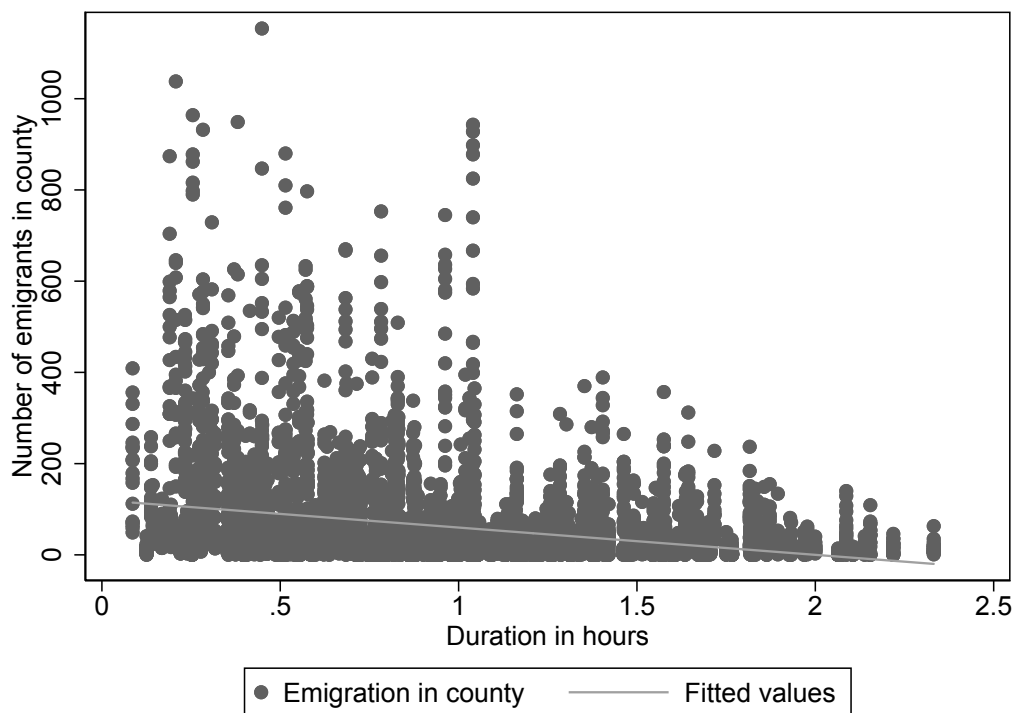
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*Note:* Figure 4.11 displays the share of votes for left-wing, center, and right-wing parties in Poland and abroad for national parliamentary elections from 2011 to 2015. Source: National Electoral Commission (PKW).

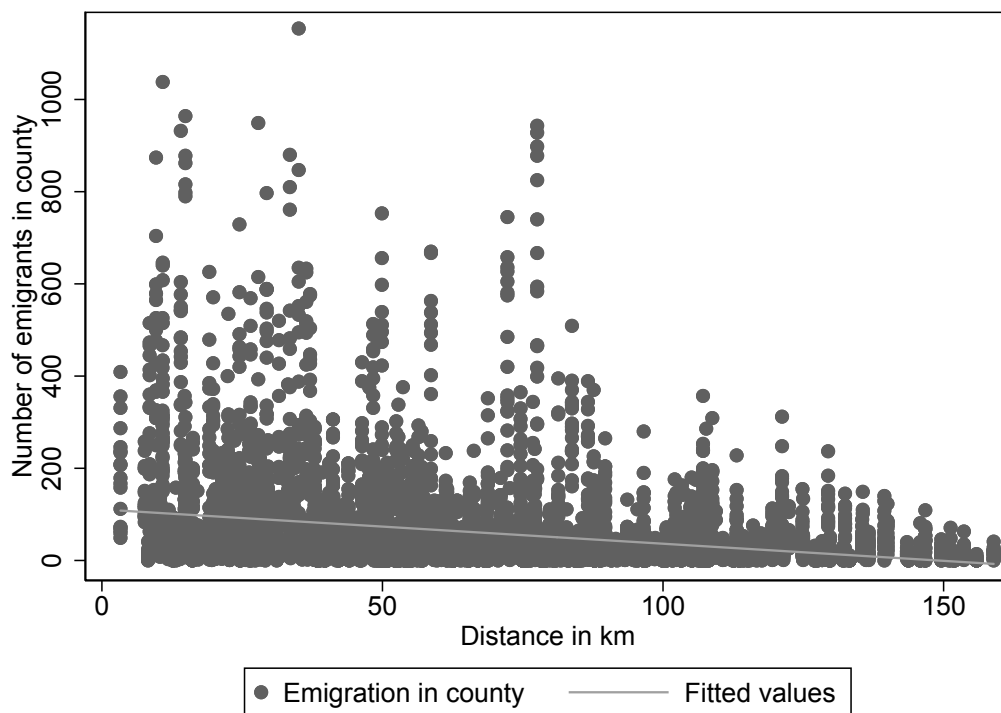


Figure 4.12: Number of emigrants in counties with different travel distances to closest border crossing points



*Note:* Figure 4.12 illustrates the relationship between emigration per year and county and the distance to the closest border crossing point measured in duration in hours. Source: Statistics PL.

Figure 4.13: Number of emigrants in counties with different travel distances to closest border crossing points



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# English Summary

This dissertation consists of four empirical chapters in migration economics.

The first chapter analyzes the effect of a recently introduced policy reform on participation in integration courses and refugees' language proficiency levels in Germany. The reform restricts initial residence for refugees with a permanent residence permit. Given that treatment intensity varies distinctly across states, I use this quasi-experiment and apply a difference-in-differences approach based on representative survey data of refugees in Germany. Despite policy makers' intention to improve access to integration measures, I find that residence restrictions have no impact on the probability to participate in integration courses and refugees' language proficiency levels. This result is robust to several robustness checks as well as the participation in any language course. Overall, the evidence suggests that refugees were being misallocated to counties with insufficient supply of integration courses.

Chapter 2 studies the causal effect of local labor market conditions and attitudes towards immigrants at the time of arrival on refugees' multi-dimensional integration outcomes (economic, linguistic, navigational, political, psychological, and social). Using a unique dataset on refugees, we leverage a centralized allocation policy in Germany where refugees were exogenously assigned to live in specific counties. We find that high initial local unemployment negatively affects refugees' economic and social integration: they are less likely to be in education or employment and they earn less. We also show that favorable attitudes towards immigrants promote refugees' economic and social integration. The results suggest that attitudes toward immigrants are as important as local unemployment rates in shaping refugees' integration outcomes. Using a machine learning classifier algorithm, we find that our results are driven by older people and those with secondary or tertiary education.

Against a background of increasing violence against non-natives, Chapter 3 estimates the effect of hate crime on refugees' mental health in Germany. For this purpose, we combine two datasets: administrative records on xenophobic crime against refugee shelters by the Federal Criminal Office and the IAB-BAMF-SOEP Survey of Refugees. We apply a regression-discontinuity-design-in-time to estimate the effect of interest. Our results indicate that hate crime has a substantial negative effect on several mental health indicators, including the Mental Component Summary score and the Patient Health Questionnaire-4 score. The effects are stronger for refugees with closer geographic proximity to the focal hate crime and refugees with low country-specific human capital. While the estimated effect is only transitory, we argue that negative mental health shocks during the critical period after arrival have important long-term consequences.

The fourth chapter focuses on political effects of emigration. Emigrants are less likely to participate in elections in their home country. They are also self-selected in

## *Summary*

terms of education, gender, age, and political preferences, changing the structure of the origin population. High emigration rates can therefore have a systematic influence on election results. Using administrative migration and voting data, we show that high emigration from Poland following the accession to the European Union in 2004 has caused an increase in vote shares for right-wing parties. To account for endogenous migration patterns, we construct an innovative instrument that measures the distance to the closest EU border and adds time variation by exploiting the gradual opening of different EU labor markets. Our results further highlight that emigration increases voting for parties with pro-European positions, but has no effect on incumbent parties.

# Deutsche Zusammenfassung

Diese Dissertation besteht aus vier empirischen Kapiteln aus dem Bereich der Migrationsökonomik.

Kapitel 1 untersucht die Auswirkungen von Aufenthaltsbeschränkungen auf die Teilnahme an Integrationskursen und auf die Sprachentwicklung von Geflüchteten. Ein neu eingeführtes Gesetz, die “Wohnsitzauflage”, beschränkt Geflüchtete mit einem längerfristigen Aufenthaltsstatus in der Wahl ihres ersten Wohnorts. Die empirische Analyse greift auf eine repräsentative Befragung von Geflüchteten in Deutschland zurück und nutzt die unterschiedlich strikte Ausführung der Wohnsitzauflage in deutschen Bundesländern als Quasi-Experiment im Rahmen einer *Difference-in-Differences* Schätzung. Die Ergebnisse unterstreichen, dass die Wohnsitzauflage keine Auswirkungen auf die Teilnahme an Integrationskursen und die Sprachkenntnisse Geflüchteter hat. Auch für die Teilnahme an anderen Sprachkursen treten keine Effekte auf. Insgesamt deuten die Ergebnisse darauf hin, dass Geflüchtete in Landkreisen mit einem zu geringen Angebot an Sprachkursen untergebracht wurden.

Das zweite Kapitel widmet sich dem kausalen Effekt lokaler Arbeitsmarktbedingungen und der Haltung der Bevölkerung gegenüber MigrantInnen bei der Ankunft von Geflüchteten auf deren multi-dimensionale Integration. Grundlage der empirischen Analyse ist die exogene Verteilung von Geflüchteten auf Landkreise in Deutschland. Je höher die Arbeitslosigkeit am ersten Wohnort, desto geringer ist die Wahrscheinlichkeit für Geflüchtete, eine Ausbildung oder Arbeit finden und umso geringer ist ihr Verdienst. Positive Einstellungen der Bevölkerung gegenüber MigrantInnen wirken sich jedoch positiv auf die ökonomische und soziale Integration von Geflüchteten aus. Die Ergebnisse der Studie zeigen, dass positive Einstellungen gegenüber MigrantInnen die Integration Geflüchteter im gleichen Ausmaß beeinflussen, wie lokale Arbeitslosigkeit. Basierend auf einem Machine Learning Algorithmus zeigen wir, dass die Effekte bei älteren Personengruppen und Geflüchteten mit sekundärer bzw. tertiärer Bildung stärker sind.

Vor dem Hintergrund steigender Gewalt gegen MigrantInnen, betrachtet Kapitel 3 die Auswirkung von Hasskriminalität auf die mentale Gesundheit von Geflüchteten. Hierfür werden zwei Datensätze miteinander verbunden: administrative Daten des Bundeskriminalamts über Hasskriminalität auf Flüchtlingsunterkünfte und die IAB-BAMF-SOEP Befragung von Geflüchteten in Deutschland. Die Ergebnisse – basierend auf einem *Regression Discontinuity Design* – zeigen einen starken negativen Zusammenhang von Hasskriminalität auf die Indikatoren der mentalen Gesundheit, den Mental Component Summary Score und den PHQ-4 score. Die Effekte sind stärker für Geflüchtete, die näher an einer Flüchtlingsunterkunft leben, und Geflüchtete mit geringem landesspezifischem Humankapital. Wenngleich die negativen Auswirkungen

## *Zusammenfassung*

mit der Zeit abklingen, können negative Schocks auf die mentale Gesundheit die Integrationsleistung Geflüchteter langfristig beeinträchtigen.

Kapitel 4 untersucht die politischen Implikationen von Emigration. Emigranten nehmen mit geringerer Wahrscheinlichkeit an Wahlen im Herkunftsland teil. Gleichzeitig unterscheiden sie sich von der Bevölkerung hinsichtlich Bildung, Geschlecht, Alter und politischer Einstellungen. Starke Migration kann daher deutliche Auswirkungen auf die politische Entwicklung im Herkunftsland entfalten. Die Untersuchung nutzt administrative Daten zu Migration und Wahlergebnissen, um zu zeigen, dass die große Auswanderungsbewegung nach dem EU-Beitritt Polens im Jahr 2004 zu einem Anstieg des Stimmenanteils rechts-stehender Parteien geführt hat. Um die Endogenität von Migration zu berücksichtigen, wird Migration durch die Distanz zur EU-Grenze unter Berücksichtigung der graduellen Öffnung des europäischen Arbeitsmarkt im Rahmen der 2 + 3 + 2 Regelung instrumentiert. Die Ergebnisse unterstreichen, dass Migration einen Anstieg des Stimmanteils für pro-Europäische Parteien induziert, allerdings keine Auswirkungen auf die Parteien der amtierenden Regierung hat.

# Ehrenwörtliche Erklärung

## **Erklärung gemäß §4 Abs. 2**

Hiermit erkläre ich, dass ich mich noch keinem Promotionsverfahren unterzogen oder um Zulassung zu einem solchen beworben habe, und die Dissertation in der gleichen oder einer anderen Fassung bzw. Überarbeitung einer anderen Fakultät, einem Prüfungsausschuss oder einem Fachvertreter an einer anderen Hochschule nicht bereits zur Überprüfung vorgelegen hat.

## **Erklärung gemäß §10 Abs. 3**

Hiermit erkläre ich, dass ich für die Dissertation folgende Hilfsmittel und Hilfen verwendet habe:

- Statistiken und Regressionen: Stata, R
- Satzsatz und Formatierung: LaTeX, TEXstudio, JabRef

Auf dieser Grundlage und soweit nicht anders vermerkt (siehe "Zusammenarbeit mit Koautoren") habe ich die Arbeit selbstständig verfasst.

(Felicitas Schikora)  
Berlin, 07.12.2020