Chapter 7

Affluent Lives Beyond the Border? Individual Wage Change Through Migration

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7.1 Introduction

Individual labour market outcomes of migration are a core interest of migration research. Several studies have analysed the consequences of migration in terms of individual socio-economic outcomes. They aim to describe mobile populations in terms of their socio-economic background and the socio-economic consequences. These studies analysed the outcomes of migration in terms of occupational achievement (Mulder and van Ham 2005), occupational status (Akresh 2006; Chiswick et al. 2005), or wages (Lersch 2014; Newbold 1996). Methodologically, researchers have increased efforts to establish causal relationships between spatial mobility and labour market outcomes. They use panel analyses to estimate the individual wage consequences of migration (Lersch 2014; McKenzie et al. 2010; Newbold 1996). However, this research often deals with internal migration in developed countries. Emigration from developed countries and labour market outcomes of these emigrants are blind spots. This chapter responds to this gap by analysing wage changes of German emigrants and their determinants in various destination countries.

The majority of research on individual labour market outcomes of migration has dealt with migration from less to more developed countries. The availability of immigrant surveys in host countries in the global North and the scale of immigration from the global South are crucial reasons for the focus of past research. However, migration flows exist between developed countries as well (Favell et al. 2007). Emigration from industrial countries and its individual consequences have gained more attention recently (Borjas et al. 2018; Gould and Moav 2016; Parey et al. 2017). However, the focus often lies with the self-selection of emigrants. These studies either compare pre-migration wages of emigrants and non-migrants in the origin country or they compare wages of emigrants in various destination

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countries. This chapter looks at migration from Germany, a highly developed country, to a variety of other countries. The hope for a better life and career options are major motives for emigrants to leave high-income countries (Engler et al. 2015; van Dalen and Henkens 2007). We examine whether migrants' wage prospects are fulfilled abroad. As a reference, we compare their wage change with that among the German resident population in a similar time frame.

We contribute to the literature on migrant selectivity and labour market outcomes by analysing changes in net hourly wages before and after emigration from Germany. Our analysis relies on present and retrospective wage information of individuals who emigrated between July 2017 and June 2018. Furthermore, we compare emigrants' wage changes with the wage changes among non-migrants. The analysis is based on the first wave of the novel German Emigration and Remigration Panel Study (GERPS) and on the 2016 and 2017 waves of the German Socio-Economic Panel Study (SOEP v34). In this way, we connect the idea of selectivity and the analysis of labour market outcomes.

7.2 Theoretical Perspectives on Migration and Wage Change

Much literature analyses migrants' labour market outcomes in terms of employment and remunerations (Adsera and Chiswick 2007; Chiswick 1978; Buzdugan and Halli 2009; Kogan 2011). These studies explore the implications of migration for individual human capital (Sjaastad 1962). Migration may devalue origin country-specific human capital resulting in deskilling (e.g. Salmonsson and Mella 2013) and it can be seen as a process that involves investment into individual human capital (Duleep and Regets 1999; Nowicka 2014). In other words, this literature aims at explaining to what extent human capital is transferable to other countries (Friedberg 2000). However, this literature is mostly concerned with migration from less developed to developed countries like the US, Australia, or European countries. Also, these studies usually compare labour market outcomes of immigrants and the native population in the destination country. The unavailability of data from an origin country perspective impairs the separation of wage changes owed to migration from wage changes owed to the selectivity of migrants.

Research has highlighted the highly selective nature of emigration (e.g. Borjas 1991, 1987; Chiquiar and Hanson 2005; Dumont and Lemaître 2005; Parey et al. 2017; see also Ette and Witte 2021 in this volume). These studies aim to determine whether immigrants are positively or negatively selected from the origin population regarding their skills and wages. In the German context, various studies have investigated the composition of emigrants in terms of their education and occupations (Diehl and Dixon 2005; Enders and Bornmann 2002; Engler et al. 2015; Erlinghagen 2011; Ette and Sauer 2010; Kopetsch 2009; Mau et al. 2008). Restrictive policies of destination countries are one reason for this selectivity, but higher human capital may also reduce the adaptation costs in foreign labour markets (Heath and Yu 2005).

We investigate the wage consequences of migration against the background of the human capital perspective. Labour market outcomes of migrants are often understood in terms of individual human capital and its transferability abroad (Friedberg 2000). From a human capital perspective, labour migration can be conceptualised as an investment in individual human capital (Mincer 1974; Sjaastad 1962). As such, (international) migration is associated with costs and returns that can be monetary or non-monetary. We focus on monetary returns, since actual individual costs and non-monetary costs are not captured by the GERPS survey.

Human capital theory suggests decreased hourly wages after migration because human capital is lost to some extent. Empirically, wage increases are more likely, because career prospects are key drivers of voluntary migration (Engler et al. 2015; van Dalen and Henkens 2007). First, this increase could be owed to wage-level differences between countries, which may raise wages regardless of human capital devaluation. Second, the increase could be owed to higher remuneration of transferable human capital abroad. The universality of the English language in high-level business and academic jobs assures the transferability of human capital among the highly skilled. We therefore expect average hourly wages to increase after migration and this increase must be higher than among non-migrants in order to incentivise labour emigration from a highly developed country.

Average wage changes after migration are not uniform across German emigrants. We therefore seek to understand the variation of wage changes between migrants. However, most existing theory is tailored to migration from less to more developed countries. As a consequence, we formulate research questions rather than hypotheses. We investigate to what extent the wage changes vary by human capital endowments and their transferability.

The transferability of human capital is likely to be high in regions where emigrants can apply their language skills (Fuller and Martin 2012; McManus et al. 1983). Although there is no direct measure for language skills and language use at work in GERPS, German and English skills are likely to be high in our selective group. Therefore human capital transferability will be higher in countries like Austria, Switzerland, the UK, and the USA. In addition, English skills are more likely to be useful in large companies than in small ones. Some employers deploy their employees abroad. In such cases, employers are apparently interested in the transfer of human capital from Germany to another country.

Since specific knowledge is desirable in these transfers, such deployment yields the wage benefits of internal labour markets (Doeringer and Piore 1971). Given companies' interest in this knowledge transfer, they are likely to offer wage premiums to incentivise deployment.

Human capital transfers are further indicated by supervisory responsibilities of emigrants. Only if their human capital is transferable will employers assign migrants to supervisory functions. If their leadership skills are valued, the number of supervised employees may increase abroad and is likely to be compensated financially. Thus, we would expect wages to be relatively higher in German and English speaking countries, in larger compared to smaller companies, for posted workers

compared to self-initiated movers, and for workers with (increased) supervisory responsibilities.

The level of human capital endowments could moderate the relationship between emigration and labour market outcomes potentially through one of two mechanisms. One is a process of cumulative advantage (CA) as expressed in Mincer's human capital earnings function (Mincer 1974). According to this model, wages grow through investment in human capital and positive rates of return on such investment. A source of potential CA arises if these rates of return on resources and investments diverge between groups (DiPrete and Eirich 2006). This simple form of CA should be sufficient to analyse whether emigrants with higher human capital endowments benefit from disproportional wage increases compared with emigrants who have lower endowments.¹

If instead there is no CA, emigration generates equal returns on emigration for individuals with various individual or firm characteristics (e.g. human capital endowments, firm-size). If that were the case, less qualified individuals would benefit as much as more qualified individuals and employees in small firms would benefit as much as employees in large firms. We aim to explore whether emigration is a CA process or not. One limitation is that we focus on short term consequences, while CA processes usually unfold over extended periods (see e.g. Fuller 2015).

In the following sections, we empirically test wage changes after migration. Furthermore, we investigate to what extent the transferability of human capital and returns on human capital endowments vary among German emigrants.

7.3 Data and Methods

We use data from the first wave of GERPS (Ette et al. 2021) and 2016 and 2017 waves from the German Socio-Economic Panel (SOEP) (Goebel et al. 2019). Our GERPS sample is restricted to employees, workers, and civil servants who held a job before and after emigration and who provided information about their net income both before and after emigration. Additional restrictions for our analysis refer to the time since arrival and age. We are interested in the relationship between migration and income change. The more years passed since migration, the more fuzzy this relationship becomes. Because some interviewees have stayed for extended periods in their destination country, we restrict our emigrant sample to individuals who arrived no longer than 2 years before the survey. The age range is restricted to individuals between 20 and 70 years old. Furthermore, the analytical sample is restricted to observations without any missing values on our models' variables to ease comparisons between models ($N = 1275$).

¹We acknowledge that our group is not unlikely to host highly talented individuals that imply CA processes of the kind described in Rosen's 1981 model of superstars. However, such cases are inherently difficult to assess with general surveys since they would appear as outliers while we are concerned with population means.

For the Difference-in-Difference estimation (DiD) we construct a reference sample from 2016 and 2017 SOEP data. That allows us to measure the net income difference between 2016 and 2017. The sample is restricted to employees, workers, and civil servants who held a job in 2016 and 2017 and who provided information about their net income and working hours in 2016 and 2017 to match the GERPS emigrant sample. The age range is restricted to individuals between 20 and 70 years old. Furthermore, the analytical SOEP sample is restricted to cases without any missing values on the variables that we include in our multivariate model ($N = 8289$). We must keep in mind that our descriptive figures refer to a very particular group of emigrants whose main activity was employment both before and after emigration.

7.3.1 Variables

The dependent variable is the difference between log net hourly wage 3 months before migration and at the time of the interview. We rely on net rather than gross wages because tax and welfare systems vary between Germany and destination countries. The change in net wages is therefore a more relevant outcome from the perspective of emigrants. We proceed as follows to obtain valid wage information.

First, negative net monthly incomes are recoded as missing values. Second, we impute net incomes for those who indicate categories instead of concrete values. The imputation relies on median values of those respondents who report exact values in the respective category range. To transform this grouped information into pseudo-exact information, we calculate the median-separately for employed and self-employed-for each particular income group based on the exact observations in the dependent variable for the corresponding income groups. Finally, all participants with grouped net wage information are assigned to this estimated group median.

Third, some respondents apparently reported their yearly income where we asked for monthly incomes in the retrospective question owed to a misleading wording of the item.² We exclude respondents whenever the following two conditions apply: the objective income decreases in spite of a subjective income increase and the retrospective monthly income has at least five digits which suggests that participants reported yearly incomes.

Finally, we calculate hourly wages by dividing monthly wages by the average weeks per month (4.345) and the actual weekly working hours. Further, we bottom- and top-code values that are lower than the first percentile value or higher than the 99th percentile value. Then, we take the natural logarithm at both times and calculate the difference. Furthermore, we match price level ratios of PPP conversion factors to market exchange rates to destination countries to control for country

²Questionnaire-item: "Please indicate your average net monthly labour earnings in the year before you moved." (*Wie hoch war Ihr durchschnittlicher monatlicher Netto-Arbeitsverdienst im Jahr vor Ihrem Umzug?*)

differences (Worldbank 2019). We use indicators for the reference year 2018 throughout.

We treat all covariates as time constant. Where we have information referring to both points in time, we include variables that indicate the change in the respective characteristic. Gender is coded one for women and zero for men, and present age is coded in years. To measure labour market skills we include a condensed ISCED scale that differentiates the following four categories: post-secondary education or less, bachelor's degrees or equivalents, master's degrees or equivalents, and doctoral degrees. In terms of human capital we further control for present work experience in years, which we derive from the first year of the employment career (if known) and education years respectively.

Furthermore, we account for the change in the number of supervisees as an indicator for managerial responsibilities. The change is included as a categorical variable indicating decreases, null changes, and increases. Also, we include two dummy variables indicating whether German or English are official languages in the respective countries of destination. Further, we include a dichotomous measure for stays abroad during school or during occupational training of 1-month minimum.

Finally, we include several control variables. Since we focus on dependent workers, just two employment statuses remain: workers or employees, and civil servants. We account for firm size through a dummy indicating whether the company has more or less than 2000 employees. We include a control for the difference between present weekly working hours and working hours before emigration. Restricted to GERPS, we include a dichotomous measure of employer deployment and one for cities with more than one million inhabitants.

7.3.2 *Methods*

We proceed in two steps. First, we compare mean wage changes among emigrants with wage changes among non-migrants using DiD estimations. In a second step, we explore the variance of wage changes among German emigrants using linear regressions on wage changes (OLS).

The basic idea of the DiD is one of counterfactual causality. The aim is to calculate a treatment effect and to interpret it as a causal relation (Gangl 2010; Gangl and DiPrete 2004; Morgan and Winship 2015; Rubin 1974). In our context, emigration represents the treatment and non-migrants are the counterfactual group. We want to approximate the effect of the treatment on net hourly wages. For this purpose, we compare emigrants' net hourly wage change with that of non-migrants to estimate a relation between emigration and wages. In other words, the approach corrects the wage change in the treatment group by the wage change of non-migrants to control for confounding unobservable time-invariant heterogeneities and period-specific effects (Angrist and Pischke 2008; Gangl 2006; Halaby 2004). Thus, in theory, the DiD allows us to estimate the average wage change of German emigrants net of the average wage change they would have experienced had they remained in Germany.

The DiD relies on income information for two groups measured at two points in time. For emigrants, the income information refers to the time 3 months before migration (retrospective) and to the time of the survey. In our control group, we stick to 2017 as a reference for the time of the survey and to 2016 as a reference for the income 3 months before migration. The time span for the control group is aligned with our analytical sample of the treatment group, where the median time since arrival is 11.4 months.

The DiD approach is prone to self-selection in the treatment on observable and unobservable characteristics. To reduce selection on observable characteristics, we adjust the non-migrant sample to the distribution of our analytical GERPS sample through entropy balancing (Hainmueller 2012) using Hainmueller and Xu's (2013) Stata implementation *ebalance*. It has been designed as a more effective alternative to matching procedures. This method aims to achieve covariate balance in observational studies with binary treatments. As mentioned above, emigration is highly selective in terms of several socio-economic characteristics and not 'assigned' at random. By balancing the control group according to characteristics of the treatment group, we aim to control for this selectivity. The covariate moments for our reweighting procedure include age in years and its squared and cubed terms, education measured by our condensed ISCED variables, and gender.

When all observable and unobservable characteristics are controlled, DiD-matching allows us to estimate a causal treatment effect of emigration on wages. However, we only account for some key observable socio-economic characteristics to account for the self-selection of German emigrants and neglect other relevant observable and unobservable characteristics that potentially influence the 'treatment assignment.' Therefore, in the following analysis we refer to a non-causal treatment effect of emigration on wage.

7.4 Findings

7.4.1 Descriptives

Table 7.1 shows the distribution of characteristics in our two analytical samples. Average wage increases are more pronounced in the emigrant sample compared with non-migrants. The mean change in net monthly labour income suggests that workers, employees, and civil servants earn on average 1495 euros more after emigration than before. This figure is considerably lower in the reference population (73 euros). Average net hourly wages increase by 8.60 euros after migration, which corresponds to a monthly wage of 1376 euros for an individual working 40 h a week. In the reference group, the average net hourly wages increase by 0.46 euros, which corresponds to a monthly wage of 80 euros for a person working 40 h a week. The respective figures are slightly higher after PPP adjustments.

Table 7.1 Variable means for emigrants and stayers

	Emigrants		Stayers	
	Mean	SD	Mean	SD
Change in net hourly wage (euros)	+8.6	16.6	+0.46	4.1
Change in net hourly wage (euros), PPP-corrected	+9.4	22.5	+0.51	4.5
Female	42%		53%	
Age in years (t_1)	36.1	8.3	46.0	10.5
ISCED (t_1)				
(1) Post-secondary, short-cycle tertiary or less	15%	—	66%	—
(2) Bachelor's degree or equivalent	24%	—	21%	—
(3) Master's degree or equivalent	44%	—	12%	—
(4) Doctoral or equivalent	18%	—	1%	—
Work experience (t_1)	11.8	8.8	21.9	11.1
Weekly working hours (t_1)	44.6	9.6	36.5	11.7
Weekly working hours (t_0)	45.1	9.8	36.4	11.9
Change in no. of supervisees ($t_1 - t_0$)				
(1) fewer than before	19%	—	—	—
(2) same number as before	57%	—	—	—
(3) more than before	24%	—	—	—
German official language in destination	37%	—	—	—
English official language in destination	24%	—	—	—
Spent 1+ month abroad during school/training	60%	—	—	—
Employment status (t_1)				
(1) Employee or worker	96%	—	91%	—
(2) Civil servant	4%	—	9%	—
Company size 2000+ (t_1)	48%	—	30%	—
Expat status: Deployed (ref. self-initiated)	19%	—	—	—
>1 mil. Inhabitants in destination place	32%	—	—	—
N	1275		8289	

GERPSw1 (Emigrants); only individuals who are employed before and after migration. SOEP 2016/2017 (Stayers); only individuals who are employed 2016 and 2017

Women constitute 42% of the emigrant sample and the mean age is 36 years (median 34). Among non-migrants the proportion of women (52%) and the average age (46 years) are much higher.

The sample is highly selective regarding skills. Twenty-four per cent of the emigrants in the analytical sample have BA degrees and 44% have MA degrees. Eighteen per cent of emigrants in our sample have doctoral degrees and only 15% have post-secondary degrees, short-cycle tertiary degrees or lower ones. The majority of our sample are employees or workers (96%) and the remaining 4% are civil servants. In contrast to the emigrants, 66% of the stayers in the analytical sample have a post-secondary or a short-cycle tertiary degree, whereas 21% have a bachelor's degree and 12% a master's degree. Only 1% of the stayers finished their education with a doctoral or equivalent degree. The majority of the stayers are employees or workers (91%) and 9% are civil servants. Thus, civil servants are slightly under-represented among emigrants.

Non-migrants have 9 years more of work experience (21 years) than emigrants (12). This is mostly explained by differences in age and education. Emigrants tend to be younger and on average they have spent more years in the educational system.

The average weekly working time is above the German average (36.5 h) and decreases slightly from 45.1 in Germany to 44.6 h abroad. This indicates that the majority of our sample worked full time before and after migration. Additional analyses show that roughly 90% worked 35 h or more and 50% worked 44 h or more before migration. These descriptive statistics indicate that part time work is the exception in our highly selective analytical sample of emigrants who had employment before and after migration. On average, weekly working hours are slightly reduced after migration for women (−1.4 h) and similar for men (+0.3 h). Among non-migrants, 90% worked 20 h or more and 50% worked 40 h or more weekly. In contrast to the emigrants, these results indicate that part time work is more common among stayers. Weekly working hours among stayers remained unchanged.

Almost every second emigrant works for a company that has more than 2000 employees, which is much higher than in the source population where less than a third work for such companies (SOEP 2017: 30%). Four in five individuals going abroad are self-initiated movers and the others have been deployed by the employer they had before migration (19%).

7.4.2 Multivariate Analyses

Table 7.2 presents the final results of the treatment effect of emigration on the net hourly wage differential between the present and before emigration. The model structure is based on that of the previous descriptive analysis (Table 7.1) and is

Table 7.2 Difference-in-Difference estimation

	Unadjusted		PPP-adjusted	
Before migration (t_0)				
Mean net hourly wage stayers	14.1		15.8	
Mean net hourly wage emigrants	21.8		24.3	
Difference net hourly wage (T-C)	7.7***	(0.68)	8.5***	(0.73)
After migration (t_1)				
Mean net hourly wage stayers	14.9		16.6	
Mean net hourly wage emigrants	30.4		33.7	
Difference net hourly wage (T-C)	15.5***	(0.68)	17.1***	(0.73)
Difference-in-Difference ($\Delta t_1 - \Delta t_0$)	7.8***	(0.96)	8.6***	(1.04)
Observations	9564		9564	
Control	8289		8289	
Treatment	1275		1275	

Standard errors in parentheses. Balanced sample. Sources: GERPSw1, SOEP2016/17

*** $p < 0.001$

compatible with the following multivariate regression analysis. In the DiD analysis, only individuals without missing values on independent variables are retained for the analysis. The model includes 1275 emigrants who reported net hourly wages before and after migration and 8289 non-migrants with wage information for the reference years 2016 and 2017.

The first three rows of Table 7.2 illustrate the mean net hourly wage of emigrants and of the weighted sample of non-migrants at the time before migration occurs. The weighted group of non-migrants is comparable to the analytical emigrant sample in terms of gender, age, and education. Before migration, German emigrants' average net hourly wage is 21.8 euros and German non-migrants' wage is 14.1 euros. Thus, before migration German emigrants' net hourly wage is on average 7.7 euros higher than among non-migrants (t_0). This wage increases to 14.9 euros among non-migrants and to 30.4 euros among emigrants after emigration (t_1). That amounts to an average difference of 15.5 euros in favour of emigrants and results in a DiD of 7.8 euros. In other words, the average net hourly wage gain of German emigrants is 7.8 euros compared with individuals staying in Germany. Model 2 is based on PPP-adjusted net hourly wages. The PPP adjustment increases the variance resulting in increased mean wages and wage differences and an average treatment effect of 8.6 euros. This lends initial support to our expectation of wage increases after migration.

The DiD estimation indicates a high positive treatment effect of emigration on net hourly wages. This finding holds for samples balanced by education, gender, and age. We performed several additional robustness checks. First, we calculated fixed-effects regressions (FE) of the treatment on the net hourly wage. The FE estimates intra-individual changes of the net hourly wage and controls for time-constant heterogeneity between both groups (Gangl 2010). Our FE regression on net hourly wages includes the treatment variable and period dummy variables as covariates. The effect of the treatment is 8.12 (SE 0.22) and the effect of the period is 0.46 (SE 0.08). Both effects are statistically significant and indicate no large difference between the FE result and the DiD result.

Second, we performed the analysis on several subsamples to deal with the large variance of net hourly wages before migration. We restricted the sample to individuals with low, middling, or high hourly wages before migration. We used three definitions including less than 10 euros, between 10 and 20 euros, and more than 20 euros. Results are similar for the first and second subsamples. For low earners, the treatment effect is 6.41 (SE 0.24) and for middling earners it is 6.81 (SE 0.28). The treatment effect for high earners is higher 12.96 (SE 7.63), but is only statistically significant at the 10% level. These results indicate positive wage changes after migration in each respective group. However, the increase is most pronounced among high wage earners.

Third, we excluded all emigrants to Switzerland. This country is a popular destination for German emigrants and wages are, partly owed to currency strength, comparatively high. Migrants destined to Switzerland therefore have a strong positive influence on the wage change. The treatment effect in this reduced sample is 5.70 euros (SE 0.87) and statistically significant. Compared to the effect in our baseline

model, the effect decreases slightly, but the net wage change remains high and positive. Table 7.3 shows beta coefficients and standard errors from a linear regression on the net hourly wage differential between present wage and wage before migration. *Ceteris paribus*, the wage difference is 4% smaller for women than for men. Thus, women benefit less than men from the potential for wage growth that comes with migration. This is an indication that emigration increases women's existing wage disadvantage, but the coefficient is not statistically significant. We should keep in mind, though, that women are more likely to be tied movers and are therefore also more likely to become inactive abroad (Boyle et al. 2001) and thus dropped from the analytical sample. Age is negatively correlated with the wage change. With each age year, the wage change decreases by 1%.

Differences in the wage change in educational groups do not diverge significantly from the wage change of master's degree holders. Similarly, the coefficient for work experience is zero. These results do not indicate unequal returns to emigration for individuals with varying human capital endowments. Thus, our results do not support the notion that emigration is a process of cumulative (dis)advantage in terms of wages.

Table 7.3 Linear regression on log net hourly wage change ($t_1 - t_0$)

	Unadjusted change		PPP-adjusted change	
	β	SE	β	SE
Gender woman	-0.04	(0.03)	-0.03	(0.03)
Age (t_1)	-0.01*	(0.00)	-0.01	(0.00)
ISCED (ref. MA degree)				
(1) Post-secondary, short-cycle tert. or less	0.05	(0.05)	0.07	(0.05)
(2) BA degree or equivalent	-0.01	(0.03)	0.02	(0.04)
(3) MA degree or equivalent	—	—	—	—
(4) Doctoral or equivalent	0.03	(0.04)	-0.00	(0.04)
Work experience in years	0.00	(0.00)	0.00	(0.00)
Change in no. of supervisees (ref. none)				
Fewer supervisees	0.01	(0.03)	0.05	(0.04)
More supervisees	0.06	(0.03)	0.13***	(0.03)
German official language in destination	0.30***	(0.03)	-0.05	(0.03)
English official language in destination	0.10**	(0.03)	-0.18***	(0.04)
Stay abroad during school +1 month	0.02	(0.03)	0.03	(0.03)
Civil servant (ref. employee/worker)	0.08	(0.07)	0.01	(0.07)
More than 2000 employees (ref. < 2000)	0.09***	(0.03)	0.07*	(0.03)
Expat status: Deployed (ref. self-initiated)	0.19***	(0.04)	0.27***	(0.04)
>1 mil. inhabitants in destination place	0.01	(0.03)	0.21***	(0.03)
Constant	0.40**	(0.12)	0.42**	(0.13)
Observations	1275		1275	
Adjusted R^2	0.095		0.132	

Standard errors in parentheses. Sources: GERPSw1, SOEP2016/17

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

There is some evidence that changes in supervisory responsibilities do affect average wage changes. For those who are responsible for more supervisees after migration than before migration the average wage increases by 6% compared with those without change in the supervisory power. However, the correlation is not statistically significant. For those whose responsibility shrinks in terms of the number of supervisees, the model indicates a small non-significant wage improvement.

Countries where German is an official language are associated with an average hourly wage benefit of 30%. The association for English-speaking countries is also positive but smaller at 10%. Both findings are statistically significant. The coefficient for stays abroad during school, our indicator for transnational human capital, is small and not statistically significant.

The mean wage differential between civil servants and employees and workers is not statistically significant. The wage differential is high and positive for those working in big companies compared with smaller employers (+9%) and for those who were posted by their employers (+19%) compared with self-initiated movers. Both coefficients are statistically significant. Both premiums indicate CA since employees in large firms (Troske 1999) and multinational companies (Schröder 2018) are known to enjoy wage premiums regardless of migration, taking expat status as an indicator of multinational employer activity. The expat premium indicates that the transferability of human capital indeed is associated with higher wage growth among emigrants.

Finally, we consider average wage differences by urbanity. Results suggest that the average wage change for those going to cities with more than one million inhabitants is not different from smaller places.

We replicated the analysis using PPP-adjusted wages to account for costs of living. PPP-adjusted wages have a higher variance between countries. The changes in coefficients compared to the raw wage measures indicate several systematic variations between emigration countries (and their respective PPP indicators) and our covariates. In general, we recommend treating the adjusted wage estimates carefully. They obscure vast variation of PPPs within countries. While country averages could be indicative in some countries, they can be misleading in others. For example, identical incomes could translate into very different purchasing powers in rural China and Beijing while the country average is in between. The changes of the 'German language' and 'English language' coefficients may have substantial meanings because identical wages may grant much lower purchasing power in English- and German-speaking countries compared with Germany. However, when it comes to the increased correlation for large cities, we would be more cautious with substantial interpretations. Within-country variation of PPPs, which our country-level measure does not account for, could partly account for these changes in coefficients.

7.5 Discussion and Conclusion

Our analyses lend initial support to the expectation of wage increases through migration among German emigrants. We calculated DiD estimates to examine the association between emigration and wage change by comparing wage changes of emigrants and non-migrants. Wage increases are on average 8 euros higher among emigrants than among the reference population. Our calculations are based on a reweighted SOEP sample that assures balance in terms of gender, age, and education. In this way, we account for the selectivity of emigration from Germany since emigrants are on average younger and have higher education levels (Ette and Witte 2021). Furthermore, men are overrepresented in our analytical sample owed to the restriction to individuals who were employed both before and after emigration. Although our weights do account for crucial correlates of emigration, they could be improved. Therefore, future studies should account for a refined set of covariates for the generation of balancing weights. There are indications that the likelihood of emigration correlates with several other observable and unobservable characteristics like health (Stawarz et al. 2021), family status (Baykara-Krumme et al. 2021; Erlinghagen 2021), and risk affinity (Lübke et al. 2021). This is beyond the scope of this chapter but should be the next step of analysis.

Our multivariate regressions aim to explain the quality of wage changes among emigrants by their varying characteristics. There is no indication of systematic correlations between socio-demographic characteristics and the wage change. The wage change seems to be uncorrelated with gender and formal skills. This finding holds when we calculate models based on PPP-corrected wages. Age is negatively correlated with the wage change, meaning that the wage gain through emigration decreases by 10% for 10 years of age. Characteristics of the employer and the employment are fairly stable. Those working for employers with more than 2000 employees and those deployed by their employers are consistently shown to receive higher returns than the respective reference groups. Some findings are sensitive to the change from raw wage changes to PPP-wage changes. Our measures of the transferability of human capital indicate positive associations in the model based on raw wages, but negative associations in the model based on PPP wages. This is an indication that raw wage increases are relatively high in German- and English-speaking countries. However, PPP-adjusted wages could result in wages below the German level. For example, raw wage increases may be higher for emigrants in Switzerland, USA, and the UK compared with other destination countries. Net of purchasing power, however, wages are apparently lower in these countries compared with other destinations. Overall, this evidence shows how the implications of the human capital perspective are sensitive to the way we deal with purchasing power differences.

Migrants may benefit from language skill regardless of the official destination country language. Future studies should therefore include better indicators of human capital transfer. Actual language skills and the use of specific languages at work would be such indicators. Moreover, we find some indications that employer

characteristics like firm size and multinational employer activity foster cumulative advantages, whereas individual human capital endowments do not. Transnational human capital measured by stays abroad during school is uncorrelated with the wage change according to our models. This does not support the assumption of transnational human capital (Gerhards and Hans 2013).

We want to mention three directions where research should expand in the future. First, we considered short-term changes in wages. Recently, several studies have pointed to the variation between short-term and long-term consequences of migration (Lersch 2014; McKenzie et al. 2010; Mulder and van Ham 2005; Newbold 1996). This chapter used information from the first wave of GERPS. In the near future, it will cover a longer period of up to 4 years and invites additional analyses that exploit these longitudinal data to analyse mid-term and long-term consequences of migration.

Second, the improvement of living standards is a major motive for emigration. Therefore, wage changes are a crucial and personally relevant indicator of labour market consequences of migration. Our analysis of wage changes through emigration from a highly developed country adds a stone to the mosaic. However, there are quite a few alternative labour market outcomes that are potentially affected by international migration. GERPS yields information about occupations, industries, and social classes in the first wave. Consecutive waves complete the picture by providing information about social origin (see Witte et al. 2021 in this volume), first job, unemployment, and occupational closure.

Third, this chapter concentrates on labour market outcomes of emigrants. The case of Germany contributes important insights in a field that has almost exclusively focused on emigration from developing countries and internal migration in developed countries. At the same time, we know very little about the labour market outcomes of return migrants in their countries of origin. GERPS provides a wealth of information about returnees' labour market participation both before and after their return. Furthermore, these data allow for comparisons of return migrants with the non-migrant population through linkage with the SOEP.

This chapter exemplarily shows how GERPS and its linkage with SOEP can be exploited to analyse wage changes among German emigrants. Our analysis indicates that emigration from Germany is beneficial in terms of wages. While individuals with varying human capital seem to benefit similarly, there is evidence that women benefit less than men and certain categories of workers like those in big companies enjoy premiums. We need more research to understand whether and how migration relates to labour market outcomes and how this may spur or mitigate inequalities in the country of origin.

References

- Adsera, A., & Chiswick, B. R. (2007). Are there gender and country of origin differences in immigrant labor market outcomes across European destinations? *Journal of Population Economics*, 20, 495–526.
- Akresh, I. R. (2006). Occupational mobility among legal immigrants to the United States. *International Migration Review*, 40(4), 854–884.
- Angrist, J. D., & Pischke, J.-S. (2008). *Mostly harmless econometrics: An Empiricist's companion*. Princeton, NJ: Princeton University Press.
- Baykara-Krumme, H., Erlinghagen, M., & Mansfeld, L. (2021). Disruption of family lives in the course of migration: 'Tied Migrants' and partnership breakup patterns among German (r) emigrants. In M. Erlinghagen, A. Ette, N. F. Schneider, & N. Witte (Eds.), *The global lives of German migrants. Consequences of international migration across the life course*. Cham: Springer.
- Borjas, G. J. (1987). Self-selection and the earnings of immigrants. *The American Economic Review*, 77(4), 531–553.
- Borjas, G. J. (1991). Immigration and self-selection. In J. M. Abowd & R. B. Freeman (Eds.), *Immigration, trade and the labor market* (pp. 29–76). Chicago: University of Chicago Press.
- Borjas, G. J., Kauppinen, I., & Poutvaara, P. (2018). Self-selection of emigrants: Theory and evidence on stochastic dominance in observable and unobservable characteristics. *The Economic Journal*, 129(617), 143–171.
- Boyle, P., Cooke, T. J., Halfacree, K., & Smith, D. (2001). A cross-national comparison of the impact of family migration on women's employment status. *Demography*, 38(2), 201–213.
- Buzdugan, R., & Halli, S. S. (2009). Labor market experiences of Canadian immigrants with focus on foreign education and experience. *International Migration Review*, 43(2), 366–386.
- Chiquiar, D., & Hanson, G. H. (2005). International migration, self-selection, and the distribution of wages: Evidence from Mexico and the United States. *Journal of Political Economy*, 113(2), 239–281.
- Chiswick, B. R. (1978). The effect of Americanization on the earnings of foreign born men. *Journal of Political Economy*, 86(5), 897–922.
- Chiswick, B. R., Lee, Y. L., & Miller, P. W. (2005). Longitudinal analysis of immigrant occupational mobility: A test of the immigrant assimilation hypothesis. *International Migration Review*, 39(2), 332–353.
- Diehl, C., & Dixon, D. (2005). Zieht es die Besten fort? Ausmaß und Formen der Abwanderung deutscher Hochqualifizierter in die USA. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 57(4), 714–734.
- DiPrete, T. A., & Eirich, G. (2006). Cumulative advantage as a mechanism for inequality: A review of theoretical and empirical developments. *Annual Review of Sociology*, 32, 271–297.
- Doeringer, P. B., and Piore, M. J. (1971). *Internal labor markets and manpower analysis*. London: Sharpe.
- Duleep, H., & Regets, M. C. (1999). Immigrants and human capital investment. *American Economic Review*, 89(2), 186–190.
- Dumont, J.-C., & Lemaître, G. (2005). Counting immigrants and expatriates in OECD countries. *OECD Social, Employment and Migration Working Papers* 25. Paris.
- Enders, J., & Bornmann, L. (2002). Internationale Mobilität bundesdeutscher Promovierter—Eine Sekundäranalyse der Kasseler Promoviertenstudie. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung*, 35, 60–73.
- Engler, M., Erlinghagen, M., Ette, A., Sauer, L., Scheller, F., Schneider, J., & Schultz, C. (2015). *International Mobil: Motive, Rahmenbedingungen und Folgen der Aus- und Rückwanderung deutscher Staatsbürger*. Berlin: Sachverständigenrat deutscher Stiftungen für Integration und Migration (SVR).
- Erlinghagen, M. (2011). Nowhere better than here? The subjective well-being of German emigrants and remigrants. *Comparative Population Studies*, 36(4), 899–926.

- Erlinghagen, M. (2021). Migration motives, timing, and outcomes of internationally mobile couples. In M. Erlinghagen, A. Ette, N. F. Schneider, & N. Witte (Eds.), *The Global lives of German migrants. consequences of international migration across the life course*. Cham: Springer.
- Ette, A., Décieux, J. P., Erlinghagen, M., Guedes Auditor, J., Sander, N., Schneider, N. F., & Witte, N. (2021). Surveying across borders: The experiences of the German emigration and remigration panel study. In M. Erlinghagen, A. Ette, N. F. Schneider, & N. Witte (Eds.), *The global lives of German migrants. Consequences of international migration across the life course*. Cham: Springer.
- Ette, A., & Sauer, L. (2010). *Auswanderung aus Deutschland. Daten und Analysen zur internationalen Migration deutscher Staatsbürger*. Wiesbaden: VS.
- Ette, A., & Witte, N. (2021). Brain drain or brain circulation? Economic and non-economic factors driving the international migration of german citizens. In M. Erlinghagen, A. Ette, N. F. Schneider, & N. Witte (Eds.), *The global lives of German migrants. Consequences of international migration across the life course*. Cham: Springer.
- Favell, A., Feldblum, M., & Smith, M. P. (2007). The human face of global mobility: A research agenda. *Society*, 44(2), 15–25.
- Friedberg, R. M. (2000). You can't take it with you? Immigrant assimilation and the portability of human capital. *Journal of Labor Economics*, 18(2), 221–251.
- Fuller, S. (2015). Do pathways matter?: Linking early immigrant employment sequences and later economic outcomes: Evidence from Canada. *International Migration Review*, 49(2), 355–405.
- Fuller, S., & Martin, T. F. (2012). Predicting immigrant employment sequences in the first years of settlement. *International Migration Review*, 46(1), 138–190.
- Gangl, M., and DiPrete, T. A. (2004). Kausalanalyse durch Matchingverfahren. *DIW Berlin Discussion Papers*.
- Gangl, M. (2006). Scar effects of unemployment: An Assessment of institutional complementarities. *American Sociological Review*, 71(6), 986–1013.
- Gangl, M. (2010). Causal inference in sociological research. *Annual Review of Sociology*, 36, 21–47.
- Gerhards, J., & Hans, S. (2013). Transnational human capital, education, and social inequality. Analyses of international student exchange. *Zeitschrift für Soziologie*, 42(2), 99–117.
- Goebel, J., Grabka, M. M., Liebig, S., Kroh, M., Richter, D., Schröder, C., & Schupp, J. (2019). The German Socio-Economic Panel (SOEP). *Jahrbücher für Nationalökonomie und Statistik*, 239(2), 345–360.
- Gould, E. D., & Moav, O. (2016). Does high inequality attract high skilled immigrants? *The Economic Journal*, 126(593), 1055–1091.
- Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20, 25–46.
- Hainmueller, J., & Xu, Y. (2013). ebalance: A stata package for entropy balancing. *Journal of Statistical Software*, 54(7), 1–18.
- Halaby, C. N. (2004). Panel models in sociological research: Theory into practice. *Annual Review of Sociology*, 30(1), 507–544.
- Heath, A., & Yu, S. (2005). Explaining ethnic minority disadvantage. In A. Heath & S. Yu (Eds.), *Understanding social change* (pp. 187–224). Oxford: Oxford University Press.
- Kogan, I. (2011). New immigrants—old disadvantage patterns? Labour market integration of recent immigrants into Germany. *International Migration*, 49(1), 91–117.
- Kopetsch, T. (2009). The migration of doctors to and from Germany. *Journal of Public Health*, 17(1), 33–39.
- Lersch, P. M. (2014). *Residential relocations and their consequences: Life course effects in England and Germany*. Wiesbaden: Springer.
- Lübke, C., Décieux, J. P., Erlinghagen, M., & Wagner, G. G. (2021). Comparing the risk attitudes of internationally mobile and non-mobile Germans. In M. Erlinghagen, A. Ette, N. F. Schneider,

- & N. Witte (Eds.), *The global lives of German migrants. Consequences of international migration across the life course*. Cham: Springer.
- Mau, S., Verwiebe, R., Kathmann, T., & Seidel, N. (2008). Die Arbeitsmigration von Deutschen in Europa : erste Ergebnisse einer qualitativen Untersuchung. In K.-S. Rehberg (Ed.), *Die Natur der Gesellschaft: Verhandlungen des 33. Kongresses der Deutschen Gesellschaft für Soziologie in Kassel 2006. Teilbd. 1 u. 2* (pp. 4471–4481). Frankfurt am Main: Campus Verlag.
- McKenzie, D., Stillman, S., & Gibson, J. (2010). How Important is Selection? Experimental vs. Non-Experimental Measures of the Income Gains from Migration. *Journal of the European Economic Association*, 8(4), 913–945.
- McManus, W., Gould, W., & Welch, F. (1983). Earnings of Hispanic Men: The Role of English Language Proficiency. *Journal of Labor Economics*, 1(2), 101–130.
- Mincer, J. (1974). *Schooling, experience, and earnings*. New York, London: Columbia University Press.
- Morgan, S. L., & Winship, C. (2015). *Counterfactuals and causal inference: Methods and principles for social research*. New York: Cambridge University Press.
- Mulder, C. H., & van Ham, M. (2005). Migration histories and occupational achievement. *Population, Space and Place*, 11, 173–186.
- Newbold, K. B. (1996). Income, self-selection, and return and onward interprovincial migration in Canada. *Environment & Planning A*, 28(6), 1019–1034.
- Nowicka, M. (2014). Migrating skills, skilled migrants and migration skills: The influence of contexts on the validation of migrants' skills. *Migration Letters*, 11(2), 171–186.
- Parey, M., Ruhose, J., Waldinger, F., & Netz, N. (2017). The selection of high-skilled emigrants. *The Review of Economics and Statistics*, 99(5), 776–792.
- Rosen, S. (1981). The economics of superstars. *The American Economic Review*, 71(5), 845–858.
- Rubin, D. B. (1974). Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Educational Psychology*, 66(5), 688–701.
- Salmonsson, L., & Mella, O. (2013). Cultural demands on skilled immigrants, a devaluation of human capital: The case of immigrant physicians in Sweden. *Nordic Journal of Migration Research*, 3(1), 3–9.
- Schröder, S. (2018). *Wage inequality and the role of multinational firms: evidence from German linked employer-employee data*. Edinburgh. <https://freit.org/WorkingPapers/Papers/ForeignInvestment/FREIT1435.pdf>. Accessed 1 Oct 2020.
- Sjaastad, L. A. (1962). The costs and returns of human migration. *Journal of Political Economy*, 70(5), 80–93.
- Stawarz, N., Ette, A., & Rüger, H. (2021). Healthy migrants? Comparing subjective health of German emigrants, remigrants and non-migrants. In M. Erlinghagen, A. Ette, N. F. Schneider, & N. Witte (Eds.), *The global lives of German migrants. Consequences of international migration across the life course*. Cham: Springer.
- Troske, K. R. (1999). Evidence on the employer size-wage premium from worker-establishment matched data. *Review of Economics and Statistics*, 81(1), 15–26.
- van Dalen, H. P., & Henkens, K. (2007). Longing for the good life: Understanding emigration from a high-income country. *Population and Development Review*, 33(1), 37–65.
- Witte, N., Pollak, R., & Ette, A. (2021). Social origins of German emigrants: Maintaining social status by international mobility? In M. Erlinghagen, A. Ette, N. F. Schneider, & N. Witte (Eds.), *The global lives of German migrants. consequences of international migration across the life course*. Cham: Springer.
- Worldbank. (2019). *Price level ratio of PPP conversion factor (GDP) to market exchange rate*. <https://data.worldbank.org/indicator/PA.NUS.PPPC.RF>. Accessed 26 Jan 2021.

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