Earnings prospects for People with Migration Background in Germany – Education in Germany vs. Education Abroad*

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Abstract

In this paper, we compare the earnings prospects between the native Germans and persons with migration background in Germany and distinguish between foreigners, German resettlers, and German citizens with migration background. We also compare the effect of degrees obtained in home country vs. those obtained in Germany for persons with migration background. We find that high- and low-skilled workers with German degree earn on average higher wages than those having a foreign degree, whereas for the medium-skilled no difference is observed. Given that the wage gap between the native workers and persons with migration background is high for high-skilled workers and negligible for the medium-skilled workers, it might suggest that the wage gap is likely to be caused by higher valuation of education obtained in Germany compared to that obtained abroad.

Keywords: Migration Background, Earnings prospects, Education, Germany
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1 Introduction

People are said to have a migration background if they themselves or their parents are foreign born or possess foreign citizenship or did so in the past. According to this definition, in 2005 about 19 percent of Germany's population have a migration background.[1] In Germany's case, two groups account for the vast majority of persons with migration background. First, persons and descendants from South European (including Turkey) and North African countries, who were recruited from the 1950s to early 1970s. Many of these people possess a foreign citizenship, but there are also quite a few who were nationalized. Second, ethnic Germans from the former Soviet Union and Eastern European states who resettled mainly after the late 1980s.[2] Ethnic Germans (and their family members and descendants) are equal to native Germans by law and can receive German citizenship at the time of or shortly after immigration to Germany. However, for a number of reasons, e.g., language difficulties, different education systems in the home countries, possible non-transferability of skills acquired in the host country to the German labor market, or cultural differences, they are likely to have different earnings prospects than native Germans.

The topic has drawn political attention recently. In the light that for children below six the share of persons with migration background is about one third, which means that the percentage of people with migration background in the population of working age is likely to rise in the future, it becomes necessary to analyze how people with migration background perform in German economy.

In contrast to US studies that distinguish races or ethnics (see, e.g., Altonji and Blank (1999) for an overview), studies for Germany typically refer to citizenship to analyze differences between immigrants and natives. However, comparison of earnings prospects based on nationality only could be problematic if there are substantial differences between native Germans and German citizens with migration background, because the reference group (German citizens) would be contaminated by naturalized immigrants. This paper focuses on the following questions:

1. Do earnings prospects differ for persons with migration background compared to persons without migration background? Do earnings prospects differ between subgroups of persons with migration background, namely foreigners, German citizens with migration background and German resettlers?

2. Does the degree obtained in the home country bring higher wages than a comparable degree obtained in Germany for people with migration background?

There is some evidence for Germany that educational attainment differs substantially between indigenous population and persons with migration background.[3] Schnepf (2004) compares a number of surveys on educational performance for selected OECD countries participating in PISA, TIMSS, and PIRLS.

[1] More than a half of the people with migration background, i.e., about 10% of Germany's population, are German citizens. The share of foreigners living in Germany amounts to 9% (Statistisches Bundesamt, 2006).

[2] Further groups that have to be mentioned are asylum-seekers, refugees and Jewish immigrants from Eastern Europe. In addition, there was a huge resettlement of ethnic Germans from Eastern Europe shortly after World War II.

[3] In the paper we use the notions indigenous and native population interchangeably referring to native Germans. We also use the notion naturalized immigrants referring to German citizens with migration background

She finds that differences in performance between native and migrant students are particularly high in Germany.[4] Moreover, the educational level of native Germans increases stronger over time than for the immigrants (Riphahn, 2005). In line with this, the share of foreigners in high-skilled labor amounts to 3.3 percent in 2000 reported by Bauer and Kunze (2005). In addition, Gang and Zimmermann (2000) argue that the longer the immigrants stay in Germany, the more likely they attain better education.

Our empirical analysis is based on the data from the German Socio-Economic Panel (GSOEP) for West Germany using the waves 1995 to 2005. We find that earnings prospects differ between persons with and without migration background and across the migrant groups. Namely, irrespective of skill level German citizens with migration background earn more on average than foreigners. Resettlers seem to have the worst earnings prospects. Moreover, the wages of the native workers and migrants diverge with age. We find that high-skilled workers with German degree earn on average higher wages than those having a foreign degree, whereas for the medium-skilled no difference is observed. Given that the wage gap between the native workers and persons with migration background is high for high-skilled workers and negligible for the medium-skilled workers, it might suggest that the wage gap is likely to be caused by higher valuation of education obtained in Germany compared to that obtained abroad.

The paper is organized as follows: Section 2 discusses the identification of people with migration background in the German population. In Section 3, we present the empirical model for the estimation of the returns to education. The dataset and selected descriptives are given in Section 4. The results are shown in Section 5. Finally, the last section provides the main conclusions.

2 Migration Background in Germany

Analyzing the labor market perspectives of people with migration background requires a thorough definition of this group. However, there is no consensus over this definition in Germany. The main reasons are, in particular, that ethnic Germans possess German citizenship at the time or shortly after immigration and that a number of foreigners who immigrated several decades ago and their descendants were naturalized. Restricting the definition only to foreigners and drawing the comparison of earnings prospects between foreigners and German nationals could be problematic if there are substantial differences between native Germans and German citizens with migration background, because the reference group (German citizens) would be rather heterogeneous.

One possible definition for persons with migration background, also used by the Federal Statistical Office (*Statistisches Bundesamt*), is the following: People are said to have a migration background if they themselves or their parents are born abroad and they themselves or their parents possess the citizenship of the foreign country or did so in the past. This definition seems to be quite appropriate for the German case as it attributes a migration background to ethnic Germans and their family members. Moreover, it

[4] PISA is the acronym for "Programme for International Student Assessment", TIMSS stands for "Third International Mathematics and Science Study", and PIRLS refers to "Progress in International Reading Literacy Study". The results of Schnepf (2004) are in line with the findings of Ammermüller (2007). See also OECD (2006).

contains naturalized foreigners as well. However, third generation immigrants are not incorporated if their parents possessed German citizenship at birth.

Although migration background relaxes the limitations of using only citizenship to investigate differences between nationals and non-nationals, the heterogeneity in the group of persons with migration background should also be considered.

In the following, we separately analyze the earnings prospects for different groups of persons with migration background. More precisely, we apply two levels of comparison. On the first level, we distinguish between people with and without migration background only. On the second level, we consider three groups within people with migration background: (i) foreigners, i.e., people possessing a citizenship different than German, (ii) people with migration background possessing a German citizenship (but not German resettlers), and (iii) German resettlers. It may be worth noting that German resettlers would belong to category (ii) with respect to the definition of migration background. However, to identify possible differences in the estimates for this particular group, using (ii) and (iii) as exclusive concepts seems to make sense.

Fig. 1: Groups of People with Migration Background

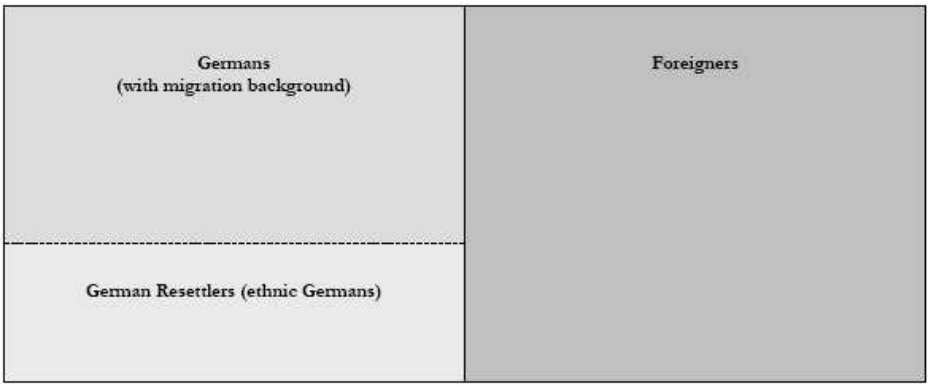


Figure 1 provides a graphical illustration of the concept of migration background in Germany with the three distinct sub-groups of the following analysis. The whole box are all persons with migration background in Germany. Left of the long vertical bar are those who possess a German citizenship. These are, in particular, foreigners who were naturalized and German resettlers who are equal to native Germans by law. The right side of the graph contains foreigners, i.e., people with non-German citizenship.

To give some idea on the migration flows over the last decade, Table 1 summarizes these flows in absolute value for selected groups.[5] As the absolute number of foreign nationals migrating to Germany has decreased (albeit still substantial), the naturalized immigrants, and especially second-generation migrants, are likely to constitute larger shares within the group of persons with migration background, which reinforces the motivation laid out in the introduction. Therefore, we cover first and second generation immigrants in the definition of migration background. People are said to be first generation immigrants

[5] We have also added asylum-seekers in the table. Since asylum-seekers are missing in our database, they are not regarded in the study.

Tab. 1: Immigration and Emigration in Germany for Selected Groups

Year		Total	Germans	there of Resettlers	Foreigners	there of Asylum-Seekers
1993	Immigration	1,277,408	287,561	217,531	989,847	322,599
	Emigration	815,312	104,653		710,659	
	Balance	462,096	182,908		279,188	
1997	Immigration	840,633	225,335	128,415	615,298	104,353
	Emigration	746,969	109,903		637,066	
	Balance	93,664	115,432		-21,768	
2001	Immigration	879,217	193,958	86,637	685,259	88,287
	Emigration	606,494	109,507		496,987	
	Balance	272,723	84,451		188,272	
2005	Immigration	707,352	128,051	30,779	579,301	28,914
	Emigration	628,399	144,815		483,584	
	Balance	78,953	-16,764		95,717	

Source: Statistisches Bundesamt

if they have a migration experience, i.e. they themselves immigrated to a host country. Second generation immigrants were born in the host country their parents immigrated to. However, due to data restrictions we do not distinguish first and second generation immigrants and pool them in one group of German citizens with migration background.

3 Estimating the Earnings Equation for People with Migration Background

The standard model of estimating the earnings equation was proposed by Mincer (1974). In that model, log earnings are modeled as an additive function of years of a linear schooling term and a quadratic term of experience,

$$y_i = \beta_0 + \beta_1 Schooling_i + \beta_2 Experience_i + \beta_3 Experience_i^2 + \varepsilon_i, \tag{1}$$

where y_i is the logarithm of earnings for individual i, $Schooling$ represents the years of completed schooling and $Experience$ is the years of experience after completed schooling, and ε is the statistical residual. Card (1999) points out the two hypotheses embedded in this specification. First, number of completed years of schooling are the correct measure of education, and second, effects of years of schooling on earnings are proportional. If both assumptions hold true, β_1 can be interpreted as the internal rate of return to schooling.[6]

However, assuming proportional effects of years of schooling may be to some extent unrealistic in educational systems with different types of schools. One can argue the credentials may be more important than years of schooling (the so-called "sheepskin effect", which basically means that, for example, one

[6] There are a number of studies that put attention on these assumption, for example, to analyze possible endogeneity of schooling by unobserved variables like motivation or intelligence. However, even more sophisticated methods, e.g., IV, random coefficients etc. do not provide strong advantage in terms of precision of the estimates. Hence, OLS-methods are still a reasonable choice for estimation (see, e.g., Card (1999) for a discussion).

year of university has a different worth than a year of high school). Therefore, a commonly used practice is to augment Eq. (1) by variables accounting for possible non-linearities at certain points in time, which are normally covered by a set of dummies for different types of education. For example, in Germany there is a tripartite school system, comprising *Hauptschule, Realschule,* and *Gymnasium*. Whereas students of the first and second type remain 9 and 10 years in school, Gymnasium graduation requires 13 years of schooling.[7] Eligibility for further education in the apprenticeship system or at advanced technical college (*Fachhochschule*) or university is subject to individual schooling. Students graduating from Gymnasium are eligible for all types of further education; in contrast, graduates from Realschule and Hauptschule are eligible for training in the apprenticeship system only. It usually takes three years to complete further training in the apprenticeship system. University graduation requires, on average, between 4 and 6 years of studying. The potential duration of completed schooling for people in the German education system is between 11.5 and 19 years.[8]

Assuming proportional effects of schooling (overall or stratified by different types of schools) may be reasonable in a "closed" system, i.e., a particular country. The situation becomes more complicated when aiming at measuring the returns to education for persons educated in different countries and within different systems as pooling degrees obtained in different countries raises the issue of comparability of degrees. Even if contents of education may be comparable in some sense, the skills acquired may be not applicable in the host country for different reasons, e.g., a lack of demand or differences in technology. Nevertheless, the approach of pooling "comparable" degrees is used by some authors. Another possible approach is to explicitly control whether the person graduated in the country of residence or abroad. However, this stratification results in fewer observations than pooling, which may be at the expense of statistical significance. In the present paper, we follow both approaches, which we discuss in Section 5.

A problem which goes hand in hand with identifying comparable education is the potential experience of individuals. In empirical applications, it is common to use potential rather than actual experience as actual experience is often not observed. Potential experience is calculated as $Experience \equiv Age - Schooling - 6$.[9] Hence, it is defined as the potential experience an individual could gather after completed schooling, where the start of schooling is assumed to be at age 6. Since we do not have the information on the actual duration of schooling and the standard durations for different education types may not necessarily be applicable to immigrants having received education in their home countries, we use age (and age squared) instead of potential experience and interact those with schooling types. In other words, we assume education type specific wage profiles over the life-cycle.

Finally, besides these modifications further determinants of earnings should be considered in the empirical model. In that sense, it is useful to take account of further socio-demographic variables as well as information on economic activities and regional heterogeneity. Therefore, the empirical analysis below

[7] In addition, there are special schools for mentally or physically handicapped persons. In some of the Federal Laender graduation from Gymnasium requires 12 years of schooling only.

[8] Further information on the German school system can be found at http://www.bildungsserver.de.

[9] It may be worth noting that schooling refers to time of education out of labor market in our approach.

relies on the following model:

$$\begin{aligned}\log y_{it} &= \beta_0 + \beta_1 Age_{it} + \beta_2 Age_{it}^2 + \sum_{j=1}^{k} \gamma_j Degree_{jit} + \\ &\sum_{j=1}^{k} \kappa_j Degree_{jit} \times Age_{it} + \sum_{j=1}^{k} \lambda_j Degree_{jit} \times Age_{it}^2 + \alpha \mathbf{X}_{it} + \nu_i + \varepsilon_{it},\end{aligned} \tag{2}$$

where $\beta_j, \gamma_j, \kappa_j$, and λ_j are the parameters for the returns to j^{th} education category to be estimated, $\mathbf{X}_{it}$ is the matrix of covariates to be described below, α is the corresponding vector of parameters, and ν_i and ε_{it} are the individual heterogeneity term and the error term respectively. For sake of completeness, t denotes the year.

The matrix **X** contains economic sectors, indicated by six categories (agriculture, industry, transportation, construction, trading services, social services and health), dummy variable for self-employment, dummy variable for part-time work (as being equal to 1 if the person works less then 30 hours a week), regional dummies (north, central and south), time of residence in Germany and its square (only used for persons with migration background).

We assume that ν_i is uncorrelated with the explanatory variables and, hence, Eq. 2 can be estimated by the random effect panel method.[10] The main advantage of the random effect method is that it allows measuring the effect of the variables which are time-invariant, like schooling degree, which is the primary objective of the paper.

4 Dataset and Selected Descriptives

4.1 Dataset

For the empirical analyses we use information of 11 waves of the German Socio-Economic Panel (GSOEP) from 1995 to 2005. GSOEP was launched in 1984 and is a wide-ranging representative longitudinal study of private households. It provides information on all household members, consisting of Germans living in all Federal Laender, foreigners, and recent immigrants to Germany. In 2005, there were nearly 12,000 households, and more than 21,000 persons sampled. Several features make the GSOEP preferential to other datasets in Germany for our purpose. The sample is not restricted to persons covered by the social security system, i.e., public officials and self-employed persons are included as well. Moreover, it provides information on wages and the hours worked. It also offers the possibility to observe persons of German origin who immigrated from former Soviet Union and Eastern European states late after 1945. In addition, second generation immigrants could be identified. A further advantage is that data are available shortly after the survey has been conducted. A potential disadvantage of the GSOEP concerning migrants is the fact that illegal immigrants and persons living in special entities like asylum camps are not covered in the sample. GSOEP is representative for migrants with the exception of the years between

[10] This is similar to De New and Zimmermann (1993) who also apply random effect methods to estimate the effect of the share of foreign labor on German wages using GSOEP.

the end of the 1980s and the early 1990s when lots of new migration groups arrived in Germany. The survey expansion in 1994/95 of the GSOEP takes this new development into account.

The study is limited to West Germany, because in East Germany there are only few observations on persons with migration background. Further, to reduce the risk of measurement error from extreme values we trim the highest two percent and the lowest two percent observations on hourly wages. The variable real gross hourly wage is obtained for all workers including the self-employed by division of last month salary by last month's work hours.

4.2 Selected Descriptives

The data set reveals that native Germans earn higher wages compared to migrants. Within the group of migrants, German resettlers earn the lowest wages. For a short overview of our sample, Tables 2 and 3 provide means of selected characteristics for the years 1995 and 2005 for males and females. In the tables, we distinguish native Germans and people with migration background which are further divided into foreigners, German citizens with migration background and German resettlers. Starting with males, we observe 1,969 (3,070) native Germans in 1995 (2005) and 974 (684) males with migration background of which 721 (358) are foreigners, 109 (200) are people with migration background and German citizenship, and 144 (126) German resettlers. For females we observe fewer persons, which is caused by lower work participation of females in general and, in particular, of women with migrational background. But, in addition to that, male migrants are over-represented as they initially came without their families for temporary work in Germany. Females with migrational background have a shorter time of residence compared to males. Overall we observe 1,451 (2,780) native German females, 583 (573) females with migration background, of those 418 (269) foreigners, 76 (177) people with migration background and German citizenship and 89 (127) German resettlers in 1995 (2005).

For males, the average hourly wage is highest for native Germans (13.99 Euro in 1995, 15.70 Euro in 2005) while German resettlers earned the lowest wages (10.64 Euro in 1995, 12.37 Euro in 2005). For all groups except for German citizen with migration background, real wages increased between 1995 and 2005. In that group, wages remained fairly stable. Compared to males, female native Germans earned the highest wages (10.77 Euro in 1995, 12.19 Euro in 2005) while in 1995 German resettlers (8.62 euro) and in 2005 foreigners (9.72 Euro) earned lowest wages.

Tab. 2: Means of Selected Characteristics – Males

	native Germans		People with migration background		thereof: Foreigners		People with migration background and German citizenship		German resettler (ethnic Germans)	
Variable	1995	2005	1995	2005	1995	2005	1995	2005	1995	2005
Hourly wage	13.99	15.70	11.69	13.34	11.64	13.61	13.43	13.46	10.64	12.37
Age	38.88	42.54	37.40	40.13	37.74	40.73	35.83	39.21	36.92	39.89
Time of Residence in Germany	38.88	42.54	19.73	25.86	21.79	27.77	24.84	29.03	5.58	15.40
Education										
No schooling	0.01	0.00	0.11	0.04	0.15	0.06	0.02	0.03	0.01	0.01
Schooling (regular school system)	0.12	0.11	0.17	0.15	0.18	0.14	0.16	0.18	0.12	0.12
Schooling (non-regular school or abroad)	0.01	0.00	0.19	0.09	0.22	0.14	0.01	0.05	0.15	0.04
Professional training (apprenticeship system)/ civil servant	0.65	0.61	0.22	0.43	0.20	0.43	0.56	0.41	0.08	0.45
Other professional training	0.01	0.01	0.23	0.04	0.20	0.04	0.07	0.03	0.51	0.04
College or University degree	0.19	0.27	0.04	0.13	0.03	0.10	0.17	0.22	0.00	0.10
College or University degree (abroad)	0.00	0.00	0.04	0.12	0.02	0.09	0.02	0.09	0.13	0.25
Part time work	0.03	0.04	0.03	0.06	0.02	0.07	0.06	0.06	0.01	0.05
Self-employment	0.06	0.09	0.03	0.06	0.03	0.06	0.06	0.09	0.01	0.01
Economic Sectors										
Agriculture	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.03
Industry	0.24	0.32	0.39	0.55	0.40	0.53	0.31	0.49	0.40	0.68
Transportation	0.13	0.08	0.18	0.07	0.18	0.07	0.20	0.09	0.17	0.04
Construction	0.09	0.08	0.05	0.07	0.05	0.09	0.03	0.06	0.06	0.03
Trading services	0.30	0.27	0.27	0.22	0.26	0.23	0.27	0.21	0.30	0.17
Social services and health	0.25	0.22	0.11	0.07	0.11	0.06	0.19	0.13	0.06	0.03
Region[a]										
North	0.22	0.20	0.15	0.15	0.11	0.12	0.16	0.13	0.31	0.27
Center	0.33	0.34	0.33	0.35	0.29	0.31	0.35	0.38	0.47	0.43
South	0.44	0.47	0.53	0.49	0.59	0.57	0.50	0.49	0.22	0.30
No. of obs	1,969	3,070	974	684	721	358	109	200	144	126

[a] *North* contains the Federal Laender of Schleswig-Holstein, Hamburg, Lower-Saxony, Bremen, and Berlin. *Center* are the Federal Laender North Rhine-Westphalia, Rhineland-Palatinate, and Saarland. *South* comprises Hesse, Bavaria, and Baden-Wuerttemberg.

Tab. 3: Means of Selected Characteristics – Females

	Native Germans		People with migration background		thereof: Foreigners		People with migration background and German citizenship		German resettler (ethnic Germans)	
Variable	1995	2005	1995	2005	1995	2005	1995	2005	1995	2005
Hourly wage	10.77	12.19	9.06	9.92	9.03	9.72	9.69	10.31	8.62	9.80
Age	37.47	41.53	37.19	40.05	36.84	40.75	36.72	38.58	39.24	40.63
Time of Residence in Germany	37.47	41.53	19.86	24.71	21.41	26.51	27.70	27.53	5.85	16.98
Education										
No schooling	0.01	0.00	0.17	0.05	0.22	0.09	0.03	0.01	0.06	0.01
Schooling (regular school system)	0.20	0.13	0.16	0.20	0.16	0.17	0.26	0.28	0.11	0.13
Schooling (non-regular school or abroad)	0.00	0.00	0.21	0.14	0.24	0.22	0.05	0.05	0.22	0.09
Professional training (apprenticeship system)/ civil servant	0.65	0.64	0.21	0.36	0.18	0.31	0.55	0.44	0.06	0.37
Other professional training	0.02	0.01	0.18	0.02	0.15	0.01	0.03	0.02	0.43	0.02
College or University degree	0.12	0.21	0.03	0.13	0.03	0.09	0.07	0.16	0.00	0.17
College or University degree (abroad)	0.00	0.00	0.04	0.11	0.02	0.10	0.01	0.06	0.12	0.22
Part time work	0.34	0.42	0.26	0.39	0.23	0.40	0.32	0.39	0.38	0.36
Self-employment	0.04	0.06	0.02	0.03	0.02	0.03	0.04	0.03	0.00	0.02
Economic Sectors										
Agriculture	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industry	0.16	0.14	0.24	0.22	0.28	0.26	0.20	0.20	0.11	0.18
Transportation	0.05	0.05	0.10	0.05	0.12	0.04	0.06	0.05	0.06	0.05
Construction	0.05	0.01	0.04	0.01	0.04	0.01	0.04	0.01	0.02	0.00
Trading services	0.29	0.37	0.16	0.39	0.16	0.40	0.19	0.39	0.17	0.35
Social services and health	0.46	0.42	0.46	0.34	0.41	0.29	0.51	0.35	0.64	0.42
Region[a]										
North	0.21	0.21	0.13	0.15	0.12	0.10	0.08	0.13	0.24	0.27
Center	0.33	0.33	0.33	0.34	0.29	0.28	0.36	0.41	0.47	0.39
South	0.46	0.46	0.54	0.51	0.58	0.62	0.57	0.46	0.28	0.35
No. of obs	1,451	2,780	583	573	418	269	76	177	89	127

[a] *North* contains the Federal Laender of Schleswig-Holstein, Hamburg, Lower-Saxony, Bremen, and Berlin. *Center* are the Federal Laender North Rhine-Westphalia, Rhineland-Palatinate, and Saarland. *South* comprises Hesse, Bavaria, and Baden-Wuerttemberg.

To give an insight why wages are higher for native Germans we take a look at the composition of the labor force of the natives and different migrant groups. Native Germans seem to be best educated compared to the migration groups. For foreigners and German resettlers there is a general trend toward higher education. For people with migration background the picture is more mixed. While the share of this group with professional training decreased from 56 percent in 1995 to 41 percent in 2005, the fraction of education groups below and above that category increased. The share of people with migration background who completed professional training doubled between 1995 and 2005. Especially the group of German resettlers experienced a large increase. Resettlers also have a higher share of persons with a college degree compared to native Germans even though these are mostly acquired abroad. The groups where the share of persons who completed education in Germany is higher, earn higher wages. This could mean that degrees obtained in Germany are more valuable. Concerning education levels, males and females have similar composition of the labor force across groups.

On average native Germans are older than persons with migrational background and hence have higher potential experience. This could also explain higher wages of the natives as age has a positive influence on wages due to higher productivity caused by higher experience or due to seniority wage payment. Within the persons with migration background, German resettlers show the lowest time of residence (5.58 years in 1995 and 15.4 years in 2005) - and the lowest wages, while it is highest for people with German citizenship who stayed on average three fourth of their life in Germany.

Unlike native Germans, people with migration background, especially German resettlers, are more concentrated in the industry sector. Also, foreigners and German citizens with migration background are over-represented in the south while German resettlers are over-represented in the center of Germany compared to native Germans. Compared to males, females and especially females with migration background are less concentrated in the industry sector but more concentrated in trading services and social services and health. The share of self-employed is highest for native Germans and German citizens with migration background (6 percent in 1995 and 9 percent in 2005) and lowest for German resettlers.

Table A.3 in the appendix describes countries of origin for males and females with migration background (and for the three subgroups: foreigners, people with migration background and German citizenship and German resettlers) for the years 1995 and 2005. The main fraction of persons with migration background comes from traditional guest-worker countries like Turkey, Italy and other South-European countries. And later on, especially German Resettlers, from the former Soviet Union and Poland.

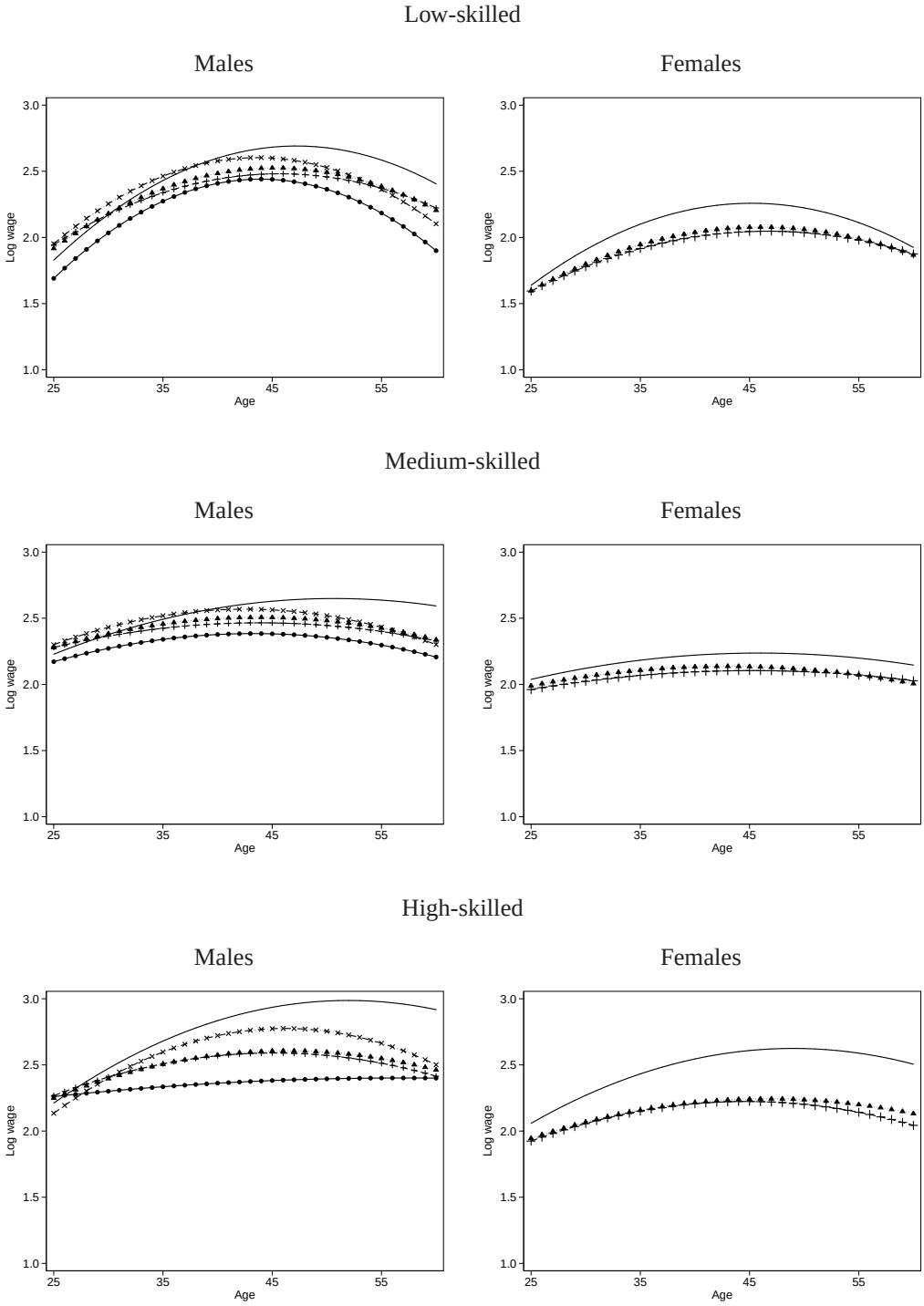
Concerning gender shares of the migration force it is interesting that for the migrants with Turkish ancestry the share of males is higher than the share of females (23.82 and 15.44 in 1995 and 18.42 and 10.99 in 2005). For the migrants with (Ex-) Yugoslavian ancestry the share of females was higher in 1995 but equalled with the share of males by 2005. In contrast the shares of males and females for persons with Polish ancestry were almost equal in 1995, but by 2005 female share is higher than the share of males.

5 Empirical Application

5.1 Comparison of the Earnings Equations

In the introduction we asked the question of how the returns to education differ between the native population and migrants and across different groups of persons with migration background. To answer the question more clearly we construct the hypothetical wage profiles for persons aged 25-60 with and without migration background and also for the three subgroups of migrants, namely, foreigners, German citizens with migration background and German resettlers, which are depicted in Figure 2.The profiles are constructed based on the estimation results presented in Tables A.1 and A.2. We define the low-skilled as persons belonging to either category ”no schooling”, ”schooling (regular school system)” or ”schooling (non-regular school or abroad)”. Persons coded ”professional training (apprenticeship system)/civil servant” or ”other professional training” are defined as medium-skilled in our analysis. The high-skilled are defined as having ”college or university degree” or ”college or university degree (abroad)”. The shares of each education category are given in Tables 2 and 3.

Fig. 2: Estimated Wage Profiles



Solid line are people without migration background.
Dotted lines with triangles ($\cdot \triangle \cdot \triangle \cdot$) are people with migration background.
Solid line with circles (-●-) are German resettlers.
Dotted line with pluses ($\cdot + \cdot + \cdot$) are foreigners.
Dash-dotted line with crosses ($- \cdot \times \cdot -$) are naturalized immigrants.

We find that native Germans reached their highest wages later than persons with migration background. Native males earn highest wages at the age of 48 if they are low-skilled, 51 if medium-skilled and with

52 if high-skilled. The respective numbers for persons with migration background are 45, 44 and 46 years of age. Females have flatter wage profiles than males. Native females earn at all skill categories higher wages than their counterparts with migration background.

Another interesting finding is that the wage profiles of persons with migration background are almost identical to those of the foreigners. Concerning the differences between the native workers and persons with migration background, the major finding is that wages are similar for those groups at the beginning of working career on average; however, the wage gap grows with age (except for low and medium-skilled females). The gap is even wider for the high-skilled male and female workers. In principle, one has to be careful when interpreting such results due to possible inherent differences across migrant generations (see Borjas (1985) critique of Chiswick (1978) and Borjas (1994) for an overview). To check the robustness of the results, we took advantage of the panel structure of the GSOEP and estimated the model controlling for birth cohorts.[11] Hence, the high gap between the natives and the migrants at later ages is not due to inherent differences of these cohorts, but it indeed implies that wages of the native workers and migrants diverge with age (or experience). One of the hypotheses which try to explain the existing differences in earnings between the indigenous population and immigrants claims that these differences can be attributed to the poor command of the language of the host country by the immigrants (see Dustmann and van Soest (2002)). An alternative explanation could be that the skills the migrants obtained in their home countries are not directly applicable in Germany. This would imply that education obtained abroad is valued less in Germany than home-based education. We come back to this hypothesis in the following section.

We are also interested to see if the earning profiles vary across different migrant groups. Due to insufficient number of observations for certain subgroups, we build the profiles for separate migrant groups only for male workers. The graph shows that for all skill groups naturalized immigrants (or German citizens with migration background) earn more on average than foreigners. Resettlers seem to have the worst earnings perspective. If we look at Table 2 we see that more naturalized immigrants attended a school in Germany than abroad (16 vs. 1 percent in 1995 and 18 vs. 5 percent in 2005). For foreigners and resettlers these shares are more comparable (18 vs. 22 percent in 1995 and 14 vs. 14 percent in 2005, foreigners and 12 vs. 15 percent in 1995 and 12 vs. 4 percent in 2005, resettlers). The discrepancy is even larger if one compares the shares of university graduates. More naturalized immigrants graduated a university or college in Germany than abroad (17 vs. 2 percent in 1995 and 22 vs. 9 percent in 2005). For foreigners and resettlers the respective shares are 3 vs. 2 percent in 1995 and 10 vs. 9 percent in 2005 (foreigners) and 0 vs. 13 percent in 1995 and 10 vs. 25 percent in 2005. If the returns to education obtained in Germany are higher than returns to education obtained broad, the higher earnings profiles of the naturalized immigrants can be due to the fact that part of the German citizens with migration background is formed by the second generation immigrants, who were born and raised in Germany and thus are mostly likely to have completed their education in Germany. This hypothesis is analyzed in detail in the next section.

[11] We do not present the estimates controlling for the cohort effects as they are almost the same as the results presented in Tables A.1 and A.2. The complete table including the cohort effects is available from the authors upon request.

Tab. 4: Differences in Returns to Education for Selected Age Cohorts

	Males					
	Difference in Euro per hour			Difference in percent		
	medium-skilled vs. low-skilled					
Age	25	40	60	25	40	60
Native Germans	3.06	-0.32	2.29	49.14	-2.34	20.66
People with migration background	2.97	0.16	1.28	43.60	1.36	14.14
Foreigners	2.78	0.19	1.02	39.76	1.68	11.08
German citizens with migration background	2.93	-0.20	1.79	41.59	-1.51	21.88
German resettler	3.35	-0.34	2.40	61.75	-3.10	35.90
	high-skilled vs. low-skilled					
Native Germans	2.91	3.56	7.42	46.72	26.41	66.92
People with migration background	2.68	1.14	2.65	39.36	9.48	29.22
Foreigners	2.66	1.57	1.95	38.13	13.67	21.09
German citizens with migration background	1.41	2.02	4.00	20.01	15.36	48.88
German resettler	4.17	-0.51	4.33	76.80	-4.59	64.79
	Females					
	medium-skilled vs. low-skilled					
Native Germans	2.53	0.03	1.70	49.15	0.36	24.75
People with migration background	2.37	0.76	0.96	48.05	9.84	14.89
Foreigners	2.18	0.70	1.07	44.23	9.43	16.45
German citizens with migration background	-	-	-	-	-	-
German resettler	-	-	-	-	-	-
	high-skilled vs. low-skilled					
Native Germans	2.69	3.56	5.39	52.26	38.74	78.70
People with migration background	2.06	1.48	1.96	41.62	19.27	30.32
Foreigners	1.92	1.66	1.19	39.00	22.37	18.28
German citizens with migration background	-	-	-	-	-	-
German resettler	-	-	-	-	-	-

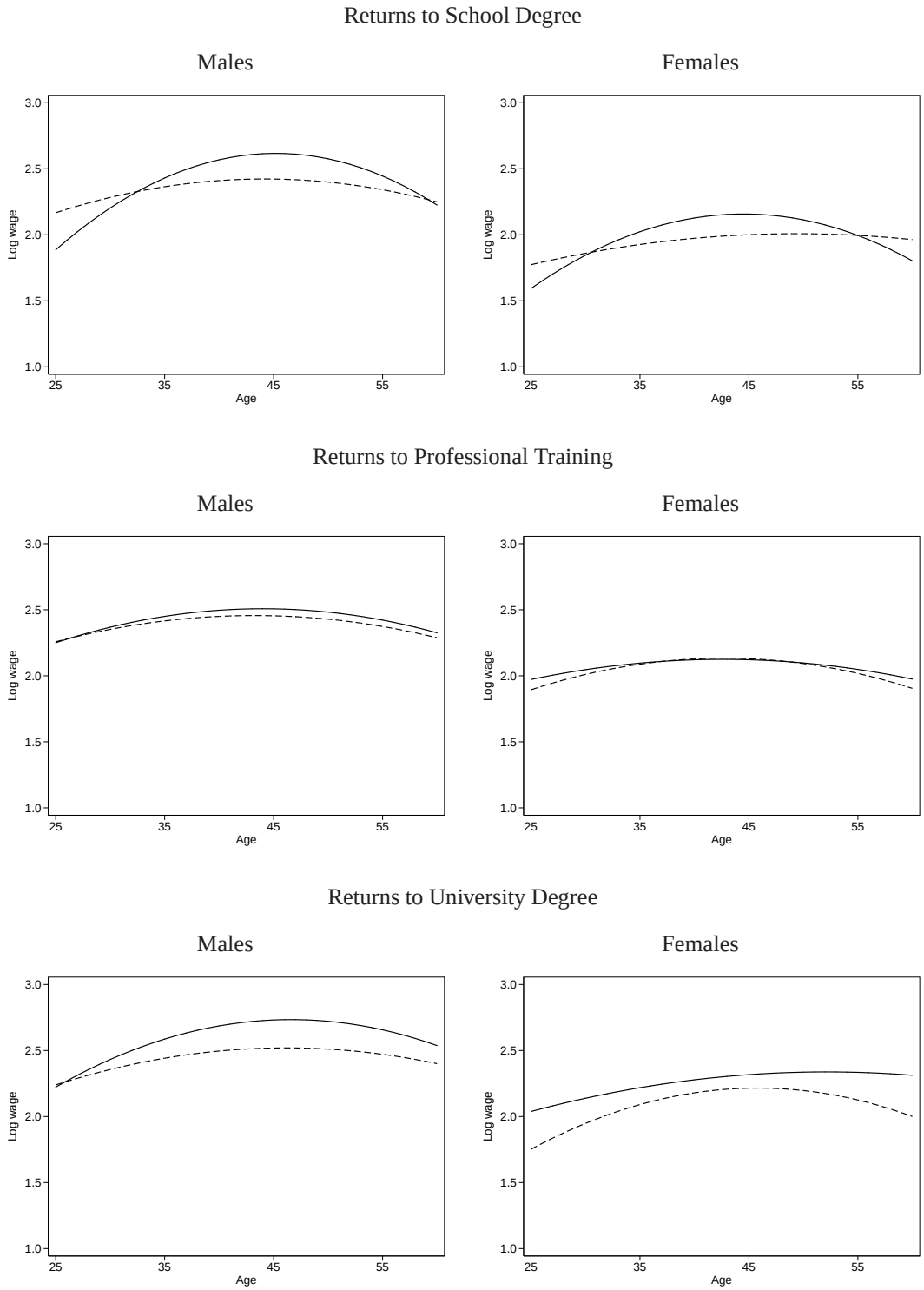
We also calculated the wage differences between skill categories within all migrant groups for selected ages. The results are presented in Table 4. The major findings are that for native Germans and naturalized immigrants the wage gap between high and low skilled increases with age. The gap between medium and low skilled decreases up to certain age and then increases again.

5.2 Education in Germany vs. Education Abroad

The second question of this study aims at assessing the value of obtaining a degree abroad compared to the German degree for persons with migration background. For this purpose, we have estimated an augmented version of Eq. 2 that considers whether the degree is obtained abroad or in Germany. We consider seven education categories given in Tables 2 and 3. Consequently, the number of interactions increases, too. To avoid problems occurring with this large number of parameters to estimate due to small sample sizes, the analysis is carried out for the joint group of persons with migration background only.[12]

[12] It may be worth noting that we also estimated the effects of education abroad vs. in Germany for the subgroups of persons with migration background. Unfortunately, estimations were not robust so we refrain from presenting the results here.

Fig. 3: Wage Profiles of Degrees obtained in Host and Home Country



Solid line represents degrees obtained in Germany, dashed line represents degrees obtained abroad.

Analogously to the figures in the last section, Figure 3 shows the calculated log wage profiles for persons aged 25 to 60.[13] The left-hand side of the graph refer to males, the right-hand side to females. Three

[13] The detailed estimates are available on request by the authors.

types of educational degrees are considered: the upper graphs present the estimates for the returns to school degree, the middle graphs that for returns to completed professional training, and the lower are the results for returns to university/advanced technical college degree. Solid lines refer to returns to degree obtained in Germany, dashed lines to returns to degree obtained abroad.

Starting with the wage profiles for the returns to schooling, it becomes obvious that except for persons aged 25 to 32 (males) and 25 to 29 or 55 to 60 (females), returns to schooling in Germany are clearly larger compared to returns to schooling abroad. Moreover, the wage profiles for returns to schooling in Germany are steeper independently of gender. For that reason, the average 45-year old male (female) has an expected wage of 13.69 (8.65) Euro if he (she) completed schooling in Germany. In contrast, the expected wage for the same person with schooling abroad is 11.27 (7.39) Euro which corresponds to the expected difference of 2.42 (1.25) Euro. The similar picture is revealed with respect to returns to university/advanced technical college education. The wage profiles for people with migration background who obtained their diplomas from German universities or colleges are clearly above those of people who obtained their diplomas abroad at all ages. For a typical 45-year male (female) the expected hourly wage is 15.35 (10.15) Euro if studies were completed in Germany and 12.42 (9.16) Euro if studies were completed in the home country. For both groups discussed so far potential gains due to schooling or university in Germany vs. abroad are fairly similar. Schooling completed in Germany brings about 18 percent wage increase for a typical 45-year male (14 percent for a female). The university degree makes about 19 percent difference for males (10 percent for females).

In clear contrast to these findings are the results for completed professional training. Except gender differences (which are observable for returns to any degree), wage profiles for persons with migration background look fairly equal independently whether professional training was completed in Germany or abroad. Due to that, the 45-old male (female) has an expected wage of 12.27 (8.34) Euro per hour if he (she) completed training in Germany and of 11.64 (8.41) Euro per hour if he (she) completed training abroad.

In some sense, the findings in this section confirm the results from the last section, where the smallest differences between natives and migrants are observable for medium-skilled persons. A possible reason may be that credentials or diplomas are assessed differently than practical experience. This would explain the different pictures for returns to schooling and returns to university obtained abroad and in Germany and for returns to completed professional training. Nevertheless, on should bear in mind that the estimates do not provide evidence on behavioral differences of employers in valuing degrees of persons.

To sum up, we find that earnings prospects differ between persons with and without migration background and across the migrant groups. Moreover, the wages of the native workers and migrants diverge with age or experience. We find that high-skilled workers with German degree earn on average higher wages than those having a foreign degree, whereas for the medium-skilled no difference is observed. Given that the wage gap between the native workers and persons with migration background is high for high-skilled workers and negligible for the medium-skilled workers, it might suggest that the wage gap

is likely to be caused by higher valuation of education obtained in Germany compared to that obtained abroad.

6 Conclusion

To be completed...

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Tab. A.1: Estimation Results: Males

	Native Germans	People with migration background	thereof: Foreigners	thereof: People with migration background and German citizenship	thereof: German resettler (ethnic Germans)
Age	0.1651***	0.1340***	0.1634***	0.1148***	0.1839***
Age (squared)	-0.0017***	-0.0015***	-0.0019***	-0.0013***	-0.0021***
Education					
Medium-skilled[a]	2.2140***	1.7753***	1.9488***	1.5970***	2.7939***
High-skilled[b]	1.3125***	1.4305***	0.6880	1.1091***	3.5535***
Interaction with age					
Medium-skilled×Age	-0.1003***	-0.0774***	-0.0889***	-0.0688***	-0.1290***
High-skilled×Age	-0.0542***	-0.0614***	-0.0312	-0.0430***	-0.1682***
Interaction with age (squared)					
Medium-skilled×Age(squared)	0.0011***	0.0008***	0.0010***	0.0007***	0.0015***
High-skilled×Age(squared)	0.0007***	0.0007***	0.0004	0.0005**	0.0020***
Economic Sectors					
Industry	0.1257***	-0.0207	-0.0964	-0.0039	0.0465
Transportation	0.0796***	-0.0602	-0.1534	-0.0274	-0.0467
Construction	0.0725***	-0.0825*	-0.1255	-0.0859*	0.0239
Trading services	0.0792***	-0.0974**	-0.1022	-0.1031*	-0.0507
Social services and health	0.0608***	-0.1385***	-0.2489*	-0.0963*	-0.0892
Self-employment	-0.0537***	0.0860***	0.0674	0.1022***	0.1724*
Part time work	0.0456***	0.0475*	0.0834	-0.0049	0.2210***
Time of residence in Germany		0.0051***	0.0043	0.0057**	0.0187*
Time of residence in Germany (squared)		0.0000	0.0001	0.0000	-0.0002
Region[c]					
North	-0.0700***	-0.0664**	-0.0031	-0.0809**	-0.0591
Center	-0.0206*	-0.0559***	-0.0917**	-0.0343	-0.0564
Dummy for years					
Year 2	0.0224**	0.0257*	-0.0033	0.0239	0.0679**
Year 3	-0.0112	0.0067	-0.0195	0.0137	0.0083
Year 4	-0.0265***	-0.0040	-0.0316	0.0030	-0.0013
Year 5	-0.0071	-0.0068	-0.0155	0.0002	-0.0167
Year 6	0.0002	-0.0216	-0.0202	-0.0156	-0.0367
Year 7	-0.0022	-0.0191	-0.0071	-0.0115	-0.0486
Year 8	0.0145*	0.0086	-0.0139	0.0232	-0.0073
Year 9	0.0315***	0.0459***	0.0530	0.0605***	-0.0080
Year 10	0.0155*	0.0150	0.0119	0.0358*	-0.0533
Year 11	0.0044	-0.0111	-0.0242	0.0095	-0.0660
Constant	-1.2059***	-0.5076***	-0.9639***	-0.1408	-1.5987***
σ_u	0.310	0.286	0.303	0.274	0.261
ρ	.702	.620	.613	.612	.625
No. of persons	6587	1976	532	1265	339
No. of obs.	29379	9069	1940	5594	1535

[a] Medium-skilled are people with completed professional training.
[b] High-skilled are people with advanced technical college or university degree.
[c] *North* contains the Federal Laender of Schleswig-Holstein, Hamburg, Lower-Saxony, Bremen, and Berlin. *Center* are the Federal Laender North Rhine-Westphalia, Rhineland-Palatinate, and Saarland. *South* comprises Hesse, Bavaria, and Baden-Wuerttemberg.

Tab. A.2: Estimation Results: Females

	Native Germans	People with migration background	thereof: Foreigners	thereof: People with migration background and German citizenship	thereof: German resettler (ethnic Germans)
Age	0.1375***	0.1001***	0.1343***	0.0901***	0.1029***
Age (squared)	-0.0015***	-0.0011***	-0.0015***	-0.0010***	-0.0011***
Education					
Medium-skilled[a]	2.1254***	1.5228***	1.9661***	1.4413***	1.6138***
High-skilled[b]	1.1141***	1.0879***	2.0245***	0.7360	0.6693
Interaction with age					
Medium-skilled×Age	-0.0957***	-0.0610***	-0.0847***	-0.0584***	-0.0700***
High-skilled×Age	-0.0412***	-0.0409**	-0.0865***	-0.0211	-0.0277
Interaction with age (squared)					
Medium-skilled×Age(squared)	0.0011***	0.0006***	0.0009***	0.0006***	0.0008***
High-skilled×Age(squared)	0.0005***	0.0005**	0.0010**	0.0002	0.0004
Economic Sectors					
Industry	0.1266***	-0.0517	0.2662	0.0020	-0.2785*
Transportation	0.0972**	-0.0577	0.2606	-0.0088	-0.2931*
Construction	0.1297***	-0.0338	0.2500	0.0149	-0.2685
Trading services	0.0674*	-0.1067	0.1749	-0.0523	-0.3296*
Social services and health	0.1551***	-0.0380	0.3098	-0.0288	-0.2190
Self-employment	-0.0277*	0.0317	0.0636	0.0870*	-0.3940***
Part time work	-0.0002	0.0134	0.0241	0.0100	0.0204
Time of residence in Germany		0.0141***	0.0156***	0.0111***	0.0464***
Time of residence in Germany (squared)		-0.0001***	-0.0001	-0.0001	-0.0007***
Region[c]					
North	-0.0286*	-0.0797**	-0.0756	-0.0792*	-0.0894
Center	-0.0242*	-0.0737***	-0.1042**	-0.0558*	-0.0472
Dummy for years					
Year 2	0.0200*	0.0201	0.0210	0.0516**	-0.0962*
Year 3	0.0080	0.0042	0.0344	0.0030	-0.0583
Year 4	0.0219*	0.0052	-0.0271	0.0261	-0.0956*
Year 5	0.0304**	0.0191	0.0119	0.0453*	-0.1350**
Year 6	0.0279**	0.0204	0.0513	0.0293	-0.1268**
Year 7	0.0196*	0.0210	0.0454	0.0399	-0.1525**
Year 8	0.0604***	0.0569***	0.0827	0.0757***	-0.1397**
Year 9	0.0733***	0.0573**	0.1038*	0.0661**	-0.1653**
Year 10	0.0781***	0.0570**	0.0710	0.0672**	-0.1452*
Year 11	0.0739***	0.0288	0.0623	0.0174	-0.1608**
Constant	-0.8491***	-0.2260	-1.1904***	-0.0528	-0.1422
σ_u	0.339	0.298	0.280	0.311	0.277
ρ	.664	.607	.552	.648	.575
No. of persons	5937	1504	442	889	298
No. of obs.	24324	6183	1510	3452	1221

[a] Medium-skilled are people with completed professional training.
[b] High-skilled are people with advanced technical college or university degree.
[c] *North* contains the Federal Laender of Schleswig-Holstein, Hamburg, Lower-Saxony, Bremen, and Berlin. *Center* are the Federal Laender North Rhine-Westphalia, Rhineland-Palatinate, and Saarland. *South* comprises Hesse, Bavaria, and Baden-Wuerttemberg.

Tab. A.3: Countries of Origin

	Females								Males							
	People with migration background		thereof: Foreigners		People with migration background and German citizenship		German resettler (ethnic Germans)		People with migration background		thereof: Foreigners		People with migration background and German citizenship		German resettler (ethnic Germans)	
1995	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Other countries	78	13.38	36	8.61	26	34.21	16	17.98	83	8.52	38	5.27	29	26.61	16	11.11
Germany[a]	87	14.92	66	15.79	21	27.63			133	13.66	92	12.76	41	37.61		
Turkey	90	15.44	89	21.29	1	1.32			232	23.82	229	31.76	3	2.75		
(Ex-)Yugoslavia[b]	107	18.35	101	24.16	6	7.89			142	14.58	135	18.72	7	6.42		
Greece	50	8.58	49	11.72	1	1.32			69	7.08	69	9.57				
Italy	49	8.40	48	11.48	1	1.32			110	11.29	107	14.84	3	2.75		
Spain	22	3.77	22	5.26					44	4.52	44	6.10				
Poland	48	8.23	6	1.44	7	9.21	35	39.33	75	7.70	7	0.97	8	7.34	60	41.67
CIS[c]	52	8.92	1	0.24	13	17.11	38	42.70	86	8.83			18	16.51	68	47.22
2005																
Other countries	119	20.77	55	20.45	47	26.55	17	13.39	108	15.79	47	13.13	45	22.50	16	12.70
Germany[a]	102	17.80	46	17.10	55	31.07	1	0.79	137	20.03	65	18.16	71	35.50	1	0.79
Turkey	63	10.99	49	18.22	14	7.91			126	18.42	94	26.26	32	16.00		
(Ex-)Yugoslavia[b]	61	10.65	50	18.59	8	4.52	3	2.36	64	9.36	53	14.80	11	5.50		
Greece	18	3.14	17	6.32	1	0.56			25	3.65	24	6.70	1	0.50		
Italy	37	6.46	35	13.01	2	1.13			55	8.04	51	14.25	4	2.00		
Spain	6	1.05	6	2.23					17	2.49	17	4.75				
Poland	71	12.39	4	1.49	25	14.12	42	33.07	52	7.60	2	0.56	11	5.50	39	30.95
CIS[c]	96	16.75	7	2.60	25	14.12	64	50.39	100	14.62	5	1.40	25	12.50	70	55.56

[a] People with migration background who are born in Germany are descendants of immigrants from foreign countries.
[b] (Ex-)Yugoslavia refers to the countries Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Slovenia, and Serbia and Montenegro (Yugoslavia).
[c] CIS denotes the Commonwealth of Independent States, i.e. Armenia, Azerbaijan, Georgian Republic, Kazakhstan, Kyrgystan, Moldova, Republic of Belarus, Russia, Tajikistan, Turkmenistan, Ukraina, and Uzbekistan.