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Carola Burkert, Annekatriin Niebuhr, Rüdiger Wapler

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**Author for correspondence:**

**Carola Burkert | IAB Hessen | Regional Research Network of the Institute for Employment Research,  
Saonstr. 24 | 60528 Frankfurt | Germany  
Phone +49 (0)69 6670 - 319 | Fax +49 (0)69 6670 - 308  
carola.burkert@iab.de**

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**Hamburg Institute of International Economics (HWWI)  
Neuer Jungfernstieg 21 | 20354 Hamburg | Germany  
Phone +49 (0)40 34 05 76 - 0 | Fax +49 (0)40 34 05 76 - 76  
info@hwwi.org | www.hwwi.org  
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# **Regional Disparities in Employment of High-Skilled Foreigners – Determinants and Options for Migration Policy in Germany**

**Carola Burkert<sup>\*</sup>, Annekatrien Niebuhr, Rüdiger Wapler**

## **Abstract**

We investigate the regional disparities in high-skilled foreign employment in Germany. The importance of different factors which attract highly qualified migrants to specific regions and the role of labour-migration policy is analysed. Our results show that labour-market variables as well as the supply of tertiary education are important for the location choice. Based on these empirical results we discuss options of decentralized migration policy in Germany.

JEL classification: J61, R23

Keywords: Migration, regional disparities, labour-migration policy, Germany

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\* Author for correspondence: IAB Hessen, Regional Research Network of the Institute for Employment Research, Saonestr. 24, 60528 Frankfurt, Germany. Phone: +49-(0)69-6670-319; Fax: +49-(0)69-6670-308; e-mail: [carola.burkert@iab.de](mailto:carola.burkert@iab.de).

## 1. Introduction

According to Florida (2005) a new global competition for talent has emerged and the ability to attract and retain high skilled, creative employees is crucial for the competitiveness of economies. Zimmermann (2005) notes that a policy that discourages low-skilled immigrants and attracts highly qualified workers from abroad will foster growth in the ageing European economies. Immigration of skilled labour might also improve the general labour-market conditions and increase demand for unskilled native workers. Therefore, the attractiveness of a region for highly educated workers will rapidly gain importance for long-term growth prospects and labour-market performance.

It seems that at least some governments have come to understand this and taken appropriate action (Bauer & Kunze 2004). Especially European countries developed new arrangements directed towards highly qualified migrants. With the new Immigration Act, Germany tried to catch up with countries that offer more favourable conditions for high-skilled immigrants. For example a permanent residence for high qualified migrants as well as the possibility for foreign students to stay up to one year in Germany after graduation to seek for an adequate job. The changes in the new Immigration Act do not affect the mobility of citizens from the EU15 countries as the free movement of labour between these countries was already possible prior to the act. However, there are still impediments for labour-market access of workers from new member states. According to the EU-agreements, the free movement of workers from these countries may be deferred for a maximum period of seven years.<sup>1</sup>

Migration policy provides a general framework for the competition for talents at the national level. However, competition for these workers is often between different regions within a country or between regions with similar characteristics in different countries. The relevance of the national level seems to diminish with proceeding globalization. London competes with Frankfurt or Singapore for highly skilled migrants and not France with Germany or the Republic of Singapore (Beaverstock et al. 2006). Therefore, it is important to learn more about the determinants of international migration on the regional level. Liebig & Souza-Poza (2005) note that despite rising high-skilled migration, its specific determinants at the subnational level have so far not played a large role in migration research. As regards Germany, there is no comprehensive research on the location choice of highly qualified migrants within the country. Migration policy as a legal framework at the national level is important for the quality as well as for the quantity of labour migrants in the German labour market. However, the German labour market is extremely heterogeneous for example with respect to unemployment rates and the demand for foreign workers.

The objective of the paper is to shed some light on the location choice of foreign high-skilled workers. In Section 2 we describe the current labour-migration policy in Germany. Section 3 discusses which factors might influence the regional distribution of high-skilled foreign workers in Germany. After a short description of the data in Section 4, we present our results

in Section 5. Section 6 discusses the implementations of these results for migration policy. Section 7 concludes.

## **2. Labour-Migration Policy in Germany on the National and Regional Level**

The new German Immigration Act came into force on 1 January 2005 following a long and difficult legislative process and intense discussions. However, a long-term strategy with respect to labour migration is still not clearly visible. The ban on recruiting foreign labour from non EU countries remains in effect for unskilled, semi-skilled and even skilled workers. The Immigration Act has however slightly simplified the immigration procedure. “The aim of this reform is to simplify the proceedings and to enable the labour administration to react flexibly to regionally and seasonally different needs of the labour market” (Hailbronner 2006: 16).

In general, two independent authorities are involved when issuing a residency permit for employment purposes: the Aliens Authority and the Federal Employment Agency (FEA). The Aliens Authority examines the foreigner’s application with respect to policy aspects of immigration, integration, and social matters. It is a community authority and hence acts on a local level. If it comes to the conclusion that there are no compelling reasons to issue a residency permit, it can reject the application without further consultations with the FEA. The FEA is only responsible for examining the aspects related to the (regional) labour market.<sup>2</sup>

The labour-migration regulations distinguish between three groups: Foreigners from the old EU member states, Malta and Cyprus are not restricted and have full labour-market access. Citizens from the other new EU member states need to apply for a residency and work permit which is granted if no suitable applicants with free access to the German labour market can be found. Citizens from other countries also need to apply for permits which are again only granted if no German or other EU-citizen is available. However, if a permit is required, it must be for a sector or type of occupation that is explicitly exempted from the general ban on foreign labour migration.

With the introduction of the new Immigration Act in 2005, an exemption from the migration ban was introduced for the highly qualified. These are broadly defined as executives or specialists in their field with a current annual salary exceeding 84,000 €, top researchers or teachers with special functions. However, even for this migration group, unless other laws apply, the FEA needs to examine the local labour-market conditions before granting a work permit and even then the top local authority can intervene and prevent the worker from immigrating. Whenever approval for migration by the FEA is required, the decision is based on several criteria. Potential negative impacts on the labour market are considered with respect to the local labour-market conditions and the sector in which the foreigner wants to work. This means that both the local aliens authority as well as the local office of the FEA have some leeway in deciding whether migrants obtain a residency permit or not.

No research has analyzed to what extent this leeway is used differently. However, a first impression can be obtained by looking at the usage of the so-called “Green Card”. During the

boom of the IT sector in 2000, a pronounced shortage of skilled manpower was proclaimed. Therefore, the federal government introduced the “Green Card”: holders of this card were entitled to a work for up to five years, had to be highly qualified IT specialists and have a job offer in Germany. By the end of 2002, roughly 10,000 IT experts had come. Regional disparities were clearly visible with a large proportion of Green-Card holders located in Munich and Frankfurt. Starting in 2001, the IT sector suffered a downturn and Green-Card holders were affected by unemployment. However, the initial permit had only been granted under the condition that the holder was employed. Hence, the question arose as to how long the aliens authorities granted the holder of a Green Card to search for a new job. This varied substantially between different parts of the country which meant that the duration for job search depended on the region where the unemployed Green Card holder lived (Schreyer 2003). This emphasizes that different legal interpretations of the same national law on a regional level can have important practical consequences for the distribution of foreigners within Germany.

### **3. Factors Attracting Skilled Foreign Workers at the Regional Level**

National migration policy is an important determinant in the migrant’s decision which country to emigrate to. However, the residential choice of where within the country she settles, depends on a number of region specific factors. We consider five broad groups of factors that are assumed to influence the decision to move to a specific location: general economic factors, labour-market conditions, housing-market variables, environmental conditions and political regulations. The migration decision is usually modeled as an utility-maximization problem in which costs and benefits of migration are compared. We focus on the determinants of labour migration and do not take into account other migration motives as well as “involuntary” migration due to political reasons or war.

In migration theory, the residential choice of workers is often modeled as a function of the economic prosperity of the region and labour-market conditions. The relative economic prosperity is supposed to be of particular importance for the migration of high-skilled workers (Garson 2004). Especially young university graduates might be attracted to dynamic, high-growth regions. Moreover, the regional climate for innovation and self-employment can affect the location choice of the high skilled who aim to start up their own business. Further, the recruitment policy and mobility within multi-national firms and international organizations is also of importance. The location of such firms and institutions might have a pronounced impact on the regional distribution of high-skilled foreign workers. This issue is closely related to the impact that the economic structure might have on the attractiveness of regions as places to work in. Especially high-skilled foreigners are likely to be employed in a few specific branches. In this context, migration policy can be extremely relevant.

Of course economic variables are likely to be highly correlated with relevant labour-market indicators such as the unemployment rate and the regional wage level. As the level of unemployment reflects the probability of getting a job, the labour-market variables directly affect

the expected income in the destination country. However, the regional unemployment rate might be of minor importance for highly qualified workers since unemployment at this skill level tends to be much lower than the average unemployment level.<sup>3</sup>

Since the migration decision is based on utility maximization, it is not only expected income but also the price level in the potential destination country and in particular house prices that play an important role. However, it is difficult to disentangle the impact of housing-market conditions from economic factors. On the one hand high house prices and low vacancy rates might restrain immigration. On the other hand, a tight housing market probably indicates a favourable economic development. The quality of regional housing markets is closely related to a broad range of environmental factors which might play a major role in the residential decisions of the highly qualified. There are direct links between housing and environmental variables such as settlement structure and crime.

However, there are other environmental factors which influence the utility and therefore the location choice of workers. Amenities are thought of as factors that are of particular importance for the migration of highly skilled. And most of these determinants might show more pronounced disparities between regions in the same country than between countries – the quality of the air, leisure facilities, education and research facilities etc. The differences in the supply of cultural events are probably smaller between large agglomerations such as Vancouver and Hamburg than e.g. between Hamburg and Uecker-Randow, a rural peripheral region close to the German-Polish border. Florida (2005) stresses the role of tolerance and openness in this context. This implies that e.g. right-wing populism might significantly reduce the attractiveness of a region for migrants.

Policy might also exert a pronounced impact on migration behaviour. Migration policy restrictions can effectively impede high-skilled foreigners from freely choosing a location at all. However, apart from the direct impact of migration policy, there might also be indirect effects of local taxation, the provision of local public goods, the availability of land for house building and regional disparities with respect to the educational system (see Liebig & Souza-Poza 2005).

Finally, ethnic links also tend to affect the expected costs and benefits from migration. Ethnic networks may provide information on the potential host regions, on labour-market conditions, etc. Access to this information decreases the risks associated with migration. Moreover, there might be positive network externalities based on the supply of ethnic goods and cultural links associated with a migration network. By affecting the costs and benefits, ethnic networks and social ties influence the likelihood of mobility. Bauer et al. (2002) emphasize the role of so-called “herd behaviour” that implies that migrants limit their destination choices to places with significant prior immigration from the same origin.<sup>4</sup>

Apart from migration costs related to information deficits, there are also other, more direct costs affecting migration. Cross-border labour mobility is not free of costs. Both moving costs and information deficits are positively affected by geographical distance. Physic and psychic costs of migration tend to rise with increasing distance between the country of origin and the

destination country. Thus, migration costs differ depending on where the host country is. Furthermore, distance might also be important because in border regions employment of foreign workers is possible without having to live in the foreign country. Thus, we have to take into account the effect of cross-border commuting on the spatial structure of foreign employment.

#### **4. Data**

We analyze the spatial structure of foreign labour in 2005. Data on the employment of foreign workers is provided by the FEA. The employment statistic covers all employment subject to social security contributions.<sup>5</sup> We use regional employment data differentiated by nationality, educational level and branch in order to analyze the regional disparities in the employment of high-skilled foreigners. We define high-skilled employees as those with a university degree and the low-skilled as those with no formal vocational qualification. The data refers to workplace location. Our observational units are 97 functional regions. These are comprised of counties which are linked by intense commuting. Thus, we consider regional labour markets, not administrative units. Furthermore, the analysis takes into account the region type. We differentiate between types of regions according to the criteria centrality and population density and distinguish between agglomerated, urbanized and rural regions.

Employment in agriculture, hunting and fishing is excluded because of the significance of foreign seasonal workers in this sector. Since some regions are more affected by seasonal employment of temporary migrants, including the primary sector could bias the results. Due to data restrictions, we cannot identify high-skilled German workers who have a migration background, i.e. Germans whose parents immigrated and naturalized migrants.<sup>6</sup> Hence, we are only able to differentiate between nationalities which mean that we tend to understate the number of migrant workers in a region. This bias might be rather pronounced for high-skilled employees because naturalized persons probably tend to be marked by a relatively high educational level due to the terms of naturalization in Germany.

In order to investigate whether the spatial pattern of migrant groups varies due to different labour-migration regulations, employment of EU 15 citizens, workers from the EU 10 countries and third country nationals is analyzed separately. We perform multivariate regressions to analyze the factors that affect the share of high-skilled foreigners in different regions.<sup>7</sup>

### **5. Regional Disparities in Employment of High-Skilled Workers in Germany**

#### **5.1 Basic Facts**

Immigrants are an important factor in the German labour market. In 2005, almost 7% of all and 4.5% of the highly-skilled employees in Germany have a foreign nationality. More than 100,000 highly-skilled foreigners with a university degree work in Germany. Employment of these immigrants concentrates on the service sector, on business-oriented services (more than 20% of all high-skilled foreign employees), especially on software consultancy and supply,



research and development and other sophisticated business activities. Other main areas of activity are education (16%) as well as health and social work (11%).<sup>8</sup> Thus, the regional distribution of branches has an important influence on the residential choice of high-skilled foreigners. More precisely, we might expect above average shares of highly qualified immigrants in those locations specialized in complex services which are often large metropolitan regions.

The regional employment shares of foreign workers are in line with this presumption. The percentage of foreign employees is clearly above average in agglomerations. Almost every tenth worker in highly agglomerated regions has a foreign citizenship. Among the low-skilled it is even every fifth worker (see Table 1). The share of high-skilled employees is generally lower with up to 5.1% in metropolitan regions. This is most likely due to past labour-migration policy which focused more on low-skilled migrants. The regional dispersion of employment shares of foreign workers is smaller for the highly qualified employees compared to the low-skilled. There are also distinct differences between eastern and western Germany. Whereas foreigners account on average for almost 8% of employment in western Germany, it is merely 2% in the eastern part. The disparities are most pronounced for workers with no vocational education.

**[Table 1 around here]**

Region-type-specific disparities and differences between eastern and western Germany determine the ranking of regions according to their employment shares. The majority of the regions with the lowest shares of foreigners belong to the group of rural regions in eastern Germany. However, apart from the East-West-disparities, there are also significant differences within the western part of the country. Employment of high-skilled foreigners clusters in the South-West (see Figure 1). Moreover, the spatial patterns of migrant groups which are subject to different labour-market access are characterized by a remarkable variance. The results for EU 15, EU 10 and third country nationals in Table 1 reveal that the regional distributions of EU 15 workers and third country nationals are similar. In contrast, the pattern of high-skilled workers from the new member states is clearly different.<sup>9</sup> The percentage of labour migrants from EU 10 countries in high-skilled employment shows no pronounced variation across region types and between the eastern and western part of Germany.

**[Figure 1 around here]**

Another distinctive spatial feature of foreign employment is the role of border regions. Almost every second region amongst those with the highest percentages of high-skilled foreign employment is a border region. The findings reflect the importance of geographical distance for labour mobility. The areas along national borders are marked by above average employment shares of foreign workers since migration costs for immigrants from neighbouring countries tend to be relatively low in these locations. Moreover, foreign workers have advantages

in gathering information about the labour market on the other side of the border (see Niebuhr & Stiller 2006). Border impediments that might increase transaction costs and information deficits should be relatively low for most German border regions because of the free movement of labour between old EU member states. The significance of geographical distance is also reflected by differences in the regional distribution of EU 15 and EU 10 workers. As Figure 1 shows, those regions that share a common border with corresponding member states tend to be characterized by above average employment of high-skilled migrants from these countries. This substantially adds to the differences in the spatial distribution of both groups.

## 5.2 Regression Results

We investigate the determinants of the regional distribution of high-skilled foreigners by means of a regression analysis. Different dependent variables are considered: the percentage of foreigners in high-skilled employment and the corresponding shares of the three migrant groups as defined by labour-migration policy in Germany. This approach allows us to take into account the differences between the spatial patterns of these groups and the possibility that different factors might be relevant for their residential choice.<sup>10</sup>

The results of the regression analysis are summarized in Table 2. In column (1), the model for the share of all foreigners in high-skilled employment is displayed. The findings for the three subgroups are given in the columns (2) – (4). It is obvious that the models are marked by distinct differences. Thus, there seems to be a remarkable variation regarding the importance of different determinants across the considered migrant groups. Altogether, the results are more or less in line with the theoretical implications outlined in Section 3. Regional labour-market conditions apparently play a major role. The percentage of foreigners among high-skilled workers is relatively high in German regions that offer above average compensation per employee. In contrast, the unemployment rate of high-skilled foreigners does not enter. This might reflect the rather favourable employment prospects of high qualified workers. The significance of labour-market integration of foreigners seems to be captured by the employment rate of foreigners (foreign workers per 1,000 foreign inhabitants). The share of migrants in high-skilled employment tends to rise with increasing employment rate in the host region. We detect significant effects for third country nationals and workers from EU 15 countries. For the latter employment growth matters as well.

[Table 2 around here]

Whereas labour-market conditions play a prominent role in explaining the regional distribution of high-skilled EU 15 workers, the occupational structure of the host region seems to be of less importance. However, there is some indication that the specialization affects the location choice of migrants from the new member states and third countries. There is a significant and positive effect of the percentage of knowledge-intensive occupations for the third country

nationals. The differences between the three migrant groups could possibly be caused by the restricted labour-market access of EU 10 and third country nationals. Occupational exceptions to the general ban on recruiting foreign labour could be quite important for these labour migrants (e.g. “Green Card”). The negative coefficient of the share of manufacturing in column (1) underlines the descriptive evidence on the specialization of high-skilled foreigners in services. The differences in labour-market access of the considered migrant groups might also be reflected by the overall number of significant factors. We can identify more determinants for the EU 15 workers than for the other groups which are marked by restricted access. The more restricted residential choice of EU 10 and third country nationals could boil down to a smaller but also mostly different number of relevant influential factors.

According to the regression results, the supply of tertiary education is an important factor as regards the regional distribution of high-skilled migrants. Corresponding indicators play a role in all models. The number of students per 1,000 inhabitants or the share of foreign students exert a positive impact on the employment of high-skilled foreigners. The effect of universities might work via different channels. The quantity and quality of universities might be relevant because of their qualification offers. Furthermore, the location of universities is relevant since education is one of the main areas of activity of high-skilled foreigners. Finally, the regression results might reflect that foreign students tend to stay in the region after graduation and start working there.

We use the number of child care slots and of practitioners per 100,000 inhabitants as indicators for the provision of local public goods. The crime rate as a measure of the “safety” of a region is also included. The average travel time to the next city centre is applied to measure the transport connectivity and there are some indicators for natural amenities included in the analysis. Altogether, the evidence on amenities and local public goods is rather mixed although they clearly show that there are different factors influencing the migration decision of people from the EU-15 countries compared to other migrants. However, the significant positive coefficient of travel time to the next city centre in model (2) suggests that the variable might capture such effects. None of the other variables are included in the final regressions. We get plausible results for child care facilities and medical supply. The effect of the crime rate is only reasonable in model (1) and (2). The findings are more or less in line with evidence provided by Clark (2003) who concludes that natural amenities are not associated with the location decisions of highly-skilled workers, whereas constructed amenities are more likely to affect the attractiveness of regions.

The last group of explanatory variables refers to the spatial dimension. The results for the border region dummies underline the importance of geographical distance for migration decisions and cross-border commuting. Only for the share of third country nationals do we find a negative impact. Since the corresponding countries do not share a common border with Germany, this is plausible. The region type only matters for EU-10 migrants but contradicts our theoretical expectations, i.e. above average shares of high-skilled foreigners in agglomerated regions.

## 6. Options for Labour-Migration Policy on a Regional Level

Immigration law on a national and EU level provides the general legal framework for all regions within a country. If a highly skilled worker cannot immigrate to Germany due to restrictions in the immigration law, she cannot be attracted by any region. However in Germany regions do have certain, restricted policy options and areas of discretion which can have a substantial indirect influence on the residential choice. Our regression results indicate which policy fields on the regional level can affect the residential choice of high-skilled migrants. They emphasize the importance of local labour-market conditions and the role of universities. These are regulated by the federal states and should therefore be integrated into a regional immigration policy. Universities should play an active role in acquiring and later on placing foreign graduates in a job. Co-operations between firms and universities could ensure the interaction of foreign students with the local economy and give potential employers valuable information.

Regions with attractive and tight labour markets are often characterized by excess demand for highly skilled workers. Our empirical results clearly indicate that regional labour-market conditions affect the regional distribution of high-skilled foreign workers. Thus, migrant workers tend to move to regions where qualified labour is scarce. Establishing regional monitoring systems could be helpful in order to better match the demand and supply of labour, to identify special demands and actively recruit qualified workers. Canada already has such a scheme in existence – the “Provincial Nominee Program”. These programs enable the provinces to select applicants whose skills and abilities fit the province’s needs best, to consider applications that may not qualify under federal immigration criteria and to reduce the application process time.

In addition, a region can be made more attractive by introducing or improving the support service of highly qualified workers and their family members, e.g. information and relocation services, welcome packages and more service orientation of public authorities responsible for aliens. This is already being done e.g. in Hamburg, which is currently establishing a web-based “Welcome Portal” as an information platform and a “Hamburg Welcome Center” for information and consulting services.<sup>11</sup> These platforms are institutionalizing some of the functions which are otherwise provided by ethnic networks.

The Aliens Authority operates at a community level, examines the foreigner’s application with respect to policy aspects of immigration, integration and social matters. These authorities are normally the first contact point for new migrants and their experiences with the authorities are crucial for the image foreigners get of Germany. Since 2002 the Alexander Humboldt Foundation awards an annual prize to the “friendliest” aliens authority. Foreign students and researchers in Germany can submit a proposal. The aim of this prize is to improve the hospitality in Germany and to encourage the employees of the authorities to use their area of discretion.

Currently, migration of the self-employed is possible through the new Immigration Act under certain, but challenging prerequisites. These regulations are regarded as too demanding.

Again, the aliens authorities do have administrative discretion and thus the potential to be more attractive for this group of migrants.

An efficient way of combining national and regional migration policies would be the introduction of a points system as in the classical immigration countries (see Unabhängige Kommission “Zuwanderung” 2001). Within such a system, the national level could establish the criteria by which points are awarded. The regions could, if need be, determine a maximum number of immigrants which can be admitted per year. The criteria should for example be based on the education level, language skills and age. The advantage of selection criteria lies in its capability to react flexibly to changing conditions in specific labour markets as the criteria can easily be adjusted.

## **7. Conclusions**

In the past, labour-migration regulations in Germany were mainly guided by short-term considerations which at the time led to a large inflow of (unqualified) migrants. Only slowly is the awareness growing that immigration policy needs to be more in favour of the high-skilled to foster growth and improve labour-market conditions. But there is general consensus that as a result of the increased globalization, Germany needs to compete for high-skilled labour with other nations. To attract high-skilled migrants, immigration for these workers needs to be made appealing and the natives in the host country need to understand cultural diversity as a benefit. This is especially true for Germany where the long-standing denial of the status as an immigration country has nourished the fear that natives will lose their jobs to immigrants and there is little understanding of the economic benefits of immigration and cultural diversity.

In addition to these national aspects, there are pronounced regional disparities: Germany is characterized by a strong concentration of high-skilled foreign workers in the dynamic agglomerations in the South-West. Our empirical evidence suggests that various factors influence their residential choice and that the important determinants differ between migrant groups which vary with respect to their labour-market access. This might indicate that the framework set by national migration policy could indeed affect the residential choice at the regional level. However, regional labour-market conditions seem to play a prominent role in this context irrespective of the labour-migration regulations. The significance of labour-market conditions suggests that regions that are characterized by labour shortages should be preferred destinations of labour migration. Evidence on the significance local public goods and tertiary education facilities suggests that there are possibilities to influence the residential choice of high-skilled migrants at the regional level because the regions are at least partly responsible for the provision of these goods. Especially universities seem to be promising starting points for regional policies aiming to attract high-skilled migrants. The significance of distance as regards the regional distribution of high-skilled migrants points at the potential role of information and consulting services since information deficits on regional labour-market conditions tend to rise with increasing distance. Thus, there are clearly several options

for a decentralized migration policy although the location choice of some migrant groups is restricted by national migration policy.

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## Appendix

**Table A1: Regression Analysis – Explanatory Variables**

<b>VARIABLES</b>	
<b><i>Labour Market</i></b>	Share of high-skilled employees, 2003 Foreign employees per 1,000 foreigners, 2002 Average employment growth, 1999-2004 Compensation per employee in Euro, 2002 Unemployment rate of high-skilled foreigners, 2004 Unemployment rate, 2003 Change of unemployment rate, 1995-2003
<b><i>Economic</i></b>	Share of employees in manufacturing occupations, 2003 Employment growth in manufacturing occupations, 1995-2003 Share of employees in service occupations, 2003 Share of employees in knowledge-intensive service occupations, 2003 Employment growth in knowledge-intensive service occupations, 1995-2003 Average GDP growth 1999-2004
<b><i>Education</i></b>	Students at universities per 1,000 inhabitants, 2002 Share of foreigners among students, 2002 Share of foreign pupils amongst all pupils at schools, 2002 Share of foreign grammar-school pupils amongst all pupils at grammar schools, 2002
<b><i>Amenities and Local Public Goods</i></b>	Share of flats with 5 or more rooms, 2002 Living space per inhabitant in sqm., 2002 Number of practitioners per 100,000 inhabitants, 2002 Child-care slots per 100 children under 6 years, 2002 Recreation area per inhabitant in sqm., 2000 Average land prices in €/sqm., 2000-2002 Number of criminal offences per inhabitant, 2005
<b><i>Spatial Dimension</i></b>	Average time to nearest city motorway in minutes, 2002 Average time to nearest city centre in minutes, 2002 Travel time to the nearest agglomeration region with public transport in minutes, 2003 Dummy variable for all border regions Dummy variable for border regions with EU15 and Switzerland Dummy variable for border regions with EU10 Variable for agglomerated, urbanized and rural Regions Dummy variable for eastern Germany



## Tables and Figures

**Table 1: Employment Share of Foreign Workers in German Regions (in %), 2005 <sup>a)</sup>**

Region	Total	No vocational education	Highly qualified			
			Total	EU15 <sup>b)</sup>	EU 10 <sup>c)</sup>	Third Country Nationals
Agglomerated regions	8.4	18.2	5.1	2.4	0.4	2.3
Urbanized regions	4.9	11.7	3.5	1.4	0.3	1.7
Rural regions	3.2	6.7	2.8	1.3	0.4	1.1
Eastern Germany	2.0	3.6	2.2	0.7	0.4	1.2
Western Germany	7.8	16.2	5.1	2.4	0.4	2.3
Germany	6.7	14.7	4.5	2.0	0.4	2.1

Source: German Employment statistic, own calculations.

Notes: a) Employment without workers in agriculture, hunting and forestry.

b) Without Germans.

c) New member states: Hungary, Poland, Latvia, Lithuania, Estonia, the Czech Republic, Slovenia, Slovakia, Cyprus and Malta.

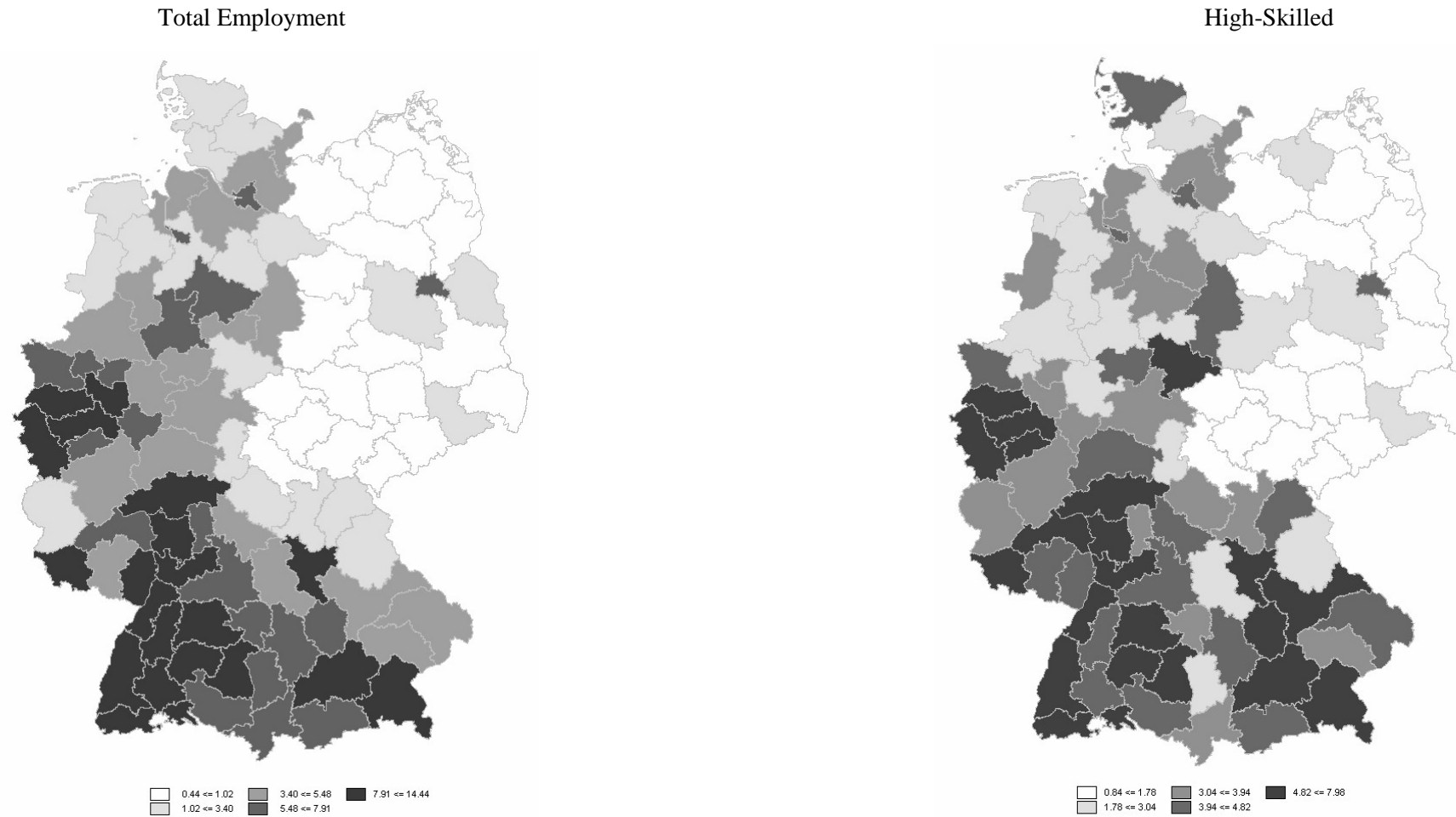
**Table 2: Regression Results**

	<b>Employment Share of Foreigners in High-Skilled Employment</b>			
	<i>(1)</i> <i>All Foreigners</i>	<i>(2)</i> <i>EU15</i>	<i>(3)</i> <i>EU10</i>	<i>(4)</i> <i>3rd Country Nationals</i>
<i>Exogenous Variables</i>				
<i>Labour Market</i>				
Foreign employees per 1,000 foreigners, 2002	0.201	0.567***		0.282**
Average employment growth, 1999-2004		23.671**		
Compensation per employee in Euro, 2002	1.084**	1.838***	1.695**	0.429
<i>Economic</i>				
Share of employees in manufacturing occupations, 2003	-0.421**			
Employment growth in manufacturing occupations, 1995-2003	-0.002			
Share of employees in service occupations, 2003			0.893	
Share of employees in knowledge-intensive service occupations, 2003				0.254***
Employment growth in knowledge-intensive service occupations, 1995-2003	0.009			
Average GDP growth 1999-2004		12.030***		
<i>Education</i>				
Students at universities per 1,000 inhabitants, 2002		0.114***		0.092***
Share of foreigners among students, in %, 2002	0.222***		0.284***	0.133*
Share of foreign grammar-school pupils amongst all pupils at grammar schools, 2002			-0.217*	
<i>Amenities and Local Public Goods</i>				
Number of practitioners per 100,000 inhabitants, 2002	0.497***			
Child-care slots per 100 children under 6 years, 2002		0.552*		0.291
Number of criminal offences per inhabitant, 2005	-0.363***	0.364**		
<i>Spatial Dimension</i>				
Average time to nearest city centre in minutes, 2002		0.434**		
Dummy for all border regions	0.144**			-0.107*
Dummy for border regions with EU 15 countries and Switzerland		0.114		
Dummy for borders with EU 10 countries			0.619***	
Variable for agglomerated, urbanized and rural regions			0.128**	
Dummy for eastern Germany	-0.184	-1.129***		-0.546**

\*\*\* Significant at the 1%-level; \*\* significant at the 5%-level; \* significant at the 10%-level

Notes: Since the share of employment share of foreigners is bounded by zero and one hundred, the dependent variables are specified in logit terms, i.e.  $y = \ln(\text{share} / (100 - \text{share}))$ .

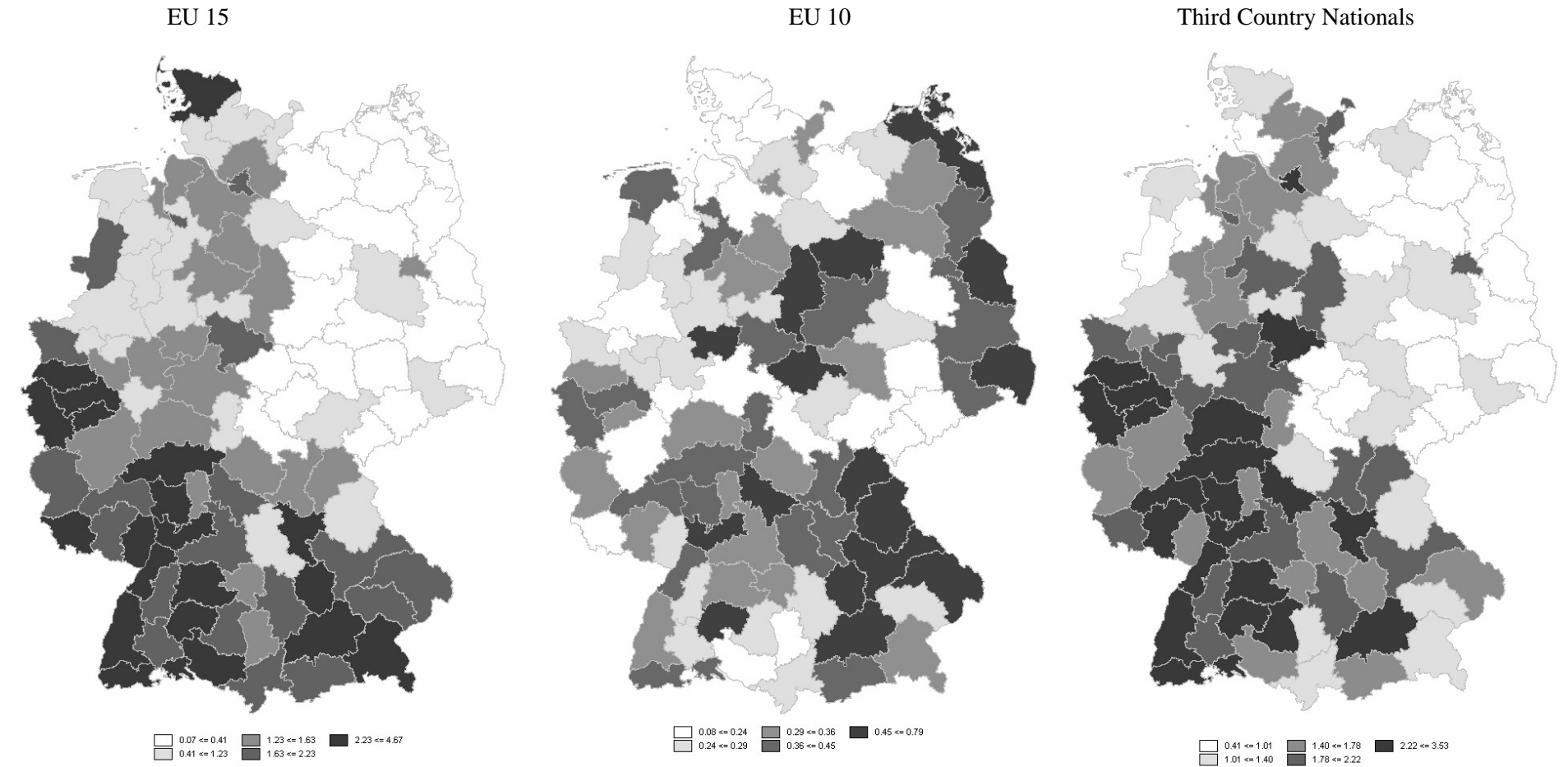
**Figure 1: Regional Disparities in Employment of High-Skilled Foreigners (Share of Foreign Workers in High-Skilled Employment, 2005) <sup>a)</sup>**



Source: German Employment statistic, own calculations.

Notes: a) Employees with a university without workers in agriculture, hunting and forestry.

**Cont'd. Figure 1: Regional Disparities in Employment of High-Skilled Foreigners (Share of Foreign Workers in High-Skilled Employment, 2005) <sup>a</sup>**



Source: German Employment statistic, own calculations.

Notes: a) Employees with a university without workers in agriculture, hunting and forest

## Acknowledgements

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<sup>1</sup> The arrangements mainly arose from the fear of mass immigration from the new member states, especially in the EU15 countries with borders to these countries. Starting in 2004, the transitional period is divided into three phases (“2 plus 3 plus 2” formula). In 2006, Germany decided to maintain restrictive measures until 2009. If justified, these can be prolonged until 2011 after which free movement must be guaranteed. This can, however, lead to highly qualified citizens from the new EU member states to decide to immigrate to one of the EU15 countries which have not placed any labour-market restrictions on the movement of citizens of the new EU members.

<sup>2</sup> Although the FEA operates both on the national as well as the regional level, the decision whether there are any labour-market aspects which prevent an applicant from obtaining a work permit are made at the regional level after having analyzed the local labour-market conditions.

<sup>3</sup> This is especially so in Germany where the low-skilled are far more likely to be out of a job. Almost 25% of the labour force with no formal vocational qualification is typically searching for a job. In contrast, there is almost full employment among workers with a university degree (unemployment rate 2004: 4%); see Reinberg & Hummel (2005).

<sup>4</sup> However, Liebig & Souza-Poza (2005) argue that perhaps ethnic ties matter less for the highly skilled than for lower skilled migrants, since qualified foreigners might be less dependent on the services that ethnic networks provide.

<sup>5</sup> Hence, civil servants and self-employed are not recorded in the employment statistic.

<sup>6</sup> According to recent estimates of the Federal Statistical Office, almost 20% of the population in Germany has a migration background. See Statistisches Bundesamt (2006).

<sup>7</sup> Table A1 in the Appendix list the variables we use.

<sup>8</sup> In the industrial sector, the only branch with a relatively high share of foreign high-skilled is the manufacture of electrical and optical equipment. This is in line with evidence provided by Bauer & Kunze (2004). They conclude that firms without foreign high-skilled employees are more likely to be found in manufacturing and financial services.

<sup>9</sup> The correlation coefficient of the shares of EU 15 and third country nationals in high-skilled employment is 0.73. The correlation of the shares of these groups with the percentages of EU 10 workers is only 0.04 (EU 15) and 0.12 (third country nationals).

<sup>10</sup> In order to ensure that in our final regressions we only use those variables which seem to have a significant influence, we first perform a regression using all potential exogenous variables. These are then sorted in decreasing order of significance. Subsequently, in further regressions, starting with only the most significant exogenous variable, we add one variable at a time. If it improves the regression as measured by the corrected Akaike Information Criterion, the variable is included. If not, it is dropped from the further regressions. This procedure is carried out for all the exogenous variables. Further, as our dependent variable can only take on values between 0 and 100, we cannot apply standard linear regression techniques. This problem can, however, be easily overcome by performing a logit-transformation of the dependent variable.

<sup>11</sup> <http://fhh.hamburg.de/stadt/Aktuell/pressemitteilungen/2005/dezember/20/2005-12-20-bwa-welcome.html>, 2006/10/12

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Hamburg Institute of International Economics (HWWI)

Neuer Jungfernstieg 21 | 20354 Hamburg | Germany  
Phone +49 (0)40 34 05 76 - 0 | Fax +49 (0)40 34 05 76 - 76  
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