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Explaining Spatial Patterns of Foreign Employment in Germany

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CESIFO WORKING PAPER NO. 6356
CATEGORY 4: LABOUR MARKETS
FEBRUARY 2017

ISSN 2364-1428

CESifo
Center for Economic Studies & Ifo Institute

CESifo *Working Paper No. 6356*

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Abstract

This paper investigates the main determinants of the regional representation of foreign employees in Germany. Since migration determinants are not necessarily the same for workers of different nationalities, we explain spatial patterns not only for total foreign employment but also for the 35 most important migration countries to Germany. Based on a total census for all 402 districts in Germany, we find a large heterogeneity in migration determinants between nationalities. We identify three groups of countries for which labor market and economic conditions, amenities or cultural factors are more important. Geographical distance plays a major role in location decisions, a finding that is especially pronounced for workers from countries neighboring Germany.

JEL-Codes: F220, J210, J610, O150, R120.

Keywords: foreign employment, migration determinants, distance, spatial models.

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This version: February 12, 2017

1. Introduction

About 3 million foreign employees work in Germany (German Federal Employment Agency, 2016), but these workers are not uniformly distributed across German regions. Economically weak and rural regions attract far fewer foreign workers than do prosperous metropolitan areas. Moreover, workers of a certain nationality tend to settle in the same region. This paper investigates the reasons behind these patterns seeing that little is known about the determinants of foreign workers' choice of a certain place of work at the regional level. There is certainly more involved in these decisions than economic conditions. For example, perhaps workers from a certain country prefer regions that have some specific local characteristics. Such characteristics might include proximity to the home country, functioning networks and specifics of the regional labor market, cultural aspects, or certain amenities.

This paper studies the determinants of foreign employees for German districts. We provide analyses for workers from each of the EU-28 countries separately as well as for workers from Bosnia-Herzegovina, Norway, Russia, Switzerland, Turkey, Ukraine, and the United States. We take a closer look at the influence of a rich set of possible determinants that have been found relevant in the literature and pay special attention to the impact of distance.

The literature on determinants of migration is substantial (e.g. Clark *et al.*, 2007; Mayda, 2010; Ruyssen *et al.*, 2014). Labor market conditions (Scott, 2010; Buch *et al.*, 2014) and amenities (Chen and Rosenthal, 2008; Partridge, 2010; Rodríguez-Pose and Ketterer, 2012) are often mentioned as the most important driving forces of migration. A low unemployment rate and a large number of vacancies attract workers, as does a low crime rate, good medical care, recreational areas, and rich cultural offerings.

Cultural and ethnic factors have become an increasingly focus of academics. Ethnic diversity may indicate tolerance (Florida, 2002), but also leads to more differentiated preferences in the provision of public goods (Alesina and La Ferrara, 2005). A cultural environment similar to the home country also fosters migration. Geis *et al.* (2011) show a positive effect of cultural closeness on the migration decision, whereas Wang *et al.* (2016) point out that a region's cultural diversity can increase its attractiveness for migrants. Isphording and Otten (2014) especially stress the positive effect of linguistic closeness.

Networks also have a strong positive effect on migration decisions (Ruyssen *et al.*, 2014). However, Pedersen *et al.* (2008) point out that the strength of the network effect can vary between different nationalities and types of welfare states. Climatic factors also play a role in migration decisions; however, the recent study by Beine and Parsons (2015) shows that long-run climatic factors have no direct effect on migration, although they do have an indirect one through the wage channel.

We are interested in the "big picture" and, therefore, in all aspects of migration determinants, but we are especially interested in the role played by geographical distance. This focus on distance is motivated by the idea of modeling immigration via a gravity model

(Lewer and Van den Berg, 2008) that assumes distance to be one of the main migration costs (Clark *et al.*, 2007; Mayda, 2010). Throughout the literature there is broad evidence for the importance of distance in explaining migration. Estimating a very sophisticated model, Clark *et al.* (2007) show a highly significant negative impact of distance on migration to the United States. They use panel data for 81 countries of origin and a rich set of control variables. Using migration flows from 14 OECD countries and controlling for income and geographic, cultural, and demographic factors, Mayda (2010) also finds a significant negative effect of distance on migration. Bessey (2012) shows that distance has a negative impact on international student mobility. Moreover, based on a study of interregional job matches in Germany, Arntz (2010) finds that within-country distance has a negative effect on relocation. Using a dynamic model, Etzo (2011) finds a negative effect of distance on interregional migration flows in Italy. Although long-distance interregional migration is mainly driven by economic factors and short-term interregional migration is mainly driven by amenities, distance seems to be relevant in both cases (Biagi *et al.*, 2011; Niedomysl, 2011).

In this paper we complement the literature by studying labor market and economic conditions, amenities, cultural aspects, and distance as pull factors for labor migration at the regional level in Germany. To our knowledge, spatial distribution of within the host country of foreign workers of different nationalities has not to date been studied in much detail. We begin our investigation with descriptive evidence for the spatial distribution in Germany of foreign workers from 35 countries. To capture over- and underrepresentation of foreign employment at the district level, we calculate representation quotients using a total census from the German Federal Employment Agency (2013). A rich set of migration determinants for the German districts is then employed to explain the different representation patterns that emerge for different nationalities. To control for spatial dependencies we apply a spatial error model. We additionally estimate a spatial lag model and a standard cross-sectional model to validate our baseline estimations.

We find that the determinants of migration vary in importance between workers from different home countries. Regional economic conditions seem to be the most important determinants for workers from Belarus, the Czech Republic, Denmark, Estonia, Finland, France, Italy, the Netherlands, Spain, Sweden, and the United Kingdom. Amenities are most important for workers from Austria, Hungary, Slovakia, and Slovenia. For the remaining countries, cultural factors are the predominant determinants. Distance is found to be an important factor as well, especially for workers from countries geographically adjacent or geographically close to Germany.

The remainder of the paper is organized as follows. In the next section we show spatial patterns of workers with different nationalities and discuss possible reasons for these patterns. Section 3 sets out our empirical strategy for estimating the impact of different determinants and describes our data. In Section 4 we present the results along with some robustness checks. The final section concludes.

2. Spatial Distributions of Foreign Employment

The literature contains well-grounded insights into the migration interdependence between countries and the determinants of emerging migration patterns. However, these insights do not tell us much about the distribution of foreign workers within the host country. When looking at spatial foreign employment patterns, it is necessary to distinguish between two dimensions: first, the distribution of workers from a particular country between regional entities, and second, the distribution of different nationalities within a specific district. In this paper we mainly concentrate on the first dimension.

A distribution is typically characterized either by the absolute number of values or in terms of relative frequencies. Instead of presenting absolute values or a simple relative frequency, we show the representation of foreign workers in relation to total employment at the regional level, which is basically a ratio between two relative frequencies. To measure the representation of workers with a specific nationality j for the German district i at time t, we use the following representation quotient RQ_{ijt}:

$$RQ_{ijt} = \frac{\text{Foreign worker quotient } (FWQ_{ijt})}{\text{Employment quotient } (EMPQ_{it})} ,$$

with

$$FWQ_{ijt} = \frac{\text{Number of workers with nationality } j \text{ in district } i \text{ at time } t}{\text{Number of all workers with nationality } j \text{ in Germany at time } t}$$

and

$$EMPQ_{it} = \frac{\text{Number of employees in district } i \text{ at time } t}{\text{Number of all employees in Germany at time } t} .$$

We first take a look at the two components of the representation quotient. The first component is the foreign worker quotient (FWQ_{ijt}), which shows the share of employees with nationality j in a specific district i, compared to all foreign workers with nationality j in Germany. It holds: $\sum_i FWQ_{ijt} = 1$. However, simply using these shares would not correctly indicate the size of the regional entity or its corresponding labor market. To account for this, we divide the foreign worker quotient by our second component: the employment quotient ($EMPQ_{it}$). Note that the $EMPQ_{it}$ is invariant to the nationality; instead, it tells us the percentage of employed persons in Germany who work in a specific district. As for the FWQ_{ijt}, it holds: $\sum_i EMPQ_{it} = 1$.

Turning to the representation quotient, we see that the share of foreign employees in a specific district is weighted by the relative size of the local labor market. To make the RQ_{ijt} comparable between different nationalities, we apply district-constant weights. However, as we can see from the equations, the shares and weights vary over time. But in which range lies the RQ_{ijt}? The lower bound is zero, that is, nobody with nationality j works in district i at that specific point in time. The upper bound tends to infinity. An $RQ_{ijt} = 1$ indicates

that the distribution of workers with nationality j in district i matches their representation in Germany as a whole. Consequently, a $RQ_{ijt} > 1$ indicates overrepresentation and a $RQ_{ijt} < 1$ underrepresentation compared to the German average.

To calculate the representation quotients, we rely on a total census of employees subject to social security insurance (see German Federal Employment Agency, 2013). The reported district is the workplace of the employee. Thus, we know the total number of employees with nationality j as well as the total number of all employees for each district i in Germany. We use annual data from 2004 to 2012 that are reported at the cut-off date of December 31 of each year. Our cross-section dimension includes all 402 German districts and district-free cities.[1] We have data for 35 nationalities.[2] In 2012, these 35 nationalities represented about 81% of all foreign employees in Germany. We have all nine of Germany's direct neighbors in the sample, as well as the complete European Union and other important immigration countries such as Belarus, Russia, Turkey, and Ukraine. Norway and the United States complete the picture.

There is large variation in the representation quotients of the different countries. In addition to substantial variation in the standard deviations, there is a huge spread in the maximums of the RQs, which runs from 2.98 for Russia to 88.46 for the Czech Republic. This last number tells us that there is a district where workers from the Czech Republic are more than 88 times overrepresented compared to the German average. There are also some districts that contain not a single worker from a certain country. These discoveries lead us to believe that there must be some spatial patterns that can be explained by district-specific characteristics.

The simplest way of detecting regional patterns is to draw maps, which we did and the results can be seen in Figures 1–4. Figure 1 presents the representation quotients in 2012 for the countries neighboring Germany. Figures 2 and 3 show the same for the member states of the European Union. Figure 4 is a map for the remaining countries and for total foreign employment (bottom right). Countries are ordered alphabetically in each figure. To achieve comparability between the countries, we use the same six RQ categories in each figure: (i) $RQ = 0.0$, (ii) $RQ < 0.5$, (iii) $RQ < 1.0$, (iv) $RQ < 1.5$, (v) $RQ < 2.0$, and (vi) $RQ > 2.0$. The color coding for these six categories runs from white (no foreign worker in a specific district) to dark gray (a high overrepresentation).

Figure 1, showing Germany's neighbors, reveals some interesting patterns. First, as one would expect, there are several hot spots. For example, it is not surprising that Frankfurt am Main and Munich are preferred by workers from abroad. A high wage level and a broad range of amenities could be two of several reasons that make these cities attractive. Second,

[1] All the data in the paper are for the territorial boundaries of Germany as of 2016.

[2] The countries are: Austria, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and the United States of America.

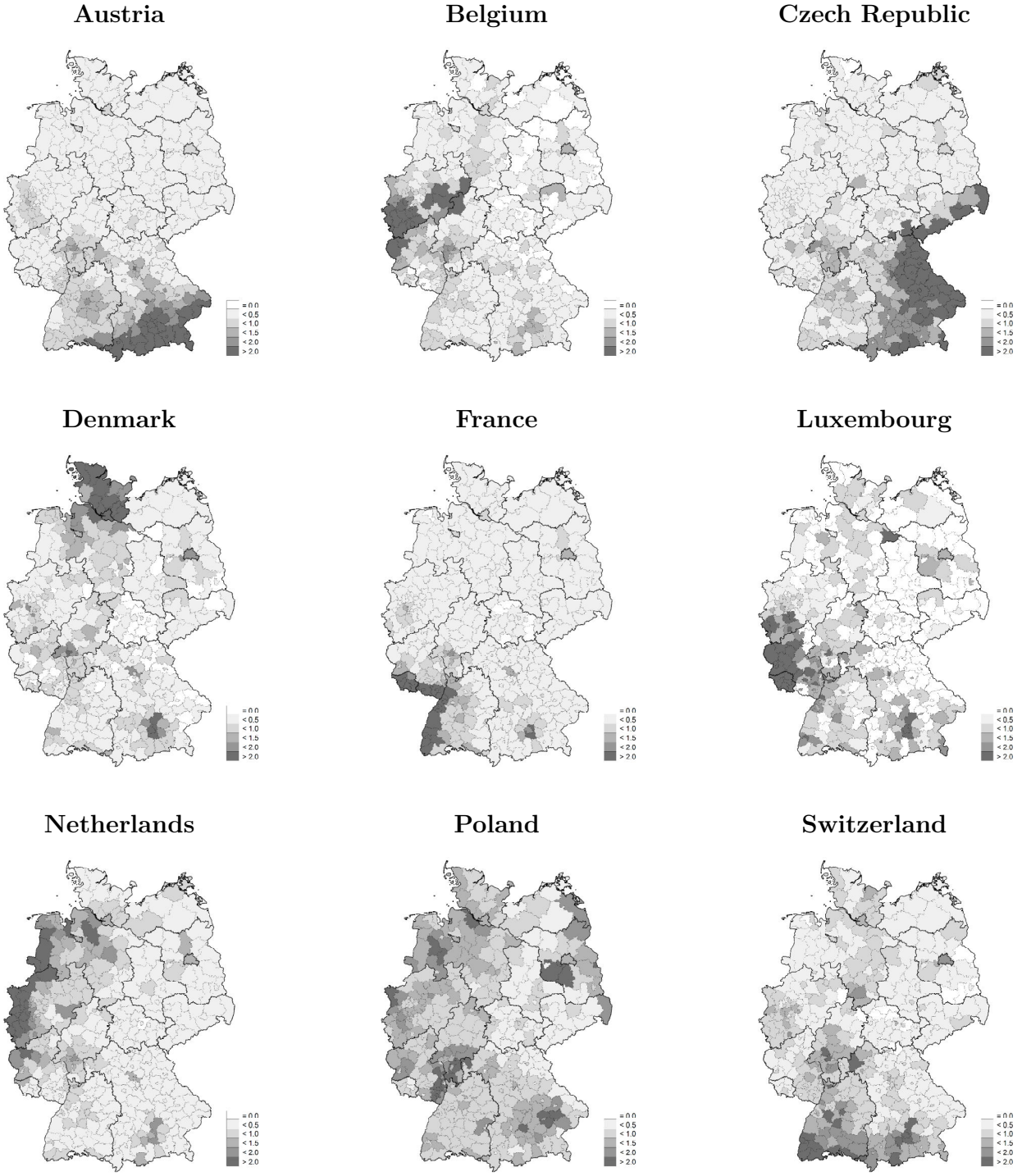
with the exception of Germany's eastern neighbors, Poland and the Czech Republic, there is a clear East-West gap in the representation quotients. Not many employees from Germany's western or southern neighbor countries work in Eastern German districts. An exception is the German capital Berlin, which is not surprising since Berlin is perceived as very attractive by people from around the world. The third and possibly most interesting pattern is that foreign workers from neighboring countries tend to locate close to the border of their home country. That is, German border districts have the highest country-specific representation quotients. This pattern holds for all countries neighboring Germany with one exception: Poland. Whereas workers from the other eight neighbors tend to cluster in rather small areas close to their home country border, Polish employees are overrepresented in Western Germany, which is no doubt due to the fact that Poland has experienced large emigration waves throughout its history (Warchol-Schlottmann, 2001). The first large wave took place in the nineteenth century when Polish people, so called *Ruhr-Polen*, mainly migrated to the Ruhr Area, a region close to the French border, to obtain employment in mining or German industry. A second large wave of Polish migration to Germany occurred in the 1970s and was chiefly comprised of Polish people with German ancestors, the so called *Aussiedler*. These people were distributed between the federal states according to a distribution scheme called *Königssteiner Schlüssel* (see Dietz, 2011), which is based on the tax receipts (weight: 2/3) and population (weight: 1/3) of a district. Another large wave took place in the 1980s; this one was mainly comprised of late repatriates or political emigrants who had been involved in the strike movement *Solidarność*. Figure 1 leads us to hypothesize that, next to important economic, social, or cultural factors, distance from the home country might be a key factor in the location decisions of workers from Germany's neighboring countries.

What about workers from non-neighboring countries? Is there any visual pattern to their location decisions? The answer is not clear-cut. Next to obvious country-specific patterns, we also find remarkable similarities between non-neighboring countries. Like their peers from neighboring countries, workers from non-neighboring countries also appear to prefer the large German cities as a destination.

To discover the reasons behind these patterns, we conduct an analysis based on the geographic direction of the non-neighboring countries. Workers from countries located to the north of Germany (Finland, Norway, Sweden, and the United Kingdom, but *not* Ireland) are overrepresented in large cities such as Hamburg, Berlin, or Munich. Figures 2, 3, and 4 also reveal that British, Finnish, Norwegian, and Swedish workers appear to prefer the northern part of Germany. This finding could be due to either regional determinants or be related to distance to their home countries.

A very distinct pattern emerges for the non-neighboring countries located to the southwest of Germany – Portugal and Spain. There seems to be an imaginary inner German border for Spanish and Portuguese workers they do not cross. These workers are mostly overrepresented in districts of four Western German federal states: Baden-Württemberg,

Figure 1: RQ 2012 – neighboring countries to Germany



Source: Geographical data ©GeoBasis-DE / BKG 2014. Own graphical representation.

Hesse, North Rhine-Westphalia, and Rhineland-Palatinate. There is also a clear West-East-pattern for workers from Portugal or Spain. Almost no Spanish or Portuguese employees work in Eastern German districts, a finding for which we believe historical circumstances are responsible. In the 1950s and 1960s, Germany signed recruitment agreements with several countries, including Spain and Portugal, to allow free movement of so called *Gastarbeiter*

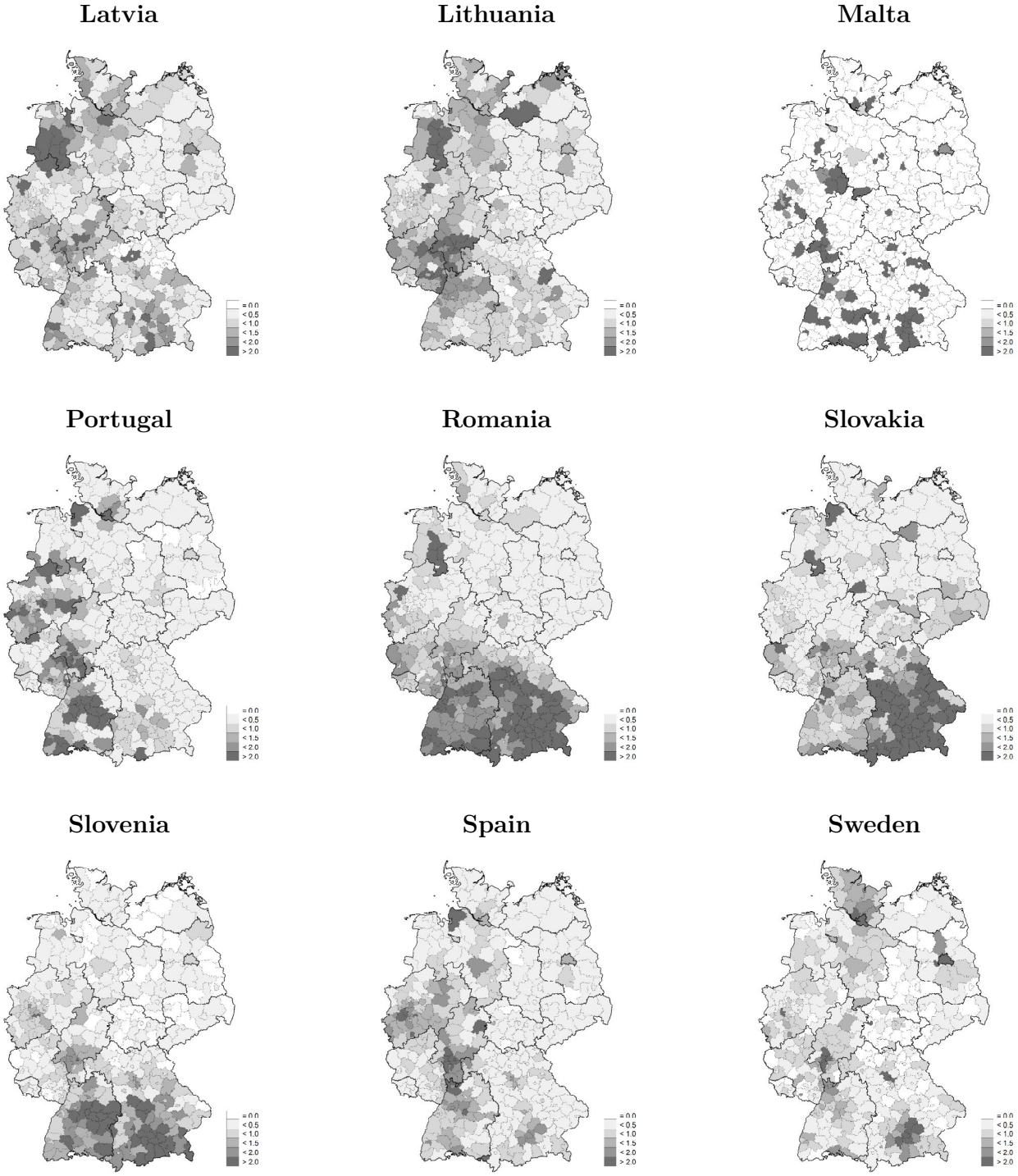
Figure 2: RQ 2012 – member states European Union I

Source: Geographical data ©GeoBasis-DE / BKG 2014. Own graphical representation.

(Hönekopp, 1997). These workers mainly located in the Ruhr Area or in the southern part of Germany.

The most important non-neighboring country in the south of Germany is Italy. Italian workers comprise the third largest group of foreign workers in Germany and are mostly located in the two southern German federal states – Baden-Württemberg and the Free State

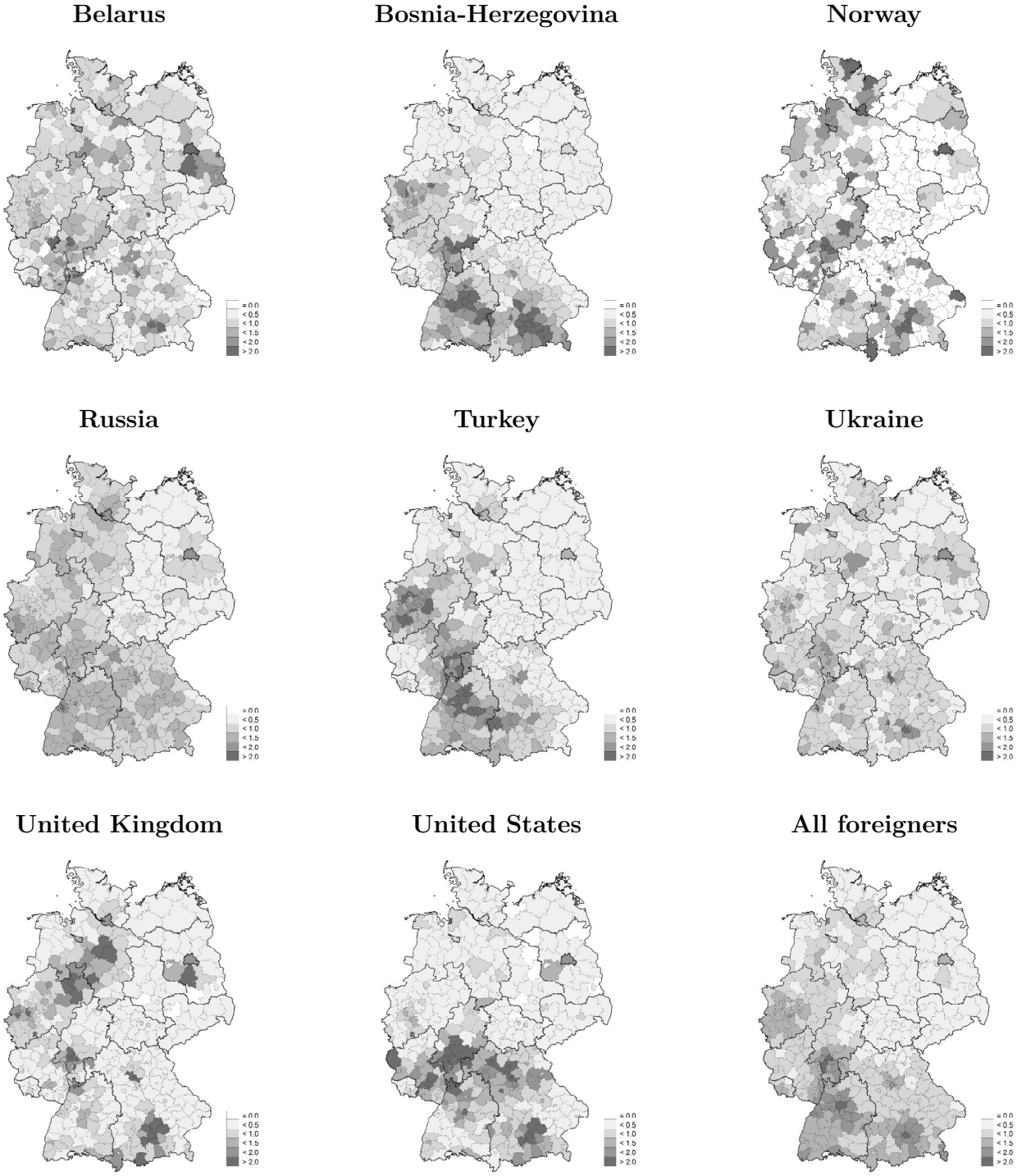
Figure 3: RQ 2012 – member states European Union II



Source: Geographical data ©GeoBasis-DE / BKG 2014. Own graphical representation.

of Bavaria. Again, recruitment agreements between Germany and Italy resulted in a large number of Italian *Gastarbeiter* moving to Germany (Hönekopp, 1997), which may very well explain the pattern observed in 2012. Malta is also located to the south of Germany, but shows no spatial pattern at all; however, the total number of workers from Malta is very small (159 employees in 2012).

Figure 4: RQ 2012 – remaining countries and total foreign employment



Source: Geographical data ©GeoBasis-DE / BKG 2014. Own graphical representation.

Cyprus, Greece, and Turkey are located to the southeast of Germany. Greece and Turkey show similar patterns: employees from these two countries tend to locate in the southwest of Germany. This pattern may, again, be due to labor recruitment agreements in the 1950s or 1960s (Hönekopp, 1997). Cypriot workers are more or less randomly distributed over Germany but, like employees from Malta, are very few in number (354 employees in 2012).

Our next group of countries are those in Central and Eastern Europe. Remarkable similarities can be found for workers from Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Romania, Slovakia, and Slovenia – all are overrepresented in the southern part of Germany. In addition to economic reasons and various amenities, we expect that distance may matter for workers from these countries. Former Soviet Union countries located to the east of Germany (Belarus, Estonia, Latvia, Lithuania, and Ukraine) do not exhibit a common pattern. Belorussian, Estonian, and Ukrainian workers are located almost everywhere in Germany, Latvians are mostly overrepresented in the northwest of Germany, and Lithuanians can be found in the whole western part of Germany. There are more Russian workers in Western Germany than there are in the eastern part of the country, although Berlin is an exception to this rule.

Workers from the United States are overrepresented in the southern and southwestern parts of Germany, which is not surprising, since many U.S. military bases are located in this area of Germany. Although U.S. soldiers and military staff are not relevant for our calculation, it is assumed that their relatives may work in the areas close to the military bases. However, cities such as Frankfurt am Main and Munich are also hot spots for U.S. workers, and thus the military base explanation falls short of completely explaining the distribution of U.S. workers. In summary, the districts in the south or southwest of Germany are magnets for foreign workers, whereas there is clear underrepresentation in Eastern German districts. In the following we provide an empirical explanation of these patterns.

3. Empirical Strategy and Data

3.1. Empirical Model

The maps of foreign worker distribution revealed very different patterns among the nationalities considered, especially in the case of employees from countries geographically close to Germany. Our next step is to discover which district-specific factors correlate with these patterns. To do so, we use the RQ_{ijt} as the dependent variable in our empirical approach. Since the representation quotients do not vary much over time within the cross-section, we pooled the data in advance and employ the following empirical model,

$$RQ_{ij} = c_j + \lambda \mathbf{W} RQ_{ij} + \alpha \mathbf{X}_{ij} + u_{ij} \,, \tag{1}$$

$$\text{with} \quad u_{ij} = \rho \mathbf{W} u_{ij} + \varepsilon_{ij} \,.$$

From this general representation, we derive three possible empirical models:

1. $\rho = \mathbf{0}$: spatial lag model (SLM),

2. $\lambda = \mathbf{0}$: spatial error model (SEM), and

3. $\rho = \mathbf{0}$ and $\lambda = \mathbf{0}$: standard cross-sectional model (CSM).

$\mathbf{W}$ represents the spatial weighting matrix based on inverse distances between the regional entities. Distances are calculated based on the longitude and latitude of each district as documented in Wikipedia.[3] All district-specific characteristics are captured in the vector $\mathbf{X}_{ij}$. The model- and nationality-specific constant is denoted by c_j; ε_{ij} represents the idiosyncratic error term.

The question arises as to which empirical model should be fitted to the data. To answer this, we first conduct a formal test on spatial dependence. There are several available tests for spatial correlation (for details, see Anselin, 2001) from which we chose Moran's I. This measure is appropriate in our case since Figures 1 to 4 reveal that a spatial pattern is present. For all representation quotients and variables described later, we find a persistent pattern of spatial correlation; the p-values indicate that spatial correlation is present since the null hypothesis is rejected at the 1% confidence level in every case. Thus, the OLS estimators for the standard CSM can be biased (see Eckey *et al.*, 2007; Lerbs and Oberst, 2014).

Based on these findings, the estimates from the CSM ($\rho = 0$ and $\lambda = 0$) can be seen as a simple confirmation of the two spatial cases. But which model should we use: the SLM or the SEM? This question can easily be answered by looking at the mechanics of the two models. The intuition of the SLM is straightforward: the representation quotient of district i is influenced by the RQs of all the other districts (with higher or lower intensity according to the attributed weights). One reason that the RQs of neighboring districts affect each other could be labor movements from one to another district by foreign workers within a year. Another reason for choosing the SLM is that the maps (Figure 1–4) clearly suggest regional clusters of overrepresentation by different nationalities. So, then, why should we even consider the SEM? Basically, the SEM works differently than the SLM: the SEM captures the spatial dependence within the error term, whereas the SLM only maps the cross-section dependence of the variable of interest. Thus, we argue that the SEM is better able to capture all general forms of spatial dependence and not just those effects introduced via the dependent variable. Imagine an economic shock that hits the neighboring district. How does this shock transfer to our region of interest? The shock is either transmitted directly (via changes in the dependent variable) or indirectly (via changes in the covariates or through changes in unspecified or even unobservable factors). Thus, by construction, the

[3] Geographical data are collected and provided by Wikipedia:WikiProject Geographical coordinates. For more details, see `https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Geographical_coordinates`.

error term may capture all general spatial influences that can bias the coefficient estimates. Therefore, the results presented in the next section are based on the SEM; the SLM and the CSM serve as validation checks of our main model.

The equations are estimated separately either by OLS or by maximum likelihood (in the case of the spatial models). For the simple OLS case, we apply standard errors that are clustered at the district level; in the spatial cases, we apply standard errors robust to autocorrelation and heteroscedasticity.

3.2. District-Specific Explanatory Variables

Following the literature discussed in the introduction of this paper, we group the district-specific variables in $\mathbf{X}_{ij}$ into four major categories: (i) labor market and economic conditions, (ii) amenities, (iii) cultural factors, and (iv) miscellaneous. Labor market and economic conditions are intuitive attractants for foreign workers. For example, a district's unemployment rate is an indicator of how tight the regional labor market is. We expect the higher the unemployment rate, the lower is representation of foreign workers. We add the median of monthly gross earnings to approximate a district's overall wage level. To capture the sectoral structure of the German districts, we introduce the shares of manufacturing, construction, and basic and advanced services in total gross value added.[4] We also take the share of high-qualified employees into account in order to capture the general level of education of the district's workforce.

The second category comprises local amenities given that quality of life can be an important factor in location decisions. We use standard measures of amenities: accessibility of European metropolises, density of physicians, share of green area, average land price, average flat size, crime rate, number of overnight stays as a measure of overall attractiveness of a district, and population density.

The third category includes two variables measuring cultural aspects: the ethnic diversity of a district and the total share of foreigners. As a measure for ethnic diversity, we use an inverse Herfindahl-Hirschman Index (HHI) based on the shares of 207 nationalities, calculated from the total census of the German Federal Statistical Office (2015a). This index captures the variety of nationalities in a specific district. The share of foreigners is self-explanatory.

In our last category we subsume two variables: the average annual net change of foreign employment and geographic distance. Net changes in foreign employment capture labor market inflows and outflows and therefore the annual average change in the representation quotients. This variable should also capture the regional persistence of the representation quotients over time, thus representing variation that arises either from network effects or because of historical reasons. Including geographic distance is based on the idea that people

[4]Basic services include retail sale, wholesale trade, transport, hotels and restaurants, and communications. Advanced services include financial intermediation, insurance services, research and development, and real estate.

would rather work closer to their home countries than far away (also known as gravitational theory). According to this theory, one would expect larger *RQ* values in those districts that are located closer to the country of origin. We additionally introduce a quadratic term of distance to measure nonlinearities. We expect that the regional representation of foreign workers correlates with these factors and that we will therefore be able to explain the observed patterns in more detail. We also presume that the correlations vary considerably by nationality. Table 3 in Appendix A sets out a comprehensive summary of all variables, their description, and their source.

Table 1 presents some descriptive statistics, illustrating the variation in the variables across districts. For example, there is large variation in local labor market conditions. The unemployment rate (UR) varies between 2.50% (the district *Eichstätt*, located in the Free State of Bavaria) and 20.30% (the district *Uckermark*, located in the German state Brandenburg). Eastern German districts exhibit regional clusters with especially high and persistent unemployment rates. There is also a wide range of wage levels across regions. Large cities such as Hamburg and Munich, as well as districts with capital-intensive production, show higher total monthly gross earnings. The district-specific economic structure reveals several agglomerations with clusters in regional economic activity. The Ruhr Area is mainly characterized by an industrial economic structure, whereas Berlin has a high share of basic and advanced services.

Table 1: Descriptive statistics – district-specific variables

Variable	Obs.	Mean	SD	Min	Max
Labor market and economic conditions					
Unemployment rate (in %)	402	8.44	3.83	2.50	20.30
Gross earnings (in €)	402	2,539	396.33	1,673	3,760
Share high qualified employees (in %)	402	8.96	4.14	3.60	29.40
Share manufacturing (in %)	402	23.55	10.60	1.10	66.70
Share construction (in %)	402	5.22	2.07	1.00	16.00
Share advanced services (in %)	402	24.77	5.38	10.60	55.20
Share basic services (in %)	402	17.74	4.62	7.10	39.60
Amenities					
European accessibility (in mins)	402	254.36	29.33	191.00	390.00
Physician density (inhabitants per doctor)	402	679.80	183.42	254.50	1,205
Green area (in %)	402	33.03	13.51	7.72	66.16
Land price (in € per m^2)	402	102.09	97.13	9.90	908.50
Flat size (per inhabitant in m^2)	402	44.24	3.90	35.80	59.40
Crime rate (cases per 100,000 inhabitants)	402	6,694	2,730	2,679	16,596
Overnight stays (per inhabitant)	402	4.77	5.68	0.40	41.10
Population density (persons per km^2)	402	519.34	671.66	39.70	4,242
Cultural factors					
Ethnic diversity (in %)	402	9.07	5.77	2.44	35.70
Share of foreigners (in %)	402	7.12	4.49	0.70	26.50

Note: Descriptive statistics are calculated over all regional entities and the complete time period. Country abbreviations are taken from official sources. For a detailed description of the data set and the corresponding sources see Table 3 in Appendix A.

Amenities also exhibit a great deal of variation. Take the accessibility of European metropolises as an example. It is not surprising that cities like Frankfurt am Main and Munich, both of which have international airports, have the least travel time to European agglomerations. Nor is it surprising that peripheral districts, especially those in north or east in Germany, have rather poor European accessibility. As a disamenity we include the

local crime rate, measured as the number of reported crimes per 100,000 inhabitants. Local crime rates range from 2,679 per 100,000 (the district *Regensburg*, located in the Free State of Bavaria) to almost 16,600 cases per 100,000 inhabitants (*Frankfurt am Main*). There is a clear urban-rural pattern in crimes rates, with higher rates in agglomerations compared to rural areas.

Ethnic diversity as well as the share of foreigners also show considerable variation across German districts. The inverse HHI lies between 2.44 (very heterogeneous foreign population in *Trier*, a city located in the German state Rhineland-Palatinate) and 35.70 (very homogenous foreign population in *Grafschaft Bentheim*, a district located in the German state Lower Saxony). The share of foreigners in German districts is on average 7.12%, but varies between 0.70% in an Eastern German district (*Sömmerda*, located in the German state Thuringia) to 26.50% in Offenbach, a city next to Frankfurt am Main. Generally, Eastern German districts, with the exceptions of large Eastern German cities, have fewer foreigners compared to Western Germany.

4. Explaining the Spatial Patterns

4.1. Results for Total Foreign Employment

To discover which determinants are responsible for spatial patterns and to make our study comparable to the existing literature, we first present the estimation results for the representation quotient of total foreign employment (RQ_{ALL}). Thereafter, we estimate nationality-specific effects and discuss similarities and differences. We start with a standard model (1) as used by Buch *et al.* (2014).[5] This allows us to compare the empirical effects to some extent. Based on this model, we subsequently add the regional economic structure (2), the accessibility of European metropolises (3), the measure of ethnic diversity (4), and, in our full model (5), the net change in foreign employment. The inclusion of variables that mirror the sectoral structure of each region in the first step might reveal foreign workers' preferred sectors. In the second step, we add European accessibility so as to capture the importance of infrastructural hot spots, airports, and international hubs such as Frankfurt am Main or Munich. These hubs should be especially important for workers from non-neighboring countries. In a third step, ethnic diversity is included, under the assumption that workers prefer to locate locate in multicultural districts that contain a substantial number of foreigners. To include labor movements either from other German districts or from abroad, we add in the fourth step the net flow of foreign employment. This should also capture, at least to some extent, regional networks and historical patterns. We expect flows to be higher in those

[5] We use almost the same set of explanatory variables as do Buch *et al.* (2014), but their research question is quite different from ours. Whereas we focus on stocks, they describe the effects on net flows of migrants. Nevertheless, we take their article as an object of comparison since they focus on German cities and thus on the same regional level as we do.

districts that are home to national-specific networks. Finally, we add the full estimation outcomes from the spatial lag (6) or simple cross-sectional model (7) to compare the results with the full spatial error model in (5). All coefficient estimates are multiplied by 100 in order to avoid four-digit decimals. Table 2 shows the estimation results.

Table 2: Estimation results – total foreign employment

Variable	**SEM**					**SLM**	**CSM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Labor market and economic conditions							
Unemployment rate	-1.15***	-1.22***	-0.42	-0.37	-0.34	-0.20	-0.29
	(0.41)	(0.42)	(0.44)	(0.45)	(0.49)	(0.48)	(0.49)
Gross earnings	0.02**	0.01	0.00	0.00	0.00	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Share high qual. empl.	0.48	0.46	-0.04	0.20	0.20	0.19	0.20
	(0.45)	(0.43)	(0.41)	(0.43)	(0.43)	(0.43)	(0.45)
Share manufacturing	–	0.70***	0.42**	0.45**	0.45**	0.46**	0.45**
		(0.19)	(0.19)	(0.19)	(0.19)	(0.18)	(0.19)
Share construction	–	-0.92	-0.13	0.15	0.13	0.42	0.22
		(0.62)	(0.67)	(0.70)	(0.69)	(0.66)	(0.67)
Share advanced services	–	1.35***	0.62**	0.62**	0.62**	0.70**	0.64**
		(0.31)	(0.29)	(0.29)	(0.29)	(0.29)	(0.29)
Share basic services	–	0.74**	0.67**	0.73***	0.73***	0.77***	0.75***
		(0.29)	(0.28)	(0.28)	(0.28)	(0.27)	(0.28)
Amenities							
European accessibility	–	–	-0.39***	-0.39***	-0.39***	-0.37***	-0.39***
			(0.06)	(0.05)	(0.05)	(0.06)	(0.06)
Physician density	0.04***	0.03***	0.02**	0.02**	0.02**	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Green area	0.08	0.04	0.23***	0.23***	0.23***	0.20***	0.23***
	(0.09)	(0.09)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)
Land price	0.09***	0.05*	0.07***	0.09***	0.08***	0.09***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Flat size	-0.54	-1.01***	-0.70*	-0.58	-0.58	-0.68	-0.58
	(0.34)	(0.37)	(0.42)	(0.42)	(0.42)	(0.42)	(0.44)
Crime rate	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Overnight stays	-0.10	0.03	0.30	0.36*	0.36*	0.50***	0.39**
	(0.20)	(0.20)	(0.20)	(0.19)	(0.19)	(0.18)	(0.18)
Population density	-0.01**	-0.01**	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Cultural factors							
Ethnic diversity	–	–	–	0.49**	0.49**	0.58**	0.52**
				(0.25)	(0.25)	(0.24)	(0.24)
Share of foreigners	7.60***	7.08***	8.64***	8.04***	8.03***	7.36***	7.92***
	(1.03)	(0.89)	(0.67)	(0.71)	(0.73)	(0.72)	(0.69)
Miscellaneous							
Net flow of workers	–	–	–	–	0.02	0.03	0.02
					(0.11)	(0.11)	(0.11)
c	0.90	2.24	102.71***	90.45**	89.82**	73.18*	83.63**
	(2.00)	(2.39)	(35.70)	(38.23)	(39.41)	(37.59)	(38.30)
Obs.	402	402	402	402	402	402	402
pseudo R^2	0.62	0.60	0.89	0.88	0.88	0.87	–
adjusted R^2	–	–	–	–	–	–	0.87

Note: The dependent variable is the representation quotient of total foreign employment (RQ_{ALL}). All coefficients are multiplied by 100 in order to avoid numbers with too many digits. The variables are ordered as in Appendix A. Standard errors are robust to autocorrelation and heteroscedasticity in the spatial cases or clustered at the district level in the OLS-case and are shown in parentheses. ***, ** and * denote statistical significance to the 1%, 5%, and 10% level.

Which region-specific characteristics correlate with the representation of total foreign employment? In general, amenities and cultural factors are the chief drivers of the spatial distribution of foreign employment in Germany. The explanatory power of our models for the variation between districts is generally very high (see the pseudo R^2). Starting with *labor market and economic conditions*, we find a negative coefficient of the unemployment rate,

which, surprisingly, vanishes after introducing European accessibility. This finding can be mainly attributed to a high correlation between the unemployment rate and European accessibility. District-specific sectoral structure also seems to matter. Districts in which total foreign employment is overrepresented are characterized by a higher share in manufacturing and advanced and basic services. For gross earnings we find a positive and significant effect in the standard model. This effect, however, vanishes after introducing regional economic structure. Thus, it is not the median of overall gross earnings that seems to matter, but, instead, sector-specific wages, which, unfortunately, we cannot observe.

Local amenities seem to be very important in attracting foreign labor. Districts with a higher density of physicians and larger green areas exhibit higher *RQ*s. As a disamenity, the crime rate shows the expected negative sign; thus, regions with higher representation quotients are characterized by less crime. Population density also shows a negative sign, suggesting that foreign workers are in general overrepresented in rural areas. Land price has a positive effect, which may reflect the higher perceived attractiveness of a district.

Turning to *cultural factors* we find that districts with higher representation quotients also have a higher share of foreigners, but are less ethnically diverse. Our net change variable points to a high persistence of *RQ*s as this variable has no significant impact. This finding leads us to suggest that these observable patterns are more driven by historical reasons than by newly arrived workers.

From Table 2 we can conclude that there is not much difference between the SEM and the other two models (SLM and CSM) for total foreign employment. Since the tests for spatial dependence indicate that this form of correlation is present, the coefficient and standard error estimates become more precise in the SEM and SLM case, compared to the cross-sectional model. However, the bias is not large.[6] Additionally, our approach is also able to mirror the results by Buch *et al.* (2014). Thus, we can build on existing work in our study of similarities and differences between nationalities.

4.2. Similarities and Differences Between Nationalities

Focusing on total foreign employment may obscure nationality-specific effects. We thus next ask: What are the main determinants for the local representation of foreign workers with different nationalities? The tables in Appendix B show the detailed estimation results for each nationality. Below, we summarize the main findings.

In general, we find large variation in the determinants of nationality-specific spatial patterns in employment. This is easily demonstrated by taking a closer look at the spread in the number of determinants that matter between countries. For countries such as the Czech Republic or Switzerland, we find only a small number of determinants that describe the patterns between districts. The opposite holds for Croatia or Spain.

[6] A small bias between the different specifications is also found by Berlemann and Jahn (2016) for regional innovation performance and owner-managed firms.

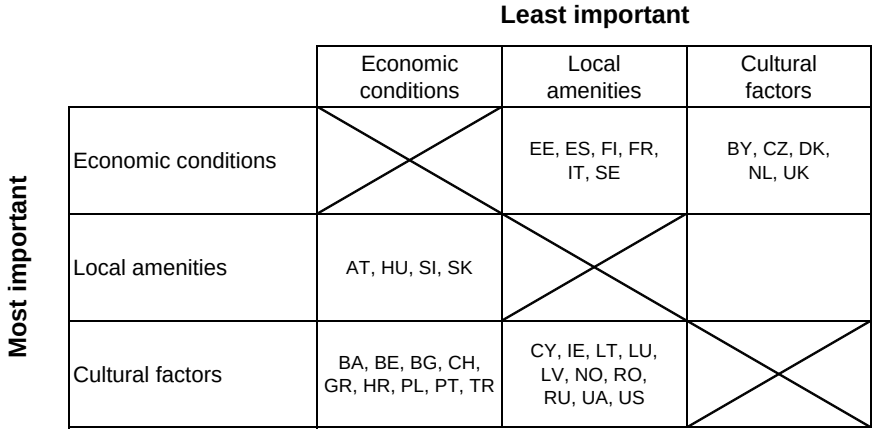
Nevertheless, the results are clear-cut. The most important characteristic of a district is the net flow of foreign workers. For 22 countries in our sample, the net change in foreign employment matters significantly. The net change is also a perfect example of effects that can be obscured by investigating aggregates. That is, for total foreign employment we found no significant correlation at all (see Table 2), which points to the fact that nationality-specific effects cancel each other out. Immediately following in terms of importance are share of advanced services, population density, and share of foreigners, which correlate with the representation quotient of 17 of our nationalities. Also, land price seems to be an important variable. The least three important determinants are overnight stays and green area (each with a value of 7) as well as the flat size (8 nationalities). It seems that cultural factors and amenities correlate in more cases with the RQs compared to labor market and economic conditions.

To put our results in finer focus, we introduce the following 3×3 matrix based on the most and least important category.[7] Each column represents the case that one of the three categories is the least important for a specific nationality. The rows show the cases for the most important category. Thus, each cell contains a number of nationalities that fit a "most-least importance" combination of the three categories. Figure 5 presents this 3×3 matrix. For the majority of 10 nationalities we observe a combination where cultural factors are most important and local amenities are least important. Additionally, nine nationalities show up in the cell that represents a "cultural factors most-important–economic conditions least-important" combination. Whenever economic conditions are the most important category, the least important category is local amenities and vice versa. However, there are no nationalities for whom local amenities are most important and cultural factors are least important.

Is there any systematic difference between nationalities? To answer this, we concentrate on the three cases where each category is classified as most important. First, we take the case of the nationalities for whom economic conditions matter most: Belarus, the Czech Republic, Denmark, Estonia, Finland, France, Italy, the Netherlands, Spain, Sweden, and the United Kingdom. The regions in which those nationalities are more represented differ from other regions especially in terms of their sectoral structure. For most of the nationalities, the share of advanced services significantly correlates with the specific representation quotients. With the exception of Estonia and the Netherlands, we find a positive coefficient for this sector's share. Additionally, the share of basic services correlates positively with the representation quotients for 10 of the 11 countries. For seven nationalities we find a positive correlation for gross earnings of a district and the share of high-qualified employees. Another characteristic of this group of nationalities is population density. With the exceptions of Denmark, the

[7] The matrix is based on relative weights for each category of explanatory variables. First, we calculate the relative sum of variables that matter for each nationality. Second, we divide the share of each category by this relative sum in order to derive the importance of each category. This procedure makes the categories comparable.

Figure 5: Matrix with most-least-importance combinations



Note: Malta (MT) is missing in the figure since no variable significantly correlates with the representation quotient. Country abbreviations are coded as in the ISO 3166-1 alpha-2 standard. AT: Austria, BA: Bosnia-Herzegovina, BE: Belgium, BG: Bulgaria, BY: Belarus, CH: Switzerland, CY: Cyprus, CZ: Czech Republic, DK: Denmark, EE: Estonia, ES: Spain, FI: Finland, FR: France, GR: Greece, HR: Croatia, HU: Hungary, IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxembourg, LV: Latvia, NL: Netherlands, NO: Norway, PL: Poland, PT: Portugal, RO: Romania, RU: Russian Federation, SE: Sweden, SI: Slovenia, SK: Slovakia, TR: Turkey, UA: Ukraine, UK: United Kingdom, US: United States.

Czech Republic, and France, people from the other five nationalities mainly work in rural districts.

The second group contains those nationalities for which local amenities are most important: Austria, Hungary, Slovakia, and Slovenia. We find a negative coefficient for population density, European accessibility, and crime rate. This is no surprise because workers with these nationalities are mainly overrepresented in rural German districts. These regions are not significantly different in terms of the unemployment rate and the shares of manufacturing and advanced services. But the share of construction seems to matter for workers from Hungary and Slovakia. For Austrians and Hungarians, the share of high-qualified employees also shows a significant positive correlation.

For the third and last group, the net flow of workers, the share of foreigners, and the measure for ethnic diversity mainly correlate with the nationality-specific representation quotients. This finding is evidence for the existence of network effects, since local labor market conditions and amenities play only a minor role. The districts where most of these workers locate have a higher total share of foreigners, labor movement of these nationalities was higher in the past, and these regional entities are more ethnically diverse. Remarkable for this group is the finding that the unemployment rate significantly negatively correlates with the representation of workers from Eastern European countries and Russia, with the exception of Croatia. For this subgroup, economic conditions in addition to local networks seem to be crucial location factors.

This last finding concerning workers from Eastern European countries motivates us to look at the following three groups of countries: (i) old member states of the European Union (joined before the year 2004); (ii) new member states of the European Union (joined in

the year 2004 or later), and (iii) non-EU countries. We start with the old member states of the European Union. The most important characteristic of this group is that the share of advanced services is in almost all cases, with the exceptions of Austria, Luxembourg, and the Netherlands, positively correlated with the representation quotients. Population density is also important and shows a negative correlation, which suggests that workers from old member states prefer to work in rural districts. Additionally, three variables – gross earnings, the share of high-qualified employees, and the share of basic services – are positively correlated with the representation quotients.

Are there differences between old and new member states of the European Union? The answer is "yes". German districts in which workers from new member states are overrepresented are characterized by a higher net flow of foreign workers, higher land prices, lower unemployment rates, a higher share of foreigners, and lower shares in construction. This may indicate that these foreign workers are employed in relatively low-skilled jobs and thus focus on districts with stronger networks.

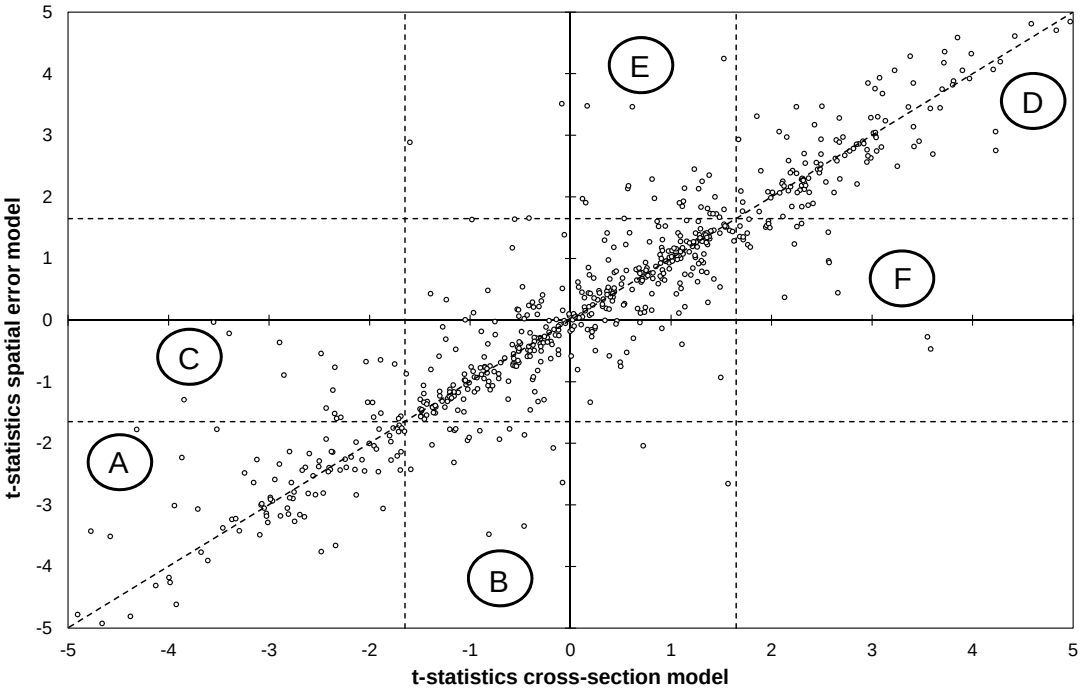
The last group consists of countries that are not members of the European Union. As was the case of workers from new member states, workers from non-EU countries are overrepresented in districts where the share of foreigners is higher. There also seem to be network effects, since the past net flow of foreign workers shows a positive influence. The unemployment rate has a negative sign and the share of advanced services has a positive coefficient.

Finally, we ask how the estimates of the spatial error model compare with those of the simple cross-section model (CSM); the comparison is presented graphically in Figure 6. Figure 6 is a scatter plot that compares nationality-specific SEM estimates with those resulting from the simple CSM. On the x-axis, the t-statistics for each variable and country resulting from the CSM are plotted. The y-axis presents the t-statistics for the SEM. We use t-statistics for two reasons: First, they show the sign of the coefficients and, second, they are comparable between estimates and variables. This enables us to show all countries in one graph. So each y-x combination, presented as a circle in the diagram, stands for a specific variable and country either resulting from the CSM or the SEM. The advantage of the scatter plot is its ability to divide the diagram into four quadrants that capture a positive-negative combination of t-statistics. We additionally introduce the 45°line. If all circles fall on this line, it means that the results from the CSM and the SEM estimations are identical, thus, the CSM estimation perfectly runs in the right direction. The worst case that can result from these comparisons would be if all circles either lie in quadrant II or IV. In this case, all signs of the coefficients are reversed. If all combinations lie in quadrant I or III, then no coefficient changes its sign. Another advantage of using t-statistics is that we can assess changes in significance between the various models. Therefore, we introduce the vertical and horizontal dashed lines, indicating the critical value of 1.648, which stands for the 10% significance level. With these two lines, we can identify six rectangles (A, B, C, D, E, and F) and one square that is located in the middle of the diagram. The interpretations are

straightforward: the square in the middle limits the combinations that are insignificant in the CSM as well as in the SEM. Each circle that lies in rectangle A (D) shows a combination of t-stats that are negative (positive) and significant in both model estimations. Rectangle B (E) presents a combination where the estimates are negative (positive) as well as significant in the SEM case and insignificant in the CSM. The last rectangle C (F) contains the combinations where the coefficient estimates are negative (positive) as well as significant in the CSM, but insignificant in the SEM.

Some variables are significant in the SEM model but not in the CSM and vice versa. However, the numbers are very small. Thus, the majority of effects are located either in rectangle A and D or in the square in the middle. We thus conclude that the CSM is generally doing a good job. However, the estimations become more precise in terms of the standard deviations of the coefficients after introduction of the SEM.

Figure 6: Comparison cross-section versus spatial error model



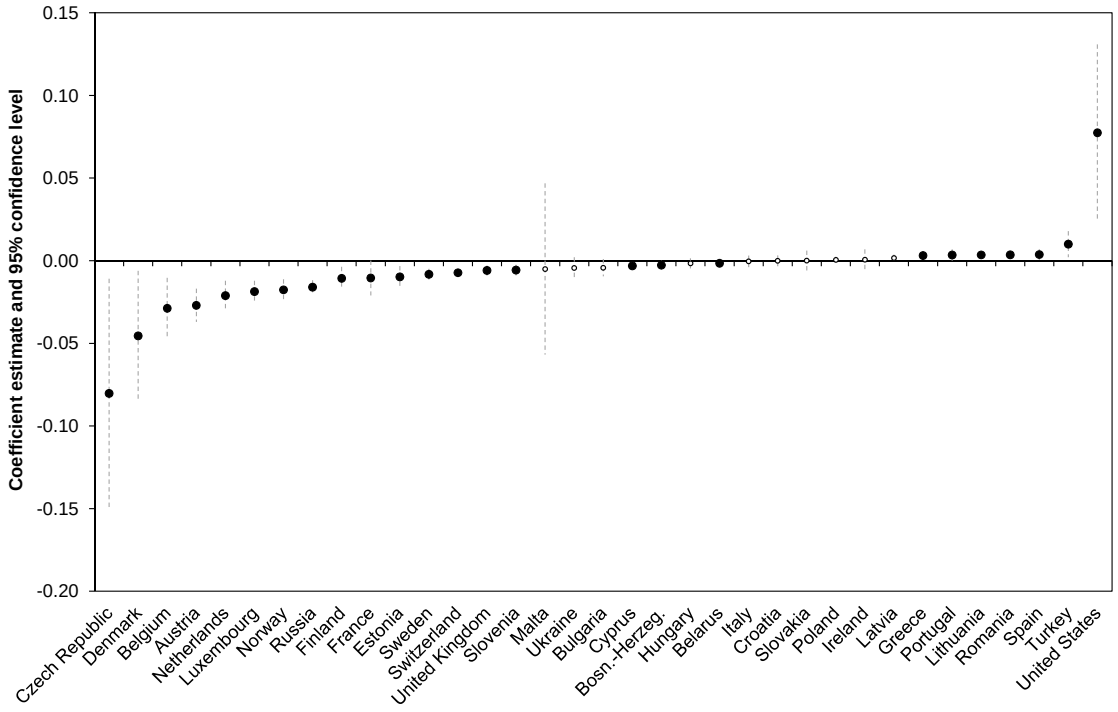
Note: Each circle represents, for a given variable and country, a combination of t-Statistics between the CSM and the SEM. The vertical and horizontal dashed lines mark the critical value of 1.648 that stands for the 10% confidence level to reject the null hypothesis. The capital letters define the rectangles of significance combinations.

4.3. The Role of Distance

This far, we have neglected the role played by distance in foreign' workers location decisions. Gravitation theory suggests that foreign workers tend to locate near to their home country (see, e.g., Lewer and Van den Berg, 2008). Thus, there are fewer foreign workers at longer distances from their home country. We therefore expect a negative effect of distance in our

empirical models. However, this should mainly hold for the neighboring countries or countries located close to Germany. Once the most probable way of traveling is by plane, distance should no longer have an impact. This hypothesis is supported by the visual evidence of representation quotients in Section 2. Figure 7 presents the coefficient estimates for the distance variable together with the 95% confidence bands. All point estimates are from the nationality-specific model in column (5) in Table 2; the coefficient estimates can be found in Appendix B. The nationalities are presented in ascending order, starting with the highest negative value. For ease of interpretation, coefficient estimates that are at least significant at the 5% level are represented by bigger black circles. In those cases where the distance variables are not significantly different from zero, we use smaller white circles.

Figure 7: Distance coefficient estimate and 95% confidence bands by nationality



Note: Big black circles indicate that the coefficient estimate is different from zero at least to the 5% significance level. A smaller white circle is applied to an insignificant effect. The coefficient estimates are presented in ascending order, starting with the highest negative value.

There is a significant influence of distance on regional representation for 25 countries. The distance estimates for the remaining 10 nationalities are not significantly different from zero. We find a negative significant impact of distance in 18 cases. For seven nationalities, the effect of distance is positive and significant (Greece, Portugal, Lithuania, Romania, Spain, Turkey, and the United States).

First, let us look at the countries neighboring Germany, for which the effects of distance are clear-cut. With two exceptions, the largest negative coefficients can be found for the countries neighboring Germany. The largest negative effect is for workers from the Czech Republic; the smallest effect is estimated for employees from Switzerland. The striking

exception is Poland: there is no effect for Polish workers at all. Additionally, the coefficient shows a positive sign. We think that the result for Poland is driven by historical patterns, since there is a large overrepresentation of Polish workers in the Western part of Germany. As discussed in Section 2, there were large Polish immigration waves to Western Germany. In the case of the so called *Aussiedler*, the German authority distributed the workers via the *Königssteiner Schlüssel*, so that most of the workers settled in the Ruhr Area. Since the lagged net flow is highly significant in our case, network effects and historical reasons seem more relevant than the actual influence of distance. We observe a small band of overrepresentation of Polish workers in German districts next to the Polish border. Possibly there is some inherent distance effect, but the variation between the districts is not large enough to indicate a statistical difference.

Distance also plays a major role in the distribution of workers from non-neighboring countries. For the countries that lie to the north of Germany – Finland, Ireland, Norway, Sweden, and the United Kingdom – distance shows a negative and significant correlation with the regional representation quotients. The only exception is Ireland, for which the effect is positive but not different from zero. Overall, it appears that workers from countries that lie to the north of Germany tend to locate in proximity to their home country.

The next group of countries comprises the Central and Eastern European states that are members of the European Union: Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia, and Slovenia. The results are very heterogeneous, since we find a positive influence for two countries, a negative influence twice, and, in five cases no significant effect. For Bulgarian, Croatian, Hungarian, Latvian, and Slovakian workers distance seems to play no role. These results are somewhat surprising since the visual evidence led us to expect the opposite (see Figures 2 and 3). We hypothesize that the main reason for the insignificance lies in possibility of possible network effects. In all five cases, the past net flow of foreign workers is highly significant. For Lithuania and Romania we observe a positive coefficient for our distance variable. In the case of Lithuania, the results mirror the visual evidence: Lithuanian workers locate in the western part of Germany. Romanian workers, in contrast, prefer to locate in both the northwestern and southwestern part of Germany. For the remaining two countries – Estonia and Slovenia – we find significant negative coefficients of distance. In the case of Slovenia, the result is straightforward: workers are exclusively overrepresented in southern Germany. The result for Estonia is confusing at first, but if we take a closer look at Figure 2, the picture becomes clear. Estonian workers are overrepresented in the northern and northeastern part of Germany. Thus, if they move to Germany because of proximity, they tend to locate in the western part of the country.

The third group contains Cyprus, Greece, Italy, Malta, Portugal, and Spain, all more or less Mediterranean countries. We find no effect for Italy and Malta. The total number of workers from Malta is too small and the visual evidence makes clear that the few workers from this country are more or less randomly distributed across Germany. Based on the

visual evidence, the insignificant effect for Italy seems odd, since Italians mainly work in the southwestern German federal state Baden-Württemberg, which is geographically close to the northern part of Italy. However, this insignificant result reflects historical circumstances, since there have been large immigration waves of Italian workers due to the German *Wirtschaftswunder* in the 1950 and 1960s (*Gastarbeiter*) and most of these workers located in the Ruhr Area as well as in the southern part of Germany. The effects for Portugal and Spain are positive, which can also be seen in Figure 3. Portuguese and Spanish workers are concentrated in an inner band of Germany, as well as being overrepresented in large German cities. Another reason for the results can be found in Germany's history. After World War II, Germany signed recruitment agreements with Portugal and Spain to legitimate free movement of Portuguese and Spanish workers to Germany. The same agreements were in force for workers from Greece, for which we also find a positive and significant coefficient.

The last group includes all the remaining countries that are not member states of the European Union. We find no significant effect for the Ukraine, thus matching the visual evidence. In the case of Belarus, Bosnia-Herzegovina, and Russia, we find negative coefficients. We find a significant positive influence for Turkey and the United States of America. The Turkish community is one of the largest in Germany, due at least partly to a recruitment agreement between Turkey and Germany, which led to many Turks settling in the Ruhr Area as *Gastarbeiter*. Thus, this pattern is driven by historical reasons.

It could be that the effect of distance is increasing or decreasing instead of linear. We thus introduce a quadratic distance variable in our regression, resulting in either a U-shaped curve or an inverse U-shaped curve. For most of the countries we found a negative impact of distance. Thus, we expect that the majority of squared effects are positive. Detailed estimation results can be found in the tables in Appendix B.

We conclude that the effect of distance becomes smaller, the longer the distance. What does this mean for the nationality-specific representation quotients? The answer is straightforward: after a certain distance from a certain country is reached, workers from that country become less represented. This numerical result clearly confirms the visual evidence. The effect is strongest for the neighboring countries, again with the exception of Poland.

5. Conclusion

Most studies on the determinants of migration focus on countries as the unit of analysis and thus at the top federal level. To date, not much is known about the within-country spatial distribution of foreign employment. This study takes a step toward addressing this gap in knowledge with four major results for the German case that were derived by relying on a total census of employment.

We first provide descriptive evidence on the spatial distribution in Germany of foreign workers from 35 different nationalities by means of maps. This evidence suggests that there are both similarities and differences in the migration determinants of workers from different countries. What is common to all the considered nationalities is a strong overrepresentation in metropolitan agglomerations such as Berlin, Munich, or Frankfurt am Main. Workers from countries geographically close countries to Germany seem to prefer to work in proximity to their home countries. Several country-specific hot spots are identified that can be attributed to existing networks. Some of these regional hot spots were created in the past by means of recruitment agreements between Germany and several countries in the 1950s and 1960s.

In a second step we investigate which local determinants significantly correlate with the representation of total foreign employment. We mirror the results of other work that focuses on migration flows instead of local representation and find that in addition to local amenities and the economic structure of a region, ethnic diversity and share of foreigners are important. Thus, our study replicates effects found in previous studies, thus providing a firm foundation for our third contribution.

Our third contribution to the literature is our exploration of the variation in location determinants between workers from different countries. Cultural factors and amenities correlate in more cases with the nationality-specific representation quotients than do local labor market and economic conditions. However, we can identify different groups of countries for which certain determinants are more important than others. For the old member states of the European Union, it is mainly labor market and economic conditions that explain the location patterns. A balanced mixture of labor market and economic conditions as well as some amenities and cultural factors are important for the location decisions of workers from the new EU member states. For workers from non-EU states, location decisions appear to be chiefly determined by cultural factors.

Our fourth and last contribution involves the role played by distance in nationality-specific representations of employment. For countries that neighbor or are geographically close to Germany, distance has a negative impact, with a U-shaped form. Therefore, we observe small inner-German bands of very high overrepresentation for several neighboring or nearby countries. The striking exception is Poland, for which there are two plausible explanations. First, the economic situation in the rural areas of Germany that are close to the Polish border is poor compared to that of Western German districts. Second, there are strong networks of Polish emigrants in Western Germany that have been in existence since the 1970s and are thus an attractive pull factor for many Poles.

We believe that the results presented in this paper have wide-ranging relevance that goes beyond a merely economic focus. For example, our results should be of interest to firm owners since our findings will enable them to specifically target their recruitment efforts toward those workers who have the highest probability of moving to the firm's district. For politicians, our results carry implications for economic prosperity and social policy. In

light of a shrinking and aging population, rural regions might be especially harmed by their paucity of foreign labor. We leave such considerations and potential investigations to future research and suggest that such work not focus exclusively on economic questions, but take a more interdisciplinary approach.

Acknowledgments: We thank Georg Hirte, Marcel Thum, and Silke Übelmesser for their helpful comments and suggestions. We are also grateful to seminar participants at the Technische Universität Dresden, the 8th Summer Conference in Regional Science 2015, Kiel, the 71st Annual Congress of the International Institute of Public Finance (IIPF) 2015, Dublin, the 55th Congress of the European Regional Science Association (ERSA) 2015, Lisbon, the 8th Geoffrey J.D. Hewings Regional Economics Workshop 2015, Vienna, the 2015 Workshop on Migration Barriers at the Friedrich-Schiller-Universität, Jena, the ifo/CES Christmas Conference 2015, Munich, the 14th Public Finance Seminar 2015, Berlin, and the Joint Annual Meeting of the Austrian Economic Association and the Slovak Economic Association 2016, Bratislava. Antje Fanghänel, Franziska Kruse, and Frank Simmen provided excellent research assistance. We also thank Deborah Willow for her language editing.

References

Alesina, A. and La Ferrara, E. (2005). Ethnic Diversity and Economic Performance. *Journal of Economic Literature*, **43**, 762–800.

Anselin, L. (2001). Spatial Econometrics. In B. H. Baltagi (ed.), *A Companion to Theoretical Econometrics*, *Chapter 14*, Blackwell Publishing Ltd., pp. 310–330.

Arntz, M. (2010). What Attracts Human Capital? Understanding the Skill Composition of Interregional Job Matches in Germany. *Regional Studies*, **44** (4), 423–441.

Beine, M. and Parsons, C. (2015). Climatic Factors as Determinants of International Migration. *Scandinavian Journal of Economics*, **117** (2), 723–767.

Berlemann, M. and Jahn, V. (2016). Regional Importance of Mittelstand Firms and Innovation Performance. *Regional Studies*, **50** (11), 1819–1833.

Bessey, D. (2012). International Student Migration to Germany. *Empirical Economics*, **42** (1), 345–361.

Biagi, B., Faggian, A. and McCann, P. (2011). Long and Short Distance Migration in Italy: The Role of Economic, Social and Environmental Characteristics. *Spatial Economic Analysis*, **6** (1), 111–131.

Buch, T., Hamann, S., Niebuhr, A. and Rossen, A. (2014). What Makes Cities Attractive? The Determinants of Urban Labour Migration in Germany. *Urban Studies*, **51** (9), 1960–1978.

Chen, Y. and Rosenthal, S. (2008). Local Amenities and Life-Cycle Migration: Do People Move for Jobs or Fun? *Journal of Urban Economics*, **64** (3), 519–537.

Clark, X., Hatton, T. J. and Williamson, J. G. (2007). Explaining U.S. Immigration, 1971–1998. *Review of Economics and Statistics*, **89** (2), 359–373.

Dietz, B. (2011). *Immigrants from East Central Europe and Post-Soviet Countries in Germany*. ENRI-East Research Report #16.

Eckey, H.-F., Kosfeld, R. and Türck, M. (2007). Regionale Entwicklung mit und ohne räumliche Spillover-Effekte. *Review of Regional Research*, **27** (1), 23–42.

Etzo, I. (2011). The Determinants of the Recent Interregional Migration Flows in Italy: A Panel Data Analysis. *Journal of Regional Science*, **51** (5), 948–966.

Florida, R. (2002). Bohemia and Economic Geography. *Journal of Economic Geography*, **2** (1), 55–71.

Geis, W., Übelmesser, S. and Werding, M. (2011). Why Go to France or Germany, if You Could as Well Go to the UK or the US? Selective Features of Immigration to the EU 'Big Three' and the United States. *Journal of Common Market Studies*, **49** (4), 767–796.

German Federal Criminal Police Office (2014). *Police Crime Statistics*. Data upon request under: *oeffentlichkeitsarbeit@bka.bund.de*.

German Federal Employment Agency (2013). *Statistics of the German Federal Employment Agency – Employed Persons Subject to Social Security According to Selected Nationalities, German Regions (NUTS-3)*. Data upon request, Nuremberg 2013.

German Federal Employment Agency (2016). *Statistics of the German Federal Employment Agency – Marginal Employed Persons According to Place of Residence and Place of Work, German Regions (NUTS-3), Various Volumes*. Nuremberg 2016.

German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015). *INKAR – Indicators and Maps on Spatial and Urban Development in Germany and Europe*. Data available under: *http://www.inkar.de*.

German Federal Statistical Office (2015a). *Foreigners According to Sex and Nationality, Cutoff date December 31, German Regions (NUTS-3), Time Series Code: 12521-0040*. GENESIS-Online Data Base Germany, available under: *http://www-genesis.destatis.de/genesis/online*.

German Federal Statistical Office (2015b). *Land Area According to Their Effective Usage, Cutoff date December 31, German Regions (NUTS-3), Time Series Code: 449-01-4*. Regional Data Base Germany, available under: *http://www.regionalstatistik.de/genesis/online*.

German Federal Statistical Office and the Statistical Offices of the Länder (2016). *Sales of Building Land, Annual Sum, German Regions (NUTS-3), Time Series Code: 400-51-4*. Regional Database Germany, available under: *http://www.regionalstatistik.de/genesis/online*.

Hönekopp, E. (1997). *Labour Migration to Germany from Central and Eastern Europe – Old and New Trends*. IAB Labour Market Research Topics No. 23.

Isphording, I. E. and Otten, S. (2014). Linguistic Barriers in the Destination Language Acquisition of Immigrants. *Journal of Economic Behavior & Organization*, **105**, 30–50.

Lerbs, O. W. and Oberst, C. A. (2014). Explaining the Spatial Variation in Homeownership Rates: Results for German Regions. *Regional Studies*, **48** (5), 844–865.

Lewer, J. J. and Van den Berg, H. (2008). A Gravity Model of Immigration. *Economics Letters*, **99** (1), 164–167.

Mayda, A. M. (2010). International Migration: A Panel Data Analysis of the Determinants of Bilateral Flows. *Journal of Population Economics*, **23** (4), 1249–1274.

Niedomysl, T. (2011). How Migration Motives Change Over Migration Distance: Evidence on Variation Across Socio-Economic and Demographic Groups. *Regional Studies*, **45** (6), 843–855.

Partridge, M. (2010). The Dueling Models: NEG vs. Amenity Migration in Explaining US Engines of Growth. *Papers in Regional Science*, **89** (3), 513–536.

Pedersen, P. J., Pytlikova, M. and Smith, N. (2008). Selection and Network Effects – Migration Flows into OECD Countries 1990–2000. *European Economic Review*, **52** (7), 1160–1186.

Rodríguez-Pose, A. and Ketterer, T. D. (2012). Do Local Amenities Affect the Appeal of Regions in Europe for Migrants? *Journal of Regional Science*, **52** (4), 535–561.

Ruyssen, I., Everaert, G. and Rayp, G. (2014). Determinants and Dynamics of Migration to OECD Countries in a Three-Dimensional Panel Framework. *Empirical Economics*, **46** (1), 175–197.

Scott, A. J. (2010). Jobs or Amenities? Destination Choices of Migrant Engineers in the USA. *Papers in Regional Science*, **89** (1), 43–63.

Wang, Z., De Graff, T. and Nijkamp, P. (2016). Cultural Diversity and Cultural Distance as Choice Determinants of Migration Destination. *Spatial Economic Analysis*, **11** (2), 176–200.

Warchol-Schlottmann, M. (2001). Polonia in Germany. *Samartian Review*, **XXI** (2).

Working Group Regional Accounts (2014). *Gross Domestic Product, Gross Value Added in Germany on NUTS3-Level 1992, 1994 to 2012*. Series 2, District Results Volume 1, Date of Calculation: August 2013, Stuttgart 2014.

A. Data set description

Table 3: Data descriptions and corresponding sources

Variable	Description	Source
	Dependent variable	
Representation quotient	Share of foreign workers to total employment (no unit)	German Federal Employment Agency (2013)
	Labor market and economic conditions	
Unemployment rate	Number of unemployed persons divided by the labor force (in %)	German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015)
Gross earnings	Median of monthly gross earnings of full-time employees (in €)	German Federal Employment Agency (2013)
Share high qualified employees	Number of high qualified employees divided by total employment (in %)	German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015)
Share manufacturing	Gross value added in manufacturing divided by total gross value added (in %)	Working Group Regional Accounts (2014)
Share construction	Gross value added in construction divided by total gross value added (in %)	Working Group Regional Accounts (2014)
Share advanced services	Gross value added in advanced services divided by total gross value added (in %)	Working Group Regional Accounts (2014)
Share basic services	Gross value added in basic services divided by total gross value added (in %)	Working Group Regional Accounts (2014)
	Amenities	
European accessibility	Average travel time per car and plane to 41 European agglomerations (in min.)	German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015)
Physician density	Number of inhabitants per physician (no unit)	German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015)
Green area	Share of green area (recreation area, woodland area and water expanse) in total area (in %)	German Federal Statistical Office (2015b)
Land price	Average market value (in € per m^2)	German Federal Statistical Office and the Statistical Offices of the Länder (2016)
Flat size	Living space divided by the number of inhabitants (in m^2 per person)	German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015)
Crime rate	Number of cases divided by the number of inhabitants (per 100,000 persons)	German Federal Criminal Police Office (2014)
Overnight stays	Number of overnight stays in tourist enterprises divided by the number of inhabitants (in persons)	German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015)

Continued on next page...

Table 3: Data descriptions and corresponding sources (cont.)

Variable	**Description**	**Source**
Population density	Total population divided by total area (in inhabitants per m^2)	German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2015)
	Cultural factors	
Ethnic diversity	Inverse Herfindahl-Hirschman-Index based on foreigner shares from 207 nationalities	German Federal Statistical Office (2015a)
Share of foreigners	Total number of foreigners divided by the number of inhabitants (in %)	German Federal Statistical Office (2015a)
	Miscellaneous	
Net flow of workers	Annual difference of foreign workers (persons per 10,000 employees)	German Federal Employment Agency (2013)
Distance	Geographical distance from the center of the district to the centroid of the country (in km)	own calculations

B. Detailed nationality-specific estimation results

Table 4: Estimation results – nationalities I

Variable	AT	BA	BE	BG	BY	CH	CY	CZ	DK	EE	ES	FI
Labor market and economic conditions												
Unemployment rate	2.98	1.90**	-2.46	-0.12	-1.83**	-1.47	3.87*	-13.42*	-0.94	-4.97***	4.04***	-0.82
Gross earnings	-0.01	0.01	-0.01	-0.01	-0.03***	0.01	0.05	0.15	-0.02	0.00	0.04***	0.05***
Share high qual. empl.	8.53***	-0.45	4.00	5.47***	3.97***	1.38	5.18**	-4.93	1.70	0.00	2.46***	0.63
Share manufacturing	-0.01	-0.45	0.39	-0.47*	0.39	-0.27	-0.50	-0.65	0.58	-1.16**	1.26***	0.75
Share construction	-2.16	-0.49	-6.56	0.11	-0.75	-3.24	3.88	6.23	-3.82	-5.88***	-2.14*	1.71
Share advanced services	-0.82	-0.59	2.93*	-0.61	1.58***	0.70	0.26	3.34	4.87*	-1.39*	3.51***	3.30***
Share basic services	2.85	0.05	-2.07	0.10	0.56	-0.46	-2.11	-3.01	7.49*	1.92**	2.32***	2.65***
Amenities												
European accessibility	-0.75**	-0.24**	0.44	-0.01	-0.05	0.13	-0.58**	2.14	-0.24	-0.09	-0.49***	-0.12
Physician density	0.06	0.03**	0.03	0.00	-0.00	0.02	-0.00	0.25	-0.11	-0.02	0.08***	0.00
Green area	1.31**	0.09	-0.64*	0.39**	0.07	0.22	0.69*	4.98	1.86	-0.26	0.36*	0.24
Land price	0.09	0.15***	-0.37	0.22***	0.10**	0.10	0.02	-0.01	-0.26	0.14**	0.00	0.18***
Flat size	2.33	-0.50	-4.87	2.01***	3.34***	-1.72	5.23	12.77	1.98	1.72	-1.55*	-1.10
Crime rate	0.01	-0.01***	-0.00	0.00	0.00***	0.00	0.00	0.00	-0.02	0.00	-0.00	0.00
Overnight stays	1.76	-0.39	-0.19	0.68	-0.88***	0.73	-0.32	13.78**	-5.72	-0.18	1.17***	0.23
Population density	-0.04*	0.00	-0.06**	-0.01	-0.00	-0.02**	0.01	0.10	0.12**	-0.01	-0.01	-0.02*
Cultural factors												
Ethnic diversity	4.17	-0.98***	-7.42**	-0.42	-0.10	0.20	-0.81	2.45	1.59	-0.56	-0.85	-1.37***
Share of foreigners	-0.04	4.72***	18.01	2.04*	0.13	2.53	2.06	10.78	-7.80	0.02	7.16***	1.76
Miscellaneous												
Net flow of workers†	-1.31***	0.67***	-0.16	0.36***	0.76**	2.22***	9.43***	0.18	-13.99	2.36**	-0.51***	1.02
Distance	-2.70***	-0.27*	-2.88***	-0.43	-0.16*	-0.73***	-0.31***	-8.03**	-4.55**	-0.98***	0.37**	-1.07***
Distance squared	0.24***	0.01*	0.27***	0.01	0.01**	0.06***	0.01***	0.80*	0.35**	0.03***	-0.01**	0.03***
c†	5.99***	2.16***	9.69**	2.28	-0.14	2.18*	0.04	0.09	13.62**	7.84***	-4.45***	8.09**
Obs.	402	402	402	402	402	402	402	402	402	402	402	402
pseudo R^2	0.78	0.84	0.27	0.77	0.45	0.60	0.20	0.38	0.44	0.31	0.60	0.58

Note: The dependent variable is the representation quotient of nationality-specific foreign employment. Country abbreviations are taken from official sources and stand for the following countries: AT...Austria, BA...Bosnia-Herzegovina, BE...Belgium, BG...Bulgaria, BY...Belarus, CH...Switzerland, CY...Cyprus, CZ...Czech Republic, DK...Denmark, EE...Estonia, ES...Spain and FI...Finland. With the exceptions of the net flow of workers and the constant (†), all coefficients are multiplied by 100 in order to avoid numbers with too many digits. The variables are ordered as in Appendix A. Standard errors are robust to autocorrelation as well as heteroscedasticity and are shown in parentheses. ***, ** and * denote statistical significance to the 1%, 5% and 10% level.

Table 5: Estimation results – nationalities II

Variable	FR	GR	HR	HU	IE	IT	LT	LU	LV	MT	NL	NO
Labor market and economic conditions												
Unemployment rate	0.77	1.15	2.66**	1.97	0.96	1.06	1.24	-12.32**	-2.31**	-7.07	-8.00**	-0.76
Gross earnings	0.07*	-0.03	0.03**	-0.00	0.04***	-0.01	-0.00	-0.08**	0.01	-0.07	-0.13**	0.02
Share high qual. empl.	5.71**	0.72	-1.04	3.13***	3.26**	2.34*	0.60	-0.67	0.13	-0.04	8.63**	3.40**
Share manufacturing	2.55***	0.86*	0.65	-0.04	-0.22	1.97***	-0.79**	0.37	-0.85**	1.37	0.39	0.55
Share construction	-3.24	-4.88***	0.83	3.60*	0.51	-2.02	-3.06**	-5.39	-1.76	-2.73	9.82**	-0.10
Share advanced services	2.25	1.77**	1.53**	-0.22	2.01**	1.71**	0.22	-0.57	0.07	0.71	-1.45	2.65***
Share basic services	1.67	-0.07	0.19	0.55	2.30***	1.19*	0.42	-0.73	0.48	5.29	2.02	1.19
Amenities												
European accessibility	0.14	-0.55***	-0.17*	-0.44***	-0.06	-0.04	-0.10	0.95***	-0.18	-1.03	0.31	-0.12
Physician density	0.12**	0.05**	0.04***	-0.02	0.05**	0.05	0.03*	-0.01	-0.01	-0.14	0.09*	-0.01
Green area	0.15	-0.56*	0.29	0.08	0.08	0.11	0.00	-1.03**	0.07	-0.43	-0.45	0.30
Land price	0.04	0.21**	0.27***	0.25***	0.32***	0.02	0.02	0.13	0.09*	0.33	0.18	0.16**
Flat size	0.93	-1.06	-1.70*	3.02	1.58	0.15	0.63	-1.21	0.63	1.73	2.54	1.75
Crime rate	0.01	-0.01**	-0.01***	-0.00**	-0.00	-0.00	0.00	0.01	0.00	-0.01	0.01*	0.00
Overnight stays	1.05	0.23	0.34	0.44	0.23	-0.44	0.37	-0.93	0.76*	-1.92	-1.21	-1.10
Population density	0.00	-0.01	-0.01	-0.02**	-0.02***	-0.02**	-0.02***	0.00	-0.01	0.03	-0.08***	-0.00
Cultural factors												
Ethnic diversity	-0.90	-0.33	-0.81*	0.11	-0.64	-0.48	-1.33***	-3.32***	-1.09***	2.16	3.94	-0.32
Share of foreigners	-2.15	5.73***	7.35***	1.99	2.65**	13.90***	5.01***	5.44	0.99	-5.81	15.87**	1.57
Miscellaneous												
Net flow of workers†	-1.42***	-0.41***	0.20**	0.25***	2.22***	-0.11	1.37***	14.71***	0.87***	13.22	-0.69	2.90***
Distance	-1.04*	0.31***	-0.01	-0.16	0.06	-0.04	0.35***	-1.87***	0.17	-0.50	-2.12***	-1.76***
Distance squared	0.05	-0.01***	-0.00	0.00	-0.00	-0.00	-0.02***	0.21***	-0.01**	0.01	0.20***	0.07***
c†	0.12	-0.07	0.10	1.30*	-3.48	0.10	-1.91***	6.28**	-0.00	10.23	4.52***	9.50***
Obs.	402	402	402	402	402	402	402	402	402	402	402	402
pseudo R^2	0.69	0.37	0.60	0.75	0.66	0.47	0.70	0.68	0.63	0.15	0.43	0.47

Note: The dependent variable is the representation quotient of nationality-specific foreign employment. Country abbreviations are taken from official sources and stand for the following countries: FR...France, GR...Greece, HR...Croatia, HU...Hungary, IE...Ireland, IT...Italy, LT...Lithuania, LU...Luxembourg, LV...Latvia, MT...Malta, NL...Netherlands and NO...Norway. With the exceptions of the net flow of workers and the constant (†), all coefficients are multiplied by 100 in order to avoid numbers with too many digits. The variables are ordered as in Appendix A. Standard errors are robust to autocorrelation as well as heteroscedasticity and are shown in parentheses. ***, ** and * denote statistical significance to the 1%, 5% and 10% level.

Table 6: Estimation results – nationalities III

Variable	PL	PT	RO	RU	SE	SI	SK	TR	UA	UK	US
Labor market and economic conditions											
Unemployment rate	-0.59	3.24	-2.03**	-5.00***	-0.50	0.49	2.41	0.97	-2.61***	4.35***	2.72
Gross earnings	-0.01	-0.01	-0.03*	-0.01*	0.05***	0.03	0.01	0.01	-0.01	0.06***	0.05***
Share high qual. empl.	0.76*	-0.29	0.98	-0.05	3.56***	-0.95	0.23	-1.05	0.38	2.65***	2.35
Share manufacturing	-0.46	0.53	-0.28	-0.27	0.63	-0.07	-0.82	0.47	-0.48**	0.28	-0.12
Share construction	-1.87**	-0.77	-4.07***	-2.37***	-0.60	-1.36	6.99**	-0.41	-3.20***	-1.05	-0.47
Share advanced services	0.31	2.95*	-0.93*	0.09	3.55***	-1.80	-0.86	1.07**	0.44	2.00**	2.22**
Share basic services	0.10	0.49	0.04	0.26	2.59**	-2.10**	1.54	1.05**	0.67	2.24***	2.23**
Amenities											
European accessibility	-0.22***	-0.96***	-0.07	-0.02	0.02	-0.19	-0.63**	-0.68***	-0.21***	-0.24	-0.04
Physician density	0.04***	0.07	-0.02	-0.01	0.02	0.02	-0.21***	0.01	-0.01	0.07***	0.04
Green area	-0.10	0.44	-0.09	-0.12	0.05	-0.16	0.46	0.02	0.06	0.39	0.07
Land price	0.03	0.01	0.15**	-0.08***	0.17**	0.45***	0.60***	-0.02	-0.04	0.06	0.07
Flat size	1.94***	-2.23	1.03	0.71	-0.78	-4.81***	-1.41	-3.13***	0.75	1.32	6.65***
Crime rate	0.00	-0.00	-0.00	0.00	-0.00	-0.01**	-0.01***	-0.01***	0.00	0.00**	0.00
Overnight stays	-0.17	1.35	-0.58	-0.96***	-0.27	0.58	4.68***	0.51	-0.56**	1.01	-0.38
Population density	-0.00	-0.04***	-0.01**	0.00	-0.02	-0.03***	-0.04***	0.00	0.01**	-0.02**	-0.02**
Cultural factors											
Ethnic diversity	0.24	-1.36	0.10	-0.76***	-1.15**	-0.65	2.99***	4.20***	-0.96***	-1.36***	-1.68***
Share of foreigners	2.98***	10.61***	4.85***	3.70***	1.74	8.10***	-3.37	5.20***	2.60**	0.67	5.79**
Miscellaneous											
Net flow of workers†	0.08***	-0.33	0.26***	0.29***	-0.21	0.98	1.00***	0.00	0.43***	0.07	0.45
Distance	0.04	0.35**	0.36***	-1.60***	-0.82***	-0.57***	0.00	1.00**	-0.44	-0.59***	7.74***
Distance squared	-0.01	-0.01**	-0.02***	0.01***	0.03***	0.03***	-0.01	-0.02**	0.01	0.03***	-0.05***
c†	-0.01	-0.01	0.04	44.07***	3.47**	5.52***	4.15**	-9.58**	4.98*	-0.26***	-312.59***
Obs.	402	402	402	402	402	402	402	402	402	402	402
pseudo R^2	0.54	0.24	0.62	0.68	0.60	0.59	0.69	0.72	0.63	0.24	0.42

Note: The dependent variable is the representation quotient of nationality-specific foreign employment. Country abbreviations are taken from official sources and stand for the following countries: PL. . .Poland, PT. . .Portugal, RO. . .Romania, RU. . .Russia, SE. . .Sweden, SI. . .Slovenia, SK. . .Slovakia, TR. . .Turkey, UA. . .Ukraine, UK. . .United Kingdom and US. . .United States. With the exceptions of the net flow of workers and the constant (†), all coefficients are multiplied by 100 in order to avoid numbers with too many digits. The variables are ordered as in Appendix A. Standard errors are robust to autocorrelation as well as heteroscedasticity and are shown in parentheses. ***, ** and * denote statistical significance to the 1%, 5% and 10% level.