The Labor Market Impact of Immigration: A Quasi-Experiment Exploiting Immigrant Location Rules in Germany

Albrecht Glitz*

Universitat Pompeu Fabra and Barcelona GSE

January 2011

Abstract

With the fall of the Berlin Wall, ethnic Germans living in the former Soviet Union and the Warsaw Pact countries were given the chance to migrate to Germany. Within 15 years, 2.8 million individuals had done so. Upon arrival, these immigrants were exogenously allocated to different regions by the German government in order to ensure an even distribution over the country. Their inflows can therefore be seen as a quasi-experiment in immigration, avoiding the typical endogeneity problem of immigrant inflows with regard to local labor market conditions. I analyze the effect of these exogenous inflows on relative skill-specific employment and wage rates of the resident population in different geographical areas between 1996 and 2001. The variation I exploit in the empirical estimations arises primarily from differences in the initial skill composition across regions. My results indicate a displacement effect of around 3.1 unemployed resident workers for every 10 immigrants that find a job. I do not find robust evidence of any detrimental effect on relative wages.

Keywords: Immigration, Labor Market Impact, Skill Groups, Germany

JEL Codes: J21, J31, J61

*Department of Economics and Business, Ramon Trias Fargas 25-27, 08005 Barcelona, Spain, e-mail: albrecht.glitz@upf.edu. This paper was written while working at University College London and the Centre for Research and Analysis of Migration (CReAM). I am grateful to Christian Dustmann, David Card, Kenneth Chay, Emilia Del Bono, Ian Preston, Imran Rasul, Regina Riphahn, Matti Sarvimäki, Uta Schönberg, the editor and two anonymous referees for helpful comments and suggestions, and to Stefan Bender for invaluable support with the data. I have benefited from many useful comments of conference participants at ESPE 2004, EEA 2005, the COST A23 meeting 2005, the CReAM/TARGET conference 2006, EEA 2006, EALE 2006 and participants of the Labor Lunch Seminar at Berkeley. Parts of this paper were written while visiting the Department of Economics at Berkeley, which I thank for their hospitality. I also thank the ESRC for funding the project (award No. RES-000-23-0332) and the Barcelona GSE Research Network, the Government of Catalonia, and the Spanish Ministry of Science (Project No. ECO2008-06395-C05-01) for its support.

1 Introduction

The impact that immigration has on the labor market outcomes of the resident population is a central issue in the public debate on immigration policies. In most European countries it has been widely discussed in recent years in connection with the eastern enlargement of the European Union and, in particular, with the potential introduction of transitional measures to restrict labor migration from the new member states. There is widespread concern that immigrants exert downward pressure on wages and reduce job opportunities for resident workers. Since the 1990s, numerous studies have tried to empirically assess the labor market effects of immigration for a number of countries, sometimes with conflicting results and using a variety of methodological approaches.[1] The most common approach in the literature is the spatial correlation approach, in which a measure of the employment or wage rate of resident workers in a given area is regressed on the relative quantity of immigrants in that same area and appropriate controls.[2] One of the main difficulties of this strategy arises from the immigrants' potentially endogenous choice of place of residence. Immigrants tend to move to those areas that offer the best current labor market opportunities, which typically leads to an underestimation of the true effect they have on the labor market outcomes of the resident population. To address this endogeneity problem, some studies have used instrumental variables that are based on past immigrant concentrations, exploiting the fact that these are good predictors of contemporary immigrant inflows, while assuming that they are uncorrelated with current unobserved labor demand shocks.

In this paper, I follow an alternative approach by taking advantage of a quasi-experiment in Germany in which a particular group of immigrants was exogenously allocated upon arrival to specific regions by government authorities. The prime objective of the allocation policy was to ensure an even distribution of these immigrants across the country. Since the actual allocation decision was based on the proximity of family members and since sanctions in the case of non-compliance were substantial, the possibility of self-selection into booming labor markets was severely restricted for this group of immigrants. Their settlement can thus be viewed as exogenous to local labor market conditions, providing a unique opportunity to study its effect on the resident population.

[1] See Friedberg and Hunt (1995), Gaston and Nelson (2002), Dustmann and Glitz (2005), or Okkerse (2008) for comprehensive surveys of the literature.

[2] Examples include Altonji and Card (1991), LaLonde and Topel (1991), Butcher and Card (1991), and Card (2001) for the U.S., Winter-Ebmer and Zweimüller (1996, 1999) for Austria, Hunt (1992) for France, Pischke and Velling (1997) for Germany, Carrington and de Lima (1996) for Portugal, Dustmann et al. (2005) for the UK, and Hartog and Zorlu (2005) for the Netherlands, the UK and Norway.

In very few instances is it feasible to view immigration as a quasi-experiment in which the immigrant inflows into a particular region are not driven by local labor market conditions. The only two examples in the literature that make use of such an experiment to identify the labor market impact of immigration are the Mariel boatlift analyzed by Card (1990) and the immigration flows as a result of Hurricane Mitch analyzed by Kugler and Yuksel (2008).[3] The main conceptual difference between these studies and the present analysis is that they examine a large exogenous inflow into a single labor market (the city of Miami, Card) or a selected number of local labor markets (Southern U.S. states, Kugler and Yuksel), whereas this analysis studies exogenous but homogeneous inflows into all regions in Germany. As I will show, in this case the main source of variation is the differences in the skill composition of the resident labor force across regions. Edin et al. (2003), Piil Damm (2009) and Gould et al. (2004) are further studies that are related to my analysis, insofar as they use spatial dispersal policies for refugee immigrants in Sweden, Denmark and Israel, respectively, as a source of exogenous initial regional allocations of immigrants. Rather than looking at the labor market impact of these inflows on the resident population, the aim of the first two studies is to assess how living in an ethnic enclave affects immigrants' own labor market outcomes, whereas the last investigates the effect of school quality on the high school performance of immigrant children.

In this paper, I set up a standard model in which immigration affects the relative supplies of different skill groups in a locality. I then estimate how changes in these relative supplies affect the employment/labor force rate and wages of the resident population, first by OLS and then using the exogenous immigrant inflows to instrument for the potentially endogenous changes in relative skill shares in a locality. I define skill groups based on broad occupational groups and distinguish between the effect on men and women, as well as on native Germans and foreign nationals. I ascertain whether the initial skill composition in a locality, which turns out to be the main source of variation in my estimations, has an independent effect on future changes in labor market outcomes that could be driving the results. Finally, to investigate whether out-migration of the resident population in response to the immigrant inflows dissipates their labor market impact across the economy, I regress overall and skill-specific local population growth rates on immigrant inflow rates.

[3]There are a number of additional studies in which the immigrant inflow to a country as a whole - rather than to particular regions within the country - can be seen as a quasi-experiment, for instance the inflow of repatriates from Algeria to France analysed by Hunt (1992) or the mass migration of Russian immigrants to Israel studied by Friedberg (2001).

The particular group of immigrants at the center of this study are so-called "ethnic German immigrants" who used to live in large numbers in Central and Eastern Europe and the former Soviet Union before they gained the opportunity to immigrate to Germany as a result of the political changes in the former Eastern Bloc towards the end of the 1980s. Between 1987 and 2001 more than 2.8 million ethnic German immigrants moved to Germany, increasing its population by 3.5%. Based on Germany's principle of nationality by descent, these immigrants are regarded as German by the constitution and granted German citizenship in the event of immigration. I collected annual county-specific inflows of ethnic German immigrants directly from the federal admission centers and combined these figures with detailed information on local labor markets that I obtained from social security based longitudinal data. The analysis focuses on West Germany, excluding Berlin, and covers the period 1996 to 2001, during which the allocation policy was in effect.

The empirical results point towards the existence of unobserved local demand shocks that are correlated with changes in relative skill shares and lead to upward-biased estimates of the labor market impact of immigration from simple OLS regressions. The instrumental variable estimates based on the exogenous ethnic German immigrant inflows imply that for every 10 immigrant workers finding employment, about 3.1 resident workers lose their jobs. Since all regressions are based on annual variation, this displacement effect has to be interpreted as a short-run effect. The fact that I find a negative effect on the employment/labor force rate of the resident population stands in contrast to a number of earlier studies for Germany, for instance to Pischke and Velling (1997), Bonin (2005), and D'Amuri et al. (2010), but are in line, also in terms of magnitude, with recent evidence from an establishment level analysis (Campos-Vazquez, 2008). My results do not show systematic evidence of significant detrimental effects on relative wages. Finally, there is no indication that the results are driven by an independent effect of initial relative skill shares on future labor market outcomes or that they are underestimates of the true immigrant labor market impact due to compensatory outflows of the resident population.

The remainder of this paper is organized as follows. In the next section, I will provide some background information on ethnic German immigration since World War II and the institutional setting in which it took place. In Section 3, I explain the underlying theoretical model and identification strategy of my analysis. I then describe the data sources in Section 4 and provide some descriptive evidence in Section 5. Finally, I present and discuss the estimation results in Section 6 and conclude in Section 7.

2 Historical Background and Institutional Framework

After the end of World War II and the ensuing repartitions and forced resettlements across Europe, about 15 million German citizens became refugees or expellees, most of whom moved back to Germany in the immediate post-war years. By 1950, some 7.8 million of these refugees had settled in West Germany and 3.5 million in East Germany (Salt and Clout, 1976). However, many German citizens and their descendants continued to live outside post-war Germany. In the following decade, the inflow of ethnic Germans, then called *Aussiedler*, gradually ebbed away as Eastern European countries became increasingly isolated. After the construction of the Berlin Wall in 1961, it practically came to a standstill. Between 1950 and 1987, the total number of ethnic Germans who came to West Germany amounted to 1.4 million.[4] In 1988, with the end of the cold war looming, travel restrictions in Central and Eastern Europe were lifted. This caused an immediate resurgence of ethnic German migrations. In 1990 alone some 397,000 individuals, mainly from the former Soviet Union (37%), Poland (34%) and Romania (28%), arrived in Germany. Faced with these enormous movements, the government limited their inflow in subsequent years to around 225,000 per year. This quota was met until 1995, after which the annual inflows gradually decreased. From 1993 onwards more than 90% of the ethnic German immigrants originated from territories of the former Soviet Union.[5]

All ethnic German immigrants who wanted to come to Germany had to apply for a visa at the German embassy in their country of origin and prove their German origin in terms of descent, language, education and culture. Once applications were accepted and a visa granted, all arriving immigrants had to pass through a central admission center where they were initially registered. If they did not have a job or other source of income that guaranteed their livelihood, which applied to the vast majority of immigrants at the time of arrival, they were then allocated to one of the 16 federal states according to pre-specified state quotas.[6] Within each state, they were subsequently further allocated to particular counties, using a state-specific allocation key as guidance which, with two exceptions, was fixed over time and based on the relative population share of each county.[7] By far the most important factor determining the final destination of

[4]Source: Bundesverwaltungsamt, Jahrestatistik Aussiedler 2003.

[5]It is important to emphasize that the ethnic German immigrant population I analyze in this study does not include Germans who used to live in East Germany and who moved to West Germany after unification in 1990. This group had complete freedom of movement within Germany from the day of unification.

[6]According to the so-called *Königsteiner Distribution Key*, the quotas since 1993 were: Baden-Württemberg 12.3%, Bavaria 14.4%, Berlin 2.7%, Brandenburg 3.5%, Bremen 0.9%, Hamburg 2.1%, Hesse 7.2%, Mecklenburg-Pomerania 2.6%, Lower Saxony 9.2%, North Rhine-Westphalia 21.8%, Rhineland Palatinate 4.7%, Saarland 1.4%, Saxony 6.5%, Saxony-Anhalt 3.9%, Schleswig-Holstein 3.3%, and Thuringia 3.5%.

[7]The exceptions were Lower Saxony where the quotas were annually adjusted for changes in each county's population, and North Rhine-Westphalia where quotas were based on both population and geographical area and

the ethnic German immigrants was the proximity of family members or relatives. The responsible authority at the Ministry of the Interior estimates that this was the decisive factor in the allocation decision in approximately 90% of all cases. Additional factors were the presence of health and care facilities and the infrastructure for single parents. Crucially for this study, the skill level of the immigrants did not play any role in the allocation process.

The legal basis for this system was the "Assigned Place of Residence Act" (*Wohnortzuweisungsgesetz*), which was introduced in 1989 in response to the large inflows experienced at the time. These inflows tended to be concentrated towards a few specific regions where they caused considerable shortages in available housing space while in other, particularly rural areas, facilities remained empty.[8] The intention of the law was to ensure a more even distribution of ethnic German immigrants across Germany and avoid a capacity overload of local communes, which are responsible for the initial care of the immigrants. However, in practice, the introduction of this law turned out to be ineffective because the entitlements to considerable benefits such as financial social assistance, free vocational training courses, and language classes were not affected if an ethnic German immigrant chose to settle in a region different from the one allocated upon arrival. As a consequence, unregulated internal migration of ethnic Germans led to the creation of a few enclaves, in some of which their concentration reached 20% of the overall population (Klose, 1996). In response to these developments, the Assigned Place of Residence Act was substantially modified on 1 March 1996. As a key feature of the new law, ethnic German immigrants would now lose all their benefits in case of non-compliance with the allocation decision. Due to the federal structure of Germany, it was subject to each of its states to adopt and implement the new legislation. Apart from Bavaria and Rhineland-Palatinate, all West German states chose to do so, most of them with effect as of 1 March 1996. Only Lower Saxony and Hesse adopted the law at a later point: the former in April 1997, and the latter in January 2002. For an overview see Table B-1 in Appendix B. The perception at both the Ministry of the Interior and the Association of German Cities and Towns is that the new provisions and sanctions were successful and ensured high compliance with the initial allocation decision.[9]

annually adjusted to population changes.

[8]The problem of housing space was particularly pronounced in the late 1980s and early 1990s when annual inflows of ethnic German immigrants were largest. By the mid 1990s, however, sufficient capacities in social housing and hostels had been established, and were even partly shut down again due to the smaller annual inflows. Therefore housing availability, which may depend directly on the state of the local economy, is unlikely to have affected the number of immigrants allocated to a region and in that way introduced endogeneity into the allocation process.

[9]This is corroborated in the commentarial statement of a related judgment by the Federal Constitutional Court in a case in which an ethnic German immigrant took legal action without avail against the restriction of her freedom of movement (BVerfG, 1 BvR 1266/00 vom 17.3.2004, Absatz-Nr. 1 - 56).

The regional allocation of the ethnic German immigrants became void if they could verify that they had sufficient housing space as well as a permanent job from which they could make a living; at the latest, however, three years after initial registration. This suggests that after arrival in the allocated place of residence there was some scope for endogenous self-selection through onward migration. However, it is likely that immigrants predominantly search for job opportunities in the vicinity of their places of residence. In fact, the difficulties of searching for a job in a different locality arising from the legal provisions of the Assigned Place of Residence Act were acknowledged by the legislature and eventually led to a further amendment of the law on 1 July 2000 that explicitly allowed for temporary residence in alternative localities for the purpose of job search activities without loss of entitlements as long as it did not exceed 30 days.[10]

To sum up, through the introduction of the new legislation in 1996 the authorities implemented a system for allocating a particular group of immigrants exogenously with regard to their skill levels to different regions while providing for the necessary sanctions to ensure compliance with these allocation decisions. This framework can therefore be regarded as a quasi-experiment in immigration in which inflows are exogenous to local labor demand conditions.

3 Methodology

3.1 Empirical Model

The empirical analysis in this paper is based on a model in which immigration impacts local labor markets by changing the relative supplies of different skill groups (compare Card, 2001). Let us assume that in each labor market a competitive industry produces a single output good using a CES-type aggregate of skill-specific labor inputs and capital. Thus, relative wages and – by substituting into a labor supply function – relative employment rates will only depend on the relative supply of each skill group.[11] The equations for the effect on the employment/labor force and wage rates are then given by

$$\Delta \log \left(N_{jrt} / P_{jrt} \right) = v_{jt} + v_{rt} + \beta_1 \Delta \log f_{jrt} + \Delta v_{jrt} \tag{1}$$

$$\Delta \log w_{jrt} = u_{jt} + u_{rt} + \beta_2 \Delta \log f_{jrt} + \Delta u_{jrt} \tag{2}$$

[10] I do not explicitly take this change in regulations into account in the analysis since it was only valid for the last six months of the six-year period I cover and did not affect the initial allocation to a particular region.

[11] The key assumptions underlying this model are that capital and labor are separable in the local production function, that the elasticities of substitution across all skill groups are identical, that natives and immigrants are perfect substitutes within skill groups, and that the per capita labor supply functions for the different skill groups have the same elasticity.

where $\Delta \log f_{jrt} = \log(P_{jrt}/P_{rt}) - \log(P_{jrt-1}/P_{rt-1})$ denotes the percentage change in the fraction of the overall labor force in labor market r that falls into skill group j, and v_{jt}, u_{jt}, v_{rt}, and u_{rt} are interactions of skill group and year fixed effects and region and year fixed effects, respectively. Δv_{jrt} and Δu_{jrt} are unobserved error components that capture skill-, region- and year-specific productivity and demand shocks.[12] As opposed to Card's study, which only uses one cross-section and thus estimates in levels, I am able to control for skill region specific fixed effects (which I difference out) and use variation in local skill shares over time to identify β_1 and β_2.

It is a well-known problem that changes in relative factor shares in a locality are likely to be endogenous due to unobserved skill-specific local productivity and demand shocks that simultaneously raise employment and wage rates and attract more workers into the specific skill group. In this case, OLS estimates of β_1 and β_2 are upward-biased. To address this problem, I take advantage of the exogenous allocation of ethnic German immigrants to Germany's counties between 1996 and 2001. Specifically, I assume that their inflows are uncorrelated with any skill-specific productivity and demand shocks and can therefore serve as an instrument for the change in the relative factor shares $\Delta \log f_{jrt}$. I will provide evidence for the validity of this assumption in Section 5.2. I construct my instrument, the skill-specific ethnic German inflow rate, by multiplying the overall inflow ΔI_{rt} into a particular locality by the nationwide fraction of ethnic German immigrants in each skill group, distinguishing skill groups along occupational lines. Let θ_{jt} denote this fraction and let ω_t denote the fraction of ethnic German immigrants that arrive in year t and are aged between 15 and 64. Since individual skills and age did not play a role in the allocation of ethnic Germans to local labor markets, one can expect the skill and age composition of the arriving ethnic German immigrants to be the same across localities.[13] The predicted skill-specific inflow rate of working age immigrants into labor market r in year t that I use as an instrument for the change in the relative factor share is then given by

$$SP_{jrt} = \frac{\theta_{jt}\omega_t \Delta I_{rt}}{P_{jrt-2}},$$

[12] Note that in order to facilitate the calculation of the regression-adjusted employment/labor force rates (see Section 4), I use the employment/labor force rate in levels in my estimations rather than in logs as suggested by the theoretical model. One can translate the estimated coefficients for the effects on the employment/labor force rate in levels into estimates of β_1 by dividing them by the average employment/labor force rate of all individuals (0.91). Finally, I use the labor force rather than the working age population for P_{jrt} and P_{rt}. I am therefore not able to capture responses through entries to or exits from the labor force which, while less an issue for men, may be problematic when looking at female labor market outcomes.

[13] In the presence of a correlation in skills between immigrants and their family contacts already living in Germany, this assumption may not hold. However, since these families were typically split up a long time ago and passed through significantly different educational systems, the correlation in skills is likely to be small.

where SP_{jrt} stands for the skill-specific supply-push component of ethnic German immigrant inflow ΔI_{rt}, and P_{jrt-2} is the overall labor force in skill group j in $t-2$. I use a lag of two years in the denominator in order to avoid any correlation with the skill-specific error terms Δv_{jrt} and Δu_{jrt} in Equations 1 and 2.[14]

Based on my administrative data, the skill-specific labor force in a locality consists of all employed individuals plus all individuals receiving official unemployment compensation, either unemployment benefits (*Arbeitslosengeld*) or unemployment assistance (*Arbeitslosenhilfe*). During the period covered by this analysis, unemployed individuals received unemployment benefits for the first 6 to 32 months depending on the duration of their previous employment. Subsequently, they received unemployment assistance which was means-tested and, in principle, indefinite. The data therefore provide a fairly good approximation of the actual labor force, in particular for men, who are less likely to lose or quit their job without receiving some sort of unemployment compensation thereafter. A peculiarity arising from these data with respect to the empirical model, however, is that year to year changes in the local skill shares are driven by new individuals becoming employed in a given skill group. This is because, in order to qualify for official unemployment compensation, individuals first have to work for at least 12 months prior to becoming unemployed, so that new entrants into the labor force always "enter" my data set as employed individuals. This has an important implication for the interpretation of the coefficients β_1 and β_2. These now measure how changes in the relative skill shares in a locality induced by additionally employed individuals affect average labor market outcomes. In the case of the employment/labor force rate (measured in levels rather than logs), β_1, appropriately scaled by the labor force share of the group under consideration, hence measures the direct displacement effect, that is, how many workers lose their job for every additional worker finding a job.[15]

[14] Using the skill-specific labor force of the previous year instead would increase the first stage correlation of the instrument with the endogenous variable $\Delta \log f_{jrt}$ but, in the presence of unobserved productivity and demand shocks, introduce a positive correlation of the instrument with the first differenced error terms Δv_{jrt} and Δu_{jrt} which would render the instrument invalid. For the skill-specific labor force of the previous year to be valid for the construction of the instrument would require that the employment/labor force rate evolves as a random walk, a requirement unlikely to hold for Germany (see Pischke and Velling, 1997, for a discussion of this issue).

[15] To see this, take the estimation equation $\Delta(\frac{N_j^*}{P_j^*}) = \beta \Delta \ln(\frac{P_j}{P})$, where $\frac{N_j^*}{P_j^*}$ is, as in the empirical analysis later, the skill-specific employment/labor force rate of the population already present in the data before 1996, and $\frac{P_j}{P}$ is the share of the total labor force in skill-group j (including those who arrived after 1995). Suppose $P_j^* = s \times P_j$ (in the main specification, we have $s = 0.89$, on average). Now suppose there is an inflow of working immigrants of I_j. Assuming that $P_t \approx P_{t-1}$, and that there is no change in the size of the already present labor force P_j^*, we then have $\Delta \frac{N_j^*}{P_j^*} = \frac{\Delta N_j^*}{P_j^*} = \beta(\ln(\frac{I_j+P_j}{P}) - \ln(\frac{P_j}{P})) = \beta \ln(\frac{I_j+P_j}{P_j}) = \beta \ln(1+\frac{I_j}{P_j}) \approx \beta(\frac{I_j}{P_j})$. Hence $\frac{\Delta N_j^*}{P_j^*} \approx \beta(\frac{I_j}{P_j}) = s\beta(\frac{I_j}{P_j^*})$, so that β, appropriately scaled by s, can be interpreted as a displacement effect.

3.2 Source of Variation

An important issue in the context of this study is that, by design, the exogenous allocation of ethnic German immigrants over the entire German labor market ensures that the variation in the overall regional inflow rates is small. Moreover, if the allocation decision is based, as in the present case, to an overwhelming extent on family ties, the skill distribution of the newly arriving ethnic German immigrants is also going to be homogeneous across different regions. However, even with the same inflow rate and skill composition of the arriving immigrants in each region, the effect on the labor market outcomes of the resident population of a particular skill group will still differ depending on the existing pre-migration skill distribution in each region. In particular, the percentage change in local skill share f_{jrt} after an inflow of immigrants that is homogenous across regions r relative to the resident population, $\frac{\Delta I_{rt}}{P_{rt-1}} = i_t$, and of which a constant share across regions of $v_{jrt} = v_{jt}$ is of skill j is given by

$$\%\Delta f_{jrt} = \frac{f_{jrt-1} + v_{jt} i_t}{f_{jrt-1}(1+i_t)} - 1, \tag{3}$$

where, for simplicity, I assume that there is no growth in the local population for other reasons than immigration. The first derivative of this term with respect to the initial skill share is negative, so the larger the initial skill share, the smaller will be the percentage change in the relative skill supply induced by the skill-homogeneous inflow of immigrants. Note that if relative skill shares were the same across regions, $f_{jrt-1} = f_{jt-1}$, Equation 3 would only vary by skill group j and time t, and all this variation would be absorbed by the inclusion of skill/time fixed effects in the estimation of Equations 1 and 2. The variation in relative skill share changes that I exploit in my estimations therefore arises mainly from variation in the pre-existing skill compositions across different labor market regions rather than from a differential composition of the immigrating population.[16]

4 Data Sources

At the end of every year, the Federal Administration Department in Germany (*Bundesverwaltungsamt*) publishes information on the recent cohort of ethnic German immigrants in their series "*Jahresstatistik für Aussiedler*". These publications contain information recorded upon

[16] To illustrate this point, suppose there are two regions, Region A and Region B, where Region A is a low skill region with 80% of the workforce low-, and 20% high-skilled while Region B is a high skill area with 20% low- and 80% high-skilled. Now suppose there is a 1% inflow into each region of which 70% are low-skilled, and 30% high-skilled. Such an inflow will now decrease the share of low-skilled workers in Region A by 0.1%, but increase it by 2.5% in Region B. Conversely, the inflow of high-skilled immigrants will lead to a 0.5% increase in the share of high-skilled individuals in Region A and a 0.7% reduction of the share in Region B.

the immigrants' arrival in Germany; specifically on their countries of origin, age structure, last occupation, last labor force participation status, and religious affiliation. They also include the absolute numbers allocated to each of Germany's 16 federal states. All the information provided is on the national level, apart from the age structure and religious affiliation, which are detailed for each state separately. Of particular importance for this analysis is the information on the last occupation in the country of origin, since it provides a measure of the immigrants' skill levels that is exogenous to local demand conditions in Germany. I use this occupational information to calculate the fraction θ_{jt} of ethnic German immigrants in each occupation group, which I require for the construction of my instrumental variable.

I augment the aggregate information from the annual publications with data on the regional inflows of ethnic German immigrants which I collected directly from the responsible federal admission centers in each state. I was able to obtain the relevant information for each county in West Germany's ten federal states with the exception of Bavaria, where records were not kept at the required regional level. The period covered is 1996 to 2001, during which the Assigned Place of Residence Act was in effect. I focus on West Germany (excluding Berlin) since data on ethnic German inflows to the territory of what was formerly known as the German Democratic Republic are very fragmentary. Furthermore, after German unification in 1990, local labor markets in that area have experienced fundamental changes in their transition to market economies which are difficult to control for and may contaminate the results of this study.

I obtained data on the labor market outcomes of the resident population and the relative skill shares in a locality from the IAB Employment Subsample 1975-2001. This administrative data set comprises a 2% subsample of all employees in dependent employment who are subject to social security contributions in Germany. It includes all wage earners and salaried employees but excludes the self-employed, civil servants, and the military. It furthermore includes all unemployed persons who receive unemployment compensation.[17] The data are collected directly on the employer level by the Federal Institute of Employment and provide detailed employment histories of 460,000 individuals in West Germany. For a detailed description of the data set see Bender et al. (2000). The sample for my analysis consists of all individuals aged 15 to 64, based on which I construct the relative occupation shares in the local labor force for each of West

[17] In 2001, 77.2% of all workers in the German economy were covered by social security and 78% of unemployed individuals in West Germany received official unemployment compensation - mostly either unemployment benefits (*Arbeitslosengeld*) or unemployment assistance (*Arbeitslosenhilfe*) - and are hence recorded in the IAB data (Bundesagentur für Arbeit, 2004). The data set does not provide information on the out of labor force population and those individuals which are currently actively looking for a job but have not yet paid into the social security system.

Germany's labor market regions for each year between 1996 and 2001.

Due to a lack of country-of-birth information, it is not possible to distinguish ethnic German immigrants from Germans born in Germany (and to whom I will henceforth refer as "native Germans") in the IAB data so that part of the observed change in the employment/labor force rate and log wages in a locality could simply be due to composition effects through newly entering immigrants. Since the ethnic German immigrants' labor market outcomes one year after arrival are substantially worse than those for the resident population (Bauer and Zimmermann, 1997), their inclusion in the calculation of average labor market outcomes would lead to a downward bias of the true change in outcomes for the resident population. For this reason, I restrict the sample to those individuals who were already observed in the data before 1996 when constructing the skill-group specific employment/labor force rates and average wages.

Both employment/labor force rates and wages are obtained by regressing separately for each year and skill group the individual level outcomes, either an employment indicator or log daily wages, on a set of observables, including a cubic of potential experience, a vector of region fixed effects, and a set of education group fixed effects.[18] In addition, I include 16 country/region of origin dummies as well as a gender dummy when I pool native Germans and resident foreign nationals and men and women to construct labor market outcomes for the overall population. In each case, I use the estimated coefficients on the region dummies as the dependent variables in the regressions of Equations 1 and 2. They reflect the employment/labor force rate and average log wage in each locality, adjusted for observable differences in experience, gender, origin, and educational composition within each occupation group across local labor markets. All outcomes are constructed for the 31st of December of each year.[19] For my analysis, the IAB sample has two major advantages compared to other data sources. First, since I am dealing with administrative data which is used to calculate health, pension and unemployment insurance contributions, the precision of the data is high. In particular, the wage data are unlikely to suffer from any measurement error or reporting bias typical in many survey data sets.[20] Second, the data sample is large and includes detailed regional identifiers.

[18]Because the data report daily wages and there is no information on hours worked, I restrict the sample for the wage regressions to full-time workers.

[19]To account for the sample variability of the estimated employment rates and wages and the heteroskedasticity arising from it, I weight each observation in the main regressions with the inverse of the standard error of the estimated outcome variable. In addition, all standard errors in the main regressions are robust and clustered at the skill-specific regional level.

[20]Wage records in the IAB data sample are top coded at the social security contribution ceiling. I impute those wages by first estimating a tobit model and then adding a random error term to the predicted value of each censored observation, ensuring that the imputed wage lies above the threshold (see Gartner, 2004 for details).

The only additional external data I use are county level population figures provided by Germany's Federal Statistical Office to calculate overall ethnic German immigrant inflow rates into each county, which are needed in order to assess the effectiveness of the Assigned Place of Residence Act. From the population data, I also construct local growth rates of both the German and foreign populations, which I use to determine whether there is evidence of out-migration in response to the inflow of ethnic German immigrants (see Section 6.1).

5 Descriptive Evidence

5.1 Definition of Skill Groups and Labor Market Regions

The theoretical model suggests that immigration affects relative labor market outcomes by changing the relative skill shares in the local economy. I define skill groups along five broad occupation lines (see also Card, 2001): I. farmers, laborers and transport workers, II. operatives, craft workers, III. service workers, IV. managers, sales workers, and V. professional & technical workers. For the immigrant population these occupations refer to the last occupation in the country of origin. The motivation for a disaggregation by occupation rather than, for example, educational attainment, is that the reported level of education that an immigrant obtained in his or her country of origin does not necessarily overlap with the corresponding level of education in the host country. Natives and immigrants in the same occupation group might therefore better reflect comparable skill levels. However, as a robustness check I will also report a set of results where skills are defined based on educational attainment.[21]

Table 1 provides some descriptive statistics on the overall ethnic German population immigrating in each year between 1996 to 2001. In 1996, 177,751 ethnic German immigrants came to Germany. This number gradually declined to 95,615 in 2000 and then increased again slightly to 98,484 in 2001. Overall, over the period 1996 to 2001, 714,265 ethnic German immigrants came to Germany, which corresponds to an average regional inflow rate relative to the resident

[21] Borjas (2003) defines skill groups in terms of education and work experience, arguing that individuals with similar education but different experience in the labor market are imperfect substitutes in the production process. Due to the unavailability of cross-tabulations of occupational attainment by age group, it is unfortunately not possible to extend my analysis in this direction and allow for imperfect substitutability across age groups. Similarly, since I cannot distinguish ethnic German immigrants from native Germans in my data, I am not able to allow for imperfect substitutability between natives and immigrants within the same skill group, as suggested in recent studies by Ottaviano and Peri (2011), Manacorda et al. (2006), and D'Amuri et al. (2010) for the U.S., the UK, and Germany, respectively. Whether this is necessary is currently still a matter of debate in the literature (see Borjas et al., 2008). Because of their existing German language skills and shared cultural background, one could, however, argue that ethnic German immigrants are better substitutes for native Germans than, say, recent arrivals of foreign immigrants.

Table 1: Descriptive statistics of ethnic German immigrants, 1996 to 2001

	Year						Overall
	1996	1997	1998	1999	2000	2001	1996 - 2001
Overall inflow	177,751	134,419	103,080	104,916	95,615	98,484	714,265
Men	85,918	65,010	49,664	50,456	46,145	47,379	344,572
Women	91,833	69,409	53,416	54,460	49,470	51,105	369,693
Mean % inflow rate	0.19	0.16	0.12	0.12	0.12	0.12	0.83
(standard deviation)	(0.09)	(0.06)	(0.04)	(0.04)	(0.04)	(0.04)	(0.27)
% Occupation I	28.3	28.9	27.3	27.5	28.4	26.1	27.9
% Occupation II	29.0	28.6	31.0	30.3	30.5	31.5	30.0
% Occupation III	18.7	18.3	17.9	17.7	18.4	18.7	18.3
% Occupation IV	4.4	4.8	4.7	5.5	5.3	4.8	4.9
% Occupation V	19.6	19.4	19.0	18.9	17.4	18.8	18.9
% Age < 15	27.6	26.2	25.5	24.2	23.3	22.6	25.3
% Age 15-64	65.9	66.5	67.8	69.0	70.1	71.1	68.0
% Age > 64	6.5	7.3	6.7	6.8	6.6	6.3	6.7

Source: *Bundesverwaltungsamt*
Note: Mean inflow rate based on the 112 West German labor market regions (77 for 1996) who implemented the Assigned Place of Residence Act. Occupation refers to last activity in country of origin and is reported upon arrival.

population of 0.83%. The age and occupational composition of the ethnic German immigrant cohorts remains relatively homogeneous over time. There is a slight decrease in the number of immigrants working in low skill occupation group I from 28.3% in 1996 to 26.1% in 2001 and a corresponding increase in occupation group II from 29.0% to 31.5%.

The theoretical model predicts that ethnic German immigrants only affect relative labor market outcomes if their inflow leads to changes in the relative supply of different labor inputs. This would require the ethnic German immigrant population to differ from the resident population with respect to their skill distribution. In 1996, on average around 19% of the resident local workforce belonged to occupation group I, 23% to occupation group II, 33% to occupation group III, 15% to occupation group IV, and 10% to occupation group V. Comparing these percentages to the occupational distribution of the ethnic German immigrants reported in Table 1 shows that the latter group tended to work in lower skill occupations before coming to Germany: close to 60% of the immigrants worked in low skill occupation groups I and II compared with only about 40% of the resident population. However, while the immigrants are substantially less likely to have worked in the service (18% vs. 33%) and, in particular, the commercial sector (5% vs. 15%), a relatively large proportion previously worked in high-skill occupation group V (19% vs. 10%), for instance as mathematicians, engineers, and teachers.[22] The occupational

[22] As occupational downgrading after arrival is potentially an issue for this group of high-skilled immigrants, I

composition of the newly arriving ethnic German immigrants thus differs substantially from the existing skill composition of the resident population and will therefore have affected the relative factor supplies in the economy. To what extent this happened in a particular local labor market depends on the existing skill composition of the labor force in that locality. As described in Section 3.2, differences in the existing skill composition of the labor force are the primary source of variation in my empirical analysis, ensuring that despite a homogeneous inflow of ethnic German immigrants in terms of relative size and skill composition, there is variation in the induced changes of relative factor supplies across regions. Looking at the distribution of skill shares, there is indeed considerable variation across the 112 labor market regions in my sample. To give an example, at the end of 1995, the share of individuals belonging to occupation group I ranges from 13.6% (county *Calw* in Baden-Württemberg) to 29.1% (county *Holzminden* in Lower Saxony), while the share belonging to high-skill occupation group V ranges from 3.0% (county *Cochem-Zell* in Rhineland-Palatinate) to 17.9% (county *Leverkusen* in North Rhine-Westphalia).

The primary regional unit in my analysis is the West German labor market region. These regions are aggregates of counties, which are the original regional units at which I observe ethnic German inflows. The aggregation takes account of commuter flows so that labor market regions better reflect separate local labor markets. Throughout this paper I focus on those 112 West German labor market regions that formally implemented the Assigned Place of Residence Act during the study period (see Table B-1 in Appendix B). These regions comprise on average around 380,000 individuals, although this number varies substantially, ranging from 82,000 to 2.7 million. Table 2 provides descriptive statistics on some socioeconomic characteristics of the workforce in these regions, including the annual changes of the log skill shares and the (unadjusted) skill-specific employment/labor force rates and wages. Over the period 1996 to 2001, there was a decline in the share of the workforce in occupation groups I and II of around 11.4% and 8.0%, respectively, and an increase in the share working in occupation group III of 8.8%. These changes reflect secular demand side changes towards a more service-oriented economy, which on the national level, for example in the case of occupation group I, dominate the disproportionately large inflow of ethnic German immigrants. In terms of labor market outcomes, there has been an overall increase in the employment/labor force rate across all occupations by between 0.7 and 3.0 percentage points, a decrease in real wages in the lowest skill occupation group I of around 2.2%, stagnation of wages in occupation group II, and an increase in wages in the higher skill occupation groups III to V of between 2.8% and 3.6%.

check the robustness of my estimation results under exclusion of this category.

Table 2: Summary statistics for West German labor market regions. Means and standard deviations

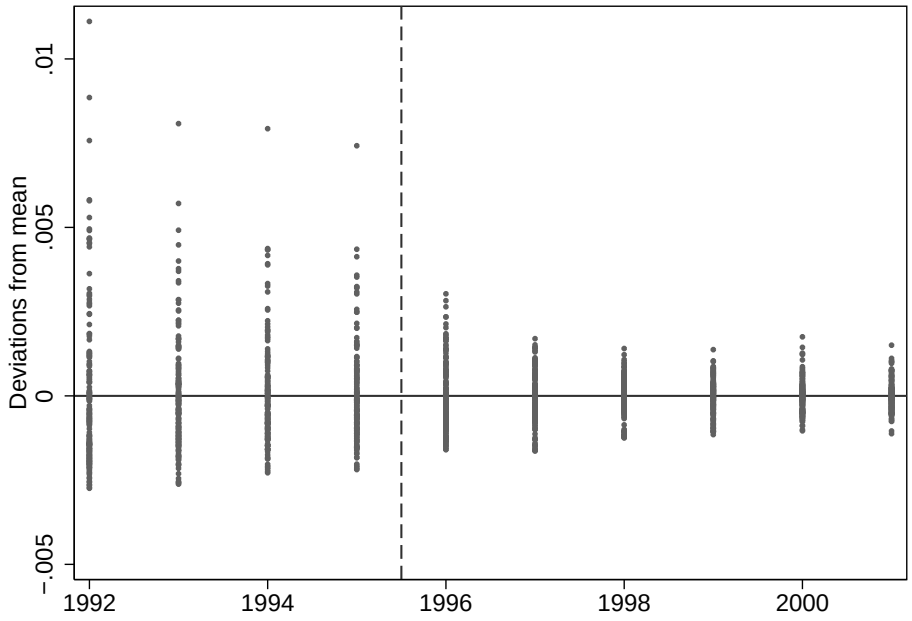
	Year						Change
	1996	1997	1998	1999	2000	2001	1996 - 2001
Overall population	442,058	378,530	378,910	379,936	380,849	382,371	0.018
	(466,578)	(414,053)	(414,130)	(415,386)	(416,876)	(419,191)	(0.030)
Working-age pop. (15-64)	300,399	256,323	256,249	255,852	255,292	255,407	0.001
	(324,460)	(287,187)	(286,832)	(286,432)	(286,045)	(286,466)	(0.032)
Foreign immigrant share	0.115	0.106	0.104	0.104	0.103	0.102	−0.003
	(0.037)	(0.036)	(0.037)	(0.036)	(0.036)	(0.036)	(0.012)
Empl/lf rate	0.894	0.898	0.897	0.913	0.919	0.924	0.021
	(0.021)	(0.023)	(0.025)	(0.022)	(0.023)	(0.022)	(0.013)
Log daily wage (in €)	4.330	4.312	4.321	4.329	4.328	4.337	0.015
	(0.067)	(0.075)	(0.075)	(0.077)	(0.077)	(0.078)	(0.018)
Occupation groups:							
Δ log share occupation I	−0.021	−0.015	−0.013	−0.019	−0.021	−0.026	−0.114
	(0.022)	(0.025)	(0.030)	(0.028)	(0.026)	(0.026)	(0.057)
Δ log share occupation II	−0.010	−0.005	−0.010	−0.021	−0.012	−0.023	−0.080
	(0.017)	(0.022)	(0.027)	(0.025)	(0.024)	(0.024)	(0.052)
Δ log share occupation III	0.018	0.017	−0.001	0.018	0.018	0.019	0.088
	(0.016)	(0.019)	(0.019)	(0.020)	(0.018)	(0.017)	(0.038)
Δ log share occupation IV	0.006	0.011	−0.007	0.003	−0.000	0.010	0.024
	(0.025)	(0.034)	(0.026)	(0.032)	(0.037)	(0.033)	(0.059)
Δ log share occupation V	−0.004	−0.036	0.058	0.011	−0.004	0.006	0.029
	(0.036)	(0.045)	(0.048)	(0.039)	(0.037)	(0.043)	(0.078)
Δ Empl/lf rate occupation I	−0.021	0.014	−0.005	0.024	0.003	0.005	0.021
	(0.014)	(0.017)	(0.018)	(0.016)	(0.016)	(0.015)	(0.024)
Δ Empl/lf rate occupation II	−0.018	0.015	−0.000	0.018	0.009	0.003	0.026
	(0.013)	(0.015)	(0.016)	(0.016)	(0.014)	(0.015)	(0.024)
Δ Empl/lf rate occupation III	−0.009	0.003	−0.003	0.014	0.004	0.006	0.014
	(0.009)	(0.010)	(0.011)	(0.011)	(0.009)	(0.009)	(0.013)
Δ Empl/lf rate occupation IV	−0.010	0.004	−0.004	0.012	0.003	0.003	0.007
	(0.013)	(0.015)	(0.014)	(0.016)	(0.014)	(0.013)	(0.016)
Δ Empl/lf rate occupation V	−0.008	0.006	0.011	0.009	0.007	0.006	0.030
	(0.017)	(0.021)	(0.018)	(0.015)	(0.015)	(0.014)	(0.021)
Relative Δ wage occupation I	−0.008	−0.013	−0.005	0.003	−0.003	0.003	−0.022
	(0.012)	(0.012)	(0.016)	(0.016)	(0.018)	(0.016)	(0.026)
Relative Δ wage occupation II	−0.001	−0.014	0.005	0.004	0.005	0.011	0.005
	(0.014)	(0.013)	(0.015)	(0.028)	(0.045)	(0.019)	(0.033)
Relative Δ wage occupation III	0.001	−0.004	0.007	0.014	0.000	0.009	0.028
	(0.012)	(0.014)	(0.013)	(0.015)	(0.015)	(0.014)	(0.025)
Relative Δ wage occupation IV	0.009	0.004	0.008	0.009	−0.000	0.006	0.036
	(0.017)	(0.022)	(0.019)	(0.022)	(0.023)	(0.025)	(0.038)
Relative Δ wage occupation V	−0.001	0.000	0.017	0.017	−0.003	0.005	0.034
	(0.017)	(0.014)	(0.022)	(0.017)	(0.017)	(0.020)	(0.029)

Source: IAB sample, Statistical Office
Notes: For the labor market outcomes and skill shares I only consider the working-age population aged 15-64. Employment and wages refer to individuals subject to social security contributions. The basis of this table are the 112 West German labor market regions (77 for 1996) which implemented the Assigned Place of Residence Act.

5.2 Exogeneity of Allocation

The validity of my instrumental variable based on the ethnic German immigrant inflows relies upon the effectiveness of the Assigned Place of Residence Act and the exogeneity of the immigrants' allocation by the authorities with regard to transitory local demand conditions. Since the main allocation criterion was the proximity of family members and labor market skills did not feature in any significant way in the allocation process, the exogeneity requirement is likely to be satisfied. In fact, if family ties were the only criterion by which immigrants would choose their place of residence themselves, one would not need the government allocation policy in order to maintain the exogeneity assumption with regard to local labor demand shocks. However,

Figure 1: Variation in the ethnic German immigrant inflow rate, 1992 to 2001



Notes: Values depicted are deviations from the mean ethnic German inflow rate in each year. The inflow rates are calculated as the number of ethnic German immigrants allocated, divided by the overall population in the county at the end of the previous year. Only the 168 counties in states that implemented the Assigned Place of Residence Act at the latest by 1997 are depicted.

local labor market conditions are likely to have played a role in the choice of place of residence before the introduction of the new legislation in 1996, as suggested by Figure 1, which shows the variation of ethnic German immigrant inflow rates across West German counties before the introduction of the new legislation in 1996 and thereafter. There is a significant reduction in the variation of regional inflow rates after the introduction of the new legislation, in particular from 1997 onwards. This reduction indicates that the new allocation policy was indeed effective in altering the direction of ethnic German immigrant inflows and ensuring a more even distribution across Germany. It also points towards the existence of a few particularly attractive destinations before 1996.[23]

[23]There are several potential reasons for the small remaining variation after 1996 shown in Figure 1. First, the quotas for each federal state and a large number of counties were not adjusted to changes in their corresponding populations after they were originally set. In addition, when the state quotas were set in 1993, they were not exclusively based on the resident population but also on the strength of the economy of each state so that some states (and thus the counties they comprise) might receive higher relative inflows than others. I control for these differences in my empirical estimations by the inclusion of region fixed effects. Another reason for the observed differences in relative inflows are different allocation procedures. For instance, in North Rhine-Westphalia the geographical area of each county features as an additional factor in determining the number of immigrants allocated, and in Lower Saxony some counties which received a disproportionate number of ethnic Germans in the early 1990s were exempted from additional allocations for some years after 1996.

Table 3: Age distribution of allocated ethnic German immigrants, 1996 to 2001

Age group	SH	HA	LS	BR	NW	HE	RP	BW	BA	SA	STDEV	STDEV all
0 - 14	25.9	24.2	26.4	26.1	25.9	25.8	25.6	25.0	25.0	24.8	0.7	1.2
15 - 24	18.7	19.7	19.2	18.9	19.3	18.6	19.1	18.9	19.0	18.9	0.3	0.3
25 - 34	15.3	15.0	14.9	15.3	14.9	15.3	15.0	14.8	14.9	15.3	0.2	0.7
35 - 44	18.2	17.8	18.0	17.5	17.7	17.8	17.4	17.8	17.7	17.9	0.2	0.5
45 - 55	9.1	10.1	8.8	9.2	9.0	8.9	9.7	9.5	9.5	9.8	0.4	0.6
55 - 64	6.4	7.1	6.6	6.8	6.6	6.7	6.6	7.0	7.2	7.0	0.3	0.4
> 64	6.4	6.2	6.2	6.3	6.6	6.8	6.6	7.1	6.7	6.3	0.3	0.8

Notes: West Germany's 10 federal states are: Schleswig-Holstein (SH), Hamburg (HA), Lower Saxony (LS), Bremen (BR), North Rhine-Westphalia (NW), Hesse (HE), Rhineland-Palatinate (RP), Baden-Württemberg (BW), Bavaria (BA) and Saarland (SA).

One way to investigate whether the allocation decision was indeed exogenous with respect to individual skill characteristics, as suggested by the overwhelming importance of family ties for the allocation decision, is to compare the age distribution of the ethnic German immigrants that were allocated to each federal state. These distributions were recorded at the central admission center and are reported in Table 3. If immigrants were exogenously allocated with respect to their individual characteristics, one would not expect there to be significant differences in their age distribution across states. As shown in Table 3, the age distributions across states are indeed very similar. As a reference point, I show the standard deviation of each age group's share of the overall resident population across the same states at the end of 1995 in the last column. Apart from the 15 to 24 year-olds, the standard deviation of the age group shares of the allocated ethnic German immigrants is substantially lower than the corresponding standard deviation in the overall population in all age groups. In particular the shares of the groups aged 25 to 34 and 35 to 44, which represent a large part of the working population and are therefore most relevant for this analysis, are very similar across states. A regression of the age group proportions of the immigrant population allocated to each state between 1996 and 2001 on the existing proportion at the end of 1995 and a set of age group fixed effects gives an estimate of -0.03 with a robust standard error of 0.12.[24] Hence there is no evidence that, for instance,

[24]Similarly, regressing annual age group shares on existing age group shares of the resident population as well as interactions of age group and year fixed effects yields a statistically not significant estimate of -0.01 with a robust standard error of 0.07.

young ethnic German immigrants were allocated to states that are generally more attractive to young people. Overall the figures suggest that there was an exogenous allocation of ethnic German immigrants to each federal state with respect to their individual characteristics. Since the allocation to each state follows similar administrative processes and decision criteria as the subsequent allocation to different counties, the results in Table 3 can be regarded as indicative of an exogenous allocation within states to different counties.

There are two additional issues that could be problematic in the context of this study. The first is that immigrants may endogenously choose their time of arrival in Germany to take advantage of particularly good local demand shocks, given that proximity to family members was the main factor determining the eventual allocated destination of a newly arriving immigrant. However, in practice, quotas took precedence over family ties in the allocation process, so that a migrant could never fully rely on being allocated to a particular region. To formally investigate this issue, I regress the annual inflow rates into each region on the employment/labor force rate and the wage level at the beginning of each year, including both year and region fixed effects. Both coefficient estimates of these regressions are virtually zero and statistically not significant, with t statistics of -0.03 and 0.58 respectively.[25] In practice, current labor market conditions therefore did not seem to have played any significant role in determining an immigrant's time of arrival, most likely because the economic benefits of moving were typically not contingent on getting a paid job in Germany upon arrival. The second potential issue is that, in principle, relatives could have moved to those areas that are particularly attractive before the immigration of the ethnic German occurs and thus allow an endogenous self-selection of the immigrant. However, even in this quite unlikely case, as long as the selective migration of relatives is based on permanent rather than transitory features of the selected labor market region, I am able to control for such behavior by including region fixed effects in the empirical estimations.

6 Empirical Results

6.1 Migratory Responses

Since the analysis in this paper is based on local labor markets, it is vital to investigate whether there is evidence for migratory responses of the resident population to the inflows of ethnic German immigrants. By dissipating the effect of immigration across the entire economy, one

[25] The point estimate on the employment/labor force rate is $-0.71 \cdot 10^{-4}$ with a robust standard error of $24.4 \cdot 10^{-4}$ while the estimate on the average wage level is $0.19 \cdot 10^{-4}$ with a standard error of $0.33 \cdot 10^{-4}$.

would in that case underestimate the magnitude of the parameters of interest β_1 and β_2 (see, for instance, Borjas, 2006). Due to Germany's relatively inflexible labor market, one would a priori not expect large migration flows in response to increased immigration, and previous results seem to confirm this (e.g. Pischke and Velling, 1997). The comparatively generous social security system, with particularly high and long-lasting unemployment benefits, typically counteracts the incentive to move to a different location in the face of adverse labor market conditions.[26]

To evaluate the extent of migratory responses, I regress the annual growth rate of the German and foreign population on the annual ethnic German immigrant inflow rates, including both year and region fixed effects, the latter to allow for region-specific population growth trends. I estimate at the county as well as the labor market region level. In the absence of migratory responses of the resident population to the immigrant inflows, every additional ethnic German immigrant moving into a particular county should increase the overall German population (which includes the ethnic German immigrants) of that county by one, while the number of foreign nationals should remain unchanged. Out-migration of the resident German and foreign population, on the other hand, would be reflected by coefficient estimates of less than one and less than zero, respectively. The results from these regressions are shown in the upper panel of Table 4. There is no evidence of either native German or foreign out-migration. Neither is there evidence that the immigrants move to areas that are particularly attractive destinations for either native Germans or foreign immigrants. In this case the coefficient estimates should be greater than one in columns (1) and (3) and greater than zero in columns (2) and (4).[27] Given that, in particular, foreign nationals are likely to move to those areas where labor market conditions are best, one could expect a similar settlement pattern from ethnic German immigrants, whose occupational distribution is comparable, if they did indeed choose their places of residence endogenously.[28] These findings thus support the claim that because of their exogenous allocation to particular counties, ethnic German immigrants did not self-select into booming local labor markets.

Since in the empirical model changes in relative factor shares determine the relative wage structure and employment rates, it is instructive to investigate whether there is evidence of skill-

[26]During the 1980s, for instance, the regional disparities of unemployment rates in West Germany widened substantially while internal migration decreased (see Bauer et al., 2005).

[27]Particularly attractive destinations are in this context regions that experience annual increases in their German or foreign population that go beyond their long-term trends.

[28]For comparison, 27.9% of ethnic German immigrants and 27.4% of foreign nationals work (or used to work in the case of the ethnic German immigrants) in occupation group I, 30.0% and 31.9% in occupation group II, 18.3% and 27.3% in occupation group III, 4.9% and 7.8% in occupation group IV, and 18.9% and 5.5% in occupation group V.

Table 4: Migratory response of native Germans and foreign nationals to inflows of ethnic German immigrants

Independent variable	**Counties**		**Labor Market Regions**	
	German	Foreign	German	Foreign
Ethnic German inflow rate	1.204	0.089	0.950	0.251
	(.329)	(.321)	(.479)	(.497)
Observations	962	962	637	637
R^2	0.43	0.17	0.37	0.17

	Counties	**Labor Market Regions**
Skill-specific inflow rate	1.059	1.386
	(.424)	(.631)
Observations	4810	3185
R^2	0.23	0.31

Notes: Entries in the upper panel are the estimated coefficients on the ethnic German immigrant inflow rate in models where the dependent variable is either the annual growth rate of the German or the foreign local population either in West Germany's 168 counties or in the 112 labor market regions that implemented the law. All estimations include a full set of region and year fixed effects. Entries in the lower panel are the estimated coefficients on the relative skill-specific ethnic German immigrant inflow rate. The dependent variable is the annual change in the log skill share in the five occupation groups. Additional covariates are a full set of interactions of skill and year fixed effects as well as region and year fixed effects. Robust standard errors are reported in parentheses and are clustered at the skill-specific regional level. Regressions are weighted by $(1/N_{jrt} + 1/N_{jrt-1})^{-1/2}$, where N_{jrt} is the overall labor force in skill group j of region r at time t. A (*) denotes that the parameter is statistically different from 1 (or different from 0 in columns (2) and (4) of the upper panel) at the 10%, a (**) at the 5% and a (***) at the 1% significance level.

specific out-migration in response to the inflow of ethnic German immigrants. Following Card and DiNardo (2000), I relate the annual change in the overall log skill share of a specific skill group in a locality to the predicted relative immigrant inflow rate for that skill group:

$$\Delta \log(P_{jr}/P_r) = a + b(\Delta I_{jr}/P_{jr_{-1}} - \Delta I_r/P_{r_{-1}}) + u_{jr},$$

where $\Delta I_{jr}/P_{jr_{-1}}$ is the predicted skill-specific inflow rate of ethnic German immigrants with skill j in region r and $\Delta I_r/P_{r_{-1}}$ is the overall inflow rate. If the migratory response of the resident population fully offsets the skill-specific inflow of immigrants, then the relative inflow rate will have no effect on the overall skill share and the coefficient b will be zero. By contrast, in the absence of a differential migratory response of the resident population in a specific skill group to inflows of ethnic German immigrants into the same group, the coefficient b will be 1. The lower panel in Table 4 shows the corresponding results for parameter b. As before, I estimate at the county as well as the labor market region level. The results show that there is no indication of any selective out-migration of the resident population that could offset the changes in relative factor shares induced by the immigrant arrival. Both parameter estimates are relatively close to 1, with point estimates of 1.06 on the county level and 1.39 on the labor market region level. It is therefore unlikely that out-migration mitigated the effect the immigrant inflow had on the

regional wage structure and relative employment rates.

6.2 Employment and Wage Effects

Turning to the main estimation results, Tables 5 and 6 present estimates of the effect of changes in skill-specific local labor force shares on the employment/labor force rate and average log daily wages of the resident population. I estimate the empirical model in Equations 1 and 2 first by OLS and then using the predicted skill-specific ethnic German inflow rate to instrument the potentially endogenous change in the skill shares in a locality. For the first stage estimation results see Table B-2 in Appendix B. The dependent variable is either the annual change in the regression-adjusted employment/labor force rate or the annual change in the regression-adjusted average log daily wages of the local labor force, thereby controlling for differences in individual characteristics across labor markets.

Consider first the effect of changes in relative skill shares on the employment/labor force rate. The OLS result for the sample comprising all local residents is reported in the first row of column (1) in Table 5. The estimated coefficient of -0.129 implies that a 10% increase in the relative occupation share induced by additionally employed individuals reduces the employment/labor force rate of the resident population by 1.29 percentage points. Instrumenting the potentially endogenous changes in the relative skill shares with the occupation-specific ethnic German inflow rate yields a statistically significant parameter estimate of -0.351, reported in column (2). Since, as explained in Section 3.1, ethnic German immigrants can only appear in the data and hence enter the numerator of the relative local skill share by becoming employed, the estimated coefficient can be interpreted as a displacement effect after appropriately scaling it by the average share of those individuals in the total labor force who were already present in the data before 1996, which is 0.89 (see footnote 15 for details). Accordingly, for every 10 ethnic German immigrants finding employment, 3.1 resident workers lose their job (or do not find one when they otherwise would have). The increase in magnitude of this estimate by a factor of around 3 compared to the OLS result points to the existence of unobserved skill-specific local demand shocks that attract workers into the labor force and at the same time lead to favorable changes in labor market outcomes. It could also be partly driven by measurement error in the skill share variables that leads to an attenuation bias in the OLS estimations (see Aydemir and Borjas, 2011).

Columns (3) to (6) of Table 5 report the corresponding OLS and IV results separately for men and women. For the specification using the entire resident workforce in the first row, these are very similar, though somewhat less precisely estimated for women, with IV estimates of

Table 5: Impact of changes in relative factor shares on the employment/labor force rate

Employment Rates	**All**		**Men**		**Women**	
	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
All	-0.129***	-0.351**	-0.130***	-0.385*	-0.100***	-0.321
	(.014)	(.153)	(.019)	(.210)	(.024)	(.273)
		[2.97]		[2.46]		[2.21]
All unweighted	-0.121***	-0.374**	-0.130***	-0.370**	-0.109***	-0.072
	(.012)	(.168)	(.017)	(.178)	(.025)	(.345)
		[2.75]		[2.75]		[2.75]
All aged 25-54	-0.121***	-0.220*	-0.115***	-0.266**	-0.091***	-0.021
	(.013)	(.123)	(.017)	(.125)	(.024)	(.257)
		[3.12]		[3.09]		[2.29]
Germans only	-0.125***	-0.337**	-0.140***	-0.417**	-0.112***	-0.314
	(.014)	(.136)	(.017)	(.189)	(.027)	(.215)
		[3.30]		[3.23]		[3.43]
Observations	3185	3185	3185	3185	3185	3185

Notes: Entries are the estimated coefficients on the change in the log factor shares $\Delta \log f_{jrt}$. The dependent variable is the annual change in the skill-specific employment/labor force rate. All estimations include five occupation groups and are estimated using those 112 labor market regions that implemented the law (see Table B-1 in Appendix B). The employment/labor force rates are based on individuals already in the data at the end of 1995 and are adjusted for differences in individual specific characteristics across labor markets. Additional covariates are a full set of interactions of skill and year fixed effects as well as region and year fixed effects. Robust standard errors are reported in parentheses and are clustered at the skill-specific regional level. For the IV estimates, the t-stat of the instrument from the first stage regression is reported in square brackets. Regressions are weighted by $(\sigma^2_{jrt} + \sigma^2_{jrt-1})^{-1/2}$, where σ_{jrt} is the standard error of the fixed effect for region r at time t taken from the regression to obtain the adjusted outcomes for skill group j. A (*) denotes statistical significance at the 10% level, a (**) at the 5% level and a (***) at the 1% level.

-0.385 (0.210) for men and -0.321 (0.273) for women. Rows 2 to 4 of Table 5 show estimates of β_1 for a number of alternative specifications and subgroups. In the second row, I report the unweighted regression results for both the OLS and IV estimations. For the overall sample and the sample of men, estimates are very similar in magnitude to their counterparts in the weighted regressions. For women the IV estimate becomes substantially smaller, with a point estimate of -0.072. Since the data have some shortcomings in terms of capturing movements into and out of the labor force, I estimate the model separately for individuals aged 25 to 54 for whom these movements are less of an option in adjusting to changing labor market conditions. The corresponding results are reported in the third row of Table 5. The point estimates indicate a smaller effect on the employment/labor force rate than that found when using all individuals, which in turn implies that young workers aged 15 to 24 and old workers aged 55 to 64 are more negatively affected by the inflow of ethnic German immigrants. This is in line with recent U.S. evidence that employment levels of young workers are particularly likely to be affected by the inflow of low-skilled immigrants (Smith, 2007). As in the unweighted regressions, the results differ substantially for men and women. While the impact on the employment/labor force rate of men is negative (-0.266) and significant at the 5% level, the point estimate for women is close

to zero (-0.021) and not statistically significant. The bigger effect for men indicates some gender segmentation of the labor market and could be due to either men's higher substitutability with the mostly male immigrants who enter the labor market after arrival, or the fact that women have a higher propensity to drop out of the labor force if they become unemployed. In the last row of Table 5, I investigate whether there are different effects for the native German population compared to foreign nationals living in Germany, who make up about 10% of the labor force. Due to the limited sample size for the latter group in the region/occupation cells, estimating separately for them is not viable. However, I can estimate separately for native Germans and compare the results with those obtained when using all individuals to obtain at least an indication of whether the effect on foreign nationals is likely to be larger or smaller than that on Germans. The point estimates for the IV estimation turn out to be quite similar and the differences not statistically significant, suggesting that foreign nationals and native Germans are similarly affected by the inflow of the ethnic Germans.

Columns (1) and (2) of Table B-3 in Appendix B report estimates from a number of additional robustness checks carried out for the overall sample of local residents (corresponding to columns (1) and (2) of the first row in Table 5). Focusing on the IV results, in the first row I use the occupational distribution of ethnic German immigrants as observed in Germany rather than based on the last occupations in their country of origin and re-estimate the model with this information. This addresses to some extent the issue of occupational downgrading of migrants after arrival in Germany. The results are very similar, with a point estimate of -0.294 compared to the original -0.351. In the second row, again using the last occupation reported in the country of origin, I drop occupation group V, the high-skilled professional and technical workers, from the sample since occupational downgrading is likely to affect this group of immigrants the most. Again, the estimates are relatively similar, although with an estimate of -0.543 somewhat larger in magnitude. I then change the time interval underlying the analysis, using two year intervals rather than year to year changes. The results are reported in the third row. Due to the drop in the number of observations, the estimates lose precision but point estimates are still comparable. Finally, I repeated the entire analysis using educational attainment rather than occupations as a skill definition. The IV estimates reported in the last two rows of Table B-3 are again of similar magnitude to the corresponding estimates found for the occupation-based regressions.

Turning to the impact of changes in relative skill shares on wages, Table 6 reports the results for the coefficient β_2 in Equation 2. The OLS estimate for the sample comprising all local residents reported in the first row in column (1) is -0.062, implying that a 10% increase in the relative skill share in a locality through additionally employed individuals decreases relative

Table 6: Impact of changes in relative factor shares on log daily wages

Log Wages	**All**		**Men**		**Women**	
	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
All	-0.062***	-0.211	-0.036**	-0.088	-0.139***	-0.704
	(.016)	(.174)	(.018)	(.235)	(.036)	(.651)
		[2.83]		[2.18]		[2.22]
All unweighted	-0.061***	-0.028	-0.032**	0.045	-0.164***	-1.289*
	(.015)	(.162)	(.016)	(.193)	(.051)	(.682)
		[2.75]		[2.75]		[2.75]
All aged 25-54	-0.060***	-0.386*	-0.028	-0.328	-0.157***	-0.069
	(.017)	(.215)	(.018)	(.207)	(.042)	(.658)
		[2.64]		[2.39]		[2.31]
Germans only	-0.060***	-0.258	-0.023	-0.143	-0.110***	-1.027*
	(.015)	(.186)	(.017)	(.224)	(.038)	(.623)
		[2.97]		[2.64]		[2.79]
Observations	3185	3185	3185	3185	3185	3185

Notes: Entries are the estimated coefficients on the change in the log factor shares $\Delta \log f_{jrt}$. The dependent variable is the annual change in the skill-specific average log daily wage of full-time employees. All estimations include five occupation groups and are estimated using those 112 labor market regions that implemented the law (see Table B-1 in Appendix B). The average log daily wages are based on individuals already in the data at the end of 1995 and are adjusted for differences in individual specific characteristics across labor markets. Additional covariates are a full set of interactions of skill and year fixed effects as well as region and year fixed effects. Robust standard errors are reported in parentheses and are clustered at the skill-specific regional level. For the IV estimates, the t-stat of the instrument from the first stage regression is reported in square brackets. Regressions are weighted by $(\sigma^2_{jrt} + \sigma^2_{jrt-1})^{-1/2}$, where σ_{jrt} is the standard error of the fixed effect for region r at time t taken from the regression to obtain the adjusted outcomes for skill group j. A (*) denotes statistical significance at the 10% level, a (**) at the 5% level and a (***) at the 1% level.

wages by 0.62%. The IV result reported in column (2) does not show a statistically significant negative effect of ethnic German immigrant inflows on wages, with a point estimate of -0.211 and a standard error of 0.174.[29] The IV estimates of most of the additional specifications that I estimate and report in Table 6 are not precisely estimated and are inconclusive regarding the effect on relative wages. Although, with one exception, always negative, the only marginally significant result in the sample that pools men and women is the estimate for the population aged 25 to 54 in the third row of column (2), which would imply that a 10% increase in the relative skill share leads to a 3.86% decrease in relative wages. Looking at men and women separately points towards larger negative effects on the relative wages of women. For the sample including all residents, the estimate for men is -0.088 (0.235) while the estimate for women is -0.704 (0.651): both, however, continue to be statistically insignificant.

While the absence of significant wage effects of immigration is consistent with most of the existing evidence for Germany, the conclusion that immigrant inflows into a local labor market

[29] Given the negative effects on employment, these wage estimates are likely to be upward-biased due to negative selection into unemployment. Card (2001) estimates this selectivity bias to be of the order of 0.05.

have a detrimental effect on the employment/labor force rate stands in contrast to a number of other studies for Germany, for instance Pischke and Velling (1997), Bonin (2005), and D'Amuri et al. (2010). All these studies, however, use an alternative identification strategy and the first two also cover a different time period, 1985 to 1989 and 1975 to 1997, respectively, so that the results are not necessarily comparable. In addition, and in contrast to this analysis, the main results from the spatial correlation study by Pischke and Velling identify a medium-run effect of immigration by looking at changes over a four-year period.[30] The longer time period allows more scope for labor market adjustments through compensatory population flows as well as changes in the output mix and production technology of the local economy, both channels which would tend to reduce the effect on relative local labor market outcomes (see, for example, González and Ortega, 2009; Lewis, 2004, 2005). The finding of a significant displacement effect of the order of 0.31 for 1, however, corresponds closely with the findings from a recent analysis on the establishment level, which finds a displacement effect of around 0.3 native workers for every one additional immigrant hired (Campos-Vazquez, 2008).

The fact that I do not find any strong evidence of negative wage effects, in particular for men, may be explained by Germany's relatively inflexible labor market due to its strong unions and strict labor market regulations. Although in decline, union coverage was still high at 68% in 2000 (OECD, 2004).[31] In addition, wages in Germany are to a large extent set by sector-level collective wage agreements, leaving little room for wage adjustments on the regional level, in particular for men, who are much more likely than women to be union members (Fitzenberger et al., 2011), and who tend to work in sectors with higher union coverage rates. The overall scope for short-term adjustments in the wage structure in Germany in response to immigrant inflows is therefore limited. This may also explain why I find relatively large adjustments in relative employment levels: with rigid wages and at least some degree of substitutability between the resident workforce and newly arriving immigrants in the production process, an increase in labor supply through immigration leads to an increase in unemployment of the resident population unless it induces a sufficiently large increase in labor demand. However, as Pischke and Krueger (1998) point out, constraints and rigidities on the product market are relatively pronounced in Germany, impacting precisely this demand side of the labor market. For instance, it is much more difficult to start up a new business in Germany than it is in the U.S., which contributes to the economy's sluggishness in creating additional jobs when its population expands.

[30] Pischke and Velling (1997) also estimate models using annual foreign inflows separately for each year between 1986 and 1989. Most of the estimated effects on the unemployment rate are positive but only few are significant at conventional levels.

[31] For comparison, the corresponding figure for the U.S. is 14%.

In fact, total employment in Germany increased by only 1.4% between 1991 and 2001 while the working age population increased by 4.7% (of which around 46% was due to ethnic German immigrants and 45% due to immigration of foreign nationals).[32] This explanation is also supported by the results of a cross-country study carried out by Angrist and Kugler (2003). Analyzing the impact of immigrants on native employment rates in eighteen European countries, the authors not only find evidence of a substantial displacement of native workers by immigrants, ranging from 35 to 83 native job losses for every 100 immigrants in the labor force, but also some clear indication that this effect is exacerbated by rigidities in the product market, such as high business entry costs, and reduced flexibility on the labor market, for instance through employment protection, union coverage, and minimum wages.

As pointed out in Section 3.2, the main source of variation I exploit in the empirical estimations are differences in the existing skill compositions across local labor markets. One concern in this context is that my results may be driven by unobserved trends in skill/region specific labor market outcomes that are correlated with the initial skill share in a locality. For instance, if for some reason regions with a small initial share of a particular skill group tend to experience faster declining employment and wage rates than regions with a large initial share, then even if there was no effect of an immigrant inflow on labor market outcomes, the empirical estimates would still show a negative effect. This is because, as described in Section 3.2, the lower the initial share of a particular skill group in a locality, the larger will be the percentage change in this share induced by the inflow of ethnic German immigrants. The observed negative correlation between the percentage change in the relative skill share and changes in labor market outcomes would in this case, however, be entirely driven by the underlying correlation between the initial skill share and future changes in labor market outcomes.

To investigate this issue, I estimate models similar to Equations 1 and 2 but now relating changes in labor market outcomes directly to the initial skill shares f_{jrt-2} in a locality. I use the skill share lagged by two periods to mimic as closely as possible my previous estimations in which I also used the skill-specific labor force lagged by two periods to construct the instrumental variable. To minimize the influence of any other compounding factors and isolate the effect of initial skill shares, I estimate these models for the period 1985 to 1988. This is a period of relatively little immigration to Germany which, at the same time, is sufficiently distant from the strong recession of 1981/82. A significant correlation between the initial skill share f_{jrt-2} and changes in labor market outcomes would point towards unobserved skill/region specific trends

[32] Source: Statistical Office and own calculation.

that are not accounted for in the model set out in Section 3.1. The estimated coefficients on the initial skill share variable from these regressions are 0.007 (0.008) for the employment/labor force rate regression and 0.006 (0.010) for the wage regression, indicating that the initial skill share is not systematically related to future changes in these labor market outcomes. In addition, all estimated gender-specific coefficients are also close to zero and statistically not significant (for the complete set of results see Table B-4 in Appendix B). Based on these findings, I conclude that unobserved long-term trends correlated with the initial skill shares in a locality are unlikely to be driving the results of the empirical estimations.

7 Conclusion

The arrival of ethnic German immigrants and their distribution across local labor markets by the German government offers a unique quasi-experiment to investigate the impact of immigration on labor market outcomes. The empirical results show that shifts in the relative supply of different skill groups in a locality systematically affect the employment/labor force rate of the resident population. Like previous researchers, I find suggestive evidence that unobserved skill-specific demand shocks lead to downward-biased OLS estimates of the effect of these relative supply shifts. Instrumenting the supply shifts with the ethnic German inflow rate points towards a short-run displacement effect of around 3.1 unemployed resident workers for every 10 immigrants that find a job. I do not find conclusive evidence of any detrimental effect on relative wages. The fact that German labor markets adjust to immigrant inflows through changes in employment rather than wages is potentially due to Germany's institutional setting in which strong unions allow relatively little wage flexibility, at least at the regional level and in the short run.

Apart from estimating the short-run labor market effects of immigration in Germany, this study also emphasizes the importance of the existing structure of a labor market in determining the effect of an immigrant inflow using spatial correlations. An identical relative inflow of immigrants into two regions will have substantially different impacts on local labor market outcomes if these regions differ in terms of their existing skill mix. In the context of a governmental allocation policy such as the one described in this paper, an even distribution in terms of numbers of immigrants relative to the existing population does not therefore necessarily lead to an even distribution of the resulting labor market effects across regions.

References

Altonji, J. G. and D. Card (1991). The effects of immigration on the labor market outcomes of less-skilled natives. In J. M. Abowd and R. B. Freeman (Eds.), *Immigration, Trade, and the Labor Market*, Chapter 7, pp. 201–234. Chicago: University of Chicago Press.

Angrist, J. D. and A. D. Kugler (2003). Protective or counter-productive? Labour market institutions and the effect of immigration on EU natives. *Economic Journal 113*(488), F302–F331.

Aydemir, A. and G. J. Borjas (2011). Attenuation bias in measuring the wage impact of immigration. *Journal of Labor Economics 29*(1), 69–113.

Bauer, T., B. Dietz, K. F. Zimmermann, and E. Zwintz (2005). German migration: Development, assimilation, and labour market effects. In K. F. Zimmermann (Ed.), *European Migration*, Chapter 7, pp. 197–261. Oxford: Oxford University Press.

Bauer, T. and K. F. Zimmermann (1997). Unemployment and wages of ethnic Germans. *Quarterly Review of Economics and Finance 37*, 361–377.

Bender, S., A. Haas, and C. Klose (2000). The IAB Employment Subsample 1975-1995: Opportunities for analysis provided by the anonymised subsample. *Journal of Applied Social Science Studies 120*, 649–662.

Bonin, H. (2005). Wage and employment effects of immigration to Germany: Evidence from a skill group approach. IZA Discussion Paper No. 1875.

Borjas, G. J. (2003). The labor demand curve is downward sloping: Reexamining the impact of immigration on the labor market. *Quarterly Journal of Economics 118*(4), 1335–1374.

Borjas, G. J. (2006). Native internal migration and the labor market impact of immigration. *Journal of Human Resources 41*(2), 221–258.

Borjas, G. J., J. Grogger, and G. H. Hanson (2008). Imperfect substitution between immigrants and natives: A reappraisal. NBER Working Paper No. 13887.

Bundesagentur für Arbeit (2004). Arbeitsmarkt 2003. Amtliche Nachrichten der Bundesagentur für Arbeit.

Butcher, K. F. and D. Card (1991). Immigration and wages - evidence from the 1980s. *American Economic Review 81*(2), 292–296.

Campos-Vazquez, R. M. (2008). The substitutability of immigrant and native labor: Evidence at the establishment level. Job Market Paper.

Card, D. (1990). The impact of the Mariel boatlift on the Miami labor market. *Industrial and Labor Relations Review 43*(2), 245–257.

Card, D. (2001). Immigrant inflows, native outflows, and the local labor market impacts of higher immigration. *Journal of Labor Economics 19*(1), 22–64.

Card, D. and J. DiNardo (2000). Do immigrant inflows lead to native outflows? *American Economic Review 90*(2), 360–367.

Carrington, W. J. and P. J. de Lima (1996). The impact of 1970s repatriates from Africa on the Portuguese labor market. *Industrial and Labor Relations Review 49*(2), 330–347.

D'Amuri, F., G. I. P. Ottaviano, and G. Peri (2010). The labor market impact of immigration in Western Germany in the 1990s. *European Economic Review 54*(4), 550–570.

Dustmann, C., F. Fabbri, and I. Preston (2005). The impact of immigration on the British labour market. *Economic Journal 115*(507), F324–F341.

Dustmann, C. and A. Glitz (2005). Immigration, jobs and wages: Theory, evidence and opinion. CEPR Report, London.

Edin, P.-A., P. Fredriksson, and O. Åslund (2003). Ethnic enclaves and the economic success of immigrants - evidence from a natural experiment. *Quarterly Journal of Economics 118*(1), 329–357.

Fitzenberger, B., K. Kohn, and W. Qingwei (2011). The erosion of union membership in Germany: Determinants, densities, decompositions. *Journal of Population Economics 24*(1), 141–165.

Friedberg, R. M. (2001). The impact of mass migration on the Israeli labor market. *Quarterly Journal of Economics 116*(4), 1373–1408.

Friedberg, R. M. and J. Hunt (1995). The impact of immigration on host country wages, employment and growth. *Journal of Economic Perspectives 9*(2), 23–44.

Gartner, H. (2004). Die Imputation von Löhnen oberhalb der Beitragsbemessungsgrenze in der IAB-Beschäftigtenstatistik. IAB Working Paper.

Gaston, N. and D. Nelson (2002). The employment and wage effects of immigration: Trade and labour economics perspectives. In D. Greenaway, R. Upward, and K. Wakelin (Eds.), *Trade, Investment, Migration and Labour Market Adjustment*, Chapter 12, pp. 201–235. Palgrave.

González, L. and F. Ortega (2009). How do very open economies absorb large immigration flows? Recent evidence from Spanish regions. *Labour Economics, forthcoming*.

Gould, E. D., V. Lavy, and M. D. Paserman (2004). Immigrating to opportunity: Estimating the effect of school quality using a natural experiment on Ethiopians in Israel. *Quarterly Journal of Economics 119*(2), 489–526.

Hartog, J. and A. Zorlu (2005). The effect of immigration on wages in three European countries. *Journal of Population Economics 18*(1), 113–151.

Hunt, J. (1992). The impact of the 1962 repatriates from Algeria on the French labor market. *Industrial and Labor Relations Review 45*(3), 556–572.

Klose, H.-U. (1996). Bevölkerungsentwicklung und Einwanderungspolitik. In *Integration und Konflikt*, Volume Nr. 69, pp. 14. Gesprächskreis Arbeit und Soziales der Friedrich-Ebert-Stiftung.

Kugler, A. and M. Yuksel (2008). Effects of low-skilled immigration on U.S. natives: Evidence from hurricane Mitch. NBER Working Paper 14293.

LaLonde, R. J. and R. H. Topel (1991). Labor market adjustments to increased immigration. In J. M. Abowd and R. B. Freeman (Eds.), *Immigration, Trade, and the Labor Market*, Chapter 6, pp. 167–199. Chicago: University of Chicago Press.

Lewis, E. G. (2004). Local open economies within the U.S.: How do industries respond to immigration. Federal Reserve Bank of Philadelphia Working Paper No. 04-1.

Lewis, E. G. (2005). Immigration, skill mix, and the choice of technique. Federal Reserve Bank of Philadelphia Working Paper No. 05-8.

Manacorda, M., A. Manning, and J. Wadsworth (2006). The impact of immigration on the structure of male wages: Theory and evidence from Britain. CReAM Discussion Paper No. 08/06.

OECD (2004). Employment Outlook 2004. OECD Publications, Paris.

Okkerse, L. (2008). How to measure labour market effects of immigration: A review. *Journal of Economic Surveys 22*(1), 1–30.

Ottaviano, G. I. P. and G. Peri (2011). Rethinking the effects of immigration on wages. *Journal of the European Economic Association, forthcoming*.

Piil Damm, A. (2009). Ethnic enclaves and immigrant labour market outcomes: Quasi-experimental evidence. *Journal of Labor Economics 27*(2), 281–314.

Pischke, J.-S. and A. B. Krueger (1998). Observations and conjectures on the u.s. employment miracle. In *Third Public GAAC Symposium: Labor Markets in the USA and Germany*, pp. 99–126. Bonn: German-American Academic Council.

Pischke, J.-S. and J. Velling (1997). Employment effects of immigration to Germany: An analysis based on local labor markets. *Review of Economics and Statistics 79*(4), 594–604.

Salt, J. and H. Clout (1976). *Migration in Post-War Europe: Geographical Essays*. London: Oxford University Press.

Smith, C. L. (2007). "Dude, where's my job?" The impact of immigration on the youth labor market. Unpublished Manuscript.

Winter-Ebmer, R. and J. Zweimüller (1996). Immigration and the earnings of young native workers. *Oxford Economic Papers 48*(3), 473–491.

Winter-Ebmer, R. and J. Zweimüller (1999). Do immigrants displace young native workers: The Austrian experience. *Journal of Population Economics 12*(2), 327–340.

Appendix A Sample Description

All data on the local labor force is based on the IAB Employment Subsample 1975-2001. For each year, I collect the relevant information at the cut-off date of 31 December. I delete all individuals who are marginally employed (*geringfügig beschäftigt*, *pers_gr*=109, 209, 110, 202, 210). I also delete observations that indicate a parallel employment spell (*level2*$\neq$0). I impute missing or unknown values for occupation, educational attainment and location of an individual, with the most recent information from previous spells of the same individual, if available. Occupations are aggregated to five groups based on the American SF-3 Occupation Table. The aggregation key can be obtained upon request. Education levels are aggregated to three groups: "low" for individuals "without completed education" (*bild*=0), "without A-levels and without vocational training" (*bild*=1), or "with A-levels but without vocational training" (*bild*=3); "intermediate" for individuals "without A-levels but with vocational training" (*bild*=2) or "with A-levels and with vocational training" (*bild*=4); and "high" for individuals "with (technical) college degree" (*bild*=5, 6). Potential experience is calculated as current year minus year of birth minus age at the end of educational/vocational training. The average age for each education level is set at 15 for individuals "without completed education", 16 for those "without A-levels and without vocational training", 19 for those "without A-levels but with vocational training" or "with A-levels but without vocational training", 22 for those "with A-levels and with vocational training", and 25 for those "with (technical) college degree" or unknown or missing values (which, based on their average wage rate, seem most similar to college educated individuals). Foreign nationals are aggregated to sixteen groups according to their countries or regions of citizenship: Turkey, former Yugoslavia, Italy, Greece, Poland, the former Soviet Union, Portugal, Romania, Western Europe, Central & Eastern Europe, Africa, Central & South America, North America, Asia, Australia & Oceania, and Others. Individuals are considered

unemployed if they are benefit receivers (*typ1*=6). For the construction of average wages I only consider individuals who are working full-time (*stib*<5). All wages are converted into real wages in Euros at constant 1995 prices using the German CPI for all private households. Wage records that are right censored at the social security contribution ceiling are imputed using a method developed by Gartner (2004). I aggregate the 326 West German counties (excluding Berlin) to 204 labor market regions of which eventually 112 are used for the empirical analysis, applying an aggregation key provided by the IAB.

Appendix B Tables

Table B-1: West Germany's states and their implementation of the Assigned Place of Residence Act

Federal state	No. of counties	No. of labor market regions	State quota in %	Actual quota 1996-2001	Law imple-mented	Date of imple-mentation	In sample
Schleswig-Holstein	15	7	3.3	3.4	yes	1.3.1996	yes
Hamburg	1	1	2.1	2.1	yes	1.3.1996	yes
Lower Saxony	46	35	9.2	8.2	yes	7.4.1997	yes, from 1997
Bremen	2	0	0.9	0.9	yes	1.3.1996	yes
North Rhine-Westphalia	54	36	21.8	21.6	yes	1.3.1996	yes
Hesse	26	16	7.2	7.2	yes	1.1.2002	no
Rhineland Palatinate	36	20	4.7	4.6	no	-	no
Baden-Württemberg	44	29	12.3	12.1	yes	1.3.1996	yes
Bavaria	96	56	14.4	14.3	no	-	no
Saarland	6	4	1.4	1.4	yes	11.3.1996	yes
Overall	**326**	**204**	**77**.3	**75**.8	**8/10**	**-**	**7/10**

Notes: The labor market region in Hamburg also comprises three counties that are situated in Schleswig-Holstein and one county that is situated in Lower Saxony. Because of the dominance of Hamburg's and Schleswig-Holstein's counties, this labor market region is already used from 1996 onwards when these two states adopted the Assigned Place of Residence Act. There are two labor market regions in Lower Saxony that each comprise one of Bremen's counties. Because each labor market region here consists of one county from Lower Saxony and one county from Bremen, I conservatively include these labor market regions only from 1997 onwards when Lower Saxony implemented the new legislation. Finally, there is one labor market region that comprises two of Baden-Württemberg's and one of Bavaria's counties. Since I do not have data on ethnic German inflows into Bavarian counties, I assign this labor market region to Bavaria and exclude it from the analysis.

Table B-2: First stage results

	Employment Rates			**Log Wages**		
	All	Men	Women	All	Men	Women
All	2.058***	1.712**	2.933**	1.760***	1.382**	2.350**
	(.693)	(.695)	(1.328)	(.622)	(.635)	(1.058)
All unweighted	1.752***	1.752***	1.752***	1.752***	1.752***	1.752***
	(.637)	(.637)	(.637)	(.637)	(.637)	(.637)
All aged 25-54	2.242***	2.280***	3.351**	1.750***	1.855**	2.373**
	(.718)	(.738)	(1.461)	(.662)	(.778)	(1.027)
Germans only	2.297***	2.162***	3.299***	1.844***	1.812***	2.169***
	(.696)	(.670)	(.961)	(.622)	(.686)	(.777)
Observations	3185	3185	3185	3185	3185	3185

Notes: Entries are the estimated coefficients on the supply-push component of ethnic German immigration from the first stage regressions. The dependent variable is the change in the log factor shares $\Delta \log f_{jrt}$. A (*) denotes statistical significance at the 10% level, a (**) at the 5% level and a (***) at the 1% level. See Table 5 for further notes.

Table B-3: Impact of changes in relative factor shares on the employment/labor force rate and log daily wages - robustness checks

	Employment Rates		Log Wages	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Use Microcensus[1)]	-0.129***	-0.294**	-0.062***	-0.548
	(.014)	(.145)	(.016)	(.487)
		[2.98]		[1.44]
Occupation group 1-4[2)]	-0.135***	-0.543*	-0.068***	-0.180
	(.017)	(.287)	(.019)	(.288)
		[1.93]		[1.69]
Two year intervals[3)]	-0.071***	-0.223	-0.059***	0.002
	(.015)	(.175)	(.019)	(.276)
		[2.08]		[1.61]
Education groups[4)]	-0.069***	-0.558*	-0.065**	0.430
	(.024)	(.337)	(.026)	(.396)
		[1.70]		[1.89]
Education groups unweighted[4)]	-0.065***	-0.262***	-0.071***	0.006
	(.018)	(.096)	(.021)	(.102)
		[3.38]		[3.38]

Notes: Entries are the estimated coefficients on the change in the log factor shares $\Delta \log f_{jrt}$. The dependent variable is the annual change in the skill-specific employment/labor force rate in columns (1) and (2), and the annual change in the skill-specific average log daily wage of all full-time employees in columns (3) and (4). All estimations include either five occupation or three education groups and are estimated using those 112 regions that implemented the law (see Table B-1 in the appendix of the paper). Both outcome measures are based on all individuals already in the data at the end of 1995, and are adjusted for differences in individual specific characteristics across labor markets. Additional covariates are a full set of interactions of skill and year fixed effects as well as region and year fixed effects. Robust standard errors are reported in parentheses and are clustered at the skill-specific regional level. For the IV estimates, the t-stat of the instrument from the first stage regression is reported in square brackets. Regressions are weighted by $(\sigma_t^2 + \sigma_{t-1}^2)^{-1/2}$, where σ_t is the standard error of the region fixed effect taken from the regression to obtain the adjusted outcome. A (*) denotes statistical significance at the 10% level, a (**) at the 5% level and a (***) at the 1% level.
1) Estimation uses occupational distribution of ethnic German immigrants as observed in the German Microcensus. Ethnic German immigrants are identified as individuals with German citizenship that arrived in Germany in any particular year between 1996 and 2001. Sample size 3185 observations.
2) Estimation using only occupation groups 1-4. Sample size 2548 observations.
3) Estimation using two year intervals. Sample size 1680 observations.
4) Estimation where skill groups are defined by educational attainment. Three groups are distinguished: low, intermediate and high (see data appendix). Educational attainment of ethnic German immigrants taken from German Microcensus. Sample size 1911.

Table B-4: Impact of initial skill shares on labor market outcomes, 1985 to 1988

	All		**Men**		**Women**	
Independent variable	$\Delta(N_{jrt}/P_{jrt})$	$\Delta \log w_{jrt}$	$\Delta(N_{jrt}/P_{jrt})$	$\Delta \log w_{jrt}$	$\Delta(N_{jrt}/P_{jrt})$	$\Delta \log w_{jrt}$
Initial skill share	0.007	0.006	0.004	0.001	-0.005	0.014
	(.008)	(.010)	(.011)	(.013)	(.016)	(.025)
Observations	2240	2240	2240	2240	2240	2240
R^2	0.80	0.66	0.72	0.69	0.86	0.74

Notes: Entries are the estimated coefficients on the local skill share lagged by two periods, f_{jrt-2}. The dependent variable is either the annual change in the employment/labor force rate or the annual change in the average log daily wage for the period 1985 to 1988. All estimations include five occupation groups and are based on those 112 labor market regions that implemented the law. Employment and wage rates are adjusted for differences in individual specific characteristics across labor markets (see text). Additional covariates are a full set of interactions of skill and year fixed effects as well as region and year fixed effects. Robust standard errors are reported in parentheses and are clustered at the skill-specific regional level. Regressions are weighted by $(\sigma_{jrt}^2 + \sigma_{jrt-1}^2)^{-1/2}$, where σ_{jrt} is the standard error of the fixed effect for region r at time t taken from the regression to obtain the adjusted outcomes for skill group j. A (*) denotes statistical significance at the 10% level, a (**) at the 5% level and a (***) at the 1% level.