Transferability of Human Capital and Immigrant Assimilation: An Analysis for Germany

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Abstract. This paper investigates the transferability of human capital across countries and the contribution of imperfect human capital portability to the explanation of the immigrant-native wage gap. Using data for West Germany, our results reveal that, overall, education and in particular labor market experience accumulated in the home countries of the immigrants receive significantly lower returns than human capital obtained in Germany. We further find evidence for heterogeneity in the returns to human capital of immigrants across countries. Finally, imperfect human capital transferability appears to be a major factor in explaining the wage differential between natives and immigrants.

JEL-Classification: J61, J31, J24

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1 Introduction

The existing literature on the economic performance of immigrants concentrates on the wage differential between migrants and natives with comparable characteristics. The common framework of these analyses is the human capital theory, wherein wage disparities between groups are attributed to the mean differences in productivity-relevant characteristics. Following Chiswick (1978) and Borjas (1985), numerous studies have shown that immigrants have an earnings disadvantage upon arrival in the destination country, which is explained by the immigrant's lack of human capital that is specifically suited to the labor market of the receiving country. With time of residence in the host country, however, they accumulate country-specific human capital, thereby narrowing the initial earnings gap (Duleep & Regets, 1999).

The majority of the existing studies on the wage assimilation of immigrants treat education and labor market experience obtained in different countries as perfect substitutes. Studies on educational mismatch of immigrants usually also assume education obtained in the home country to be comparable to education obtained in the receiving country (Duncan & Hoffman, 1981; Korpi & Tåhlin, 2009). These studies ignore the possibility that skills valuable in one labor market may not raise productivity in another labor market (Schmidt, 1997), and hence may not be rewarded equally in terms of earnings. So far, only a few studies allow the returns to human capital to vary not only for immigrants and natives, but also according to where the human capital has been obtained. Distinguishing between foreign and domestic education and allowing for their rates of return to differ, Schoeni (1997) and Bratsberg & Ragan (2002) find that the returns to education for US-immigrants with US schooling are substantially higher than for those who only have foreign schooling.

Some studies allow both, the returns to schooling and labor market experience to vary with the country in which these skills have been obtained (Beggs & Chapman, 1988; Kossoudji, 1989; Friedberg, 2000; Schaafsma & Sweetman, 2001; Sanromá et al., 2015). The results of Kossoudji (1989), for example, indicate almost zero returns to labor market experience accumulated outside the US and small difference in the returns to pre- and post-immigration schooling. Schaafsma & Sweetman (2001) confirm that work experience from abroad yields virtually no return in Canada and,

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in addition, find that the return to education varies with age at immigration. In a similar vein Friedberg (2000) finds that education and labor market experience acquired abroad are significantly less valued than human capital obtained in Israel, and that this difference can fully account for the earnings disadvantage of immigrants relative to their Israeli counterparts. Cohen-Goldner & Eckstein (2008) confirm the results of Friedberg (2000), finding substantial returns to training and experience undertaken by immigrants in Israel and zero returns to imported skills. Similar patterns of the returns to education obtained in different countries also appear in Spain (Sanromá et al., 2015). Chiswick & Miller (2009) argue that the development of educational mismatch among immigrants in the US may be explained by imperfect international transferability of skills obtained pre-immigration.

This paper investigates whether human capital accumulated in different countries are rewarded differently in the German labor market – an aspect that hitherto has not been dealt with. Using data from the German Socio-Economic Panel (SOEP), we are able to approximate the years of education and labor market experience undertaken abroad and in Germany. While most of the earlier studies only consider male immigrants[1], we also carry out the analysis for females. We examine immigrants by region of origin and arrival cohort.

Germany, a major immigrant destination in the European Union, represents an excellent case study for the investigation of the transferability of human capital across countries. The history of immigration to Germany has generated different types of migrants in terms of their human capital composition. For almost a decade until the early 1970s, a large number of guest-workers were encouraged to migrate to Germany as a reaction to a perceived shortage of unskilled labor. At the time of immigration, most of the guest-workers had already completed their schooling and accumulated some labor market experience in their home countries. In addition, since the work arrangement under the guest-worker program was intended to be predominantly temporary, these immigrants did not have pronounced incentives to invest in German-specific human capital. However, many of them ended up staying in Germany permanently. As the recruitment of guest-workers was stopped in 1973, family reunification, humanitarian immigration in the form of asylum seekers and

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[1]One exception is for instance the study for Canada of Li & Sweetman (2014), who include females in their analysis.

war refugees, and the immigration of ethnic Germans from Eastern Europe became the major avenues of legal immigration to Germany thereafter (Schmidt & Zimmermann, 1992; Fertig & Schmidt, 2001; Bauer et al., 2005). Some of these immigrants entered at very young ages and were likely to have obtained virtually all of their skills in Germany or have a combination of foreign- and domestically-acquired human capital. Furthermore, with the series of expansions of the European Union, labor mobility within Europe has been made easier, and more recently, programs were implemented to encourage the admission of highly-skilled professionals (Martin, 2002). In short, the different immigration regimes have brought forth immigrants who vary in the configurations of the regional sources of their human capital allowing us to gain further insights on the role of human capital transferability to explain the native-immigrant wage gap.

Our results suggest that the native-immigrant earnings gap at the time of arrival can largely be explained by the different regional sources of human capital. Overall, education and labor market experience obtained outside of Germany receive significantly lower returns than human capital obtained in Germany. We further find evidence for heterogeneity in the returns to human capital of immigrants across Source countries, with immigrants from countries that are very similar to Germany with respect to their level of economic development receiving similar returns than natives.

The paper is structured as follows. Section 2 describes the data set and discusses the empirical strategy. Section 3 presents the basic estimation results, while Section 4 investigates heterogeneity in the returns to human capital in more detail. Section 5 concludes.

2 Empirical Strategy and Data

Following the seminal paper on immigrants' earnings assimilation by Chiswick (1978), we estimate wage equations of the form:

$$w_{it} = \beta_0 + \beta_1 S_{it} + \beta_2 EXP_{it} + \beta_3 I_i + \beta_4 YSM_{it} + \beta_5' X_{it} + \epsilon_{it}, \tag{1}$$

for $i=1,...,$ N and $t=1,...,$T, where w_{it} represents the log real hourly gross wage of individual i in year t, S_{it} refers to years of schooling, EXP_{it} to years of potential labor market experience, and YSM_{it} to the number of years since an immigrant's arrival in Germany. I_i is a dummy variable of the individuals' immigrant status. The coefficient β_3 shows the wage gap between immigrants and comparable natives at the year of arrival in Germany, while β_4 captures the rate at which this native-immigrant wage gap diminishes with time of residence in Germany. Other individual characteristics that potentially affect the wage are subsumed in the vector X_{it}, which includes information on the individual's marital status and number of children, state of residence and industry of employment. Since we apply pooled Ordinary Least Squares (OLS) to panel data covering the period 1984-2013, X_{it} also includes a set of year-specific effects, which are assumed to be the same for both natives and immigrants. While most of the literature focus on the wage assimilation of male immigrants, we carry out our analysis separately for both males and females.

Based on the standard specification shown in equation (1) it is not possible to estimate different returns to foreign and domestic human capital because human capital (S_{it} and EXP_{it}) acquired by immigrants in their home and host countries is treated as homogeneous. As Friedberg (2000) points out, equation (1) makes several restrictive implicit assumptions. It is assumed that the returns to immigrants' education and labor market experience obtained abroad equal the returns to education and labor market experience they accumulate in the destination country. This implies first that the *relative* returns to immigrants' human capital obtained in their home and in the host country are the same for education and experience. Second, the returns to human capital obtained in the destination country are assumed to be equal for both, natives and immigrants. There are several arguments why these assumptions may be violated.

Firstly, the quality of education varies substantially across countries (Friedberg, 2000). Education acquired in poorer countries may obtain lower returns in the host country as this education may be of (real or perceived) lower quality due to limited resources that these countries are able to devote to their educational systems. As a consequence of the various immigration regimes, for example, the non-German born population is a mixture of immigrants who originated from countries that are highly diverse in terms of their levels of economic development, as well as linguistic,

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institutional and cultural backgrounds. Secondly, training and work experience accumulated in less developed economies may not be suited to the needs of the often more technologically-advanced labor markets of the host countries. Hence, training and work experience obtained abroad may be discounted compared to human capital collected in the host country. These arguments suggest an specification of a wage equation that allows for different returns to schooling and experience depending on where this human capital has been accumulated, i.e of the following form:

$$
\begin{aligned}
w_{it} = {} & \gamma_0 + \gamma_1 I_i + \gamma_2 (S_{it}^f \times I_i) + \gamma_3 S_{it}^d + \\
& + \gamma_4 (EXP_{it}^f \times I_i) + \gamma_5 EXP_{it}^d + X_{it} + \varepsilon_{it},
\end{aligned} \tag{2}
$$

However, the returns to education and experience acquired in the host country, on the other hand, may be lower or higher for immigrants than natives. As Friedberg (2000) asserts, since natives have country-specific skills – predominantly greater language proficiency – each year of education or experience could translate to an earnings potential higher than what immigrants could achieve. On the other hand, immigrants may get additional benefits in terms of language training, familiarization with institutions, work etiquettes, etc. Therefore, each year of German schooling or labor market experience could have compounded benefits.

To relax the above-mentioned restrictions, we follow Friedberg (2000) and estimate the following model:

$$
\begin{aligned}
w_{it} = {} & \gamma_0 + \gamma_1 I_i + \gamma_2 (S_{it}^f \times I_i) + \gamma_3 S_{it}^d + \gamma_4 (S_{it}^d \times I_i) \\
& + \gamma_5 (EXP_{it}^f \times I_i) + \gamma_6 EXP_{it}^d + \gamma_7 (EXP_{it}^d \times I_i) + X_{it} + \varepsilon_{it},
\end{aligned} \tag{3}
$$

where the superscripts f and d refer to foreign- and domestically-acquired human capital, respectively. This model allows the returns to foreign- and domestically-acquired human capital to vary. Based on estimations of equations (1) and (3), one can analyze the validity of the various implicit restrictions of equation (1) discussed above by testing, whether the returns to education (experience) obtained in the home country are significantly different from the returns to education (experience) acquired in the host country i.e., whether $\gamma_2 = \gamma_3 + \gamma_4$ and $\gamma_5 = \gamma_6 + \gamma_7$. A more comprehensive model also allows for interaction effects $(S_{it}^f \times I_i) \times S_{it}^d$, $(S_{it}^f \times I_i) \times EXP_{it}^d$ and $(EXP_{it}^f \times I_i) \times EXP_{it}^d$, to allow the returns to foreign human capital to

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vary with the accumulation of domestic human capital. We will present the results of such a specification in Section 4.

The data used in this study are drawn from the German Socio-Economic Panel (SOEP) for the years 1984 to 2013.[2] We define immigrants as persons who were born outside Germany and immigrated after 1948. Table A1 provides a description of all variables used in the analysis. As immigrants living in East Germany comprise less than two percent of the population, we restrict our analysis to West Germany. We further restrict our sample to individuals aged 16 to 64 years who are in wage and salaried employment and excluded those who are in the military or civil service or undergoing full-time training. Unlike previous studies, which focused only on male immigrants, we also examine the assimilation of female immigrants. Pooled OLS estimations are implemented for full-time workers, separately by gender.[3]

After applying our selection criteria, we are left with 113,684 person-year observations of full-time workers (18,848 unique respondents), of which 69% are males. Immigrants comprise about 20% of the sample for either gender. We categorize immigrants into regions of origin, namely: high-income OECD[4], Turkey, Eastern Europe and the former Soviet Union (fSU), Ex-Yugoslavia, and a heterogeneous group *Others*, which consists of immigrants coming from countries other than the four regions specified.[5] We further split the sample into three immigration cohorts: pre-1974, which is predominantly a period of manpower recruitment; 1974-1988, an era in which mainly family migrants entered Germany; and 1989-2012, which covers

[2]The data used in this paper were extracted using the Add-On package PanelWhiz v4.0 (Oct 2012) for Stata. PanelWhiz was written by Dr. John P. Haisken-DeNew (john@panelwhiz.eu). The PanelWhiz generated DO file to retrieve the SOEP data used here and any Panelwhiz Plugins are available upon request. Any data or computational errors in this paper are our own. Haisken-DeNew & Hahn (2010) describe PanelWhiz in detail.

[3]In carrying out OLS estimations, we took into account the survey design of the dataset. Since we observe an individual multiple times, there is obviously a violation of independence among observations. We address this issue by clustering the standard errors at the individual level.

[4]Excluded from this category are Mexico (which is not a high-income OECD country as based on the World Bank (2011) classification of economies) as well as Turkey, Slovakia, Poland, Hungary and the Czech Republic (which belong to another or their own category).

[5]This category thus covers immigrants from South America (Paraguay, Brazil and Chile), Asia (Vietnam and the Philippines) as well as Africa (Ghana, Eritrea and Marocco).

the period of the dissolution of socialism and its aftermath, which was characterized mainly by the immigration of ethnic Germans from Eastern Europe, asylum seekers and war refugees.

In constructing our dependent variable, log real hourly wages, we use information on individuals' gross monthly wages and weekly hours of work (contractual working hours if available, otherwise self-reported working hours by the respondents). We take the reported completed years of schooling as the measure of education. In order to disaggregate the years of schooling obtained in the country of origin and in Germany, we follow the procedure of Friedberg (2000), i.e. we assume that children start school at age six and undertake education continuously until they complete their total years of schooling. Since we know the age at which the immigrant arrived in Germany, we can calculate the years of schooling that would have been completed before and after the individuals' migration to Germany. Potential labor market experience is defined as current age minus years of schooling minus 6.

Appendix-Tables A2 and A3 present key descriptive statistics for the samples of males and females, respectively. Immigrants of the pre-1974 cohort represent the largest proportion (44%) of all immigrants in the sample. Immigrants belonging to the regime of family re-unification and of the cohort after the fall of the iron curtain make up equal shares. In general, while natives acquired around 12.2 years of education in Germany, immigrants acquired on average roughly one year less. Exceptions are immigrants from Turkey (10.2 years of total education) and the heterogeneous group of *Others* with 12.6 years of overall education. Immigrants obtained most of their education abroad (8.8 years). Immigrants from Turkey again differ in this respect: They have a lower fraction of education acquired in Turkey as they immigrated to Germany on average at a younger age. The mean immigrant is 20.9 years old at the time of arrival, whereby Turkish immigrants are almost two years younger at the time of arrival. In contrast, migrants from Eastern Europe/fSU and the Ex-Yugoslavia are older at the time of immigration and thus acquired a

higher proportion of education in their home country. For males, total experience differs for Germans (23 years) and migrants (25 years), which is accompanied by the fact that immigrants are slightly older than natives and, as already mentioned, received less education. Around a fourth of the total labor market experience of the immigrants was acquired abroad. Again, immigrants from Eastern Europe/fSU spent a longer time abroad and thus gained a bigger proportion of their experience abroad (more than one third). The same compositional pattern arises for women.

3 General Results

Table 1 shows the pooled OLS estimation results for the full sample of males and females, respectively. Columns (1) and (4) depict the results of estimating equation (1). As expected, schooling and labor market experience affect wages positively. An additional year of schooling is associated with a wage increase of about 8% and an additional year of potential labor market experience of about 1% for both males and females. Male immigrants earn about 23% and female immigrants about 16% less than their native counterparts upon arrival in Germany. This initial wage disadvantage diminishes, albeit modestly, as male immigrants' relative wages on average increase by 0.4% and female immigrant's wages by 0.2% each year after migration, with the latter being not statistically significant at conventional significant levels.

Columns (2) and (5) (equation (2)) of Table 1 decompose the total education of immigrants into education prior- and post-migration, and similarly for experience. The results indicate that the equality of returns to foreign and domestic-source human capital can be rejected for males (see $\gamma_2 = \gamma_3$ and $\gamma_4 = \gamma_5$ of equation (2)). An additional year of schooling in Germany increases their wage by 8.2%, while each year of schooling obtained in another country yields a return of 7.2% on the German labor market. For female immigrants, however, the returns to schooling abroad and in Germany are not significantly different from each other. The returns

to labor market experience abroad are significantly lower than the returns to labor market experience in Germany for both males and females. Experience in the home country is not rewarded at all for females.

The results for the unrestricted model (3) are reported in columns (3) and (6) of Table 1. They suggest that the implicit restrictions on the returns to human capital for natives and immigrants of equation (1) could be rejected, at least for males and most prominently for labor market experience (i.e. $\gamma_5 = \gamma_6 + \gamma_7$). The marginal returns to a year of schooling and labor market experience acquired in Germany are significantly higher than the returns to human capital obtained in the home country. The returns to labor market experience obtained prior to immigration are not statistically significant at all. Overall, these results are in accordance with the existing evidence for the US and Canada (Kossoudji, 1989; Schaafsma & Sweetman, 2001).

The results also show that male immigrants yield lower returns to education undertaken in Germany, with a 2 percentage point discount relative to natives. As indicated by Friedberg (2000), this may be explained by the inadequacy of immigrants' country-specific skills, including a relatively weak command of the German language, which prevents them from extracting full productive benefits from each year of schooling. In contrast, there are no differences in the returns to labor market experience accumulated in Germany between male natives and immigrants, which suggests that immigrants can improve their German language proficiency and acquire more information about domestic institutions and work standards, among others. Note that after controlling for the differences in the returns to foreign and domestic human capital, the initial 23% native-immigrant wage gap found for men not only vanishes. It also turns positive and statistically significant as reported in column (3), which indicates a positive selection of migrants. Results presented in column (6) of Table 1 for females tell a similar story, except that female immigrants gain slightly less (0.3 percentage points) than their native counterparts from one

year of experience in Germany.

Overall, the estimation results reported in Table 1 are consistent with the view of imperfect transferability of human capital across different labor markets. They further show that allowing for imperfect transferability of human capital appears to be able to explain the immigrant-native wage gap at the time of arrival. The results clearly indicate that the standard model used in the literature on the wage assimilation of immigrants is misspecified.

We have checked the reliability of the estimation results in Table 1 in several ways. In order to allow experience (abroad and in Germany) to have a non-linear form and to account for the varying quality of immigration cohorts, we re-estimated the regression models shown in Table 1 and by adding squared terms of the variables measuring labor market experience in Germany and abroad as well as cohort dummies to the estimation equation. In general, the results are qualitatively similar to those presented in Table 1 if we add the respective variables step-wise or completely.

Another potential concern may be that the coefficients for the female sub-sample may be biased because of their selective labor supply decision. We therefore employ a Heckman-selection procedure and re-estimate the specifications presented in Table 1 (columns 4-6). Overall, if we compare these results to the OLS results of our main analysis, the returns to foreign experience appear to be higher and the decomposition of the origin of human capital explains less of the initial wage gap between foreign and native females. However, foreign labor market experience does not yield significantly positive returns in both tables and if experience abroad is statically significant, the returns are economically small. Even though the results do not perfectly correspond to the estimation results of Table 1, the inclusion of the origin of where human capital was obtained leads to a decrease of the initial wage gap and disappears as well as turns to be positive and significant in column 6.

Further, the results do not change if we relax several of our sample restrictions. First of all, we changed the assumption of a common start schooling age of 6 years

and used data provided by UIS (2010) on the specific start schooling age in each source county. Allowing for country-specific starting age leads to almost identical estimation results, which is not surprising as the age of 6 is the most common age to start compulsory school overall. Second, the results remain unchanged if we include part-time workers in the analysis, too.[6]

4   Heterogeneity in the Returns
to Human Capital

While the above analysis permits the distinction between domestic and foreign human capital, it assumes that foreign human capital across different immigrant groups is rewarded homogenously. Foreign human capital, however, could be valued differently in the German labor market depending on the quality of education or work training in the source country and the transferability of these qualifications to the necessities of the German labor market. Transferability, in turn, depends on how closely the country of origin compares to Germany in terms of economic conditions, educational systems, industrial structure, institutional settings, language, etc. For instance, developed countries are able to devote more resources to their educational systems and, hence, are more likely to have a higher general quality of education. Similarly, developed countries would use more advanced machineries and complex processes that require a different human capital. In this sense, human capital acquired in developed countries is expected to have a higher degree of substitutability with human capital obtained in Germany. To allow for the returns to education and experience to vary across immigrant groups, we estimate equation (2) separately for immigrants from different regions.

The results are shown in Table 2. The estimates for male immigrants, taken as a whole, confirm the findings reported in Table 1. Education obtained in Germany

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[6]The estimation results for all mentioned checks are available upon request from the authors.

receives higher returns than foreign education, and the returns to labor market experience in Germany are higher than the returns to foreign labor market experience. We, nevertheless, find evidence for heterogeneity across regions of origin. With respect to education, we can differentiate between three different cases. First, for OECD migrants, immigrants from Eastern Europe/fSU and Ex-Yugoslavia returns to education obtained abroad are not significantly different to the returns to education obtained in Germany. Second, the returns to foreign and domestic education are statistically different for immigrants from Turkey and the group of *Others*, whereby education obtained in the home countries is associated with smaller returns than education obtained in Germany. These results are in line with the argumentation that first, education is valued differently according to the quality of the education system where it was acquired and second, that the transferability depends on how close the respective educational system is to the German one. Given the general pattern of rankings on the quality of educational systems (for instance UNESCO, 2010) Germany is grouped as one of the leading countries, whereby other OECD countries are on top of those rankings. Eastern European countries are quite comparable in their performance compared to the German case (all of them are classified as "High Education for All Development Index (EDI) countries"), whereby Turkey (classified as "Medium EDI country") shows a remarkable gap.

Further, for males only labor market experience accumulated in high-income OECD countries as well as the country-group of *Others* generates significant positive returns in Germany, while foreign experience obtained elsewhere appears not to be valued at all. On average, we expect the industrial structures and technology to be comparable between Germany and high-income OECD countries. Hence, work experience accumulated in these countries is more easily transferable to the German labor market than labor market experience obtained in other regions. Immigrants from Turkey, East Europe/fSU, and Ex-Yugoslavian countries earn about 0.9-1.5% (Table 2) in wage increment with every year spent in the German labor market. The

returns to foreign and domestic experience of these immigrants differ significantly.

For females, we find that the returns to German education do not statistically differ at conventional significance levels from the returns to education acquired abroad, irrespectively of the region of origin. Similar to what we found for males, only foreign labor market experience of immigrants from high-income OECD receive positive returns in the German labor market (Table 2). All others obtain zero returns.[7]

Table 3 shows the results of estimating equation (2) separately by cohort of arrival. Among male immigrants, those who arrived in Germany in the period 1974-1988 receive slightly higher returns to foreign education than the other immigration cohorts. The gains from one year of education in Germany are comparable across the different arrival cohorts. Again, for labor market experience acquired in the home countries we can reject the null hypothesis on equal returns. In addition, labor market experience acquired at home is not rewarded at all. Immigrants who arrived during the guest-worker regime yield the lowest return to experience in Germany. For females, we find that education markedly influences the wages of the earliest wave of migrants, while in general foreign labor market experience does not appear to translate significantly to an increase in earnings. Overall, it is again only German work experience that matters.

Upon arrival, immigrants may be constrained in their job opportunities and forced to take up low-paying jobs that do not require local-specific skills. Thus, they may not be able to extract the full benefits for the qualifications they have previously obtained in their home countries. However, over time, as they gain these country-specific skills – by e.g. attending school in Germany or on-the-job training – they may be able to find better-paying jobs to which they will be able to apply their pre-migration qualifications more efficiently. Hence, potential complementarities between pre- and post-immigration human capital investments may result in the

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[7]The selective labor supply of women may also play a crucial role when we conduct our analysis for different regions of origin. However, the results from a Heckman-approach similar to the analysis already discussed above, do not differ qualitatively from those presented in Table 2. The results are available upon request.

returns to the pre-migration stock of human capital to increase with human capital investments in the receiving country.

To examine whether there are such complementarities, we estimate equation (2) augmented with variables interacting foreign and domestic human capital. The results of this specification are presented in Table 4. Overall, they show that most of the interaction effects are statistically insignificant both for the males and females. If there are single statistically significant effects, they are economically small in magnitude. This suggests that the returns to foreign human capital do not vary significantly with the accumulation of human capital in Germany.

So far, our analysis assume linearity in the returns to schooling. That is, each year of schooling earns the same returns irrespective of whether it was at the primary, secondary, university or post-graduate level. However, if returns to schooling are decreasing over levels, then the returns to German education of immigrants may be biased downwards. To investigate this potential bias, we split education into three levels, namely: Primary (1-9 years of schooling), Secondary (10-13 years of schooling) and University or post-secondary (14 and more years of schooling). To investigate the returns to education at different schooling levels, we estimate a piecewise linear function using the mentioned educational levels as knots, i.e. we estimate the model:

$$
\begin{aligned}
w_{it} = & \ \gamma_0 + \gamma_1 I_i + \gamma_2(S_{it}^f \times I_i) + \gamma_3[((S_{it}^f \times I_i) - S(9)) * d_9] \\
& + \gamma_4[((S_{it}^f \times I_i) - S(13)) * d_{13}] \\
& + \gamma_5 S_{it}^d + \gamma_6[(S_{it}^d - S(9)) * d_9] + \gamma_7[(S_{it}^d - S(13)) * d_{13}] \\
& + \gamma_8(EXP_{it}^f \times I_i) + \gamma_9 EXP_{it}^d + \gamma'_{10} X_{it} + \varepsilon_{i,t},
\end{aligned}
$$

where $S(9)$ and $S(13)$ are structural breaks at 9 and 13 years of schooling, respectively, and d_9 and d_{13} are the respective break dummies.

Table 5 shows that there are indeed non-linearities in the returns to education. For natives, primary education does not generate significant returns, while an ad-

ditional year of secondary education increases wages by 10.4% (11.1%) for males (females) and university education by 7.2% (6.9%). For immigrants, university education has the highest returns. In general, primary education, regardless from where it was obtained - yields only modest returns, whereby male immigrants form East Europe/fSU as well as female immigrants from Turkey and Ex-Yugoslavia are the exceptions from this finding. For these groups primary education yields positive and significant returns. Concerning secondary education, with the exception of male immigrants from former Yugoslavia, migrants receive positive returns to education acquired abroad. Immigrants, who originated from Turkey and Ex-Yugoslavia gain more from secondary schooling spent in Germany. University education obtained abroad generates positive returns, which are in general, however, lower than for university education obtained in Germany. This could indicate that the skills incorporated at low levels of education are quite transferable across different labor markets. However, this portability decreases with higher schooling levels.

5   Conclusion

This paper examines whether the returns to human capital differ for natives and immigrants, and whether they depend on where the qualifications were acquired. Human capital obtained from the origin country may not be equivalent to those obtained in the host country due to limited transferability of skills and imperfect compatibility of home and host country labor markets. The returns to domestic human capital may differ for natives and immigrants depending on who derives compound benefits from each year of human capital. For instance, immigrants may yield higher returns to German labor market experience because each year of work experience does not only allow them to gain occupational skills but also gain language proficiency and local knowledge.

We find that, for immigrants taken as a whole, foreign schooling is valued lower

in the German labor market than domestic schooling. Remarkably, foreign labor market experience yields virtually zero returns. The returns to schooling obtained in Germany also appear to be lower for immigrants if compared to natives, at least for males. Our results further indicate that the wage differential between natives and immigrants upon arrivial of the immigrants can be explained by the lower value attached to immigrants' foreign human capital.

We further find evidence for substantial heterogeneity across immigrant groups. In particular, immigrants from high-income countries tend to earn higher returns to their foreign human capital than the other groups. This lends support to the importance of compatibility of the immigrants' home and host countries for the transferability of human capital.

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Tables

Table 1

Returns to Human Capital: Foreign versus Domestically-acquired Skills

	MALES			FEMALES		
	(1)	(2)	(3)	(4)	(5)	(6)
Immigrant	-0.2306***	-0.0004	0.1907***	-0.1570***	-0.0130	0.2698**
	(0.0223)	(0.0263)	(0.0711)	(0.0337)	(0.0345)	(0.1090)
Education	0.0819***	...	...	0.0844***	...	...
	(0.0017)			(0.0026)		
Education abroad	...	0.0720***	0.0590***	...	0.0776***	0.0644***
		(0.0035)	(0.0058)		(0.0047)	(0.0078)
Education in Germany	...	0.0822***	0.0845***	...	0.0827***	0.0850***
		(0.0016)	(0.0017)		(0.0027)	(0.0027)
Education Germany x Immig	...	...	-0.0203***	...	...	-0.0208**
			(0.0058)			(0.0081)
Total Experience	0.0099***	...	...	0.0110***	...	...
	(0.0004)			(0.0005)		
Experience abroad/100	...	0.3161***	0.1282	...	0.1315	-0.2195
		(0.1200)	(0.1333)		(0.1710)	(0.1987)
Experience in Germany	...	0.0106***	0.0106***	...	0.0113***	0.0116***
		(0.0004)	(0.0004)		(0.0005)	(0.0005)
Experience Germany x Immig	...	...	0.0003	...	...	-0.0038**
			(0.0012)			(0.0016)
Years since Migration	0.0043***	...	...	0.0020	...	...
	(0.0010)			(0.0014)		
Constant	0.9821***	0.9641***	0.9358***	0.7155***	0.7337***	0.6995***
	(0.0237)	(0.0233)	(0.0239)	(0.0382)	(0.0404)	(0.0406)
R-squared	0.498	0.499	0.500	0.495	0.494	0.496
Observations	75708	75784	75784	34432	34461	34461
$\gamma_2 = \gamma_3$		0.001			0.185	
$\gamma_4 = \gamma_5$		0.000			0.000	
$\gamma_2 = \gamma_3 + \gamma_4$			0.085			0.955
$\gamma_5 = \gamma_6 + \gamma_7$			0.000			0.000

Notes: * (**, ***) Significant at 10% (5%, 1%). Weighted OLS using weights provided by the SOEP. Standard errors, which are reported in parentheses, are adjusted in order to take repeated observations on the same worker into account. The regression further includes information on the individual's marital status and number of children, and dummies for state of residence, industry of employment and year of observation. Tests are adjusted for the re-scaling of variable Experience abroad/100. Education abroad and Experience abroad are 0 for natives by definition.

Table 2: Returns to Human Capital, by Region of Origin

| | | MALES | | | | | |
| | | All | | | East Europe/ | Ex- | |
	Natives	Immigrants	OECD	Turkey	fSU	Yugoslavia	Others
Education abroad	...	0.059***	0.071***	0.028***	0.052***	0.034***	0.039***
		(0.006)	(0.010)	(0.009)	(0.008)	(0.007)	(0.013)
Education in Germany	0.085***	0.064***	0.066***	0.043***	0.058***	0.034***	0.076***
	(0.002)	(0.006)	(0.010)	(0.010)	(0.008)	(0.009)	(0.014)
Experience abroad/100	...	0.020	0.815***	-0.268	-0.283*	-0.962***	1.221**
		(0.131)	(0.211)	(0.207)	(0.146)	(0.229)	(0.495)
Experience in Germany	0.011***	0.011***	0.006***	0.012***	0.015***	0.009***	0.013***
	(0.000)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)
R-squared	0.509	0.411	0.536	0.479	0.432	0.461	0.524
Observations	59978	15806	5388	4497	2969	2534	418
$\gamma_2 = \gamma_3$		0.114	0.272	0.000	0.133	0.971	0.000
$\gamma_4 = \gamma_5$		0.000	0.406	0.000	0.000	0.000	0.948

Notes: * (**, ***) Significant at 10% (5%, 1%). The OECD category excludes Turkey and other non-high income member nations while East Europe excludes countries from former Yugoslavia. See further notes in Table 1 A

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Table 2 continued: Returns to Human Capital, by Region of Origin

				FEMALES			
	Natives	All Immigrants	OECD	Turkey	East Europe/ fSU	Ex- Yugoslavia	Others
Education abroad	...	0.063***	0.098***	0.056***	0.042***	0.069***	0.046**
		(0.008)	(0.010)	(0.014)	(0.012)	(0.015)	(0.018)
Education in Germany	0.085***	0.063***	0.100***	0.059***	0.047***	0.061***	0.047**
	(0.003)	(0.009)	(0.011)	(0.013)	(0.014)	(0.016)	(0.020)
Experience abroad/100	...	-0.184	0.677***	-0.126	-0.407	0.357	0.070
		(0.206)	(0.231)	(0.288)	(0.348)	(0.333)	(0.571)
Experience in Germany	0.012***	0.009***	0.013***	0.011***	0.012***	0.007*	0.004
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)
R-squared	0.500	0.449	0.638	0.596	0.395	0.461	0.658
Observations	27901	6560	2180	1198	1553	1455	174
$\gamma_2 = \gamma_3$		0.952	0.658	0.518	0.399	0.578	0.895
$\gamma_4 = \gamma_5$		0.000	0.015	0.015	0.000	0.396	0.503

Notes: * (**, ***) Significant at 10% (5%, 1%). The OECD category excludes Turkey and other non-high income member nations while East Europe excludes countries from former Yugoslavia. See further notes in Table 1 A

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Table 3

Returns to Human Capital, by Immigration Cohort

	MALES				FEMALES			
	Immigrants	Pre-1974	1974-1988	1989-2012	Immigrants	Pre-1974	1974-1988	1989-2012
Education abroad	0.058***	0.049***	0.058***	0.051***	0.061***	0.085***	0.054***	0.032***
	(0.006)	(0.010)	(0.007)	(0.008)	(0.009)	(0.012)	(0.011)	(0.010)
Education in Germany	0.062***	0.058***	0.057***	0.052***	0.062***	0.078***	0.037***	0.044***
	(0.005)	(0.009)	(0.009)	(0.010)	(0.009)	(0.012)	(0.014)	(0.011)
Experience abroad/100	0.010	-0.078	-0.092	-0.205	-0.192	0.322	0.189	-0.930***
	(0.134)	(0.170)	(0.231)	(0.168)	(0.209)	(0.230)	(0.266)	(0.321)
Experience in Germany	0.011***	0.010***	0.014***	0.017***	0.009***	0.003	-0.004	0.024***
	(0.001)	(0.003)	(0.004)	(0.005)	(0.002)	(0.004)	(0.005)	(0.006)
R-squared	0.417	0.538	0.457	0.361	0.454	0.564	0.585	0.335
Observations	15806	8826	3932	3048	6560	3614	1841	1105
$\gamma_2 = \gamma_3$	0.131	0.096	0.957	0.913	0.787	0.377	0.009	0.078
$\gamma_4 = \gamma_5$	0.000	0.004	0.002	0.000	0.000	0.970	0.207	0.000

Notes: * (**, ***) Significant at 10% (5%, 1%). See further notes in Table 1. Besides the control variables listed in the preceding tables, here region of origin dummies are included additionally (Group *Others* as reference.)

Table 4:

Complementarity of Foreign and Domestic Human Capital by Region of Origin

		MALES				
	All Immigrants	OECD	Turkey	East Europe fSU	Ex-Yugoslavia	Others
Education abroad	0.0546***	0.0775***	0.0299***	0.0444***	0.0238**	0.0272**
	(0.0069)	(0.0104)	(0.0106)	(0.0103)	(0.0111)	(0.0129)
Education in Germany	0.0608***	0.0667***	0.0406***	0.0560***	0.0324***	0.0655***
	(0.0061)	(0.0104)	(0.0097)	(0.0076)	(0.0088)	(0.0158)
Experience abroad/100	0.3734	0.3498	1.4472***	-0.0053	-0.0960	3.0418***
	(0.2540)	(0.3766)	(0.4708)	(0.2740)	(0.5177)	(0.8133)
Experience in Germany	0.0109***	0.0073*	0.0181***	0.0121***	0.0060	0.0120
	(0.0030)	(0.0042)	(0.0039)	(0.0036)	(0.0045)	(0.0078)
Educ abroad x Educ Germany	0.0018**	-0.0008	0.0014	0.0017	0.0027*	0.0042*
	(0.0009)	(0.0022)	(0.0012)	(0.0015)	(0.0016)	(0.0022)
Educ abroad x Exp Germany	0.0001	-0.0003	-0.0003	0.0004	0.0006	0.0004
	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0006)
Exp abroad /100 x Exp Germany	-0.0185	0.0253	-0.0881***	-0.0168	-0.0422*	-0.1197**
	(0.0150)	(0.0214)	(0.0270)	(0.0215)	(0.0249)	(0.0494)
R-squared	0.414	0.537	0.489	0.437	0.468	0.559
Observations	15806	5388	4497	2969	2534	418

Table 4 continued:

Complementarity of Foreign and Domestic Human Capital by Region of Origin

	FEMALES					
	All Immigrants	OECD	Turkey	East Europe/ fSU	Ex-Yugoslavia	Others
Education abroad	0.0525***	0.0923***	0.0515***	0.0196	0.0783***	0.0466**
	(0.0118)	(0.0109)	(0.0147)	(0.0172)	(0.0223)	(0.0197)
Education in Germany	0.0621***	0.0950***	0.0583***	0.0459***	0.0576***	0.0419**
	(0.0087)	(0.0105)	(0.0123)	(0.0122)	(0.0185)	(0.0208)
Experience abroad/100	-0.3239	0.8193	0.0041	-1.1747*	1.2483*	0.8008
	(0.4088)	(0.5277)	(0.7676)	(0.6231)	(0.6666)	(1.0061)
Experience in Germany	0.0038	0.0116**	0.0095**	-0.0018	0.0155**	0.0075
	(0.0041)	(0.0050)	(0.0046)	(0.0058)	(0.0071)	(0.0054)
Educ abroad x Educ Germany	0.0006	0.0032	-0.0025	-0.0008	0.0016	0.0012
	(0.0011)	(0.0022)	(0.0019)	(0.0013)	(0.0027)	(0.0036)
Educ abroad x Exp Germany	0.0006	0.0001	0.0002	0.0013**	-0.0007	-0.0003
	(0.0004)	(0.0005)	(0.0005)	(0.0006)	(0.0007)	(0.0007)
Exp abroad /100 x Exp Germany	0.0157	-0.0046	-0.0134	0.0763*	-0.0548*	-0.0683
	(0.0218)	(0.0299)	(0.0378)	(0.0410)	(0.0305)	(0.0721)
R-squared	0.454	0.642	0.599	0.422	0.470	0.664
Observations	6560	2180	1198	1553	1455	174

Notes: * (**, ***) Significant at 10% (5%, 1%). See further notes in Table 1.

Table 5:

Returns to Schooling by Level and Region of Origin

			MALES				
	Natives	Immigrants	All OECD	Turkey	East Europe/ fSU	Ex- Yugoslavia	Others
Experience abroad/100	...	-0.0811	0.5941***	-0.4722**	-0.3230**	-0.9792***	1.4818***
		(0.1200)	(0.2105)	(0.2372)	(0.1406)	(0.2299)	(0.4835)
Experience in Germany	0.0108***	0.0107***	0.0058***	0.0112***	0.0150***	0.0089***	0.0151***
	(0.0004)	(0.0011)	(0.0020)	(0.0017)	(0.0017)	(0.0017)	(0.0036)
Primary School Germany	0.0304	0.0252*	0.0257	0.0147	0.0958*	-0.0130	0.0347
	(0.0253)	(0.0140)	(0.0209)	(0.0284)	(0.0544)	(0.0211)	(0.1225)
Primary School abroad	...	0.0210	0.0261	0.0046	0.0906*	0.0030	-0.0289
		(0.0135)	(0.0192)	(0.0275)	(0.0538)	(0.0213)	(0.1176)
Upper Secondary Germany	0.1042***	0.0275*	0.0063	0.0347*	0.0214	0.0953***	-0.0099
	(0.0051)	(0.0152)	(0.0315)	(0.0208)	(0.0199)	(0.0259)	(0.0656)
Upper Secondary abroad	...	0.0334***	0.0426*	0.0118	0.0412***	0.0357**	0.0796**
		(0.0099)	(0.0245)	(0.0107)	(0.0122)	(0.0141)	(0.0345)
University Germany	0.0728***	0.1177***	0.1219***	0.0782***	0.1375***	0.0481	0.1385***
	(0.0035)	(0.0130)	(0.0251)	(0.0143)	(0.0223)	(0.1385)	(0.0402)
University abroad	...	0.1109***	0.1203***	0.0422	0.0704***	0.0461***	0.0247
		(0.0188)	(0.0243)	(0.0651)	(0.0162)	(0.0148)	(0.0476)
R-squared	0.511	0.437	0.559	0.475	0.470	0.473	0.577
Observations	59978	15806	5388	4497	2969	2534	418

Table 5 continued:

Returns to Schooling by Level and Region of Origin

				FEMALES			
	Natives	Immigrants	All OECD	Turkey	East Europe/ fSU	Ex- Yugoslavia	Others
Experience abroad/100	...	-0.0923	0.4123*	-0.0174	-0.1622	0.3339	0.0076
		(0.1711)	(0.2376)	(0.2577)	(0.3026)	(0.3363)	(0.5614)
Experience in Germany	0.0120***	0.0101***	0.0126***	0.0132***	0.0139***	0.0072*	0.0044
	(0.0005)	(0.0014)	(0.0021)	(0.0029)	(0.0022)	(0.0037)	(0.0034)
Primary School Germany	0.0068	0.0325**	0.0167	0.0601**	0.0008	0.0626**	0.0245
	(0.0493)	(0.0155)	(0.0227)	(0.0245)	(0.0509)	(0.0314)	(0.0770)
Primary School abroad	...	0.0306**	0.0145	0.0417*	-0.0080	0.0595**	0.0243
		(0.0147)	(0.0205)	(0.0235)	(0.0495)	(0.0256)	(0.0807)
Upper Secondary Germany	0.1109***	0.0657***	0.0682**	0.0415*	0.0684***	0.0255	0.0748**
	(0.0067)	(0.0152)	(0.0341)	(0.0212)	(0.0223)	(0.0485)	(0.0347)
Upper Secondary abroad	...	0.0748***	0.1142***	0.1291***	0.0680***	0.0725***	0.0377
		(0.0104)	(0.0161)	(0.0254)	(0.0167)	(0.0218)	(0.0350)
University Germany	0.0699***	0.0983***	0.1635***	0.0504*	0.0640***	0.1249***	0.0041
	(0.0050)	(0.0185)	(0.0325)	(0.0287)	(0.0144)	(0.0413)	(0.0855)
University abroad	...	0.0766***	0.0669***	-0.0389	0.0460*	0.1408	0.1144
		(0.0197)	(0.0228)	(0.0642)	(0.0260)	(0.2709)	(0.0824)
R-squared	0.502	0.477	0.655	0.615	0.423	0.466	0.691
Observations	27901	6560	2180	1198	1553	1455	174

Notes: * (**, ***) Significant at 10% (5%, 1%). See further notes in Table 1. Education categories: *Primary* (years 1-9), *Secondary* (years 10-13) and *University* or post-secondary (years 14+). See further notes in Table 1.

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Appendix

DEFINITION OF VARIABLES

Variable	Description
Immigrant	Dummy-variable that takes the value 1 if the respondent is born outside Germany and immigrated after 1948
Log wages	Real hourly labor earnings of the individual (in log), includes wages and salary from all employment
Education	Total number of completed years of schooling
Experience	Total number of years of potential labor market experience, computed as current age - years of schooling - 6
Education abroad	Total number of years of schooling completed outside Germany; assumed 0 for natives
Education in Germany	Total number of years of schooling completed in Germany
Experience abroad	Total number of years of experience outside Germany, assumed 0 for natives
Experience in Germany	Total number of years of experience in Germany
YSM	Number of years since migration to Germany
Region of Origin	
OECD	Dummy-variable that takes the value 1 if the respondent was born in an OECD member-state, except in Turkey, a state in Eastern Europe (Poland, Czech Republic, Slovakia and Hungary) or of the former Soviet Union
Turkey	Dummy-variable that takes the value 1 if the respondent was born in Turkey
East Europe/fSU	Dummy-variable that takes the value 1 if the respondent was born in Eastern Europe and/or a state of the former Soviet Union, except from Ex-Yugoslavia
Ex-Yugoslavia	Dummy-variable that takes the value 1 if the respondent was born in an ex-Yugoslavian country
Others	Dummy-variable that takes the value 1 if the respondent was born in a country other than the regions specified above
Education Categories	
Primary	Schooling years 1-9
Secondary	Schooling years 10-13
Higher education	Schooling years 14 and above

Table A2:

DESCRIPTIVE STATISTICS, MALE FULL-TIME WORKERS, 1984-2013

	Natives	Migrants	High Income OECD	Turkey	East Europe/fSU	Ex-Yugoslavia	Others
Age	41.460	42.535	45.471	39.015	41.765	44.307	41.378
	(0.149)	(0.323)	(0.631)	(0.527)	(0.598)	(0.784)	(1.312)
Married	0.635	0.779	0.749	0.858	0.798	0.730	0.617
	(0.007)	(0.014)	(0.027)	(0.017)	(0.024)	(0.048)	(0.076)
Log Hourly Wage	2.673	2.541	2.619	2.437	2.582	2.450	2.584
	(0.006)	(0.013)	(0.032)	(0.018)	(0.020)	(0.020)	(0.068)
Age at Migration	...	20.980	19.182	17.984	24.449	22.539	21.695
		(0.373)	(0.805)	(0.554)	(0.694)	(0.831)	(1.749)
Years since Migration	...	21.562	26.300	21.046	17.316	21.774	19.683
		(0.370)	(0.843)	(0.421)	(0.635)	(0.657)	(1.978)
(I) x Cohort Pre 1974	...	0.439	0.628	0.443	0.151	0.660	0.335
		(0.018)	(0.038)	(0.032)	(0.028)	(0.043)	(0.089)
(I) x Cohort 1974 to 1988	...	0.268	0.246	0.416	0.243	0.092	0.314
		(0.016)	(0.035)	(0.033)	(0.029)	(0.021)	(0.079)
(I) x Cohort After 1989	...	0.294	0.126	0.141	0.606	0.248	0.351
		(0.016)	(0.025)	(0.023)	(0.033)	(0.040)	(0.074)
Education abroad	...	8.801	8.493	7.511	9.842	9.205	9.659
		(0.173)	(0.446)	(0.250)	(0.236)	(0.327)	(0.932)
Education in Germany	12.273	2.355	2.822	2.782	1.835	1.437	3.043
	(0.042)	(0.163)	(0.410)	(0.245)	(0.221)	(0.258)	(1.055)
Experience abroad	...	6.497	5.205	4.850	8.761	7.551	6.104
		(0.258)	(0.477)	(0.338)	(0.575)	(0.602)	(1.129)
Experience in Germany	23.189	18.883	22.951	17.872	15.327	20.115	16.572
	(0.156)	(0.308)	(0.665)	(0.385)	(0.559)	(0.667)	(1.360)
Total Primary	8.989	8.889	8.827	8.843	8.990	8.872	8.951
	(0.002)	(0.011)	(0.027)	(0.027)	(0.005)	(0.028)	(0.027)
Total Secondary	2.460	1.826	1.801	1.322	2.241	1.608	2.579
	(0.019)	(0.051)	(0.124)	(0.080)	(0.074)	(0.097)	(0.216)
Total University	0.824	0.440	0.687	0.128	0.446	0.161	1.171
	(0.026)	(0.059)	(0.158)	(0.045)	(0.068)	(0.109)	(0.326)
Primary Abroad	...	7.274	6.874	6.726	7.860	7.855	7.292
		(0.113)	(0.273)	(0.201)	(0.158)	(0.189)	(0.636)
Secondary Abroad	...	1.280	1.229	0.731	1.720	1.202	1.871
		(0.056)	(0.141)	(0.074)	(0.082)	(0.125)	(0.269)
University Abroad	...	0.246	0.389	0.054	0.261	0.147	0.496
		(0.041)	(0.109)	(0.018)	(0.055)	(0.109)	(0.145)
Observations	59978	15730	5372	4486	2948	2518	406

Notes: Weighted sample using weights provided by the SOEP.

Table A3:

DESCRIPTIVE STATISTICS, FEMALE FULL-TIME WORKERS, 1984-2013

	Natives	Migrants	High Income OECD	Turkey	East Europe/fSU	Ex-Yugoslavia	Others
Age	38.184	41.779	42.391	39.651	40.663	45.023	39.706
	(0.244)	(0.472)	(0.986)	(1.038)	(0.882)	(0.801)	(2.151)
Married	0.351	0.552	0.564	0.591	0.538	0.515	0.611
	(0.010)	(0.025)	(0.047)	(0.062)	(0.039)	(0.063)	(0.089)
Log Hourly Wage	2.435	2.307	2.342	2.145	2.391	2.262	2.267
	(0.009)	(0.016)	(0.036)	(0.032)	(0.028)	(0.033)	(0.052)
Age at Migration	...	19.529	18.753	15.658	22.188	19.142	19.128
		(0.519)	(0.820)	(1.253)	(0.987)	(1.127)	(2.752)
Years since Migration	...	22.257	23.642	24.021	18.475	25.884	20.590
		(0.558)	(1.146)	(0.878)	(0.842)	(1.284)	(2.756)
(I) x Cohort Pre 1974	...	0.451	0.560	0.558	0.178	0.726	0.296
		(0.026)	(0.051)	(0.060)	(0.038)	(0.064)	(0.113)
(I) x Cohort 1974 to 1988	...	0.277	0.247	0.423	0.312	0.165	0.208
		(0.023)	(0.040)	(0.059)	(0.039)	(0.059)	(0.068)
(I) x Cohort After 1989	...	0.272	0.193	0.019	0.510	0.108	0.496
		(0.023)	(0.050)	(0.008)	(0.042)	(0.040)	(0.111)
Education abroad	...	8.251	8.539	6.297	9.213	8.010	7.511
		(0.263)	(0.478)	(0.709)	(0.451)	(0.570)	(1.208)
Education in Germany	12.386	2.893	2.550	3.876	3.118	1.951	3.805
	(0.058)	(0.269)	(0.388)	(0.735)	(0.472)	(0.686)	(1.144)
Experience abroad	...	5.680	4.646	4.103	7.326	5.327	6.021
		(0.327)	(0.554)	(0.600)	(0.648)	(0.669)	(1.866)
Experience in Germany	19.800	18.956	20.656	19.375	15.007	23.735	16.370
	(0.255)	(0.503)	(1.128)	(0.679)	(0.730)	(1.005)	(2.118)
Total Primary	8.994	8.831	8.817	8.626	8.988	8.710	8.957
	(0.002)	(0.030)	(0.033)	(0.087)	(0.005)	(0.116)	(0.029)
Total Secondary	2.569	1.835	1.621	1.259	2.644	1.194	1.891
	(0.027)	(0.082)	(0.175)	(0.237)	(0.108)	(0.176)	(0.276)
Total University	0.823	0.478	0.651	0.289	0.699	0.057	0.469
	(0.037)	(0.057)	(0.152)	(0.132)	(0.101)	(0.023)	(0.165)
Primary Abroad	...	6.876	7.057	5.663	7.121	7.342	6.239
		(0.189)	(0.285)	(0.491)	(0.312)	(0.502)	(0.981)
Secondary Abroad	...	1.101	1.067	0.489	1.703	0.658	0.974
		(0.082)	(0.187)	(0.220)	(0.138)	(0.130)	(0.276)
University Abroad	...	0.274	0.415	0.145	0.389	0.010	0.298
		(0.045)	(0.120)	(0.111)	(0.079)	(0.008)	(0.143)
Observations	27901	6531	2179	1193	1536	1452	171

Notes: Weighted sample using weights provided by the SOEP.