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RESEARCH ARTICLE

# Attitudes toward immigration in Europe: Cross-regional differences

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## Abstract

**Background:** This article investigates how European public opinion has responded to short-term variations in regional immigration over the past decade (2010-2019).
**Methods:** Combining data from the European Social Survey and the European Union Labour Force Survey and using multilevel modelling, we test how natives' opinions over migration policy and the contribution of immigrants to society have changed with the net rate of international migrants in 183 EU regions from 21 countries.
**Results:** We find that while European natives living in regions with a higher share of foreign-born populations are generally less anti-immigrant, a short-term increase in the number of immigrants within a given region is associated with more negative attitudes.
**Conclusion:** Our findings demonstrate the importance of temporal dynamics for attitudes to immigration. They also point to the relevance of regional variations in attitudes beside cross-country differences.

## Keywords

attitudes to immigration, migration flows, public opinion, regions

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## 1. Introduction

Attitudes to immigration are becoming part of a new political cleavage in many countries (Kriesi *et al.,* 2012). While a growing share of foreign-born residents is viewed positively by those stressing the benefits of immigration, others regard these demographic changes with suspicion. Especially in the aftermath of the so-called "migration crisis", governments of Western as well as Central and Eastern European countries, though historically on the sending side of immigration, have faced public resentment against immigrants among their domestic population.

Against this backdrop, opposition to immigration has gained a lot of attention from social scientists. While the majority of studies have focused on individual drivers of attitudes to immigration (see Dražanová *et al.*, 2022 for a meta-analysis), the scientific literature has shown that contextual drivers, and in particular, the real or perceived size of immigration can have a significant influence on public opinion (see for instance Alesina *et al.*, 2018). At the same time, several recent studies have documented the role played by immigrants' characteristics as potential drivers of attitudes towards migration in Europe (Bridges & Mateut, 2014; Hale Williams & Chasapopoulos, 2019; Markaki & Longhi, 2013; Weber, 2015). This work contributes to this literature by exploring the link between the temporary changes in migration flows in European regions on individuals' attitudes towards immigration and deepening our understanding of the macro-level drivers of attitudes to migration in European countries.

Previous empirical research has examined the impact of regional factors on attitudes towards immigrants in Europe, and in particular how the size of immigration and the characteristics of immigrants predict attitudes to immigration. In this regard, our paper is similar to Markaki and Longhi (2013) and Hale Williams and Chasapopoulos (2019). However, we differentiate ourselves from these studies in several ways. While these works focus on the effect of between-region variations in the share of foreign-born immigrants, we primarily consider how short-term, temporal within-region variations predict attitudes to immigration. Traditionally, the share of the foreign-born population residing in a territory is usually the product of long-term changes and migration history, whose effects can be hard to disentangle from other macro-level, contextual drivers of attitudes to immigration such as economic conditions, cultural and religious beliefs, as well as national or regional policies. In this regard, we believe the predictive power of immigration on public opinion is better identified by focusing on migration pressure, or how natives' attitudes towards immigration change with the recent arrival of foreign-born immigrants. In particular, we focus our attention on within-region, short-term temporal variations in the regional share of foreign-born immigrants.

A few studies have examined the impact of migration flows on natives' attitudes towards preferences for redistribution (see for instance Murard, 2017) or voting behaviour (Moriconi *et al.*, 2019). Others have studied more specifically their effect on support for far-right parties (Brunner & Kuhn, 2018; Dustmann *et al.,* 2019; Halla *et al.,* 2017; Moriconi *et al.*, 2022). Only a handful of papers, however, investigate the relationship between natives' exposure to short-term variations in the presence of foreign-born individuals and their attitudes towards immigrants. Among them, Karreth *et al.* (2015) find that increasing diversity is associated with negative attitudes toward immigrants among natives on the political right, while Newman and Velez (2014) document how rapidly growing immigration can lead to increased hostility when immigrants are perceived as a threat by the native population. Our paper extends this line of research by looking at the predictive power of regional migration flows on attitudes towards immigration at the European level, which has not yet been studied. One exception is Murard (2017), who examines the impact of immigration on preferences for redistribution and attitudes towards migration policy, finding a positive correlation between the arrival of migrants and anti-immigration attitudes between 2002 and 2012. Unlike him, we focus our attention on the past decade (2010–2019), a period when European countries experienced major economic turbulences and rising immigration.

We ask the following research question: How do regional temporal variations in flows of foreign-born migrants predict changes in natives' attitudes about migration policy and their assessment of migrants' economic, cultural and overall contribution to society?

Our analysis combines individual-level information with regional-level data from various sources. To measure immigration attitudes, we use the European Social Survey (ESS) data from rounds 5 to 9 and build two indices about natives' attitudes to immigration. Firstly, their policy preference regarding levels of immigration. Secondly, their assessment of the economic, cultural, and overall contribution of immigration to their country. The data cover 97,193 individual respondents surveyed between 2010 and 2019 in 183 regions across 21 European countries. Our measure of regional migrant flows captures short-term variations in the share of foreign-born individuals at the NUTS2 regional level, obtained from the European Labour Force Survey. We also build on the recent literature on the determinants of public attitudes to immigration and control for individual drivers as well as contextual, region-specific factors such as GDP, unemployment rate and population density.

Our goal is to explain the differences in individual attitudes to immigration through variations in the share of immigrants within European regions and across time. The complexity of our design requires an accurate specification of influential factors at each level of analysis. In the present research, the data has a four-level hierarchical structure with individuals (micro-level) nested in region-years, regions and countries (macro-level). When, as here, nested data across multiple levels of analysis are present, it is appropriate, both theoretically and statistically, to employ multilevel models. We apply four-level random effects multilevel models that allow the

estimation of effects based on intra-regional differences over time and stable differences between regions (Bell *et al.*, 2019; Fairbrother, 2014). Immigration in Europe occurs not only across countries but also across regions within countries. To maximize the variation in immigrant shares across regions at the highest possible level of granularity, we focus on NUTS2 regions whenever possible.

Our findings reveal a statistically significant and positive association between attitudes to immigration and immigrants' historical presence in the European Union – as measured through the share of foreign-born population over the past decade.[1] In contrast, short-term increases in the share of foreign-born immigrants are correlated with more negative attitudes on both migration policy as well as natives' assessment of immigrants' contribution to the country.

Our paper makes a direct contribution to the studies looking at the relationship between immigrants' presence and public opinion on immigration in Europe. Hatton (2016) finds that pro-immigration opinion is negatively related to the share of immigrants living in a country. At the regional level, several empirical papers examine the impact of immigrants' presence on attitudes towards immigrants (Bridges & Mateut, 2014; Green *et al.*, 2010; Markaki & Longhi, 2013; Rustenbach, 2010; Weber, 2015; and Hale Williams & Chasapopoulos, 2019). For instance, Weber (2015)'s results show a negative correlation between the national proportion of immigrants and perceived threat. Across European NUTS1 regions, both Markaki and Longhi (2013) and Hale Williams and Chasapopoulos (2019) find that regions with a higher percentage of immigrants born outside the EU have a higher probability that natives express negative attitudes to immigration. Among the few papers investigating local migration flows, Kawalerowicz (2021) finds that anti-immigrant attitudes in the UK are more likely to be expressed by natives who live in constituencies where there has been a large change in diversity between 2001 and 2011. On the same topic, Karreth *et al.* (2015) show that increasing and visible diversity in Austria, Germany, and Switzerland is associated with negative attitudes toward immigrants, but only among natives on the political right. Like us, Murard (2017) studies the effect of regional flows of international migrants on preferences regarding migration policy. He finds that where immigrants tend to compete with natives for jobs due to similar skills or occupations, natives prefer policies that support welfare and put restrictions on migration.

Finally, this work is related to a recent working paper by Di Iasio and Wahba (2021), which proposes a symmetric approach to ours and studies the causal impact of attitudes to immigration on migration flows. Their findings indicate a negative causal relationship between anti-immigration attitudes and migration inflows to the EU. If natives' hostility acts as a deterrent for migrants, this reinforces concerns about the self-selection of immigrants to areas where natives' have more positive views on immigration.

[1] The UK is included in our sample despite having left the European Union in 2020. However, our period of investigation ranges from 2010 until 2019, a period during which the UK was still a member of the EU.

The next section briefly introduces the theoretical framework on which we build to explore the relationship between regional migration and public opinion. We then present the data and our empirical strategy in Section 3. Our findings are discussed in Section 4. We conclude and discuss some opportunities for further research in Section 5.

## 2. Theoretical background

This paper builds on the large body of literature on the determinants of attitudes to immigration. Natives' fears over immigration are usually regarded as a mix of economic and cultural concerns.

The theory of economic competition posits that natives and immigrants are economic rivals. In the labour market, this implies that immigration is perceived by natives as a threat to wages and job security (Citrin *et al.*, 1997; Facchini & Mayda, 2012; Scheve & Slaughter, 2001). Negative perceptions about immigrants also appear to be driven by the fear that foreigners represent a net fiscal burden (Boeri, 2010; Dustmann & Preston, 2007), leading to restrictive preferences about redistribution and effectively lower public spending in some instances (Razin *et al.*, 2002; Speciale, 2012). Several works have shown that the perceived economic threat from immigrants plays a substantial part in driving natives' attitudes (Facchini & Mayda, 2009; Hainmueller & Hiscox, 2010; Hanson *et al.*, 2007; Pardos-Prado & Xena, 2019; Scheve & Slaughter, 2001).

The cultural threat, or conflict, theory, postulates that natives perceive immigrants as a challenge to their ethnicity and values. It holds that observable differences lead to discrimination and often hostility between groups with a preference for their own ethnicity (Gorodzeisky & Semyonov, 2016; Hainmueller & Hiscox, 2007). As a result, where immigrants are socio-ethnically different, their arrival may upset the demographic and social structure of society and elicit more negative responses (see for instance Hainmueller and Hangartner, 2013) or increased support for xenophobic, far-right parties (see for instance Barone *et al.*, 2016). Symmetrically, it is important to highlight how the context of immigration can also improve public opinion: According to the contact theory, a larger immigrant group can increase the incidence of contact between natives and newcomers at the local level, therefore reducing prejudice and the perception of threat in the long run. In this regard, the work of Coenders and Scheepers (2008) and Hopkins (2010) suggest that negative reactions to immigrants are most likely in response to competition from recent foreign arrivals, rather than existing ethnic diversity. Therefore, natives who have been recently exposed to immigrants, and experienced a rapid increase in the number of immigrants living around them are likely to be immune to prejudice-reducing contact with immigrants, while feelings of economic or/and ethnic competition are then more likely to emerge.

## 3. Methods

In this paper, we combine data from multiple sources to create a dataset that includes individual-level information on native individuals' attitudes toward immigration and several regional variables.

At the individual level, the present analysis relies on biannual data from the European Social Survey (ESS). It contains 97,193 respondents from 21 European countries across 183 regions. Because our primary objective is to identify how public opinion reacts to short-term, within-region changes in attitudes to immigration, we only include in our analysis countries surveyed by the ESS at least twice over the time period under scrutiny (2010–2019).[2] Using the ESS allows us to disentangle attitudes to immigration across a number of European regions and within regions across time because people of the same region are observed at different time periods. Table 1 below shows the number of respondents for each region and each ESS round included in the sample.

ESS respondents were selected by means of strict probability samples of the resident populations aged 15 years and older at the country level. Respondents also provided information on their socio-demographic characteristics that we use as control measures in our model. We included a set of demographic variables such as age, gender, educational attainment, type of community the respondent resides in (urban versus rural), subjective income difficulties, and minority and citizenship status as controls. These are the factors found most commonly affecting attitudes to immigration (Dražanová *et al.*, 2022). We restrict our sample to natives (defined as respondents born in the country where they were interviewed). We

[2] We discuss the implication of this modeling strategy in section 3.3 (Empirical strategy)

**Table 1. Number of observations per region and year.**

| Country | Region | 2010 | 2012 | 2014 | 2016 | 2018 | Total |
|---|---|---|---|---|---|---|---|
| Austria (AT) | AT1 | 863 | 0 | 615 | 0 | 916 | 2394 |
| | AT2 | 435 | 0 | 332 | 0 | 518 | 1285 |
| | AT3 | 724 | 0 | 637 | 0 | 791 | 2152 |
| Belgium (BE) | BE10 | 74 | 0 | 89 | 0 | 66 | 229 |
| | BE21 | 281 | 0 | 224 | 0 | 255 | 760 |
| | BE22 | 147 | 0 | 133 | 0 | 145 | 425 |
| | BE23 | 207 | 0 | 195 | 0 | 195 | 597 |
| | BE24 | 159 | 0 | 140 | 0 | 140 | 439 |
| | BE25 | 194 | 0 | 217 | 0 | 210 | 621 |
| | BE31 | 49 | 0 | 57 | 0 | 67 | 173 |
| | BE32 | 154 | 0 | 199 | 0 | 178 | 531 |
| | BE33 | 137 | 0 | 168 | 0 | 131 | 436 |
| | BE34 | 42 | 0 | 50 | 0 | 41 | 133 |
| | BE35 | 72 | 0 | 70 | 0 | 61 | 203 |
| Bulgaria (BG) | BG31 | 366 | 0 | 0 | 0 | 285 | 651 |
| | BG32 | 334 | 0 | 0 | 0 | 271 | 605 |
| | BG33 | 322 | 0 | 0 | 0 | 290 | 612 |
| | BG34 | 403 | 0 | 0 | 0 | 305 | 708 |
| | BG41 | 537 | 0 | 0 | 0 | 544 | 1081 |
| | BG42 | 450 | 0 | 0 | 0 | 487 | 937 |
| Czech Republic (CZ) | CZ01 | 277 | 0 | 254 | 0 | 319 | 850 |
| | CZ02 | 230 | 0 | 249 | 0 | 276 | 755 |
| | CZ03 | 262 | 0 | 250 | 0 | 251 | 763 |
| | CZ04 | 235 | 0 | 256 | 0 | 266 | 757 |
| | CZ05 | 345 | 0 | 347 | 0 | 328 | 1020 |
| | CZ06 | 388 | 0 | 281 | 0 | 375 | 1044 |
| | CZ07 | 310 | 0 | 191 | 0 | 256 | 757 |
| | CZ08 | 293 | 0 | 275 | 0 | 267 | 835 |
| Germany (DE) | DE1 | 255 | 0 | 295 | 0 | 228 | 778 |
| | DE2 | 371 | 0 | 355 | 0 | 356 | 1082 |
| | DE3 | 89 | 0 | 140 | 0 | 73 | 302 |
| | DE4 | 224 | 0 | 179 | 0 | 62 | 465 |
| | DE5 | 22 | 0 | 22 | 0 | 6 | 50 |
| | DE6 | 21 | 0 | 41 | 0 | 42 | 104 |
| | DE7 | 162 | 0 | 162 | 0 | 124 | 448 |
| | DE8 | 116 | 0 | 120 | 0 | 51 | 287 |
| | DE9 | 168 | 0 | 222 | 0 | 244 | 634 |
| | DEA | 487 | 0 | 427 | 0 | 414 | 1328 |
| | DEB | 117 | 0 | 112 | 0 | 97 | 326 |
| | DEC | 19 | 0 | 30 | 0 | 23 | 72 |
| | DED | 248 | 0 | 261 | 0 | 133 | 642 |
| | DEE | 177 | 0 | 146 | 0 | 66 | 389 |
| | DEF | 77 | 0 | 78 | 0 | 79 | 234 |
| | DEG | 192 | 0 | 156 | 0 | 58 | 406 |
| Denmark (DK) | DK01 | 364 | 0 | 354 | 0 | 172 | 890 |
| | DK02 | 200 | 0 | 201 | 0 | 351 | 752 |
| | DK03 | 332 | 0 | 341 | 0 | 349 | 1022 |
| | DK04 | 382 | 0 | 346 | 0 | 393 | 1121 |
| | DK05 | 197 | 0 | 142 | 0 | 204 | 543 |

| Country | Region | 2010 | 2012 | 2014 | 2016 | 2018 | Total |
|---|---|---|---|---|---|---|---|
| Spain (ES) | ES11 | 97 | 0 | 133 | 0 | 125 | 355 |
| | ES12 | 42 | 0 | 51 | 0 | 37 | 130 |
| | ES13 | 23 | 0 | 30 | 0 | 23 | 76 |
| | ES21 | 75 | 0 | 89 | 0 | 74 | 238 |
| | ES22 | 27 | 0 | 24 | 0 | 15 | 66 |
| | ES23 | 6 | 0 | 16 | 0 | 9 | 31 |
| | ES24 | 55 | 0 | 58 | 0 | 49 | 162 |
| | ES30 | 265 | 0 | 211 | 0 | 169 | 645 |
| | ES41 | 110 | 0 | 105 | 0 | 86 | 301 |
| | ES42 | 77 | 0 | 85 | 0 | 88 | 250 |
| | ES43 | 52 | 0 | 52 | 0 | 45 | 149 |
| | ES51 | 208 | 0 | 222 | 0 | 180 | 610 |
| | ES52 | 159 | 0 | 181 | 0 | 142 | 482 |
| | ES53 | 23 | 0 | 35 | 0 | 21 | 79 |
| | ES61 | 374 | 0 | 336 | 0 | 295 | 1005 |
| | ES62 | 42 | 0 | 50 | 0 | 35 | 127 |
| | ES63 | 0 | 0 | 4 | 0 | 4 | 8 |
| | ES64 | 2 | 0 | 5 | 0 | 3 | 10 |
| | ES70 | 56 | 0 | 69 | 0 | 60 | 185 |
| Finland (FI) | FI19 | 484 | 0 | 544 | 0 | 437 | 1465 |
| | FI1B | 454 | 0 | 504 | 0 | 446 | 1404 |
| | FI1C | 416 | 0 | 424 | 0 | 363 | 1203 |
| | FI1D | 459 | 0 | 502 | 0 | 421 | 1382 |
| | FI20 | 0 | 0 | 13 | 0 | 4 | 17 |
| France (FR) | FR10 | 209 | 0 | 216 | 0 | 213 | 638 |
| | FRB0 | 55 | 0 | 75 | 0 | 75 | 205 |
| | FRC1 | 37 | 0 | 48 | 0 | 55 | 140 |
| | FRC2 | 42 | 0 | 19 | 0 | 38 | 99 |
| | FRD1 | 46 | 0 | 51 | 0 | 49 | 146 |
| | FRD2 | 49 | 0 | 47 | 0 | 50 | 146 |
| | FRE1 | 114 | 0 | 84 | 0 | 122 | 320 |
| | FRE2 | 34 | 0 | 78 | 0 | 70 | 182 |
| | FRF1 | 41 | 0 | 58 | 0 | 54 | 153 |
| | FRF2 | 45 | 0 | 17 | 0 | 31 | 93 |
| | FRF3 | 88 | 0 | 42 | 0 | 56 | 186 |
| | FRG0 | 103 | 0 | 104 | 0 | 118 | 325 |
| | FRH0 | 91 | 0 | 130 | 0 | 122 | 343 |
| | FRI1 | 90 | 0 | 111 | 0 | 110 | 311 |
| | FRI2 | 28 | 0 | 45 | 0 | 24 | 97 |
| | FRI3 | 84 | 0 | 40 | 0 | 51 | 175 |
| | FRJ1 | 54 | 0 | 77 | 0 | 71 | 202 |
| | FRJ2 | 68 | 0 | 125 | 0 | 85 | 278 |
| | FRK1 | 35 | 0 | 44 | 0 | 44 | 123 |
| | FRK2 | 169 | 0 | 126 | 0 | 185 | 480 |
| | FRL0 | 92 | 0 | 157 | 0 | 146 | 395 |
| Croatia (HR) | HR03 | 493 | 0 | 0 | 0 | 586 | 1079 |
| | HR04 | 989 | 0 | 0 | 0 | 1042 | 2031 |
| Hungary (HU) | HU11 | 0 | 0 | 294 | 0 | 203 | 497 |
| | HU12 | 0 | 0 | 225 | 0 | 227 | 452 |
| | HU21 | 181 | 0 | 176 | 0 | 210 | 567 |
| | HU22 | 160 | 0 | 151 | 0 | 155 | 466 |
| | HU23 | 170 | 0 | 154 | 0 | 103 | 427 |
| | HU31 | 183 | 0 | 207 | 0 | 217 | 607 |
| | HU32 | 255 | 0 | 259 | 0 | 296 | 810 |
| | HU33 | 183 | 0 | 205 | 0 | 231 | 619 |
| Ireland (IE) | IE04 | 0 | 0 | 533 | 0 | 424 | 957 |
| | IE05 | 0 | 0 | 725 | 0 | 636 | 1361 |
| | IE06 | 0 | 0 | 819 | 0 | 763 | 1582 |
| Italy (IT) | ITC1 | 0 | 62 | 0 | 206 | 0 | 268 |
| | ITC2 | 0 | 0 | 0 | 32 | 0 | 32 |
| | ITC3 | 0 | 24 | 0 | 38 | 0 | 62 |
| | ITC4 | 0 | 79 | 0 | 335 | 0 | 414 |
| | ITF1 | 0 | 35 | 0 | 26 | 0 | 61 |
| | ITF3 | 0 | 80 | 0 | 217 | 0 | 297 |
| | ITF4 | 0 | 22 | 0 | 230 | 0 | 252 |
| | ITF5 | 0 | 43 | 0 | 50 | 0 | 93 |
| | ITF6 | 0 | 70 | 0 | 59 | 0 | 129 |
| | ITG1 | 0 | 121 | 0 | 185 | 0 | 306 |
| | ITG2 | 0 | 35 | 0 | 66 | 0 | 101 |
| | ITH1 | 0 | 15 | 0 | 19 | 0 | 34 |
| | ITH2 | 0 | 10 | 0 | 10 | 0 | 20 |
| | ITH3 | 0 | 60 | 0 | 204 | 0 | 264 |

| Country | Region | 2010 | 2012 | 2014 | 2016 | 2018 | Total |
|---|---|---|---|---|---|---|---|
| | ITH4 | 0 | 5 | 0 | 69 | 0 | 74 |
| | ITH5 | 0 | 55 | 0 | 257 | 0 | 312 |
| | ITI1 | 0 | 68 | 0 | 97 | 0 | 165 |
| | ITI2 | 0 | 13 | 0 | 37 | 0 | 50 |
| | ITI3 | 0 | 19 | 0 | 87 | 0 | 106 |
| | ITI4 | 0 | 74 | 0 | 171 | 0 | 245 |
| Lithuania (LT) | LT01 | 0 | 0 | 527 | 0 | 409 | 936 |
| | LT02 | 0 | 0 | 1648 | 0 | 1370 | 3018 |
| Norway (NO) | NO01 | 273 | 0 | 282 | 0 | 301 | 856 |
| | NO02 | 102 | 0 | 93 | 0 | 79 | 274 |
| | NO03 | 272 | 0 | 256 | 0 | 219 | 747 |
| | NO04 | 222 | 0 | 155 | 0 | 177 | 554 |
| | NO05 | 252 | 0 | 227 | 0 | 238 | 717 |
| | NO06 | 143 | 0 | 130 | 0 | 109 | 382 |
| | NO07 | 132 | 0 | 124 | 0 | 134 | 390 |
| Poland (PL) | PL12 | 227 | 0 | 225 | 0 | 174 | 626 |
| | PL21 | 141 | 0 | 162 | 0 | 152 | 455 |
| | PL22 | 204 | 0 | 175 | 0 | 220 | 599 |
| | PL41 | 146 | 0 | 139 | 0 | 107 | 392 |
| | PL42 | 79 | 0 | 64 | 0 | 51 | 194 |
| | PL43 | 39 | 0 | 43 | 0 | 34 | 116 |
| | PL51 | 109 | 0 | 85 | 0 | 102 | 296 |
| | PL52 | 50 | 0 | 31 | 0 | 33 | 114 |
| | PL61 | 101 | 0 | 96 | 0 | 77 | 274 |
| | PL62 | 64 | 0 | 50 | 0 | 62 | 176 |
| | PL63 | 115 | 0 | 80 | 0 | 78 | 273 |
| | PL71 | 125 | 0 | 129 | 0 | 118 | 372 |
| | PL72 | 69 | 0 | 62 | 0 | 48 | 179 |
| | PL81 | 112 | 0 | 96 | 0 | 83 | 291 |
| | PL82 | 95 | 0 | 105 | 0 | 103 | 303 |
| | PL84 | 50 | 0 | 57 | 0 | 46 | 153 |
| Portugal (PT) | PT11 | 818 | 0 | 456 | 0 | 332 | 1606 |
| | PT15 | 80 | 0 | 60 | 0 | 37 | 177 |
| | PT16 | 368 | 0 | 289 | 0 | 221 | 878 |
| | PT17 | 663 | 0 | 256 | 0 | 231 | 1150 |
| | PT18 | 75 | 0 | 109 | 0 | 103 | 287 |
| Sweden (SE) | SE11 | 212 | 0 | 347 | 0 | 276 | 835 |
| | SE12 | 247 | 0 | 220 | 0 | 192 | 659 |
| | SE21 | 125 | 0 | 155 | 0 | 113 | 393 |
| | SE22 | 196 | 0 | 205 | 0 | 185 | 586 |
| | SE23 | 280 | 0 | 301 | 0 | 260 | 841 |
| | SE31 | 128 | 0 | 137 | 0 | 129 | 394 |
| | SE32 | 58 | 0 | 87 | 0 | 61 | 206 |
| | SE33 | 78 | 0 | 102 | 0 | 98 | 278 |
| Slovenia (SI) | SI03 | 761 | 0 | 687 | 0 | 669 | 2117 |
| | SI04 | 507 | 0 | 439 | 0 | 494 | 1440 |
| Slovakia (SK) | SK01 | 218 | 0 | 0 | 0 | 75 | 293 |
| | SK02 | 594 | 0 | 0 | 0 | 360 | 954 |
| | SK03 | 455 | 0 | 0 | 0 | 317 | 772 |
| | SK04 | 539 | 0 | 0 | 0 | 313 | 852 |
| United Kingdom (UK) | UKC | 103 | 0 | 107 | 0 | 106 | 316 |
| | UKD | 257 | 0 | 230 | 0 | 226 | 713 |
| | UKE | 211 | 0 | 159 | 0 | 190 | 560 |
| | UKF | 166 | 0 | 159 | 0 | 149 | 474 |
| | UKG | 197 | 0 | 166 | 0 | 125 | 488 |
| | UKH | 204 | 0 | 188 | 0 | 199 | 591 |
| | UKI | 120 | 0 | 116 | 0 | 114 | 350 |
| | UKJ | 295 | 0 | 275 | 0 | 288 | 858 |
| | UKK | 177 | 0 | 180 | 0 | 187 | 544 |
| | UKL | 134 | 0 | 121 | 0 | 90 | 345 |
| | UKM | 227 | 0 | 192 | 0 | 169 | 588 |
| | UKN | 60 | 0 | 54 | 0 | 62 | 176 |
| | Total | 31879 | 890 | 29382 | 2395 | 32647 | 97193 |

integrate the micro-attitudinal data from the ESS with contextual data at the regional and region-year level to capture the size and composition of the foreign-born population. These regional-level variables are gathered from various sources, particularly the European Labour Force Survey (EULFS) and the OECD's database, which are described in more detail below.

The EULFS Data was received and processed through the European University Institute library following approval of research proposal number RPP 47/2021-LFby Eurostat Microdata Access Team. The data was stored and processed

on a single designated computer located in a locked office of the EUI premises. Data analysis was conducted using Stata 15 and supported by the EULFS codebook and user guide. The EULFS microdata are anonymized according to anonymisation and aggregation criteria agreed between Eurostat and the National Statistical Institutes in order to enable Eurostat to make EU LFS microdata available to researchers.

### 3.1 Attitudes to immigration

The ESS survey instrument has been widely used by scholars to measure attitudes towards immigration (Hainmueller & Hopkins, 2014). We distinguish between two types of attitudes to immigration in our analysis – a*ttitudes toward policy preferences regarding the level of immigration* and *the evaluation of the contribution and consequences of immigration on society.* These two dependent variables complement each other. The first one mostly deals with policy debates regarding immigration inflows and captures individuals' preferences for the future. The second one represents opinions on whether immigration is beneficial to the community in the present.

Distinguishing between different types of attitudes to immigration has not always been the case in previous research. While these attitudes co-vary, they are not necessarily the same. For example, it is possible for a respondent to want to reduce the inflow of immigrants, but at the same time recognize their social and democratic rights once admitted. In this study, we specifically analyse attitudes toward allowing immigrants into the country and the perceptions of the effect of immigration. These are different, although strongly connected, dimensions of attitudes to immigration.

***3.1.1 Policy variable.*** Our policy dependent variable is a composite index that measures the overall willingness to allow only a few or many different types of immigrants into the country. Respondents were asked three questions: (1) To what extent do you think [country] should allow people of the same race/ethnic group as the majority to come and live here? (2) To what extent do you think [country] should allow people of different races/ethnic groups as the majority to come and live here? And (3) To what extent do you think [country] should allow people from the poorer countries outside Europe to come and live here? The answers are coded on a four-point scale ranging from (1) allowing many to come and live here to (4) allowing none. We created an average index and rescaled it so that it ranges from 0 to 1.[3] The original coding has been reversed so that higher numbers mean more positive attitudes. We included all respondents that have answered at least two of the three items comprising our dependent variable.

***3.1.2 Contribution variable.*** Our contribution dependent variable is a composite index that measures a person's overall assessment of the impact of immigration on their society. Respondents were asked three questions: (1) Would you say it is generally bad or good for [country]'s economy that people come to live here from other countries? (2) Would you say that [country]'s cultural life is generally undermined or enriched by people coming to live here from other countries? and (3) Is [country] made a worse or a better place to live by people coming to live here from other countries? Answers are coded on an eleven-point scale where 0 is the most negative and 10 is the most positive reply. As with the policy variable, we created an average index ranging from 0 to 1, so that the two dependent variables are directly comparable.[4] We included all respondents that have answered at least two of the three items comprising our dependent variable.

Attitudes of immigration measured in a form of indices comprising several related questions have been widely used by scholars studying attitudes to immigration (see for example Davidov & Meuleman, 2012; Just & Anderson, 2015; Solheim, 2021 for the use of the policy index and Gorodzeisky & Semyonov, 2018; McLaren & Paterson, 2020 for the contribution index).

### 3.2 Regional migration data

We use repeated, cross-sectional data from the European Labour Force Survey (EULFS) to construct variables that capture the average and the short-term variations in the regional share of migrants at the NUT2 level.[5] These level and change variables are assigned to each ESS respondent based on the year they were interviewed and his or her region of residence.[6] Besides demographic information, the EULFS also reports the birthplace of each individual, distinguishing fifteen different regions of origin[7]. We use all foreign-born individuals to compute a measure of the share of immigrants as a share of the total population at the regional level:

$$S^{s}_{r,t} = \frac{M^{s}_{r,t}}{Pop_{r,t}}$$

where M is the total stock of migrants in region r born in a foreign country, with skills (tertiary educated or not) and/or origin (Europe or non-European), or gender (male or female) in year t.[8] Thus, S represent that group of immigrants as a share

[3] The Cronbach's Alpha for the three items is 0.89, thus confirming that the three questions measure the same underlying concept.

[4] The Cronbach's Alpha is 0.86, thus confirming that the three items measure a similar underlying concept.

[5] We use the intermediate geographic level, NUTS2, commonly referred to as "regions" in our analysis.

[6] As a general rule, respondents surveyed between July of year t and June of year t+1 are assigned the share of foreign-born in year $S_t$ and respective average $avg_t$.

[7] These regions are the country-groups/regions of residence separately identified: EU15 country different from the country of residence, EU country that joined the EU in 2004, EU country that joined EU in 2007/2013, EFTA, Other European country, North Africa, Other Africa, Near and Middle East, East Asia, South and Southeast Asia, North America, Central America and Caribbean, South America and Australia and Oceania. Germany does not provide information on the birthplace of its foreign-born population. Accordingly, we impute the birthplace of the foreign-born population using information on the nationality of immigrants.

[8] European immigrants also include North America and Australia as those immigrants are culturally, ethnically and socio-economically closer to immigrants originating from European countries.

of the total population. The average immigration variable is then constructed as:

$$avg_r^s = \frac{\sum_{t \in T} S_{r,t}^s}{|T|}$$

and represent the average share of immigrants from a given origin in region r over the time period T under investigation. For each region r, T corresponds to the period of time between the first and last year an individual was surveyed by the ESS in region r.

There are two ways to operationalize these regional demographics of interest, and we employ a longitudinal as well as a cross-sectional perspective for each (see methods section). Longitudinally, our main variable of interest captures how Europeans react to temporal shares of (non-)European foreign-born individuals that are below or above the regional average during the period of investigation.

Table 2 presents basic statistics for the variables we include in the model. Variables are averaged over the considered period at the individual level, region-year level and regional level. The average share of foreign-born living in the regions is 8.96 %, most of whom are of EU origin.

### 3.3 Empirical strategy

As an empirical strategy, we employ random effects multilevel modelling tailored to the structure of repeated cross-sectional data that allows us to decompose the variance of the outcome

**Table 2. Summary statistics.**

| | Full sample | | | | |
|---|---|---|---|---|---|
| | **N** | **Mean** | **S.D.** | **Min** | **Max** |
| Contribution | 94110 | 0.505 | 0.217 | 0 | 1 |
| Policy | 94474 | 0.529 | 0.273 | 0 | 1 |
| ***Individual level*** | | | | | |
| age | 96919 | 49.973 | 18.799 | 14 | 104 |
| university | 94909 | 0.273 | 0.445 | 0 | 1 |
| tertiary without degree | 94909 | 0.054 | 0.225 | 0 | 1 |
| Upper secondary | 94909 | 0.389 | 0.488 | 0 | 1 |
| Lower secondary | 94909 | 0.174 | 0.379 | 0 | 1 |
| female | 97146 | 0.53 | 0.499 | 0 | 1 |
| Living in urban area | 97193 | 0.294 | 0.456 | 0 | 1 |
| Income difficulty | 96052 | 0.235 | 0.424 | 0 | 1 |
| minority | 95967 | 0.091 | 0.287 | 0 | 1 |
| non citizen | 97137 | 0.003 | 0.056 | 0 | 1 |
| ***Region-year level*** | | | | | |
| Change in share of foreign-born | 580 | -0.059 | 1.257 | -7.037 | 5.439 |
| Change in share of foreign-born from Europe | 580 | -0.020 | 0.683 | -3.467 | 3.62 |
| Change in share of foreign-born outside Europe | 580 | -0.039 | 0.874 | -4.991 | 4.011 |
| ***Regional level*** | | | | | |
| Share of foreign-born | 183 | 8.966 | 6.702 | 0.129 | 42.499 |
| Share of foreign-born from Europe | 183 | 5.183 | 4.094 | 0.129 | 21.778 |
| Share of foreign-born outside Europe | 183 | 3.780 | 3.829 | 0 | 22.353 |
| GDP per capita (PPS) | 177 | 24674 | 9008.3 | 7007 | 57365 |
| % unemployed 15+ | 181 | 10.152 | 4.808 | 2.6 | 31.9 |
| Population density | 177 | 361.415 | 939.455 | 3.3 | 6957.2 |

(immigration attitudes) into a within- and between- region part (Bell *et al.*, 2019; Fairbrother, 2014). These models are four-level hierarchical linear models, with individuals nested in region-years nested in regions nested in countries respectively (Schmidt-Catran & Fairbrother, 2016).

The four-level random intercept multilevel models are estimated using restricted maximum likelihood (reml).

Our final four-level model[9] is defined as:

$$Y_{ijkc} = \beta_{0ijkc} + \beta_1 X_{ijkc} + \beta_2 S^s_{jkc} + \beta_3 avg^s_{kc} + \beta_4 W_{jkc} + \beta_5 Z_c + f_c + \mu_{kc} + \nu_{jkc} + e_{ijkc}$$

where, within each region-year $j$, region $k$ and country $c$, respondents' attitudes to immigration (Y) are a function of their individual characteristics (vector X), the demeaned version of the variable capturing the annual share of immigrants S, whether at the aggregate level or distinguishing between their origin, the average regional share of immigrants *avg* – also origin - over the whole time period considered, region-year characteristics (vector W) and Western/Eastern country-year binary combinations (vector Z). $\beta_{0ijkc}$ is the mean of attitudes to immigration of individuals in region-year $j$, region $k$, and country $c$, $\beta_1$ is the level-1 fixed effects, $\beta_2$ and $\beta_4$ are the level-2 fixed effects, $\beta_3$ is the level-3 fixed effects and $\beta_5$ are the level-4 fixed effects. In the random part of the model $f_c$ is the residual random effect of country $c$, $\mu_{kc}$ is the residual random effect of region $k$, $\nu_{jkc}$ is the residual random effect of region-year $j$ and $e_{ijkc}$ is the random individual variation. The random effects $\mu_{kc}$, $\nu_{jkc}$ and $f_c$ are assumed normally distributed with mean 0 and variance $\tau_\mu$, $\tau_\nu$ and $\tau_f$ respectively.

A series of individual sociodemographic controls are included. We control for a person's age (in years), gender (female), and education (four categories with less than lower secondary as reference). Dummy variables are included to control for individuals who live in urban areas (urban area=1) and report having income difficulties (income difficulty=1). We also include a minority dummy for respondents whose at least one parent was born outside of the country and/or are part of an ethnic minority (minority=1). Finally, we also control for respondents' citizenship status (non-citizens=1), since our sample is restricted to respondents who were born in the country but might not be citizens.

The demeaned variable for immigration *S* yields within regional effects or, in other words, the longitudinal within-region change component (WE) (previously referred to as inflows or short-term variations) for each observation at region-year, while the mean variable *avg* captures cross-sectional between regional effects (BE). The advantage of this four-level multilevel model is that it distinguishes between-regional effects and within-regional change while controlling for compositional differences at the individual level (see Fairbrother, 2014). Within-effects automatically control for all regional characteristics that are time-invariant and are not afflicted by omitted variable bias due to any time-constant aspects on the regional level such as stable differences in political, historical or legal factors. Between effects are, in turn, based only on time-stable differences between regions.

Apart from controlling for within and between regional effects, we also control for clustering at the country level since possible clustering at the country level might still occur (Schmidt-Catran & Fairbrother, 2016). We employ a Western/Eastern country-year dummy to model a general geography-time trend.

We also collect data about GDP and unemployment rate from the OECD database and Eurostat to use as controls for time-varying differences across regions that could influence individuals' attitudes to immigration. A contextual variable regarding regional population density was also added to the model. Since these are not of our primary interest, only between-region (and not also within-region) macro indicators are included. A similar approach has been used by McLaren (2012) and Jeannet (2020) for country-level controls.

We do not control specifically for any country-level characteristics apart from countries being either part of Western or Central and Eastern Europe. Nevertheless, we assume that individuals from the same country are significantly more similar in their attitudes to immigration than individuals from different countries. This is confirmed by the likelihood ratio (LR) tests comparing a three-level model (individuals nested within region-year and region) to a four-level model (individuals nested within region-year, region and country) ($\chi_1^2$ = 174.94, $p < 0.001$ for contribution and $\chi_1^2$ = 223.85, $p < 0.001$ for policy). Thus, respondents from the same country are significantly more alike in their attitudes to immigration than respondents from different countries.

Clustering at the country level also distinguishes our analysis from the one conducted by Hale Williams and Chasapopoulos (2019). While Hale Williams and Chasapopoulos (2019) employ multilevel modelling, they do not cluster regions within countries. As shown in Table 3 in the two null models, when including countries as a level-4 cluster, they represent the most important clustering factors on immigration attitudes and the regional variation becomes negligible.

It is important to incorporate four-level structures in the models when they arise in the data and lead the higher-level clusters to differ substantially from one another on the response variable. Fitting models with a lower number of levels to data with, in fact, more hierarchical clusters could lead to misattributing response variation to only the included levels. This in turn may lead to drawing misleading conclusions about the relative importance of different sources of influence on the response.

Table 3 shows two null (or so-called "empty") models in order to partition the variance of our two dependent variables of

[9] A classic four-level model would also feature level-4 fixed effects and country level characteristics. However, we do not control for any country-level characteristics in our model.

**Table 3. Multilevel regressions of attitudes toward immigrants, individual controls only.**

| | Attitude Toward Immigrants´ Contribution | | | | Attitude Toward Immigration Policy | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 0 | | Model 1 | | Model 0 | | Model 1 | |
| | β | S.E. | β | S.E. | β | S.E. | β | S.E. |
| *Individual level effects* | | | | | | | | |
| age | | | 0.0007*** | (0.000) | | | 0.002*** | (0.0001) |
| university | | | 0.131*** | (0.0026) | | | 0.146*** | (0.0032) |
| tertiary without degree | | | 0.069*** | (0.0036) | | | 0.081*** | (0.0045) |
| Upper secondary | | | 0.047*** | (0.0025) | | | 0.057*** | (0.0031) |
| Lower secondary | | | 0.030*** | (0.0027) | | | 0.042*** | (0.0033) |
| female | | | -0.001 | (0.0013) | | | 0.006*** | (0.0016) |
| Living in urban area | | | 0.015*** | (0.0015) | | | 0.018*** | (0.0019) |
| Income difficulty | | | -0.050*** | (0.0017) | | | -0.048*** | (0.0021) |
| minority | | | 0.035*** | (0.0023) | | | 0.039*** | (0.0029) |
| non citizen | | | 0.015 | (0.012) | | | 0.010 | (0.0149) |
| Intercept | 0.505*** | (0.014) | 0.482*** | (0.013) | 0.533*** | (0.019) | 0.545*** | (0.018) |
| *Random effects* | | | | | | | | |
| country | 0.004 | (0.001) | 0.003 | (0.0011) | 0.007 | (0.002) | 0.0064 | (0.002) |
| region | 0.0005 | (0.001) | 0.002 | (0.0001) | 1.30e-14 | (4.71e-13) | 3.16e-17 | (1.64e-13) |
| Region-year | 0.0018 | (0.001) | 0.002 | (0.0001) | 0.004 | (0.0003) | 0.0039 | (0.0002) |
| Individual | 0.412 | (0.002) | 0.037 | (0.0001) | 0.062 | (0.0002) | 0.0578 | (0.0002) |
| N respondents | 94 110 | | 89 634 | | 94 474 | | 90 036 | |
| N countries | 21 | | 21 | | 21 | | 21 | |
| N regions | 183 | | 183 | | 183 | | 183 | |
| N region-years | 580 | | 574 | | 580 | | 574 | |

interest across the four levels. This model provides information on the variance components of immigration attitudes at each level of analysis (Level 1 - individual, Level 2 – region-year, Level 3 – region and Level 4 - country). It includes only an intercept, region-year random effects, region random effects, country random effects and an individual level residual error term. The overall mean attitude toward immigrants´ contribution across all countries, all regions, all region-years and all respondents is estimated to be 0.505 on a scale of 0–1, whereas the overall mean attitude toward immigration policy across countries, all regions, all region-years and all respondents is estimated to be 0.533 on a scale 0–1.[10]

The null model shows that 86.6 % of the variation in attitudes toward immigrants' contribution lies between individuals within region-years, 3.8 % lies between region-years within regions, 1 % lies between regions within countries and 8.6 % lies between countries. On the other hand, 83.6 % of the variation in attitudes toward immigration policy lies between individuals within region-years, 6 % lies between region-years within regions and 10.4 % lies between countries. There is no variation between regions within countries for attitudes toward immigration policy. However, as we are interested mostly in the effect of region-year variations, this shall not pose a problem for our models. At first, 3.8 and 6 % might seem small, but the longitudinal variance excludes all variation that is due to time-invariant idiosyncrasies between regions as well as between countries. The resulting within (WE) effects in further models thus exclude the impact of all-time stable confounding aspects, which is an advantage of our modelling strategy compared to usual cross-sectional estimates.

[10] $\beta_0$ is strictly a precision weighted mean of the supercluster means which typically gives more weight to small superclusters than would a simple weighted average of these means (see, for example, Raudenbush and Bryk, 2002, page 40).

Most of the variation in attitudes to immigration is found at the individual level, which is consistent with previous literature regarding differences in immigration attitudes. However, there is also a modest variation at the country, region (for attitude toward immigrants' contribution) and region-year level, thus justifying a multilevel approach.

## 4. Results

Our baseline analysis captures how public opinion varies with the average and short-term variations in the regional share of foreign-born individuals over the 2010–2019 period. All models presented hereafter include individual controls mentioned above as well as regional, time-varying variables that are likely to influence public opinion towards immigration over time such as GDP, unemployment, and the density of population.

Figure 1 presents the results for the full sample estimated using multi-level restricted likelihood and four levels of nesting (country, region, region-year and individuals). By including both the average level of foreign-borns' presence and the short-term variations due to migration pressure measured as deviations from this mean (inflows or outflows, see section 3.2), we are able to disentangle between the channels that are driving the relationship between the size of immigration and public attitudes. In particular, while the *avg* variable measures variations in opinion on immigration that are imputable to differences between regions, the *change* variable captures the reaction of individuals with respect to within-region changes in the share of immigrants over time.

Our results in Figure 1 and Table 4 indicate that on aggregate, the share of immigrants in a given region is associated with more positive attitudes towards immigrants in matters of both migration policy and individual feelings about immigrants' contribution.[11] This result is in line with the contact theory, which posits that prolonged interaction with high levels of immigration at the local level increases the incidence of contact between natives and newcomers and therefore reduces prejudice and the perception of threat in the long run. The coefficient measuring attitudes towards immigrants' contribution suggests that, *ceteris paribus*, a 10 % increase in the average share of immigrants (in absolute terms) across regions is associated with an increase in positive attitudes by 1.8 percentage points on the contribution scale.[12] This effect is slightly larger (2.1 %) and still very significant when respondents are asked about their opinion on migration policy. Moreover, our analysis suggests a negative association between a short-term increase in the share of immigrants and attitudes towards immigration. Controlling for differences in the average share of immigrants across European regions, we find that a 10 % increase in the share of immigrants is associated with a decrease in support for allowing more immigrants by 7.5 % within a given region. This negative association (- 4.6 %) is also significant for attitudes towards migrants' contribution.

These results are in line with the findings of Coenders and Scheepers (2008) and Hopkins (2010), who suggest that negative reactions to immigrants are more likely to occur in response to competition from recent foreign arrivals, rather than existing diversity.

Recent evidence suggests that European natives' attitudes to the arrival of foreign-born migrants may vary based on the composition of migration flows (see for instance Dražanová and Geddes, (2022) on the differences in European public opinion towards Syrian and Ukrainian refugees). In this regard, we test whether the origin of immigrants affects the sign and magnitude of the association between attitudes and immigration.

Figure 2 and Table 5 distinguish between the flows of European and non-European immigrants. In line with the existing

[11] Coefficients for individual and regional control variables are reported in Table A.2 in the Appendix.

[12] Both dependent variables are standardized on a 0–1 scale. A 1.8 percentage increase is therefore equivalent to a coefficient of 0,018. We report results in percentage points in the rest of the paper.

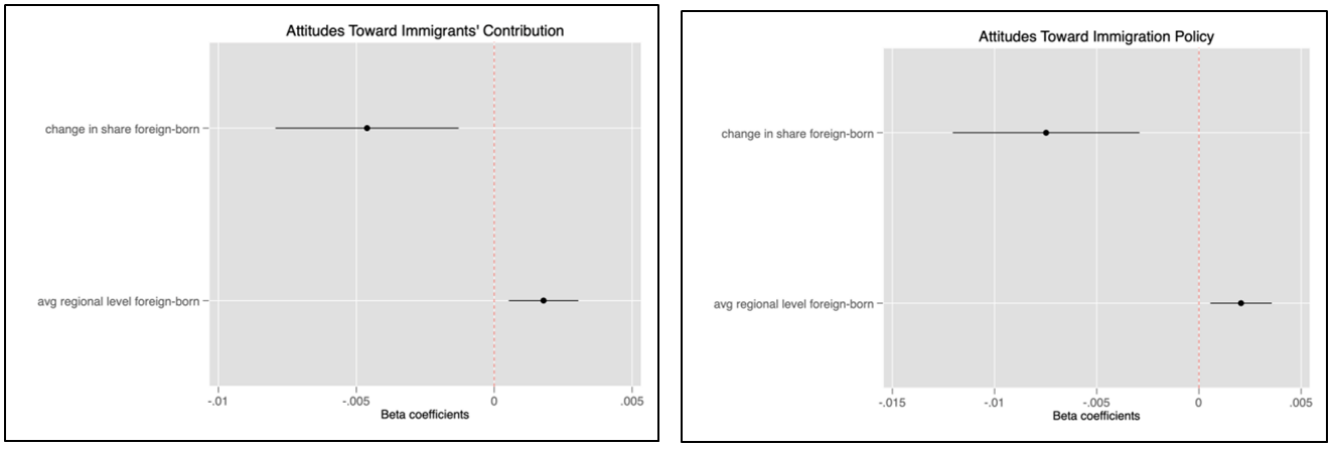



**Figure 1. Multi-level coefficients for regional shares of foreign-born with confidence intervals.**

**Table 4. Multi-level estimation results, total immigration - Attitudes toward immigrants' contribution.**

| | β | S.E. | β | S.E. | β | S.E. | β | S.E. |
|---|---|---|---|---|---|---|---|---|
| age | -0.0007*** | (0.00003) | -0.0017*** | (0.0004) | -0.0007*** | (3.71e-05) | -0.0007*** | (3.69e-05) |
| university | 0.1316*** | (0.0263) | 0.146*** | (0.0032) | 0.131*** | (0.00263) | 0.131*** | (0.00262) |
| tertiary without degree | 0.0694*** | (0.0367) | 0.0808*** | (0.0045) | 0.0691*** | (0.00367) | 0.0691*** | (0.00366) |
| Upper secondary | 0.0472*** | (0.0257) | 0.057*** | (0.003) | 0.0470*** | (0.00257) | 0.0472*** | (0.00257) |
| Lower secondary | 0.0307*** | (0.0277) | 0.0416*** | (0.003) | 0.0305*** | (0.00277) | 0.0303*** | (0.00276) |
| female | -0.0012 | (0.0132) | 0.006*** | (0.0131) | -0.00117 | (0.00132) | -0.00116 | (0.00131) |
| Living in urban area | 0.0149*** | (0.0159) | 0.0181*** | (0.0019) | 0.0151*** | (0.00159) | 0.0154*** | (0.00158) |
| Income difficulty | -0.0497*** | (0.0172) | -0.048*** | (0.002) | -0.0498*** | (0.00172) | -0.0502*** | (0.00171) |
| minority | 0.0347*** | (0.0237) | 0.0389*** | (0.0029) | 0.0347*** | (0.00237) | 0.0347*** | (0.00236) |
| non citizen | 0.0156 | (0.121) | 0.0102 | (0.0149) | 0.0152 | (0.0121) | 0.0150 | (0.0121) |
| change in share foreign-born | -0.0046** | (0.0016) | -0.006** | (0.0023) | | | | |
| avg regional level foreign-born | 0.0017** | (0.0067) | 0.0020*** | (0.0005) | | | | |
| change in share European foreign-born | | | | | 0.00380 | (0.00260) | 0.00387 | (0.00262) |
| avg regional level European foreign-born | | | | | 0.00364*** | (0.00110) | 0.0043*** | (0.00106) |
| change in share non-European foreign-born | | | | | -0.0110*** | (0.00226) | -0.0102*** | (0.00228) |
| avg regional level non-European foreign-born | | | | | 0.000297 | (0.00115) | -0.0138 | (0.0983) |
| regional gdp per capita | 7.29e-06 | (4.29e-06) | | | 6.57e-07 | (3.77e-07) | | |
| regional unemployment | -0.006 | (0.0072) | | | -0.00147 | (0.00075) | | |
| regional density | -5.45e-05 | (3.93e-05) | | | -4.73e-06 | (3.82e-06) | | |
| *Random effects* | | | | | | | | |
| country | 0.003 | 0.001 | 0.005 | 0.001 | 0.0034 | (0.0012) | 0.032 | (0.001) |
| region | 0.0003 | 0.001 | 0.0003 | 8.23e-06 | 0.0003 | (0.00009) | 0.0003 | (0.00009) |
| Region-year | 0.007 | 0.001 | 0.0016 | 0.00019 | 0.0007 | (0.00008) | 0.0007 | (0.00008) |
| Individual | 0.0379 | 0.001 | 0.057 | 0.0004 | 0.0379 | (0.0001) | 0.037 | (0.0001) |
| Intercept | 0.428*** | (0.0230) | 0.560*** | (0.0287) | 0.472*** | (0.257) | 0.462*** | (0.022 |
| N respondents | 89,001 | | 89,634 | | 89,001 | | 89,634 | |
| N countries | 21 | | 21 | | 21 | | 21 | |
| N regions | 182 | | 182 | | 182 | | 183 | |
| N region-years | 566 | | 566 | | 566 | | 574 | |

All full sample models control for Western/Eastern Europe-year dummy variables. *** p<0.001, ** p<0.01, * p<0.05

literature documenting a negative bias towards immigrants that are ethnically and culturally more distant (Murard (2017); Moriconi *et al.* (2019)), we find that a similar bias largely applies to non-European immigrants for both policy and contribution dependent variables: The coefficients are negative and statistically significant, suggesting that a 10 % increase in the share

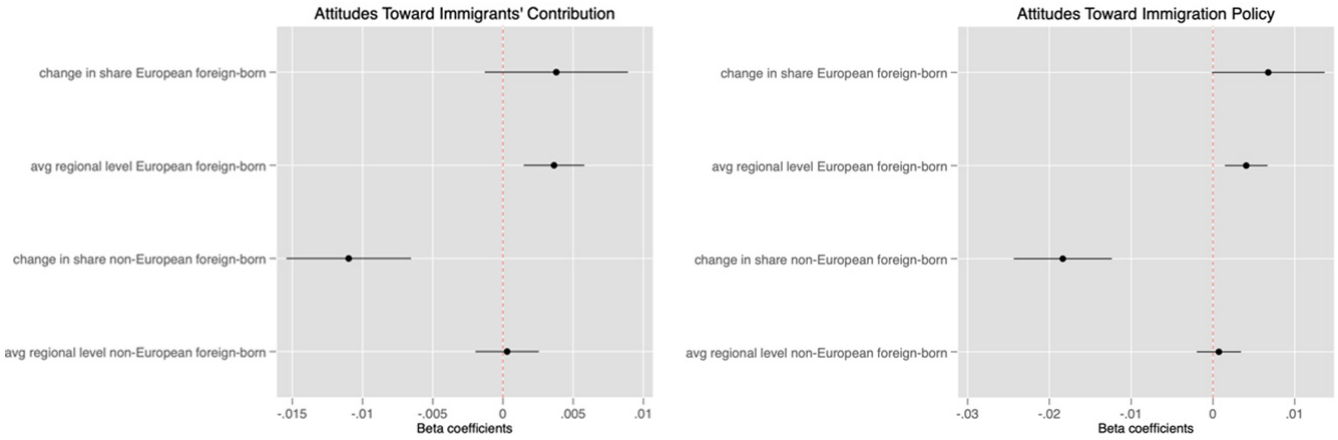



**Figure 2. Multi-level coefficients of shares of foreign-born by region of origin with confidence intervals.**

**Table 5. Multi-level estimation results, total immigration - Immigration policy.**

| | β | S.E. | β | S.E. | β | S.E. | β | S.E. |
|---|---|---|---|---|---|---|---|---|
| age | -0.002*** | (4.56e-05) | -0.0017*** | (4.54e-05) | -0.0017*** | (4.56e-05) | -0.0017*** | (4.54e-05) |
| university | 0.146*** | (0.00323) | 0.146*** | (0.00322) | 0.146*** | (0.00323) | 0.146*** | (0.00322) |
| tertiary without degree | 0.080*** | (0.00453) | 0.0809*** | (0.00452) | 0.0810*** | (0.00453) | 0.0810*** | (0.00452) |
| Upper secondary | 0.057*** | (0.00315) | 0.0578*** | (0.00315) | 0.0577*** | (0.00315) | 0.0579*** | (0.00315) |
| Lower secondary | 0.041*** | (0.00339) | 0.0416*** | (0.00338) | 0.0419*** | (0.00339) | 0.0417*** | (0.00338) |
| female | 0.006*** | (0.00163) | 0.0061*** | (0.00162) | 0.0062*** | (0.00163) | 0.0061*** | (0.00162) |
| Living in urban area | 0.018*** | (0.00196) | 0.0181*** | (0.00195) | 0.0181*** | (0.00196) | 0.0182*** | (0.00195) |
| Income difficulty | -0.048*** | (0.00211) | -0.0489*** | (0.00210) | -0.0486*** | (0.00211) | -0.0490*** | (0.00210) |
| minority | 0.039*** | (0.00291) | 0.0390*** | (0.00290) | 0.0391*** | (0.00291) | 0.0390*** | (0.00290) |
| non citizen | 0.010 | (0.0149) | 0.0102 | (0.0149) | 0.0104 | (0.0149) | 0.0100 | (0.0149) |
| change in share foreign-born | -0.007** | (0.00233) | -0.0068** | (0.00233) | | | | |
| avg regional level foreign-born | 0.002** | (0.0007) | 0.0020*** | (0.00055) | | | | |
| change in share European foreign-born | | | | | 0.00676 | (0.00352) | 0.00665 | (0.00353) |
| avg regional level European foreign-born | | | | | 0.00407** | (0.00133) | 0.0048*** | (0.00128) |
| change in share non-European foreign-born | | | | | -0.0184*** | (0.00306) | -0.0172*** | (0.00307) |
| avg regional level non-European foreign-born | | | | | 0.000726 | (0.00138) | -0.000275 | (0.00118) |
| regional gdp per capita | 8.10e-07 | (4.73e-07) | | | 7.34e-07 | (4.71e-07) | | |
| regional unemployment | -0.00156 | (0.00095) | | | -0.00184 | (0.000954) | | |
| regional density | -7.42e-06 | (4.53e-06) | | | -7.80e-06 | (4.63e-06) | | |
| *Random effects* | | | | | | | | |

| | β | S.E. | β | S.E. | β | S.E. | β | S.E. |
|---|---|---|---|---|---|---|---|---|
| country | 0.005 | (0.001) | 0.005 | (0.001) | 0.005 | (0.002) | 0.0057 | (0.001) |
| region | 0.0002 | (0.001) | 0.0003 | (8.23e-06) | 0.003 | (0.0001) | 0.0004 | (0.0001) |
| Region-year | 0.016 | (0.001) | 0.001 | (0.0001) | 0.0014 | (0.0001) | 0.0014 | (0.0001) |
| Individual | 0.057 | (0.0002) | 0.057 | (0.0004) | 0.0578 | (0.0002) | 0.0578 | (0.0002) |
| Intercept | 0.562*** | (0.032) | 0.560*** | (0.028) | 0.562*** | (0.0334) | 0.552*** | (0.029) |
| N respondents | 89,378 | | 90,036 | | 89,378 | | 90,036 | |
| N countries | 21 | | 21 | | 21 | | 21 | |
| N regions | 182 | | 183 | | 182 | | 183 | |
| N region-years | 566 | | 574 | | 566 | | 574 | |

All full sample models control for Western/Eastern Europe-year dummy variables. *** p<0.001, ** p<0.01, * p<0.05

of non-European immigrants at the regional level is associated with respectively an 11 % and 19 % decrease in natives' opinion about the contribution of immigrants and support for immigration. Moreover, we find no significant negative correlation between the arrival of European immigrants and natives' attitudes. Instead, these coefficients – which are statistically significant at the 10% level - point towards a positive relationship. Likewise, the coefficients of the *avg* variable suggest that views about immigration are significantly more positive in regions that host a higher share of EU immigrants.

These results suggest that the negative association between changes in foreign-born immigration and attitudes is entirely driven by the arrival of immigrants from outside the European Union. It is therefore possible that the negative reactions to immigrants in response to competition from recent foreign arrivals documented in the literature only materialize when those migrants are from a different origin, or ethnically distant from natives, to the extent that origin can be regarded as valid cue for ethnic proximity.

In contrast, the positive association between the historical presence of migrants and public opinion about immigration presented in Figure 1 is driven by the arrival of migrants from within the European Union, which could be interpreted as evidence that the contact hypothesis only has traction when migrants are ethnically closer to natives.

Put together, these findings indicate that the temporal dynamics of attitudes to immigration vary with the origin of immigrants. Only the presence of EU immigrants is significantly correlated with changes in the perception and political preferences of public opinion regarding immigration in the long term (historical presence). Investigating what lies behind this pattern is beyond the scope of our analysis, but further investigation in this direction is necessary.

## 5. Discussion and conclusion

In recent years, European countries have experienced a surge in migration flows and public resentment against immigrants among their domestic population.

This paper proposes a novel empirical design to study how public attitudes to immigration reacted to increased migration pressure across European regions over the past decade. We explore the nature of this relationship beyond cross-region differences and focus our attention on the predictive power of within-region, short-term migration flows. Controlling for important individual cofounders and contextual drivers of attitudes to immigration, we examine how variations in migration pressure correlate with public opinion towards natives' support for immigration and their views of immigrants' contribution to their destination country. Our analysis is informed by theories of economic competition between natives and immigrants, cultural backlash, and the contact hypothesis, which are all part of the canonical framework developed by social scientists to study public opinion towards immigration.

At the aggregate level, across all European regions contained in the sample, our findings indicate that immigration is positively correlated with natives' attitudes regarding migration policy and opinions about immigrants' contribution, in line with the contact hypothesis. Further analysis concerning the composition of migration flows is consistent with theories of economic and ethnic competition. In particular, we find that inflows of EU-origin are positively correlated with natives' attitudes.

We must stress that our empirical design does not permit us to make causal predictions about the role played by immigrant inflows on public opinion and predict with certainty the risks of tensions that may arise from increased migration pressure. Indeed, exploring the causal relationship between migration

flows and attitudes towards immigration would require accounting for endogeneity biases such as the self-selection of migrants into areas with better economic conditions or where natives happen to be less hostile to immigrants. For instance, European immigrants are likely to face fewer constraints in the choice of destination when migrating because of their greater freedom of movement. To the extent that further immigration tends to polarize attitudes to immigration, whereby regions with more positive (resp. negative) opinions tend to become more positive (resp. negative) with the arrival of new immigrants, the correlation found in our study could thus be artificially inflated.

Finally, it is possible that natives with the most negative attitudes simply move out of regions receiving more immigrants, and that our results are driven by a crowding-out effect (see Dustmann & Preston, 2001).

That said, we believe our analysis informs the current political debate about the consequences of short-term migration flows on public attitudes to immigration in several ways. First, our study of regional migration flows furthers our understanding of how European public opinion may respond to local migration and can help policymakers and practitioners anticipate potential risks of tensions as a result of future migration. That said, further research remains necessary to investigate whether migration pressure has a direct and causal impact on attitudes to immigration.

## Ethical approval and consent

Ethical approval and consent were not required.

## Data availability

### Underlying data

ESS Data used in this study are extracted from round 4, 5, 6, 7 and 8 of the European social survey. This data is publicly available from the European Social Survey (ESS) data portal: https://doi.org/10.21338/NSD-ESS-CUMULATIVE.

Access to microdata from the European Union Labour Force Survey (EU-LFS) is granted for legitimate research purposes only. To protect the anonymity of respondents (persons, organisations), the access to microdata is restricted and requires filing a research proposal to the Eurostat Microdata Access Team. A guide for how to apply for dataset access is available at:

https://ec.europa.eu/eurostat/documents/203647/771732/How_to_apply_for_microdata_access.pdf

Data from the OECD is publicly available from the following link: https://stats.oecd.org/

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# Open Peer Review

## Current Peer Review Status: ✔ ✔ ? ?

**Version 1**

Reviewer Report 28 June 2023

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?

**Alexander Schmidt-Catran**
Professor of Sociology, Goethe-University, Frankfurt, Germany

This is an interesting article that aims to answer an important research question. The authors analyze the impact of immigration on public opinion towards immigrants and immigration policies. The paper has the potential to make an important contribution. However, I believe the article needs further revisions, which I detail below. In my review, I have put the focus on the empirical analysis.

- The ESS provides regional identifiers which typically correspond to the NUTS regions; but the problem is that this variable is not at the same NUTS-level in each country. Some countries provide only NUTS-1 information and others provide information down to the NUTS-2 level. For example, Germany provides only NUTS-1 levels, which correspond to the federal states; Belgium, on the other hand, provides NUTS-2-levels. It looks like the authors simply used what was given by the ESS regional identifiers and did not consider the imbalance that this choice introduced into the size of regions in their data. For Germany there are 16 regions and for Belgium there are 11. Belgium has less inhabitants than Germany's federal state NRW (about 12 vs. 18 million) and is about the same size. Yet, within Belgium the authors differentiate between 11 regions, while they do not differentiate within NRW. Why does that matter? It has been argued that there are different mechanisms at work, depending on the level at which immigration is investigated. Within narrow regional entities (e.g. Neighborhoods) contact theory may play an important role, while national immigration numbers may invoke different reactions. In an ideal design, there would be a comparable definition of "a region", in terms of size and population. With the ESS that means to go with NUTS-1 units, as it is the common denominator. If the authors decided against this, they should at least explain this decision and be transparent about its implications.

- Related to this point: In footnote 5 the authors claim to use NUTS-2-levels for their definition of regions. This is not correct and the statement should be adjusted (see discussion above).

- Why is there no data for 2012 and 2016 (Table 1)? The text explicitly says that the data is biannual.

- As for the dependent variable on policies: The authors constructed a simple sum index here. It may be asked whether the three items really measure the same construct, which is the underlying assumption if they are merged into a sum index. I would recommend to test this assumption by means of (confirmatory) factor analysis or at least some simple indicator like Cronbach's alpha. Using confirmatory factor analysis would also allow to test for measurement invariance between countries and time points. Having comparable measures over time (and to a lesser extend between countries) is very important for the modelling approach. The same argument can be made for the index derived from the "contribution" variables. I do realize that the authors cite other researchers who treat these variables in the same way. This can be an alternative to a detailed analysis of the factor structure and the invariance issue; but in that case I would recommend to specifically cite sources that have tested or at least discussed such issues. For example, Billiet, Meuleman, and De Witte (2014) or Kuntz, Davidov, and Semyonov (2017) for the three items on "contributions". I am not aware of a study performing similar analysis with the three items on policies, but there is likely something out there.

- The authors need to explain better how they constructed the share of immigrants variables (S). From reading just the description in section 3.2 it sounds as if the authors distinguish between 8 different immigrant groups (a cross classification of origin, skill level and sex). In Table 2 it becomes obvious that they differentiate only between two groups (EU vs. non-EU immigrants).

- I am not sure that I understand how exactly the averaging of the variable S happens. It reads as if it is simply the average across time, separately for each group. But later it sounds like it is the average across all groups and time. In Table 2 both variables appear. It may be a good idea to tell readers already here which variables will be used in which combinations.

- Table 2: Is this table based on the sample before listwise deletion or did the author not do lwd? All estimates should be based on the same number of cases and the authors need to state how they treat missing values.

- I do not think it is a good to choice to call the demeaned versions of the region-level variables "change in...". A variable measuring change is typically understood as the change from t to t+1, which is not identical to what is measured here. The authors use a group-mean-centering approach.

- Section 3.3: Why not show the group-mean centering (demeaning) in the formula of the model. Some people may know what demeaning means in this context, but it would be more transparent to put the transformation of the variable into the formula.

- Using the indices itrc instead of ijkc may be a better choice, as it is a bit more self-explanatory: i for individuals, t for time, r for region and c for country. However, this is simply a recommendation and not necessary.

- f_c should be u_c as it is a convention to use u for the random intercepts. I have never seen a f there. That would also imply to name v_jkc u_jkc. So all error terms (except e) would have the symbol u and only the indices would indicate the level.

- What is meant by the variable Z_c, which the authors call "Western/Eastern country-year binary combinations. Does it distinguish only between East and West, i.e. is this a dummy variable? Later the authors call this variable "a Western/Eastern country-year dummy"? But this is still not enough information to understand what exactly happens here. Is it a linear time trend interacted with a East-West-dummy? Or a set of year dummies interacted with a binary East-West indicator? I cannot find any of such variables in the regression estimates. Please clarify!

- The author state that the fixed intercept (beta_0) is the mean of Y. This is only true in an empty model or it implies that all variables must be centered. Is that the case? It is not stated anywhere. The variables in Table 2 are certainly not centered. So, if there is an additional transformation happening before the regression analysis, the authors need to tell readers.

- The authors have a number of control variables (GDP, unemployment rate). In section 3.3 they argue that these are not of primary interest and are therefore only included as averages across time and not as group-mean centered versions. I am not sure about this argument. If these are important control variables, why is it justified to not control the within-effects for these variables? I would like to see at least a robustness check which includes these variables. Also, at the beginning of section 4, it reads as if the demeaned versions of these variables are actually included. Table 4 again looks like these variables are not in the models. Please clarify!

- Tables 3, 4 and 5 should indicate the reference categories of the categorical variables.

- Table 3, 4 and 5: the ordering of rows giving the Ns maybe should follow same order as the rows with the random effects.

- Why are the results from the null model included in section 3.3 (Empirical strategy) instead of section 4 (Results)?

- After Table 4 the authors name two studies which report similar findings (a negative effect of within-variation, i.e. short term variation, on positive attitudes towards immigrants). I think it would be fair to also cite studies which find the opposite. For example, in a recent study Christian Czymara and I found the opposite: A positive effect of within-changes on attitudes (Schmidt-Catran & Czymara: Political elite discourses polarize attitudes toward immigration along ideological lines. A comparative longitudinal analysis of Europe in the twenty-first century). Some more studies, which show ambiguous effects, are cited there.

**Is the work clearly and accurately presented and does it engage with the current literature?**
Yes

**Is the study design appropriate and is the work technically sound?**
Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**

Partly

**Are all the source data and materials underlying the results available?**
Partly

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Are the conclusions drawn adequately supported by the results?**
Yes

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** Multilevel modelling, public opinion towards immigrants, welfare states, immigrations, redistribution

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Reviewer Report 16 June 2023

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?

**Francisco Rowe**
Department of Geography and Planning, University of Liverpool, Liverpool, England, UK

The paper is well structured, and I think It makes a contribution to an area of much needed attention; that is, understanding geographic variations in attitudes towards immigration. There is a consolidated body of evidence of geographic variations in relation to immigration sentiment. Yet, limited progress has been made on advancing empirical research and conceptual thinking in understanding how this occurs - how we find such wide variations within a country. Hence, I think the paper is a welcome contribution to the literature on attitudes toward immigration, but I have some major concerns regarding the analysis and conceptual ideas being tested.

1. I would like to raise questions about the geographical scale of the analysis. I agree on the importance of considering and understanding geographical variations in attitudes towards migration. I think that is a valuable endeavour, but I am not persuaded about the geographic scale of analysis. What is the rationale of the analysis to focus on a regional scale? What is the conceptual link between immigration sentiment and the regional net rate of foreign-born population? Most migration theories would consider the proximate environments where people live (i.e. neighbourhoods, cities, towns) to be the relevant unit of analysis as local contextual

factors operate at this level. It is at this level at which such factors are argued to operate influencing individual perceptions, and at which face-to-face interactions between migrants and the local born occur. The geographic unit used in the analysis seems to have been a function of data availability (which is fine), but is it the appropriate geography for analysis? What are the hypotheses that are and can be tested at the level of geography used in the analysis?

2. Definition of the gap in the literature. I think the gap in the literature that the paper is seeking to fill should be more clearly defined. The paper seeks to differentiate itself from existing literature by focusing on how short-term changes in the share of migrant population may influence public opinion on immigration and developing an argument that there is limited empirical research examining this changes at a regional level. While I agree on the lack of research seeking to understand public opinion towards migration at local scales and their temporal changes, the paper should explicitly state why analysing this is conceptually relevant.

3. The study emphasises the importance of considering the temporal dynamics of attitudes towards immigration, but it does not consider research based on digital footprint data capturing how immigration sentiment is highly responsive to contemporary events. Given that this is one of the main arguments in the conclusion of the paper, I feel this body of work should be appropriately considered in the introduction, background, and discussion and conclusion sections. Key pieces that I should should be included are: the work by Rowe *et al* on immigration sentiment and recent reports by the IOM and JRC - see relevant references below. I see this work being particularly relevant because news and representations about migrants are likely to be more influential on shaping public opinion on immigration than numbers of migrants per se. But only the latter is the focus of the paper.

- Rowe, F., Mahony, M., Graells-Garrido, E., Rango, M. and Sievers, N., 2021. Using Twitter to track immigration sentiment during early stages of the COVID-19 pandemic. Data & Policy, 3, p.e36[1].

- Rowe, F., Mahony, M., Graells-Garrido, E., Rango, M. and Sievers, N., 2021. Using Twitter Data to Monitor Immigration Sentiment. Harnessing Data Innovation for Migration Policy: A Handbook for Practitioners. International Organization for Migration (IOM). IOM, Geneva. pp. 104-119[2].

- Freire-Vidal, Y., Graells-Garrido, E. and Rowe, F., 2021. A framework to understand attitudes towards immigration through Twitter. Applied Sciences, 11(20), p.9689[3].

- International Organization for Migration (IOM), 2023. Harnessing Data Innovation for Migration Policy: A Handbook for Practitioners. IOM, Geneva[4].

- Bosco, C., Grubanov-Boskovic, S., Iacus, S., Minora, U., Sermi, F. and Spyratos, S., Data Innovation in Demography, Migration and Human Mobility, EUR 30907 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46702-1, doi:10.2760/958409, JRC127369[5].

4. The introduction describes related work but it is unclear how the work discussed is related to the current paper. Elaboration on this is needed, specifically describe how the current paper fits within the broader literature.

5. The background is relatively short to other sections. Particularly important would be to include a

more comprehensive discussion on the relationship between attitude formation and the size and speed of local immigrant communities. I feel that the current discussion should be expanded.

6. Treatment of time. The methodology does not explicitly describe how time is being modelled. Are independent variables lagged? Or are they on the same time period as the dependent variable? Please explain how this is done and why, as well as any issues readers should be aware with the approach taken.

7. Related to the previous point, a variable labelled “average immigration variable” which is constructed using all years as the denominator i.e. 2012-16 or 18. Does this mean sense if the dependent variable is measured at different points in time. For example, how do we conceptually explain the relationship between a dependent variable measured in 2010 and an independent variable x measured in 2018?

8. The paper describes the application of a nested model using 4 levels. However, some of the levels used are not mutually exclusive pointing to a potential model specification issues. A cross-classified specification seems more appropriate in this case. Please amend the model specification appropriately i.e. please justify your model specification, or amend the model.

9. The type of model estimated is not stated in the description of the methodology. Was it a linear or a logistic regression? The fact that the dependent variable is bounded to 0 and 1 imposes some challenges. Please describe the model estimated and how you answer the underlining challenges of modelling a variable bounded between 0 and 1. Does the model used produce predicted values of the dependent variable beyond this range?

10. P11. Discusses the results from the multilevel model reported in Table 3. The paragraph on the second column discusses the variability in the dependent variable explained by the model at various levels. I was unable to reproduce the results discussed with the data provided in Table 3. How these results were produced should be explained in the text so readers are able to replicate the reported numbers.

11. I could not find details about the software code used and how readers would go about processing the data to replicate the analysis. Would encourage authors to share their code through open repositories so others can replicate the analysis and reuse it on their own data.

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**Is the work clearly and accurately presented and does it engage with the current literature?**
Partly

**Is the study design appropriate and is the work technically sound?**
Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**
No

**Are all the source data and materials underlying the results available?**
Partly

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Are the conclusions drawn adequately supported by the results?**
Partly

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** Migration, human mobility, geographic data science, spatial inequality

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Reviewer Report 12 June 2023

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**Cengiz Erisen**
Department of Political Science and International Relations, Yeditepe University, Istanbul, Turkey

I really enjoyed reading the article. The authors attempt to test the connection between attitudes toward migration and regional influences (i.e., foreign-born share in the region and change in that indicator). The authors tease out the differences between European and non-European foreign-born migrant share in the region and find that Europeans are sensitive to the origin of the migrants. Using the large-n ESS data and random effects multi-level analysis, authors provide an observational test of their main expectation. All in all, there is much to like in this work, and I support the indexing of this work after some minor revisions.

First, the authors repeatedly refer to the concept of “regional differences” at the front end of the

paper. However, this is unclear because they use different wording at each time. First, they refer to “migration flows” on page 3, and in the same paragraph, they refer to the “arrival of migrants.” Later, on page 4, they refer to “immigrants’ historical presence” and then use “migration inflows.” These all refer to the same concept of “contextual migrant effects in the region,” but we see differing versions. So, I recommend making this clear in this regard.

Second, regarding the empirical analysis, I have a few comments: 1. Table 1 is unnecessary and can be carried over to the appendix; 2. Tables 3 and 4 are also unnecessary. The main results of these tables are presented in figures, which very nicely present the main effects; 3. In the three tables reporting the primary empirical analysis, almost every individual-level indicator is significant. As the authors focus on the regional effects, they omit the individual-level effects. With that, how can we make sense of a model where all of the individual-level indicators are significant on the DV, and yet the regional effects matter the most? These individual-level indicators require discussion and connecting with the overall empirical approach.

Third, the authors suggest that according to the contact hypothesis, Europeans favor foreign-born from Europe migrants (e.g., Ukrainians), as opposed to foreign-born outside Europe (e.g., Syrians). I don’t think that we can separate the expectations of the contact hypothesis on the basis of foreign-born Europe vs. non-Europe. For the contact hypothesis to work, specific requirements must be fulfilled (regardless of the migrant's birth location), which we don’t see being tested here. What the authors find here is closer to social identity theory (SIT) preferences, whereby the host country members favor in-group migrants instead of out-group migrants. The authors can find more discussion about this subject in Erisen & Kentmen-Cin (2017)[1] and Kentmen-Cin and Erisen (2017)[2]. So, I recommend that the authors reconsider their inferences and relate their argument to the relevant literature.

Minor issue: authors use too many self-pronouns and third-person pronouns for the authors to whose work they refer. Referring to the authors by name or calling them “the author(s)” would read better.

Again, I enjoyed reading this manuscript and support its indexing after minor revisions. I believe that the work will make a fine contribution about the regional/contextual effects of migrants in individual-level preferences on migration policies.

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2. Kentmen-Cin C, Erisen C: Anti-immigration attitudes and the opposition to European integration: A critical assessment. *European Union Politics*. 2017; **18** (1): 3-25 Publisher Full Text

**Is the work clearly and accurately presented and does it engage with the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**Are all the source data and materials underlying the results available?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Yes

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** Comparative Political Behavior, Political Psychology, Public Opinion research

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Reviewer Report 24 May 2023

https://doi.org/10.21956/openreseurope.16952.r31419

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**Linda Basile**
Department of Social, Political and Cognitive Sciences, University of Siena, Siena, Italy

The article explores the impact of region-level dynamics on individual attitudes toward immigration. In particular, the authors focus on both the short and long-term dynamics of migration at the regional level. I appreciate the choice to focus on the regional level, which is a rather under looked perspective for analyses of public preferences and that is why I support this submission.

Nonetheless, I would like to advance a few comments that might help the authors to improve the manuscript. I mention them not in order of relevance, but as they appear in the manuscript.

1. The research fully engages in a complete, yet concise review of the main literature, which can be easily summarised in the three key theories of economic competition, cultural threat, and contact theory. Indeed, this theoretical background fully justifies the results. However, the authors do not present hypotheses based on theories. Advancing hypotheses would help better identify the dynamics that could explain the different effects of short and long-term migration. In particular, economic/cultural theory would explain the negative attitudes following a short-term increase in migration, whilst the contact theory would explain the effect of long-term migration.

2. At p.5 I did not understand very well why the authors restrict the sample to natives rather than

including the whole sample and probably controlling for the effect of being native or not. The choice can be reasonable but need to be better justified. Also, they should report the share of non-natives that were included in the original sample.

3. On p. 7 the authors mention data from both EULFS and OECD, but in the end, they refer only to EULFS on p.8, please clarify on the use of OECD data.

4. The description of the main independent variable on p. 8 refers to migrants' skills in the formula used to calculate the share of migrants, yet it is not clear how this data is calculated and whether it is used in the analyses (it seems not).

5. I would suggest removing Table 1 (it is enough to mention in the paper the average number of respondents per region, plus the regions with lower and higher numbers of respondents); rather, I would include a table or some nice descriptives about the regional distribution of migrants, both from and outside the EU. This could also be done through a map that could help better visualise regional differences in patterns of migration (indeed, I suspect that these variations tend to cluster by countries, but there might be differences, for example, between some coastal regions in southern countries and others more internal).

6. The empty models and the ICC (I think the percentages reported on p.11 refer to it, and this should be clarified) confirm a limited impact of regional-level effect, whilst attitudes towards migration tend to hinge upon individual characteristics. This is in line with some research I am also conducting on similar topics. The authors are convincing, in my opinion, in their explanation of the need to keep a multilevel model. However, I would suggest further checking analyses with pooled OLS, for instance, while controlling for year and country.

7. I found tables 4 and 5 quite confusing. From the description of the text, table 4 should refer to attitudes towards both dependent variables (policy and contribution). However, the caption refers just to "contribution". Same with Table 5. I think the description of the text is correct, so the authors should put clear captions and specify in the models which of them refers to one dependent variable and which to the other.

8. The authors refer to long-term dynamics as "historical" immigration. However, this label sounds a little bit misleading to me, since the variable calculates immigration over the far decade, which includes the 2015 period when the EU experienced a surge in migration flows. I would say that this variable (the average share) rather measures a consolidated, or simply long-term immigration. This way, also the policy impact of the research would gain more value because it would support the expectations of the contact theory concerning the positive effects of migrants' integration. However, on this last point see also comment 9.

9. The authors correctly point out that even the contact theory "works" better with migrants from the EU. Nonetheless, my interpretation of Figure 2 is that long-term migration from outside the EU has at least non-negative effects on attitudes. I would stress this aspect in the comments, too, if my interpretation is correct.

**Is the work clearly and accurately presented and does it engage with the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**
Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**
Yes

**Are all the source data and materials underlying the results available?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Yes

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** Survey research, with a focus on public attitudes towards immigration, solidarity, and sovereignism; Quantitative methods (I apply multilevel modelling, although not very frequently); Territorial inequalities and regional-level differences.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**