

More Immigrants, Less Solidarity?  
Immigration, Perception of Immigrants, and Support for Redistribution  
in Europe

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**Abstract**

Support for redistribution depends on economic self-interest and mutual solidarity within a society. Applying a recursive bivariate probit estimation framework, I examine the impact of solidarity with immigrants on welfare attitudes holding the economic self-interest transmission channel constant. I investigate the impact of daily interethnic contact in the neighborhood on support for redistribution using survey data of 18 European countries in 2014. To attenuate concerns about bias stemming from selective out-migration, I employ regional immigrant shares as an instrument for daily interethnic contact. Furthermore, I address omitted variable and selection bias concerns by implementing an instrumental variable approach that exploits cross-regional variation of immigrant settlements in 2007, along with the nationality composition of recent immigrant flows adjusted for demand-pull factors. I find that perceptions of immigrants as a threat to cultural and societal values of the country are decisive in shaping welfare attitudes. However, personal animosities towards particular immigrants in private life and at work are not. Computing partial indirect effects, I detect that daily interethnic contact strengthens support for redistribution through a gain of solidarity with immigrants.

Keywords: attitudes, immigration, recursive bivariate probit,  
redistribution, partial effect decomposition

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# 1 Introduction

The outbreak of the Syrian civil war in 2011 and the subsequent migration of refugees to Europe have put immigration policy back onto the agenda of policymakers and economists. The *European refugee crisis* reached its peak in 2015 with almost 1.26 million first-time asylum applications, the highest number since the fall of the Iron Curtain ([European Commission, 2019b](#)). This sudden surge in the extent of foreign-born people in the European host countries brought out previously hidden anxieties. In particular, voters in Western and Central Europe are concerned about the economic and societal consequences of immigration. As a result of the refugee crisis, far-right parties were able to mobilize voters in many countries by stigmatizing immigrants as a threat to the economy, cultural values, and national safety. Thus, natives' perception of immigrants as competitors for tangible goods (e.g. labor market, housing market) and non-tangible goods (e.g. national identity, societal values) is crucial for their voting behavior, sociopolitical preferences and attachment towards immigrants. Whether natives' perceptions are following observed real-world consequences of immigration or are misperceptions is beyond the scope of this paper. There is empirical literature showing that natives' attitudes towards immigrants strongly drive misperceptions. [Burgoon \(2014\)](#) points out that there are upwardly biased misperceptions in natives' perceived share of immigrants when natives have stronger anti-immigrant attitudes. Particularly in crime research, natives' misperception of immigration's impact on crime rates is prevalent. Empirical findings show that there is no association between immigration and crime, but that there is a positive link between immigration and natives' fear of crime (see [Bianchi et al., 2012](#); [Nunziata, 2015](#)).

This paper connects to two strands of literature. The first strand of literature deals with the association of immigration and natives' support for redistribution. The second strand of literature examines whether immigration generates anti-immigrant attitudes among natives. One way to combine these two fields is to regress natives' support for redistribution on immigration and interaction terms between immigration and their attitudes towards immigrants (see [Alesina et al., 2019](#)). While this approach measures the change in immigration's impact on natives' support for redistribution due to anti-immigrant attitudes, it neglects that immigration, in turn, shapes attitudes towards immigrants. More recent empirical work by [Alesina et al. \(2018\)](#) has shown that respondents of a survey experiment become less supportive redistribution if they have been asked questions about immigration before those about redistribution. These findings emphasize the importance of natives' perception of immigration's impact and their attitudes towards immigrants in shaping their sociopolitical preferences, even if there is no change in immigration. In general, immigration can affect natives' support for redistribution through two channels. First, natives adjust their support for redistribution due to economic self-interest in the light of an influx of foreign-born people. Natives' change their demand for redistribution depending on whether immigrants are recipients or contributors to the tax and transfer system or competitors on markets, such as the labor or housing market. Thus, natives' adjustment depends on their socioeconomic

position and the composition of immigrants by education, occupation and location of choice (see [Alesina et al., 2019](#); [Moriconi et al., 2019](#); [Mayda et al., 2018](#)).

Second, natives' social capital in terms of trust, tolerance, and solidarity is an essential factor in supporting governmental redistribution. As pointed out by [Freeman \(1986\)](#), governmental redistribution follows the distributive logic of need and capacity. Thus, it is crucial for a tax and transfer system that there is some feeling of fellowship and trust present among recipients and payers. However, natives may differentiate in their solidarity towards fellow residents between their ethnic peers and out-group members, i.e. foreign-born residents. Once natives put a lower social weight on immigrants in their decision about the support for redistribution, immigration lowers *ceteris paribus* their support for redistribution ([Alesina and Stantcheva, 2020](#)). However, natives' social weight on immigrants is not exogenous and is itself a function of immigration according to the sociological literature. Depending on whether immigration strengthens natives' perception of immigrants as a threat to non-tangible goods or whether an increase of interethnic contact has positive feedback effects, natives' solidarity towards immigrants may change in either direction. Therefore, immigration's impact on natives' support for redistribution through the solidarity channel is not direct, but rather immigration may change natives' social weight on immigrants, which is eventually coupled with a change in natives' redistribution preference. This paper takes these considerations into account to identify and measure the solidarity transmission channel.

First, I examine the effect of immigration on natives' solidarity towards immigrants. Second, I assess whether anti-immigrant attitudes explain lower support for redistribution among natives. Third, I measure immigration's indirect impact on natives' support for redistribution through the solidarity channel. As both natives' solidarity towards immigrants and their support for redistribution are categorical variables, a recursive bivariate probit model is applied for detecting the solidarity channel. This estimation approach has the unique feature of distinguishing between the direct effect of a predictor on the dependent variable and the indirect effect of the same predictor on the dependent variable through an adjustment of the endogenous explanatory variable. Since the solidarity transmission channel assumes that immigration affects natives' support for redistribution only by a change in their attitudes towards immigrants, the applied method allows quantifying the transmitted effect. To the best of my knowledge, this decomposition of predictors' effects has so far only applied to recursive bivariate binary probit models (see [Alrasheed, 2019](#); [Edwards et al., 2019](#); [Hasebe, 2013](#), among others). This paper shows an application of the method to the mixed case where one of the endogenous variables is ordinal. Instead of reporting bootstrapped standard errors for the partial effects (see [Edwards et al., 2019](#)), I provide a suitable solution for calculating adequate standard errors of average partial direct and indirect effects by applying the delta method.

The seventh wave of the European Social Survey (ESS) is a well-suited data set to reveal the underlying mechanisms of the solidarity transmission channel. It provides appro-

priate measures of natives' support for redistribution, solidarity towards immigrants, and interethnic contact in everyday life. Natives' solidarity with immigrants is measured by dividing questions on their attitudes towards immigrants into two dimensions. First, social distance measures cover natives' desired or current non-contact with immigrants in their private life and at the workplace. Thus, they map natives' apprehension of increased social contact with immigrants. Second, out-group threat measures involve natives' perception of immigrants as a threat to societal values, e.g. culture, way of life, and religious beliefs, and provision of tangible goods, e.g. national prosperity. Accordingly, they capture natives' vague and abstract fears and concerns about more intense competition for tangible and non-tangible goods with other ethnic groups.

The empirical results provide three insights into the solidarity transmission channel. First, social distance measures show no significant association with natives' support for redistribution. Second, out-group threats decrease natives' demand for redistribution significantly by 16 to 24 percentage points. Therefore, natives' solidarity with immigrants in sociopolitical issues is not shaped by their rejection of social interaction with immigrants, but rather by their perceptions of immigrants as an abstract out-group. Third, more interethnic contact in everyday life is related to a more pro-immigrant attitude among natives. This finding is true for both social distance and out-group threat measures. Therefore, interethnic contact increases natives' support for redistribution through an adjustment of their social weight on immigrants by 1 to 1.8 percentage points. Due to concerns about estimates biased by selective out-migration, i.e. outflow of natives with anti-immigrant attitudes to areas with fewer immigrants present, I instrument natives' interethnic contact with regional immigrant shares. Since regions' demand-pull factors may correlate with the ethnic composition of regional immigrant shares and natives' support for redistribution, I also apply a modified shift-share IV strategy to capture variation in immigrant shares derived by supply-push factors. Estimation results of this modified recursive system of equation model confirm the results of the basic models.

The remainder of the paper is organized as follows: Section 2 provides the theoretical background and a literature review. Section 3 presents the data sources and some descriptive statistics. Section 4 describes the recursive bivariate probit estimation and the computation of direct and indirect partial effects. Section 5 shows baseline estimation results, robustness checks and application of different instrument variable strategies to account for reverse causality, sampling error and endogeneity of regional immigrant shares. Finally, Section 6 concludes.

## 2 Theoretical Background and Related Literature

There is a vast theoretical and empirical literature on the relationship between immigration and redistribution or support for redistribution.<sup>1</sup> Some empirical studies are based on survey questions about natives' demand for redistribution in general or their support for specific social policy measures. Another group of studies apply natives' voting behavior and categorize parties into more or less redistributive. [Brady and Finnigan \(2014\)](#) note that their estimates do not support the generic hypothesis of a negative relationship between immigration and natives' welfare attitudes based on individual-level ISSP panel data from 17 countries. Using ESS data, [Alesina et al. \(2019\)](#) find a significant negative effect of immigration on natives' support for redistribution in a panel of European regions. They state that the effect is largely driven by countries with generous welfare systems and individuals at the center or right of the political spectrum. For Sweden, [Dahlberg et al. \(2012\)](#) show a negative association between immigration and preferences for redistribution. Based on natives' voting behavior, [Moriconi et al. \(2019\)](#) conclude that high-skilled immigration shifts votes to more redistributive parties and low-skilled immigration favors voting of less redistributive parties. [Gerdes \(2011\)](#) identifies no significant link between the immigrant share and votes for pro-redistribution parties in Denmark. Since an inflow of foreign-born people may change natives' attitudes towards the welfare state through the economic self-interest and solidarity channel, incongruent results on immigration's impact are not surprising. Depending on the transmission channel, immigration may have opposite effects on natives' support for redistribution. Therefore, examining a direct link between immigration and natives' welfare attitudes conceals the underlying mechanisms. Since transmission channels may also be correlated, this paper aims to measure and quantify the solidarity channel holding the other underlying mechanisms of immigration's impact constant.

Social preferences and behaviors, such as solidarity, altruism and trust, are important in natives' decisions about the level of a country's inequality that they prefer or are willing to tolerate. However, natives' may distinguish between groups that deserve social benefits and those that do not. For instance, [van Oorschot \(2006\)](#) shows that the native population in Europe generally sees immigrants as substantially less deserving of social benefits and protections than other vulnerable groups, such as the elderly, disabled, or unemployed. Thus, natives' willingness to support governmental redistribution policies depends on solidarity with in-group members, i.e. native residents, and with out-group members, i.e. foreign-born residents. [Luttmer \(2001\)](#) shows that survey respondents in the United States are supportive of more redistribution if the proportion of their same-ethnic peers is higher among social benefit recipients in their immediate area. [Lind \(2007\)](#) shows that when blacks identify more strongly with whites, blacks are supportive of less redistribution. Based on results across cantons in Switzerland, [Spies and Schmidt-Catran \(2016\)](#) conjecture that the perceived integration of immigrants is more important than actual integration for

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<sup>1</sup>[Elsner and Concannon \(2020\)](#), [Stichnoth and Van der Straeten \(2013\)](#) and [Alesina and La Ferrara \(2005\)](#), among others, provide extensive summaries of the literature.

natives' welfare attitudes. Therefore, whether natives differentiate between their peers and immigrants in deservingness of governmental social benefits, depends on their perception of immigrants as an out-group. In a nutshell, if natives' in-group bias strengthens, their solidarity with out-group members decreases, leading to lower support for redistribution. Recent experimental studies attempt to capture the causal effect of natives' attitudes towards immigrants on their welfare attitudes. A survey experiment in Germany by [Runst \(2018\)](#) finds that priming natives with immigration lead to more support of the welfare state among less educated and less support among more educated. [Alesina et al. \(2018\)](#) show that respondent groups that were primed about immigration report lower support for redistribution compared to the control group. Furthermore, their results suggest that natives' perceptions of immigrants are relevant in shaping their sociopolitical preferences, rather than real-world facts about immigrants in the country. Therefore, it is straightforward to ask what drives natives' perceptions of immigrants and what perceptions are traced to natives' support of redistribution. According to the sociological literature, contact between in-group and out-group members is a striking driver of in-group members' attitudes towards out-group members. But there are two competing theories about the relationship between natives' perceptions of immigrants and their interethnic contact.

First, intergroup contact theory assumes that a lack of contact between natives and immigrants explains anti-immigrant attitudes. Thus, more interethnic contact can fill information gaps about members of other ethnicities and can reduce existing prejudices and stereotypes ([Hewstone, 2009](#)). Therefore, natives adjust their tolerance, trust and solidarity towards immigrants once they experience more interethnic contact. [Schlueter and Scheepers \(2010\)](#) finds empirical evidence for a positive relationship between natives' pro-immigrant attitudes and ethnic diversity for Denmark and [Schlueter and Wagner \(2008\)](#) in an earlier cross-country analysis of European countries. In the United States, [Dixon \(2006\)](#) finds similar results regarding the effect of whites experiencing contact with Hispanics and Asians. [Laurence \(2014\)](#) shows for the United Kingdom, greater ethnic diversity only harms natives' interethnic attitudes and respect for ethnic minorities if natives have no interethnic contact at all.

Second, opposed to intergroup contact theory, conflict theory predicts that the existence of different ethnic, linguistic, and cultural groups leads to more intense competition between these groups for scarce resources. In-group members expect the presence of individuals from dissimilar groups to lead to some negative consequences ([Stephan et al., 2009](#)). In general, competition for resources can be split into competition for tangible resources, such as the labor and housing market, and non-tangible resources, such as culture, way of life and religious beliefs. Conflict theory implies that the perceived out-group threat creates and strengthens natives' negative attitudes towards immigrants, resulting in discrimination and physical conflict between members of different groups. Natives try to protect or restore the status of their in-group by developing negative attitudes towards outsiders ([Quillian, 1995](#)). Further, more interethnic contact increases the potential for conflict between eth-

nic groups. Natives distinguish more strongly between members of their ethnic group and members of other ethnic groups resulting in less tolerance, trust and solidarity towards immigrants. Findings of lower trust are obtained for more ethnically and linguistically diverse communities in Australia (Leigh, 2006b), a higher population share of persons with a migration background in Sweden (Gustavsson and Jordahl, 2008), and in a cross-country empirical analysis (Leigh, 2006a). Scheepers et al. (2002) find a positive correlation between the share of non-EU citizens and ethnic exclusionism in a cross-country analysis of European countries. However, natives living in urban areas with a much higher concentration of immigrants have more favorable attitudes towards immigrants than do natives who live in rural areas.

Intergroup contact theory and conflict theory differ in terms of the relationship they assume between immigration and natives' solidarity with immigrants. However, they have in common that immigration and interethnic contact affect natives' social capital in terms of solidarity, trust and tolerance. Since immigrants benefit to a certain degree from governmental redistribution, a lower social weight on immigrants decreases natives' support for redistribution. This contention is correct even if immigrants are net contributors to the tax and transfer system, but natives perceive them as net recipients. In all European countries under study, immigrants earned, on average, 4 to 37 percent less than natives (European Commission, 2019b). There was almost no difference in gross income only in Portugal. Thus, on average, immigrants are more likely to benefit more from governmental redistribution than natives. Suppose it were possible to transform the tax and transfer system to benefit a single ethnic group solely. In that case, natives exhibiting anti-immigrant attitudes could attempt to ensure that governmental redistribution takes place in such a way that only their ethnic group profits from it. However, the implementation of such a selective redistribution scheme is not feasible in European countries, since income tax policies and most types of social benefits cannot be discriminatory based on ethnicity. Thus, natives with anti-immigrant attitudes will have lower support for redistribution.

### 3 Data

I use the seventh wave of the ESS, which covers 21 countries (20 European countries and Israel) as the ultimate sampling unit and contains persons aged 15 and above residing in private households (European Social Survey, 2014). It provides detailed information on respondents' socio-economic and demographic background, their attitudes towards immigrants on both a personal and a general level, and their support for redistribution.<sup>2</sup> On average, there is a high demand for redistribution in European countries. Almost 71 percent of the respondents agree that the government should take measures to reduce the differences

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<sup>2</sup>Respondents are asked whether they agree or disagree with the following statement on a 5-point-scale: "The government should take measures to reduce differences in income levels". In the empirical literature, this question has emerged as an appropriate measure for the individual support for redistribution (see Alesina et al., 2019; Burgoon, 2014; Corneo and Grüner, 2002, among others)

**Table 1:** Support for redistribution across European countries

Country	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Austria	1.6	5.1	10.6	43.1	39.7
Belgium	3.1	12.0	12.6	44.0	28.4
Czech Republic	4.2	12.9	23.9	37.8	21.3
Denmark	10.4	30.6	22.9	27.5	8.6
Finland	2.0	8.4	13.8	40.4	35.5
France	6.8	8.9	13.4	37.9	32.9
Germany	1.6	15.0	13.7	47.5	22.2
Hungary	0.8	2.7	9.3	42.4	44.8
Ireland	1.4	9.2	9.5	48.1	31.9
Netherlands	2.6	22.5	19.0	39.6	16.3
Norway	1.7	14.6	22.0	42.7	19.0
Poland	2.4	6.8	9.7	40.3	40.8
Portugal	0.6	2.8	7.3	40.9	48.4
Slovenia	1.4	8.2	9.0	36.7	44.6
Spain	1.0	5.1	7.9	34.8	51.2
Sweden	1.3	7.9	21.5	46.9	22.4
Switzerland	4.5	21.4	17.4	40.5	16.2
United Kingdom	3.2	15.6	18.8	41.6	20.7
<i>Average</i>	3.1	11.9	14.3	41.4	29.3

Notes: Calculation based on responses of natives, weighted with country-specific design weights. Shares are in percent.  
Source: ESS 2014; own calculations.

in income levels (see Table 1). However, there is quite a variation in the distribution of redistribution preferences across European countries. While in Spain and Portugal, the majority of natives strongly supports redistribution measures, in Denmark and Switzerland, roughly 41 and 26 percent, respectively, disagree with governmental measures of reducing income disparities. Because the share of natives who strongly reject governmental redistribution is meager across almost all European countries, I collapse the last two bottom categories for empirical analysis following Hamilton (1992).<sup>3</sup> Further, the immigration module of the ESS features a battery of questions about attitudes towards immigrants. From this pool, I select seven questions to map two dimensions of attitudes towards immigrants.<sup>4</sup> First, the personal relationship of natives to immigrants is defined by three questions that cover natives' social distance from immigrants.<sup>5</sup> The variables *mind marriage to relative* and *mind as boss* express natives' aversion to social contact with immigrants in their private and professional life, respectively. Whereas natives should find it difficult to avoid social interactions at work, they are free to decide on contact in their free time. However, the share of natives who disapprove to a certain degree of interactions in their free time or at work is mostly the same across European countries (see Table 2). On average, 60 and 62 percent of natives mind an immigrant's marriage to their relatives and mind an immigrant as a boss, respectively. The last question *no immigrant friends* measures whether natives have no foreign-born friends. Across all European countries, one out of two natives has at least one friend born abroad.<sup>6</sup> In contrast to previous questions, this variable measures seeking and realizing active social

<sup>3</sup>Since ordered probit estimations are based on the proportional odds assumption, all categories of the ordered dependent variable must be sufficiently filled to ensure convergence of the maximum likelihood estimations.

<sup>4</sup>The wording of these questions is in Table 20 in the Appendix.

<sup>5</sup>All three variables are recoded as dichotomous variables.

<sup>6</sup>Due to revisions of the ESS there is no data for social distance measures in Austria available.



**Table 2:** Social distance and out-group threat measures across European countries

Country	Mind Marriage to Relative	Mind as Boss	No Immigrant Friends	Culture Undermined	Way of Life Worsens	Religious Beliefs Undermined	Immigrants Bad for Economy
Austria				85.7	92.9	93.0	86.8
Belgium	69.9	68.7	48.2	77.7	91.1	92.5	93.5
Czech Republic	90.3	90.1	71.3	96.1	96.3	96.8	96.3
Denmark	60.2	58.8	47.7	70.0	76.5	88.2	84.5
Finland	61.3	68.4	62.6	55.5	81.8	77.9	82.2
France	65.2	65.6	35.4	76.4	90.4	90.7	87.9
Germany	55.1	59.9	51.3	64.5	82.4	85.9	72.4
Hungary	85.2	86.7	73.3	90.9	97.5	90.4	96.2
Ireland	66.5	67.0	58.2	77.6	81.0	88.2	84.0
Netherlands	58.1	59.6	49.2	76.1	90.3	93.1	93.3
Norway	60.4	60.6	47.4	71.7	83.4	90.3	79.8
Poland	68.6	67.0	79.1	69.7	83.0	86.4	85.7
Portugal	59.3	59.9	50.2	75.0	91.3	86.1	83.4
Slovenia	54.7	59.1	37.0	76.7	91.1	86.6	89.9
Spain	51.9	45.4	46.6	67.2	85.3	86.9	82.8
Sweden	36.9	38.1	34.1	46.9	62.5	82.3	78.4
Switzerland	58.1	64.6	38.7	70.9	85.8	85.9	71.6
United Kingdom	56.7	62.1	44.9	82.0	87.0	92.9	87.3
<i>Average</i>	60.1	61.8	49.3	72.7	86.0	88.9	83.4

Notes: Calculation based on responses of natives, weighted with country-specific design weights. Shares are in percent.  
Source: ESS 2014; own calculations.

contact of natives to immigrants.

Second, four questions measure natives' concerns that immigrants endanger social life and economic prosperity of the country.<sup>7</sup> The variables *culture undermined*, *way of life worsens*, and *religious beliefs undermined* express whether natives perceive immigrants as serious competitors for the non-tangible goods culture, social life and religion. The variable *immigrants bad for economy*, however, covers natives' concerns about a negative impact of immigration on the economic prosperity of the country. On average, natives perceive immigrants to some extent as a threat to the social fabric and prosperity of the country. This set of natives' perceived out-group threats differ from social distance measures because they enclose a more abstract and generalized perspective on immigrants. In their attitudes towards immigrants, natives may differentiate between perceived effects of immigration on the social fabric of a country and its effect on their personal daily life. The two dimensions of natives' attitudes towards immigrants offer a unique opportunity to examine whether personal animosities towards immigrants or rather societal fears of immigration drive the solidarity channel of natives' support for redistribution.

Natives' solidarity with immigrants measured by social distance and out-group threats refers to their bridging social capital that is formed by social contact with persons who are in some way different (Putnam, 2007). Therefore, I examine the correlation of natives' attitudes toward immigrants with more general components of social capital and the human values by Schwartz (1992). There is a significant and negative correlation between natives' anti-immigrant measures and their perception of trust, helpfulness and fairness within society (see Table 3). Though social distance measures are less correlated than out-group threat measures. The subdimensions *helpfulness*, *loyalty*, and *independence* of the human values

<sup>7</sup>All four variables are recoded as dichotomous variables.

**Table 3:** Correlations between attitudes towards immigrants and social capital measures

Attitudes	General Social Capital			Human Values		
	Trust in Society	Helpfulness in Society	Fairness in Society	Independence	Helpfulness	Loyalty
Mind Marriage to Relative	-0.162***	-0.108***	-0.151***	-0.063***	-0.103***	-0.087***
Mind as Boss	-0.171***	-0.109***	-0.159***	-0.055***	-0.104***	-0.102***
No Immigrant Friends	-0.076***	-0.033***	-0.040***	-0.050***	-0.096***	-0.068***
Culture Undermined	-0.303***	-0.196***	-0.265***	-0.042***	-0.062***	-0.045***
Way of Life Worsens	-0.323***	-0.238***	-0.281***	-0.013*	-0.060***	-0.034***
Religious Beliefs Undermined	-0.214***	-0.145***	-0.173***	-0.031***	-0.054***	-0.027***
Immigrants Bad for Economy	-0.300***	-0.206***	-0.264***	-0.039***	-0.036***	-0.029***

Notes: Calculation based on original responses of natives before recoding social distance and out-group threat measures.  
Source: ESS 2014; own calculations.

also show a negative and significant correlation with natives' attitudes towards immigrants. However, these correlations are by far less pronounced. Thus, social distance and out-group threat measures may be good candidates to reflect natives' solidarity with immigrants.

In contrast to the global trade of goods and services, migration of workers always causes to some extent contact between natives and people from foreign countries. As pointed out by [Elsner and Concannon \(2020\)](#), adequate measurement of exposure to immigrants is a challenge. Due to the lack of individual data, many studies use the immigrant share at the regional or national level as a proxy for natives' exposure (see, for example, [Alesina et al., 2019](#); [Moriconi et al., 2019](#)). However, the skewed distribution of immigrants within regions or countries may conceal natives' actual exposure to immigrants. The immigration module of the ESS provides a suitable measure of natives' frequency of contact with immigrants in the neighborhood, which does not stem from friendship or other relations to immigrants.<sup>8</sup> The variable *interethnic contact* measures natives' contact with immigrants in everyday life, i.e. social interactions in public transport, public places, and the neighborhood. Across European countries, only 12 percent of natives report no interethnic contact at all in their everyday life (see [Table 4](#)). However, Hungary and Poland are strong outliers for interethnic contact. In these countries, 30 to 50 percent of natives have no contact with immigrants, respectively.

Since socio-economic and demographic characteristics are important determinants of natives' support for redistribution and their attitudes towards immigrants, a basic set of exogenous variables is prepared. They include the respondent's age, gender, years of education, marital status, employment status, household size, household income, political orientation, size of the area of residence, presence of children, and type of employment.<sup>9</sup> In order to prevent distortions of the estimations due to an insufficient number of observations within NUTS level 2 regions, regions with less than 30 valid observations are not taken into account. In total, the final sample includes 18 European countries and confines to natives, i.e. all respondents with a place of birth inside the country of data collection.<sup>10</sup>

<sup>8</sup> Respondents are asked the following question: "How often do you have any contact with people of a different race or ethnic group [...] when you are out and about?"

<sup>9</sup> Respondents who are currently in education are not taken into account, as most of them are not entitled to vote.

<sup>10</sup> Estonia is excluded from the analysis because there is no information on respondents' household income.

**Table 4: Interethnic contact across European countries**

Country	Never	Less than once a month	Once a month	Several times a month	Once a week	Several times a week	Every day
Austria	7.9	11.6	7.8	17.3	8.0	26.3	21.1
Belgium	10.1	10.6	7.1	14.2	8.7	23.4	25.8
Czech Republic	18.4	17.5	10.6	19.7	9.8	14.2	9.7
Denmark	5.5	10.9	7.3	13.9	11.4	24.0	26.9
Finland	8.4	24.2	13.8	14.8	10.1	17.7	10.9
France	8.7	9.9	9.2	18.2	8.8	20.3	24.9
Germany	5.9	9.4	5.8	17.0	7.5	23.0	31.4
Hungary	29.5	16.8	5.8	15.9	8.9	13.0	10.1
Ireland	10.6	13.9	6.7	12.1	13.3	20.7	22.8
Netherlands	5.3	10.5	7.0	16.3	9.1	29.2	22.5
Norway	2.6	10.1	8.2	14.5	8.8	27.5	28.3
Poland	49.4	18.8	7.7	10.1	3.1	6.5	4.3
Portugal	17.1	16.5	10.9	16.7	7.9	14.3	16.5
Slovenia	13.0	13.2	11.3	12.9	9.0	14.0	26.6
Spain	15.5	10.3	5.5	13.2	6.3	17.9	31.4
Sweden	1.6	4.6	3.9	10.5	7.6	23.1	48.7
Switzerland	4.9	10.1	7.9	15.4	11.8	25.1	24.8
United Kingdom	5.2	9.9	8.4	13.1	10.4	22.8	30.3
<i>Average</i>	12.0	11.3	7.5	15.2	8.2	20.4	25.5

Notes: Calculation based on responses of the natives, weighted with country-specific design weights. Shares are in percent.  
Source: ESS 2014; own calculations.

## 4 Econometric Specification

Considering the solidarity channel of natives' support for redistribution, I assume that immigration has no direct impact on natives' support for redistribution. Natives' solidarity with immigrants is not exogenous and depends on their interethnic contact in everyday life. Whether more interethnic contact enhances or lowers natives' solidarity with immigrants is an empirical question, since there are two competing theories. Therefore, immigration's impact on natives' redistribution is indirectly transmitted through a change in natives' solidarity with immigrants. A recursive bivariate probit model captures best the features of the economic model, represented mathematically below and estimated by maximum likelihood methods (see [Greene, 2018](#), for a discussion). For  $i = 1, \dots, n$ ,

$$A_i^* = \mathbf{x}'_{A,i} \beta_A + \delta_A \cdot E_i + \epsilon_{A,i}, \quad A_i = 1 \quad \text{if} \quad A_i^* > 0, \quad (1)$$

$$R_i^* = \mathbf{x}'_{R,i} \beta_R + \gamma_R \cdot A_i + \epsilon_{R,i}, \quad R_i = m \quad \text{if} \quad \kappa_{m-1} \leq R_i^* < \kappa_m \quad \text{for} \quad m = 1, \dots, 4, \quad (2)$$

where  $\kappa_m$  are the threshold points of the continuous latent variable  $R_i^*$  with  $\kappa_0 = -\infty$  and  $\kappa_4 = +\infty$ . The error terms are assumed to be jointly normally distributed and may be correlated, expressed by the correlation parameter  $\rho$ :

$$\begin{pmatrix} \epsilon_A \\ \epsilon_R \end{pmatrix} \sim \mathcal{N} \left( \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix} \right)$$

In this system of equations,  $A_i^*$  and  $R_i^*$  are the latent endogenous variables of the model, which are observed only as their categorical realizations  $A_i$  and  $R_i$ . The dichotomous vari-

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Moreover, Israel and Lithuania are excluded due to missing regional information and lack of variation at the NUTS level 2, respectively.

able  $A_i$  represents natives' attitudes towards immigrants and the ordered variable  $R_i$  defines natives' support for redistribution. The common and identical basic set of socioeconomic and demographic variables  $x_{A,i}$  and  $x_{R,i}$  are included to the right-hand side of the equations. Further, the basic set of exogenous variables includes a full set of country dummies to capture country-specific effects. Since the parsed panel is very long with a small  $N$  (countries) and a high  $T$  (observations), there is no indication for the incidental parameter problem (Chamberlain, 1984).<sup>11</sup> Natives' frequency of interethnic contact  $E_i$  is only a predictor of the attitudes equation due to previously described theoretical considerations. The error terms  $\epsilon_A$  and  $\epsilon_R$  pick up unmeasured economic and societal features of natives' region of residence, taste for solidarity and redistribution.

There are two aspects of the econometric model that should be outlined. First, there may be a correlation between the error terms of the attitudes and redistribution equation because they both include unmeasured regional characteristics. By jointly estimating the system of equations and allowing for correlation between the error terms, Greene (2018) notes that we can ignore the endogenous nature of the attitudes variable in the redistribution equation and treat it as exogenous once we carry over the categorical realizations of the latent attitudes variable to the redistribution equation. Second, the model is identified because the exclusion restriction is fulfilled by including natives' interethnic contact only on the right-hand side of the attitudes equation. In contrast to Wilde (2000) who argued that the recursive bivariate probit model does not require an exclusion restriction for identification once there is sufficient variation in the explanatory variables, Han and Lee (2019) clarified that estimates are at best weakly identified in this case.

#### 4.1 The Recursive Bivariate Probit Model

For the recursive bivariate binary probit model, the definition of the unconditional mean function is straightforward, since both dependent variables are dichotomous. The current system of equations, however, includes natives' support for redistribution as an ordered dependent variable and calls for a mathematical notation in probabilities. Taking the ordered nature of the redistribution variable into account has two advantages. First, ordered variables are a better representation of the underlying latent variable than binary variables because they allow for more variation and a more precise ranking in respondent's decision. Second, partial effects of predictors can be calculated for each specific category of the ordered variable or for the probability of taking a higher or lower response category. In order to improve the interpretation of estimation results and to answer the question whether natives support governmental redistribution or not, I focus on the probability that natives choose one of the two top categories of the redistribution variable, i.e. the probability that natives actively support governmental redistribution. The probability functions of the re-

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<sup>11</sup>The maximum likelihood estimator of the incidental parameters (fixed effects) is consistent as long as  $T \rightarrow \infty$  for given  $N$ , assuming that there are  $T$  observations for each unit  $i = 1, \dots, N$ . The estimator, however, is inconsistent for given  $T$ , as  $N \rightarrow \infty$ .

cursive bivariate probit model are as follows.<sup>12</sup>

$$\Pr(A_i = 1) = \Phi(\mathbf{x}'_{A,i}\boldsymbol{\beta}_A + \delta_A E_i), \quad (3)$$

$$\Pr(R_i \geq 3, A_i) = \Phi_2(\mathbf{x}'_{R,i}\boldsymbol{\beta}_R + \gamma_R, \mathbf{x}'_{A,i}\boldsymbol{\beta}_A + \delta_A E_i, \rho) + \Phi_2(\mathbf{x}'_{R,i}\boldsymbol{\beta}_R, -\mathbf{x}'_{A,i}\boldsymbol{\beta}_A - \delta_A E_i, -\rho), \quad (4)$$

The first and second term of the redistribution probability function compute the probabilities  $\Pr(R_i \geq 3, A_i = 1)$  and  $\Pr(R_i \geq 3, A_i = 0)$ , respectively.<sup>13</sup>

## 4.2 Computing Partial Effects

Although coefficient estimates of the recursive bivariate probit model give insights into the sign and the significance of the predictors, they cannot be interpreted in terms of economic or social impact. To address the question, which predictors are important in determining the values of the dependent variables, I compute the average partial effects of each predictor of the system of equations. The partial effects of exogenous variables that affect natives' attitudes towards immigrants are computed the same way as in the usual probit case, since  $\mathbf{x}_R$  has no impact on the attitudes equation. Considering the partial effects of predictors on the redistribution equation, however, is more complicated because three cases can be distinguished: (i) partial effects of exogenous variables that are included in both equations, that is  $\mathbf{x}_R$  because  $\mathbf{x}_R = \mathbf{x}_A$  holds, (ii) partial effects of natives' interethnic contact  $E$ , and (iii) partial effect of the endogenous explanatory attitudes variables  $A_i$ . In the first case, explanatory variables have both a direct and indirect impact on natives' support for redistribution. The direct partial effect measures the impact of an explanatory variable that appears in the redistribution equation ( $\mathbf{x}_R$ ) on natives' redistribution preference. The indirect partial effect, however, is the impact of an explanatory variable on the redistribution decision coming from the attitudes equation and operating through natives' attitudes towards immigrants. For continuous variables, the partial effects are computed via the calculus method by taking partial derivatives.<sup>14</sup> Then, the direct partial effect on natives' support for redistribution is

$$\begin{aligned} \frac{\partial \Pr(R \geq 3, A)}{\partial x_r} = & \left[ \phi(\mathbf{x}'_R \boldsymbol{\beta}_R + \gamma_R) \times \Phi \left( \frac{\mathbf{x}'_A \boldsymbol{\beta}_A + \delta_A E - \rho(\mathbf{x}'_R \boldsymbol{\beta}_R + \gamma_R)}{\sqrt{1 - \rho^2}} \right) \right. \\ & \left. + \phi(\mathbf{x}'_R \boldsymbol{\beta}_R) \times \Phi \left( \frac{-(\mathbf{x}'_A \boldsymbol{\beta}_A + \delta_A E) + \rho(\mathbf{x}'_R \boldsymbol{\beta}_R)}{\sqrt{1 - \rho^2}} \right) \right] \times \frac{\partial(\mathbf{x}'_R \boldsymbol{\beta}_R)}{\partial x_r}. \end{aligned} \quad (5)$$

<sup>12</sup>Greene and Hensher (2010) show this for the recursive bivariate binary case. Due to the proportional odds assumption, I can translate their implementation from the binary case to the ordinal case.

<sup>13</sup>The respective thresholds points are integrated into  $\mathbf{x}'_{A,i}$  and  $\mathbf{x}'_{R,i}$ .  $\phi(\cdot)$  and  $\Phi(\cdot)$  indicate the univariate standard normal density and the cumulative density function, respectively, whereas  $\phi_2(\cdot)$  and  $\Phi_2(\cdot)$  specify the bivariate normal density and cumulative density function, respectively.

<sup>14</sup>More precisely, I compute average partial effects by computing the partial derivatives for each observation, totaling these values, and obtaining the mean. For notational simplicity, the summation operator and the index  $i$  are suppressed.

and the indirect partial effect is defined by

$$\begin{aligned} \frac{\partial \Pr(R \geq 3, A)}{\partial x_a} = & \phi(\mathbf{x}'_A \boldsymbol{\beta}_A + \delta_A E) \times \left[ \Phi \left( \frac{\mathbf{x}'_R \boldsymbol{\beta}_R + \gamma_R - \rho(\mathbf{x}'_A \boldsymbol{\beta}_A + \delta_A E)}{\sqrt{1 - \rho^2}} \right) \right. \\ & \left. - \Phi \left( \frac{\mathbf{x}'_R \boldsymbol{\beta}_R - \rho(\mathbf{x}'_A \boldsymbol{\beta}_A + \delta_A E)}{\sqrt{1 - \rho^2}} \right) \right] \times \frac{\partial(\mathbf{x}'_A \boldsymbol{\beta}_A)}{\partial x_a}. \end{aligned} \quad (6)$$

where  $x_r$  and  $x_a$  are a single explanatory variable of the basic sets  $\mathbf{x}_R$  and  $\mathbf{x}_A$ , respectively.<sup>15</sup> The sign of the direct partial effect is equal to the sign of the fraction  $\partial(\mathbf{x}'_R \boldsymbol{\beta}_R)/\partial x_r$ , as the term in the square brackets is positive. The sign of the indirect partial effect, however, depends on the sign of  $\partial(\mathbf{x}'_A \boldsymbol{\beta}_A)/\partial x_a$  and  $\gamma_R$ . If  $\gamma_R > 0$  holds, the term in the square brackets is positive, and the indirect partial effect takes the same sign as  $\partial(\mathbf{x}'_A \boldsymbol{\beta}_A)/\partial x_a$ . If  $\gamma_R < 0$  applies, the opposite is true. Further, natives' interethnic contact  $E$  has only an indirect effect on natives' support for redistribution because  $E$  appears only in the attitudes equation.<sup>16</sup> For discrete explanatory variables, partial effects are computed by using the finite-difference method. Since the endogenous explanatory variable  $A$  is dichotomous, partial effects of natives' attitudes towards immigrants on their support for redistribution are computed by using the finite-difference method:

$$\Pr(R_i \geq 3, A_i = 1) - \Pr(R_i \geq 3, A_i = 0) = \Phi(\mathbf{x}'_R \boldsymbol{\beta}_R + \gamma_R) - \Phi(\mathbf{x}'_R \boldsymbol{\beta}_R) \quad (7)$$

This partial effect on the marginal probability detects the impact of a change in natives' attitudes on their support for redistribution while holding all other observed and unobserved variables constant. [Greene \(2018\)](#) notes that the averaging of equation (7) over the full sample yields the average treatment effect. Finally, standard errors are clustered at the NUTS level 2 and calculated using the delta method. Bootstrapping the standard errors of partial effects would neglect the adjustment of the variance-covariance matrix due to clustering at the regional level.

## 5 Empirical Results

### 5.1 Baseline Estimations

#### 5.1.1 Impact of Social Distance and Out-group Threat

I estimate the recursive bivariate probit model by full information maximum likelihood and carry natives' perceptions of immigrants as observed realizations into the right-hand side of the redistribution equation ([Roodman, 2011](#)). Estimations are applied separately for each attitudes variable of the two dimensions *social distance* and *out-group threat*. Considering

<sup>15</sup>The derivations of the bivariate normal cumulative distribution function are based on the implications of the recursive bivariate binary case in [Greene and Hensher \(2010\)](#).

<sup>16</sup>This can be achieved by replacing  $\partial(\mathbf{x}'_A \boldsymbol{\beta}_A)/\partial x_a$  with the coefficient estimate of  $\delta_A$ .

social distance measures, more interethnic contact in everyday life lowers natives' social distance to immigrants in all three attitudes variables (see Table 5). Contact to immigrants

**Table 5:** Impact of social distance measures on support for redistribution

	<u>Mind Marriage to Relative</u>		<u>Mind Immigrant as Boss</u>		<u>No Immigrant Friends</u>	
	<i>support for redistribution</i>	<i>mind marriage to relative</i>	<i>support for redistribution</i>	<i>mind immigrant as boss</i>	<i>support for redistribution</i>	<i>no immigrant friends</i>
mind marriage with relative	-0.1713 (0.1845)					
mind immigrant as boss			-0.1250 (0.1469)			
no immigrant friends					-0.0496 (0.0933)	
interethnic contact		-0.0784 (0.0063)***		-0.0816 (0.0067)***		-0.1743 (0.0075)***
$\text{atanh } \hat{\rho}$	0.0834 (0.1157)		0.0663 (0.0919)		0.0293 (0.0563)	
Obs.	18915		18915		18915	
AIC	67807		67743		67747	
BIC	68332		68269		68273	
Log Likelihood	-33836		-33805		-33807	

Notes: Coefficient estimates are reported. In the maximum likelihood estimation,  $\rho$  is not directly estimated, but  $\text{atanh } \rho = 0.5 \times \ln((1 + \rho)/(1 - \rho))$  applies. Country fixed effects, socioeconomic and demographic predictors are included, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014; own calculations.

in daily life decreases natives' aversion to a marriage of an immigrant with relatives and to having an immigrant as a supervisor at work. Further, natives' with more interethnic contact in their close neighborhood have also more friends with a migration background. Therefore, more social interactions in public transport, public places and in other circumstances of everyday life enable opportunities to learn more about immigrants as an out-group and to generate affective ties. A more benevolent attitude towards immigrants in private life and at work may imply stronger solidarity towards immigrants as an out-group among natives. Natives may adjust their social weight on immigrants in sociopolitical issues and may perceive immigrants as equally deserving social benefits. The estimates, however, show that all social distance measures have no significant impact on natives' support for redistribution. Moreover, the correlation parameters indicate that unobserved factors of the redistribution and attitudes equation are not correlated.

Whether the positive effect of more interethnic contact on natives' social distance can be generalized for immigrants as an out-group remains open at first. A change in natives' social distance in everyday life due to more interethnic contact does not necessarily imply that positive attitudes are also transferred to immigrants who are not personally known and with whom no contact occurs. Examining the out-group threat measures shows that more interethnic contact also lowers natives' fear of immigration's impact on the social fabric and prosperity of the country (see Table 6). Thus, natives' experiences from contact with immigrants are also associated with a lower in-group bias regarding the competition for tangible and non-tangible goods. More interethnic contact leads to more positive expectations among natives about immigration's consequences. In contrast to the social distance

**Table 6:** Impact of out-group threat measures on support for redistribution

	<b>Culture Undermined</b>		<b>Way of Life Worsens</b>	
	<i>support for redistribution</i>	<i>culture undermined</i>	<i>support for redistribution</i>	<i>way of life worsens</i>
culture undermined	-0.5727 (0.1630)***			
way of life worsens			-0.8642 (0.1151)***	
interethnic contact		-0.0725 (0.0065)***		-0.0490 (0.0075)***
atanh $\hat{\rho}$	0.3181 (0.1070)***		0.4905 (0.0811)***	
Obs.		18989		18989
AIC		64547		59468
BIC		65089		60010
Log Likelihood		-32205		-29665

	<b>Religious Beliefs Undermined</b>		<b>Immigrants Bad for Economy</b>	
	<i>support for redistribution</i>	<i>religious beliefs undermined</i>	<i>support for redistribution</i>	<i>immigrants bad for economy</i>
religious beliefs undermined	-0.5409 (0.1525)***			
immigrants bad for economy			-0.5579 (0.1372)***	
interethnic contact		-0.0443 (0.0078)***		-0.0651 (0.0075)***
atanh $\hat{\rho}$	0.2638 (0.0887)***		0.3206 (0.0837)***	
Obs.		18989		18989
AIC		58137		59932
BIC		58679		60473
Log Likelihood		-29000		-29897

Notes: Coefficient estimates are reported. In the maximum likelihood estimation,  $\rho$  is not directly estimated, but  $\text{atanh } \rho = 0.5 \times \ln((1 + \rho)/(1 - \rho))$  applies. Country fixed effects, socioeconomic and demographic predictors are included, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014; own calculations.

measures, all out-group threat measures have a significantly negative impact on natives' support for redistribution. Hence, rather natives' their vague fear of changes in the social environment and the economic consequences due to the presence of immigrants drive welfare demands than their animosity towards particular immigrants. Therefore, the solidarity channel of natives' support for redistribution works through the competition for tangible and non-tangible goods. Once natives' perceive immigrants as serious competitors, they lower their social weight on immigrants in their decisions about welfare issues.

Since country fixed effects are applied, the recursive bivariate probit estimations exploit variation within countries. Employing regional fixed effects at the NUTS level 1 leads to similar results (see Table 13 in the Appendix). Estimations based on social distances and out-group measures include 68 and 71 regions, respectively. On average, each region contains between 267 and 278 natives. Thus, the parsed panel gets shorter with a higher N (regions) and smaller T (observations). In order to avoid inconsistent estimates due to the incidental parameter problem, however, country fixed effects estimations are preferred.

### 5.1.2 Comparison to Bivariate Probit Estimations

As pointed out by [Filippini et al. \(2018\)](#), the correlation parameter  $\rho$  or  $\text{atanh } \hat{\rho}$  of a recursive bivariate probit model does not have to take the same sign as the endogenous relationship between the dependent variables. Whereas the coefficient of the explanatory endogenous variable captures the relationship between the endogenous variables, the correlation pa-



parameter subsumes the correlation between the unobserved factors. Considering previous results, the relationship between out-group threat measures and natives' support for redistribution is negative, but the unobserved factors of the dependent variables are positively correlated. Hence, some unobserved drivers that increase both natives' perceived out-group threats and their support for redistribution. Once a recursive system is estimated by bivariate probit estimation, the correlation parameter is a weighted average of the correlation parameter from recursive bivariate probit estimation and the coefficient on the explanatory endogenous variables (see Table 7). For the recursive bivariate probit estimations, the cor-

**Table 7:** Bivariate probit estimations of attitudes towards immigrants and support for redistribution

	Culture Undermined	Way of Life Worsens	Religious Beliefs Undermined	Immigrants Bad for Economy
interethnic contact	-0.0756 (0.0064)***	-0.0533 (0.0074)***	-0.0439 (0.0074)***	-0.0662 (0.0075)***
$\text{atanh } \hat{\rho}$	-0.0286 (0.0123)**	-0.0180 (0.0130)	-0.0264 (0.0129)**	0.0049 (0.0151)
Obs.	18989	18989	18989	18989
AIC	64565	59519	58147	59949
BIC	65098	60053	58680	60483
Log Likelihood	-32214	-29691	-29005	-29907

Notes: Coefficient estimates are reported. In the maximum likelihood estimation, the correlation parameter  $\rho$  is not directly estimated, but  $\text{atanh } \rho = 0.5 \times \ln((1 + \rho)/(1 - \rho))$  applies. Country fixed effects, socioeconomic and demographic predictors are included, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014; own calculations.

relation parameters and coefficients on the explanatory endogenous variables have opposite signs. Neglecting the endogeneity of the attitudes variables and estimating the same model by bivariate probit yield insignificant or slightly negatively significant correlation parameters. Usually, a zero or close to zero bivariate probit correlation parameter serves as evidence for independence between the endogenous variables under study. Such a conclusion, however, would be misleading in this case because the observed independence results from opposite signs of the recursive bivariate probit correlation parameter and the coefficient on the explanatory endogenous variable. This simple test confirms the theoretical foundation of the empirical approach and excludes the possibility of independence between out-group threat measures and natives' support for redistribution.

## 5.2 Partial Indirect and Direct Effects

### 5.2.1 Impact of Out-group Threats and Interethnic Contact

The recursive bivariate probit estimation allows for the division of a predictor's partial effect into a direct and an indirect effect. The direct effect measures the impact of a variable on natives' support for redistribution via a direct association. In contrast, the indirect effect identifies the influence of a variable on natives support for redistribution through a change in their attitudes towards immigrants. The sum of both effects subsequently yields the total effect. Since social distance measures yielded insignificant coefficient estimates, decompositions are applied to estimations using out-group threat measures. The breakdown of the

overall partial effect enables us to investigate whether direct and indirect effects compensate for one another in some cases (see Table 14 and 15 in the Appendix). All estimations of out-group measures show that the direct and indirect effect of natives' education has opposite signs. On the one hand, more educated natives prefer less redistribution. On the other hand, a higher education lowers natives' anti-immigrant attitudes and hence foster their support for redistribution. The total partial effect of education is significantly negative, indicating that the direct effect overcompensates the indirect. The same is true for the partial effects of natives' household income. In contrast, natives employed in the private sector or more leftist natives have the same signs for both the direct and indirect effect. Decomposing the partial effects gives a more detailed insight into mechanisms underlying the relationship between the endogenous and the explanatory endogenous variable. Moreover, the direct impact of perceived out-group threats and the indirect impact of interethnic contact on natives' support for redistribution can be measured (see Table 8). Natives' perceived out-

**Table 8:** Partial effects of out-group threat measures on support for redistribution

	<u>Culture undermined</u>		<u>Way of Life Worsens</u>		<u>Religious Beliefs Undermined</u>		<u>Immigrants Bad for Economy</u>	
	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>
culture undermined	-0.1656 (0.0439)***							
way of life worsens			-0.2239 (0.0243)***					
religious beliefs undermined					-0.1493 (0.0369)***			
immigrants bad for economy							-0.1553 (0.0340)***	
interethnic contact		0.0039 (0.0011)***		0.0031 (0.0006)***		0.0014 (0.0005)***		0.0026 (0.0007)***

Notes: Average direct and indirect partial effects are reported. Country fixed effects, socioeconomic and demographic predictors are included at every stage of estimation, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.  
Source: ESS 2014; own calculations.

group threats reduce their support for redistribution by 15 to 22 percentage points, whereas more interethnic contact increases their support for redistribution by 0.1 to 0.4 percentage points. Since the impact of interethnic contact on natives' support for redistribution works solely through a change in their perceived out-group threats, the small magnitude of the partial effects is not surprising. Nevertheless, the results reveal that more immigrants in the neighborhood enhance pro-immigrant attitudes and more support for redistribution among natives.

At first glance, this finding may challenge the previous results of the empirical literature. However, it does not exclude the possibility of an overall negative effect of immigration at the country level. First, examining the association between immigration and natives' support for redistribution at the country level averages immigration's impact coming from the economic self-interest and solidarity transmission channel. Whereas the economic channel depends on the skill and occupational composition of immigrants, the solidarity channel depends on the frequency of interethnic contact. To what extent one transmission channel

may overcompensate the other in its effects on natives' support for redistribution depends on the composition and distribution of immigrants in a country. Second, the frequency of interethnic contact in daily life depends on the share of immigrants in the surrounding area. If immigrants are unequally distributed across the country, and the immigrant population gathers in a few agglomerations, most natives do not experience any interethnic contact. Therefore, a positive correlation between immigrant share and a more skewed distribution of immigrants may drive empirical results at the country level. Since this paper aims to isolate and measure the solidarity channel of natives' support for redistribution, the indirect effect of interethnic contact is merely transmitted through a change in natives' attitudes towards immigrants holding all other observed and unobserved factors constant.

### 5.2.2 Robustness Checks

There may be some concerns about the selection of countries under study. First, respondents in the Czech Republic and Hungary differ, on average, more in their attitudes towards immigrants from respondents in the remaining countries. In both countries, the proportion of respondents with anti-immigrant attitudes based on out-group threat measures is the highest. As results might be driven by respondent behavior in these countries, estimations are repeated excluding the Czech Republic and Hungary from the sample (see Table 9, Exclusion I). Second, there may be concerns about the effects of the different survey fieldwork periods across European countries on the estimates. Since the ESS was conducted between 2014 and 2015 in the countries under study, some European countries experienced during their fieldwork time a substantial increase in the inflow of asylum applicants, in particular from Syria, Iraq and Afghanistan. As a rapid change in asylum applications may influence respondents' attitudes towards immigrants, the assumption of a stable social environment for all respondents of a country over the fieldwork period must be questioned. In particular, respondents in Hungary, Poland, Portugal and Spain experienced a rapid change in first-time asylum applications during the fieldwork period of the ESS (see Figure 1, in the Appendix). Therefore, estimations are repeated, excluding these countries from the sample (see Table 9, Exclusion II). Third, in federal states, a considerable stake of welfare policies is set at the regional level. In this case, country fixed effects only capture countries' averaged social policy across the regions, whereas natives base their support for redistribution on regional welfare politics. Thus, I repeat the estimations excluding the federal states Austria, Belgium, Germany, and Switzerland (see Table 9, Exclusion III). The comparison of estimates from the full sample and the subsamples indicates no changes for significance and no notable changes for the size of the direct and indirect partial effects. There is even a slight decrease in partial effects of out-group threat measures, indicating that the negative impact of anti-immigrant attitudes on natives' support for redistribution is slightly more substantial. The same applies to the indirect effect of natives' interethnic contact.

**Table 9:** Exclusion of particular countries: Partial effects of out-group threat measures on support for redistribution

	<u>Culture undermined</u>		<u>Way of Life Worsens</u>		<u>Religious Beliefs Undermined</u>		<u>Immigrants Bad for Economy</u>	
	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>
<b>Exclusion I: Strong Anti-Immigrant Attitudes</b>								
culture undermined	-0.1914 (0.0363)***							
way of life worsens			-0.2379 (0.0217)***					
religious beliefs worried					-0.1558 (0.0372)***			
immigrants bad for economy							-0.1609 (0.0349)***	
interethnic contact		0.0048 (0.0010)***		0.0036 (0.0007)***		0.0015 (0.0005)***		0.0029 (0.0008)***
<b>Exclusion II: Strong Increases of Refugee Inflows during Fieldwork Period</b>								
culture undermined	-0.2079 (0.0406)***							
way of life worsens			-0.2677 (0.0197)***					
religious beliefs worried					-0.1810 (0.0369)***			
immigrants bad for economy							-0.1912 (0.0344)***	
interethnic contact		0.0048 (0.0011)***		0.0036 (0.0007)***		0.0016 (0.0005)***		0.0034 (0.0008)***
<b>Exclusion III: Federal Countries</b>								
culture undermined	-0.1913 (0.0483)***							
way of life worsens			-0.2377 (0.0272)***					
religious beliefs worried					-0.1739 (0.0414)***			
immigrants bad for economy							-0.1999 (0.0304)***	
interethnic contact		0.0043 (0.0013)***		0.0034 (0.0008)***		0.0017 (0.0006)***		0.0032 (0.0008)***

Notes: Average direct and indirect partial effects are reported. Country fixed effects, socioeconomic and demographic predictors are included at every stage of estimation, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.  
Source: ESS 2014; own calculations.

## 5.3 Instrument Variable Strategy for Interethnic Contact

### 5.3.1 Regional Immigrant Shares as Instruments

So far, estimation results show that interethnic contact is positively related to all attitudinal measures. However, in order to detect the effect of interethnic contact on anti-immigrant attitudes of natives who are randomly assigned across regions with different immigrant shares, the effect of interethnic contact must be measured before natives have chosen their permanent place of residence according to their attitudes. Further, the immigrants' choice of residence is not random. It is based on the location decision of previous immigrant generations from the same country and on the labor market condition in a region. Thus, the estimated effects of interethnic contact could be biased by selective out-migration (Card and DiNardo, 2000). The main issue is that natives' self-sorting might bias the effect of interethnic contact on out-group threat measures. Natives who have negative attitudes avoid interaction and contact with immigrants during daily life and may leave their neighbor-

hoods due to an inflow of immigrants in order to escape interethnic contact. In contrast, natives who have positive out-group attitudes actively seek contact with immigrants and may stay in neighborhoods when the share of immigrants increases. In conclusion, there is reverse causality if natives' attitudes determine the frequency of their interethnic contact. I can address this endogeneity problem by using values of interethnic contact at higher levels of spatial aggregation as suitable instruments (Dustmann et al., 2011). For Sweden, Andersson et al. (2021) show that immigration increases emigration of natives with high ability to move, but moving is restricted to neighborhoods within rather than between municipalities. Since interethnic contact in a given neighborhood depends on the presence of immigrants, I use the share of immigrants at the NUTS level 2, which is calculated based on the European Union Labour Force Survey (EU-LFS), as instrument variable (European Commission, 2019a):<sup>17</sup>

$$m_{rc,2014} = \frac{M_{rc,2014}}{Pop_{rc,2014}} \quad (8)$$

where  $M_{rc,2014}$  is the total stock of immigrants in region  $r$  in country  $c$  born in a foreign country in 2014, and  $Pop_{rc,2014}$  is the respective total population. The immigrant shares vary widely across European countries as well as across NUTS level 2 regions within countries.<sup>18</sup> The Lake Geneva Region in Switzerland shows the highest immigrants share (44 percent), and Lesser Poland Province in Poland has the lowest immigrant share (0.3 percent). The countries of the former Eastern bloc have relatively low immigrant shares compared to Western European countries. In general, the immigrant share is higher in urban agglomerations than in rural regions of the European countries. The key idea of the identification strategy is that natives who leave their neighborhoods due to an increase in the number of immigrants are more likely to move to neighboring areas than to more distant areas, e.g. from cities to rural areas nearby. A possible reason for restricted mobility out of a given geographical region could be the desire to remain in proximity to family, friends, and workplace. Dustmann and Preston (2001) show that such instruments reduce the bias induced by natives' self-sorting. Using the regional immigrant share as an instrument for natives' interethnic contact transforms the previous recursive framework to a system of three equations with error terms that are jointly normally distributed and may correlate. Furthermore, all equations contain the full set of socioeconomic and demographic predictors. In order to obtain consistent and efficient estimates, full information maximum likelihood is applied.<sup>19</sup>

For all out-group threat measures coefficient estimates are similar in magnitude and

<sup>17</sup> Respondents were defined as immigrants or foreign-born if they were not born in the respective country regardless of their parents' place of birth. Alternative definitions of migration background yielded similar estimation results.

<sup>18</sup> Germany, Ireland and the Netherlands are excluded from estimations since these countries have no information on respondents' country of birth at the NUTS level 1 or 2. For Austria and the United Kingdom, the calculations base on NUTS level 1 regions.

<sup>19</sup> See Roodman (2011) for a detailed explanation about the advantages and disadvantages of the modified Geweke-Hajivassiliou-Keane algorithm.

significance to previous results (see Table 16 in the Appendix). However, the coefficient estimates of natives' interethnic contact are greater due to the application of the instrument variable in all estimations. This finding can be traced to the fact that the correlation parameter ( $\rho_{23}$ ) is significant for all out-group threat measures. Thus, the possibility of endogeneity due to selective out-migration cannot be ruled out. Unobserved factors that are related to natives' perceived out-group threats and their interethnic contact are positively correlated. This may be due to two reasons. First, immigrants' choice of residence is not random. Regional characteristics not captured by immigrant shares may correlate with natives' perceived out-group threats and their interethnic contact. In particular, economic conditions in regions, such as high unemployment rates and tight housing markets, may shape natives' anti-immigrant attitudes despite the frequency of interethnic contact. Second, immigrants tend to reside in urban agglomerations of NUTS level 2 regions due to job opportunities and previous settlement of immigrants. Thus, within the same NUTS level 2 region, natives in urban areas experience more interethnic contact than natives in rural areas. Regions with the same average interethnic contact may still differ in anti-immigrant attitudes and immigrant share once they differ in the distribution of immigrants across the region. If immigrants are equally distributed across a region with a small immigrant share, natives' likelihood of interethnic contact may be the same or even higher than in regions with a higher spatial concentration of immigrants and higher immigrant share. In a nutshell, natives' have more anti-immigrant attitudes, on average, if interethnic contact in the urban areas can not compensate for missing interethnic contact in rural areas of the region. Since there is no data on the distribution of immigrants across European regions available, some evidence gives the addition of the regional population density in the instrumenting equation. Based on the assumption that the concentration of immigrants should be higher in more densely populated regions due to the likelihood of greater urban agglomeration, the estimation results show that the correlation parameter  $\rho_{23}$  for all out-group threat measures gets insignificant.<sup>20</sup> Since I am interested in predictors' partial effects on natives' support for redistribution, the correlation parameter  $\rho_{23}$  needs no consideration in the computation of direct and indirect partial effects. Only changes in coefficient estimates and the correlation parameter  $\rho_{12}$  due to instrumenting natives' interethnic contact is reflected in the computation of partial effects. Moreover, there is no significant correlation between the error terms of the redistribution and the instrumenting equation for all perceived out-group threats. Thus, there are no significant unobserved regional characteristics that correlate with natives' support for redistribution and their interethnic contact, once the system of equations accounts for natives' perceived out-group threats.

The direct effects of out-group threat measures are in magnitude similar to previous results and range between 16 and 24 percentage points (see Table 10). The indirect effect of interethnic contact on natives' redistribution preference, however, increases by a factor of four. Thus, adjusting for natives' self-sorting into neighborhoods due to their attitudes

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<sup>20</sup>The estimation results are not reported and are available upon request.

**Table 10:** Partial effects of out-group threat measures on support for redistribution, adjusted for selective out-migration

	<u>Culture</u>		<u>Way of Life</u>		<u>Religious Beliefs</u>		<u>Immigrants Bad</u>	
	<u>Undermined</u>		<u>Worsens</u>		<u>Undermined</u>		<u>for Economy</u>	
	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>
culture undermined	-0.1940 (0.0445)***							
way of life worsens			-0.2432 (0.0219)***					
religious beliefs worried					-0.1630 (0.0367)***			
immigrants bad for economy							-0.2080 (0.0261)***	
interethnic contact		0.0152 (0.0057)***		0.0159 (0.0059)***		0.0075 (0.0039)*		0.0148 (0.0044)***

Notes: Average direct and indirect partial effects are reported. Country fixed effects, socioeconomic and demographic predictors are included at every stage of estimation, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.  
Source: ESS 2014; own calculations.

towards immigrants strongly increases the contribution of interethnic contact to natives' support for redistribution. More interethnic contact leads to an increase of natives' support for redistribution by 1.6 to 0.8 percentage points through a change in natives' perception of immigrants as a threat to tangible and non-tangible goods.

### 5.3.2 Split-Sampling Instrumental Variables

There may be concerns about the mismeasurement of the instrument variable because the immigrant share of European regions is based on EU-LFS survey data. First, immigrants make up a small proportion of the population in many regions of Europe. Thus, the calculation of immigrant shares at the regional level can be affected by sampling errors. This is particularly true when the cell size of regions in surveys is small. Second, illegal immigrants may be underrepresented in survey data or may not have been surveyed at all. Third, immigrants may be less likely to participate in a survey than natives. Based on Monte Carlo simulations, [Nunziata \(2015\)](#) shows that the average EU-LFS region cell size is sufficient enough to exclude any sizable attenuation bias coming from sampling error in regional immigrant shares. Using regularization episodes in Italy, [Bianchi et al. \(2012\)](#) state a high correlation between shares of legal immigrants and shares of total immigrants in Italian provinces. In order to address the third possible source of measurement error, the classic error in variables framework is a feasible solution. Once the error in regional immigrant shares are assumed to be at random, the measurement error problem may be solved by means of a split-sample instrumental variables (SSIV) approach ([Nunziata, 2015](#); [Angrist and Krueger, 1995](#)). Potentially mismeasured regional immigrant shares are instrumented using a second measure of regional immigrant share from a different survey whose design is independent. This approach is based on the assumption that the true unobserved measure of regional immigrant share  $m^*$  is uncorrelated with the error term. Let us assume there is an observed measure of regional immigrant share  $m_1$  measured with error  $e_1$  and an alternative measure of regional

immigrant share  $m_2$  measured with error  $e_2$ :

$$m_1 = m^* + e_1 \quad (9)$$

$$m_2 = m^* + e_2 \quad (10)$$

As both  $m_1$  and  $m_2$  are uncorrelated with the error term of the recursive system of equations,  $m_2$  can be used as an instrumental variable for  $m_1$  once  $e_1$  and  $e_2$  are uncorrelated. Data from the ESS and the EU-LFS provide two alternative measures of regional immigrant shares that may be mismeasured. Since the two survey designs are independent, both measures can be used to implement an SSIV estimation within the recursive estimation framework. Given the small regional cell size in the ESS data, there may be serious concerns about sampling error. However, Nunziata (2015) notes that an SSIV design can drastically reduce the attenuation bias when the instrumental variable comes from large enough region cell size, like in the case of EU-LFS data. The coefficients estimates indicate a strong and significant correlation between both immigrant share measures (see Table 17 in the Appendix). There are almost no changes in the predictors' coefficients and partial effects (see Table 11)

**Table 11:** Partial effects of out-group threat measures on support for redistribution, adjusted for sample errors in regional immigrant shares

	<u>Culture</u> <u>Undermined</u>		<u>Way of Life</u> <u>Worsens</u>		<u>Religious Beliefs</u> <u>Undermined</u>		<u>Immigrants Bad</u> <u>for Economy</u>	
	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>
culture undermined	-0.1948 (0.0442)***							
way of life worsens			-0.2439 (0.0218)***					
religious beliefs worried					-0.1636 (0.0361)***			
immigrants bad for economy							-0.2086 (0.0259)***	
interethnic contact		0.0157 (0.0058)***		0.0166 (0.0059)***		0.0080 (0.0040)**		0.0154 (0.0046)***

Notes: Average direct and indirect partial effects are reported. Country fixed effects, socioeconomic and demographic predictors are included at every stage of estimation, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014; own calculations.

### 5.3.3 Supply-Push Factors as Instruments

So far endogeneity concerns, such as selective out-migration, have been addressed by the application of regional immigrant shares as instruments for natives' daily interethnic contact. Although the recursive system of equations allows for correlation of error terms, there may be concerns about unobserved factors that correlate with both the regional immigrant share and natives' perceived out-group threats. In such a case, the estimated coefficient will be biased and not reflect the causal effect of interethnic contact on natives' perceived out-group threats and support for redistribution. In order to mitigate this potential bias, a suitable instrumental variable for contemporaneous regional immigrant share is needed. Employing



of the well-known shift-share methodology, I use the past location of immigrants by country of origin as a predictor for subsequent inflows of immigrants (see [Altonji and Card, 1991](#); [Card, 2001](#); [Munshi, 2003](#); [Manchin and Orazbayev, 2018](#)). For the instrument to be valid, the predicted immigrant share should affect interethnic contact only through its direct effect on the current immigrant share. Therefore the shares are based on the population in 2007 to precede the European refugee crisis and the subsequent stark inflows of refugees from the Middle East and Northern Africa. The European refugee crisis led to a substantial change in the composition of immigrants among European regions from economic migrants to asylum seekers. Also, the relation of European and non-European immigrants changed considerably in some regions during the crisis. Thus, conditional on individual covariates and country fixed effects, the 2007 distributions are unlikely to be correlated with unobservable predictors of natives' interethnic contact and natives' perceived out-group threat coming from the present composition of immigrants in a region. I compute the initial share of immigrants from origin country  $h$  as the share of their presence in region  $r$  in their total population across all European regions in year 2007 as follows:

$$sh_{rh,2007} = \frac{M_{rh,2007}}{\sum_r M_{rh,2007}} \quad (11)$$

where  $M_{rh,2007}$  is the total stock of immigrants from origin country  $h$  in region  $r$  in year 2007 and the denominator gives the total population of immigrants from origin country  $h$  across all European regions in year 2007. The harmonized codification scheme of the EU-LFS groups the origin countries into 8 subcontinental areas that can be used as countries of origin.<sup>21</sup>

Next, the changes in inflows of immigrants from different countries of origin towards European regions are allocated across European regions following the predetermined distribution of immigrants from the same origin countries. These changes in immigration patterns account for exogenous supply-push factors that increase immigration from each country of origin. The change in immigration of a country of origin  $h$  to a region  $r$ , however, may be due to both exogenous supply-push factors from the country of origin and demand-pull factors from destination region  $r$ . Furthermore, demand-pull factors of regions may correlate within destination countries due to shared country-specific characteristics not solely captured by country fixed effects. Thus, I compute for each region  $r$  in country  $c$  the total stock of immigrants from the country of origin  $h$  across all European regions  $k$  in year 2014, excluding the regions of the same destination country  $c$ . This eliminates changes in regional immigration due to demand-pull factors at the regional level and spillover-effects

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<sup>21</sup>The eight subcontinental areas of birthplace by the EU-LFS are the following: natives, EU-28, Other Europe, North Africa and Middle East, Other Africa, East and South Asia, North America and Australia, Latin America.

in immigration changes between regions of the same destination country:

$$TM_{rh,2014} = \sum_k M_{kh,2014} \quad (12)$$

The predicted stock of immigrants from a country of origin  $h$  in region  $r$  in year 2014 is the interaction of the two values. Summing across all origin countries for region  $r$  and standardizing for the 2007 population in region  $r$  gives the predicted immigrant share of region  $r$  in year 2014:

$$\tilde{m}_{rh,2014} = \frac{\sum_h (sh_{rh,2007} \times TM_{rh,2014})}{Pop_{r,2007}} \quad (13)$$

Expression (13) identifies an instrument for the immigrant share in region  $r$  in year 2014 that excludes changes in the composition of immigrants at the regional level due to the European refugee crises and eliminates demand-pull factors at the regional and country level. Recently, there has been some criticism of this IV strategy, pointing out that a persistent correlation between regional conditions and immigrants' past location of residence invalidates the instrument variable (see [Jaeger et al., 2018](#); [Goldsmith-Pinkham et al., 2020](#)). First, using stock of immigrants in year 2007 for computing initial shares at the regional level lowers the likelihood of a stable spatial distribution of immigrants until year 2014 due to the changes in the composition of immigrants in European regions caused by the European refugee crisis. Second, identification does not solely come from initial shares because  $TM_{rh,2014}$  is restricted to regions outside the destination country of region  $r$ , reflecting aggregate trends in immigration in all other regions of Europe. Nevertheless, I checked whether the instrument variable significantly correlates with pre-2014 trends in economic variables at the regional level, which may affect interethnic contact and natives' perceived out-group threats. Once there is a correlation, the validity of the instrument variable can be doubted, as it merely captures persistent regional trends. Thus, I regress the predicted immigrant share in year 2014 separately on GDP per capita growth, employment growth, unemployment growth and growth in tertiary education share between 2007 and 2014. Table 19 in the Appendix shows no significant correlation between economic variables' pre-trend and the predicted immigrant share in year 2014.

The modified recursive system of equations yields similar coefficients estimates for natives' out-group threat measures and interethnic contact (see Table 18 in the Appendix). However, the correlation parameter  $\rho_{23}$  gains greater standard errors for some out-group threat measures and becomes entirely insignificant for others. An indication that the shift-share instrument captures mostly supply-push factors of regional immigrant shares. Considering the partial effects, almost no difference in magnitude and significance occurs compared to previous results (see Table 12). Three causes may explain the similarity between estimation results, once the recursive system of equations includes regional immigrant shares. First, I use interethnic contact as natives' real-world exposure to immigrants rather than regional

**Table 12:** Partial effects of out-group threat measures on support for redistribution, adjusted for regional demand-pull factors

	<u>Culture</u>		<u>Way of Life</u>		<u>Religious Beliefs</u>		<u>Immigrants Bad</u>	
	<u>Undermined</u>		<u>Worsens</u>		<u>Undermined</u>		<u>for Economy</u>	
	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>direct effect</i>	<i>indirect effect</i>
culture undermined	-0.1947 (0.0438)***							
way of life worsens			-0.2443 (0.0219)***					
religious beliefs worried					-0.1636 (0.0365)***			
immigrants bad for economy							-0.2087 (0.0257)***	
interethnic contact		0.0181 (0.0078)**		0.0166 (0.0068)**		0.0095 (0.0047)**		0.0172 (0.0059)**

Notes: Average direct and indirect partial effects are reported. Country fixed effects, socioeconomic and demographic predictors are included at every stage of estimation, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.  
Source: ESS 2014; own calculations.

immigrant shares. Second, employing regional immigrant shares as an instrumental variable for natives interethnic contact is sufficient for adjusting due to natives' self-sorting. Third, the recursive bivariate probit estimation allows for correlation of error terms. Thus, unobserved regional characteristics that may affect natives' perceived out-group threats and their support for redistribution can be captured by the correlation parameter. The partial effects of natives' out-group threats on support for redistribution can be interpreted as average treatment effects, holding unobserved regional factors that may affect the attitudes and redistribution equation constant. Thus, the estimation results of the shift-share IV strategy indicate that the correlation parameter  $\rho_{23}$  partly captures demand-pull factors of regions.

## 6 Conclusion

Immigration plays a crucial role in shaping economic and social policy in European countries. On the one hand, natives' may adjust their welfare attitudes due to economic self-interest in the light of an inflow of foreign-born people. The skill and occupational composition of immigrants may challenge or support natives' position on markets, such as the labor and housing market. On the other hand, natives' may perceive immigrants as severe competitors for non-tangible goods, such as culture and societal values. Since support for redistribution in a society depends on mutual solidarity, an inflow of immigrants may lower natives' solidarity with immigrants and decrease their support for welfare policies. By the application of recursive bivariate probit estimations, this paper examines the solidarity channel of natives' support for redistribution, holding the economic self-interest transmission channel constant. The empirical results contribute three new insights to the current literature. First, considering the solidarity channel, exposure to immigrants has an indirect impact on natives' support for redistribution through a change in solidarity with immigrants rather than a direct relationship. Second, natives' perceived fears and concerns

about a more intense competition on tangible and non-tangible goods with other ethnic groups are decisive in the formation of welfare attitudes, but not their animosity towards particular immigrants in everyday life. Once natives' perceive immigrants as a threat to cultural and societal values, their support for redistribution decreases by 16 to 24 percentage points. Third, more interethnic contact in daily life enhances natives' redistribution preference by 1 to 1.8 percentage points through a positive adjustment of their attitudes towards immigrants. These results are important in the light of current migration patterns and the status of the welfare state in European countries. Despite the fiscal impact of immigration on the welfare state, this paper and recent experimental studies (see [Alesina et al., 2019](#), for example) show that the existence of bonding social capital among natives is important for future acceptance of the welfare state. Since this paper is restricted to a single cross-section, future work should deal with the evolution of natives' solidarity and their support for redistribution over time. In particular, measuring natives' exposure to immigrants at a lower grid is needed. Furthermore, a clear decomposition of immigration's impact on sociopolitical preferences through both natives' economic self-interest and solidarity channel could help to understand immigration's economic and societal impact.

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# Appendix

**Table 13: Impact of social distance and out-group threat measures on support for redistribution, using NUTS level 1 fixed effects**

	<u>Mind Marriage to Relative</u>		<u>Mind Immigrant as Boss</u>	
	<i>support for redistribution</i>	<i>mind marriage to relative</i>	<i>support for redistribution</i>	<i>mind immigrant as boss</i>
mind marriage with relative	-0.2585 (0.1848)			
mind immigrant as boss			-0.1805 (0.1401)	
interethnic contact		-0.0803 (0.0064)***		-0.0833 (0.0067)***
atanh $\rho$	0.1378 (0.1173)		0.1001 (0.0884)	
Obs.		18915		18915
AIC		67562		67488
BIC		68229		68155
Log Likelihood		-33696		-33659

	<u>No Immigrant Friends</u>	
	<i>support for redistribution</i>	<i>no immigrant friends</i>
no immigrant friends	-0.1182 (0.0947)	
interethnic contact		-0.1679 (0.0074)***
atanh $\rho$	0.0650 (0.0578)	
Obs.		18915
AIC		67421
BIC		68088
Log Likelihood		-33625

	<u>Culture Undermined</u>		<u>Way of Life Worsens</u>	
	<i>support for redistribution</i>	<i>culture undermined</i>	<i>support for redistribution</i>	<i>way of life worsens</i>
culture undermined	-0.6066 (0.1521)***			
way of life worsens			-0.8826 (0.1160)***	
interethnic contact		-0.0717 (0.0065)***		-0.0490 (0.0076)***
atanh $\rho$	0.3367 (0.1019)***		0.5026 (0.0827)***	
Obs.		18949		18949
AIC		64126		59118
BIC		64769		59761
Log Likelihood		-31981		-29477

	<u>Religious Beliefs Undermined</u>		<u>Immigrants Bad for Economy</u>	
	<i>support for redistribution</i>	<i>religious beliefs undermined</i>	<i>support for redistribution</i>	<i>immigrants bad for economy</i>
religious beliefs undermined	-0.5872 (0.1355)***			
immigrants bad for economy			-0.6202 (0.1262)***	
interethnic contact		-0.0469 (0.0079)***		-0.0640 (0.0075)***
atanh $\rho$	0.2935 (0.0807)***		0.3575 (0.0790)***	
Obs.		18949		18949
AIC		57845		59621
BIC		58591		60296
Log Likelihood		-28828		-29724

Notes: Coefficient estimates are reported. In the maximum likelihood estimation,  $\rho$  is not directly estimated, but  $\text{atanh } \rho = 0.5 \times \ln((1 + \rho)/(1 - \rho))$  applies. NUTS level 1 fixed effects, socioeconomic and demographic predictors are included, but not reported. Standard errors are clustered at NUTS Level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014; own calculations.

**Table 14:** Partial effects of out-group threat measures on support for redistribution (part 1)

	Culture undermined			Way of Life Worsens		
	direct effect	indirect effect	total effect	direct effect	indirect effect	total effect
age	0.0007 (0.0003)***	0.0002 (0.0001)***	0.0009 (0.0002)***	0.0008 (0.0002)***	0.0001 (0.0001)	0.0009 (0.0002)***
education years	-0.0096 (0.0016)***	0.0036 (0.0011)***	-0.0060 (0.0009)***	-0.0086 (0.0011)***	0.0028 (0.0005)***	-0.0058 (0.0009)***
female	0.0193 (0.0055)***	0.0018 (0.0014)	0.0211 (0.0056)***	0.0233 (0.0057)***	-0.0028 (0.0018)	0.0204 (0.0056)***
employment type ( <i>ref.: public sector</i> )						
private sector	-0.0235 (0.0054)***	-0.0042 (0.0020)**	-0.0278 (0.0052)***	-0.0218 (0.0052)***	-0.0060 (0.0020)***	-0.0277 (0.0052)***
self-employed	-0.0567 (0.0096)***	0.0015 (0.0025)	-0.0552 (0.0098)***	-0.0585 (0.0099)***	0.0034 (0.0032)	-0.0551 (0.0098)***
other	-0.0369 (0.0167)**	0.0103 (0.0053)*	-0.0265 (0.0172)	-0.0360 (0.0179)**	0.0111 (0.0055)**	-0.0249 (0.0173)
household income	-0.0220 (0.0014)***	0.0017 (0.0006)***	-0.0203 (0.0013)***	-0.0222 (0.0014)***	0.0021 (0.0005)***	-0.0201 (0.0013)***
household member	0.0108 (0.0040)***	0.0004 (0.0008)	0.0112 (0.0037)***	0.0113 (0.0040)***	0.0000 (0.0010)	0.0113 (0.0038)***
kids at home	-0.0097 (0.0089)	-0.0031 (0.0019)	-0.0128 (0.0086)	-0.0096 (0.0089)	-0.0038 (0.0022)*	-0.0134 (0.0085)
employment status ( <i>ref.: not in labor force</i> )						
unemployed	0.0357 (0.0134)***	0.0047 (0.0037)	0.0404 (0.0129)***	0.0420 (0.0133)***	-0.0027 (0.0041)	0.0393 (0.0129)***
employed	-0.0064 (0.0073)	0.0034 (0.0021)	-0.0029 (0.0070)	-0.0032 (0.0073)	0.0009 (0.0024)	-0.0023 (0.0069)
married	0.0058 (0.0067)	-0.0007 (0.0015)	0.0051 (0.0065)	0.0057 (0.0067)	-0.0015 (0.0020)	0.0043 (0.0065)
right-left scale	0.0325 (0.0024)***	0.0046 (0.0017)***	0.0371 (0.0024)***	0.0324 (0.0022)***	0.0052 (0.0011)***	0.0377 (0.0024)***
(sub-)urban	-0.0195 (0.0084)**	0.0067 (0.0026)***	-0.0128 (0.0072)*	-0.0190 (0.0076)**	0.0069 (0.0023)***	-0.0121 (0.0071)*
culture undermined	-0.1656 (0.0439)***					
way of life worsens				-0.2239 (0.0243)***		
interethnic contact		0.0039 (0.0011)***			0.0031 (0.0006)***	

Notes: Average direct and indirect partial effects are reported. Country fixed effects are included, but not reported. Standard errors are clustered at NUTS level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent. Source: ESS 2014; own calculations.

**Table 15: Partial effects of out-group threat measures on support for redistribution (part 2)**

	Religious Beliefs Undermined			Immigrants Bad for Economy		
	<i>direct effect</i>	<i>indirect effect</i>	<i>total effect</i>	<i>direct effect</i>	<i>indirect effect</i>	<i>total effect</i>
age	0.0009 (0.0002)***	-0.0001 (0.0000)	0.0009 (0.0002)***	0.0007 (0.0002)***	0.0002 (0.0001)***	0.0009 (0.0002)***
education years	-0.0069 (0.0010)***	0.0011 (0.0004)***	-0.0058 (0.0009)***	-0.0079 (0.0012)***	0.0021 (0.0006)***	-0.0058 (0.0009)***
female	0.0198 (0.0055)***	0.0010 (0.0009)	0.0208 (0.0056)***	0.0294 (0.0058)***	-0.0085 (0.0023)***	0.0209 (0.0056)***
employment type ( <i>ref.: public sector</i> )						
private sector	-0.0253 (0.0054)***	-0.0029 (0.0012)**	-0.0282 (0.0052)***	-0.0260 (0.0052)***	-0.0022 (0.0011)**	-0.0281 (0.0053)***
self-employed	-0.0553 (0.0097)***	-0.0006 (0.0015)	-0.0559 (0.0098)***	-0.0585 (0.0099)***	0.0024 (0.0022)	-0.0561 (0.0098)***
other	-0.0295 (0.0171)*	0.0027 (0.0029)	-0.0267 (0.0171)	-0.0307 (0.0166)*	0.0042 (0.0036)	-0.0265 (0.0170)
household income	-0.0203 (0.0013)***	0.0002 (0.0002)	-0.0201 (0.0013)***	-0.0216 (0.0014)***	0.0014 (0.0004)***	-0.0202 (0.0013)***
household member	0.0102 (0.0039)***	0.0008 (0.0005)	0.0110 (0.0037)***	0.0112 (0.0039)***	0.0000 (0.0006)	0.0112 (0.0037)***
kids at home	-0.0096 (0.0090)	-0.0028 (0.0013)**	-0.0124 (0.0086)	-0.0113 (0.0087)	-0.0017 (0.0015)	-0.0130 (0.0086)
employment status ( <i>ref.: not in labor force</i> )						
unemployed	0.0398 (0.0131)***	0.0002 (0.0021)	0.0400 (0.0128)***	0.0383 (0.0131)***	0.0020 (0.0030)	0.0403 (0.0128)***
employed	-0.0032 (0.0071)	0.0012 (0.0012)	-0.0021 (0.0069)	-0.0025 (0.0070)	0.0005 (0.0017)	-0.0021 (0.0069)
married	0.0054 (0.0067)	-0.0010 (0.0011)	0.0045 (0.0066)	0.0052 (0.0066)	-0.0003 (0.0012)	0.0049 (0.0065)
right-left scale	0.0351 (0.0022)***	0.0020 (0.0008)***	0.0371 (0.0024)***	0.0350 (0.0023)***	0.0023 (0.0008)***	0.0373 (0.0024)***
(sub-)urban	-0.0129 (0.0073)*	0.0019 (0.0010)*	-0.0110 (0.0071)	-0.0161 (0.0077)**	0.0045 (0.0018)**	-0.0116 (0.0071)
religious beliefs worried	-0.1493 (0.0369)***					
immigrants bad for economy				-0.1553 (0.0340)***		
interethnic contact		0.0014 (0.0005)***			0.0026 (0.0007)***	

Notes: Average direct and indirect partial effects are reported. Country fixed effects are included, but not reported. Standard errors are clustered at NUTS level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent. Source: ESS 2014; own calculations.

**Table 16:** Impact of out-group threat measures on support for redistribution, adjusted for selective out-migration

	Support for Redistribution	Out-group Threat	Interethnic Contact
<b>out-group threat: culture undermined</b>			
culture undermined	-0.6899 (0.1739)***		
interethnic contact		-0.2530 (0.0797)***	
immigrant share			3.8947 (0.6518)***
atanh $\hat{\rho}_{12}$		0.3433 (0.1129)***	
atanh $\hat{\rho}_{13}$		-0.0143 (0.0135)	
atanh $\hat{\rho}_{23}$		0.3364 (0.1666)**	
Obs.		14585	
AIC		107222	
BIC		107958	
Log Likelihood		-53514	
<b>out-group threat: way of life worsens</b>			
way of life worsens	-0.8012 (0.1216)***		
interethnic contact		-0.2558 (0.0553)***	
foreign-born population share			3.8974 (0.6522)***
atanh $\hat{\rho}_{12}$		0.4104 (0.0751)***	
atanh $\hat{\rho}_{13}$		-0.0073 (0.0110)	
atanh $\hat{\rho}_{23}$		0.3614 (0.1178)***	
Obs.		14585	
AIC		103368	
BIC		104097	
Log Likelihood		-51588	
<b>out-group threat: religious beliefs undermined</b>			
religious beliefs undermined	-0.9785 (0.1122)***		
interethnic contact		-0.2258 (0.0720)***	
foreign-born population share			3.8970 (0.6521)***
atanh $\hat{\rho}_{12}$		0.5166 (0.0823)***	
atanh $\hat{\rho}_{13}$		-0.0087 (0.0109)	
atanh $\hat{\rho}_{23}$		0.3179 (0.1462)**	
Obs.		14585	
AIC		102687	
BIC		103423	
Log Likelihood		-51246	
<b>out-group threat: immigrants bad for economy</b>			
immigrants bad for economy	-0.6065 (0.1591)***		
interethnic contact		-0.2038 (0.0778)***	
foreign-born population share			3.8991 (0.6536)***
atanh $\hat{\rho}_{12}$		0.2736 (0.0908)***	
atanh $\hat{\rho}_{13}$		0.0007 (0.0104)	
atanh $\hat{\rho}_{23}$		0.2844 (0.1533)*	
Obs.		14585	
AIC		103743	
BIC		104479	
Log Likelihood		-51775	

Notes: Coefficient estimates are reported. In the maximum likelihood estimation,  $\rho$  is not directly estimated, but  $\text{atanh } \rho = 0.5 \times \ln((1 + \rho)/(1 - \rho))$  applies. Country fixed effects, socioeconomic and demographic predictors are included, but not reported. Standard errors are clustered at NUTS level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014 and EU-LFS; own calculations.

**Table 17: Impact of out-group threat measures on support for redistribution, adjusted for sample errors in regional immigrant shares**

	Support for Redistribution	Out-group Threat	Interethnic Contact	ESS: Immigrant Share
<b>out-group threat: culture undermined</b>				
culture undermined	-0.6929 (0.1729)***			
interethnic contact		-0.2600 (0.0804)***		
ESS: immigrant share			3.5877 (0.6444)***	
EU-LFS: immigrant share				0.9227 (0.0621)***
atanh $\hat{\rho}_{12}$		0.3431 (0.1119)***		
atanh $\hat{\rho}_{13}$		-0.0146 (0.0134)		
atanh $\hat{\rho}_{14}$		0.0035 (0.0119)		
atanh $\hat{\rho}_{23}$		0.3515 (0.1699)**		
atanh $\hat{\rho}_{24}$		-0.0103 (0.0135)		
atanh $\hat{\rho}_{34}$		-0.0276 (0.0155)*		
Obs.		14585		
AIC		40064		
BIC		40929		
Log Likelihood		-19918		
<b>out-group threat: way of life worsens</b>				
way of life worsens	-0.9821 (0.1117)***			
interethnic contact		-0.2353 (0.0708)***		
ESS: immigrant share			3.5898 (0.6450)***	
EU-LFS: immigrant share				0.9227 (0.0621)***
atanh $\hat{\rho}_{12}$		0.5150 (0.0812)***		
atanh $\hat{\rho}_{13}$		-0.0090 (0.0108)		
atanh $\hat{\rho}_{14}$		0.0032 (0.0124)		
atanh $\hat{\rho}_{23}$		0.3383 (0.1456)**		
atanh $\hat{\rho}_{24}$		-0.0178 (0.0182)		
atanh $\hat{\rho}_{34}$		-0.0276 (0.0155)*		
Obs.		14585		
AIC		36211		
BIC		37076		
Log Likelihood		-17991		
<b>out-group threat: religious beliefs undermined</b>				
religious beliefs undermined	-0.6087 (0.1567)***			
interethnic contact		-0.2138 (0.0775)***		
ESS: immigrant share			3.5917 (0.6466)***	
EU-LFS: immigrant share				0.9227 (0.0621)***
atanh $\hat{\rho}_{12}$		0.2732 (0.0889)***		
atanh $\hat{\rho}_{13}$		0.0003 (0.0104)		
atanh $\hat{\rho}_{14}$		0.0058 (0.0114)		
atanh $\hat{\rho}_{23}$		0.3046 (0.1544)**		
atanh $\hat{\rho}_{24}$		-0.0075 (0.0137)		
atanh $\hat{\rho}_{34}$		-0.0276 (0.0155)*		
Obs.		14585		
AIC		35532		
BIC		36405		
Log Likelihood		-17651		
<b>out-group threat: immigrants bad for economy</b>				
immigrants bad for economy	-0.8042 (0.1207)***			
interethnic contact		-0.2642 (0.0565)***		
ESS: immigrant share			3.5900 (0.6452)***	
EU-LFS: immigrant share				0.9227 (0.0621)***
atanh $\hat{\rho}_{12}$		0.4091 (0.0741)***		
atanh $\hat{\rho}_{13}$		-0.0077 (0.0109)		
atanh $\hat{\rho}_{14}$		0.0060 (0.0122)		
atanh $\hat{\rho}_{23}$		0.3792 (0.1218)***		
atanh $\hat{\rho}_{24}$		0.0014 (0.0153)		
atanh $\hat{\rho}_{34}$		-0.0276 (0.0155)*		
Obs.		14585		
AIC		36589		
BIC		37462		
Log Likelihood		-18180		

Notes: Coefficient estimates are reported. In the maximum likelihood estimation,  $\rho$  is not directly estimated, but  $\text{atanh } \rho = 0.5 \times \ln((1 + \rho)/(1 - \rho))$  applies. Country fixed effects, socioeconomic and demographic predictors are included, but not reported. Standard errors are clustered at NUTS level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014 and EU-LFS; own calculations.

**Table 18:** Impact of out-group threat measures on support for redistribution, adjusted for regional demand-pull factors

	Support for Redistribution	Out-group Threat	Interethnic Contact	Shift-Share: Immigrant Share
<b>out-group threat: culture undermined</b>				
culture undermined	-0.6926 (0.1710)***			
interethnic contact		-0.3036 (0.1186)**		
EU-LFS immigrant share			2.9216 (0.6825)***	
shift-share instrument				5.2424 (0.4040)***
atanh $\hat{\rho}_{12}$		0.3282 (0.1117)***		
atanh $\hat{\rho}_{13}$		-0.0146 (0.0134)		
atanh $\hat{\rho}_{14}$		-0.0060 (0.0132)		
atanh $\hat{\rho}_{23}$		0.4463 (0.2728)		
atanh $\hat{\rho}_{24}$		0.0215 (0.0279)		
atanh $\hat{\rho}_{34}$		0.0293 (0.0197)		
Obs.		14585		
AIC		30030		
BIC		30895		
Log Likelihood		-14901		
<b>out-group threat: way of life worsens</b>				
way of life worsens	-0.9844 (0.1123)***			
interethnic contact		-0.2346 (0.0871)***		
EU-LFS immigrant share			2.9238 (0.6817)***	
shift-share instrument				5.2424 (0.4039)***
atanh $\hat{\rho}_{12}$		0.5170 (0.0874)***		
atanh $\hat{\rho}_{13}$		-0.0089 (0.0109)		
atanh $\hat{\rho}_{14}$		-0.0092 (0.0137)		
atanh $\hat{\rho}_{23}$		0.3357 (0.1786)*		
atanh $\hat{\rho}_{24}$		-0.0019 (0.0246)		
atanh $\hat{\rho}_{34}$		0.0293 (0.0197)		
Obs.		14585		
AIC		26180		
BIC		27053		
Log Likelihood		-12975		
<b>out-group threat: religious beliefs undermined</b>				
religious beliefs undermined	-0.6088 (0.1587)***			
interethnic contact		-0.2498 (0.0848)***		
EU-LFS immigrant share			2.9246 (0.6830)***	
shift-share instrument				5.2425 (0.4039)***
atanh $\hat{\rho}_{12}$		0.2664 (0.0879)***		
atanh $\hat{\rho}_{13}$		0.0006 (0.0104)		
atanh $\hat{\rho}_{14}$		-0.0045 (0.0135)		
atanh $\hat{\rho}_{23}$		0.3781 (0.1779)**		
atanh $\hat{\rho}_{24}$		0.0175 (0.0176)		
atanh $\hat{\rho}_{34}$		0.0293 (0.0197)		
Obs.		14585		
AIC		25497		
BIC		26370		
Log Likelihood		-12634		
<b>out-group threat: immigrants bad for economy</b>				
immigrants bad for economy	-0.8044 (0.1197)***			
interethnic contact		-0.2940 (0.0772)***		
EU-LFS immigrant share			2.9235 (0.6823)***	
shift-share instrument				5.2424 (0.4039)***
atanh $\hat{\rho}_{12}$		0.3971 (0.0748)***		
atanh $\hat{\rho}_{13}$		-0.0075 (0.0110)		
atanh $\hat{\rho}_{14}$		-0.0067 (0.0144)		
atanh $\hat{\rho}_{23}$		0.4447 (0.1769)**		
atanh $\hat{\rho}_{24}$		0.0135 (0.0191)		
atanh $\hat{\rho}_{34}$		0.0293 (0.0197)		
Obs.		14585		
AIC		26553		
BIC		27426		
Log Likelihood		-13162		

Notes: Coefficient estimates are reported. In the maximum likelihood estimation,  $\rho$  is not directly estimated, but  $\text{atanh } \rho = 0.5 \times \ln((1 + \rho)/(1 - \rho))$  applies. Country fixed effects, socioeconomic and demographic predictors are included, but not reported. Standard errors are clustered at NUTS level 2 and given in parentheses. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: ESS 2014 and EU-LFS; own calculations.

**Table 19:** Correlation between regional economic variables' pre-2014 trends and predicted immigrant share in year 2014

	Shift-Sahre IV of immigrant share
GDP per capita growth rate	0.0018 (0.0342)
Obs.	105
R <sup>2</sup>	0.0000
Employment growth rate	0.0831 (0.0515)
Obs.	105
R <sup>2</sup>	0.1150
Unemployment growth rate	0.0017 (0.0025)
Obs.	105
R <sup>2</sup>	0.0033
Tertiary education growth rate	-0.0153 (0.0132)
Obs.	105
R <sup>2</sup>	0.0238

Notes: Coefficient estimates are reported based on sample of ESS regions in. Standard errors are given in parentheses and clustered at country level. GDP per capita is measured in constant prices and constant PPP with base year 2015. \*\*\*significant at 1 percent, \*\*significant at 5 percent, \*significant at 10 percent.

Source: EU-LFS, Eurostat database and OECD.Stat; own calculations.

**Table 20:** Survey questions about attitudes towards immigrants

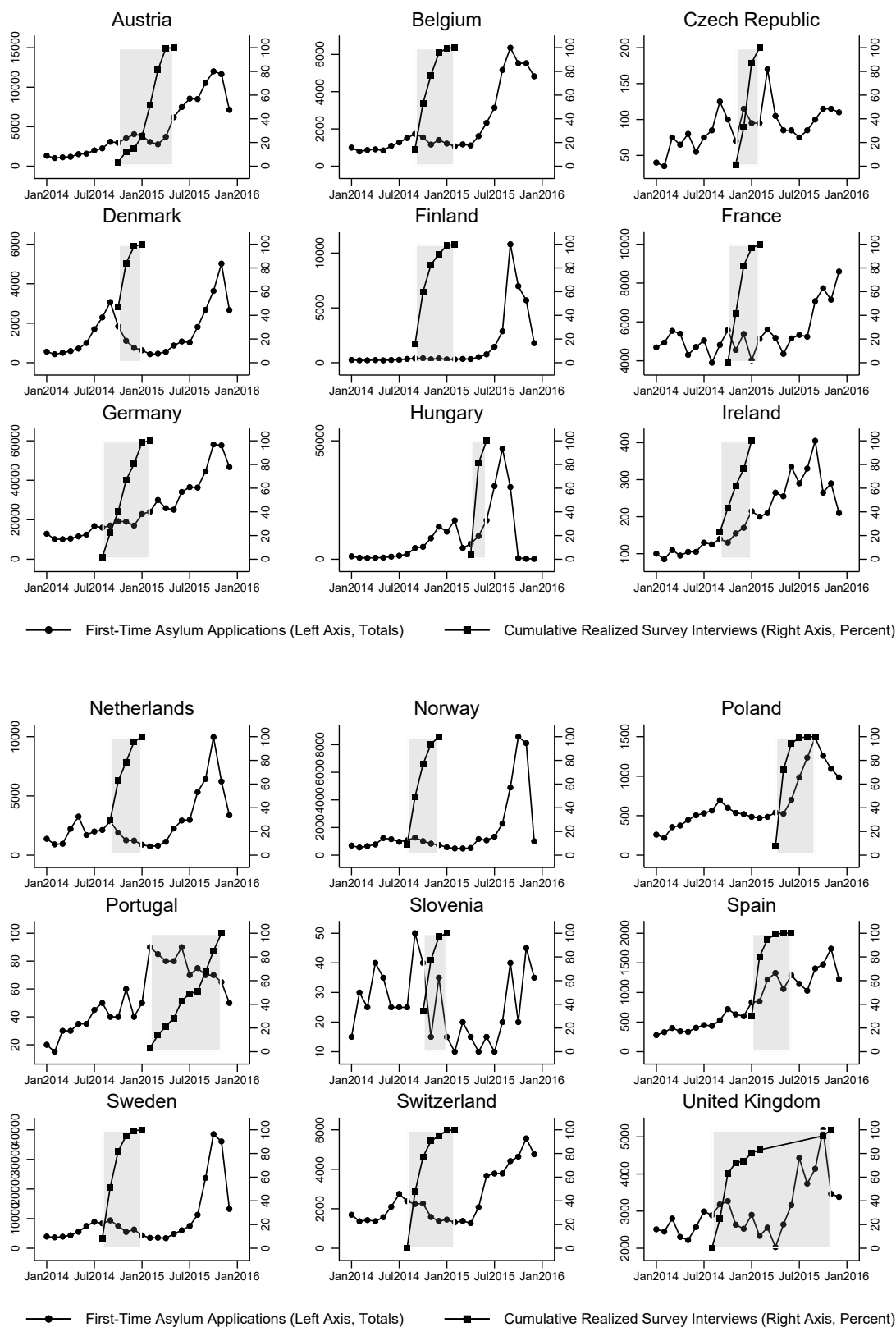
Variable	Survey Question	Original Range of Responses
<b>Dimension: Social Distance</b>		
<i>Mind Marriage to Relative</i>	Would you mind or not mind if someone like this (different race or ethnic group) married a close relative of yours?	1: not mind at all - 11: mind a lot
<i>Mind as Boss</i>	Would you mind or not mind if someone like this (different race or ethnic group) was appointed as your boss?	1: not mind at all - 11: mind a lot
<i>No Immigrant Friends</i>	Do you have any close friends of a different race or ethnic group?	1: no, none at all 2: yes, a few; 3: yes, several
<b>Dimension: Out-group Threat</b>		
<i>Culture Undermined</i>	Is cultural life generally undermined or enriched by people coming to live here from other countries ?	1: cultural life enriched - 11: cultural life undermined
<i>Way of Life Worsens</i>	Is this country made a worse or better place to live by people coming to live here from other countries ?	1: better place to live - 11: worse place to live
<i>Religious Beliefs Undermined</i>	Religious beliefs and practices are generally undermined or enriched by people coming to live here from other countries ?	1: religious beliefs enriched - 11: religious beliefs undermined
<i>Immigrants Bad for Economy</i>	Generally bad or good for country's economy that people come to live here from other countries ?	1: good for economy - 11: bad for economy

Notes: Questions about attitudes towards immigrants are based on original scaling of the European Social Survey, but ordering is partially reversed.

Source: ESS 2014.



**Figure 1: Evolution of first-time asylum applications and share of completed interviews during fieldwork time across European countries**



Notes: Fieldwork periods are shaded in gray. Shares are in percent  
 Source: ESS 2014 and [European Commission \(2019b\)](#); own calculations.