INSTITUTE FOR EMPLOYMENT RESEARCH
The Research Institute of the Federal Employment Agency

IAB-DISCUSSION PAPER

Articles on labour market issues

26|2020 On the foreign to native wage differential in Germany: Does the home country matter?

Stephan Brunow, Oskar Jost

ISSN 2195-2663

On the foreign to native wage differential in Germany: Does the home country matter?

Stephan Brunow (University of Applied Labour Studies, HdBA),
Oskar Jost (Institute for Employment Research, IAB)

Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

The “IAB Discussion Paper” is published by the research institute of the German Federal Employment Agency in order to intensify the dialogue with the scientific community. The prompt publication of the latest research results via the internet intends to stimulate criticism and to ensure research quality at an early stage before printing.

Contents

Tables

Abstract

The German labour force is expected to shrink in the next two decades due to a decline in population. Therefore, the immigration of workers from abroad could compensate potential negative effects of such decline. Is Germany competitive for immigration – i. e., do German employers pay enough to make it attractive as a destination country? We explore the wage gap between foreigners and German employees in particular and focus on different countries of origin to better understand issues related to wage setting among these groups. For this purpose, a threefold Oaxaca–Blinder decomposition is performed using a comprehensive data with a vast amount of information on a large number of workers and firms. The results suggest that most of the wage gap can be explained by observed characteristics, and in most cases, very little difference remains unexplained. We provide evidence on differences specific to the country of origin which could be taken in into consideration to attract people from abroad to better integrate them into the German labour market.

Zusammenfassung

Es ist zu erwarten, dass die Anzahl der Erwerbstätigen in Deutschland in den nächsten beiden Dekaden erheblich schrumpfen wird. Migrationsströme aus dem Ausland können die damit verbundenen negativen Effekte kompensieren. Damit geht die Frage einher, ob Deutschland für Migranten ein attraktives Ziel darstellt – zahlen Arbeitgeber genug, um für Migranten attraktiv genug zu sein? Wir analysieren das Lohngefälle zwischen ausländischen und deutschen Beschäftigten in Vollzeit und berücksichtigten dabei das Herkunftsland, um etwaige landesspezifische Unterschiede in der Lohnsetzung und Lohnstrukturen besser zu verstehen. Hierfür nutzen wir eine dreiteilige Oaxaca-Blinder Zerlegung und einen umfangreichen Datensatz mit diversen Informationen zu Individuen und Firmen. Die Ergebnisse zeigen, dass der Großteil der Lohnlücke auf Unterschiede in den beobachtbaren Charakteristiken zurückgeführt werden kann und zumeist nur sehr wenig unerklärt bleibt. Weiterhin zeigen wir Unterschiede zwischen den Herkunftsländern, die bei der Anwerbung der Beschäftigten berücksichtigt werden sollten, um die Personen besser in den Arbeitsmarkt zu integrieren.

JEL classification

J31, J60, R23

Keywords

Migrant pay gap, country specific wage gap, inequality, Oaxaca-Blinder decomposition

Acknowledgements

We would like to thank Uwe Blien, Viktor Venhorst, Duncan Roth, Anja Rossen and participants at the ERSA Congress 2019 in Lyon/ France for many valuable comments and suggestions as well as Johannes Ludsteck for his valuable support regarding the quantile decomposition. Furthermore, we thank Jeanette Carstensen for excellent research assistance.

1 Introduction

Current German labour market research points out that an immigration flow of more than 400,000 people per year is necessary to prevent the German labour force from declining in the next few decades (Fuchs et al. 2017). Which countries should all these (skilled) individuals come from – and is Germany attractive for immigration from these countries in terms of expected earnings? Can migrants expect fair wages given their individual skill levels and endowments? This question is the subject of numerous studies, although most of them do not take into account the heterogeneity of migrants with respect to their home countries and therefore provide only rough answers. This is the initial situation on which the following analysis is based.

Similar to Lehmer/Ludsteck (2011, 2015) and Brunow/Jost (2019), we focus on the wage differences between Germans and foreigners grouped by country of origin. This separation not only takes into account the changed immigrant structure in recent years but also better captures the heterogeneity of migrants with respect to their educational levels, among others.

The triggers, which changed the migrant structure in recent years, are essential: Gastarbeiter, or "guest workers", in the 1960s and 1970s had primarily low qualification structures and were required to fill the vacancies in production. Most of these workers came from Spain, Italy, Turkey, former Yugoslavia, and some from Portugal. Since 1990, significant changes have emerged. Ethnic Germans from the former Soviet Union as well as refugees from former Yugoslavia settled down in Germany. After that, migration to Germany increased in the course of the economic recovery in the mid-2000s. The economic crisis in the years 2008 to 2010 clearly reinforced this trend. For instance, people from crisis-ridden countries such as Greece, Italy, Portugal, and Spain took advantage of the possibility of free movement of workers for their countries of origin and migrated to Germany. These workers had a different qualification and experience structure compared to the previous migrants in Germany. Their qualification structure was considerably higher than for older migrant groups. For example, around 40 percent of immigrants in 2011 hold academic degrees. After this, the gradual expansion of the free movement of labour zone in Europe has contributed to increased migration rates from neighbouring countries of the EU-8 since 2011. As these workers had, on average, lower qualification structures, the average qualification level of migrants declined from around that time on. Then, in 2014, free movement of workers was granted to the EU-2 countries Bulgaria and Romania.

Germany was somewhat restrictive in granting free movement of workers to the EU-8 and EU-2 countries. The majority of other countries in the EU had already granted the EU-8 and EU-2 countries access to their labour markets in 2004 and 2007, respectively. As a result, workers with higher education levels were more likely to migrate to the UK or Ireland. Nevertheless, these newer migrant flows to Germany had higher qualification structures on average compared to settled migrants in Germany. These changes in qualification structures were accompanied by labour market experience which differs from the other migrants in Germany. Immigration from other countries – the remaining world – was very restrictive back then. Briefly, potential migrants from the rest of the world were required to already have a job contract or be in contact with an employer in order to migrate to Germany, or else have certain levels of qualification. Some exceptions existed, mainly for specific occupations according to a white list as a cause of labour shortages and for

students in certain fields. Given the immigration structures and policy changes in the past, in this analysis we want to focus on migrants from the EU-15, EU-8, and EU-2 and Balkan countries, from Turkey, and the remaining world. We are comparing them to German employees to identify wage differentials and potential (un)fair payment.

Our analysis is based on the Oaxaca–Blinder decomposition methodologies. We use a unique linked employee-employer dataset including about 10 percent of all German employees. Such a large sample secures a sufficient overlap in characteristics between foreigners and Germans. The comparison group is German employees who work for the same firms as the migrants included. We identify certain patterns among the foreigners and provide evidence on structural differences within the wage structures based on individual characteristics, educational levels, and firm variables, among others.

The paper is structured as follows: Section 2 reviews related literature on the wage gap between foreigners and natives with a German focus. At the end of this section we derive the relevant hypotheses. Section 3 provides information on the data basis, and Section 4 introduces the variables under consideration. Some descriptive insights are provided in Section 5. Section 6 introduces the decomposition method and the econometric discussion. The results of the multivariate analysis are presented in Section 7. Section 8 discusses the differences among Germans and foreigners, taking heterogeneity into consideration, and presents further robustness checks. Finally, Section 9 concludes.

2 Literature Review

The wage gap between migrants and nationals is the subject of numerous studies in Germany. The results are quite clear: the studies indicate that migrants earn significantly lower wages than German employees do. There are different explanations for this: Nanos and Schluter (2014) show that migrants have lower reservation wages and certain search frictions. They are therefore willing to offer their work capacity on the labour market at lower wages, which entails a pay gap. Aldashev/Gernandt/Thomsen (2012) emphasise the differences in both, qualification- and occupation-related structure between migrants and German workers. These differences result from the migrant cohorts of the past, which were characterised by low qualifications. In principle, there are two difficulties associated with this approach, leading to biased estimates: Foreign educational qualifications are not (fully) recognised and reported in the data and most of the current and available data do not contain any information on the level of language and literacy – another source for differences in qualification. Aldashev/Gernandt/Thomsen (2012) complement their analysis with potential solutions by including another group of migrants: those who have acquired their educational qualifications in Germany. This approach solves a large part of the problem, because it can be assumed that these persons have an adequate language level and that their educational qualifications can be considered to be of full value here. Addressing this issue in their analysis, the authors find that the unexplained wage gap shrinks remarkably to around 2 percent. Hofer et al. (2017) analyse the pay gap for the Austrian area and use second-generation migrants as a reference instead. This group should have little or no difficulties with language or recognition of educational qualifications. Again, the unexplained wage gap shrinks clearly almost to zero. A study by

Himmler and Jäckle (2017) from Germany uses precise information on language skills and concludes that the complete pay gap can be explained if information on language level is taken into account.

Lehmer and Ludsteck (2011, 2015) focus on new migrant groups in Germany. They explicitly control for firm fixed effects and therefore deliver unbiased estimates due to unobserved firm characteristics. Unobserved firm heterogeneity potentially drives wage differences not between foreigners and Germans but between firms. However, since they focus on new migrant groups, they are unable to observe and study the long-term integration process. Thus, a wage gap might occur due to uncontrolled language barriers leading to biased estimates, as described above.

Similar to Lehmer and Ludsteck (2011, 2015), we consider migrants from the new EU member states but additionally from other countries of origin. We can build the analysis with more recent data and capture a longer time horizon. Furthermore, we identify differences between the migrant groups with regard to their individual characteristics. This provides an insight into the specific differences between the groups, which contributes substantially to the political-economic integration debate and active labour market policy programmes can be adjusted to the specific needs of the respective groups. In our empirical analysis, we explicitly account for differences in individual characteristics, characteristics describing the integration process, selectivity into occupations, tasks and firms.

3 Data

For our analysis, we use a sample of the Integrated Employment Biographies (IEB) provided by the Institute for Employment Research. The IEB contains individual day-by-day information on employees working subject to social security contributions on the German labour market, excluding self-employed persons and civil servants. The data provides information on over 90 percent of the entire German workforce. Our sample covers around 10 percent of all foreign employees in Germany. Such a huge data set secures a sufficient overlap in the groups of Germans and foreigners, even if we disentangle by migrant groups. We prepare our data for a cross-section analysis using the reference day 15th of September 2015. For the period from 1975 to 2015, information is available on the respective individual employment and unemployment insurance periods within Germany. We compile the entire employment biographies for each person and evaluate any changes in, among others, wages, place of work, industrial sector, age, or occupation occurring at some point in the subjects' lives to capture individual heterogeneity.

The IEB record information on nationality. Because we explicitly consider migrant groups, only those employees for whom information on nationality is available are included in our data sample. There is no information on citizenship recorded, or else we would have preferred to use that as a factor instead of nationality. However, the IEB is the only existing data base in Germany which allows controlling for firm characteristics by merging firm information to the individuals; we have to accept this limitation. Based on the employment biographies, we can identify immigrated individuals who were naturalised during their stay in Germany by changing their nationality to "German". These naturalised Germans are marked dummies and considered in several sensitivity analyses.

Similar to Brunow/Jost (2019), our comparison group is Germans who work in the same firms as the foreigners included. This enables to control for firm effects even more precise and takes the selectivity of firms and individuals in regions into account.

Because we are interested in the differences between various immigration groups, we distinguish between foreigners of the EU-15, the new Member States EU-8 and EU-2 (Bulgaria/Romania), Turkey, and rest of the world. However, the latter does not provide useful results due to the high heterogeneity within this group.

We consider both men and women in our analysis to get a broader picture of the labour market situation for both genders, which is important when it comes to attracting female migrants for Germany, too, in the context of skilled labour demand. In contrast, existing studies are often limited to men. However, as our focus is on labour-oriented immigration, we restrict our analysis to full-time employees, as this group is closer to the labour market. Because the data does not report hours of work, including only full-time employees gives us comparable working times. That fact allows for more valid statements to be made. As our data period extends until 2015, the absolute majority of our considered group of migrants is first-generation migrants. There have been legislative changes since the year 2000, granting young second-generation migrants the option to become German or obtain dual citizenship. However, these changes do not affect us, as these persons did not enter the labour market until around 2016 (at the age of 16).

We complement our individual data with additional firm characteristics. As a result, precise firm information of the firm is available for each employee including the size, location, and the proportion of highly qualified employees of the firm, among others. We are thus able to use extensive information from the firm level when analysing the pay gap, which gives us a better insight into the labour market structures of migrants.

Finally, we improve the data quality by relying on two proven imputation techniques. First, we impute the education variable according to Fitzenberger/Osikominu/Völter (2005). This imputation considerably reduces cases where there is no or invalid information on education. The second imputation according to Card/Heining/Kline (2013) corrects the information on employees' high wages, which are censored at the upper limit for social contributions (6,050 EUR/month for West and 5,200 EUR/month for East Germany in 2015). The imputation leads to a wage distribution that is not censored at the social contribution limit and is therefore more representative for the intended wage decomposition.

4 Variables

Table 1 details the individual variables and a brief description.

Table 1: Individual characteristics

Variable	Description
Personal characteristics (INDIVID)	
Gender	Indicator of gender (1=female, 0=male)
Age	Categorical variable representing the individual's age grouped into five age brackets: 16–24 years old, 25–34 years old, 35–44 years old, 45–54 years old, 55–64 years old
Educational attainment and vocational training (EDUC)	
School-leaving certificate[1)]	Categorical variable of highest school certificate, consisting of three groups: no school graduation, intermediate school-leaving certificate and upper secondary school-leaving certificate (Abitur//higher education entrance qualification)
Vocational Education[1)]	Categorical variable of highest vocational qualification, consisting of three groups: no vocational qualification, vocational education and training (VET)[2)], and university degree
VET training Germany	A dummy variable indicating whether the worker has completed VET training in Germany
Labour market experience (EXP)	
Observed time in data	Categorical variable indicating four quantiles of the distribution of years observed in the data
Share of non-employment in the data	Categorical variable representing the share of time observed in which a worker was not in employment: < 5 %, > 5 % and < 10 %, > 10 % and < 25 %, and > 25 % and < 75 %
Ln mean duration	Log of no. of years working per firm
Ln firm duration	Log of years working in current firm
Selectivity-related variables on location, industry, and occupation	
Regions (LM-REGION)	Categorical variable encompassing 141 labour market regions in Germany
Occupation (OCC)	Categorical variable encompassing 50 occupations according to the occupational classification system KldB 2010 (related to ISCO-08)
Task level (TASK)	Categorical variable representing three different task levels of the job. It consists of three groups: auxiliary activity (unskilled task), trained/professional task (clerks), and specialist/expert task
Industry (IND)	Categorical variable encompassing 96 distinct industries at the 2-digit level according to the German classification scheme WZ 2008 (NACE Rev. 2.)
Supervisor	Dummy variable indicating whether an employee is a supervisor
Executive	Dummy variable indicating whether an employee is an executive

1) A correction procedure was applied for both variables (Fitzenberger/Osikominu/Völter 2005).

2) The system of Vocational education and training (VET) is quite unique in the international context. The training takes place in private firms and is combined by education in public schools. This training usually lasts 3 years.

Source: Own variable definitions.

Because we do not limit our analysis to individual characteristics only, we provide the firm characteristics in Table 2. The CHK effects are particularly relevant for our analysis; they help us to control a large part of the unobserved firm heterogeneity.

Table 2: Firm characteristics

Variable	Description
Key firm variables (FIRM)	
Firm size	Categorical variable representing the number of employees and consisting of four groups: 1–9 employees, 10–49 employees, 50–249 employees, and above 250 employees
Females	Proportion of females employed in the firm
Youth	Proportion of employees under 35 years of age
Human capital intensity	Two variables capturing the human capital intensity of the firm: first, the proportion of professional assistants employed, and second, the proportion of specialists/experts employed, each as a share of total employment in the firm
Firm age	Categorical variable representing the firm age in years, consisting of the following groups: under 5 years old, 5–10 years old, 10–25, and over 25 years old
Characteristics for robustness checks	
Card-Heining-Kline effects	Firm and individual specific effects defined by Card, Heining, and Kline (2013) that capture all unobserved firm and individual characteristics
Proportion of foreigners	The proportion of foreigners employed in the firm aims to control for firms having previous experience of employing foreigners. In addition, it controls for segregated ethnic communities that exhibit lower productivity levels on average.

Source: Own variable definitions.

5 Descriptive Analysis

Table 3: Distribution of daily gross median wages for full-time employees

15th of September 2015, Wages per day in Euro

	Germans	Foreigners					
		All Foreigners	EU-15	EU-8	EU-2 + Balkan	Turkey	Remaining World
Wage €	120.55	90.64	105.54	71.85	82.97	99.18	94.10
No. obs.	1,514,150	142,305	44,815	20,693	26,475	41,321	43,628
Separated by tasks							
Auxiliary workers	80.30	69.15	77.05	58.81	64.31	85.09	69.04
Clerks	109.56	89.24	98.18	74.66	84.83	102.36	88.85
Experts[1)]	168.33	150.08	167.79	141.81	146.89	134.34	152.08

1) The group of experts includes both, experts and specialists.

Source: Own calculation based on IEB V12.01.

The descriptions in Table 3 provide an initial overview of the wage structure and clearly reveal that there are large wage differences between the groups themselves. The German employees have a median wage, which is higher than that of all the foreign groups. With a median gross daily wage of around 120 Euro, they earn around 15 Euro more than the second highest income group, the EU-15 foreigners. At the same time, migrants from the EU-8 countries have the lowest median gross wage of 72 Euro per day. Thus, the range of the median wages in the groups between the highest and lowest median wages amounts to approximately 50 Euro. In addition, the table contains the

median wages conditionally at the task levels, which we have split into three categories: auxiliary workers, Clerks, and Specialists/Experts.

An interesting picture emerges here: Among the auxiliary workers, Turkish employees have the highest median income, which even exceeds that of Germans. However, here the deviations in wages are much lower than in the unconditional median. The range increases when looking at the median wages of the clerks, where the German employees again have the highest wages. In this category, Turkish employees reach a comparable level and earn the second highest wage. Remarkably, migrants from the EU-8 countries also earn the lowest wages among clerks.

With regard to the specialists and experts, German employees and employees from the EU-15 countries receive equal payment. This is a remarkable result of the descriptive analysis, and in particular, it shows that Turkish workers are the group with the lowest wages among this task level. It is surprising here that Turkish employees, who earn relatively high wages among the auxiliary workers and clerks, are left behind in the most complex task levels. However, many differences can play into this, as the picture does not distinguish by information about how someone immigrated to Germany, age, experience, or occupations.

In order to take up the integration process, we restrict in the data in Table 4 to auxiliary workers and Clerks who hold a VET degree (completed in Germany or, potentially, abroad) excluding individuals holding a university degree. This somewhat levels out the reasons for different migration motives between the different educational groups and facilitates a better analysis of the integration and immigration process.

Table 4: Wages of workers holding a VET certificate

15th of September 2015, Wages per day in Euro

	Germans	Foreigners					
		All Foreigners	EU-15	EU-8	EU-2 + Balkan	Turkey	Remaining World
Clerks	118.05	108.23	111.18	101.59	110.22	113.85	102.69
Did not participate in VET during life-course within Germany							
Auxiliary workers	74.90	67.73	75.57	58.62	59.81	82.59	68.54
Clerks	99.94	83.15	92.81	72.45	71.70	95.25	83.50
Experts	144.06	117.92	142.99	99.18	102.27	110.63	114.74
Participated in VET during life-course within Germany							
Auxiliary workers	87.47	89.59	88.70	78.04	80.8	96.53	84.60
Clerks	113.47	104.46	106.62	96.48	91.35	112.13	102.69
Experts	156.19	132.34	142.71	116.5	120.52	135.26	137.72

Notes: Median gross daily wages in €; including all individuals holding a vocational training certificate, excluding university graduates

Source: Own calculation based on IEB V12.01.

Table 4 shows that the previously observed wage differences are notably reduced, especially for foreigners who have attained their VET degrees in Germany. In particular, foreigners from the EU-8, EU-2 and Balkan countries benefit considerably from VET in Germany, as their wages increase substantially. This shows that VET acquired in Germany can explain a large part of the

wage difference and shows the signalling character of certificates, although selectivity in various occupations is still uncontrolled. Another decisive influence on the reported median wages is the distribution of employees within the task (Table 5) and educational levels (Table 6).

Table 5: Distribution of migrants within the task levels
15th of September 2015, in percent

	Task level		
	Auxiliary workers	Clerks	Specialists/Experts
Germans	11.68	53.51	34.81
EU-15	19.34	51.19	29.47
EU-8	36.21	48.36	15.43
EU-2 + Balkan	32.05	47.18	20.77
Turkey	28.87	60.62	10.51
Remaining World	25.81	44.78	29.41

Source: Own calculation based on IEB V12.01.

According to Table 5, German employees not only have the smallest share of auxiliary workers among the groups considered, they also have the highest share of specialists and experts among the employees. This partly explains the highest median wage for German employees. At the same time, it is noticeable that the groups that tend to have lower median wages, such as EU-8 foreigners or EU-2 and Balkan foreigners, supply about three times as many auxiliary workers as German employees. One interesting fact is that Turkish employees, who also have a high proportion of auxiliary workers and by far the smallest proportion of specialists and experts (10.5 %), earn higher wages than the two groups mentioned above. However, this can be attributed to their longer labour market experience in Germany, as they have been in the German labour market longer than the EU groups.

The high percentage of specialists and experts from the remaining world is also remarkable. This is an indication of the higher hurdles for foreigners from other countries, who are only allowed to migrate to Germany under certain restrictive conditions. These figures generally show a high correlation with the level of education, which is why the next table includes this information.

Table 6: Distribution of educational levels

15th of September 2015, in percent

	Educational attainment		
	w/o degree	VET	University
Germans	10.27	69.42	20.31
EU-15	26.96	51.38	21.65
EU-8	23.93	60.04	16.02
EU-2 + Balkan	29.55	50.99	19.46
Turkey	44.64	51.20	4.16
Remaining World	31.74	39.90	28.36

Note: All values in percent. w/o degree – without degree, VET – vocational training, university – university or university of applied science degree.

Source: Own calculation based on IEB V12.01.

Table 6 reveals pronounced differences in educational attainment. These differences correspond to the pattern already shown in Table 5. German employees have the lowest proportion of workers without VET, i. e., around 10 percent. This proportion rises to 25–30 percent for the EU groups and is highest among Turkish workers (around 45 %). Considering the proportion of workers with VET the variance is considerably smaller: The VET proportions show that vocational training is an important part of the qualification of German workers, as around 70 percent have completed such training. This share is reduced to around 50 and 60 percent for the remaining foreigners and the EU-8 group, respectively.

In terms of the proportion of workers with a university degree, the heterogeneity between the groups is even smaller. For example, the proportion of highly skilled workers is between 16 and around 22 percent, with the EU-15 foreigners most often holding a university degree. It is striking here that Turkish employees have a particularly low proportion of highly qualified workers, which indicates structural differences between the considered groups.

In order to better address these structural differences, which are related to the immigration cohort and thus to the age of the considered workers, the age groups and their corresponding middle incomes are considered in Table 7. For all groups, somewhat similar patterns can be found; the older the individuals are, the higher is their respective wage. The second part of the table shows the change in wages when entering another age group. Here, young EU-15 foreigners and those from the remaining world enjoy even higher wage growth compared to the Germans. However, some also experience a negative change, and for other foreign groups the increase in salaries is very small, indicating flat wage profiles. Once again, however, this only shows a bivariate picture, and therefore an analytical approach has to be chosen to consider such limitation.

Table 7: Wage differences by age

15th of September 2015, Median gross daily wages in Euro

Age in years	Germans	Foreigners					
		All Foreigners	EU-15	EU-8	EU-2 + Balkan	Turkey	Remaining World
< 25	85.90	65.06	71.24	56.68	58.12	72.18	65.17
25–34	109.21	88.52	99.57	71.99	77.64	92.09	101.92
35–44	128.90	94.05	113.63	74.14	79.92	102.53	98.12
45–54	132.42	94.11	109.49	70.37	76.16	106.00	88.64
55+	125.06	95.76	108.26	77.78	79.57	102.42	93.93
Change in earnings when entering the next age group in €							
25–34	23.31	23.46	28.33	15.31	19.52	19.91	36.75
35–44	19.69	5.53	14.06	2.15	2.28	10.44	-3.80
45–54	3.52	0.06	-4.14	-3.77	-3.76	3.47	-9.48
55+	-7.36	1.65	-1.23	7.41	3.41	-3.58	5.29

Source: Own calculation based on IEB V12.01.

A more descriptive overview of the distribution across age cohorts and gender is provided in Table 8. As can be seen, foreigners are on average younger, and, with the exception of the EU-8, EU-2 and Balkan groups, more frequently male when compared to Germans. The group of Turkish employees shows the lowest female share: a mere 17.2 percent.

Table 8: Distribution across age cohorts and gender

15th of September 2015, all values in percent

Age in years	Germans	Foreigners					
		All Foreigners	EU-15	EU-8	EU-2 + Balkan	Turkey	Remaining World
Distribution across age categories							
< 25	5.50	5.40	4.60	7.20	7.30	6.40	3.10
25–34	24.00	25.60	22.40	31.90	32.20	21.90	25.50
35–44	21.50	31.30	26.50	31.30	33.80	33.80	32.60
45–54	31.20	25.90	29.00	19.30	19.70	30.10	25.40
55+	17.90	11.80	17.50	10.30	7.00	7.80	13.40
Share of females	30.70	26.60	26.70	33.60	32.70	17.20	28.30

Source: Own calculation based on IEB V12.01.

6 Empirical Analysis and Estimation Strategy

The descriptions already show large wage differences between Germans and foreigners as well as among the migrant groups themselves, even after the differentiation into task levels, age, education, and vocational training within Germany. Additional factors can be responsible for these additional differences. For example, task levels do not take into account the employee's place of work or their occupation. Thus, certain patterns can occur here due to, e. g., certain selections or segregations.

Because we employ the wage decomposition based on the method of Oaxaca (1973) and Blinder (1973), we primarily rely on a Mincer earnings function for the wage setting on the labour market. In the analysis, we have reduced issues of multicollinearity to a large extent, so that the standard errors are validly identified for the individual influences. This is important when comparing the groups, especially the meaning and significance of single effects. Furthermore, we ensure that the model itself provides robust results that are not sensitive to the usual wage equation transformations, such as adding to, leaving out, or recoding variables. With the help of the preferred wage equation, we then perform the wage decomposition.

For this, we rely on the threefold wage decomposition according to Jones and Kelly (1984), which converts the wage difference between the comparison groups into three parts on the basis of separate OLS estimates providing a set of estimates, i. e. coefficients, for each migrant group and Germans. The first part of the decomposition is the endowment part, which attributes a part of the pay gap to differences in the respective observable variables. The interpretation here is how the wages of migrants would change if we adjust their endowments (i. e. characteristics) to the level of Germans, evaluated at German coefficients. The second part explains the part of the pay gap that is due to differences in coefficients. We interpret this as the extent to which a given characteristic pay off. The interpretation of the resulting wage gap is: How would the wages of migrants turn out if their coefficients are adjusted to the levels of the German coefficients evaluated at the average of the German characteristics? The third part of the wage decomposition is an interaction effect consisting of the multiplication of the two previous effects. As this part offers little insight into the wage differences, we neglect the discussion on this.

The choice of the reference categories for dichotomous variables is another important point which plays a decisive role in the wage decomposition, as the interpretation of effects becomes cumbersome and can change significantly. We therefore rely on normalised groups according to Yun (2005). Then the results can be interpreted as a deviation from the average of the particular variable.

The problem of endogeneity, driven, for instance, by certain displacement mechanisms in the labour market—leads to biased estimates, which results in wrong endowment and coefficient effects. This can occur, for example, if foreigners self-select or are forced into certain "worse-paid" occupational groups and/or tasks due to a lack of language proficiency, for example. As a result, foreigners would have higher coefficients than Germans in such "less desired" occupations because of their potential "downgrading". To identify the relevance of such crowding, we estimate

all models without any selectivity-related variables. If the remaining effects do not change much, then at least such selectivity and a potential influence of endogeneity will be of little impact.

7 Results

The overall results of our wage decomposition are presented in Table 9, and the detailed decomposition in Table 10. For comparison purposes, column 1 reports the decomposition of all foreigners relative to Germans. Columns 2 to 6 show the results for different countries of origin. In the analysis, we always select the German employees as the reference group to better identify differences among the migrant groups (relative to Germans). That means that we can directly compare the change in wages (in Euro) whenever a change in a specific variable occurs for the respective migrant groups. In assessing the coefficient effect, we again apply and adjust Germans to the respective levels of the foreigner groups.

Table 9: Oaxaca–Blinder decomposition for mean wages with both German groups
15th of September 2015

	Foreigners					
	All Foreigners	EU-15	EU-8	EU-2 + Balkan	Turkey	Remaining World
	(1)	(2)	(3)	(4)	(5)	(6)
Average gross daily wages in Euro						
Foreigners	91.91	108.27	74.59	81.78	90.58	92.68
Germans	125.20	125.20	125.20	125.20	125.20	125.20
difference	0.734***	0.865***	0.596***	0.653***	0.723***	0.740***
Oaxaca-Blinder effect decomposition						
Endowments	0.740***	0.856***	0.586***	0.640***	0.747***	0.766***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.004)
Coefficients	0.985***	1.008***	0.950***	0.961***	0.934***	0.976***
	(0.002)	(0.003)	(0.008)	(0.005)	(0.005)	(0.004)
Interaction	1.008***	1.001	1.070***	1.062***	1.037***	0.990**
	(0.002)	(0.003)	(0.009)	(0.006)	(0.005)	(0.004)
No. Foreigners	142,305	40,315	18,979	18,431	29,033	30,749
No. Germans	1,379,013	1,379,013	1,379,013	1,379,013	1,379,013	1,379,013
No. Firms	124,935	109,271	107,383	107,446	107,646	108,573

Notes: Only full-time workers with valid information on educational attainment and qualifications are considered; * 10 %, ** 5 %, *** 1 %; cluster-robust s. e. at firm level in (). Variations of the average wages from Table 3 are due to the transfer of logarithmic wages to the exponential form.
Source: Own calculation based on IEB V12.01.

Firstly, German employees earn about 14 percent higher wages than employees from the EU-15 countries, which is the smallest pay gap (column 2). The endowment effect for this wage decomposition of the EU-15 foreigners amounts to almost the same value as the wage gap itself (0.856).

This means that if the observed German employees had the same endowment levels in the observable characteristics as the EU-15 foreigners, they would have about 14 percent lower wages. About 0.8 percent of the wage gap is due to differences in the coefficients. Although significant, this means that there are little differences in the evaluation of "pay off" between the two groups in economic terms, i. e., 1 Euro gross daily income. Consequently, the wage gap between these two groups can be explained almost entirely, and this can be attributed exclusively to differences in endowments.

With regard to the EU-8 countries (column 3), there are larger differences. The average wage gap between the two groups is around 40 percent. Again, the endowment effect does not deviate greatly from the observed difference. Thus, if the endowment levels of German employees were adjusted to the levels of EU-8 foreigners, their wages would be 41.4 percent lower. However, this decomposition reveals significant differences in coefficients: Thus, Germans with the same characteristics would earn, on average, 5 percent less (about 6.25 EUR per day) when adjusting German coefficient levels to the levels of EU-8 employees. It is worth noting that, on average, the proportion of females and young individuals among the EU-8 foreigners is higher (see Table 8). Therefore, coefficients for this group tend to be usually lower, as coefficients are lower in general for these groups.

A similar picture results for the groups of EU-2 and Balkan foreigners, workers from Turkey, and the remaining world—with slightly different effects: Regarding selectivity and the "downgrading" of foreigners, the wage decomposition excluding occupations and tasks does not show any major deviations from the first decomposition. In principle, the endowment effect increases in all three decompositions, so that German employees, if they had the same endowment levels as those considered migrants groups, would receive slightly higher wages than those migrants. However, these advantages are in a small range, so it does not contrast with our previous conclusions.

Detailed analysis: Endowments

Which characteristics are relevant and drive the wage difference between German employees and the considered groups? Table 10 provides a detailed decomposition of the endowment effect. Each row represents the joint impact of a set of variables as outlined in Section 4. The interpretation of the values is analogous to the previous approach but split into subgroups here: How would a German worker earn more (> 1) or less (< 1) if the endowment level were adjusted to the endowment levels of foreigners, evaluated at German coefficients? It is worth mentioning that a 1-percent change in wages of Germans means a change in gross daily wage of approximately 1.25 Euro (≈ 37.50 EUR per month).

Table 10: Detailed decomposition of the endowment effects

15th of September 2015

	Foreigners					
	All Foreigners	EU-15	EU-8	EU-2 + Balkan	Turkey	Remaining world
	(1)	(2)	(3)	(4)	(5)	(6)
RAM	1.015***	1.023***	0.989***	1.024***	1.019***	1.014***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
IND	0.967***	0.983***	0.940***	0.951***	0.982***	0.962***
	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
OCC	0.959***	0.975***	0.946***	0.954***	0.930***	0.976***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
TASK	0.960***	0.981***	0.940***	0.946***	0.938***	0.971***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INDIVID	1.003***	1.008***	0.989***	0.988***	1.020***	1.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
EDUC	0.969***	0.984***	0.972***	0.961***	0.922***	0.998
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
EXP	0.904***	0.947***	0.819***	0.848***	0.956***	0.888***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)
FIRM	0.933***	0.948***	0.901***	0.905***	0.954***	0.934***
	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)

Note: Only full-time workers with valid information on educational attainment and qualifications are considered. * 10 %, ** 5 %, *** 1 %, cluster-robust s. e. at firm level in (). Variations to the average wages from Table 3 are due to the transfer of logarithmic wages to the exponential form.

Source: Own calculation based on IEB V12.01.

Consideration of the regional labour markets (RAM) shows positive (> 1) results for all groups except EU-8 foreigners. This indicates that most of the migrants work in regions, which are linked to higher wages than the average regional wage for Germans. Germans would thus benefit if they were distributed in the same regions as migrants. As EU-8 foreigners are more frequently employed in East Germany, where average wage levels are lower, they show negative results for this endowment. With regard to the distribution across industries, occupations, and task levels, German employees would suffer wage losses if they had exactly the same distribution across those variables as the considered migrant groups. Foreigners are therefore more frequently employed in industries and jobs/tasks that tend to pay less, providing evidence for a partial crowding in less popular jobs. However, this does not necessarily imply discrimination, as it is not clear whether such a choice was made on purpose due to a lack of better alternatives. Interestingly, the individual characteristics (INDIVID: gender and age) show that the differences are economically negligible for most foreign groups, and relatively higher for individuals from Turkey (+2 %). Because foreigners' ages are highly correlated with the immigration waves (i. e. with the guest workers of the late 1960s and '70s), we interpret the results as comparable wages with respect to age (and gender).

In terms of education and, in particular, work experience on the German labour market, however, an adjustment of German levels to the one of foreigners is associated with an economically valuable reduction in wages of 10–20 percent for Germans. Because age and first appearance on the labour market is already controlled for, the experience measures are not biased with respect to age and immigration time. The serious disadvantage in terms of labour market experience can be primarily attributed to the fact that these groups have not had full access to the labour market in Germany until recent years. Accordingly, they have not yet been able to gain much labour market experience in Germany or still have language deficits, for example.

Large differences of 5–10 percent in wages relate to firm structure. Foreigners tend to be employed in firms that pay lower wages. These are usually smaller firms which have lower shares of high-skilled workers. Considering the results of the various migrant groups reveals an interesting pattern: the adjustment of endowments from German levels to the levels of EU-15 foreigners and those from remaining world are quite similar. Because immigration from outside of the EU countries is rather limited, those foreigners obviously have very individual characteristics that are potentially very valuable for Germany and comparable to the characteristics of EU-15 countries. Additionally, wages in EU-15 countries are, in real terms, partly competitive to Germany, although potentially lower; therefore, incentives to migrate from those countries to Germany are not as strong. The new EU Member States and individuals from former Yugoslavia show also rather similar patterns. The group of Turkish workers is more of a mixture. On average, they have a lower level of education than the other groups, but in terms of labour market experience, they have the smallest deficit compared to German workers, together with the EU-15 migrants.

Coefficients

In Table 11 we present details of the coefficient effect. The interpretation is as before: How would a German earn more (> 1) or less (< 1) if the German coefficients were adjusted to the coefficient levels of foreigners, evaluated at mean German endowment levels?

Table 11: Detailed decomposition of the coefficient effects

15th of September 2015

	Foreigners					
	All Foreigners	EU-15	EU-8	EU-2 + Balkan	Turkey	Remaining World
	(1)	(2)	(3)	(4)	(5)	(6)
RAM	0.978***	0.984***	0.970***	0.961***	0.966***	0.984***
	(0.002)	(0.006)	(0.004)	(0.005)	(0.006)	(0.004)
IND	0.994	0.986***	1.014**	1.015*	0.994	0.992
	(0.004)	(0.004)	(0.007)	(0.008)	(0.005)	(0.006)
OCC	1.009***	1.000	1.006	1.002	1.011	1.012***
	(0.003)	(0.004)	(0.008)	(0.007)	(0.007)	(0.004)
TASK	0.981***	0.996	0.968	1.044**	0.949***	0.981
	(0.007)	(0.010)	(0.022)	(0.022)	(0.018)	(0.014)
INDIVID	0.995***	1.005***	0.987***	0.989***	0.990***	1.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
EDUC	1.015***	1.010**	1.004	1.022***	1.010**	1.026***
	(0.003)	(0.004)	(0.008)	(0.006)	(0.004)	(0.005)
EXP	0.930***	0.923***	0.901***	0.932***	0.952***	0.928***
	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)	(0.005)
FIRM	1.113***	1.082***	1.072***	1.065***	1.162***	1.127***
	(0.013)	(0.017)	(0.019)	(0.019)	(0.019)	(0.019)
Constant	0.979	1.030	1.037	0.938**	0.916***	0.939***
	(0.014)	(0.021)	(0.033)	(0.028)	(0.026)	(0.022)

Note: Only full-time workers with valid information on educational attainment and qualifications are considered. * 10 %, ** 5 %, *** 1 %, cluster-robust s. e. at firm level in (). Variations to the average wages from Table 3 are due to the transfer of logarithmic wages to the exponential form.

Source: Own calculation based on IEB V12.01.

The coefficient effect shows higher pay offs emerging from their labour market regions for German workers than for foreigners. Hence, German workers can make better use of the conditions of a region to achieve higher wage levels. Industry coefficients show on average only minor and insignificant deviations, indicating negligible differences in pay off between the groups. A similar picture emerges for the coefficients considering occupations. There are also only insignificant and negligible differences indicating equal pay offs for occupations.

These results are interesting because, in view of the high number of cases, the insignificance of the results is particularly important. The implication of this finding is remarkable: When filling a vacancy, it does not matter to the employer where the individual comes from — all the workers get offered the same pay off for their characteristics.

Concerning the tasks, there are as well no differences in pay off for the EU-15, EU-8, and remaining world foreigners compared to Germans. The coefficients for Turkish workers are evaluated significantly lower, i. e., 5.1 percent, leading to a wage gap of approximately 187.50 Euro gross monthly income. Noteworthy is also a positive gap of about 4.4 percent for the task levels of EU-2 and Balkan foreigners above German coefficient levels. Again, this has remarkable implications, as foreigners from this group are often seen as individuals coming to Germany for welfare reasons. Our

result show higher pay offs for this group, which could also indicate a certain compensation for over-qualification. This is conceivable for this group, as they have only recently gained full access to the German labour market. It may indicate that German employers struggle to assess the quality of the qualifications correctly. This could be, for example, due to different education systems that do not send a clear or known signal to German employers. As a potential consequence, German employers hire these workers as auxiliary workers at the beginning. Alternatively, it can also be that these workers chose these unskilled occupations. It may be that EU-2 and Balkan foreigners need time to reach higher task levels, as employers need time to recognise their skills and qualifications. The endowment effect in Table 10 shows clear disadvantages at least for this group, which once again supports our integration time argument; i. e., they are employed more frequently as auxiliary workers.

The differences in the coefficients for individual characteristics and education are significant. However, these are for the most part in the economically rather negligible range of less than or about 1 percent. Thus, there are no noteworthy deviations in the evaluation by the employer for these characteristics.

By contrast, labour market experience shows marked differences in pay off. Migrants receive lower returns for their labour market experience than comparable German employees. These flat experience profiles are frequently found in literature; see Bosseler (2014), Brunow/Jost (2019) and Zibrowius (2012). However, non-linear relationships are also conceivable here, leading to lower experience profiles, since migrants on average also have lower values in endowment levels of labour market experience. We address this issue in the Robustness chapter.

With regard to the firm characteristics, there are considerable differences. It is obvious throughout the analysis that foreigners have consistently higher firm coefficients. Apparently, foreigners can make better use of the firm structures and realise a higher pay off. Similar results are shown by Brunow and Nijkamp (2016) who provide evidence of higher productivity of firms which employ foreigners.

8 Robustness and Discussion

Our results show that there are group-specific differences, but also similarities. More specifically, they show similarities in terms of certain agglomerations and selections in some characteristics. Foreigners tend to sort into firms offering higher wages, with their individual pay off being assessed in the same way as that of their German counterparts. Furthermore, migrants have significantly less work experience in Germany than native workers, but that is due to the gradual opening of the labour market over the last 15 years. At the same time, their labour market experience is less valued, which leads to a slower development over time. With regard to the differences between the groups, the results show different endowment levels for experience or educational attainment. In addition, there are some notable differences within the coefficients for task levels.

In order to be able to better include this aspect as well as other details, we carried out the following various robustness checks (results can be obtained upon request).

Labour market experience

Labour market experience is the subject of numerous discussions led by the ground-breaking work of Chiswick (1978). We took a closer look at this by looking at potential catching-up processes of foreigners on the German labour market. Since the majority of the EU-8 and EU-2 workers in our sample belong to the newer groups which have only had access to the labour market in Germany for a few years, we can track catching-up processes for these groups here only to a limited extent. For older cohorts of these countries and foreigners from other immigration countries, the differences in coefficients compared to German workers converge clearly over time (see Brunow/Jost 2019). As a result, it can be observed in some cases that after 10 years some differences are hardly measurable. Especially with regard to labour market experience, it becomes clear that foreigners can make more and more use of their experience the longer they have been part of the German labour market.

Gender

Most of the literature considering the migrant pay gap is limited to men only in the analysis. This often results from the discontinuous employment biographies of women, which can be volatile due to, for example, housework, family responsibilities, or children. We followed this example and performed an analysis for men only.

As for the endowment and coefficient effect, there was no significant deviation. Men and women of the migrant groups thus have similar endowments and pay offs on the labour market. The results suggest that there are no differences in employment patterns between the two genders.

Imputation of wages and education

There is a possibility of potential biases occurring as a result of the wage imputation used, which is why we wanted to take this into account in our subsequent wage decomposition. To this end, we excluded all employees holding a university degree, as these persons are, to a large extent, affected by the higher, potentially imputed salaries.

There were no significant differences from the previous results. High salaries as well as certain biases that may be associated with them can be excluded. Neither the endowment nor the coefficient effect changed noticeably.

VET in Germany

As mentioned in the descriptions, we have generated an indicator which identifies foreigners who have completed their VET in Germany. Since this does not apply to all migrants, we also carried out analyses in which this variable was not included. There were no substantial changes in the decomposition, indicating robust results without this information.

We restricted the sample to foreigners without VET in Germany, and the results were as already presented above. Lastly, we considered only foreigners that held such German VET certificate and found similar results: the coefficient effect became slightly smaller, indicating again the signalling character of the certificates for the employer.

Individual and firm-specific heterogeneity

Due to the fact that we only use a cross-section of the year 2015 for our analysis, individual-specific fixed effects can only be inadequately controlled for. We therefore used what is called the CHK effects. These effects consist of a term specific to the individual and a term specific to the firm, which are incorporated into the decomposition accordingly.

As expected, the inclusion of CHK effects reduced the differences in endowment and coefficient effects between groups clearly. At the same time, however, the larger differences remained, particularly in terms of labour market experience—endowment and coefficient. This confirms the results of the previous estimates and makes it clear that time spent on the labour market is the strongest indicator of convergence between groups to date.

9 Conclusion

Our analysis of the wage structures of migrant workers with a focus on workers belonging to newer migrant groups from EU countries has provided some insights into the labour market structures. Migrants still earn lower wages compared to German employees. At the same time, it becomes apparent that there are some significant differences among the observed migrant groups themselves. The data shows great differences in the distribution of task levels and qualifications across the groups under consideration. On average, Turkish workers have the lowest qualification structures and a relatively low proportion of highly qualified workers. Among EU migrants, however, EU-2 and EU-8 foreigners have lower education and task distributions compared to EU-15 employees. These distributions are also reflected in the median wages, with Turkish workers in particular benefiting from their long labour market experience in Germany and compensating for some of their deficits.

All these differences and deficits are considered in our analytical approach, and we were able to show that the wage gap relative to the German reference group can be explained almost entirely by these differences. The major explanatory factors are selectivity in occupations, industries, task levels, and education as well as less labour market experience and firm characteristics. With regard to the differences in pay offs, it can be seen that there are few significant differences between the native and migrant groups. When foreigners work in the same task levels or occupations, they earn, on average, the same wages as their German counterparts. However, the firm coefficients are higher for foreigners compared to Germans: a result which has been found before. Accordingly, they tend to sort themselves into more firms that pay higher wages, which is also associated with a better distribution in the labour market regions.

Furthermore, our results show that from a policy point of view, the most relevant parameters to reduce the wage gap are labour market experience and education. Consequently, the wage gap will shrink over time if migrants stay for a longer period. It can be assumed that this will be accompanied by a degree of economic integration in the sense of Chiswick (1978), according to which migrants improve their language skills and benefit from a better knowledge of the market. Our sensitivity analyses indicate that migrants show a clear catching-up process especially within the

first 10 years on the German labour market. In general, our results are very robust, and various changes to the models do not lead to any contradictory statements or findings.

Seeing as we consider only employed full-time workers in our analysis, the uncertainty regarding the findings of migrants with greater proximity to the labour market decreases. We infer therefore that our findings are particularly valuable in view of the debate on skilled worker migration. This brings us to the following conclusion: As differences in endowments can explain most of the wage gap between the considered groups, we conclude that migrants, on average, earn fair wages given their current endowment levels. For the political debate on the immigration of skilled workers, which is particularly close to the labour market, this means that Germany is an attractive destination for immigration, as migrants generally tend not to be disadvantaged. Possible wage differentials narrow over time, which we can observe particularly among EU-15 migrants, but also foreigners of EU-8 and EU-2 + Balkan countries show similar effects.

At the same time, our findings suggest that a potential clustering of migrants in less-favoured occupations might occur. Thus, policy programmes should prevent potential crowding and support the integration process for faster returns on labour market experience.

References

Aldashev, Alisher; Gernandt, Johannes; Thomsen Stephan L. (2012): The immigrant-native wage gap in Germany. In: Jahrbuecher fuer Nationaloekonomie und Statistik, Vol. 232 (5), pp. 490–517.

Bosseler, Mario (2014): Sorting within and across establishments. The immigrant-native wage differential in Germany. IAB-Discussion Paper 10/2014.

Blinder, Alan S. (1973): Wage Discrimination: Reduced Form and Structural Estimates. In: The Journal of Human Resources, 8 (4), pp. 436–455.

Brunow, Stephan; Jost, Oskar (2019): Wages of migrant and native employees in Germany: new light on an old issue. IAB-Discussion Paper, 10/2019.

Brunow, Stephan; Nijkamp, Peter (2016): The impact of a culturally diverse workforce on firms' revenues and productivity: an empirical investigation on Germany. International Regional Science Review.

Card, David; Heining, Jörg; Kline, Patrick (2013): Workplace heterogeneity and the rise of West German wage inequality. In: The Quarterly Journal of Economics, Vol. 128 (3), pp. 967–1015.

Chiswick, Barry R. (1978): The Effect of Americanization on the Earnings of Foreign-born Men. In: Journal of Political Economy, Vol. 86(5), pp. 897–921.

Fitzenberger, Bernd; Osikominu, Aderonke; Völter, Robert (2005): Imputation rules to improve the education variable in the IAB employment subsample. IAB-FDZ-Methodenreport, Nürnberg.

Fuchs, Johann; Söhnlein, Doris; Weber, Brigitte (2017): Projektion des Erwerbspersonenpotenzials bis 2060: Arbeitskräfteangebot sinkt auch bei hoher Zuwanderung. (IAB-Kurzbericht, 06/2017), Nürnberg, 8 S.

Himmler, Oliver; Jäckle, Robert (2017): Literacy and the Migrant-Native Wage Gap. In: Review of Income and Wealth, Vol. 64 (3), pp. 592–625.

Hofer, Helmut; Titelbach, Gerlinde; Winter-Ebmer, Rudolf; Ahammer, Alexander (2017): Wage Discrimination Against Immigrants in Austria? In: Labour, Vol. 31 (2), pp. 105–126.

Jones, F.L; Kelley, Jonathan (1984): Decomposing Differences between Groups. A Cautionary Note on Measuring Discrimination. In: Sociological Methods & Research, Vol. 12 (3), pp. 323–343.

Lehmer, Florian; Ludsteck, Johannes (2011): The Immigrant Wage Gap in Germany: Are East Europeans Worse Off? In: International Migration Review, Vol. 45 (4), pp. 872–906.

Lehmer, Florian; Ludsteck, Johannes (2015): Wage Assimilation of Foreigners: Which Factors Close the Gap? Evidence from Germany. In: Review of Income and Wealth, Vol. 61 (4), pp. 677–701.

Nanos, Panagiotis; Schluter, Christian (2014): The composition of wage differentials between migrants and natives. In: European Economic Review, Vol. 65, pp. 23–44.

Oaxaca, Ronald (1973): Male-Female Wage Differentials in Urban Labor Markets. In: International Economic Review, 14 (3), pp. 693–709.

Yun, Myeong-Su (2005): A Simple Solution to the Identification Problem in Detailed Wage Decomposition. Economic Inquiry Economic Inquiry (2005), 43(4), pp. 766–772, with Erratum, Economic Inquiry, 44 (1), p. 198.

Zibrowius, Michael (2012): Convergence or divergence? Immigrant wage assimilation patterns in Germany. In: SOEP papers, DIW Berlin, pp. 479–2012.

Imprint

IAB-Discussion Paper 26|2020

Date of publication
12 August 2020

Publisher
Institute for Employment Research
of the Federal Employment Agency
Regensburger Str. 104
90478 Nürnberg Germany

Download of this IAB-Discussion Paper
http://doku.iab.de/discussionpapers/2020/dp2620.pdf

All publications in the series "IAB-Discussion Paper" can be downloaded from
https://www.iab.de/en/publikationen/discussionpaper.aspx

Website
www.iab.de

ISSN
2195-2663

Corresponding authors
Stephan Brunow
Phone: +49 385 540-8493
Email: stephan.brunow@arbeitsagentur.de

Oskar Jost
Phone: +49 30 5555 99-5916
Email: oskar.jost@iab.de