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DISCUSSION PAPER

NO 387

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IMPRINT

DICE DISCUSSION PAPER

Published by:
Heinrich-Heine-University Düsseldorf,
Düsseldorf Institute for Competition Economics (DICE),
Universitätsstraße 1, 40225 Düsseldorf, Germany
www.dice.hhu.de

Editor:
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ISSN 2190-9938 (online) / ISBN 978-3-86304-386-5

Becoming Neighbors with Refugees and Voting for the Far-Right? The Impact of Refugee Inflows at the Small-Scale Level *

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April 2022

Abstract

We investigate the effect of the refugee inflow between 2014 and 2017 on voting for the far-right party Alternative for Germany (AfD) in the national parliamentary election in 2017 in Germany. Drawing on unique small-scale data enables us to distinguish between the contact theory, captured by the inflow of refugees into the immediate neighborhood (1km x 1km), and county-level (NUTS 3) effects, which might pick-up other, broader factors such as media coverage or specific county-level policies. We alleviate concerns of an endogenous refugee allocation by a shift-share instrument. Our results indicate that the contact theory is valid in urban West Germany, i. e., higher refugee inflows in West German urban neighborhoods decrease the shares of far-right voting, while there is no robust evidence of a relationship between refugee inflow and far-right vote shares in East Germany and rural West Germany.

Keywords: *voting behavior, neighborhood characteristics, refugees, immigration*

JEL classification numbers: *D72, J15, R23*

*We thank Thomas K. Bauer, Julia Bredtmann, Fabian Dehos, Albrecht Glitz and Andreas Lichter as well as seminar participants at the DICE Düsseldorf, RWI Essen and University Pompeu Fabra for helpful comments and suggestions. Further, we thank Alper Demirci, Jan Dohmann, Lisa Duletzki, Niklas Hübner, Filip Malkowski, Michael Schweitzer, and Thorben Wiebe for research assistance. Data collection would not have been possible without the students involved. We gratefully acknowledge financial support from the Leibniz Competition (K165/2018/Segregation and regional mobility).

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1 Introduction

In many Western European countries, the electoral success of far-right parties has increased in the last decades. Until 2017, Germany was one of the last European countries without a far-right party in the parliament.[1] In 2017, however, the Alternative for Germany (AfD)[2] became the first far-right party which entered the German federal parliament since World War II and represented with 12.6% the third biggest parliamentary group. The rise of authoritarian populist parties, like the AfD, is a cause for concern for several reasons. First and foremost, such parties can destabilize liberal democracies (Norris and Inglehart, 2019). Moreover, the leadership of populist parties can bear economic costs, e.g. Funke et al. (2020) find that populist leaders lead to more than 10% lower GDP p.c. using synthetic control methods. Bellodi et al. (2021) observe that populist parties in the local government can lead to both the replacement of good with bad bureaucrats and overall worse government performance. In the context of Germany, the AfD is still far from forming the government, but its already strong support may have economic consequences. Because of its low fertility rates, Germany needs immigration in general and especially of high skilled workers. Strong far-right parties, however, put pressure on established parties to implement restrictive immigration and integration policies (see Muis and Immerzeel, 2017, for a literature review). Further, they create a xenophobic atmosphere that makes it less attractive for potential migrants to come to Germany.

The increased refugee inflows into Europe in 2015 and 2016 were challenging for the European societies and raised concerns that inflows increase support for far-right parties, causing an academical and political debate about the overall effect of the refugee inflow on voting behavior. The literature mainly finds that negative attitudes towards immigration foster the rise of far-right parties (see, e.g., Lubbers and Scheepers, 2000; Van der Brug et al., 2000; Norris and Inglehart, 2016).[3] These negative attitudes may stem from natives fearing competition for economic resources (e.g., jobs, public goods, housing), consistent with the racial threat theory (Campbell, 1965; Quillian, 1995). However, the contact theory by Allport et al. (1954) suggests that natives and immigrants living in close proximity to each other increase the likelihood of encountering each other, thus reducing stereotypes and anti-immigrant attitudes. To identify this suggested negative relationship between refugee inflow and far-right voting, one must analyse it on a sufficiently small scale, since close proximity is a necessary condition of Allport´s theory. However, many studies rely

[1] Besides in Germany, also in Cyprus, Estonia, Portugal, Spain and in the United Kingdom a far-right party (according to the classification of Rooduijn et al. (2019)) entered the national parliament for the first time in the last decades.

[2] While the AfD started as a Euro-critical and economically liberal party, its manifesto is openly xenophobic since the large refugee inflow into Germany in 2015 (Heckmann, 2016; Schmitt-Beck, 2017).

[3] Other factors driving the recent rise of far-right parties in European countries are for instance, the effects of import competition from China (Dippel et al., 2015), the European Great Recession and political distrust (Algan et al., 2017), robotization (Anelli et al., 2019) or overall, the cultural backlash (Norris and Inglehart, 2016).

on data that are aggregated at the county or municipality level. If refugee inflow is not evenly distributed within the county or municipality, the analysis on aggregate levels overlooks important heterogeneities. This seems to be the case for Germany, where a historically persistent ethnic segregation is documented in the literature (see, e.g., Glitz, 2014). Furthermore, our granular data show an uneven distribution of refugees within counties and municipalities.[4]

In this paper, we investigate the relationship between refugee inflows and far-right votes in Germany on a highly granular level. We collect and exploit data on small-scale election results from the federal election in 2017 combined with socio-economic and demographic characteristics on 1km x 1km grid cell level. Using this unique small-scale data allows us to analyze the impact of refugee inflows into the immediate neighborhood on far-right voting. Different to existing studies on this issue, we do not only account for an uneven geographic distribution of refugees within counties or municipalities, but exploit the considerable intra-county variation at the 1km x 1km grid cell level. Based on this small-scale analysis we are able to test the validity of the contact hypothesis by Allport et al. (1954). We further analyze the effect of inflows at the county (NUTS 3) level. Using this aggregated scale, our results are comparable with previous findings of the literature. Additionally, voters can perceive refugees not only if they move into the same neighborhood, but also when refugees locate in the same county. Due to the increasing coverage of local media (Steinmayr, 2021), refugees are perceived even if they do not live in the immediate vicinity. The relationship at this scale is potentially driven by other mechanisms than the contact at the neighborhood level. At this more aggregated level, it could be the fear of economic loss or changes in local policies.

The institutional setting for the allocation of refugees in Germany eases worries of sorting to some extent. During the official asylum process, refugees have to stay within a predefined area which mainly corresponds to the respective county. Depending on the different federal states' law, refugees who have completed the asylum process, however, were allowed to change residence within the federal state, county, or municipality. We alleviate remaining endogeneity concerns by constructing an instrumental variable approach based on the assumption that refugees settle in regions where there are more migrants from the same source countries/regions (see Altonji and Card, 1991; Card, 2001). While there is an extensive literature using past settlements to predict current immigration shocks (e.g., Otto and Steinhardt, 2014; Barone et al., 2016; Halla et al., 2017; Mayda et al., 2022), in recent years, criticism on this method appeared (Jaeger et al., 2018; Clemens and Hunt, 2019), inter alia, because long-term effects of past immigration might be confounded with the short-term effects of current immigration. We argue that the method is reliable in our context because the share of immigrants from today's typical refugee countries was not large

[4]The dissimilarity index for the segregation of residents from typical refugee countries on the county level ranges between 0.08 and 0.35 (with a mean of 0.21) in our estimation sample.

enough to influence the majority society before 2014, while being large enough to constitute ethnic networks, at least in West Germany, such that the instrument is not weak.

Our results indicate that the spatial scale matters: While we find no robust effect of the county level, the inflow of refugees within a neighborhood (1km x 1km grid cell) has a negative effect on the support for the AfD in West Germany. This effect already fades out at the 3km x 3km grid cell level. We show that this relationship is driven by urban counties, while we find no robust significant relationship in rural counties. These findings suggest that in urban West Germany the contact theory seems to be valid, i. e., high inflow rates within the own neighborhood are assumed to facilitate contact of natives with refugees and to foster tolerance which, in turn, leads to lower AfD vote shares. Using the share of bohemians to proxy a county´s openness, we find a stronger negative effect of refugee inflow on AfD support in more open counties. Heterogeneity analyses show that the negative relationship is the largest in regions with high unemployment rates. Heterogeneity analyses show that the negative relationship is greatest in regions with high unemployment rates. This suggests that even in economically weak areas, the influx of refugees is not perceived as an economic threat. In East Germany, we find very large but imprecisely estimated coefficients leading to an insignificant relationship between the inflow of refugees and voting for the AfD.

We contribute to the literature on the effects of refugees on the far-right voting behavior along three dimensions. First, existing studies investigate the impact of refugees on a relatively high level of aggregation. Therefore, they cannot account for direct exposure of natives to refugees in the immediate neighborhood. One exception is the paper by Kretschmer and Kruse (2020) analyzing immediate neighborhood effects on attitudes, concluding that the share of refugees in the neighborhood influences German adolescents' attitudes whether immigrants should adopt to the German society. Second, we contribute to studies which demonstrate that the relationship between immigrants or ethnic minorities and far-right voting can vary across spatial scales (Della Posta, 2013; Janssen et al., 2019; Vasilopoulos et al., 2021). Third, we investigate differences between urban and rural areas. Urban-rural gaps with respect to the impact of immigration on far-right parties are well known in the literature. Harteveld et al. (2021) show that immigration is an important factor for far-right support in urban areas, whereas immigration cannot explain the variation in the voting behavior in favor of the far-right across rural areas. By contrast, Barone et al. (2016) and Dustmann et al. (2019) examine heterogeneities with respect to urbanity and find that the positive effect is driven by small municipalities, while the effect is smaller or even reversed in urban areas. Our results support the latter by underlining that the negative effect at the neighborhood level in West Germany seems to be driven by urban areas.

While this work analyzes the voting behavior in favor of a far-right party in the aftermath of the large refugee inflow in 2015, several studies investigate the relationship between immigration and

far-right voting before the immigration shock of 2015. Those studies mostly reveal a positive effect which is persistent across different Western European countries, e.g., Otto and Steinhardt (2014) for Germany (Hamburg), Barone et al. (2016) for Italy, Halla et al. (2017) for Austria, Harmon (2017) and Dustmann et al. (2019) for Denmark, and Roupakias and Chletsos (2020) for Greece.[5] Evidence for effects of the recent inflow of refugees on far-right voting also points in the direction of a positive relationship in European countries (see Dinas et al. (2019) for Greece, Edo et al. (2019) for France, Campo et al. (2021) for Italy). Bredtmann (2020) and Kellermann and Winter (2021) show positive effects of refugees on far-right voting. Interestingly, the positive effect in Bredtmann (2020) is driven by refugees living in centralized accommodations. In contrast, Steinmayr (2021) finds evidence for the contact theory in Austria, i. e., that the interaction between asylum seekers and natives reduces far right votes. Studies that investigate a longer time period including the immigration shock in 2015 – as Tomberg et al. (2021) for Germany between 1998 and 2017 and Edo et al. (2019) for France between 1988 and 2017 – show positive effects of asylum seekers or of immigrants on far-right voting, respectively. In line with our insignificant results in rural areas, other studies also find no effect of refugees on far-right vote shares in different German areas (see e.g., Gehrsitz and Ungerer (2017) for Baden Wurttemberg, Rhineland-Palatinate, and Saxony-Anhalt and Schaub et al. (2021) for rural East German municipalities).

The paper is structured as follows: Section 2 describes the data set. Section 3 explains the estimation strategy. Section 4 reports our results, while Section 5 shows results for different parties, discusses possible transmission channels, and presents robustness checks of our regressions. Section 6 concludes.

2 Data and Institutional Setting

The rise of the far-right party AfD in the aftermath of the large refugee inflow into Germany in 2015 and 2016 was unique in German history since World War II. This section highlights the institutional settings of refugee allocation within Germany and describes the success of the AfD. Furthermore, we describe the data used. We combine different data sets for our analysis: data on voting behavior, data on refugee inflows, neighborhood characteristics and, finally, an indicator of urbanity.

[5] In contrast to the studies identifying a positive effect, Dill (2013) finds evidence for Germany, which rather supports Allport et al. (1954)'s contact theory and indicates a negative relationship between foreigners and far-right voting in the period before the large refugee inflow in 2015.

Refugee Inflow

Europe and especially Germany experienced a large inflow of refugees in 2015 and 2016.[6] To allocate the refugees to different regions, they are first assigned to one of the 16 federal states by predefined quotas (Königsteiner Schlüssel). Within the federal states they were assigned to reception facilities. Each state has different rules for the distribution across counties. As long as refugees are within the asylum process, they have a domicile requirement which means that they have to stay within a predefined area. After asylum has been granted, the federal states[7] regulate the place of residence within the framework of the integration act (Integrationsgesetz, 2016). In some states they must reside within the federal state, in some within the county and in some regions within the municipality.[8] In 2017, refugees could still be in the asylum process, but those who had already been granted political asylum were allowed to change their residence and dependent on the federal state's law also their county.[9]

For information on the refugee inflow and neighborhood characteristics we use the RWI-GEO-GRID data (RWI and microm, 2020). This data set covers aggregate information for all Germany on the 1km x 1km grid cell level. The definition of grid cells follows the European INSPIRE regulation. We construct the (net) inflow rate of refugees by the difference in the number of residents from typical refugee countries (non-European Islamic and African states) between 2017 and 2014 divided by the respective total local population in 2014. The information on the migration background in the RWI-GEO-GRID data is originally provided by the microm GmbH.[10] Residents from foreign countries cannot be distinguished by every origin country but by language groups. One group is non-European Islamic states which includes Northern Africa, Middle East, Iran, Pakistan, and Muslims of Southeast Asia. This group covers most refugees in the years prior to the election. e.g., in 2015 and 2016 Syria (424,907 asylum seekers), Afghanistan (158,394), Iraq (125,900), and Iran (31,814) were the main origin countries of asylum seekers.[11] Their share is about 64% of all asylum seekers during 2015 and 2016. The second biggest origin group of asylum seekers are

[6]The number of asylum applications in Germany more than tripled in 2016 compared to 2014. Total asylum applications in 2016 (almost 750,000) also exceeded the figures in 1992 (430,000), which were the peak in asylum applications to date (Federal Office for Migration and Refugees, 2017).

[7]See asyl.net for details regarding the implementation in the different federal states.

[8]Exceptions are possible for taking up a job, education etc.

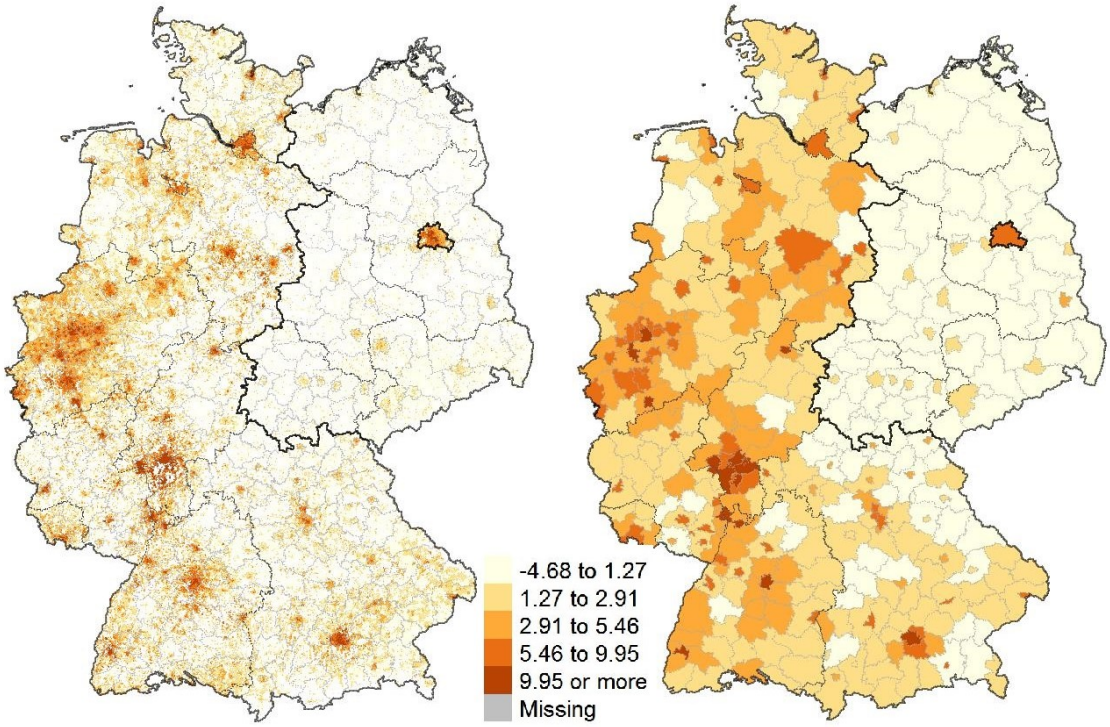
[9]The mean duration of the asylum process was 5, 7, 11 and 8 months in 2015, 2016, 2017, and 2018, respectively (Federal Government 2017).

[10]microm GmbH calculates the share of residents by analyzing the family names of the cardholders of debit and credit cards. Refugees are very likely to be captured by this process, because since 2016 every legal resident in Germany has the right to open a bank account. This measure was especially directed at asylum seekers and homeless people (Bundesregierung. 2016. https://www.bundesregierung.de/breg-de/aktuelles/jeder-hat-das-recht-auf-ein-konto-321068. 09.09.2021).

[11]BAMF. Das Bundesamt in Zahlen 2016. Asyl, Migration und Integration: Nürnberg: Bundesamt für Migration und Flüchtlinge, 2017. https://www.bamf.de/SharedDocs/Anlagen/DE/Statistik/BundesamtinZahlen/bundesamt-in-zahlen-2016.pdf (21.07.2021). & BAMF. Das Bundesamt in Zahlen 2016. Asyl, Migration und Integration: Nürnberg: Bundesamt für Migration und Flüchtlinge, 2016.https://www.bamf.de/SharedDocs/Anlagen/DE/Statistik/BundesamtinZahlen/bundesamt-in-zahlen-2015.pdf (21.07.2021).

migrants from African countries[12]. Hence, we define people stemming from non-European Islamic and African countries as refugees. A comparison of our figures with official refugee statistics at the county level shows a very high degree of congruence (correlation coefficient above 0.94).[13]

Figure 1: Change of Population from Main Refugee Source Countries at the Grid Cell (Left Map) and County (Right Map) Level (2014-2017)



Notes: Population changes are measured as the share of all residents in 2014 within the 1km x 1km/county in percent. The map on grid cell level is based on a sample of populated grid cells. Source: Own calculations based on RWI-GEO-GRID (© GeoBasis-DE / BKG 2020)

Table 1 shows that there is a higher inflow rate of refugees in West Germany (2.3%), than in East Germany (0.6%). This is also illustrated in Figure 1, where the inflow rate at the grid and county level is shown in the left and right panels, respectively. The maps indicate, that there exists a large variation between East and West Germany, across counties but also within counties on grid cell level. The standard deviation of the county level inflow rate ranges from 0.38% in East to 2.06% in West Germany, while the standard deviation of refugee inflows on grid cell level is 0.62% and 2.33% in East and West Germany. However, within county variation is not negligible. In West Germany, the between county standard deviation is 2.53% and the within county standard deviation amounts to 1.56%. The corresponding numbers of East Germany are 0.51% and 0.53%. We capture the variation of refugee inflows on both spatial scales, the grid cell and county level, in order to account for potentially different mechanisms how refugee inflows affect the voting

[12]African asylum seeker came mainly from Eritrea (29,730) and Nigeria (17,916).
[13]For a visual check, see Figure A1.

behavior.

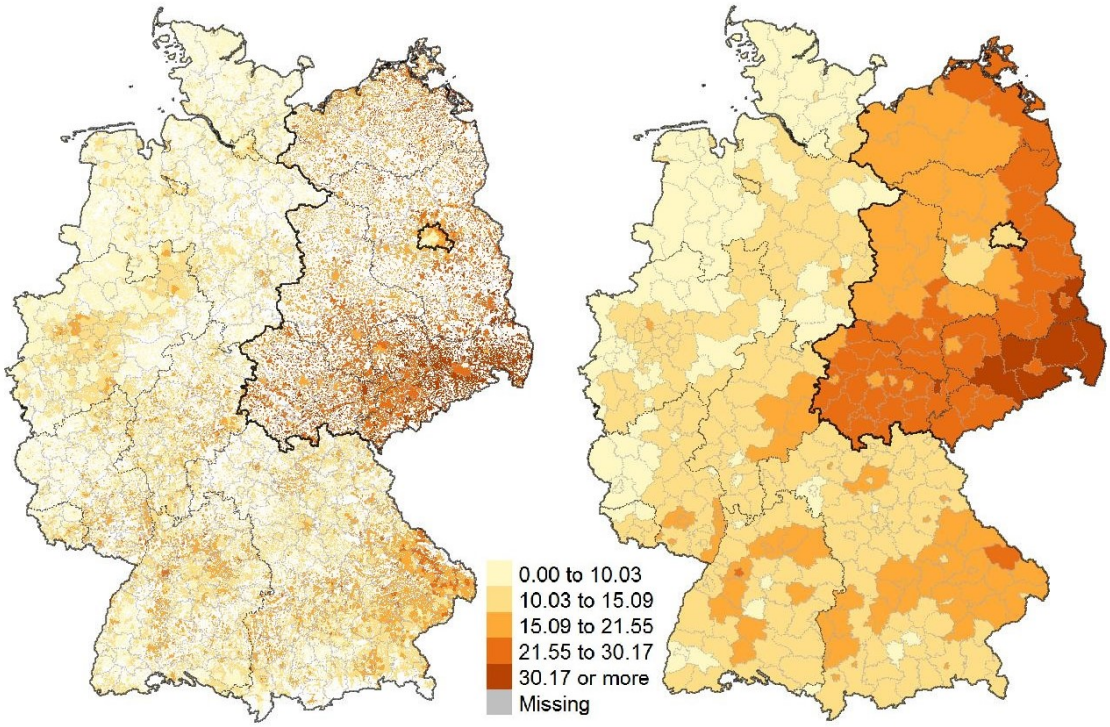
German Federal Election in 2017

In the 2017 federal election, the AfD became the first far-right party which entered the German federal parliament since the second World War and represented the third biggest parliamentary group. While the AfD started as a Euro-critical and economically liberal party, it has become a mainly anti-immigrant party (Schmitt-Beck, 2017; Heckmann, 2016). Especially since 2015, when the inflow of refugees to Germany sharply increased, the AfD opposed the open border policy of the German federal government and demonized the incoming refugees.

To analyse support for the far-right party AfD on a spatially small scale, we build a data set with election results at the 1km x 1km grid cell level for the German federal election in 2017. The head of the electoral management body (Bundeswahlleiter) provides information on election results on electoral district level (Wahlbezirk, smallest regional unit). Unfortunately, the data do neither cover information on the geography of the electoral district nor of the polling station. Hence, we searched for the locations of polling stations and geometries of electoral districts on the websites of the municipalities or information directly provided by the municipality. Based on the assumption that the polling station is the closest to each grid cell within an electoral constituency, we generate a comprehensive small-scale (1km x 1km) data set of the federal election 2017. Thereby, we combine information on the shape of all constituencies, geometries of electoral districts if available and the location of the polling station if geometries are not available. We exclude postal votes as these are collected on a higher spatial scale. Table A1 shows that the aggregated election results from our data match closely the official ones. We describe our exact procedure in the Appendix 7.2. The final data set RWI-GEO-VOTE (Fremerey et al., 2021) is a data set that will be available through the FDZ Ruhr.

Figure 2 illustrates the election results of the AfD on the small-scale level and on the more aggregated county level in the left and right panel, respectively. The clearest pattern is that AfD voting is higher in East Germany than in West Germany. In addition, the grid cell level map shows substantive variation within counties. The differences in levels of vote shares for the AfD between East and West Germany are shown in Table 1. The mean grid cell vote share for the AfD is about 11.6% and 24.8% in West and East Germany, respectively. Our granular data allow us to exploit the considerable within county variation of AfD vote shares. The between standard deviation is 3.02% and the within standard deviation is 2.5% in West Germany. The corresponding standard deviations for East Germany are 4.96% and 3.95%.

Figure 2: Federal Election results at the Grid Cell (Left Map) and County (Right Map) Level for the AfD (in%) in 2017



Notes: The map on grid cell level is based on a sample of populated grid cells. Source: Own calculations based on RWI-GEO-VOTE; (© GeoBasis-DE / BKG 2020)

Additional characteristics

Table 1 reports summary statistics of the main variables of interest as well as additional control variables at the grid cell level, which we later use to control for potential confounders. Since East and West Germany differ in many dimensions, we expect the effect of refugee inflow on AfD support to differ between the two regions. Overall, East and West Germany experienced different political, economic and societal systems after the second World War. The West German economic upswing was accompanied by an immigration of many "Guest-workers", especially from Italy and Turkey. The immigration of Turks has meant that West Germans have had increased contact with Islam for about 50 years. Whereas in East Germany, there were fewer "Guest-workers" and the few immigrants mainly came from non-Islamic countries like Vietnam and Cuba (Münz et al., 1999). Furthermore, state-regulated policies regarding refugees and immigration showed more segregative than integrative tendencies in East Germany (Bade et al., 2004). Hence, contact with foreigners and the religion of most of the refugees in 2015 and 2016 was more familiar in West than in East Germany. Although Germany has been reunited for 25 years in 2015, West and East Germany are still different in most socio-economic indicators. As Table 1 indicates, the grid cell level unemployment rate in West Germany is on average more than 4 percentage points lower than

in East Germany in 2014. The ageing of the population is also more pronounced in the East: The share of the elderly (above 60) is almost 4 percentage points higher in East than in West Germany, while the share of the younger population (18 to 35) is about 2 percentage points lower. These persistent differences in economic prosperity and demography may also lead to differential effects of refugee inflow on support for far-right parties, as racial threats might be more pronounced in East Germany.

The full set of covariates in our regressions include the number of residents, the composition of residents by age and gender, the unemployment rate, average purchasing power and the share of households with a high credit default risk in 2014 as well as the net inflow of other ethnic groups between 2011 and 2014 at the grid cell level and a factor variable of the degree of urbanity of the respective county[14]. This classification divides the German counties into four categories: very urban (cities with at least 100,000 residents that constitute an independent county), urban, rural (rural counties with some denser parts) and very rural counties. Additionally, we compute a rent index on the grid cell level to account for the local housing market[15], as housing prices might determine both the location decision of refugees and xenophobic natives. To exclude the possibility that the covariates are themselves outcomes of the refugee inflow, we take lagged values for all controls: stock variables 2014 and change of migrant shares between 2011 and 2014.

[14]We apply the classification of counties into four categories by the Federal Institute on Building, Urban Affairs and Spatial Development (BBSR) (siedlungsstrukturelle Kreistypen; https://www.bbsr.bund.de/BBSR/DE/forschung/raumbeobachtung/Raumabgrenzungen/deutschland/kreise/siedlungsstrukturelle-kreistypen/kreistypen.html).

[15]The index is constructed by the mean of residuals on grid cell level of a hedonic price function on log rents per square meter using a rich set of characteristics. Characteristics include the number of rooms, the construction year, an indicator of the level of equipment and urbanity, and dummies whether it is a house (as opposed to apartments) and for first occupancy, as well as respective dummies for the existence of balcony, garden, fitted kitchen, guest toilet, and cellar. Further, because of many incomplete ads, for each covariate there is a corresponding dummy which is one if the information is missing. Information stems from the data set RWI-GEO-RED (RWI Real Estate Data (Scientific Use File) - apartments for rent. DOI: 10.7807/immo:red:wm:suf:v5). The data set covers the universe of rent ads from the internet platform ImmobilienScout24, which is the largest internet platform for both private and commercial providers of housing ads in Germany (Schaffner, 2020).

	West		East	
	Mean	St. Dev.	Mean	St. Dev.
AfD vote share	11.74	3.91	24.97	6.68
Inflow refugees (Grid)	2.46	2.42	0.62	0.63
Inflow refugees (County)	2.96	2.17	0.71	0.42
Immigration from Turkey (per 100,000) 2014-2011	3.56	312.86	-0.71	76.45
Immigration from South EU (per 100,000) 2014-2011	2.56	197.07	-2.58	309.25
Immigration from East EU (per 100,000) 2014-2011	2.69	176.69	-0.54	196.32
Immigration from Aisa (per 100,000) 2014-2011	0.24	17.22	-0.98	92.27
Other immigration (per 100,000) 2014-2011	1.83	222.80	-1.61	358.39
Share males younger 18 (in %) 2014	8.98	1.12	7.44	1.37
Share males 18-35 (in %) 2014	9.57	1.63	8.62	1.69
Share males 35-60 (in %) 2014	18.84	1.35	19.98	2.13
Share males older 60 (in %) 2014	12.03	1.88	13.63	2.11
Share females younger 18 (in %) 2014	8.53	1.09	7.04	1.34
Share females 18-35 (in %) 2014	9.46	1.64	8.51	1.70
Share females 35-60 (in %) 2014	18.86	1.38	19.67	2.15
Share females older 60 (in %) 2014	14.44	2.49	17.07	3.11
Children (mean per hh) 2014	0.31	0.10	0.24	0.10
Singles (in % hh) 2014	28.34	19.43	31.38	27.04
Families (in % hh) 2014	40.34	26.16	24.41	27.39
Couples (in % hh) 2014	31.32	20.92	44.20	28.73
Log purchasing power per capita 2014	9.99	0.14	9.84	0.11
Population (in 1,000) 2014	619.12	1271.42	409.06	902.74
Unemployment rate (in %) 2014	4.06	2.79	8.12	3.45
High credit default risk (in % hh) 2014	9.25	15.46	13.53	20.58
Rent index	-0.11	0.20	-0.12	0.17
Very urban counties	0.08	0.27	0.05	0.21
Urban counties	0.44	0.50	0.07	0.26
Rural counties	0.26	0.44	0.38	0.49
Very rural counties	0.22	0.42	0.50	0.50
Observations	108279		28518	

Notes: Own calculations based on RWI-GEO-GRID and RWI-GEO-VOTE. The refugee inflow rates are the net inflow rates between 2014 and 2017 in relation to total population in 2014. The immigration from other countries is the inflow rate between 2011 and 2014 in relation to total population in 2011. The shares of females and males in different age categories correspond to the share with respect to the total population. The shares of males and females younger than 18 years and single households are omitted, as we define these variables as reference categories.

Table 1: Descriptive Statistics of the Estimation Sample (observation unit is the grid cell level)

3 Estimation Strategy

The aim of the paper is to analyze the effect of refugee inflows on voting for the far-right party AfD in Germany (AfD_{ics}). As indicated in the previous section, we expect that the large differences between East and West Germany are also reflected in a different relationship between refugee inflow rate and AfD vote shares. Therefore, we run regressions for West and East Germany separately.[16] The equation below shows our regression model for the election results AfD_{ics} in the direct neighborhood i (1km x 1km grid cell) in county c and federal state s:

$$AfD_{ics} = \alpha + \beta_1 \Delta R_i + \beta_2 \Delta R_c + X_i' \gamma + \theta Z_s + \phi U_c + \epsilon_{ics} \tag{1}$$

where the refugee inflow rate in the 1km x 1km grid cell is notated by ΔR_i, and the county level inflow by ΔR_c. We estimate the regressions corresponding to Equation (1) in three different ways. First, we only include the grid cell level inflow rate. In a second specification, we only consider the county level inflow rate and third, we include both inflow rates simultaneously, as Equation (1) indicates. When including the inflow rates of both spatial scales simultaneously, we compute a leave-one-out variant of the county level inflow rate. It is defined as the inflow rate within the county without the corresponding grid cell. We control for neighborhood characteristics X_i, degree of county urbanity U_c and federal state fixed effects Z_s. Since refugee allocation rules determined the refugee inflow mainly at the county level, standard errors might be correlated at this level. Therefore, we cluster standard errors at the county level.[17] Including both inflow rates as explanatory variables allows us to simultaneously control for both regional scales and infer which scale is decisive in terms of magnitude. We also run different specifications, where we include the grid cell and county level inflow rates separately.[18]

When estimating the effect of the refugee inflow rates on voting in favor of a far-right party by OLS regressions of the discussed variants of Equation (1), concerns of endogeneity arise. First, within the predefined area during a refugee process, refugees could avoid moving into regions which are characterized by strong anti-immigrant sentiments (see Section 2). This can lead to a downward bias. Second, a downward bias can also arise due to residents with an anti-immigrant attitude sorting into areas where neighbors share their attitudes and into areas with a low share of

[16] Regression results of the joint specification are reported in Table A4 in the Appendix.

[17] In total, Germany has 401 counties. Thereof, 325 counties are located in West Germany, while there are 76 counties in East Germany. East Germany has 15 urban counties, and 61 rural counties. Therefore, we refer to p-values from a wild cluster bootstrap when investigating the heterogeneity across urbanity in East Germany. West Germany has 183 urban counties and 142 rural counties, hence bootstrapping is not necessary for the West German sample.

[18] We refrain from analyzing the municipality level because municipalities are not comparable administrative units. There are more than 200 municipalities with a population below 100 in 2017, while on the other extreme urban municipalities often constitute their own county or even federal state like in the case of Hamburg and Berlin.

foreigners. However, endogenous sorting of natives seems unlikely, as Halla et al. (2017) find no evidence that natives move due to the inflow of immigrants. Overall, the German moving rate is quite low and out-migration of xenophobic natives would imply an increase in the German moving rate c.p. However, we observe a decrease.[19] Further, allocation of refugees was rather exogenous in first place (see Section 2). Some studies leverage the allocation of asylum seekers as a possible source of exogenous variation, see e.g., Gehrsitz and Ungerer (2017) and Dehos (2021). Since refugees were allowed to choose their location within a county after their asylum process was granted, we implement a shift-share instrumental variable approach as a strategy to account for the remaining concerns regarding the endogenous location of refugees.

It is well-established that immigrants tend to locate in ethnic enclaves in the receiving country to benefit from ethnic networks (Bartel, 1989; Zimmermann, 1996; Bauer et al., 2002; Munshi, 2003). This inspired Altonji and Card (1991) and Card (2001) to use past settlement shares of immigrants to instrument for recent immigrant inflows. Afterwards, this methodology has been widely used in the migration literature (see for instance, Dustmann et al., 2005; Saiz, 2007; Gonzalez and Ortega, 2011; Bianchi et al., 2012; Tabellini, 2020; Mayda et al., 2022). Correspondingly, we use the share of people from nowadays typical refugee countries in 2005 to predict the refugee inflow rate between 2017 and 2014 at the respective spatial scales.

The IV strategy mainly depends on three assumptions, namely relevance, the exclusion restriction, and the independence assumption to identify the local average treatment effect.[20] First, the relevance assumption requires that the possibly endogenous variable, the inflow rate, and the instrument, the share of people from African and Islamic countries in 2005, are correlated. Derived from the ethnic network literature we expect a positive effect of the past settlement on the current refugee inflow rate. Second, the exclusion restriction claims that the past settlement shares and the outcome are only correlated through one single channel, which is the refugee inflow between 2017 and 2014. Finally, the independence assumption requires the instrument to be independent of the potential outcomes and treatment assignments. It is very plausible that this condition holds since the voting outcome in 2017 is highly unlikely to influence past settlements of refugees in 2005.

Figure 3 shows that enclaves of African and Islamic minorities already existed in 2005. While this is necessary for the correlation of past settlements and the inflow between 2014 and 2017, the illustrated regional distribution reveals that the share of the minorities in most of East Germany is essentially zero. Also, in West Germany, enclaves strongly concentrate in urban areas. Table A2 gives a more detailed picture of the realizations of the instrument in the total sample and by urbanity. In the rural counties[21] of East Germany, 81% of populated grid cells have a

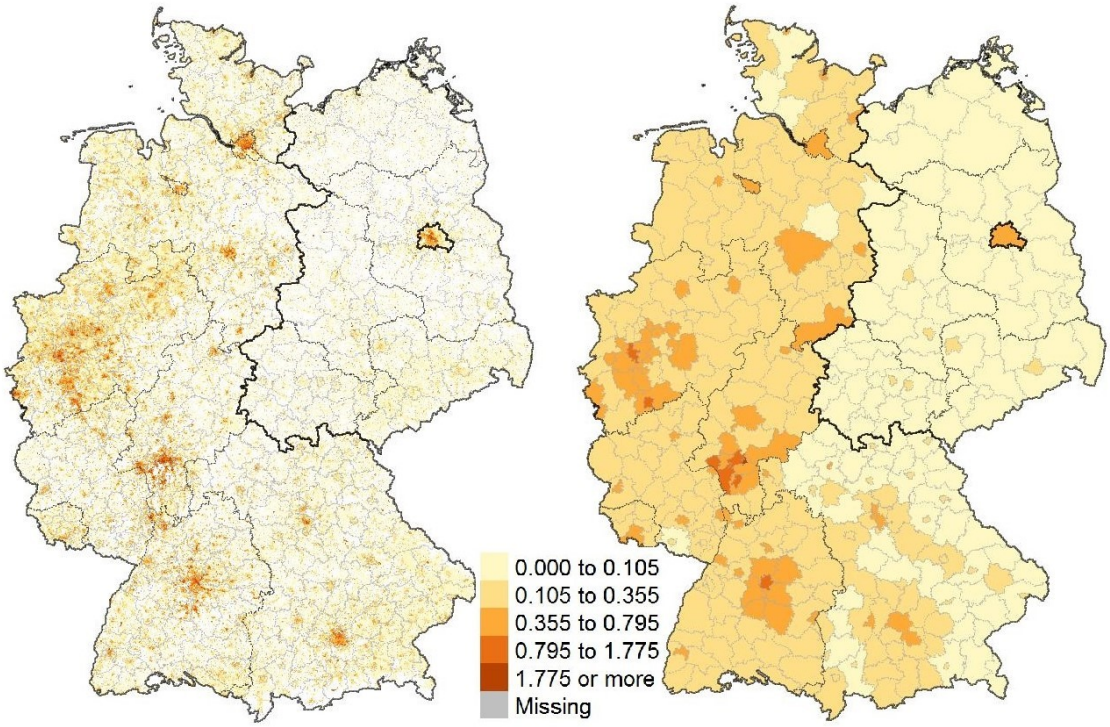
[19] The German moving rate in 2017 was 8.8%, and with that, the first time below 9% (techem, 2018).

[20] Thereby, we measure the effect for those grid cells that react in the expected way to the instrument, i.e. regions with a non-zero share of people from African and Islamic countries in 2005 receiving a positive inflow of refugees from these countries between 2014 and 2017.

[21] To increase the sample size of each category of urbanity and to have more comparable groups in term of size, we

past settlement share of zero. Even in East German urban areas, this figure drops to just 59%, suggesting that the instrument will most likely fail to predict the inflow in East Germany. While rural-urban differences are similar in West Germany, the number of observations with positive shares of minorities is higher in both rural and urban counties than in the corresponding East German counties. This suggests that, if the expected channel exists, the instrument is reliable only in the West German sample.

Figure 3: Distribution of the instrumental variables: Share of residents from refugee countries in 2005 at the Grid Cell (Left Map) and County (Right Map) Level



Notes: Residents are measured as the share of all residents within the 1km x 1km/county in percent. The map on grid cell level is based on a sample of populated grid cells. Source: Own calculations based on RWI-GEO-GRID (© GeoBasis-DE / BKG 2020)

To further illustrate the relationship between the past settlement shares and the net inflow rate between 2014 and 2017, Figure 4 plots the inflow rate on the grid cell and county level in Panel A and B, respectively, against the respective 2005 refugee share for West and East Germany. For better visibility, we add a linear fit conditional on federal state fixed effects. This reveals a strong and positive correlation in West Germany and a close to zero correlation in East Germany on the grid cell level. On the county level the coefficient more than doubles in West Germany and is even higher in East Germany, indicating that the past settlement patterns predict very strongly the inflow rates at the county level. Hence, the first stage for the grid cell inflow provides robust results only in West Germany, whereas the county inflow can be instrumented for both

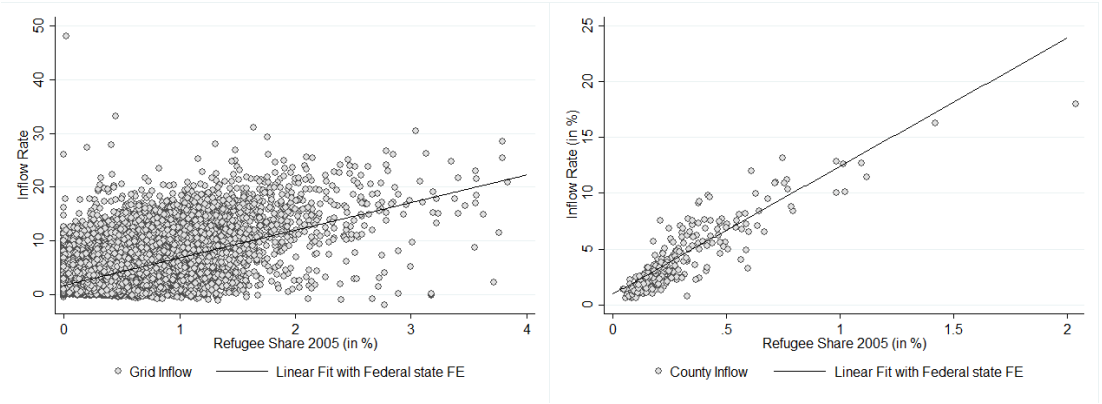
refrain from using the urbanity indicator with four realizations and use the binary indicator of urban and rural counties.

regions. Therefore, we instrument the grid cell and the county level inflow rate of refugees in West Germany, while we instrument only the county level inflow rate of refugees in East Germany and include the grid cell level inflow as covariate in the IV regressions.

Figure 4: Spatial correlation between refugee share in 2005 and refugee inflow

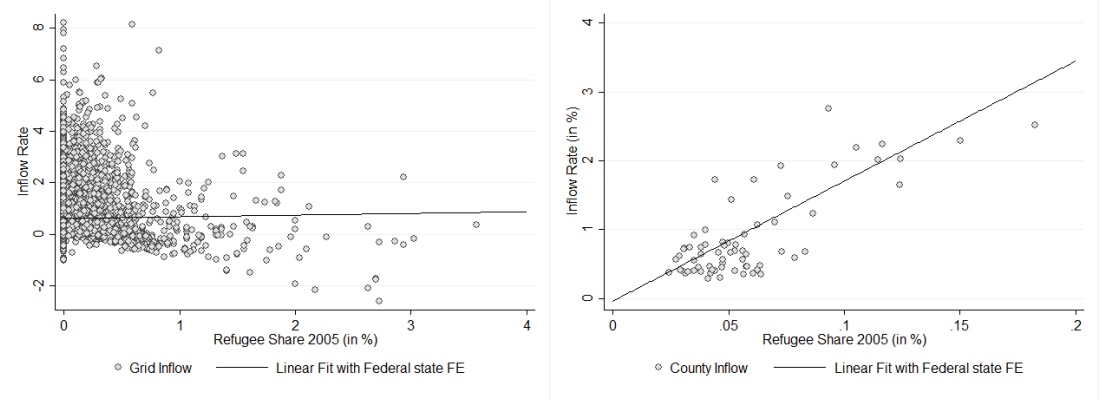
(a) West Germany - Grid Cell Level
Slope (se): 5.145 (0.307)

(b) West Germany - County Level
Slope (se): 11.469 (0.867)



(c) East Germany - Grid Cell
Slope (se): 0.065 (0.131)

(d) East Germany - County Level
Slope (se): 17.427 (1.331)



Notes: These figures present the spatial correlations between refugee shares in 2005 –the instrument applied–and the refugee inflow between 2014 and 2017– our variable of interest–for East and West Germany, separately. Figure (a) and (c) rely on the grid cell level, while figure (b) and (d) show the correlation on the county level. The slope coefficients including state fixed effects and the respective standard errors (in parentheses) are indicated below the titles. Source: Own calculations based on RWI-GEO-GRID.

The shift-share instrument fulfils the exclusion restriction if the correlation of the past settlements of migrants from refugee countries on the AfD's election outcome is only driven through the current refugee inflow rate. Doubts on this assumptions has appeared in recent years (e.g., Jaeger et al., 2018). One of Jaeger et al.'s main concerns is that long-term effects of past immigration might be confused with the short-term effects of current immigration violating the exclusion assumption. Since this assumption is, in contrast to the relevance condition, not directly testable, our argumentation is twofold.

First, typical refugee origin countries from the 2014 to 2017 inflow accounted for only a very small share of immigrants in Germany before 2014[22], which is why we do not expect large effects of previous immigration from African and Islamic countries on AfD election outcomes. We strengthen this argument of no long-term effects of the past settlement pattern by running placebo regressions. For this purpose, we look at the effect of the inflow rate between 2014 and 2017 on the AfD result in the federal election of 2013. Since election results from the federal election in 2013 are only available at the municipality level, we aggregate the specifications from Equation (1) to the municipality level where we exclude the county inflow rate as there are several municipalities that constitute a county of their own. Apart from this, we use the same specification on the right hand side of the regression. As outcome variables we use not only the AfD vote share, but also the NPD vote share of the federal election in 2013. The NPD is an ideological descendant of the National Socialist German Workers' Party's (NSDAP) (Mudde, 1995). We include it in the placebo regressions because it might capture xenophobic reactions to past immigration better than the AfD of 2013, because the AfD at that time was more of a single-issue party focused on opposition to the euro (Schmitt-Beck, 2014).

Regression results presented in Table A3 indicate no statistically significant effect of the inflow rate on neither the AfD nor the NPD election result in 2013. This is true for both OLS and IV regressions results in West and East Germany. Note that the large IV coefficients of the municipality level inflow rate in East Germany are likely to be driven by the weak first stage (the F statistic equals 0.04). These results provide suggestive evidence that we do not capture the effect of past settlement patterns. Second, we use a rich set of covariates controlling for other possible channels driving the effect of the past settlement of refugees on AfD voting outcome. Since we control for economic conditions (like the unemployment rate, credit default risk, income) and demographic characteristics (such as age, gender and family status) we are confident to capture other major channels.[23]

[22]The average share of persons from Islamic and African countries across all grid cells was 0.15% in West and 0.04% in East Germany in 2005.

[23]Another channel that could drive potential reverse causation are historical attitudes leading to a lower refugee inflow. However, Cantoni et al. (2019) show that the correlation between historical NSDAP vote shares and refugee shares nowadays is, though negative, quantitatively very small (correlation coefficient, conditional on state fixed effects: -0.09).

4 Results

Table 2 shows our results for West Germany in the upper panel and East Germany in the bottom panel. Columns one to three report OLS estimation results, with the inflow rate on grid cell, county, and both levels jointly. This pattern is repeated in columns four to six in the IV setting, where the inflow rate between 2014 and 2017 is instrumented with the settlement shares of residents from typical refugee countries in 2005 on the corresponding regional level. All specifications include state fixed effects and a full set of covariates for a year or period before the refugee inflow in 2015 (see Table 1). The OLS results in Table 2 of Panel A show that there is a negative relationship between the inflow rate on grid cell level on the voting for the AfD in West Germany, while there is no relationship between the county level inflow rate and AfD support.

The IV estimation of the coefficient of the grid level inflow provides both qualitatively identical and quantitatively similar results. This suggests that, as discussed in Section 2, refugees do not proactively avoid xenophobic neighborhoods. Also, for inflow at the county level, OLS and IV show qualitatively the same results, i. e., no statistically significant relationship. The negative effect of the inflow rate on grid cell level is robust against the inclusion of the instrumented county level inflow rate which itself does not have a statistically significant effect on AfD support. A one standard deviation (2.42) higher grid cell inflow rate leads to a reduction in AfD support by 0.5 percentage points when simultaneously controlling for the county level refugee inflow. The IV regressions rely on a strong instrument in the first stage, as indicated by the high F-statistics (larger than 100 in each specification). The estimated first stage coefficient of grid level settlement shares in 2005 for West Germany (column 4 of Table 2) of 2.82 suggests that a one standard deviation higher refugee share in 2005 (0.26; see Table A2 for detailed summary statistics of the instrument and the inflow rate) is associated with an about 0.73 percentage point higher inflow rate. The first stage coefficients on county level are even larger in magnitude, while the F-statistic is smaller but remains on a very high level (see columns five and six).

Table 2: OLS and IV Regression Results inflow refugees on AfD vote share

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Panel A: West Germany						
Inflow refugees	-0.127***		-0.148***	-0.145**		-0.206***
(Grid)	[0.035]		[0.028]	[0.061]		[0.073]
Inflow refugees		-0.041	0.063		0.054	0.186
(County)		[0.088]	[0.090]		[0.124]	[0.138]
Observations	108279	108279	108279	108279	108279	108279
Adjusted R^2	0.38	0.37	0.38	0.38	0.37	0.37
				1st Stage Results		
Kleibergen-Paap F				189.98	138.77	106.38
Refugee share 2005 (Grid)				2.82***		2.35***
				[0.205]		[0.165]
Refugee share 2005 (County)					7.74***	7.76***
					[0.657]	[0.668]
Panel B: East Germany						
Inflow refugees	0.009		-0.030	0.285		0.797
(Grid)	[0.246]		[0.127]	[2.617]		[0.646]
Inflow refugees		0.169	0.190		-3.339	-3.840
(County)		[1.041]	[1.039]		[3.039]	[3.378]
Observations	28518	28518	28518	28518	28518	28518
Adjusted R^2	0.51	0.51	0.51	0.51	0.49	0.49
				1st Stage Results		
Kleibergen-Paap F				1.12	20.62	22.05
Refugee share 2005 (Grid)				-0.09		
				[0.089]		
Refugee share 2005 (County)					8.55***	7.60***
					[1.88]	[1.61]

Notes: Robust clustered standard errors on county level are reported in brackets. Regressions include state fixed effects and full set of covariates.

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

Panel B of Table 2 shows the estimation result for the East German sample. The first stage results for the separate specifications for grid cell and county level inflow rates in columns (4) and (5) show that the instrument is strong enough only on the county level in this sub-sample. The coefficient of the past settlement pattern on the grid cell level is essentially zero and the F-statistic is 1.12 (see bottom panel column four).[24] We therefore abstain from further interpreting the IV results for East Germany on the grid cell level and do not instrument the grid cell level in the joint specification in column (6) of Table 2. Hence, in the joint specification of the inflow rates on grid cell and county level in column (6), only the inflow rate on county level is instrumented and the inflow on grid cell level is added as a covariate. This slightly decreases the first stage coefficient but increases the first stage's F-statistic between columns (5) and (6). OLS and IV regressions both

[24]The weak first stage on grid cell level in East Germany could be expected by the descriptive statistics and was already discussed in Section 3. There is too little variation of the instrumental variable in East Germany, as most of the grid cells have a refugee share of zero in 2005.

show no statistically significant relationship between AfD support and refugee inflow – neither on the grid cell nor on the county level. Though the IV estimation leads to large inflow coefficients on the county level, these are very imprecisely estimated.

As existing literature shows, there can be substantial differences between urban and rural areas regarding voting and attitudes towards immigrants (e.g., Barone et al., 2016; Dustmann et al., 2019). These studies suggest that the negative relationship between refugee inflow and far-right voting in West Germany is driven by urban areas, while it may not exist or even be reversed in rural areas. Hence, the insignificant effect in East Germany might hide opposing effects by degree of urbanity. Further, the negative effect in West Germany might be driven by only a subgroup of regions. We divide our two samples by urbanity[25]. Table 3 and Table 4 present the regression results for the sub-samples by urbanity for West and East Germany, respectively.

The OLS regression results in Panel A of Table 3 fit well with previous findings in the literature. The negative correlation between inflow rate at the grid cell level and far-right voting is negative and statistically significant only in urban areas (see columns (1) and (4)). Based on columns (3) and (5), where we include both inflow rates, there is a statistically significant negative relationship in both areas, though it is more pronounced in urban areas. All OLS coefficients of the county level inflow are statistically insignificant. The IV regressions overall mirror these findings. The estimated effect of the grid level inflow on AfD support for the West German urban sample is statistically significant and negative in both the separate and joint specification. In terms of magnitude the effect is slightly higher as in the total West German sample. Following column (1) of Panel B, an one standard deviation increase in the refugee inflow (2.87) leads to an decrease of 0.43 percentage points in the AfD vote share in urban counties in West Germany. In urban countries, the positive coefficient of the refugee inflow rate on county level becomes significant in the joint regression with the grid inflow rate (see columns (2) and (3)). In the IV regressions of the West German rural sub-sample, there is no statistically significant relationship between inflow rates and AfD support. Coefficients become positive and relatively large in magnitude, but are imprecisely estimated.

As opposed to the West German sample, Table 4 shows no robust evidence for heterogeneity by urbanity in the relationship between refugee inflow and far-right voting in East Germany. While we again observe large coefficients especially at the county level, they are statistically insignificant. For inference, we rely in this analysis on wild bootstrapped p-values because of the small number of counties in the East German sub-samples.

Overall, in West Germany, the contact to refugees in the direct neighborhood reduces AfD votes shares. This effect is driven by urban counties. There seems to be a positive effect of refugee

[25]We apply a binary indicator of urbanity following the classification of the federal office for construction and regional development planning (BBSR). This indicator corresponds to the four categories described in Table 1, but the two urban categories and the two rural categories are summarized into one category each.

inflow on AfD votes on the county level in urban West Germany, possibly picking up different policies at the county level or an increased media coverage that might reinforce fears of economic loss. In rural West German counties, we do not observe a significant relationship between refugee inflow rates and AfD support. In East Germany, we find no statistically significant relationship, we estimate large negative coefficients of the county level inflow rate with high imprecision. Furthermore, there is no evidence of heterogeneity by urbanity in the East German sample. The findings speak in favor of the validity of the contact theory in urban West Germany but not in East Germany or rural West Germany.

The results for West Germany replicate findings of Barone et al. (2016), Dustmann et al. (2019) and Harteveld et al. (2021) according to which immigration has heterogeneous effects on far-right voting by urbanity. Furthermore, we show like Della Posta (2013) and Janssen et al. (2019) that effects can be different depending on the investigated spatial scale. A major contrast is evident between East and West Germany. While AfD support is overall much stronger in East than in West Germany, we find no statistically significant relationship between refugee inflow in East Germany. One explanation for this deviation could be the discussed differences between East and West Germany with respect to their post-Second World War history and more recent economic development. Another explanation can lie in the different levels of refugee inflow in East and West Germany. The effect of refugee inflow is not necessarily linear. Hence, there might be a threshold of refugees that must be exceeded, such that, following Allport´s theory, contacts between the majority and minority population are realized and xenophobic sentiments are reduced. In Section 5.4 we investigate such non-linearities in more depth.

Table 3: OLS and IV results inflow refugees on AfD vote share by urbanity for West Germany

	Urban			Rural		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS						
Inflow refugees	-0.154***		-0.163***	-0.002		-0.076*
(Grid)	[0.035]		[0.034]	[0.073]		[0.042]
Inflow refugees		-0.075	0.030		0.185	0.241
(County)		[0.082]	[0.085]		[0.214]	[0.215]
Observations	56446	56446	56446	51833	51833	51833
Adjusted R^2	0.31	0.30	0.31	0.46	0.46	0.46
Panel B: IV						
Inflow refugees	-0.150**		-0.226***	0.281		0.319
(Grid)	[0.070]		[0.082]	[0.220]		[0.225]
Inflow refugees		0.122	0.255*		-0.069	-0.240
(County)		[0.134]	[0.150]		[0.333]	[0.340]
Observations	56446	56446	56446	51833	51833	51833
Adjusted R^2	0.12	0.11	0.12	0.05	0.06	0.05
			1^{st} Stage Results			
Kleibergen-Paap F	204.82	109.21	108.01	35.88	27.94	18.80
Refugee share 2005 (Grid)	3.17***		2.74***	0.946***		0.837***
	[0.222]		[0.195]	[0.157]		[0.145]
Refugee share 2005 (County)		7.19***	2.97***		8.98***	4.60***
		[0.688]	[0.474]		[1.70]	[1.18]

Notes: Robust clustered standard errors on county level are presented in brackets. Regressions include state fixed effects and full set of covariates.

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

Table 4: OLS and IV results inflow refugees on AfD vote share by urbanity for East Germany

	Urban			Rural		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: OLS						
Inflow refugees	-0.438		0.023	0.145		-0.077
(Grid)	(0.154)		(0.780)	(0.667)		(0.638)
Inflow refugees		-2.561	-2.575		1.030	1.086
(County)		(0.250)	(0.244)		(0.461)	(0.425)
Observations	3470	3470	3470	25048	25048	25048
Adjusted R^2	0.68	0.72	0.72	0.51	0.51	0.51
Panel B: IV						
Inflow refugees	0.342		0.156	0.468		0.933
(Grid)	(0.405)		(0.156)	(0.752)		(0.933)
Inflow refugees		-3.218	-3.316		-3.375	-3.866
(County)		(0.334)	(0.324)		(0.629)	(0.620)
Observations	3470	3470	3470	25048	25048	25048
Adjusted R^2	0.41	0.49	0.49	0.04	-0.01	-0.02
			1^{st} Stage Results			
Kleibergen-Paap F	0.66	29.57	28.11	10.34	5.79	6.69
Refugee share 2005 (Grid)	0.576			-0.18***		
	(0.725)			(0.003)		
Refugee share 2005 (County)		13.7**	13.0**		6.21**	5.57**
		(0.036)	(0.026)		(0.026)	(0.020)

Notes: P-values (in parentheses) come from a wild cluster bootstrap with clustering on county level (based on 999 replications). Regressions include state fixed effects and full set of covariates.

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

5 Contextual Discussion and Robustness of Results

5.1 Other parties

The results of the AfD are not independent from the results of all other parties and refugee inflow may also affect support for other parties. Therefore, we analyze the relationship between refugee inflow and vote shares also for all other parliamentary groups (i. e. Die Linke – socialists, Grüne – greens, SPD – social-democrats, Union – conservatives, FDP – liberals) and groups of extremist parties which are not part of the Bundestag (far-left and far-right parties), separately. We apply the same methods as implemented before but only change the outcome variable. The upper left and right side of Figure A2 present the OLS (Panel (a)) and IV (Panel (b)) results for the estimated coefficients for the inflow on grid cell and county level jointly for West Germany. The IV estimates reveal no other statistically significant negative coefficient of the inflow rate at the grid cell level than for the AfD. There is, however, a statistically significant positive effect of the county level inflow rate on the FDP vote share. For the grid cell level inflow rate, we find a positive effect on the vote shares of the Green party. The interpretation regarding the validity of the contact theory is different with respect to this party, because among the parties in the German national parliament, members of the Green Party show the least support for limiting immigration (Mader and Schoen, 2019). Hence, a positive effect of inflow rate on such a rather pro immigration party is further evidence in favour of the validity of the contact theory in West Germany.

The bottom part of Figure A2 shows the OLS and IV coefficients of the inflow rate on grid cell and county level of the joint specification for the East German sample in Panel (c) and (d), respectively. As before, grid cell inflow is not instrumented because of the weak instrument on this geographical level in East Germany. Hence, the only instrumented variables are the county level inflow rates in the right panel. The county inflow has a significant effect only on the Greens vote shares. Refugee inflow rates on the grid cell level seem rather unrelated to the voting behavior in East Germany, which might be driven by the low overall level of refugee inflow in East Germany.

5.2 Effect Heterogeneities

We observe differences in the analyzed relationship between urban and rural West German regions. However, heterogeneities exist not only between urban and rural regions, but potentially also across several other dimensions. We therefore divide the West and East German sample along the quartiles of other important socio-economic characteristics to test for additional heterogeneities. As the relationship between inflow rates and xenophobic voting might differ between economically prosperous and weak neighborhoods and depending on the age composition, we chose the unemployment rates and the share of residents aged older than 60 to construct quartiles on the

grid cell level. Especially the heterogeneity along unemployment rates is useful to test the validity of the contact theory in comparison to the racial threat theory. The latter suggests a positive relationship between refugee inflow and far-right voting because natives fear for their economic resources. This effect should be strongest in the economically weakest regions, as shown in Halla et al. (2017). Furthermore, we approximate the openness of a county with the Bohemian index to investigate whether the estimated relationship between far-right voting and refugee inflow is driven by some counties being characterized as tolerant. With this, we further check the validity of the contact theory, since it presupposes not only contacts, but contacts with a minimum of openness and friendliness as a necessary condition for the reduction of xenophobia. Hence, we expect the negative relationship between refugee inflow and far-right voting to be most pronounced in the most open counties.

Table A5 and Table A6 in the Appendix show the same specifications as in the main part but for quartile groups of the unemployment rate at the grid cell level for West and East Germany, respectively. In West Germany, the negative correlation on grid cell level persists in OLS estimations for all quartiles of the unemployment rate, while the county level effect is insignificantly related to AfD support (see Table A5). The magnitude of the correlation in areas with very high unemployment rates is comparable to the magnitude of the correlation in areas with lower unemployment rates. In contrast, the IV estimates do not show such a homogeneous pattern. Except for the joint specification in the second quartile (where the grid cell inflow and the county level inflow seem to balance each other), the only statistically significant effects of the grid cell inflow rate are found in the neighborhoods with the highest unemployment rates. Hence, we find no evidence that the racial threat theory explains voting behavior in West Germany. This would have suggested, that AfD support is highest in economically weak regions but our results suggest that the contact theory is most valid in the economically weakest regions. This result is not that surprising, as the meta-study by Sipma and Lubbers (2020) shows mixed results on this heterogeneity. In East Germany, we find no evidence of a statistically significant relationship in any unemployment quartile (see Table A6).

Table A7 and Table A8 repeat this heterogeneity analysis but group the West and East German sample according to the quartiles of the grid cell level shares of the population aged above 60. The OLS results show that in West Germany, the negative correlation on grid cell level can be observed in all types of regions. But it is most pronounced in the first quartile (i. e. lowest share of elderly) in terms of magnitude and the coefficient of the grid cell level inflow is only significant in the joint regression and smaller in magnitude in regions with a higher share of elderly (third and fourth quartile) (see Table A7). The IV estimations confirm the negative effect of the refugee inflow rate on grid cell level only for those regions with the lowest share of older residents. We do not find any significant IV effect of the refugee inflow on the county level on AfD support. These findings,

which suggest that the contact theory applies less to the elderly, are consistent with the results of younger generations having more socially liberal views on cultural topics than older generations, while the older generation's values are systematically over-represented in conventional elections due to their higher voter turnout (Norris and Inglehart, 2019). In East Germany, we again find no evidence of a statistically significant and robust relationship (see Table A8).

We closely follow Florida (2002) to calculate a Bohemian index for the share of bohemians within a region.[26] Table A9 shows OLS and IV regressions including the Bohemian index both without and with interactions with the grid cell level inflow rate. This is again repeated for West and East Germany separately in Panel A and B, respectively. Panel A shows across all specifications a negative coefficient of the non-interacted Bohemian index. This indicates that the Bohemian index captures the "open atmosphere" as the number of bohemians is too small for a pure composition effect. In columns two and four, we show the interaction with the Bohemian index and the refugee inflow at the grid cell level. This renders the non-interacted inflow rate statistically insignificant, while the interacted term is negative and statistically significant. Hence, we provide suggestive evidence for another necessary condition of Allport´s contact theory: contacts alone, which are caused by physical proximity, are not sufficient to break down stereotypes, but these contacts must take place in an environment characterized by a minimum of friendliness and openness. For East Germany, although we observe a large magnitude of the imprecisely measured coefficient of the bohemian index, all coefficients remain statistically insignificant. This again emphasizes our finding that even in counties which are characterized by a high share of open-minded residents the AfD election outcome is not statistically significantly related to the refugee inflow at the grid cell level in East Germany.

5.3 Robustness checks

We execute several robustness checks to show that our results are not driven by our sample or regression specifications. We replicate our results using weighted regressions, splitting Berlin into its former Federal Republic of Germany (FRG) and German Democratic Republic (GDR) parts, and inserting commuting area and county instead of state fixed effects. Furthermore, we show the importance of the spatial scale in contextual analysis by repeating our estimations with a wider

[26] For this index we use the sum of employees in bohemian occupations which are defined as occupations in art related fields. This includes artisan craftwork and fine arts (KldB 2010 = 933), artisans designing ceramics and glassware (934), artisans working with metal (935), occupations in musical instrument making (936), musicians, singers, and conductors (941), actors, dancers, athletes and related occupations (942), presenters and entertainers (943), occupations in theatre, film and television productions (944), occupations in photography (2332) and occupations in fashion design (2821). We conducted a special statistical request to the federal employment agency and got the number of workers in bohemian occupations at June, 30th of 2017 on county level. One part of the finally used data set stems from the Federal Employment Agency. Since many of these workers are not employed and thus not obliged to be member of the federal social security system, we additionally use member data of the artist social security fund that is a special social insurance for artists and publicists. We got information on all members on the zip code level that we aggregate to the county level. We combine the two data sets and calculate the share of workers in bohemian jobs on the population in the county.

neighborhood definition.

As we are interested in the general relationship between refugee inflow and far-right voting across neighborhoods, we take each neighborhood with the same weight in the regressions. However, it may be of interest to investigate the effect on the actual national election outcome. For this, we weight each neighborhood by its number of valid votes. Table A10 shows the results for these weighted regressions. The results in Panel A for West Germany are quite similar to those presented above. Although the magnitude of the IV estimate of the grid cell level inflow rate in the joint estimation specification is even slightly larger, it is not significant anymore. For East Germany in Panel B, we find a statistically significant and positive coefficient of the grid level inflow in the joint specifications for both OLS and IV regressions. Whereas, the county level inflow has a negative effect on AfD voting following the weighted IV regressions.

One of our main assumptions is that voting and refugee inflow but also their relationship differ between East and West Germany. East and West Germany are defined by the former borders of the GDR and FRG without Berlin which we fully account to West Germany although it is located in the East. To account for possible effects driven by the assignment of Berlin, we further apply a different classification by dividing Berlin into its former GDR and FRG part. The results in Table A11 indicate that the results for West Germany as well as East Germany are robust. Since Berlin is by far the biggest city in Germany its assignment to West and East Germany can significantly influence the heterogeneous results by urbanity. As the new categorization of East and West Germany only changes the sample's composition of urban counties, we only provide the analysis of this group. The results in Table A12 show, that – when removing the Eastern part of Berlin from the West German urban sample – the coefficient of grid level inflow remains qualitatively unchanged and only slightly decreases in magnitude. Panel B shows the corresponding regressions for East German cities, now including East Berlin. All coefficients remain statistically insignificant.

All regressions shown so far capture federal state fixed effects. Alternatively, it is possible to account for local commuting area fixed effects since these regions are characterized by similar labor market conditions. We follow the commuting area definition by Breidenbach et al. (2018) who define commuting areas on the county level. Since some of them consist of only one county, we apply federal state fixed effects to avoid multicollinearity problems in the main specification. The results presented in Table A13 are robust to the inclusion of commuting area fixed effects. We further test the effect of the refugee inflow rate on grid cell level exploiting only within county variation. Therefore, we apply county fixed effects as Table A14 indicates. Because of collinearity of county level inflow with county fixed effects, we include only the coefficient of the inflow rate at the grid cell level. Further, we report the estimation results for the total sample of East and West Germany, respectively (columns (1) and (4)), the urban sample (columns (2) and (5)), and the

rural sample (columns (3) and (6)). While OLS regressions for the West German sample suggest a negative relationship across all columns, the IV estimation confirms the heterogeneity by urbanity. The negative effect in the total West German and urban sample, however, become insignificant and the former negative effect in rural areas is now replaced with a significantly positive effect. Panel B reports these regressions for the East German sample where OLS results suggest a negative relationship between refugee inflow at the grid cell level and far-right voting which is driven by rural areas. IV estimations here are again not reliable as indicate by the low F statistic and first stage coefficients with negative signs.

In our main analysis in Section 4, we distinguish between the refugee inflow rate within the same 1km x 1km grid cell and the inflow rate within the county. To test for the size of the neighborhood, we investigate the effect of a larger neighborhood (3km x 3km). The estimated OLS coefficients for the larger neighborhood (see Table A15) are similar to those for the grid cells in West Germany, but the IV coefficients are smaller in magnitude and statistically insignificant. This highlights the importance of the very granular level where contacts between the majority and minority population are actually likely to happen. The differences for East Germany are negligible since all estimated coefficients are still insignificant.

5.4 Non-linearity

We further report various specifications to test for a non-linear relationship between refugee inflow and far-right voting. First, we include both the linear and the squared inflow rate in the regression. Second, we implement the inflow rate as 10 step-wise indicator variables, where each variable corresponds to one decile.

Table A16 and Table A17 follow the specification from our main regressions (see Section 4) only that the linear inflow rate is complemented with its squared term and report results for West and East Germany, respectively. The results for the West German sample in Table A16 suggest that there is no threshold for the grid cell inflow rate to realize its negative effect on far right-voting – neither one above which the negative effect of the grid cell inflow rate is offset nor a minimum inflow required. This is supported by the negative signs of all grid level inflow coefficients in both the OLS and IV estimations. For the county level inflow we find a positive coefficient on the linear term and a negative coefficient on the squared term. This indicates a concave relationship, i. e. a negative effect is realized only above a certain inflow at the county level. However, the large coefficient of the linear term leads to a realization of positive effects for all counties. The highest positive effects realize at a county level inflow rate of 9.35% based on column (6). Negative effects would be realized only for counties with a inflow rate of more than 18.7%. We do not observe such a high county level inflow rate. For East Germany the findings in Table A17 do not differ

between the linear and quadratic specification, since we do not find any statistically significant relationships in the East German sample.

We allow for a more flexible relationship between refugee inflow at the grid cell level and AfD support in Table A18. As main independent variables, we include dummies for the deciles of the refugee inflow rate at the grid cell level with the first decile as reference group. Columns (1) to (3) and (4) to (6) show these for West and East Germany separately (inflow deciles are also separately computed by region). The first specification (i. e. columns (1) and (4)) include the full set of covariates and federal state fixed effects. We add the inflow rate at the county level in the second specification, see columns (2) and (5). In the last specification, federal state fixed effects and the county level inflow are replaced by county fixed effects. In linear regressions, we identify a negative relationship between refugee inflow at the grid level and AfD support in West Germany and no statistically significant relationship in East Germany. The latter absence of a relationship is also obvious in columns (4) to (6) in Table A18, where all estimated coefficients for the deciles are statistically insignificant. For West Germany, the results indicate that the negative effect is driven by the highest inflow decile only. In the first two specifications it is the only decile that is statistically significant different from the first decile. While in the third specification, there are all reported nine decile dummies statistically significant smaller than the first decile, the tenth decile is by far largest in magnitude. These specifications indicate that there are large non-linearities in that way that there is a big jump of the effect at the upper end of the distribution (10th decile). The negative relationship seems to be mainly driven by very high shares of refugee inflow which supports the contact theory.

6 Conclusion

This paper analyzes the effect of the inflow of refugees in the direct neighborhood on voting for the German far-right party AfD. The AfD has increased its vote share from 4.7% in 2013 to 12.6% in 2017 which was the third biggest share of all parties in the federal elections in 2017. Between 2013 and 2017 the AfD had become openly xenophobic and the inflow of immigrants, especially that of refugees, sharply increased during the same period. On the one hand, the refugee inflow was accompanied by many volunteers who helped regarding food, clothes, and German language courses for refugees. On the other hand, demonstrations against the inflow of refugees occurred. Although the inflow of refugees has had already decreased in 2017, it was still part of the AfD election campaign.

Support for the AfD is strongest in East Germany where the inflow rate of refugees and generally the share of residents with a migrant background is relatively low. Also, within East and West Germany, refugees are unequally distributed between neighborhoods. There is a public

and scientific discussion on the influence of living in close proximity to refugees (and/or any non-natives) on attitudes towards immigration. Sometimes it is argued that natives only need to get to know refugees to reduce stereotypes and anti-immigration sentiments. While this is a simplified version of the contact theory, the racial threat theory states that it is possible that fears and anti-immigration sentiments are more pronounced in neighborhoods with a high share of refugees.

We apply a unique data set of self-collected small-scale election data and socio-economic and demographic information on a very small-scale neighborhood level (1km x 1km). We exploit this data to empirically examine the relationship between refugee inflows and far-right voting (for the party AfD) in the German federal elections of 2017. The granular level of our analysis is crucial to test for the validity of the contact theory. Higher-level analyses miss potentially important heterogeneities within cities, as refugees are not evenly distributed within cities and segregation is a common phenomenon. Our results show substantial differences between West and East Germany but also between urban and rural areas within West Germany. We show that refugee inflows into the direct neighborhood lead to reduced far-right voting in West Germany. This effect is especially driven by urban counties, while no relationship between the refugee inflow and AfD support is found in rural areas. This suggests that the contact theory is valid in urban West Germany. In East Germany, there is no robust evidence of any statistically significant relationships between refugee inflow and AfD support.

Differences between urban and rural regions can be driven by the sorting of different people into these regions. We interact the inflow rate at the grid cell level with the Bohemian index (which indicates a tolerant society) and investigate heterogeneities along economic and demographic dimensions. Our findings indicate that there are indeed heterogeneities: In contrast to the racial threat theory, we find that the negative relationship between refugee inflow and AfD support persists even in regions which face a high unemployment rate. Furthermore, the division of the sample by the share of elderly show that the contact theory in West Germany is valid rather in neighborhoods with low shares of elderly. The analysis incorporating the Bohemian index suggests that the negative effect of the grid cell inflow rate is driven by counties with more Bohemians in West Germany. This also supports the contact theory, as it sees not just any contact, but contact within a tolerant and open atmosphere as a necessary condition for reducing xenophobia.

Germany has become an immigration country within the last years. Moreover, current developments as in Afghanistan or the Ukraine can again increase the inflow of refugees. While our findings do not claim external validity, they indicate that in certain areas and contexts the contact theory applies and the inflow of refugees reduces far-right votes in receiving neighborhoods.

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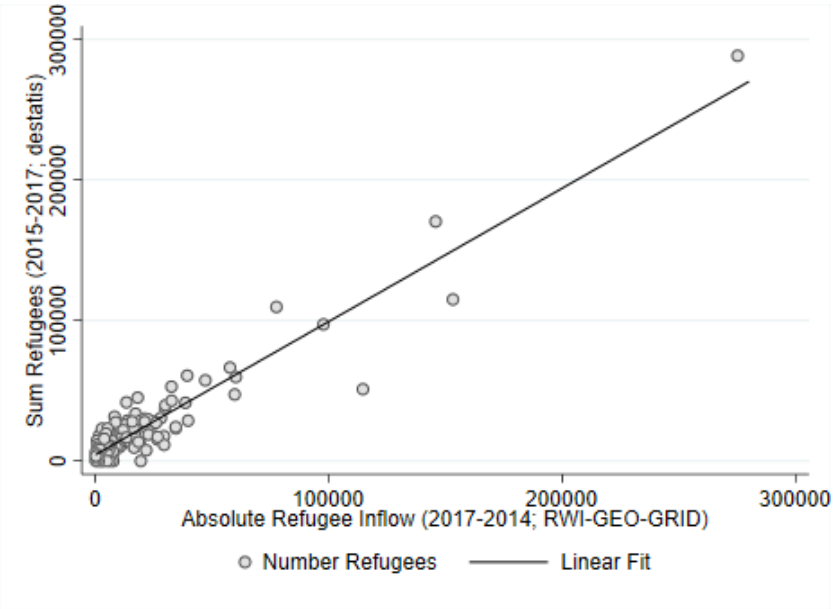
7 Appendix

7.1 Supplementary Materials and Robustness Checks

Figure A1: Spatial correlation between official refugee data and aggregated RWI-GEO-GRID

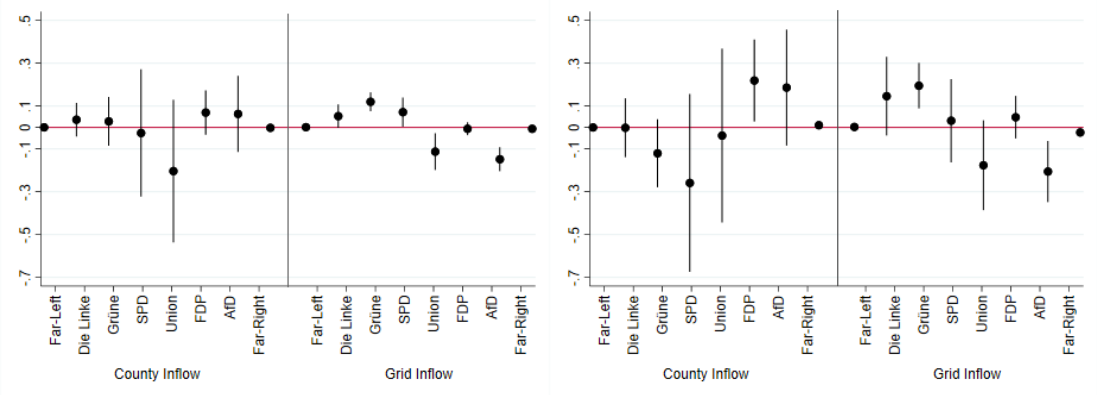


Notes: Slope (se): 0.95 (0.02) *Source:* Official refugee data stem from destatis and are the sum of refugees from 2015 to 2017.

Figure A2: OLS and IV Regression Results inflow refugees on other parties' vote shares in West and East Germany

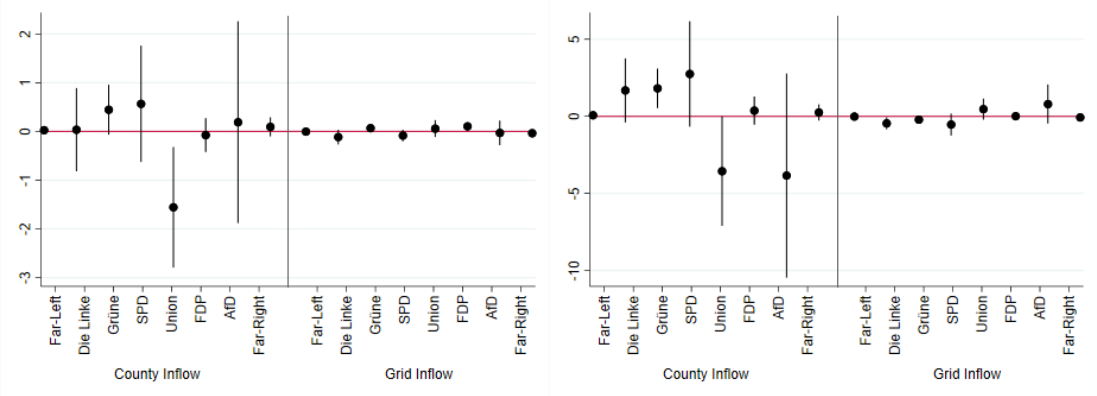
(a) West Germany - OLS estimates

(b) West Germany - IV estimates



(c) East Germany - OLS estimates

(d) East Germany - IV estimates



Notes: Graph indicates estimated coefficients and 95% intervals of single estimations. Far-left parties include the vote shares for MLPD, SGP, B and DKP, while far-right parties comprise the vote shares for NPD and Die Rechte. For graph (c) and (d): The y axes have different scales because both point estimates and standard errors increase strongly in magnitude when running the IV regressions. Coefficients of the grid cell inflow in the IV specification are not instrumented.

Table A1: Federal Election Results 2017: Official and data collection

Party	Official	GEO-VOTE	GEO-VOTE incl postal votes
Union	33	31.56	32.97
SPD	20.5	20.96	20.51
AfD	12.6	13.81	12.58
FDP	10.7	10.29	10.78
Die Linke	9.2	9.67	9.2
Grüne	8.9	8.76	8.97
NPD	0.4	0.43	0.37

Notes: Own calculations based on RWI-GEO-VOTE and official figures of the Bundeswahlleiter as described in Section 2. RWI-GEO-VOTE data are weighted by residential population above 18 years. Absentee ballot cannot be distributed below the municipality level.

Table A2: Summary statistics by urbanity

	Total			**Urban counties**			**Rural counties**		
	AfD	Inflow rate	Share 2005	AfD	Inflow rate	Share 2005	AfD	Inflow rate	Share 2005
Panel A: West Germany									
Observations	108279	108279	108279	56446	56446	56446	51833	51833	51833
No. Zeros	22	42	47308	3	2	17123	19	40	30185
Mean	11.74	2.46	0.15	11.48	3.34	0.21	12.03	1.5	0.09
St. Dev.	3.91	2.42	0.26	3.42	2.87	0.31	4.37	1.24	0.17
Panel B: East Germany									
Observations	28518	28518	28518	3470	3470	3470	25048	25048	25048
No. Zeros	0	458	22327	0	10	2058	0	448	20269
Mean	24.97	0.62	0.04	25.21	1.13	0.06	24.94	0.55	0.04
St. Dev.	6.68	0.63	0.17	5.28	0.93	0.14	6.85	0.53	0.17

Notes: Own calculations based on RWI-GEO-VOTE and RWI-GEO-GRID.

Table A3: Placebo Regression Results for 2013 Elections

	AfD		NPD	
	(1)	(2)	(3)	(4)
	OLS	IV	OLS	IV
Panel A: West Germany				
Inflow refugees	-0.020	-0.002	-0.032	-0.043
(Municipality)	(0.402)	(0.947)	(0.214)	(0.249)
Observations	7017	7017	7017	7017
Adjusted R^2	0.22	0.08	0.16	0.10
Kleibergen-Paap F		9.04		9.04
Refugee share 2005 (Municipality)		3.18**		3.18**
p-Value		(0.024)		(0.024)
Panel B: East Germany				
Inflow refugees	-0.185	-8.789	0.183	2.953
(Municipality)	(0.476)	(0.758)	(0.118)	(0.784)
Observations	1719	1719	1719	1719
Adjusted R^2	0.22	-3.60	0.20	-0.30
Kleibergen-Paap F		0.04		0.04
Refugee share 2005 (Municipality)		-0.07		-0.07
p-Value		(0.863)		(0.863)

Notes: P-values (in parenthesis) come from a wild cluster bootstrap at the state level (based on 999 replications). Regressions include state fixed effects and full set of covariates.

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

Table A4: OLS and IV Regression Results for the inflow of refugees on AfD vote share for all Germany

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Inflow refugees	-0.019		-0.103***	0.025		-0.082
(Grid)	[0.043]		[0.030]	[0.072]		[0.080]
Inflow refugees		0.147	0.222**		0.226*	0.282**
(County)		[0.093]	[0.094]		[0.122]	[0.138]
Observations	136797	136797	136797	136797	136797	136797
Adjusted R^2	0.75	0.75	0.75	0.75	0.75	0.75
				1^{st} Stage Results		
Kleibergen-Paap F				174.26	176.19	89.72
Refugee share 2005 (Grid)				2.76***		2.20***
				[0.209]		[0.163]
Refugee share 2005 (County)					8.32***	8.31***
					[0.627]	[0.636]

Notes: Robust clustered standard errors on county are reported in brackets. Regressions include state fixed effects and full set of covariates.

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

Table A5: OLS and IV Regression Results inflow refugees on AfD vote share by quartiles of the unemployment rate for West Germany

	Q1			Q2			Q3			Q4		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint
Panel A: OLS												
Inflow refugees	-0.168***		-0.160***	-0.087		-0.094**	-0.134***		-0.144***	-0.130***		-0.167***
(Grid)	[0.056]		[0.043]	[0.056]		[0.042]	[0.051]		[0.037]	[0.038]		[0.044]
Inflow refugees		-0.130	-0.021		-0.041	0.020		-0.063	0.028		-0.007	0.118
(County)		[0.127]	[0.131]		[0.122]	[0.122]		[0.101]	[0.099]		[0.080]	[0.090]
Observations	27247	27247	27247	26970	26970	26970	27082	27082	27082	26980	26980	26980
Adjusted R^2	0.33	0.33	0.33	0.42	0.42	0.42	0.42	0.42	0.42	0.36	0.35	0.36
Panel B: IV												
Inflow refugees	-0.031		-0.056	-0.179		-0.363**	-0.124		-0.185	-0.139*		-0.167*
(Grid)	[0.149]		[0.185]	[0.129]		[0.177]	[0.096]		[0.117]	[0.076]		[0.094]
Inflow refugees		0.021	0.055		0.186	0.397*		0.059	0.156		-0.021	0.099
(County)		[0.175]	[0.216]		[0.178]	[0.228]		[0.127]	[0.146]		[0.121]	[0.147]
Observations	27247	27247	27247	26970	26970	26970	27082	27082	27082	26980	26980	26980
Adjusted R^2	0.08	0.08	0.08	0.06	0.06	0.05	0.04	0.04	0.04	0.10	0.09	0.10
						1st Stage Results						
Kleibergen-Paap F	95.21	105.78	38.88	88.17	113.53	38.93	87.59	116.07	59.67	154.55	95.14	67.87
Refugee share 2005 (Grid)	1.88***		1.48***	1.96***		1.52***	2.02***		1.62***	3.27***		2.77***
	[0.193]		[0.167]	[0.209]		[0.179]	[0.216]		[0.157]	[0.263]		[0.250]
Refugee share 2005 (County)		7.11***	3.73***		7.65***	3.92***		7.94***	3.60***		7.84***	3.70***
		[0.691]	[0.479]		[0.718]	[0.485]		[0.737]	[0.515]		[0.804]	[0.660]

Notes: Robust clustered standard errors on county are reported in brackets. Regressions include state fixed effects and full set of covariates.

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

Table A6: OLS and IV Regression Results inflow refugees on AfD vote share by quartiles of the unemployment rate for East Germany

	Q1			Q2			Q3			Q4		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint
Panel A: OLS												
Inflow refugees	-0.341		-0.124	0.367		0.163	-0.057		-0.045	0.145		-0.008
(Grid)	(0.412)		(0.614)	(0.371)		(0.585)	(0.815)		(0.799)	(0.630)		(0.957)
Inflow refugees		-1.415	-1.321		1.363	1.254		-0.103	-0.073		0.590	0.596
(County)		(0.417)	(0.442)		(0.407)	(0.447)		(0.943)	(0.958)		(0.614)	(0.626)
Observations	7136	7136	7136	7134	7134	7134	7123	7123	7123	7125	7125	7125
Adjusted R^2	0.58	0.58	0.58	0.58	0.58	0.58	0.52	0.52	0.52	0.33	0.33	0.33
Panel B: IV												
Inflow refugees	-0.438		-0.036	-5.392		1.297	-0.036		0.915	2.882		0.600
(Grid)	(0.817)		(-0.036)	(0.245)		(1.297)	(0.987)		(0.915)	(0.143)		(0.600)
Inflow refugees		-1.920	-1.859		-4.944	-5.692		-5.056	-5.712		-1.407	-1.770
(County)		(0.734)	(0.766)		(0.348)	(0.314)		(0.115)	(0.107)		(0.626)	(0.593)
Observations	7136	7136	7136	7134	7134	7134	7123	7123	7123	7125	7125	7125
Adjusted R^2	0.13	0.13	0.13	-0.11	0.12	0.11	0.18	0.08	0.07	-0.03	0.06	0.05
						1st Stage Results						
Kleibergen-Paap F	7.64	10.11	10.50	3.04	9.20	9.19	0.21	19.53	19.37	5.59	13.59	17.02
Refugee share 2005 (Grid)	-0.36*			-0.09*			0.087			-0.20*		
	(0.065)			(0.087)			(0.811)			(0.075)		
Refugee share 2005 (County)		7.87**	7.22**		6.35**	5.82**		8.03***	7.22***		10.5***	9.07***
		(0.017)	(0.015)		(0.022)	(0.021)		(0.002)	(0.001)		(0.003)	(0.002)

Notes: P-values (in parentheses) come from a wild cluster bootstrap (based on 999 replications). Regressions include state fixed effects and full set of covariates.

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

Table A7: OLS and IV Regression Results inflow refugees on AfD vote share by quartiles of the population aged above 60 for West Germany

	Q1			Q2			Q3			Q4		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint
Panel A: OLS												
Inflow refugees	-0.203***		-0.188***	-0.106**		-0.126***	-0.063		-0.085**	-0.063		-0.097***
(Grid)	[0.042]		[0.045]	[0.045]		[0.034]	[0.041]		[0.034]	[0.039]		[0.033]
Inflow refugees		-0.204**	-0.050		-0.025	0.060		0.009	0.062		0.034	0.091
(County)		[0.103]	[0.113]		[0.104]	[0.104]		[0.090]	[0.092]		[0.085]	[0.087]
Observations	27144	27144	27144	27063	27063	27063	27006	27006	27006	27066	27066	27066
Adjusted R^2	0.41	0.40	0.41	0.42	0.42	0.42	0.38	0.37	0.38	0.34	0.34	0.34
Panel B: IV												
Inflow refugees	-0.212***		-0.223**	-0.009		-0.067	0.060		0.015	-0.052		-0.120
(Grid)	[0.081]		[0.105]	[0.071]		[0.088]	[0.090]		[0.096]	[0.100]		[0.118]
Inflow refugees		-0.135	0.033		0.131	0.169		0.150	0.141		0.166	0.226
(County)		[0.118]	[0.154]		[0.156]	[0.179]		[0.131]	[0.139]		[0.131]	[0.152]
Observations	27144	27144	27144	27063	27063	27063	27006	27006	27006	27066	27066	27066
Adjusted R^2	0.13	0.13	0.13	0.10	0.10	0.10	0.09	0.09	0.09	0.08	0.07	0.07
						1st Stage Results						
Kleibergen-Paap F	187.76	178.72	57.94	97.60	104.63	49.17	113.08	94.44	69.33	96.37	101.30	57.69
Refugee share 2005 (Grid)	3.12***		2.63***	2.32***		1.96***	2.45***		2.02***	2.13***		1.78***
St. Error	[0.227]		[0.247]	[0.235]		[0.204]	[0.230]		[0.178]	[0.217]		[0.174]
Refugee share 2005 (County)		7.40***	3.64***		7.34***	3.45***		7.74***	3.55***		8.25***	3.68***
St. Error		[0.553]	[0.517]		[0.718]	[0.539]		[0.796]	[0.561]		[0.820]	[0.555]

Notes: Robust clustered standard errors on county level are reported in brackets. All regressions include state fixed effects and full set of covariates.

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

Table A8: OLS and IV Regression Results inflow refugees on AfD vote share by quartiles of the population aged above 60 for East Germany

	Q1			Q2			Q3			Q4		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint	Grid	County	Joint
Panel A: OLS												
Inflow refugees	-0.164		-0.106	0.185		0.031	-0.175		-0.140	0.424		0.189
(Grid)	(0.514)		(0.510)	(0.549)		(0.885)	(0.674)		(0.674)	(0.411)		(0.567)
Inflow refugees		-0.516	-0.437		0.720	0.695		-0.223	-0.130		1.114	0.975
(County)		(0.757)	(0.803)		(0.506)	(0.525)		(0.857)	(0.923)		(0.457)	(0.485)
Observations	7137	7137	7137	7142	7142	7142	7116	7116	7116	7123	7123	7123
Adjusted R^2	0.47	0.47	0.47	0.54	0.54	0.54	0.50	0.50	0.50	0.49	0.50	0.50
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional FE	State	State	State	State	State	State	State	State	State	State	State	State
Panel B: IV												
Inflow refugees	-1.964		0.764	1.085		1.138	-3.375		0.972	-71.612		0.209
(Grid)	(0.757)		(0.764)	(0.538)		(1.138)	(0.173)		(0.972)	(0.771)		(0.209)
Inflow refugees		-6.311	-6.898*		-3.604	-4.290		-3.729	-4.199		0.981	0.892
(County)		(0.117)	(0.099)		(0.367)	(0.319)		(0.427)	(0.416)		(0.826)	(0.863)
Observations	7137	7137	7137	7142	7142	7142	7116	7116	7116	7123	7123	7123
Adjusted R^2	0.14	0.10	0.09	0.09	0.03	0.02	-0.02	0.04	0.03	-50.94	0.10	0.10
						1st Stage Results						
Kleibergen-Paap F	0.03	24.59	24.21	9.30	17.13	19.85	2.03	14.04	16.80	0.03	10.64	11.60
Refugee share 2005 (Grid)	0.053			-0.23**			-0.15			0.011		
	(0.881)			(0.010)			(0.229)			(0.858)		
Refugee share 2005 (County)		8.40***	7.70***		8.65***	7.66***		8.44***	7.49***		8.43***	7.52***
		(0.002)	(0.004)		(0.001)	(0)		(0)	(0)		(0.007)	(0.003)

Notes: P-values (in parentheses) come from a wild cluster bootstrap with clustering on county level (based on 999 replications). Regressions include state fixed effects and full set of covariates.

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

Table A9: OLS and IV Regression Results inflow refugees and bohemian index on AfD vote share

	(1)	(2)	(3)	(4)
	OLS	OLS	IV	IV
Panel A: West Germany				
Inflow refugees	-0.097***	0.003	-0.100	0.068
(Grid)	[0.036]	[0.052]	[0.063]	[0.079]
Bohemian index	-3.855***	-2.529**	-3.851***	-2.173*
	[0.844]	[1.114]	[0.854]	[1.313]
Inflow (Grid) x		-0.260**		-0.340*
Bohemian		[0.109]		[0.175]
Observations	108279	108279	108279	108279
Adjusted R^2	0.39	0.39	0.10	0.11
			1st Stage Results	
Kleibergen-Paap F			179.16	65.36
Refugee share 2005 (Grid)			2.78***	1.88***
St. Error			[0.207]	[0.309]
Refugee share 2005 x Bohemian				6.85***
St. Error				[0.559]
Panel B: East Germany				
Inflow refugees	0.096	0.125	0.518	0.507
(Grid)	[0.263]	[0.403]	[2.623]	[1.966]
Bohemian index	-5.399	-5.290	-5.603	-5.555
	[4.165]	[5.282]	[4.587]	[4.274]
Inflow (Grid) x		-0.095		-0.033
Bohemian		[1.187]		[1.974]
Observations	28518	28518	28518	28518
Adjusted R^2	0.52	0.52	0.14	0.14
			1st Stage Results	
Kleibergen-Paap F			1.08	3.78
Refugee share 2005 (Grid)			-0.09	-0.72*
			[0.088]	[0.420]
Refugee share 2005 x Bohemian				3.09
				[2.09]

Notes: Robust clustered standard errors on county are reported in brackets. Regressions include state fixed effects and full set of covariates.

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

Table A10: OLS and IV Regression Results inflow refugees on AfD vote share (weighted by valid votes)

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Panel A: West Germany						
Inflow refugees	-0.201***		-0.233**	-0.228*		-0.252
(Grid)	[0.072]		[0.095]	[0.125]		[0.159]
Inflow refugees		-0.078	0.092		-0.089	0.083
(County)		[0.067]	[0.107]		[0.092]	[0.162]
Observations	108279	108279	108279	108279	108279	108279
Adjusted R^2	0.39	0.38	0.39	0.39	0.38	0.39
				1st Stage Results		
Kleibergen-Paap F				71.17	206.82	22.74
Refugee share 2005 (Grid)				3.79***		3.25***
				[0.449]		[0.548]
Refugee share 2005 (County)					7.57***	7.77***
					[0.527]	[0.523]
Panel B: East Germany						
Inflow refugees	0.257		0.421*	-5.922		1.679**
(Grid)	[0.384]		[0.217]	[5.863]		[0.711]
Inflow refugees		-0.161	-0.535		-3.543*	-4.634**
(County)		[1.097]	[1.076]		[1.904]	[2.183]
Observations	28518	28518	28518	28518	28518	28518
Adjusted R^2	0.58	0.58	0.58	0.20	0.54	0.54
				1st Stage Results		
Kleibergen-Paap F				2.48	38.34	44.36
Refugee share 2005 (Grid)				0.548		
				[0.348]		
Refugee share 2005 (County)					10.5***	8.77***
					[1.70]	[1.31]

Notes: Robust clustered standard errors on county level are reported in brackets. Regressions include state fixed effects and full set of covariates.

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

Table A11: OLS and IV Regression Results inflow refugees on AfD vote share with FRG and GDR region

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Panel A: BRD Germany						
Inflow refugees	-0.117***		-0.133***	-0.116**		-0.169***
(Grid)	[0.034]		[0.023]	[0.052]		[0.059]
Inflow refugees		-0.046	0.047		0.047	0.155
(County)		[0.088]	[0.089]		[0.124]	[0.134]
Observations	107900	107900	107900	107900	107900	107900
Adjusted R^2	0.37	0.37	0.37	0.37	0.37	0.37
				1st Stage Results		
Kleibergen-Paap F				204.10	138.40	135.27
Refugee share 2005 (Grid)				2.76***		2.29***
St. Error				[0.193]		[0.142]
Refugee share 2005 (County)					7.73***	7.76***
St. Error					[0.658]	[0.668]
Panel B: DDR Germany						
Inflow refugees	-0.076		-0.119	2.929		0.491
(Grid)	[0.199]		[0.114]	[9.743]		[0.530]
Inflow refugees		0.187	0.272		-3.288	-3.595
(County)		[1.035]	[1.036]		[3.024]	[3.281]
Observations	28897	28897	28897	28897	28897	28897
Adjusted R^2	0.52	0.52	0.52	0.44	0.49	0.49
				1st Stage Results		
Kleibergen-Paap F				0.20	20.70	21.61
Refugee share 2005 (Grid)				-0.04		
St. Error				[0.101]		
Refugee share 2005 (County)					8.58***	7.86***
St. Error					[1.88]	[1.69]

Notes: Robust clustered standard errors on county level are reported in brackets. Regressions include state fixed effects and full set of covariates.

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

Table A12: OLS and IV results inflow refugees on AfD vote share with FRG and GDR region for urban counties

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Former FDR borders						
Inflow refugees	-0.139***		-0.143***	-0.113**		-0.180***
(Grid)	[0.032]		[0.026]	[0.055]		[0.063]
Inflow refugees		-0.080	0.012		0.114	0.221
(County)		[0.082]	[0.082]		[0.134]	[0.144]
Observations	56102	56102	56102	56102	56102	56102
Adjusted R^2	0.29	0.29	0.29	0.12	0.10	0.11
				1st Stage Results		
Kleibergen-Paap F				231.64	109.05	149.79
Refugee share 2005 (Grid)				3.09***		2.65***
				[0.203]		[0.159]
Refugee share 2005 (County)					7.18***	3.00***
					[0.688]	[0.472]
Panel B: Former GDR borders						
Inflow refugees	-0.372		-0.197	-0.852		-0.152
(Grid)	(0.102)		(0.564)	(0.303)		(-0.152)
Inflow refugees		-2.410	-2.287		-2.969	-2.888
(County)		(0.248)	(0.260)		(0.385)	(0.393)
Observations	3814	3814	3814	3814	3814	3814
Adjusted R^2	0.69	0.72	0.72	0.41	0.47	0.47
				1st Stage Results		
Kleibergen-Paap F				1.66	29.61	28.68
Refugee share 2005 (Grid)				0.936		
				(0.345)		
Refugee share 2005 (County)					13.7**	13.7**
					(0.030)	(0.030)

Notes: Robust clustered standard errors on county level are presented in squared brackets. The p-values (in round brackets) come from a wild cluster bootstrap with clustering on county level (based on 999 replications). Regressions include state fixed effects and full set of covariates.

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

Table A13: OLS and IV Regression Results inflow refugees on AfD vote share with commuting area fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Panel A: West Germany						
Inflow refugees	-0.136***		-0.132***	-0.139**		-0.135*
(Grid)	[0.025]		[0.027]	[0.060]		[0.073]
Inflow refugees		-0.106*	-0.015		-0.106	-0.015
(County)		[0.054]	[0.057]		[0.068]	[0.088]
Observations	108279	108279	108279	108279	108279	108279
Adjusted R^2	0.58	0.58	0.58	0.58	0.58	0.58
				1st Stage Results		
Kleibergen-Paap F				197.84	274.98	102.33
Refugee share 2005 (Grid)				2.71***		2.30***
St. Error				[0.193]		[0.163]
Refugee share 2005 (County)					9.14***	9.16***
St. Error					[0.552]	[0.553]
Panel B: East Germany						
Inflow refugees	-0.149		-0.152	0.364		-0.004
(Grid)	[0.117]		[0.092]	[1.787]		[0.195]
Inflow refugees		-0.085	0.021		-1.113	-1.105
(County)		[0.697]	[0.706]		[1.295]	[1.391]
Observations	28518	28518	28518	28518	28518	28518
Adjusted R^2	0.68	0.68	0.68	0.68	0.68	0.68
				1st Stage Results		
Kleibergen-Paap F				1.36	10.97	11.53
Refugee share 2005 (Grid)				-0.10		
				[0.087]		
Refugee share 2005 (County)					11.0***	10.3***
					[3.34]	[3.04]

Notes: Robust clustered standard errors on county level are presented in squared brackets. The p-values (in parentheses) come from a wild cluster bootstrap with clustering on county level (based on 999 replications). Regressions include commuting area fixed effects and full set of covariates.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A14: OLS and IV Regression Results inflow refugees on AfD vote share with county fixed effects

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	Urban	Rural	All	Urban	Rural
Panel A: West Germany						
Inflow refugees	-0.105***	-0.096***	-0.093***	-0.054	-0.101	0.522***
(Grid)	[0.027]	[0.034]	[0.031]	[0.079]	[0.091]	[0.186]
Observations	108279	56446	51833	108279	56446	51833
Adjusted R^2	0.63	0.57	0.68	0.07	0.10	-0.02
Kleibergen-Paap F				187.90	184.70	37.48
Refugee share 2005 (Grid)				2.23***	2.65***	0.849***
p-Value				[0.163]	[0.195]	[0.138]
Panel B: East Germany						
Inflow refugees	-0.192**	0.029	-0.266**	0.640	0.255	0.518
(Grid)	(0.043)	(0.787)	(0.022)	(0.537)	(0.380)	(0.573)
Observations	28518	3470	25048	28518	3470	25048
Adjusted R^2	0.71	0.81	0.70	0.05	0.45	0.03
Kleibergen-Paap F				1.72	0.61	12.16
Refugee share 2005 (Grid)				-0.11	0.545	-0.19***
p-Value				(0.196)	(0.760)	(0.001)

Notes: Robust clustered standard errors on county level are reported in brackets. The p-values (in parentheses) come from a wild cluster bootstrap with clustering on county level (based on 999 replications). Regressions include county fixed effects and full set of covariates.

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

Table A15: OLS and IV Regression Results inflow refugees on AfD vote share: refugee inflow rate on a larger neighborhood level (3km x 3km)

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Panel A: West Germany						
Inflow refugees (3x3	-0.128***		-0.159***	-0.051		-0.091
Grid)	[0.046]		[0.038]	[0.065]		[0.072]
Inflow refugees		-0.041	0.073		0.054	0.112
(County)		[0.088]	[0.089]		[0.124]	[0.134]
Observations	108279	108279	108279	108279	108279	108279
Adjusted R^2	0.37	0.37	0.37	0.37	0.37	0.37
				1st Stage Results		
Kleibergen-Paap F				200.06	138.77	118.89
Refugee share 2005 (Grid)				4.10***		3.54***
				[0.290]		[0.231]
Refugee share 2005 (County)					7.74***	7.76***
					[0.657]	[0.660]
Panel B: East Germany						
Inflow refugees (3x3	-0.010		-0.072	-0.649		1.006
Grid)	[0.341]		[0.180]	[4.410]		[0.869]
Inflow refugees		0.169	0.228		-3.339	-3.740
(County)		[1.041]	[1.018]		[3.039]	[3.348]
Observations	28518	28518	28518	28518	28518	28518
Adjusted R^2	0.51	0.51	0.51	0.51	0.49	0.49
				1st Stage Results		
Kleibergen-Paap F				0.87	20.62	25.00
Refugee share 2005 (Grid)				0.124		
				[0.133]		
Refugee share 2005 (County)					8.55***	7.48***
					[1.88]	[1.49]

Notes: Robust clustered standard errors on county level are reported in brackets. Regressions include state fixed effects and full set of covariates.

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

Table A16: OLS and IV Results of inflow refugees (squared) on AfD vote share in West Germany

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Inflow refugees	-0.054		-0.120***	-0.003		-0.092
(Grid)	[0.060]		[0.037]	[0.121]		[0.127]
Inflow refugees	-0.006**		-0.002	-0.008*		-0.004
squared	[0.003]		[0.002]	[0.005]		[0.005]
Inflow refugees		0.230	0.295		0.550**	0.561**
(County)		[0.187]	[0.186]		[0.271]	[0.278]
Inflow refugees		-0.024**	-0.021*		-0.036**	-0.030**
squared		[0.011]	[0.011]		[0.015]	[0.015]
Observations	108279	108279	108279	108279	108279	108279
Adjusted R^2	0.38	0.37	0.38	0.09	0.08	0.08
					1^{st} Stage Results	
Kleibergen-Paap F				114.19	46.46	63.08
Refugee share 2005 (Grid)				2.34***		1.90***
St. Error				[0.216]		[0.168]
Squared refugee share (Grid)				19.7***		18.2***
				[2.48]		[1.94]
Refugee share 2005 (County)					8.00***	8.04***
					[1.26]	[1.27]
Squared refugee share (County)					79.4***	78.8***
					[18.7]	[18.7]

Notes: Robust clustered standard errors on county level are reported in brackets. All regressions include state fixed effects and full set of covariates.

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

Table A17: OLS Regression Results inflow refugees (squared) on AfD vote share in East Germany

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Inflow refugees	0.055		-0.027	0.676		1.053
(Grid)	[0.321]		[0.166]	[1.981]		[2.112]
Inflow refugees	-0.010		-0.002	0.015		0.051
squared	[0.018]		[0.010]	[0.134]		[0.136]
Inflow refugees		2.467	2.489		-0.280	-0.348
(County)		[3.120]	[3.118]		[10.800]	[10.762]
Inflow refugees		-0.978	-0.977		-1.089	-1.348
squared		[1.113]	[1.115]		[2.995]	[2.902]
Observations	28518	28518	28518	28518	28518	28518
Adjusted R^2	0.51	0.51	0.51	0.12	0.10	0.08
					1^{st} Stage Results	
Kleibergen-Paap F				1.36	3.87	0.68
Refugee share 2005 (Grid)				-0.01		-0.04
				[0.138]		[0.131]
Squared refugee share (Grid)				-0.41		-0.39
				[0.254]		[0.245]
Refugee share 2005 (County)					5.88	5.88
					[3.69]	[3.69]
Squared refugee share (County)					152.***	152.***
					[39.9]	[39.8]

Notes: Robust clustered standard errors on county level are reported in brackets. All regressions include state fixed effects and full set of covariates.

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

Table A18: OLS Regression Results of refugee inflow rate deciles on AfD vote share

	West			East		
	(1)	(2)	(3)	(4)	(5)	(6)
Inflow Decile 2	-0.048	-0.048	-0.215***	0.036	0.039	0.020
	[0.110]	[0.109]	[0.068]	[0.246]	[0.240]	[0.145]
Inflow Decile 3	-0.095	-0.096	-0.315***	0.196	0.199	0.139
	[0.135]	[0.132]	[0.073]	[0.254]	[0.252]	[0.191]
Inflow Decile 4	-0.125	-0.126	-0.302***	0.505	0.503	0.294
	[0.176]	[0.169]	[0.077]	[0.322]	[0.321]	[0.220]
Inflow Decile 5	-0.043	-0.045	-0.295***	0.447	0.442	0.118
	[0.194]	[0.184]	[0.080]	[0.339]	[0.333]	[0.235]
Inflow Decile 6	-0.109	-0.112	-0.318***	0.515	0.503	0.060
	[0.202]	[0.188]	[0.085]	[0.382]	[0.367]	[0.236]
Inflow Decile 7	-0.093	-0.097	-0.337***	0.471	0.453	0.058
	[0.208]	[0.188]	[0.093]	[0.432]	[0.405]	[0.216]
Inflow Decile 8	0.017	0.012	-0.195*	0.500	0.472	-0.097
	[0.240]	[0.206]	[0.111]	[0.467]	[0.411]	[0.238]
Inflow Decile 9	0.019	0.012	-0.273**	0.489	0.448	-0.172
	[0.253]	[0.206]	[0.107]	[0.526]	[0.444]	[0.253]
Inflow Decile 10	-0.783***	-0.797***	-0.845***	0.136	0.062	-0.322
	[0.299]	[0.228]	[0.170]	[0.555]	[0.359]	[0.244]
Inflow refugees		0.006			0.171	
(County)		[0.087]			[1.027]	
Observations	108279	108279	108279	28518	28518	28518
Adjusted R^2	0.374	0.374	0.633	0.513	0.513	0.711
Regional FE	State	State	County	State	State	County

Notes: Robust clustered standard errors on county level are reported in brackets. All regressions include full set of covariates.

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

7.2 Description of Voting Data set

To generate a comprehensive small-scale data set of the federal election 2017 we proceed as follows. We intersect populated grid cells with a shapefile of constituencies (Wahlkreise). Grid cells, which belong to more than one constituency, were divided into the parts of the grid cell belonging to each constituency. For these grid cells, the adult population was adjusted by the share of the grid cell within one constituency, i. e. if a third of one grid cell is in constituency A and two thirds in constituency B, and nine adults live in the grid cell, then three adults are allocated to grid cell A and six to grid cell B. The implicit assumption is that population is equally distributed within the grid cell. While this assumption is simplifying, it is reasonable because of the small regional scale of the 1km x 1km grid cell. Afterwards each grid cell-constituency combination is assigned to a municipality by its geographic center. Election results are added to the grid cell-constituency combinations in two different ways depending on the type of the original source. If geometries of the electoral districts are available, the grid cell-constituency combinations of the corresponding municipalities are intersected with the electoral district geometries. The votes were divided among the intersection in proportion to the adult population. Finally, the combinations are aggregated on grid cell level. If geometries are not available, the addresses of the polling stations are used. To ensure that no electoral district is allocated to a wrong grid cell, the procedure is repeated for each constituency-municipality combination separately. If addresses of all polling stations within a constituency-municipality combination are known, the polling station is allocated to the grid cell with the minimum distance between the grid cell center and the polling station. By this, the possibility of coarse misspecifications is eliminated. Remaining grid cells cannot be allocated to wards, as the minimum distance to mere addresses of polling station would be prone to errors. Therefore, the grid cells without allocation to a ward, are filled with their population proportionate share of the valid votes at the municipality level. Table A1 displays the official German wide election results and our data aggregated. It becomes obvious that the results are quite similar without any systematical shift.

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ISSN 2190-992X (online)
ISBN 978-3-86304-386-5