

Licensing, educational credentialing and wages among foreign skilled workers in Germany

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Online-Appendix

1 Further discussion of the foreign skilled sample population

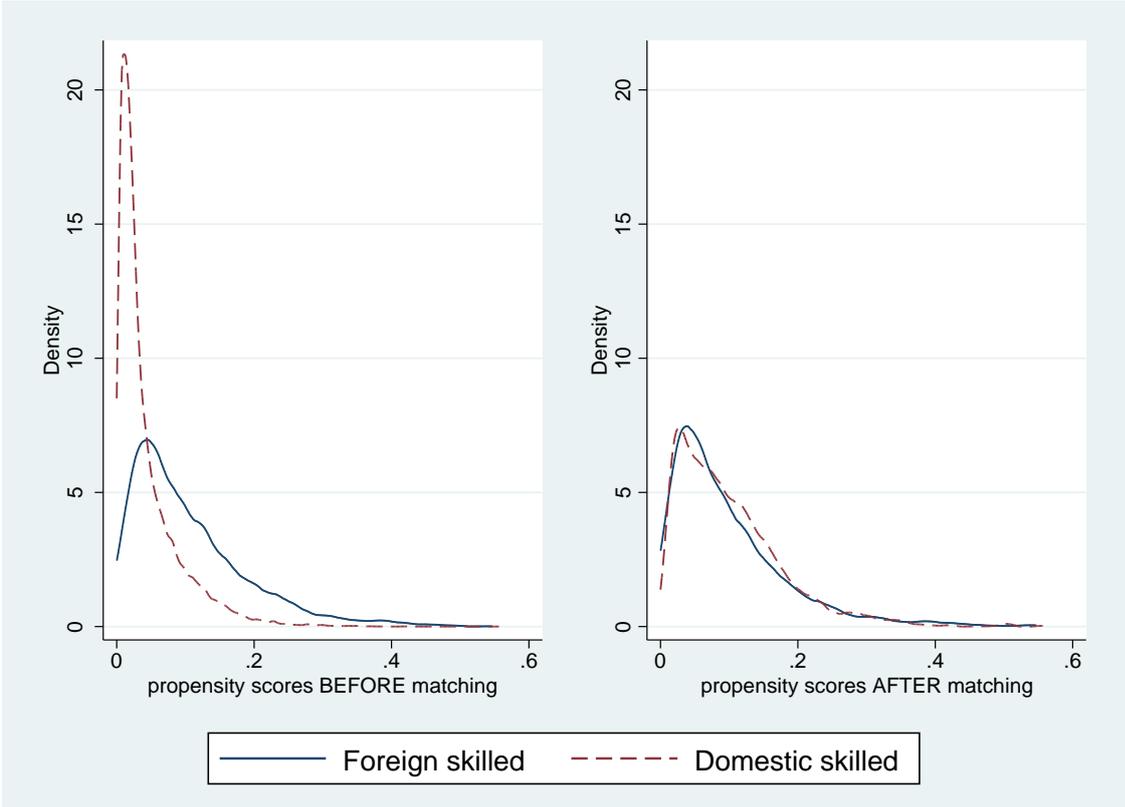
To identify foreign skilled workers in the data I use information on whether the respondent has achieved (all of) his or her vocational or academic degrees outside Germany. In contrast to non-German mother tongue or citizenship as (visible) characteristics of ethnic origin, the presence of a foreign vocational qualification is the relevant characteristic for testing the hypotheses. In the main text of the article, I argue that the majority of persons with foreign qualifications in the three subsamples probably grew up in another country, went to school there and immigrated to Germany. An analysis of mother tongues and citizenship reveals, that across all three survey waves, among foreign skilled workers, 70% did not learn German as one of their mother tongues or 64% did not have German citizenship. In contrast, these shares in the group of workers with German credentials are 6.4% and 5.4%, respectively. In the data collection 2017/2018 for the first time, respondents were asked whether the first employment was carried out in Germany or abroad. Only 2% of workers with German credentials but 65% of those with foreign credentials had their first job abroad. Although the group of people who are qualified abroad may also include people who grew up in Germany 'only' studying abroad they make up the much smaller proportion of those with foreign qualifications (around 8%, as can only be estimated from the 2018 data). If the assumption is correct that the employment and wage opportunities of these non-immigrants with foreign qualifications are better than those of immigrants with foreign qualifications (e.g. due to better networks, language skills, knowledge of education pathways, etc.), then the effects of being trained abroad on the chance of a licensed or highly credentialed employment, and on their wages tend to be underestimated compared to the 'true' effect for immigrants with foreign qualifications.

Based on the German Microcensus 2014 (see Mergener 2018) 49% of all 25 to 64 old immigrants from EU states have a foreign degree (30% of non-EU immigrants). The remaining

immigrants more often have no (34.8% from EU states and 55.3% from non-EU states) than a German qualification (16.5% and 14.4%). Those immigrants with foreign qualifications more often have an academic degree and less often a vocational training degree than nonimmigrants: Academic degree: immigrant EU/non-EU/non-immigrants: 39.2%/50.6%/24.6%; vocational degree: 55.7%/ 46.4% /67.4% (Mergener 2018). These educational distributions are also evident for the German and non-German educated individuals selected in the sample (see Table 1 in the main manuscript). The employment rate of EU/non-EU immigrants with foreign qualifications (79.8%, 63.3%) is below the rate for Germans (83.5%, Mergener 2018).

2 Appendix figures and tables

Fig. A1 Distribution of the propensity score before and after matching



Source: BIBB/BAuA Employment Surveys 2006, 2012, 2018 weighted values (reweighting), own calculations. Notes: Sample is restricted to 20-65 year olds. Workers without any vocational degree are dropped. N=52,417.

Table A1 Means and standard deviations of covariates for treated (foreign skilled workers) and control subjects (German skilled workers) using the stabilized weights

	German skilled workers	Foreign skilled workers
Women	0,416 (0,493)	0,414 (0,493)
Married	0,706 (0,455)	0,704 (0,457)
Highest voc. educ. attained		
VET	0,470 (0,499)	0,465 (0,499)
Advanced training degree	0,0234 (0,151)	0,0233 (0,151)
University degree	0,507 (0,500)	0,512 (0,500)
Age	44,15 (10,67)	43,99 (9,984)
Employment status		
Blue-collar workers	0,271 (0,445)	0,278 (0,448)
White-collar workers	0,579 (0,494)	0,576 (0,494)
Public servants	0,0157 (0,124)	0,0156 (0,124)
Self-employed, free-lancers	0,131 (0,337)	0,127 (0,333)
Helping family members	0,00337 (0,0580)	0,00339 (0,0582)
Yrs. of lab. market experience	20,27 (11,39)	20,12 (11,28)
Tenure	9,605 (9,052)	9,570 (8,657)
Average weekly working time	38,88 (12,72)	38,88 (12,81)
German language requirements		
No requirements	0,128 (0,334)	0,129 (0,335)
Basic requirements	0,485 (0,500)	0,488 (0,500)
Advanced requirements	0,387 (0,487)	0,383 (0,486)
Health status		
Bad	0,0290 (0,168)	0,0283 (0,166)
Not so good	0,0947 (0,293)	0,0963 (0,295)
Good	0,496 (0,500)	0,493 (0,500)
Very good	0,286 (0,452)	0,288 (0,453)
Excellent	0,0944 (0,292)	0,0946 (0,293)
<i>N</i>	51,100	1,317

Source: BIBB/BAuA Employment Surveys 2006, 2012, 2018 weighted values (reweighting), own calculations.
Notes: Sample is restricted to 20-65 year olds. Workers without any vocational degree are dropped. Mean coefficients; Standard deviation in parentheses.

Table A2 Reweighted regression models of credentialism and licensure with German labor market experience

	(1)	(2a)	(2b)
	Credentialism immigrant def.: Foreign qualification	Licensure immigrant def.: Labour market experience abroad	Credentialism immigrant def.:
Immigrant	-0,112 ⁺ (0,061)	-0,252 (0,216)	-0,126* (0,072)
Yrs. of <u>German</u> lab. market experience	0,004 (0,004)	-0,005 (0,012)	0,004 (0,004)
Immigrant *German lab. market exp.	0,011* (0,005)	-0,007 (0,017)	0,005 (0,006)
Yrs. of <u>foreign</u> lab. market experience	-0,028 (0,025)		
Immigrant *foreign lab. market exp.	0,034 (0,025)		
Constant	-0,463*** (0,071)	-2,261*** (0,180)	-0,446*** (0,073)
R ² (M2a: Pseudo R ²)	0,174	0,106	0,168
N	17,474	17,474	17,474

Source: BIBB/BAuA Employment Survey 2018 weighted values (reweighting), own calculations. *Notes:* Because of sample size restrictions, compared to the models based on all three rounds (Table 2 in the main text), the models include a reduced set of controls (gender, highest voc. degree, entry cohort, language req., health status, federal states). Robust standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3 Predicted probabilities for employment in a licensed occupation and predicted degree of credentialism of the current occupation with average years of labor market experience for different origin regions of qualifications (robust std. err. in parentheses)

	(1) Licensed occ. AME	(2) Credentialism
German qualification	0,194*** (0,004)	-0,027** (0,011)
EU, Switzerland, repatriate countries	0,164*** (0,014)	-0,080* (0,038)
EU-candidates	0,144*** (0,026)	-0,277** (0,093)
Other European countries	0,153*** (0,027)	-0,466*** (0,097)
American or Caribbean countries	0,140*** (0,043)	0,063 (0,094)
Asian countries	0,164*** (0,030)	-0,548*** (0,100)
N ¹	52,393	52,393

Source: BIBB/BAuA Employment Surveys 2006, 2012, 2018 weighted values (reweighting), own calculations. *Notes:*. Sample is restricted to 20-65 year olds. Workers without any vocational degree are dropped. All models include gender, survey round and labor market entry cohort. For the distribution by country of origin, see Table 1. ¹Because of their small sample size (n=27), workers with degrees from African countries are not considered in the analyses. 147 cases have missing information on the qualification's country of origin. Robust standard errors in parentheses. + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A4 Reweighted linear regression models of log hourly wages with controls for occupational dummies and requirement levels

	(1)	(2)	(3)	(4)	(5)	(6)
		Women		Men		
	Occ.	Req.	Occ+Req.	Occ.	Req.	Occ+Req.
Foreign skilled	-0,163*** (0,040)	-0,099** (0,037)	-0,115** (0,037)	-0,065 (0,063)	-0,018 (0,067)	-0,038 (0,060)
<i>Highest voc. educ. (Ref. VET)</i>						
Advanced training degree	-0,018 (0,044)	-0,034 (0,041)	-0,042 (0,042)	0,135 (0,092)	-0,104 (0,106)	-0,007 (0,085)
University degree	0,276*** (0,033)	0,099* (0,042)	0,115** (0,042)	0,417*** (0,055)	0,141+ (0,082)	0,150* (0,065)
<i>Occ. Dummies (Ref.: Medical and health care occupations, 81)</i>						
Occupations in construction scheduling, architecture and surveying (31)	-0,061 (0,048)		-0,139** (0,055)	-0,139* (0,056)		-0,210*** (0,052)
Drivers and operators of vehicles and transport equipment ¹ (52)	NAV		NAV	0,637** (0,212)		0,676*** (0,179)
Occupations in safety and health protection, security and surveillance (53)	-0,145+ (0,075)		-0,057 (0,082)	-0,447*** (0,063)		-0,272*** (0,067)
Occupations in financial services, accounting and tax consultancy (72)	-0,053 (0,058)		-0,007 (0,054)	-0,077 (0,094)		-0,107 (0,094)
Occupations in law and public administration (73)	-0,014 (0,059)		-0,069 (0,054)	-0,066 (0,074)		-0,099 (0,073)
Occupations in non-medical healthcare, body care, wellness, medic. technicians (82)	-0,254*** (0,053)		-0,132* (0,056)	-0,217+ (0,112)		-0,064 (0,105)
Occupations in education and social work, housekeeping, and theology (84)	-0,197*** (0,042)		-0,141*** (0,039)	-0,374*** (0,051)		-0,314*** (0,052)
Occupations in teaching and training (84)	0,053 (0,040)		-0,041 (0,036)	-0,208** (0,068)		-0,278*** (0,066)
<i>Requirement level (5th digit, Ref.: Unskilled or semi-skilled activities)</i>						
Specialist activities		0,282*** (0,087)	0,250** (0,089)		0,401** (0,136)	0,359** (0,119)
Complex specialist activities		0,374*** (0,096)	0,319** (0,099)		0,747*** (0,153)	0,591*** (0,122)
Highly complex activities		0,631*** (0,102)	0,572*** (0,107)		0,826*** (0,144)	0,815*** (0,130)
Constant	2,830*** (0,049)	2,428*** (0,081)	2,518*** (0,083)	2,949*** (0,080)	2,323*** (0,158)	2,493*** (0,138)
R ²	0,275	0,328	0,340	0,318	0,290	0,364
N	8,053	8,053	8,053	3,412	3,412	3,412

Source: BIBB/BAuA Employment Surveys 2006, 2012, 2018, weighted values (reweighting), own calculations. Notes: Sample is restricted to 20-65 year olds. Workers without any vocational degree are dropped. All models include years of. lab. market exp. (and its square), and tenure, dummies for survey rounds, labor market entry cohorts, federal states, state of health, language req., firm size,. ¹ This only includes aircraft pilots (523). Robust standard errors in parentheses, + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001