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Does better pre-migration performance accelerate immigrants' wage assimilation?*

Boris Hirsch^a, Elke J. Jahn^b, Ott Toomet^c, and Daniela Hochfellner^d

Abstract: This paper analyzes wage assimilation of ethnic German immigrants to Germany. We use unique administrative data that include a standardized measure of immigrants' pre-migration wage based on occupation, industry, tenure, qualification, and the German wage structure. We find that immigrants experience a substantial initial wage disadvantage compared to natives. During their first 15 years in the host country they manage to close a considerable part of this gap, though assimilation is only partial. A 10% higher pre-migration wage translates into a 1.6% higher wage in Germany when also controlling for educational attainment, thus pointing at partial transferability of human capital acquired in the source country to the host country's labor market. We also find that wage assimilation is significantly accelerated for immigrants with a higher pre-migration wage. Our results are in line with strong complementarities between general skills and host country-specific human capital, in particular proficiency in the host country's language.

JEL-Classification: J61, J31, J24

Keywords: migration, labor market assimilation, ethnic Germans, transferability of human capital

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1 Introduction

Wage assimilation of immigrants has been extensively analyzed since the seminal paper by Chiswick (1978). The initial optimistic results according to which immigrants were closing the gap with natives in 10–15 years, though, have not proven to be robust to including cohort effects (Borjas, 1985, 1995; Antecol *et al.*, 2006), using panel data (Hu, 2000; Lubotsky, 2007), or controlling for selective return migration (Edin *et al.*, 2000; Constant and Massey, 2003). More recent research addressing such concerns generally suggests that the disparity between immigrants' and natives' labor market performance decreases over time since migration. Yet, even after a long stay in the host country immigrants only partially catch up with natives (Dustmann and Glitz, 2011).

The extant literature stresses that a major factor behind incomplete wage assimilation is imperfect transferability of human capital acquired in the source country. In a large number of studies it is found that both education and work experience acquired in the source country are valued less than host country education and experience pointing at immigrants' limited ability to translate pre-migration skills into post-migration earnings (Schoeni, 1997; Eckstein and Weiss, 2004; Ferrer and Riddell, 2008; Basilio and Bauer, 2010). What is more, there is broad empirical evidence showing that human capital transferability is closely related to language skills with immigrants' fluency in the host country's language enhancing their returns to pre-migration human capital (Bratsberg and Ragan, 2002; Chiswick and Miller, 2002, 2003; Sanromá *et al.*, 2009; Haley and Taengnoi, 2011).

This paper contributes to this strand of the literature by focusing on the impact of pre-migration labor market performance on immigrants' wage assimilation. Using unique administrative data, we are able to identify a specific group of Germany's immigration population, so-called ethnic Germans or (*Spät-*)*Aussiedler*. Since ethnic Germans immigrating to Germany are eligible to payments from the German public pension system based on their employment career in the source country, the data set includes a standardized measure of immigrants' pre-migration wage based on occupation, industry, tenure, and qualification, which we use as a proxy of their pre-migration labor market performance. Other than immigrants' pre-migration education or (potential) experience, the pre-migration wage captures their *actual* la-

bor market performance back in the source country, and thus its impact on post-migration wages should be more informative on immigrants' ability to transfer their pre-migration human capital to the host country's labor market. As this standardized wage is used to calculate immigrants' pension payments as if they had spent their whole employment career in Germany, it is based on the German wage structure at that time and thus a superior measure of immigrants' pre-migration performance compared to actual wages earned in the source country under communist rule and the following transformation process. To the best of our knowledge, this is the first study to investigate the impact of pre-migration wages on post-migration ones.

On top of that, our paper complements the existing literature in several ways. First, unlike all previous studies on ethnic Germans (and many on other groups of immigrants), we use a high-quality administrative data set based on the German pension and unemployment insurances. Second, the size of our data set enables us to analyze both differences in the initial wage in Germany and the speed of wage assimilation of immigrants coming from three Central and Eastern European countries – from Poland, Romania, and the former Soviet Union (FSU). Since ethnic Germans immigrating from these countries differ considerably in their German language proficiency and their knowledge on German culture, with those from Romania showing the largest average familiarity and those from the FSU the least, this allows us to investigate human capital transferability depending on prior exposure to the host country's language and culture. Third, the ethnic German population under investigation possesses several attractive properties: As these immigrants are from German ancestry, they were immediately granted full citizen rights and consequently had access to welfare benefits when entering Germany. Existing evidence suggests that ethnic German migration was little selective, with the vast majority of eligible individuals relocating to Germany. Even more, only a negligible number of them have later left Germany, rendering the selection on return migration a non-issue.

Focusing on Germany may be of particular interest as Germany is the third most popular destination for immigrants in the world after the U.S. and Russia (Freeman, 2006). Since the 1950s, about 10.7 million people have settled in Germany. Although the net immigration rate has declined since the beginning of the millennium, in 2011 the share of individuals with foreign citizenship was still about 8.8% while the share with a migration background

amounted to ca. 19.5% (Statistisches Bundesamt, 2012). Among the groups of immigrants arriving in Germany, ethnic Germans stand out as one of the largest with roughly 4.5 million entrants since the 1950s.

Our results show that ethnic German immigrants experience a substantial initial wage penalty when entering the German labor market with significant, though incomplete subsequent wage assimilation relative to natives. Generally, immigrants from Romania show the most favorable assimilation pattern and those from the FSU the least. Immigrants' pre-migration wage is related to both the initial wage in Germany and the speed of wage assimilation thereafter: A higher pre-migration wage is associated with a better initial wage for immigrants from Poland and Romania only, but with faster wage assimilation for immigrants from all source countries. Interestingly, subsequent wage assimilation is fastest for those from the FSU for whom initial wages are not affected by pre-migration performance. Our results suggest that immigrants are able to transfer part of the human capital acquired in the source country, that transferability increases with the time spent in the host country, and that transferability is lagged for those with the lowest average endowment of host country-specific skills upon arrival in Germany. These findings are in line with Chiswick and Miller's (2003) conclusion that host country-specific skills and pre-migration human capital are complements.

The paper proceeds as follows: In Section 2, we give an overview of the historical background of ethnic German immigration to Germany. Section 3 describes the administrative data set used, while Section 4 develops our hypotheses and exposes our econometric approach. Our results are presented and discussed in Section 5, and Section 6 concludes.

2 Historical Background

The immigration of ethnic Germans to Germany goes back to the first years of the young Federal Republic of Germany. As a result of World War II, about 15 million ethnic Germans in the 1937 borders of Germany lived now outside the country, the overwhelming majority of them in the Soviet Union, Poland, and Romania.¹ Since the 1950s, Germany allowed ethnic

¹ Other source countries with very small numbers of ethnic Germans immigrating to Germany are former Czechoslovakia, Hungary, and former Yugoslavia.

Germans to immigrate to the Federal Republic as German citizens. After proving their German origin they could enter Germany and receive both a German passport and full citizenship rights. In case they did not find a job or another source of income immediately upon arrival, which applied to the vast majority of them, they were also eligible for free vocational training, language courses, social assistance, and unemployment benefits. Moreover, they were eligible for payments from the German public pension system based on their employment career in the source country (for details, see Bauer and Zimmermann, 1997, Münz and Ohlinger, 1998, or Münz, 2003).

Most ethnic Germans who immigrated to Germany up to the beginning of the 1990s had maintained their German culture and possessed relatively good proficiency in German. This holds particularly for ethnic Germans coming from Romania and, to a somewhat lesser degree, for those from Poland (Roll, 2003; Wolff and Cordell, 2003), who form the vast majority of ethnic German immigrants before the fall of the Iron Curtain. As one may expect, existing studies find that these early cohorts of ethnic German immigrants achieved virtual parity with native-borns in terms of wages (Schmidt, 1997). However, the link to German culture and German language proficiency of those entering Germany later, the bulk of them emigrating from the FSU, is considerably more limited (Roll, 2003; Ihrig, 2005). Consequently, they often face similar integration problems as foreign immigrants and are confronted with a lack of acceptance in the host society. Although most ethnic Germans are well educated and possess a long employment history in their source country, they often seem to be unable to transfer all their professional skills to the new labor market and are more likely to be unemployed than comparable native Germans (Bauer and Zimmermann, 1997).

Between 1950 and 2010 about 4.5 million ethnic Germans immigrated to Germany. As Figure 1 shows, the surge of immigrants came in two waves. The first wave, during the period 1950–1987, comprised 1.4 million ethnic Germans, most of them emigrating from Poland (60%), Romania (15%), and the Soviet Union (8%). After the construction of the Berlin Wall this influx dropped markedly. At the end of the Cold War when travel restrictions were relaxed, immigration swelled again. Between 1988 and 2010 about 3.1 million ethnic Germans moved to West Germany. In this second wave of ethnic German immigration, the majority of ethnic Germans came from the

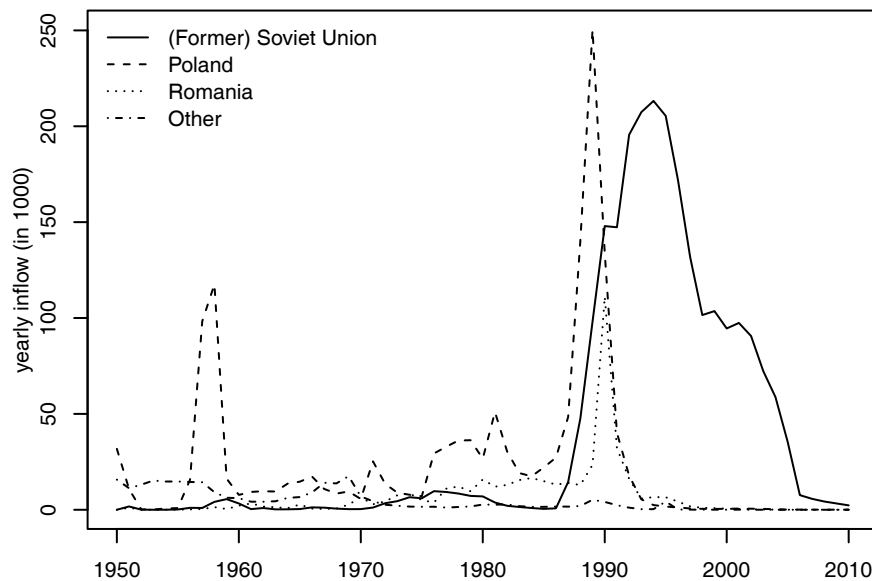


Figure 1: Immigration of ethnic Germans to Germany, 1950–2010 (source: Bund der Vertriebenen, 2012)

(former) Soviet Union (70%), Poland (21%), and Romania (8%) (see Bund der Vertriebenen, 2012).

In general, emigration of ethnic Germans was so widespread that the vast majority of them left the sending countries. Until 1999, about 1.4 million ethnic Germans emigrated from Poland, leaving behind an ethnic German minority of just 300,000–500,000 people (Wolff and Cordell, 2003). Apart from the shrinking ethnic German community, the decreasing influx from Poland after the Cold War is also related to the fast transformation of that country from a centrally planned to a market economy. The decrease of immigration from Romania after 1992 is merely a consequence of the small size of the remaining ethnic German community there, with 430,000 ethnic Germans leaving Romania since the 1950s. Between 1967 and 1989 the German government “ransomed” about 225,000 ethnic Germans from Romania and spent for that reason roughly one billion Deutsche Mark (Münz and Ohlinger, 1998). During the first six months after the Romanian revolution in 1989, another 111,000 ethnic Germans left the country. As a result, the remaining ethnic German community in Romania in 1999 is estimated to only 60,000 people mainly consisting of elderly people unwilling to move

(Münz, 2003). Turning to the FSU, in 1999 the number of remaining ethnic Germans was estimated as 500,000–1,000,000 (Münz, 2003). Since then, another 472,000 ethnic Germans emigrated to Germany, so that the remaining ethnic German community consists of no more than 500,000 people. As a consequence, we do not think selective emigration to play much a role for ethnic Germans. What is more, due to the German roots of ethnic Germans and the political and economic situation in the source countries return migration of ethnic Germans is negligible (Schönhut, 2008; Kuhlenkasper and Steinhardt, 2012), rendering selective return migration a non-issue for ethnic German immigrants.

3 Data

3.1 The BASiD Data Set

Since ethnic German immigrants receive the German citizenship immediately upon arrival, they are not identifiable in many of the widely used data sets. As a consequence, previous analyses of this group of immigrants have typically relied on surveys and suffered from small samples.² In contrast, our empirical analysis is based on BASiD, a new administrative data set provided by the Institute for Employment Research (IAB) of the German Federal Employment Agency. BASiD combines longitudinal information from three administrative sources: The baseline data set is a 1% sample of all individuals aged between 15 and 67 years living in Germany as of December 31, 2007 who contributed to the pension insurance in 2007. As the pension insurance is mandatory for most workers (notable exceptions are self-employed and civil servants), more than 90% of the German population are registered with the public pension system (Himmelreicher and Stegmann, 2008).

The BASiD data set contains all activities of a person, including schooling and training spells, that are relevant to calculate pension entitlements. A special pension agreement grants ethnic German immigrants, who have spent a considerable part of their working life outside Germany, pension

² For instance, Schmidt (1997) observes 195 ethnic German men in the ALLBUS survey, while Haberfeld *et al.* (2011) base their inference on a survey of 707 men (and 801 women).

rights out of the public German pension scheme based on their education and employment career in the source country. Specifically, the German pension system treats schooling and professional experience in the source country in exactly the same way as if ethnic Germans had been educated or working in Germany at that time. This enables us to identify all ethnic Germans and their country of origin provided they have spent at least three years in the education system of the source country. Moreover, as ethnic Germans have to prove their education and employment career, information on pre-migration employment in the data is highly reliable.³

In order to calculate pension entitlements, a wage is assigned to every employment spell in the source country according to the Act on Foreign Pensions (*Fremdrentengesetz*) taking into account the job’s qualification structure and industry, the individual’s sex, and the year of the spell, resulting in 60,832 different wage cells. The wage assigned to a job is based on the gross average wage of the German population working in similar jobs, and thus tells us what an ethnic German would have earned on average if the job had been in Germany. Hence, we observe a “standardized” pre-migration wage, based on occupation, industry, previous qualifications, and the German wage structure at that time. Other than the actual pre-migration wage stemming from the compressed wage structure of the source country under communist rule and the following transformation process, this “standardized” wage provides us with a measure of pre-migration labor market performance that eliminates interferences arising from the source country wage structure. We therefore consider it as especially well-suited for investigating the transferability of human capital acquired in the source country to the host country’s labor market.

This baseline data set is merged with the Integrated Employment Biography and the Establishment History Panel. Both cover the period 1975–2009. The Integrated Employment Biography contains information on employment spells subject to social security contributions, unemployment periods, and socio-economic as well as job characteristics at the individual level. The Establishment History Panel includes numerous workplace characteristics like plant size, workforce composition, and industry (for details see Spengler,

³ However, the pension system only acknowledges three years of source country education at maximum. Consequently, we are not able to identify whether the education observed after migration was obtained in the source or host country.

2009 and Hochfellner *et al.*, 2011). Moreover, the merged data set provides information on the date when the immigrant has entered Germany which allows us to calculate the years spent in the host country since migration. As we additionally know both the exact dates when the last job in the source country ended and when the worker accepted the first job in Germany, we are also able to calculate the time the worker has not been employed while migrating to Germany, which we term the immigrant’s employment gap.

The combination of these three data sources makes the BASiD data set especially useful for income-related analyses. Data are based on the notification procedure of the German social insurances that requires all employers to report information on their employees for the period they have been employed, but at least once at the end of a year. Since the wage information included is used to calculate social security contributions, the data are highly reliable. That said, they do not include detailed information on the number of hours worked, and reported gross daily wages are top-coded at the social security contribution, which affects 23.8% of our observations. To address the first shortcoming, we restrict our analysis to full-time employees. To cope with the second, we impute wages above the social security ceiling using a heteroskedastic single imputation approach developed by Büttner and Rässler (2008) for the data. Finally, in our data set information on workers’ education is provided by employers. As a consequence, education is missing for 7.7% of all observations in the data set. To alleviate this problem, we impute the missing information on education by employing a procedure proposed by Fitzenberger *et al.* (2006) that allows inconsistent education information to be corrected. After applying this procedure only 0.6% of our observations are dropped due to missing or inconsistent information on education.

3.2 Sample Selection and Descriptive Statistics

To investigate wage assimilation of ethnic Germans, we made the following sample selection decisions: First of all, we will focus our analysis throughout on full-time employed individuals in West Germany (excluding Berlin) during the period 1980–2007. Although the BASiD data set contains observations for East German workers from 1992 onwards, restricting our analysis to the post-unification period would markedly reduce our period of obser-

vation and thus the scope of our investigation. It would also add only few observations for ethnic German immigrants as the number of ethnic Germans entering through East Germany is rather small (see, e.g., Glitz, 2012*b*). Moreover, we focus on ethnic Germans emigrating from Poland (PL), Romania (RO), and the former Soviet Union (FSU), which are the three largest source countries sending 99.0% of ethnic German immigrants in our period of observation. Since our focus lies on the assimilation of ethnic Germans and we are missing immigration-related information, such as date of entry and pre-migration wages, for other groups of immigrants, we exclude all individuals without German citizenship who are likely to be immigrants from other source countries.⁴ As there is some empirical evidence on differences in the early retirement behavior between natives and immigrants (Bonin *et al.*, 2000) and to ensure that immigrants had some employment experience in the source country, we further restrict our analysis to individuals aged 21–55 years upon arrival in Germany. This decision also renders it likely that the education observed was attained in the source country. Due to selection issues regarding female (immigrant) employment, we focus on male workers. Our final sample comprises 97,194 native and 2,247 ethnic German men, 859 of whom emigrating from Poland, 263 from Romania, and 1,125 from the FSU, where slightly more than 70% of the ethnic Germans in our sample are observed for more than 10 years.

Table 1 provides descriptive information for the most important variables used in our analysis. Averages are taken over the observed person-years (hence, the number of observations reported in Table 1 is far larger than the number of individuals) and are split into four groups: natives and ethnic Germans from the three different source countries. As can be clearly seen from the first three rows of the table, natives earn higher gross daily wages than most of the immigrant groups. The only exception are ethnic Germans from Romania with at least 10 years of German experience who even earn 5.3% more than natives on average.

Turning to immigrants' pre-migration wages, we find only marginal differences across the three groups pointing at little differences in pre-migration performance for ethnic Germans emigrating from different sending countries. Only for ethnic Germans from the FSU, pre-migration wages are somewhat

⁴ To mitigate possible effects of naturalization, we classify all individuals as immigrants who are reported as foreign citizens in their first observation available.

Table 1: Selected descriptive statistics (averages over person-years)

	Natives	Ethnic Germans from		
		Poland	Romania	FSU
Daily gross wage w (€)	102.30	90.66	98.01	78.79
Daily gross wage w (€) at $YSM < 10$	—	84.74	89.37	75.38
Daily gross wage w (€) at $YSM \geq 10$	—	96.28	107.71	84.73
Last wage in source country w^S (€)	—	74.51	74.04	71.90
w with below-average w^S	—	85.33	88.32	76.95
w with above-average w^S	—	97.03	113.86	81.38
w with below-average w^S at $YSM < 10$	—	80.40	82.20	73.99
w with below-average w^S at $YSM \geq 10$	—	90.02	95.08	81.93
w with above-average w^S at $YSM < 10$	—	89.94	100.87	77.27
w with above-average w^S at $YSM \geq 10$	—	103.72	128.83	88.93
Age (years)	35.48	40.58	41.30	41.40
Age at entry (years)	—	31.25	32.75	34.20
Cohort 1980–1987 (dummy)	—	0.44	0.40	0.04
Cohort 1988–1995 (dummy)	—	0.56	0.59	0.86
Cohort 1996–2007 (dummy)	—	0.00	0.00	0.11
Low-skilled (dummy)	0.10	0.16	0.14	0.33
Medium-skilled (dummy)	0.77	0.77	0.70	0.63
High-skilled (dummy)	0.13	0.07	0.16	0.04
Years since migration (YSM)	—	10.17	9.41	8.04
Employment gap (years)	—	1.68	0.91	1.35
Plant size	1,671.45	1,853.00	2,662.08	837.07
Share of foreigners in the workforce	0.08	0.14	0.12	0.09
Metropolitan region (dummy)	0.60	0.65	0.53	0.44
Urban region (dummy)	0.31	0.27	0.34	0.47
Rural region (dummy)	0.09	0.08	0.13	0.09
Regional unemployment rate (in %)	8.96	9.62	7.25	8.66
Observations	1,134,558	12,390	3,710	11,822
Individuals	97,194	859	263	1,125

Notes: The data set used is BASiD, 1980–2007. Low-skilled individuals are those with neither apprenticeship nor academic education, medium-skilled those with an apprenticeship, and high-skilled those with an academic education.

lower on average. Interestingly, average post-migration wages are considerably larger for immigrants who earned above-average wages back in the source country compared to those with below-average pre-migration wages. What is more, the gap between the average wage of immigrants with ten or more years experience in Germany and the average wage of those with less is more pronounced for immigrants with above-average pre-migration wages. Thus, immigrants with higher pre-migration labor market performance show a stronger average increase in wages as they spend time in the host country.

Turning to the other characteristics, the average age at entry is 30–35

years for all immigrant groups, and most arrived during the period 1988–1995. In line with the numbers from Section 2, ethnic Germans from Romania and Poland to a higher degree immigrated to Germany before the fall of the Iron Curtain than those from the FSU. Interestingly, ethnic Germans do not seem to differ much from natives in terms of qualifications.⁵ The notable exception are immigrants from the FSU with a larger share of low-skilled workers, the same group which has the lowest average wage. Furthermore, immigrants from Poland have the longest employment gap associated with the relocation while this gap is lowest for those from Romania. Eventually, we find that ethnic Germans tend to work in larger plants (with the exception of those from the FSU) and in plants employing a higher share of immigrants than natives, pointing at employment segregation. This is in line with findings for other groups of immigrants in Germany (e.g., Glitz, 2012a).

4 Econometric Specification and Hypotheses

Wage assimilation includes a number of relevant dimensions. Potentially, the wage gap between immigrants and natives depends on different time and age-related variables such as the year of immigration (*cohort*), the age at immigration (age^E), the years since migration (*YSM*), the age, and the calendar time (*year*). Clearly, as two of these are related to the others through an identity (i.e. $age^E \equiv age - YSM$ and $cohort \equiv year - YSM$), we need additional information to identify the effects of interest. Below, we follow the traditional approach in the literature and estimate a joint wage equation for immigrants and natives assuming that year effects and age-earnings profiles are common to both groups (see, e.g., Borjas, 1999).

The main outcome of interest – our measure of wage assimilation – is the relationship between *YSM* and ethnic Germans’ wage in the host country. As *YSM* is a proxy for host country-specific human capital, a positive relationship between *YSM* and the wage tells us that ethnic Germans catch up with natives over time as they acquire country-specific skills. In addition, we are interested in the relationship between the pre-migration wage and

⁵ We distinguish three levels of education: low-skilled (i.e. no vocational training), medium-skilled (i.e. with vocational training), and high-skilled workers (i.e. with academic education).

the wage earned in the host country. As the pre-migration wage proxies immigrants' pre-migration labor market performance and thus their human capital acquired in the source country, a positive effect would inform us that at least part of the human capital is transferable to the host country.

Our baseline model for the log gross daily wage of individual i in period t (deflated by the consumer price index) is the following:

$$\begin{aligned} \log w_{it} = & \alpha^A \mathbf{age}_{it} + eger_i [\alpha^{eger} + \alpha^Y \mathbf{YSM}_{it} + \alpha^E \mathbf{age}_i^E + \alpha^C \mathbf{cohort}_i \\ & + \alpha^S \log w_i^S + \alpha^G \mathbf{egap}_i] + \beta \mathbf{X}_{it} + \omega_t + \varepsilon_{it}, \end{aligned} \quad (1)$$

where \mathbf{age} is a vector of six age dummies, $eger$ a dummy marking ethnic German individuals, \mathbf{YSM} a vector of five years since migration dummies, \mathbf{age}^E a vector of six age at entry dummies, \mathbf{cohort} a vector of two cohort dummies, w^S the last wage in the source country, $egap$ the employment gap between the last employment in the source country and the first employment in Germany, ω a year fixed effect, and \mathbf{X} a vector of other individual and plant characteristics.

Note that besides of traditional variables, we include two variables which are unique to our data set: the last wage in the source country as a measure of pre-migration human capital and the employment gap capturing initial problems of finding a job when arriving in the host country. On top of that, we add different sets of control variables including two education and twelve occupation dummies as socio-demographic controls as well as four plant size and 24 sector dummies and the share of immigrant workers in the plant's workforce as plant controls. Finally, all models include nine regional dummies for the federal state the worker is living in, dummies for the size of the regional labor market (i.e. rural, urban, or metropolitan), year dummies, and the unemployment rate at the municipality level.

As discussed in Sections 2 and 3, ethnic Germans are a quite heterogeneous group. Immigrants coming from Poland, Romania, and the FSU not only differ in their average pre-migration exposure to the German culture and their German language proficiency, but also in their average post-migration wage. We thus expect immigrants from different sending countries to show different assimilation profiles. In a second set of models, we therefore further add country of origin interactions with years since migration,

the last wage in the source country, and other migration-related variables:

$$\begin{aligned} \log w_{it} = & \alpha^A \mathbf{age}_{it} + \mathbf{C}_i [\alpha^O + \alpha^{YO} \mathbf{YSM}_{it} + \alpha^{EO} \mathbf{age}_i^E + \alpha^{CO} \mathbf{cohort}_i \\ & + \alpha^{SO} \log w_i^S + \alpha^{GO} \mathbf{egap}_i] + \beta \mathbf{X}_{it} + \omega_t + \varepsilon_{it}, \end{aligned} \quad (2)$$

where \mathbf{C} is a vector of three country of origin dummies. This specification allows us to analyze whether source country differences in assimilation patterns exist.

Finally, assimilation profiles may not be the same for ethnic Germans with different pre-migration labor market performance. To see this, we build upon the ideas by Chiswick and Miller (2003). Suppose immigrants possess two types of productive characteristics: general work skills s proxied by their pre-migration wages and host country-specific human capital H proxied by their years since migration. s comprises capacities like numeric skills, motivation, and reliability that are easily transferable in case of migration, while H includes skills specific to the host country such as language proficiency and knowledge of the host country's labor market institutions. Assume both s and H are used in production and are imperfect substitutes. Figure 2 depicts a family of production isoquants.

Assume for the moment that upon arrival in the host country immigrants do not differ in their country-specific human capital H but in their general skills s . While spending time in the host country, they all gain in H and move up in Figure 2. In the presence of strong enough positive complementarities between general and country-specific skills, high- s immigrants move up the productivity ladder faster than their low- s comrades, that is, the vertical line for high- s immigrants crosses more isoquants than the line for low- s immigrants. Empirically, we thus expect assimilation profiles to be steeper for immigrants with a higher pre-migration wage.

However, as we already emphasized, ethnic Germans immigrating from different source countries are likely to differ in their host country-specific skills depending on previous exposure to German language and culture. And our theoretical considerations imply that initial productivity differences between high- s and low- s immigrants depend on their endowments of country-specific human capital H at migration: For low- H immigrants initial productivity differences should be small (i.e. the isoquants depicted

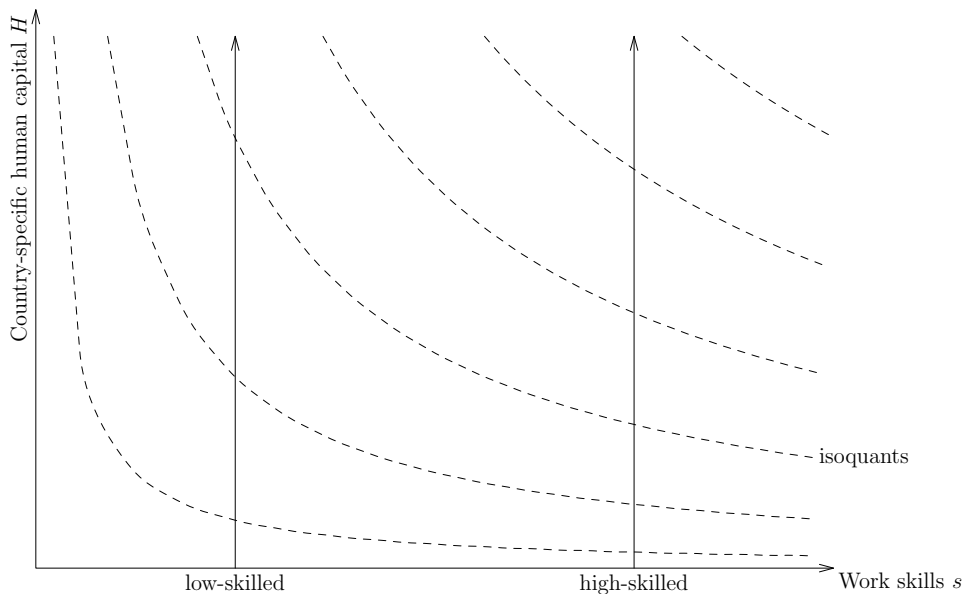


Figure 2: Productivity trends for immigrants depending on general work skills s and host country-specific human capital H .

in Figure 2 are quite flat), while larger initial endowments of H create a larger gap in favor of high- s immigrants (i.e. isoquants become steeper). Empirically, we therefore expect the impact of the pre-migration wage on the initial wage in the host country to be more pronounced for those groups of immigrants with higher average country-specific skills at migration.

To sum up, we expect ethnic Germans' wage assimilation profiles to be steeper the higher is their pre-migration wage and the impact of the pre-migration wage on their post-migration wage just after migration to differ by source country depending on the average pre-migration exposure to German language and culture. Hence, our final set of models additionally includes three-way interactions between years since migration, the pre-migration wage, and the country of origin.

5 Results

5.1 Wage Assimilation of Ethnic Germans

As outlined in the last section, we estimate three sets of models. In our first set of models, we investigate wage assimilation of ethnic Germans and

analyze the robustness of our results by conditioning on different sets of regressors. In particular, we are interested in the robustness of our findings when including the pre-migration wage and the employment gap between the first job in Germany and the last job in the source country. As estimated coefficients of the different sets of control variables are for the most part standard, Table 2 presents only selected coefficients.⁶

All specifications show that ethnic Germans suffer from a wage disadvantage when first entering the German labor market but manage to close a substantial part of this gap over time. For the reference group of ethnic Germans immigrating to Germany during the period 1988–1995 specifications without occupation and plant characteristics (models 1–3) indicate that they initially earn between 20–23 log points less than natives. Including occupation dummies and plant controls (models 4 and 5) lowers the estimate for the initial disadvantage to 13–15 log points, suggesting that nearly a half of it is related to working in less-paying occupations and plants. This is in line with several recent studies stressing the importance of immigrants sorting into low-wage occupations (Weiss *et al.*, 2003; Eckstein and Weiss, 2004; Constant and Massey, 2005) and low-wage firms (Aydemir and Skuterud, 2008; Pendakur and Woodcock, 2010; Barth *et al.*, 2012). In addition, Table 2 indicates a worsening trend across cohorts, with those arriving before 1988 earning 4–11 log points more and those arriving after 1995 8–12 log points less than immigrants entering Germany during the fall of the Iron Curtain and the years immediately thereafter. The disadvantage for later cohorts may partly reflect the large inflow of East Germans to the West German labor market hampering immigrants’ labor market perspectives.

The models shown in Table 2 also reveal that a non-trivial extent of wage assimilation takes place. For those who have spent 15 years or more in Germany wages are on average 8–9 log points higher than for the (omitted) reference group with less than three years since migration. The lower estimated value of 5 log points for the specification including plant characteristics (model 5) suggests that part of the assimilation is achieved by moving to better-paying plants. As the initial wage disadvantage of the 1980–1987 cohort is just 8–12 log points depending on specification, this implies that ethnic Germans immigrating before the fall of the Iron Curtain

⁶ The full set of estimates are available upon request.

Table 2: Wage assimilation profiles of ethnic Germans

	Model 1	Model 2	Model 3	Model 4	Model 5
eger	-0.225*** <i>0.012</i>	-0.233*** <i>0.011</i>	-0.200*** <i>0.011</i>	-0.154*** <i>0.011</i>	-0.128*** <i>0.010</i>
YSM 3–5	0.035*** <i>0.005</i>	0.037*** <i>0.005</i>	0.041*** <i>0.005</i>	0.045*** <i>0.005</i>	0.030*** <i>0.005</i>
YSM 6–8	0.048*** <i>0.006</i>	0.051*** <i>0.006</i>	0.056*** <i>0.006</i>	0.063*** <i>0.006</i>	0.038*** <i>0.006</i>
YSM 9–11	0.063*** <i>0.007</i>	0.066*** <i>0.007</i>	0.072*** <i>0.007</i>	0.078*** <i>0.006</i>	0.046*** <i>0.006</i>
YSM 12–14	0.060*** <i>0.008</i>	0.062*** <i>0.007</i>	0.069*** <i>0.007</i>	0.075*** <i>0.007</i>	0.043*** <i>0.007</i>
YSM ≥ 15	0.086*** <i>0.010</i>	0.086*** <i>0.009</i>	0.093*** <i>0.009</i>	0.093*** <i>0.009</i>	0.054*** <i>0.008</i>
$\log w^S$		0.302*** <i>0.024</i>	0.162*** <i>0.023</i>	0.089*** <i>0.021</i>	0.042** <i>0.019</i>
employment gap		-0.020*** <i>0.004</i>	-0.025*** <i>0.004</i>	-0.027*** <i>0.004</i>	-0.016*** <i>0.004</i>
cohort 1980–1987	0.110*** <i>0.013</i>	0.113*** <i>0.012</i>	0.081*** <i>0.011</i>	0.068*** <i>0.010</i>	0.044*** <i>0.009</i>
cohort 1996–2007	-0.116*** <i>0.018</i>	-0.104*** <i>0.018</i>	-0.090*** <i>0.017</i>	-0.091*** <i>0.017</i>	-0.078*** <i>0.015</i>
age ^E 21–25	0.023 <i>0.017</i>	0.046*** <i>0.016</i>	0.046*** <i>0.014</i>	0.047*** <i>0.014</i>	0.039*** <i>0.012</i>
age ^E 31–35	-0.081*** <i>0.014</i>	-0.079*** <i>0.013</i>	-0.073*** <i>0.012</i>	-0.063*** <i>0.011</i>	-0.047*** <i>0.010</i>
age ^E 36–40	-0.125*** <i>0.016</i>	-0.130*** <i>0.015</i>	-0.134*** <i>0.013</i>	-0.120*** <i>0.013</i>	-0.090*** <i>0.012</i>
age ^E 41–45	-0.195*** <i>0.016</i>	-0.207*** <i>0.016</i>	-0.210*** <i>0.015</i>	-0.184*** <i>0.015</i>	-0.145*** <i>0.013</i>
age ^E 46–50	-0.218*** <i>0.022</i>	-0.227*** <i>0.021</i>	-0.235*** <i>0.019</i>	-0.213*** <i>0.017</i>	-0.159*** <i>0.017</i>
age ^E ≥ 51	-0.343*** <i>0.045</i>	-0.368*** <i>0.048</i>	-0.373*** <i>0.042</i>	-0.348*** <i>0.043</i>	-0.261*** <i>0.035</i>
low-skilled			-0.164*** <i>0.003</i>	-0.108*** <i>0.003</i>	-0.106*** <i>0.003</i>
high-skilled			0.410*** <i>0.003</i>	0.239*** <i>0.004</i>	0.227*** <i>0.003</i>
low-skilled \times eger			0.125*** <i>0.010</i>	0.081*** <i>0.010</i>	0.071*** <i>0.009</i>
high-skilled \times eger			-0.096*** <i>0.028</i>	-0.081*** <i>0.025</i>	-0.038* <i>0.023</i>
Occupation controls				√	√
Plant controls					√

Notes: The data set used is BASiD, 1980–2007. The dependent variable is the log daily gross wage. Standard errors clustered at the individual level in italics; ***/**/* denotes statistical significance at the 1/5/10% level. All models include six age, nine federal state, and 28 year dummies, two dummies indicating the size of the regional labor market, and the unemployment rate at the municipality level. Occupation controls consist of twelve occupation dummies; as plant controls we include four plant size and 24 sector dummies as well as the share of immigrant workers in the plant’s workforce.

show substantial wage assimilation, in line with earlier findings by Schmidt (1997). During their first 15 years in Germany, they manage to more than halve initial wage gaps. On the other hand, ethnic Germans migrating later are able to close initial gaps by considerably less: around 40% for the 1988–1995 cohort and around 30% for the latest 1996–2007 cohort (with some differences across specifications).

In line with existent studies, such as Borjas (1995) and Schaafsma and Sweetman (2001), the age at entry variables paint a picture of integration that gets increasingly complicated for older immigrants. Those who arrive in their early twenties earn up to 40 log points more compared to immigrants who migrate in their fifties. As age at entry is closely related to pre-migration work experience, this finding also stresses that source country experience is not valued in the German labor market, which is in line with results for other countries (Eckstein and Weiss, 2004; Ferrer and Riddell, 2008; Basilio and Bauer, 2010). As in the case of entry cohorts, adding more controls lowers the span here, too, suggesting that part of the gains for young migrants come from working in more favorable occupations and plants.

We are particularly interested in the impact of the pre-migration wage ($\log w^S$) on immigrants' post-migration wage. As can be seen from Table 2, its coefficient is positive and significant in all specifications. This strongly suggests that at least some of the human capital acquired in the source country is transferable to the host country's labor market. Even if we control for education (model 3), earning a 10 log points higher wage in the source country is associated with an about 1.6 log points higher wage in Germany. Although estimated elasticities are considerably lower than one, suggesting that human capital transferability between the former communist countries and Germany's economy is limited and pre-migration wage dispersion is compressed after migration, these estimates point at non-trivial effects of pre-migration labor market performance on post-migration wages. Interestingly, adding occupation and plant controls decreases the estimated impact of the pre-migration wage considerably, indicating that a substantial part of the gains from higher pre-migration labor market performance shows up in working in better-paying occupations and plants.

When interpreting these results, it is important to bear in mind that we do not observe the actual wage in the source country but rather a “standard-

ized” pre-migration wage, calculated using the previous industry, occupation, qualification, and tenure evaluated at the German wage distribution at that time (see Section 3 for the details). Hence, the estimated coefficient cannot be interpreted, strictly speaking, as the elasticity of German with respect to pre-migration wages. However, true elasticities may be of little interest anyway because the wage structure in the (former) communist economies was very different from that in a developed market economy and therefore has little to say about immigrants’ pre-migration labor market performance that is relevant to post-migration outcomes. We admit, though, that individual performance, unrelated to occupation and experience, may not be fully reflected in our measure of pre-migration labor market performance.

The coefficient for the employment gap indicates that every additional year spent in non-employment before starting the first job in Germany is associated with about 2 log points lower wages, where differences between specifications are only minor. Note, however, that we cannot determine causality here. The negative relationship may either be due to a genuine causal effect with time in non-employment worsening immigrants’ earnings capacity or because of high-productive workers finding a job earlier.

Other control variables included show no surprises: First of all, the wage is increasing in education. But we also see that returns to education are considerably smaller for ethnic Germans than for natives. In particular, for ethnic Germans there are very small gains from a vocational training. The wage difference between low-skilled and medium-skilled immigrants is no larger than 4 log points in models 3–5. On the other hand, an academic education is associated with a large wage premium for ethnic Germans which is nevertheless significantly lower when compared to natives. As discussed in Section 3.2, our sample selection criteria (in particular focussing on immigrants aged 21–55 years when entering Germany) suggest that for most immigrants education was completed in the source country. So our findings are in line with the extant literature documenting lower post-migration gains from source country education compared to education acquired in the host country such as Bratsberg and Ragan (2002), Chiswick and Miller (2008), Ferrer and Riddell (2008), or Basilio and Bauer (2010). Finally, the wage is increasing in age and plant size, and plants with many foreigners in their workforces pay lower wages (results are available on request).

5.2 Wage Assimilation by Source Country

In our next set of models, we allow the assimilation profile to differ for ethnic Germans immigrating from different countries of origin by including interactions of the source country and the years since migration dummies. We estimate two models: The first model just allows for source country differences in the assimilation profile, while the second introduces additional cross effects, namely source country interactions with the pre-migration wage, the employment gap, the cohort, age at entry, and education dummies. Both models build on model 3 from the previous subsection in that they include controls for education, but neither occupation nor plant characteristics. We focus on models without occupation and plant controls lest to lose the part of wage assimilation stemming from moving to better-paying occupations and plants.⁷

As can be seen from Table 3, both models suggest that the 1988–1995 cohort of all three groups of ethnic German immigrants initially earns considerably lower wages than natives. Yet, there are clear differences by source country. In terms of the initial disadvantage, ethnic Germans from Poland do best with a wage disadvantage of just 16 log points, whereas those from the FSU perform worst with a wage disadvantage of 23–24 log points. Cohort dummies are positive for the communist period (1980–1987) for all source countries, indicating that early immigrants did better than those who moved to Germany right after the collapse of the communist regimes. Early cohorts from all three source countries nevertheless suffer from substantial initial wage gaps. Estimates for ethnic Germans migrating in 1996–2007 show widely different effects for those coming from Romania and Poland. This is probably related to the very low numbers of remaining arrivals from these countries in that period (see Figure 1 and also Table 1) and should thus not be over-interpreted. When interpreting these findings it is important, though, to bear in mind that the vast majority of ethnic Germans from the FSU arrived in the 1988–1995 and 1996–2007 periods and are thus facing a markedly higher initial wage disadvantage than the many immigrants from Romania and Poland arriving between 1980 and 1987.

⁷ Note that qualitatively similar results to those discussed in the following also show up when using the specification of model 5 from the previous subsection that includes occupation and plant controls.

Table 3: Wage assimilation profiles by source country

	Model 1		Model 2	
PL	-0.160	<i>0.013</i> ***	-0.163	<i>0.015</i> ***
YSM 3–5 × PL	0.020	<i>0.007</i> ***	0.019	<i>0.007</i> ***
YSM 6–8 × PL	0.029	<i>0.009</i> ***	0.028	<i>0.009</i> ***
YSM 9–11 × PL	0.041	<i>0.010</i> ***	0.041	<i>0.010</i> ***
YSM 12–14 × PL	0.034	<i>0.011</i> ***	0.034	<i>0.011</i> ***
YSM ≥ 15 × PL	0.052	<i>0.012</i> ***	0.056	<i>0.012</i> ***
RO	-0.184	<i>0.017</i> ***	-0.206	<i>0.033</i> ***
YSM 3–5 × RO	0.042	<i>0.012</i> ***	0.044	<i>0.012</i> ***
YSM 6–8 × RO	0.070	<i>0.014</i> ***	0.074	<i>0.014</i> ***
YSM 9–11 × RO	0.091	<i>0.017</i> ***	0.095	<i>0.016</i> ***
YSM 12–14 × RO	0.100	<i>0.018</i> ***	0.105	<i>0.017</i> ***
YSM ≥ 15 × RO	0.132	<i>0.023</i> ***	0.128	<i>0.021</i> ***
FSU	-0.240	<i>0.013</i> ***	-0.231	<i>0.017</i> ***
YSM 3–5 × FSU	0.058	<i>0.007</i> ***	0.058	<i>0.007</i> ***
YSM 6–8 × FSU	0.076	<i>0.009</i> ***	0.077	<i>0.009</i> ***
YSM 9–11 × FSU	0.094	<i>0.010</i> ***	0.094	<i>0.010</i> ***
YSM 12–14 × FSU	0.093	<i>0.011</i> ***	0.092	<i>0.011</i> ***
YSM ≥ 15 × FSU	0.127	<i>0.016</i> ***	0.117	<i>0.016</i> ***
$\log w^S$	0.159	<i>0.023</i> ***		
$\log w^S \times \text{PL}$			0.207	<i>0.042</i> ***
$\log w^S \times \text{RO}$			0.267	<i>0.071</i> ***
$\log w^S \times \text{FSU}$			0.104	<i>0.028</i> ***
empl. gap	-0.024	<i>0.004</i> ***		
empl. gap × PL			-0.022	<i>0.005</i> ***
empl. gap × RO			-0.041	<i>0.012</i> ***
empl. gap × FSU			-0.025	<i>0.008</i> ***
cohort 1980–1987	0.066	<i>0.012</i> ***		
cohort 1980–1987 × PL			0.054	<i>0.014</i> ***
cohort 1980–1987 × RO			0.084	<i>0.026</i> ***
cohort 1980–1987 × FSU			0.133	<i>0.041</i> ***
cohort 1996–2007	-0.072	<i>0.018</i> ***		
cohort 1996–2007 × PL			-0.610	<i>0.147</i> ***
cohort 1996–2007 × RO			0.131	<i>0.049</i> ***
cohort 1996–2007 × FSU			-0.065	<i>0.018</i> ***

Table 3 – continues . . .

Table 3 – continued

	Model 1		Model 2	
age ^E 21–25	0.046	<i>0.014</i> ***		
age ^E 21–25 × PL			0.044	<i>0.021</i> **
age ^E 21–25 × RO			0.061	<i>0.043</i>
age ^E 21–25 × FSU			0.041	<i>0.023</i> *
age ^E 31–35	-0.070	<i>0.012</i> ***		
age ^E 31–35 × PL			-0.055	<i>0.017</i> ***
age ^E 31–35 × RO			-0.086	<i>0.035</i> **
age ^E 31–35 × FSU			-0.082	<i>0.018</i> ***
age ^E 36–40	-0.131	<i>0.013</i> ***		
age ^E 36–40 × PL			-0.116	<i>0.021</i> ***
age ^E 36–40 × RO			-0.160	<i>0.039</i> ***
age ^E 36–40 × FSU			-0.138	<i>0.019</i> ***
age ^E 41–45	-0.205	<i>0.015</i> ***		
age ^E 41–45 × PL			-0.186	<i>0.025</i> ***
age ^E 41–45 × RO			-0.215	<i>0.037</i> ***
age ^E 41–45 × FSU			-0.211	<i>0.022</i> ***
age ^E 46–50	-0.237	<i>0.019</i> ***		
age ^E 46–50 × PL			-0.192	<i>0.031</i> ***
age ^E 46–50 × RO			-0.280	<i>0.052</i> ***
age ^E 46–50 × FSU			-0.254	<i>0.026</i> ***
age ^E ≥ 51	-0.361	<i>0.041</i> ***		
age ^E ≥ 51 × PL			-0.346	<i>0.019</i> ***
age ^E ≥ 51 × RO			-0.217	<i>0.086</i> **
age ^E ≥ 51 × FSU			-0.406	<i>0.047</i> ***
low-skilled	-0.164	<i>0.003</i> ***	-0.164	<i>0.003</i> ***
low-skilled × eger	0.130	<i>0.010</i> ***		
low-skilled × PL			0.130	<i>0.017</i> ***
low-skilled × RO			0.143	<i>0.035</i> ***
low-skilled × FSU			0.122	<i>0.013</i> ***
high-skilled	0.410	<i>0.003</i> ***	0.410	<i>0.003</i> ***
high-skilled × eger	-0.101	<i>0.028</i> ***		
high-skilled × PL			-0.115	<i>0.042</i> ***
high-skilled × RO			-0.055	<i>0.050</i>
high-skilled × FSU			-0.171	<i>0.058</i> ***

Notes: The data set used is BASiD, 1980–2007. The dependent variable is the log daily gross wage. Standard errors clustered at the individual level in italics; ***/**/* denotes statistical significance at the 1/5/10% level. Further regressors included in both models are six age dummies, nine federal state dummies, two variables indicating the size of the regional labor market, the unemployment rate at the municipality level, and 28 year dummies.

Remarkably, not only initial wage disadvantages, but also assimilation profiles differ between groups: During the first 15 years in Germany, the initial wage gap narrows by about 5–13 log points depending on the country of origin. The most rapid assimilation is observed for immigrants from Romania and the FSU, and the slowest for those from Poland. As a result, 15 years after migration wages are quite similar for immigrants from the 1988–1995 cohort coming from Poland and the FSU, whereas ethnic Germans from Romania perform somewhat better than the former two groups. Yet, as a substantial fraction of immigrants from Romania and Poland entered Germany before 1988, they experience much lower initial wage penalties than immigrants from the FSU predominantly arriving in the 1988–1995 and 1996–2007 periods and thus perform better on average than these. Our results thus corroborate earlier findings by Cohen and Kogan (2007) who report only partial wage assimilation for ethnic Germans immigrating from the FSU.

Next, we look at the impact of the pre-migration wage and the employment gap. If assumed to be the same across all source countries (model 1), the effect of the pre-migration wage is significantly positive and of the same magnitude as in model 3 in the previous subsection. As above, this points at partial transferability of source country human capital to the host country's labor market. Yet, looking separately at ethnic Germans from different countries of origin (model 2) we see large differences: The pre-migration wage seems to matter most for ethnic Germans originating from Romania for whom a 10 log points higher pre-migration wage is related to an about 2.7 log points higher wage in Germany. For immigrants from Poland the estimated effect is lower and amounts to 2.1 log points, whereas the effect is smallest and estimated as just 1.0 log point for those from the FSU. Interestingly, this pattern corresponds to the average language proficiency of ethnic Germans documented in the literature, with ethnic Germans from Romania showing the best proficiency and those from the FSU the least (see, e.g., Wolff and Cordell, 2003; Roll, 2003; Ihrig, 2005). If we think of proficiency in the host country's language as one important part of host country-specific skills required to transfer source country human capital into host country wages, the different effect may reflect that human capital transferability is larger for those groups of ethnic Germans with higher endowments of host country-specific human capital. The coefficients for the employment gap are

significantly negative for all three groups, though the coefficient for immigrants from Romania is a bit larger than for those from Poland and the FSU. Moreover, they are similar in magnitude to the common estimate from the previous subsection: One additional year of non-employment before starting the first job in Germany is associated with a 2–4 log points lower wage.

Turning to the other variables, the coefficients of the age at entry dummies suggest a similar negative trend across all source countries, the maximum (initial) wage being achieved by those who migrate in their early twenties. As in the previous subsection, we see that the education–earnings profile is substantially flatter for immigrants with a low pay-off for a vocational training. Also college premia are smaller for ethnic Germans, where the penalty is lowest for immigrants from Romania and largest for those from the FSU. These differences may reflect two different processes: On the one hand, the quality of academic education in the source countries may differ. On the other hand, ethnic Germans from Romania and, to a lesser extent, Poland may be able to transfer their skills better due to their higher average country-specific skills upon arrival compared to those from the FSU.

5.3 Wage Assimilation and Pre-Migration Performance

In our final set of models, we add three-way interactions with the pre-migration wage to analyze whether assimilation profiles of ethnic Germans immigrating from Poland, Romania, and the FSU differ depending on their pre-migration labor market performance. As in the previous subsection, we estimate two models: In the first model, we just add the three-way interactions of the pre-migration wage, the years since migration, and the source country dummies on top of the cross-effects of years since migration and source countries. As before, the second model adds source country interactions with the employment gap as well as the cohort, age at entry, and education dummies. For brevity and since the other coefficients remain nearly unchanged, Table 4 just presents the most interesting outcomes.

The main years since migration coefficients indicate almost the same extent of wage assimilation as before.⁸ Wage assimilation is still considerably

⁸ Note that the pre-migration wage is centered around its mean when included as regressor, so that the two-way interactions of the years since migration and the source country dummies can still be regarded as the “average” wage assimilation profile.

more pronounced for ethnic Germans immigrating from Romania and the FSU than for those from Poland. For immigrants from Poland wages grow by about 5 log points during the first 15 years in Germany, whereas for those from Romania and the FSU the increase amounts to 13–14 log points.

Part of the wage assimilation is now captured by the source country-specific cross-effects of years since migration and the pre-migration wage. The interaction effect of the pre-migration wage and the source country now represents the impact of labor market performance back in the source country on the German wage during the first three years after migration for the respective group of ethnic Germans, while adding the three-way cross-effects for later periods gives the respective effect later on. For instance, we have to add the coefficients for $\log w^S \times PL$ and, say, $\log w^S \times YSM$ 9–11 $\times PL$ to arrive at the impact of the pre-migration wage on the wage of immigrants from Poland 9–11 years after arriving in Germany.

Starting with the initial impact of the pre-migration wage, the interaction effect is positive and significant for both ethnic Germans from Poland and Romania, but negative, small, and statistically insignificant for immigrants from the FSU. Hence, in the first three years after migration ethnic Germans from Poland and Romania with a higher pre-migration wage also earn a higher wage in Germany, where the effect is more marked for Romanians. This is consistent with our theoretical considerations in Section 4: As ethnic Germans immigrating from Romania seem to have the largest pre-migration exposure to German culture and language, we should expect them to possess the highest endowment of host country-specific human capital upon arrival in Germany. If there are strong enough complementarities between general skills acquired in the source country and host country-specific human capital, they should therefore also show the largest impact of pre-migration wages on initial post-migration wages.

Turning to later periods, estimated three-way interaction effects for all groups are monotonously increasing in years since migration suggesting that those who performed better back in the source country catch up faster with native Germans. These results are also illustrated in Figure 3: For all three countries of origin, immigrants who earned one standard deviation (or about 25 log points) more than the average pre-migration wage assimilate markedly faster than immigrants with the average pre-migration wage. In contrast,

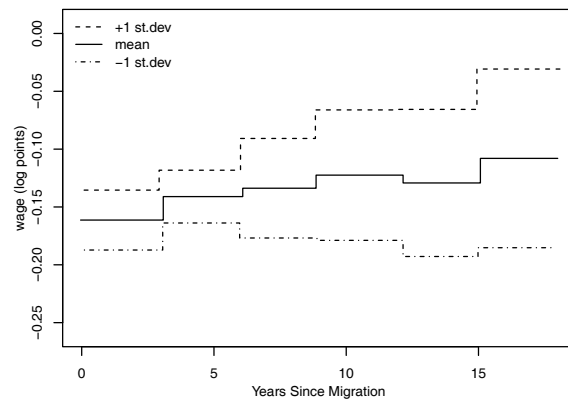
Table 4: Wage assimilation profiles by source country and pre-migration labor market performance

	Model 1		Model 2	
PL	-0.159	<i>0.012***</i>	-0.161	<i>0.015***</i>
<i>YSM 3-5 × PL</i>	0.021	<i>0.007***</i>	0.020	<i>0.007***</i>
<i>YSM 6-8 × PL</i>	0.028	<i>0.009***</i>	0.028	<i>0.009***</i>
<i>YSM 9-11 × PL</i>	0.039	<i>0.010***</i>	0.039	<i>0.010***</i>
<i>YSM 12-14 × PL</i>	0.031	<i>0.011***</i>	0.032	<i>0.011***</i>
<i>YSM ≥ 15 × PL</i>	0.048	<i>0.012***</i>	0.053	<i>0.012***</i>
$\log w^S \times \text{PL}$	0.108	<i>0.053**</i>	0.104	<i>0.053*</i>
$\log w^S \times \text{YSM 3-5} \times \text{PL}$	-0.013	<i>0.042</i>	-0.012	<i>0.041</i>
$\log w^S \times \text{YSM 6-8} \times \text{PL}$	0.067	<i>0.056</i>	0.069	<i>0.055</i>
$\log w^S \times \text{YSM 9-11} \times \text{PL}$	0.125	<i>0.056**</i>	0.122	<i>0.056**</i>
$\log w^S \times \text{YSM 12-14} \times \text{PL}$	0.152	<i>0.063**</i>	0.151	<i>0.062**</i>
$\log w^S \times \text{YSM} \geq 15 \times \text{PL}$	0.210	<i>0.071***</i>	0.205	<i>0.071***</i>
RO	-0.182	<i>0.017***</i>	-0.207	<i>0.033***</i>
<i>YSM 3-5 × RO</i>	0.041	<i>0.012***</i>	0.046	<i>0.012***</i>
<i>YSM 6-8 × RO</i>	0.068	<i>0.014***</i>	0.076	<i>0.013***</i>
<i>YSM 9-11 × RO</i>	0.090	<i>0.017***</i>	0.096	<i>0.016***</i>
<i>YSM 12-14 × RO</i>	0.099	<i>0.017***</i>	0.106	<i>0.016***</i>
<i>YSM ≥ 15 × RO</i>	0.130	<i>0.022***</i>	0.128	<i>0.021***</i>
$\log w^S \times \text{RO}$	0.244	<i>0.069***</i>	0.212	<i>0.075***</i>
$\log w^S \times \text{YSM 3-5} \times \text{RO}$	-0.060	<i>0.056</i>	-0.054	<i>0.055</i>
$\log w^S \times \text{YSM 6-8} \times \text{RO}$	0.020	<i>0.065</i>	0.022	<i>0.062</i>
$\log w^S \times \text{YSM 9-11} \times \text{RO}$	0.095	<i>0.077</i>	0.099	<i>0.073</i>
$\log w^S \times \text{YSM 12-14} \times \text{RO}$	0.123	<i>0.082</i>	0.119	<i>0.079</i>
$\log w^S \times \text{YSM} \geq 15 \times \text{RO}$	0.168	<i>0.095*</i>	0.153	<i>0.089*</i>
FSU	-0.248	<i>0.013***</i>	-0.238	<i>0.016***</i>
<i>YSM 3-5 × FSU</i>	0.063	<i>0.007***</i>	0.063	<i>0.007***</i>
<i>YSM 6-8 × FSU</i>	0.083	<i>0.009***</i>	0.083	<i>0.009***</i>
<i>YSM 9-11 × FSU</i>	0.102	<i>0.010***</i>	0.101	<i>0.010***</i>
<i>YSM 12-14 × FSU</i>	0.102	<i>0.011***</i>	0.100	<i>0.011***</i>
<i>YSM ≥ 15 × FSU</i>	0.138	<i>0.016***</i>	0.130	<i>0.016***</i>
$\log w^S \times \text{FSU}$	-0.038	<i>0.036</i>	-0.048	<i>0.036</i>
$\log w^S \times \text{YSM 3-5} \times \text{FSU}$	0.083	<i>0.031***</i>	0.086	<i>0.031***</i>
$\log w^S \times \text{YSM 6-8} \times \text{FSU}$	0.132	<i>0.038***</i>	0.135	<i>0.038***</i>
$\log w^S \times \text{YSM 9-11} \times \text{FSU}$	0.167	<i>0.046***</i>	0.173	<i>0.045***</i>
$\log w^S \times \text{YSM 12-14} \times \text{FSU}$	0.222	<i>0.049***</i>	0.229	<i>0.048***</i>
$\log w^S \times \text{YSM} \geq 15 \times \text{FSU}$	0.266	<i>0.076***</i>	0.285	<i>0.074***</i>

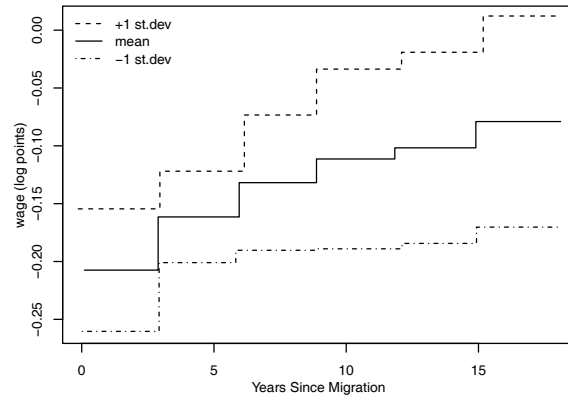
Notes: The data set used is BASiD, 1980–2007. The dependent variable is the log daily gross wage. Standard errors clustered at the individual level in italics; ***/**/* denotes statistical significance at the 1%/5%/10% level. Further regressors included both models are five age at entry and three cohort dummies, the employment gap, and three education dummies (model 1) as well as their interactions with the source country dummies (model 2), six age and nine federal state dummies, two dummies indicating the size of the regional labor market, the unemployment rate at the municipality level, and 28 year dummies.

there is little, if any, assimilation for those who earned one standard deviation less than the average pre-migration wage. Again, these findings are in line with our theoretical expectations from Section 4: If there are strong enough complementarities between general skills and host country-specific human capital, productivity and thus assimilation profiles are expected to be steeper for high-skilled individuals. Put differently, in this case higher pre-migration labor market performance accelerates immigrants' wage assimilation.

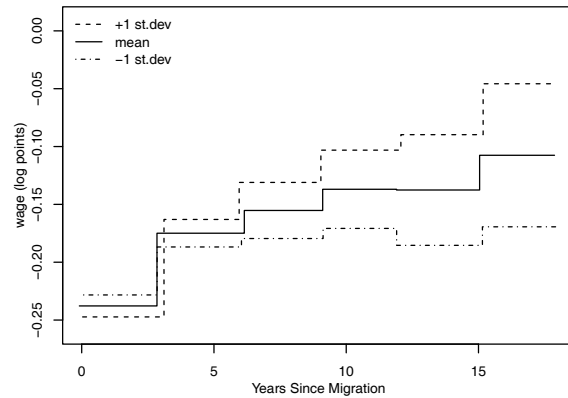
Finally, the amplification in the cross-effect of years since migration and the pre-migration wage over time spent in the host country is largest for immigrants from the FSU and smallest for those from Romania. Although initial differences in the interaction effects are reduced by roughly 30–50 percent depending on specification, after 15 years in the host country the effects are still quite different across the three groups of ethnic Germans: Immigrants from Romania with a 10 log points higher pre-migration wage earn another 3.7–4.1 log points higher wage 15 years after migration, whereas these numbers are smaller for immigrants from Poland (3.1–3.2 log points) and smallest for those from the FSU (2.3–2.4 log points). Our theoretical framework suggests that this is because high-skilled ethnic Germans from Romania and Poland are able to transfer a larger part of their pre-migration human capital immediately after their arrival in Germany because they possess higher initial endowments of host country-specific human capital on average. In the course of time spent in Germany, the additional country-specific skills they gain allow them to become even more productive. On the other hand, skilled immigrants from the FSU are unable to translate their pre-migration labor market performance into host-country wages at the very beginning of their careers in Germany as they lack country-specific human capital initially. Yet, in a few years they accumulate sufficient country-specific skills to become substantially more productive than their less-skilled compatriots. After 15 years in the host country, source country differences in the impact of immigrants' pre-migration wage are smaller but still sizeable, pointing at a substitutability between country-specific skills and the transferability of pre-migration human capital occurring as immigrants spend time in the host country.



(a) Poland



(b) Romania



(c) FSU

Figure 3: Wage assimilation profiles of ethnic Germans from the 1988–1995 cohort immigrating from Poland, Romania, and the FSU depending on pre-migration labor market performance based on the estimates of model 2 from Table 4. “+1 st.dev.” (“–1 st.dev.”) refers to the profile of those who earned one standard deviation more (less) than average and “mean” to the profile of those who earned the average wage back in the source country.

6 Conclusions

In this paper, we have analyzed wage assimilation of ethnic German men immigrating to Germany between 1980 and 2007 from Poland, Romania, and the (former) Soviet Union. We used a unique administrative data set which enabled us to identify ethnic German immigrants – a group of immigrants for whom selective emigration and return migration are of minor importance – and which also provided us with a “standardized” measure of immigrants’ pre-migration wage based on occupation, industry, tenure, qualification, and the German wage structure at that time. Since immigrants’ pre-migration wage captures their actual labor market performance before migration, we regard it as an attractive proxy of immigrants’ pre-migration human capital, and its impact on post-migration wages should inform us on immigrants’ ability to transfer pre-migration human capital to the host country’s labor market.

Our estimates show that there is a sizeable initial wage penalty for ethnic German immigrants relative to native Germans which is larger for later cohorts that experience a more crowded labor market than earlier ones. During their first 15 years in Germany, ethnic Germans manage to close a substantial part of this gap. The 1980–1987 cohort more than halves the initial gap, whereas later cohorts manage to close it by roughly 40% (1988–1995 cohort) or a third (1996–2007 cohort), respectively. Furthermore, around half of the initial wage difference relative to natives is explained by occupation and plant characteristics, suggesting that immigrants are employed in less-paying occupations and plants.

Turning to pre-migration labor market performance, we find that a 10% larger pre-migration wage is related to an about 1.6% higher post-migration wage when controlling for educational attainment and that estimates become smaller but remain significantly positive when additionally including occupation and plant controls. These positive estimates suggest that ethnic Germans are able to transfer human capital acquired in the source country, albeit just partially. Since the impact becomes smaller when controlling for occupation and plant characteristics, part of this transfer seems to be achieved by moving to better-paying occupations and plants.

Allowing for different assimilation profiles by country of origin, we find that wage assimilation is largest for ethnic Germans from the former So-

viet Union and Romania. This, combined with the better initial position of the latter group, renders immigrants from Romania the group which does most favorably, followed by those from Poland and those from the former Soviet Union. Focusing on differences in assimilation profiles depending on pre-migration performance reveals another interesting pattern: A higher pre-migration wage is associated with a better initial wage in Germany for immigrants from Poland and Romania only. However, it accelerates subsequent wage assimilation for immigrants from all three source countries with the largest impact for those from the former Soviet Union.

Since there is evidence suggesting that ethnic Germans differ in the pre-migration exposure to German culture and language with immigrants from Romania showing the largest familiarity and those from the former Soviet Union the least, our results are in line with Chiswick and Miller's (2003) conclusion that host country-specific skills, especially proficiency in the host country's language, and pre-migration human capital are complements. This kind of complementarity explains our most interesting outcomes: that immigrants are able to transfer part of their pre-migration human capital, that transferability increases with time spent in the host country, and that transferability is lagged for the group of immigrants which arguably possesses the lowest endowment of host country-specific skills upon arrival in Germany.

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