Residential Segregation in Europe: Immigration and Spatial Integration

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Introduction

Residential segregation is a key social indicator of spatial assimilation and social inclusion among immigrant minority populations (Alba and Foner 2015; Kazepov 2014; Phillips 2010). The unprecedented tidal wave of new immigration throughout much of Europe, resulting both from the free movement of people within the European Union and from new arrivals from other parts of the global South (including former colonies), has raised the specter of cultural fragmentation and disunity, inter-ethnic conflict, and growing antipathy towards immigrants (Koopmans 2013). Coleman (2010) refers to the unprecedented growth of ethnic minorities in much of Europe as evidence of a Third Demographic Transition, where rapid immigration has occurred in tandem with below-replacement fertility among native-born populations. Whether new ethnic minority populations are now integrating into the social and economic fabric of European society is far from clear (Cassiers and Kesteloot 2012; Malmberg, Andersson and Östh 2013; Semyonov and Glikman 2009). Indeed, now is a propitious time to reevaluate recent patterns of residential segregation among immigrant populations and the prospect for social and spatial integration across Europe, now and in the future.

Spatial integration reflects and reinforces social, cultural, and economic integration and incorporation (Alba and Foner 2015). Unfortunately, comparative demographic analyses of residential segregation in Europe are surprisingly rare. Country-to-country differences in data collection and measurement, including alternative definitions to ethnic and national identification, different indicators of immigrant status (e.g., first and second generation status, or citizenship), and widely divergent geographic scales of analyses, make straightforward

comparisons of immigrant residential segregation difficult (Lichter, Parisi, and DeValk 2016). Previous segregation studies, for the most part, have centered on a single city (Bråmå 2008; Fahey and Fanning 2010; Maloutas 2007), on several cities within a single country (Marcińczak, Musterd and Stępniak 2012; Sager 2012; Shon and Verdugo 2015), or on a small number of cities in countries in close proximity to each other or share cultural or economic commonalities (Arbaci 2007; Skifter Andersen, Andersson, Wessel and Vilkama 2016). Other studies have provided general summaries of international city-specific studies of segregation (Iceland 2015; Massey 2016; Musterd 2005). The current literature is often inchoate and difficult to neatly summarize in light of the current widespread upheaval in the spatial distribution of different population groups, disparate contexts of immigrant reception, and varying immigrant integration policies (e.g., acquisition of citizenship or receptivity to asylum seekers) across the continent.

We focus our attention here on arguably the most important axes of minority spatial differentiation in Europe: Nativity status. The Population Division of the United Nations has documented the arrival between 2010 and 2015 of 4.1 million net immigrants into Europe overall, offsetting net emigration from Southern Europe (United Nations 2016; see Bijak, Kicinger, and Kupiszewski 2013). Immigration numbers have swelled, even in parts of Eastern Europe, as a result of political unrest, sectarian violence, and civil war in Syria, Eritrea, Iraq, and Afghanistan, among other developing countries. Growing refugee and immigrant populations are fundamentally linked to geographical isolation and segregation, which raises new questions about societal cohesion or fragmentation. Anti-immigrant sentiment is on the rise throughout Europe. European immigrants are increasingly heterogeneous—and "hard to assimilate" in some cases—on a number of salient dimensions: Socioeconomic status (i.e., income, education, and occupational skills); religion (e.g., Muslim or Christian), race and ethnicity (i.e., the racialization

of immigrant minorities), and national origin (e.g., non-Western populations originating from Asia, Africa, or other parts of the so-called Global South). Current and past immigration and growing cultural and ethnic diversity are highly interrelated (Sáenz and Douglas 2015). Placing the spotlight on Europe's foreign-born population—originating both from within and from outside of Europe—serves to identify (in a uniform way) the so-called "other" and uncovers emerging patterns of integration or spatial separation from the majority populations across European societies.

To summarize, our fundamental objective is to document patterns of immigrant-native residential segregation in Europe, where our analyses focus on the changing distribution of immigrant patterns in 26 countries (in the European Union), 1396 local areal units (so-called NUTS-3), which in turn are nested within larger economic and cultural sub-regions (i.e., NUTS-2).[5] First, we provide up-to-date comparative estimates of residential concentration and segregation in Europe during the current period of growing ethnic diversity. Our estimates of segregation (i.e., the index of dissimilarity) are calculated from data drawn from Eurostat. Second, we provide evidence of substantial geographic variation in immigrant segregation throughout Europe, which is driven, at least in part, by differences in the uneven spatial distribution of different national origin groups. Indeed, residential segregation is now being transformed in unpredictable ways by new immigration from around the world. Third, we fit several descriptive multivariate models that include key economic (i.e., GDP per capita), social (i.e., education), and ecological (i.e., urbanization) predictors of segregation within and between European countries. Our fundamental goal is to provide a timely and comprehensive set of comparative estimates of immigrant segregation across Europe.

The Recent History of European Settlement Patterns of Immigrants

Beginning with the Schengen Agreement in 1985, the free movement of Europeans throughout the continent has been made easier by eliminating or easing border checks and visa requirements while still imposing controls on movement into and out of much of Europe itself (i.e., the so-called Schengen Area). Incipient native depopulation and natural decrease, in turn, have created labor shortages and new demands for immigrant workers. Transnational migration also has accelerated globally. The European Union has been reshaped by the unprecedented South-to-North movement of workers benefiting from guest worker programs (e.g., the Turks in Germany or Moroccans in the Netherlands) and the rapid growth of new immigrant groups from former European colonies. For example, France (especially in the Paris region) is now home to immigrants from outside of Europe, often from ex-colonies in Northern Africa, West Africa, and Indochina. Since the late 1990s, net immigration in England has spiked upward, with large influxes of low-skill workers from Eastern Europe (e.g., Poland, Bulgaria, and Romania) and of noncitizens from outside the EU. Europe has been on the frontline of refugee and displaced populations outside of Europe. Some estimates indicated that Germany, for example, was on pace to accept more than 1 million new Syrian refugees in 2015 alone.

A recently-released report by Eurostat indicates that 3.8 million people immigrated to one of the EU-28 Member States during 2014 (Eurostat 2016). Of these, 1.6 million were citizens of non-member countries and another 1.3 million people were citizens from of a different EU member state. Nearly 1 million immigrants returned to a country in which they were citizens. Only about 12,000 were so-called stateless people, presumably asylum seekers or refugees. Among new immigrants moving from outside member states, most originated from outside of Europe rather than from non-member states in Europe. Germany received the largest number of

new immigrants (885,000), followed by the United Kingdom (632.000) and France (340). Only slightly more than one-half (i.e., 15 of the 28 EU countries) experienced more in- than out-migration. Out-migration was highest in Spain (400,000), which was offset by substantial in-migration (306,000). Bulgaria, Ireland, Greece, Spain, Croatia, Cyprus, Poland, Portugal, Romania, Slovenia and the three Baltic Member States also had more emigrants in 2014 than immigrants. Many high-immigration countries—such as Germany or France—also had large numbers of outmigration (reflecting circular and onward migration), but at levels insufficient to make them a net exporter of population. These figures also clearly highlight population shifts away from Southern and Eastern Europe to the more economically prosperous European countries in the North and West (Eurostat 2016).

Of course, highly-aggregated statistics often mask evidence on the changing spatial distribution of all immigrants living in Europe. At the beginning of 2015, 34.3 million immigrants were born outside of EU's member state countries, of which the majority—18.5 million persons or 54 percent—were born in a different member state. They represents internal migrants within the European Union, much as inter-state movers represents internal migration in the United States. In only five countries (Hungary, Ireland, Luxembourg, Slovakia and Cyprus) the majority of the foreign-born population arrive from outside EU member states. The immigrant population from countries that are not members of the EU28 (Iceland, Lichtenstein, Norway, and Switzerland) also mostly drew its foreign-born populations from EU28 countries. The foreign-born population of Switzerland, for example, represented 27.4 percent of its overall population, among the highest in Europe, and most of these (16.6 percent overall) come from EU28 countries (Eurostat 2016). The small country of Lichtenstein has a majority-immigrant population (i.e., 63 percent), of which the majority originate from outside of Europe.

The growing diversity of immigration across Europe is clearly reflected in country-to-country differences in the absolute and relative sizes of immigrant populations, the national origin of immigrants from EU28 or other European countries, the uneven regional distribution of immigrants across Europe (i.e., North/West vs. South/East), and, lastly, the motivations of different immigrant populations (i.e., refugees or asylum seekers vs. economic migrants seeking a better life). But such diversity also is expressed differently *within* each European country, in the uneven spatial distribution of immigrants across cities and the countryside, between economic core and periphery regions, and between established immigrant gateways and new or emerging immigrant destinations. The typical narrowly-framed conceptualizations and analyses of immigrant-native segregation across neighborhoods within the largest or richest cities or metropolitan regions in Europe arguably hide newly-emerging patterns of so-called macro-segregation (Lee et al. 2008; Lichter, Parisi, and Taquino 2015). To distinguish it from neighborhood or micro-segregation, macro-segregation occurs at a different or higher scale of geography—between places (i.e., cities, suburbs, and rural communities) and economic regions within nation states. Macro-segregation can also be measured by outward radiating distances from ego-neighborhoods (e.g., Lee et al. 2008,) or, more recently, by administrative or legal units (e.g., municipalities) that can impose restrictions on immigrant in-migration or on factors, such as income or housing (e.g., the availability of affordable or social housing), that are over-represented among immigrant populations (Lichter et al. 2015).

Recent studies of metropolitan area segregation in the United States is illustrative of this new genre of research on macro patterns of spatial differentiation among different economic or immigrant populations (Fowler et al. 2016; Lichter et al. 2016; Parisi, Lichter, and Taquino 2012). In summarizing global patterns of segregation, Massey (2016) has argued that recent

residential segregation levels have converged between the United States and Europe—decreasing in the United States and increasing throughout much of Europe. But blanket generalizations of current patterns require a cautious reading of the evidence, especially if segregation is increasingly expressed in a different form—at different spatial scales (e.g., macro- rather than micro-segregation). In the United States, a recent study by Parisi et al. (2012) showed that nearly one-half of all black-white segregation nationally was located in differences *between* higher-level spatial units (i.e., regions, counties, and places) rather than *within* conventional spatial units (e.g., neighborhood differences within places). Moreover, white-nonwhite macro-segregation has seemingly increased over the past two decades as a percentage of all metropolitan segregation, at least as measured using conventional methods of decomposition based on the Theil index (Lichter et al. 2015).

Comparable analyses of macro-segregation are generally unavailable across European countries, although regional analyses of segregation are available in some countries, such as Italy and Germany, which indicate that non-native groups are distributed unevenly. And these emerging patterns of macro-segregation are played out in differences in receptivity to immigration. Among Nordic countries, for example, Denmark has a highly restrictive immigration policies, expressing growing antipathy towards immigrants, especially refugees seeking asylum. This contrasts with Sweden, or even Norway, where the shares of immigrants—including immigrants from the Middle East—have ticked upward over the past decade or so. These patterns represent segregation of a different kind—between countries rather than the common-place emphasis on neighborhood-to-neighborhood segregation within heavily populated metropolitan regions.

Of course, the potential demographic, economic, and cultural impacts of uneven settlement patterns from country to country in Europe are exacerbated by the uneven distribution of immigrants within countries—to particular cities, suburb or periphery communities, and rural areas. Segregation of different nationality groups across multiplicities is commonplace. For example, in France, the Muslim population is distributed unevenly over different metropolitan regions, with comparatively high percentages of Muslims (mostly but not exclusively foreign-born) in Paris and Marseille (Pew Research Center 2016). Indeed, Paris has the largest Muslim population anywhere in Europe, but Muslims are not evenly distributed among the various suburban municipalities that make up the broader Paris metropolitan region (e.g., Seine-Saint-Denis). This argues for a broader geographic perspective, one that acknowledges immigrant segregation at different spatial scales.

In this paper, we start with a fundamental working assumption: Residential segregation—the uneven distribution of populations across geographic space—represents a useful summary indicator of immigrant assimilation or integration. Segregation from the native-born population is linked to social, cultural, and economic isolation and inequality, which implies fewer opportunities to attend good schools, find employment, or cultivate informal and formal social networks with the majority population. Spatial assimilation is regarded as a necessary (but hardly sufficient) condition for immigrant integration more generally. In this paper, we provide baseline estimates of segregation across 26 European countries, and identify key indicators that account for disparities in immigrant integration at a time of massive new immigration in Europe and growing concerns about societal cohesion, cultural solidarity, and shared values among native populations (and the politicians that represent them).

Data and Geography

Data come from multiple sources. We use World Bank National Accounting Data (2016) to examine the trends in migration flow in Europe from 1960 to 2015. Next, we used Eurostat 2011 census data (Eurostat 2015) to examine the level of segregation between natives and immigrants. These data are also used to measure socioeconomic conditions at the country and sub-regional levels. We also used data to measure integration policy domains across European countries (MIPEX 2015).

We used a different scale of geography to assess the extent to which immigrants are dispersed between and within European countries. Our analysis is done at three levels of geography. First, we used country boundary to examine trends of migration flow and the extent to which migrants move from gateway countries to new destinations. We use sub-regions within countries to asses the extent to which the original parameters account for variation in the segregation of natives from immigrants. Sub-regions are delineated using Nomenclature of Territorial Units for Statistcs (NUTS) which, according to Johnson et al. (2015:655), take into account "existing geographic and political divisions in each European country to produce standard spatial units that permit cross-national comparisons." For example, in Italy, NUTS2 perfectly delineates the 21 regions. Each region has its own political and economic environment that can favor the integration or the isolation of immigrants across its territory. As such, they make a perfect unit to examine how regional variation might contribute to spatial integration of immigrants.

Finally, we use local areal units as the accounting units for the concentration or dispersal of immigrants and the computation of segregation of natives from immigrants using the index of dissimilarity (*D*). These local areal units are delineated by NUTS3 that range in size from

150,000 to 800,000 in population. In Italy, for example, they typically delineate provinces or small metropolitan areas. These are the smallest geographic unit available for any spatial analysis. They are perfectly nested within NUTS2, which, in turn, is perfectly nested within country boundary.

Measurement

We calculate segregation indices using the index of dissimilarity (*D*), which is the workhorse of segregation analyses in the United States and Europe. The Index of Dissimilarity (*D*). D_t is defined as

$$D_t = \tfrac{1}{2} \sum_{i=1}^{k} |n_{it} - m_{it}|$$

where n_{it} and m_{it} are the respective percentages of the native and minority populations (e.g., native (or whites) residing in local areal units (NUTS3) *i* at time *t*. This index is based on pair-wise comparisons and varies from 0 (no segregation) to 100 (complete segregation). *D* indicates the percentage of nativesthat would have to move to other local areal units (NUTS3) to achieve parity between natives and minorities in their percentage distributions across all local areal units (NUTS3) within a given country or sub-region within a country. For the purpose of this study, we computed to indices, one for the country as a whole and one for sub-regions within a country.

Several independent variables are used to measure the characteristics of European countries. We used the gross domestic product (GDP) to gauge the size of a country's economy. GDP is measured in U.S> dollars and is converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used. The size of the foreign population was measured as a percentage of the foreign

population to the total population. Country integration policy was measured using the Migrant Integration Policy Index (MIPEX). For the purposes of this study, we used eight sub scores on a scale of 0 to 100 where the higher the score, the higher the level of integration. Specifically, we sued labor market mobility to examine the workers' rights and opportunities for legal migrants. Family reunion for foreign citizens was used to examine the policies that provide rights to migrants to reunite with their families. Education was used to examine the policies that encourage children of immigrants to achieve and develop in school like the children of citizens. Political participation was used to examine the policies that determine the opportunities to legal resident foreign citizens to participate in country's political process. Permanent residence was used to examine the extent to which legal residents have facilitated access to a long-term residence permit. Access to nationality was used to examine the extent to which legal immigrants encouraged to naturalize and are their children born in the country entitled to become full citizens. The anti-discrimination score was used to gauge the effectiveness of legal protection from racial, ethnic, religious, and nationality discrimination in all areas of life. Finally, the health score was used to gauge if the health system responsive to immigrants' needs.

As part of our analysis we also developed sub regional indicators. Population size is measured as the natural log of the population of a place (to account for skew in the size distribution of places). Economic conditions is measured using GDP per capita purchasing power standardized in Euros. Education was measured as percent of people with High School education, some college education and collage and higher education. Industry structure was measured as the percent of individuals employed in the agriculture, manufacturing, construction, service, and government sectors.

Results

Spatial Distribution of European Immigrants

We start by highlighting the changing spatial distribution of the foreign born across the European continent over the 1965 to 2015. Specifically, the country maps in Figure 1 show the changing volumes of foreign-born immigrants in Europe. Massive immigration are vividly illustrated here by shifts in the color of the maps—from light gray (low immigration) to dark gray (high immigration). More importantly, the numerical growth of immigrant populations undoubtedly masks the overall ethnic and cultural transformation of Europe during the recent period of widespread below-replacement fertility of native born populations and the changing national origin of new immigrant groups throughout Europe (Coleman 2005).

This substantive point is clearly illustrated with in the local areal unit (NUTS3) maps of the European and non-European immigrant populations in Europe. Figure 2 distinguishes European local areal units (i.e., NUTS3) by whether the percentage immigrant is below the overall European average of 9.88 percent, more than but less than two times the European average (9.88 to 19.66 percent), and more than 2 times the average (19.66 percent or more). These estimates of the size of the immigrant population are based on available Eurostat data and allows us to visually identify areas of low and high immigrant concentration, both within and between countries in Europe.

At a minimum, these data reveal widespread variation in the geographic distribution of immigrants. The data in Figure 1 clearly show that large parts of Eastern Europe (Poland, Slovakia, Hungary, and Romania) are overwhelmingly native-born, as is the case in much of Finland and the outlying rural areas in Sweden, Norway, and France. But even in low immigration countries, there are clear hotspots of immigrant population concentration. In

Finland, immigrants are concentrated in the southern (e.g., in the Helski metro area) and Western coastline (near Vaasa), and in the Budapest region in Hungry (data not shown), but at levels below the overall European average. Although Italy, France, and the United Kingdom have experienced substantial recent immigration, the spatial distribution of immigrants is much more highly concentrated (e.g., in the London area in the U.K., northern Italy, and Paris, Lyon, and Marseille in France). Immigrants are distributed in high percentages across much of the western parts of Germany, with immigrant "hotspots" similarly distributed broadly across this region of the country. The former East Germany, on the other hand, is mostly comprised of native-born German populations and has experienced substantial net outmigration to Berlin and the regions in the former West Germany where economic opportunities and job growth are greater, and where the native populations is much less virulently anti-immigrant in sentiment.

As shown in Figure 3, spatial differences in immigrant population concentration are much more dramatic when we consider "hot spots" comprised of non-European immigrants. The average percentage of immigrants originating from outside of Europe is only 3.58. Figure 3 reveals the uneven spatial distribution of non-European immigrants at levels below, above, and well above this figure. Non-European immigrants are concentrated in large parts of Ireland and Northern Ireland (from Asia and parts of Africa, especially Nigeria), and Switzerland (and surrounding areas in Germany, France, and Austria). Comparatively large shares of non-Europeans immigrants also are present in Estonia, most often originating from the (former) Soviet Union, and in other densely populations parts of Europe (e.g., Brussels in Belgium, Barcelona and Madrid in Spain). In Germany, immigrant populations from Turkey, Greece, and Russia and other groups (Asians) also are located in above-averages percentages in North Rhine-Westphalia (e.g., Cologne), Baden-Württemberg, and Bavaria (e.g., Munich).

Tables 1 and 2 highlight the fact that these spatial differences in immigrant residential concentration are highly uneven—at the macro level. They also raise questions about how best to summarize these differences—both between and within countries—and to both identify and account for differences of the putative sources (e.g., public policy, economic context, or demographics) of European segregation. We now turn to these issues.

Segregation of Immigrants from Natives

The immigrant-native segregation indices (*D*'s) in Table 1 usefully summarize the uneven spatial distribution of immigration across European countries. The overall mean *D* is 19.7 for all 27 European local areal units, which means that roughly 1-in-5 immigrants would have to move to another local areal unit in their European country to achieve residential parity with natives across all European local areal units. These estimates of immigrant-native segregation vary substantially across Europe. *D*'s range in size from lows in Malta (3.2), Slovakia (8.2) and Ireland (8.2), which suggests that natives and immigrants are spatially integrated at the macro-scale, to highs in Poland (34.3), Belgium (28.6), Estonia (28.6), and Lithuania (28.0).

Of course, much of the new immigration in European countries involves the movement of Europeans who often share economic or cultural advantages that make segregation less pronounced from the native-born population. Indeed, most migrants are Europeans (and visibly white) and have avoided racialization (e.g., Icelanders in the UK), which is often a barrier to integration among immigrant population from outside of Europe, such as Africa, the Middle East, and Asia. Overall estimates of immigrant-native segregation may hide substantial variation in segregation among non-Western immigrants across Europe.

This fact is clearly revealed in columns 2-4 in Table 1, which provides immigrant-native segregation scores for immigrants from non-European countries, from European countries, and from member states of the European Union. In every country except Spain and Sweden, segregation rates from natives are higher among immigrants from non-European countries than from member countries of the European Union. The overall *D* for non-European immigrants was 26.8, or nearly 60 percent higher than *D's* observed immigrants from countries of the EU (17.0). Segregation from natives occupies an intermediate position among all immigrants of European origin (i.e., in and not in the EU). For immigrants who originated from outside of Europe, *D*'s ranged from a low of 7.6 in Malta to a highs of 48.6 in Romania and 45.3 in Hungary, which largely reflects the concentration of immigrants in (a few) large cities.

(Table 1 about here)

Multivariate Analyses of European Segregation

The uneven spatial distribution or segregation of immigrants—both from Europe and outside of Europe—requires explanations that acknowledge the role of country-specific public policies, uneven levels of economic development, and widely disparate demographic conditions, as well as other local economic and demographic conditions that make specific areas of immigration more or less attractive as destinations in each country. This is stated plainly but eloquently by Bolt et al. (2010): "The integration pathway not only depends on the characteristics of migrants themselves, but also on the reactions of the institutions and the population of the receiving society."

As an initial statistical benchmark, we begin by identifying in key correlates of variation in *D*'s across the 27 European countries considered here. This is accomplished by estimating Spearman's rank-order correlation coefficients between *D* and several country-specific indicators

thought to be associated with segregation vis-à-vis spatial integration. These estimates are reported in Table 2. Perhaps surprisingly, these data show no statistically significant associations between the country-wide indicators presented here and *D*, either between all immigrants and natives or between all non-European immigrants and natives. These baseline country-level correlations seemingly suggest that country-to-country variation in segregation—at least as measured here—is highly idiosyncratic and difficult to explain with the country-level variables considered here. And this conclusion applies to segregation patterns among European and non-European immigrants.

Although none of the country-level coefficients are statistically significant, the size of the coefficients nevertheless are potentially meaningful. The countries considered here are drawn from the universe of European countries, so issues of sampling for statistical inference arguably are less problematic than if we had a small sample of countries. From this perspective, many of the Rho's in Table 3 are of sufficient size to briefly mention. For example, local areal unit-to-local areal unit segregation is associated positively with GDP (Rho = .261); the immigrants in countries with large economies (and greater spatial differentiation on many economic dimensions) are clearly spread more unevenly across the country. Immigrant segregation from natives also increases as the percentage of immigrants in the country grows (Rho = .135). Interesting enough, the overall migration integration policy index is unexpectedly positively associated with immigrant-native segregation (Rho = .115). Of course, from these cross-sectional analyses we are unable to identify causal effects or even determine the causal order of variables, which is problematic in this case. Indeed, it is plausible that higher scores on the migration integration policy reflect a policy response to low levels of immigrant integration, in general, and to high rates of spatial segregation, in particular.

Although national characteristics, including public policy, have small but seemingly heterogeneous effects across countries, it may also be the case that these country-level traits are most likely to be observed in sub-regions (NUTS-2) and local areal units (NUTS-3) were immigrants actually live. In other words, immigrant-native segregation may be expressed at a finer spatial scale *within* each country and influenced by national immigration policies that operate differentially at the local area or regional level. To address this empirical question, we have recomputed estimates of *D within* specific sub-regions (NUTS-2) in each European country. Local areal units (i.e., NUTS-3 units) can be nested perfectly within the surrounding regional territory defined by administratively-defined geography (i.e., NUT-2 units). This allows us fit multivariate models of inter-local areal unit segregation within NUT-2 regional units, which we conceptualize to be a function of both regional conditions (for each NUT-2) and economic and policy characteristics of the country itself.

The results of this modeling exercise are shown in Table 4. These data show that heavily-populated regions are associated positively with immigrant-native residential segregation, and that this association is observed regardless of whether immigrants originate from Europe or outside of Europe. The segregation of immigrants across local areal units within the various regions of the country is associated with educational levels of the overall population. In general, regions with the highest shares of its population have at least a high school education are least likely to have high levels of immigrant-native segregation. This finding may simply reflect the shared educational backgrounds of most natives and immigrants, which arguably would translate into more immigrant-native similarity in occupation and earnings, and ultimately in less segregated residence patterns. For non-European immigrants and immigrants from non-EU European countries, the association between immigrant-native segregation is lowest is

countries with some post-secondary education. This finding is seemingly consistent with the higher levels of education observed among immigrants from outside of Europe, and perhaps more residential integration in countries with average education levels that mirror those of immigrants. Finally, these data indicate that immigrant-native segregation is lowest in regions that are more dependent on employment in construction (which may serve as a proxy for economic and population growth) and in government jobs. The latter finding is consistent with most neighborhood segregation studies in the United States, which typically show that cities with large shares of the population working in government are less segregated from whites (Lichter et al. 2015). The implication is that government jobs has the effects of reducing economic disparities among workers, which is revealed in more spatial integration in residence patterns.

Unlike the bivariate analyses reported in Table 3, the multivariate analysis in Table 4 reveals several statistically significant negative associations between the integration policy variables and immigrant-native segregation. Specifically, among the 32 regression coefficient presented in Table 4 (i.e., 8 indicators for each of the 4 immigrant national origin groups), 7 were statistically significant and negatively signed, as expected. For example, countries that had immigrant policies that encouraged family reunification, that provided a legal pathway to citizenship, or that encouraged political participation were less likely to be highly segregated by nativity. Conversely, 6 regression coefficients were unexpectedly positive in sign, which suggests that some immigrant policies may have been introduced in response to the lack of integration among immigrants. The most consistent finding in this regard was the statistically significant positive *b*'s for policies that promotion workers' rights and greater employment opportunities among legal immigrants. Finally, the bivariate correlations reported in Table 3 showed that GDP, measured at the country level, was positively associated with the segregation

of immigrants across local areal units. But this relationship does not hold for immigrant-native segregation at the regional level. Indeed, any effects of national GDP appears to operate indirectly through economic development indicators at the regional level (where the regional GDP was statistically significant and positively associated with immigrant-native segregation).

Discussion and Conclusion

The recent rapid immigration of ethnic and immigrant minorities in Europe has raised important questions about their social, economic, and cultural incorporation into mainstream society. This is an important topic, especially at a time of below-replacement fertility and depopulation among native-born populations throughout much of Europe. Here, we have presented evidence of spatial assimilation or, alternatively, residential segregation, which is sometimes viewed as an indicator of integration or incorporation on other salient indicators (e.g., education, language, and citizenship status). Our fundamental goal was to provide, we believe for the first time, cross-country baseline segregation estimates that answer the question of whether immigrant minority populations share the same social and geographic space as the native-born or majority populations in Europe.

Our results suggests at least two general conclusions. First, immigrant-native segregation patterns vary widely *between* and *within* European countries with very different economies, demographic conditions, and histories of immigration. But, as we showed here, it is difficult to fully explain or account for current cross-sectional patterns of national and regional segregation among immigrants on the basis of the small number of national and regional characteristics presented in this paper. To adequately address this task requires, at a minimum, longitudinal data that links changes in immigration (volume and characteristics) and immigration

integration policies to changes in assimilation, in general, and spatial assimilation, in particular. In particular, it will be important to link upward social mobility among different immigrant populations to patterns of segregation from the native-born population, and to consider the income segregation of immigrant populations.

Second, in almost all European countries, immigrants from outside of Europe or the EU were more segregated from natives than were immigrants from other countries in Europe. Interestingly, at least at the scale of geography examined here (NUTS-3) any differences in immigrant-native segregation were nevertheless small or modest. This suggests the need to take into account differences in the socioeconomic status and job skills of immigrants from different national origin groups, a task that we have not considered in these baseline analyses. Moreover, the comparatively high rates of segregation among non-Europeans also argue for additional analyses of immigrants from Africa, the Middle East, and Asia, as well as the Americas. Each may exhibit unique patterns of segregation that may be masked by the highly aggregated results presented here.

Finally, our analyses represents a platform or baseline for additional analyses of the extent and etiology of residential segregation across Europe. We have focused primarily on macro-segregation, which we have defined at the local areal unit level (NUTS3). In some ways our results speak most directly to the identification of new immigrant destinations or to new gateways that now demand our attention. Immigrants are dispersing across Europe but they also are concentrating at the national, regional, and local areal unit levels. Going forward arguably will require analyses at a finer spatial scale—at the district, municipal, or neighborhood levels. It is at smaller scale of geography where immigrant often come into daily contact (or not) with

native, and where positive social integration can break drop the economic and cultural barriers to integration.

References

Arbaci, S. (2007). Ethnic segregation, housing systems and welfare regimes in Europe. European Journal of Housing Policy, 7(4), 401-433.

Bijak, J., Kicinger, A., & Kupiszewski, M. (2013). International migration scenarios for 27 European countries, 2002–2052. In International migration and the future of populations and labour in Europe (pp. 75-92). Springer Netherlands.

Bolt, G., Özüekren, A. S., & Phillips, D. (2010). Linking integration and residential segregation. Journal of ethnic and migration studies, 36(2), 169-186. Bråmå, Å. (2008). Dynamics of ethnic residential segregation in Göteborg, Sweden, 1995–2000. Population, Space and Place, 14(2), 101-117.

Cassiers, T., & Kesteloot, C. (2012). Socio-spatial inequalities and social cohesion in European cities. Urban Studies, 49(9), 1909-1924.

Fahey, T., & Fanning, B. (2010). Immigration and socio-spatial segregation in Dublin, 1996-2006. Urban Studies.

Eurostat. 2016. http://ec.europa.eu/eurostat/statistics-explained/index.php/Migration_and_migrant_population_statistics

Iceland, J. (2014). Residential Segregation: A Trans-Atlantic Analysis. Washington, D.C.: Migration Policy Institute.

Kazepov, Y. (Ed.). (2008). Cities of Europe: Changing contexts, local arrangement and the challenge to urban cohesion (Vol. 2). John Wiley & Sons.

Malmberg, B., Andersson, E., & Östh, J. (2013). Segregation and urban unrest in Sweden. Urban geography, 34(7), 1031-1046.

Maloutas, T. (2007). Segregation, social polarization and immigration in Athens during the 1990s: theoretical expectations and contextual difference. International Journal of Urban and Regional Research, 31(4), 733-758.

Marcińczak, S., Musterd, S., & Stępniak, M. (2012). Where the grass is greener: social segregation in three major Polish cities at the beginning of the 21st century. European Urban and Regional Studies, 19(4), 383-403.

Marcińczak, S., Tammaru, T., Novák, J., Gentile, M., Kovács, Z., Temelová, J.,Valatka, V., Kährik, A., & Szabó, B. (2015). Patterns of socioeconomic segregation in the capital cities of fast-track reforming postsocialist countries. Annals of the Association of American Geographers, 105(1), 183-202.

Massey, D. S. (2016). Segregation and the Perpetuation of Disadvantage. The Oxford Handbook of the Social Science of Poverty, 369.

Musterd, S. (2005). Social and ethnic segregation in Europe: Levels, causes, and effects. *Journal of urban affairs*, *27*(3), 331-348.

Musterd, S., & Ostendorf, W. (Eds.). (2013). Urban segregation and the welfare state: Inequality and exclusion in western cities. Routledge.

Pew Research Foundation. 2016. http://www.pewresearch.org/fact-tank/2016/07/19/5-facts-about-the-muslim-population-in-europe/ Accessed on August 22, 2016.

Phillips, D. (2010). Minority ethnic segregation, integration and citizenship: A European perspective. Journal of Ethnic and Migration studies, 36(2), 209-225.

Koopmans, R. (2013). Multiculturalism and immigration: A contested field in cross-national comparison. Annual Review of Sociology, 39, 147-169.

Sáenz, R., & Douglas, K. M. (2015). A call for the racialization of immigration studies on the transition of ethnic immigrants to racialized immigrants. Sociology of Race and Ethnicity, 1(1), 166-180.

Sager, L. (2012). Residential segregation and socioeconomic neighbourhood sorting: Evidence at the micro-neighbourhood level for migrant groups in Germany. Urban Studies, 49(12), 2617-2632.

Semyonov, M., & Glikman, A. (2009). Ethnic residential segregation, social contacts, and anti-minority attitudes in European societies. European Sociological Review, 25(6), 693-708.

Shon, J. L. P. K., & Verdugo, G. (2015). Forty years of immigrant segregation in France, 1968–2007. How different is the new immigration?. Urban Studies, 52(5), 823-840.

Skifter Andersen, H., Andersson, R., Wessel, T., & Vilkama, K. (2016). The impact of housing policies and housing markets on ethnic spatial segregation: comparing the capital cities of four Nordic welfare states. International Journal of Housing Policy, 16(1), 1-30.

Smets, P., & Salman, T. (2008). Countering urban segregation: Theoretical and policy innovations from around the globe. Urban Studies, 45(7), 1307-1332.

Tammaru, T., van Ham, M., Marcińczak, S., & Musterd, S. (Eds.). (2015). Socio-economic segregation in European capital cities: East meets West (Vol. 89). Routledge.

United Nations. 2016. https://esa.un.org/unpd/wpp/Publications/Files/WPP2015_Volume-II-Demographic-Profiles.pdf. Accessed on August 21, 2016.

Verdugo, G. (2011). Public housing and residential segregation of immigrants in France, 1968-1999. Population, 66(1), 169-193.

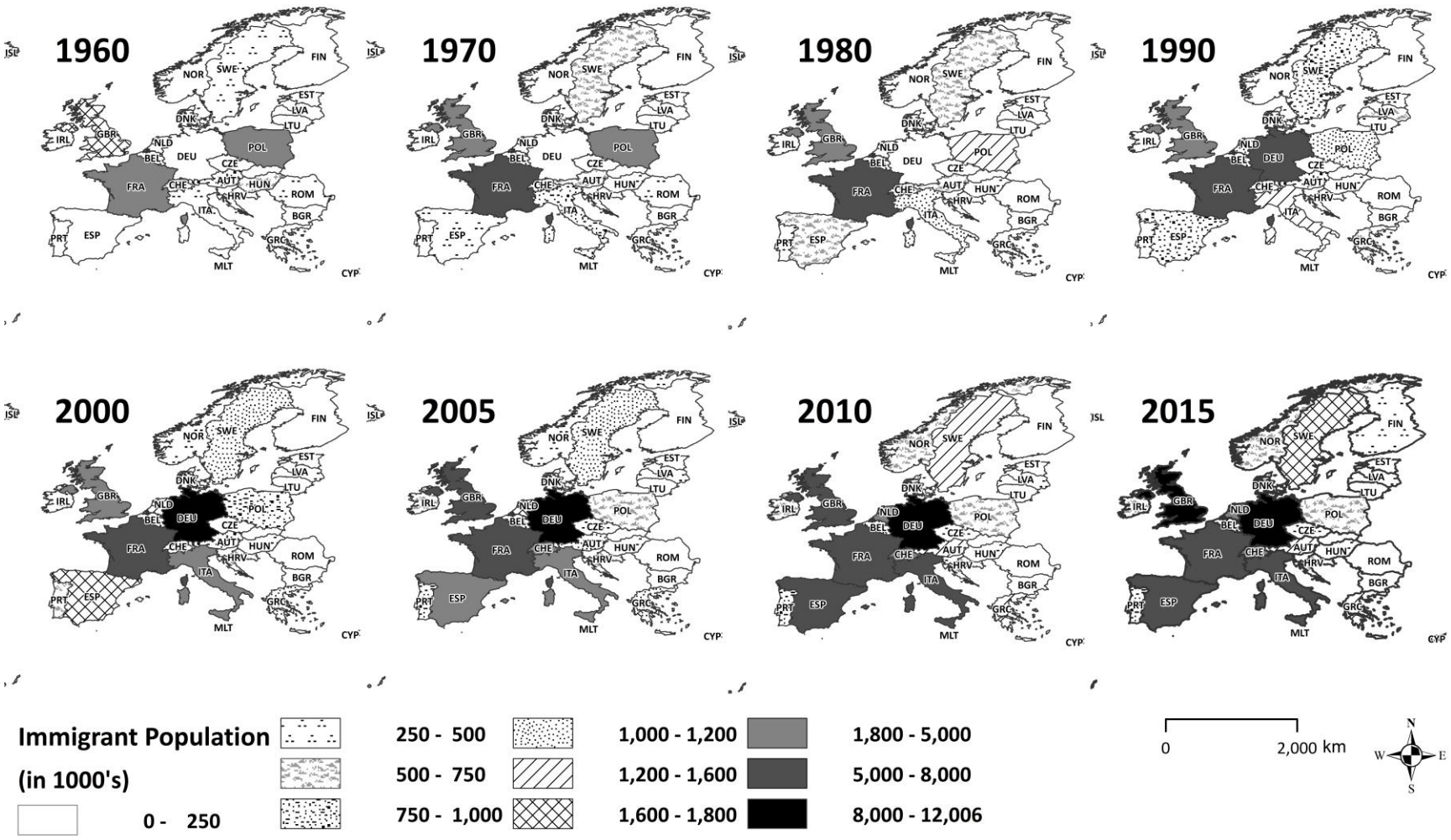

Figure 1. Trends in migration flow in Europe 1960 – 2015. Source: The World Bank

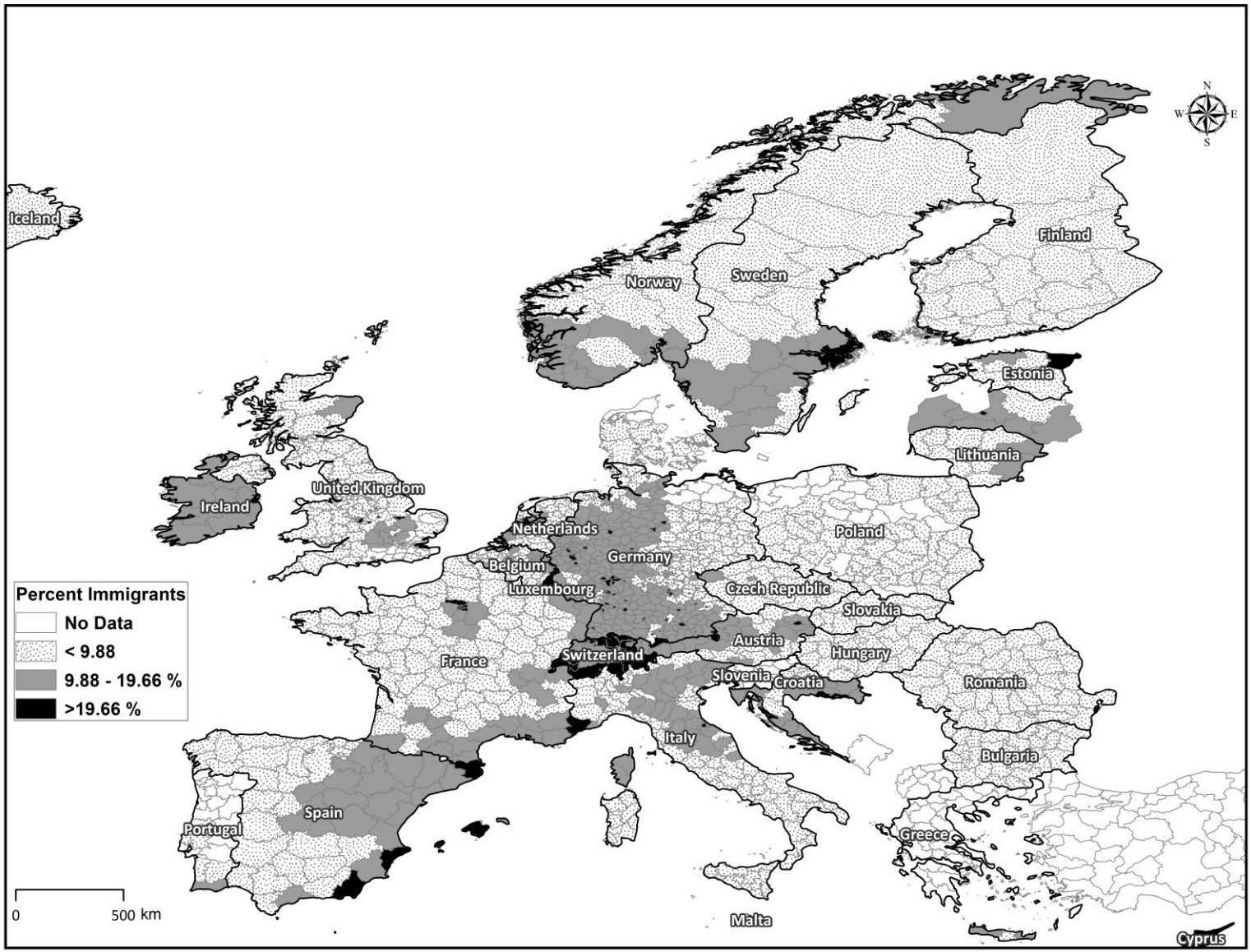

Figure 2. Total Immigrants in Europe at Local (NUTS3) Level. Source: Eurostat- 2011.

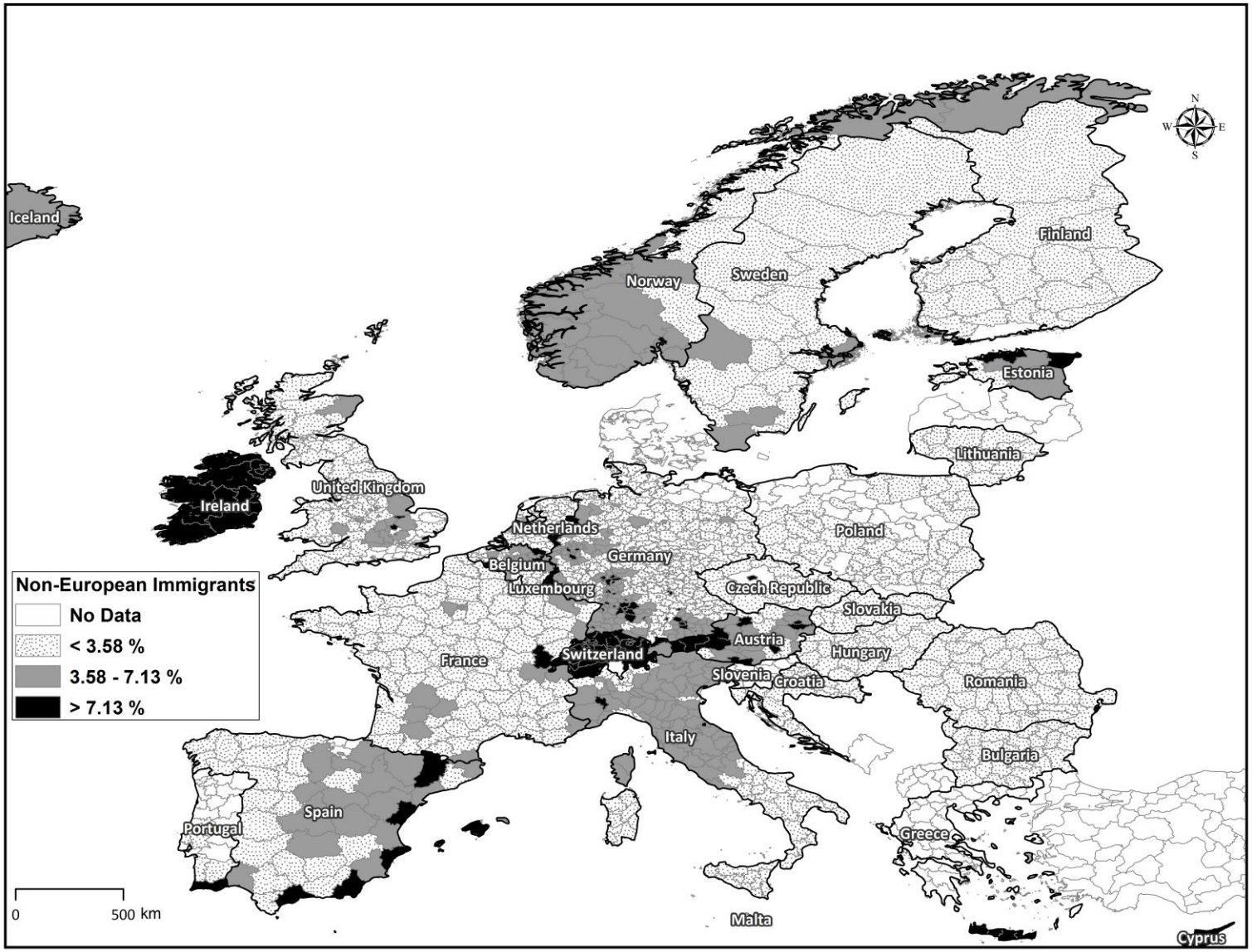

Figure 3. Non-European Immigrants in Europe at Local (NUTS3) Level. Source: Eurostat 2011.

Table 1. Local-to-Local (NUTS3) Differences between Natives and Immigrants within Country Boundaries

Country	All Countries	Non-European Countries	European but Non-EU Countries	EU Countries
Austria	25.5	34.9	29.1	20.4
Belgium	28.6	33.2	27.0	29.7
Bulgaria	20.4	27.2	17.6	24.1
Croatia	15.3	31.1	16.9	11.0
Czech Republic	18.9	32.5	33.2	13.2
Denmark	17.0	21.0	11.9	14.8
Estonia	28.6	29.5	29.6	13.9
Finland	25.0	29.2	16.9	23.6
France	27.7	31.7	39.4	23.0
Germany	18.0	24.9	21.3	14.7
Greece	12.9	27.2	11.9	16.7
Hungary	19.9	45.3	25.6	19.3
Ireland	8.2	19.6	17.8	5.7
Italy	18.3	23.8	25.5	17.4
Latvia	16.3	23.7	17.3	12.2
Lithuania	28.0	21.8	30.9	11.3
Malta	3.2	7.6	4.0	0.4
Netherlands	21.9	25.6	15.3	19.3
Norway	17.3	21.5	17.1	14.4
Poland	34.3	32.4	42.4	26.3
Romania	24.2	48.6	34.6	18.4
Slovakia	8.2	14.1	25.7	10.5
Slovenia	13.9	20.4	15.2	15.9
Spain	21.6	23.5	21.8	25.4
Sweden	15.2	17.0	14.9	17.0
Switzerland	18.1	23.9	12.3	19.5
United Kingdom	25.4	31.6	22.7	19.9
Total Average	19.7	26.8	22.1	17.0

Table 2: Descriptive Statistics

	Mean	SD
NUTS2 Characteristics		
Total Population	1,892,246	1,608,753
D Index :Natives and Immigrants	10.2	6.6
D Index: Natives and Immigrants from Outside Europe	27.4	16.9
D Index: Natives and immigrants from Outside the EU but Within Europe	12.8	8.2
D Index: Natives and EU Members	20.2	12.3
Entropy Index	30.2	16.1
GDP Percapita PPS (000's)	26.5	10.5
% High School Education	33.3	8.8
% Some College Education	2.1	2.1
% College or Higher Education	18.2	5.0
% in Agriculture & Fisheries	1.8	1.5
% in Manufacturing	8.2	3.8
% in Construction	3.6	0.9
% in Government	12.4	2.6
% in Services	9.8	3.0
Country Characteristics		
GDP (billion $)	1,880	1,299
% Foreign Born	11.6	3.8
Migration Integration Policy Index	57.8	7.6
Labor Market Mobility	66.9	16.1
Family Union	57.1	15.0
Education	45.7	13.2
Political Participation	53.2	15.0
Permanent Residency	60.7	10.5
Path to Citizenship	57.7	13.0
Antidiscrimination Policy	67.6	13.6
Access to Health Care	53.4	10.4

Table 3. Rank order Correlations (Spearman's Rho) between Country Indicators and Country Native - Immigrant Segregation (*D*).

		GDP	Migration Integration Policy Index	Labor Market Mobility	Family Union	Education	Political Participation	Permanent Residency	Path to Citizenship	Antidiscrimination Policy	Access to Health Care	% Foreign Born
All Countries	Correlation Coefficient	0.261	0.115	0.166	-0.328	0.189	-0.19	0.211	0.089	0.039	0.002	-0.135
	Sig. (2-tailed)	0.189	0.575	0.418	0.109	0.356	0.354	0.301	0.665	0.85	0.993	0.502
	N	27	26	26	25	26	26	26	26	26	26	27
Non-European Countries	Correlation Coefficient	0.175	0.026	0.033	-0.336	-0.026	-0.342	0.039	-0.045	0.218	-0.067	-0.131
	Sig. (2-tailed)	0.382	0.898	0.874	0.1	0.9	0.088	0.851	0.825	0.284	0.744	0.516
	N	27	26	26	25	26	26	26	26	26	26	27
D_Europeans but Non-EU members	Correlation Coefficient	0.086	-0.227	-0.268	-0.185	-0.162	-.446*	-0.095	-0.107	0.018	-0.227	-0.243
	Sig. (2-tailed)	0.669	0.265	0.186	0.375	0.429	0.022	0.645	0.603	0.93	0.265	0.222
	N	27	26	26	25	26	26	26	26	26	26	27
D_EU Members	Correlation Coefficient	.556**	.390*	0.253	0.006	0.234	0.097	0.362	0.258	0.377	0.266	-0.139
	Sig. (2-tailed)	0.003	0.049	0.212	0.977	0.25	0.639	0.069	0.203	0.058	0.19	0.491
	N	27	26	26	25	26	26	26	26	26	26	27

Note: *p<.05, **p<.01, ***p<.001

Table 4. Ordinary Least Square Regression of Local Diversity (D) between Natives and immigrants from countries.

	All Countries		Non-European Countries		European but Non-EU Countries		EU Countries	
	b	*SE*	*b*	*SE*	*B*	*SE*	*b*	*SE*
Intercept	8.50	19.37	-59.51	49.46	-22.24	25.94	-8.25	37.64
NUTS2 Characteristics								
Ln Population	2.41***	0.83	7.60***	2.11	3.49***	1.11	4.87***	1.61
Entropy Index	-0.02	0.06	-0.24*	0.14	-0.05	0.08	0.09	0.11
GDP PPS (1000s Euro)	-0.06	0.14	0.07	0.35	-0.07	0.18	-0.32	0.26
% High School Education	-0.22*	0.11	0.15	0.28	0.01	0.14	-0.57**	0.21
% Some College Education	-0.91!	0.50	-2.52*	1.29	-1.47*	0.68	-0.41	0.98
% College or Higher Education	0.13	0.22	0.12	0.57	0.29	0.30	0.51	0.43
% in Agriculture & Fisheries	0.40	0.64	-0.37	1.63	0.35	0.86	2.58*	1.24
% in Manufacturing	-0.14	0.23	-0.82	0.58	-0.14	0.31	-0.10	0.44
% in Construction	-1.93*	0.91	-1.96	2.33	-2.31!	1.22	-1.88	1.77
% in Government	-1.00*	0.43	-2.50*	1.09	-1.30*	0.57	-1.75*	0.83
% in Services	-0.21	0.38	-0.02	0.97	-0.53	0.51	-1.05	0.74
Country Characteristics								
GDP (billion $)	0.00	0.00	0.01*	0.00	0.00	0.00	0.00	0.00
% Immigrants	0.34	0.27	0.60	0.70	0.70!	0.37	1.47**	0.53
Migration Integration Policy Index								
Labor Market Mobility	0.29*	0.12	0.91***	0.31	0.46***	0.16	0.43!	0.24
Family Union	-0.21**	0.08	-0.68***	0.20	-0.02	0.11	-0.34*	0.16
Education	0.38	0.15	0.64!	0.39	0.22	0.20	0.04	0.30
Political Participation	-0.26*	0.12	-0.62*	0.31	-0.20	0.16	-0.26	0.24
Permanent Residency	0.14	0.10	1.02***	0.25	0.08	0.13	0.05	0.19
Path to Citizenship	-0.35*	0.15	-1.25**	0.37	-0.52**	0.19	0.05	0.28
Antidiscrimination Policy	0.06	0.07	0.47*	0.19	0.23*	0.10	0.09	0.14
Access to Health Care	-0.22	0.15	-0.65*	0.38	-0.27	0.20	-0.13	0.29
Adjusted R^2	26.10		35.00		12.50		18.50	

Note: !p<.10, *p<.05, **p<.01, ***p<.001 (two-tailed test)