



Does Certifying Foreign Qualifications Lead to Better Immigrant Skills Utilization?

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Abstract

Using a novel panel dataset on recent immigrants in Switzerland, we study the relationship between the degree of skills utilization, the foreign-acquired education and its certification in the host country. We find that the relationship with foreign education is negative, especially when acquired in a non-EU country, in line with the literature documenting the imperfect international transferability of human capital. Obtaining a “Certificate of Equivalence” in Switzerland makes this relationship statistically non-significant: in other words, the certification enables immigrants to enjoy the same degree of skills utilization in the Swiss labour market as those with Swiss education. Additional results suggest that immigrants with a foreign but not Swiss-certified education keep the degree of skill utilization as high as it would be if they were Swiss educated when they obtain a job contract or job offer before migrating to Switzerland. These findings are robust to controlling for self-selection on unobserved characteristics.

Keywords Immigration · Qualifications · Recognition · Skills utilization · Labour market

JEL Classification J15 · J24 · J44 · J61

1 Introduction

Economic migration is typically framed as the observed outcome of an opportunity cost calculation whereby an individual compares expected benefits of moving vis-à-vis those of staying put. Costs reflect awareness about an uncertain future (Barker & Bijak, 2020; O’Connell, 1997; Williams & Baláž, 2012), the stress placed on family ties (Lu, 2012; Tabor & Milfont, 2011), a loss of social capital (Boski, 2013; McCann et al., 2010; Silver, 2014), and openness to start a new life from a position of disadvantage relative to the natives of the destination country (Borjas, 2015; Constant & Zimmermann, 2011; Hatton & Leigh, 2011), to name a few. Notwithstanding these challenges, and the imperfect

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information set on which migrants' expectations are built (Mbaye, 2014), migrants self-select to relocate (Borjas, 1987).

A large empirical literature shows that, after settlement, human capital is a prominent determinant of immigrants' economic success, especially the level of education (and mastery of the host country's language—Chiswick & Miller, 1995; Dustmann, 1999; Isphording, 2014): better education is associated with higher earnings and more general labour market outcomes, like the probability of finding employment and jobs that reflect the level of education acquired. The relevance of human capital is also reflected in the screening placed by many destination countries to set minimum educational requirement among the would-be immigrant pool (Bertoli & Rapoport, 2015). Emphasis on education reflects the idea that it is an objective signal of productivity (Spence, 1976), preferable, for instance, to height (which is used as a proxy of ability) or ethnicity.

However, when education is acquired abroad, its signal value to domestic employers diminishes relative to a qualification obtained at home. The penalty grows with employers' unawareness about the foreign education system of an immigrant applicant. The resulting statistical discrimination, and associated immigrant skills wastage, may be addressed when a trusted signal, like a certification from host country authorities, is added. This hypothesis is empirically supported (Siniver, 2011; Tani, 2017), but existing analyses could not recommend precise policy interventions because the data covered only part of the potential applicants or were sourced for a country like Australia—where economic migrants are screened based on their pre-settlement education level. The influence of immigration policy on the final outcome adds to the challenge to measure the effect of foreign education and its recognition in the host country. We contribute to address this limitation thereby producing estimates that are fundamental to the design of effective policy.

To our knowledge, the only comparable study trying to disentangle the effects of migrants' education from those of migration policy is Brücker et al. (2021) who analyse the employment and wage effects of occupational recognition among migrants to Germany. Using a linked dataset from the IAB-SOEP Migration survey and the German social security data, their empirical analysis shows that immigrants gain from obtaining a formal *occupational* recognition in the German labour market because that certification enables them access to occupations subject to licensing.¹ Their findings suggest that the certification of foreign qualifications plays a signalling role, in the sense that it reduces or eliminates uncertainty about immigrant workers' skills in the eyes of prospective domestic employers and licensing organisations.

We complement the analysis of Brücker et al. (2021) by investigating the effect of domestic certifications of *foreign education*, which is a broader indicator—hence potentially applicable to several occupations—than pre-migration occupation, on recent immigrants' skills utilization in the host labour market—a crucial dimension to understand the labour market integration of immigrants. As we follow well-known principles of human capital theory (Becker, 1964), our crucial contribution is empirical. In particular we use survey data for Switzerland—a country with a large share of immigrant population and no education-specific criteria for their selection—to measure how much certifying foreign education contributes to a better education-occupation match in the host labour market.

The case of Switzerland is relevant to study the effect of domestic educational certifications for at least two additional reasons. First, the variety of official languages across Swiss cantons enables one to identify the effect of similar culture and language, and institutional

¹ The IAB-SOEP Migration Sample is a household survey conducted jointly by the Institute for Employment Research (IAB) in Nuremberg and the German Socio-Economic Panel (SOEP) at DIW Berlin.

ties, between various countries of origin and the place of destination. For example, it is possible to study the effects of the recognition of an educational qualification between countries that neighbour Switzerland and have similar systems of vocational education and training (e.g., Germany and Austria), and those that do not, for which obtaining a local signal may be more relevant.² Second, the nature of the data at hand enables us to distinguish between immigrants that applied to obtain a local certification of educational equivalence, and either failed or succeeded, and those who did not. This information is hardly available but it is critical to control the individual heterogeneity arising from personal motivation (which is commonly unobserved), and identify with precision the baseline group against which the treatment (i.e. the certification) is assessed. These advantages yield better measures of the effect of certifications of foreign education, hence contributing the essential evidence needed for policy design.

The results show that the relationship between the degree of skills utilization and the foreign-acquired education is negative, especially among immigrants with a non-EU education. This result is in line with the literature documenting the imperfect international transferability of human capital (see, e.g., Chiswick & Miller, 2009; Tani et al., 2013). Our findings confirm above any reasonable doubt that obtaining a “Certificate of Equivalence” issued by Swiss authorities, which certifies that the foreign qualification is equivalent to a corresponding qualification awarded in Switzerland, makes this relationship statistically insignificant. Put differently, the degree of skills utilization in the Swiss labour market is similar among immigrants, whether they acquired their education in Switzerland or in another country as long as their foreign qualifications are accompanied by a certificate of equivalence issued by Swiss authorities. Additional results suggest that our baseline results differ across key dimensions such as the job status at the time of immigration and the level of education. Most interestingly, immigrants with a foreign but not Swiss-certified education have similar degrees of skills utilization to those who are Swiss educated when they obtain a job contract or job offer before migrating to Switzerland. As a matter of fact, these prior arrangements with Swiss employers remove uncertainty about immigrant workers’ skills after settlement. In other words, both post-migration certification and pre-migration job arrangements are trusted sources of human capital content in the Swiss labour market.

The rest of the paper is organised as follows. Section 2 provides an overview of the literature on migrants’ skills wastage in the international and Swiss contexts. Section 3 describes the data source and the regression specification used for the empirical analysis. Section 4 reports the baseline results and to which extent they differ across key dimensions such as the job status at the time of immigration or the level of education. Section 5 summarizes the main results and presents some policy implications.

2 Literature

The theory of human capital, whereby an individual’s productivity is directly and positively affected by formal education, is at the core of migration studies examining why immigrants cannot entirely translate their foreign-acquired education into a commensurate occupation in the country of destination (Burton-Jones & Spender, 2012; Hartog, 2000; Leuven & Oosterbeek, 2011), and hence waste part of their original investment in education.

² Since 1937, Switzerland and Germany have been applying mutual recognition of professional diplomas in a simplified procedure. To continue this practice and to extend it to additional areas, a new agreement was approved by the Federal Council on February 3, 2021.

2.1 Migrants' skills wastage

Migrants' skills wastage is well documented. With respect to education, the literature commonly finds that the returns to foreign education are lower than those acquired domestically in regards to wages (Chiswick & Miller, 2008; Sanromá et al., 2015; Sweetman, 2004) and quality of the education-occupation match (McGuinness, 2006; Green et al., 2007; Wald & Fang, 2008; Poot & Stillman, 2010; Chiswick & Miller, 2009). Immigrants' economic integration improves over time, but the discount associated with foreign education persists: this may occur as knowledge acquired abroad is country-specific and hence less productive when applied in different institutional settings (Duleep & Regets, 1997), or is of lower schooling quality relative to comparable domestic qualifications because of overcrowded classrooms, poorly paid teachers, or inadequate public investments that deliver education inefficiently, slowing down or capping human capital formation (Betts & Lofstrom, 2000; Bratsberg & Terrell, 2002). International data on student learning outcomes support this hypothesis (OECD, 2010), implying that poor literacy and numeracy scores in many sending countries are positively related to the lower earnings of their emigrants and vice-versa (Chiswick & Miller, 2010; Sweetman, 2004).

Notwithstanding these findings, the literature also suggests that investing in schooling after settlement recovers some of the human capital accumulated before migration (Friedberg, 2001). This occurs as education contributes general and transferable skills such as the ability to learn that enable migrants to overcome country-specific notions acquired in formal education.

In addition to labour supply-based explanations, a small stream of research advances that migrants' skills wastage also reflects the informational asymmetry of labour demand about their perceived productivity. Host country employers facing an unknown foreign qualification react to the unawareness by under-weighting its productivity signal value in favour of other productivity proxies. As a result they weight up observable characteristics such as gender and race (Arrow, 1974; Lundberg & Startz, 1983), age (Altonji & Pierret, 2001), and height (Wang, 2015) whilst disregarding past educational achievements. As employers observe migrants' productivity over time, they can adjust the weights away from group indicators towards individual-specific attributes and recent work performance. But the time for this to emerge is slow (Lange, 2007), during which migrants continue to make sub-optimal career and labour market choices in the host country.

Certifications issued by credible host country organisations seem effective to reduce this case of statistical discrimination. The certification can take the form of a formal test, like the mandatory 'accuracy test' introduced in Israel in 1989 to screen off Russian-trained physicians relocating to the country (Siniver, 2011). Alternatively, it can be voluntary, as occurring in Australia for migrants wanting to enter an occupation subject to licensing (Tani, 2017, 2021). In both cases, the local signal helped migrants to achieve better returns on their education, as domestic employers could rely on a trusted domestic source validating migrants' productivity signal. Both analyses however are likely affected by selection bias. In Siniver (2011) the analysis is cross-sectional, hence there is no control for unobserved individual characteristics that are positively associated with earning ability, like motivation. In Tani (2017), obtaining a local certification is voluntary, adding a layer of complexity in controlling selection. Our paper complements these analyses by focusing on a country that does not screen migrants based on their educational level, hence where the return to education is not affected by immigration policy. Furthermore, we focus on the

quality of the education-occupation match, offering additional insights besides the probability of participating in the labour market, being employed or earnings trajectory.

2.2 Immigration and Labour Demand in Switzerland

For a country that has one of the highest share of foreign workers in the world (about 30%), with a mix of economic, family and refugee migration, and with migrants resettling from countries of origin with vastly different features (both high and low income per capita, nearby and far away geographic distance, identical and different languages), there is surprising little research about migrants' labour market outcomes in Switzerland. This partly reflects the high rate of employment enjoyed by immigrants to the country, and the fact that Switzerland's cantonal structure limits the development of federal policy initiatives targeted at migrants throughout the whole country. As highlighted by Liebig et al. (2012), "apart from some instruments such as basic language training financed by the Federal Office for Migration, only few integration measures directly targeted at immigrants are available throughout the whole of Switzerland. Indeed, the overall approach to integration in Switzerland is one of immigrants' inclusion in mainstream services, rather than providing targeted measures" (p.6).

Despite the favourable economic outcomes at large, skills wastage among immigrants in Switzerland exists and is a source of concern, especially as the wastage occurs in areas of high demand, such as technical jobs, and particular countries of origin—typically outside the European Union (Pecoraro, 2011; Liebig et al., 2012). In 2008, the average penalty for foreign education was estimated at 6.5% with a trough of 26% for education completed in a low-income country (ibid., Table 3). The discount persists even after obtaining Swiss certification, despite evidence supporting the relevance of obtaining a local certification to get a job commensurate with education (Weins, 2010; Pecoraro & Wanner, 2019).

This unresolved puzzle is interpreted by making recourse to country-specific issues with respect to both labour supply and demand, such as the reluctance of immigrants to apply for the Swiss certification and employers' disinterest to change the status quo (ibid., p.34). While these issues appear to be concentrated among immigrants who have lived in Switzerland for more than 10 years, as they are predominantly from non-EU countries of origin (Auer & Fossati, 2019; Pecoraro et al., 2022; Wanner, 2019), some concerns remains about the labour market outcomes of their children (second generation), who face similar issues, and immigrant women, against whom taste discrimination seems to be common (ibid; Riaño, 2021; Zschirnt, 2020).

3 Certification of Foreign Qualifications in Switzerland

As in most European countries, in Switzerland the right to work in some professional activities requires an official certification of foreign qualifications.³ More specifically, the application for certification is only required in the case of regulated occupations that can only legally be carried out by holders of a specific Swiss qualification (issued by relevant

³ All the detailed information regarding the certification process in Switzerland can be found on the website of the State Secretariat for Education, Research and Innovation (SERI) [last accessed: December 20, 2022]: <https://www.sbfi.admin.ch/sbfi/en/home/education/recognition-of-foreign-qualifications.html>.

authorities at the federal, cantonal, or municipal level).⁴ In this situation, applicants must request confirmation from the appropriate Swiss authority that the foreign qualification is equivalent to a corresponding Swiss qualification.⁵ On the other hand, many professional activities are not regulated and can be carried out without obtaining a formal certification. In this case, the hiring decision rests solely with the employer according to its needs and requirements. Put differently, for a number of jobs recognition is optional and applicants might want to apply voluntarily for certification depending on their type of diploma. Obtaining a certification in this context should facilitate contacts with potential employers and/or Swiss authorities.

All recognition of foreign qualifications is an individual process, with various criteria being taken into account under applicable legislation, the specificities of the education and training received, or even the professional experience acquired. During a recognition procedure, should the competent authority find substantial differences between the content of the foreign and the Swiss education, it may refuse to recognize a diploma or, if necessary, require compensatory measures before granting recognition. These can take the form of an internship or an examination of professional competence. Finally, it should be noted that a recognition procedure is usually not free of charge. The amount varies according to the different competent authorities and the respective procedures. In general, the costs of a procedure are between CHF 150 and CHF 1000.

4 Data and Methodology

The empirical analysis is based from the Migration-Mobility Survey. In this section, we first present an overview of the panel data extracted by the database. Then, we consider a regression specification linking the degree of skills utilization, foreign qualifications and their recognition at the individual level over three time periods. When estimating this relationship, panel data methods are applied to control for possible self-selection bias on unobserved heterogeneity.

4.1 Data Source

The Migration-Mobility Survey has been conducted every two years since 2016 to collect information on the reception and integration of recent immigrants in Switzerland (for in-depth information on this survey, see Steiner & Landös, 2019). The first round was conducted in fall 2016 on a foreign-born population who were not Swiss citizens and immigrated to Switzerland in the last ten years at the time of the survey. To be eligible, respondents had to be aged 24–64 and at least 18 when they arrived in Switzerland.

Conducted in six languages, the survey covers the most important immigrant groups from eleven countries or regions of birth, excluding Balkan and Asian countries (except

⁴ The list of regulated occupations can be found in the following link [last accessed: December 20, 2022]: https://www.sbfi.admin.ch/dam/sbfi/en/dokumente/2016/08/reglementierte-berufe.pdf.download.pdf/Liste_regl_Berufe_D.pdf.

⁵ In Switzerland, there are various authorities responsible for recognising foreign qualifications. The one to contact depends on the applicant's professional title. An overview of which authority should be contacted to obtain the recognition of foreign qualification is provided in the following link [last accessed: December 20, 2022]: <https://www.sbfi.admin.ch/sbfi/en/home/education/recognition-of-foreign-qualifications/recognition-procedure-on-establishment/recognition-authorities.html>.

for India).⁶ Thus, while the survey is not representative of the overall working population of recent immigrants, it includes the largest groups living in Switzerland over the period 2016–2020. These groups represent at least two thirds of the total immigrant population (cf. Steiner & Landös, 2019).

The Swiss Federal Statistical Office's sample register (SRPH), which is drawn from the harmonized registers of persons at the federal, cantonal and municipal levels, is used as the sampling frame. The frame is an exhaustive list of persons living in Switzerland, satisfying the eligibility criteria mentioned previously. A stratified random sampling strategy was applied to obtain representative samples for the eleven origin-groups. Moreover, immigrants with less than 2 years in Switzerland were oversampled to prevent the lower participation rates that this specific group is likely to face over the panel. Reserve samples for all origin-groups with a similar structure as the main sample were also drawn. These additional samples aimed to ensure that the minimum sample size for the survey is met and that there are enough interviews for each stratum in the event of too-low response rates. More than one-third of the sampled individuals with valid addresses participated, with total response rates ranging from 26% for the Portuguese subsample to 45% for the Indian subsample.

It should be noted that, due to a technical problem, the survey did not collect any information on the recognition of foreign qualifications among PhD holders before 2020. As a result, this group is omitted over the panel in the regression analyses.⁷ Another important limitation relates to the lack of information on occupational groups. This prevents us from identifying whether immigrants work in regulated occupations or not. Overall, the final sample considers only the first cohort of respondents surveyed at the 2016 round, who were employed and reported valid information for the variables of interest at least twice over the three waves of the survey. The selection process leaves us with an unbalanced panel with 1,400 individuals and a total of 3,577 observations.⁸ This selection procedure yields a lower bound of the effect estimated, as will be explained below.

4.2 Empirical Methods

Our empirical specification relates to Pecoraro and Wanner (2019) who analysed the relationship between a dummy for skills mismatch and the status of recognition in a cross-sectional setting. However, here we use the degree of skills utilization as our main dependent variable over three time periods from 2016 to 2020. This indicator is measured using a

⁶ Table 2.1 in Steiner & Landös (2019) provides an overview of the nationalities, the attributed languages and their share in the total foreign-born population.

⁷ Because information on the recognition of foreign qualifications among PhD holders is only available in 2020 (i.e., the third wave), as a robustness check, we run our baseline regressions on two samples either excluding or including immigrants with a PhD for this specific wave. The results based on a cross-sectional ordered probit model are qualitatively similar across both subsamples and confirm our panel estimation results; they are not presented here and are available upon request.

⁸ The criterion based on the selection of at least 2-time observations over the 3-year panel amounts to retaining 1,339 individuals out of a total of 4,169 valid observations in the first wave. This represents an attrition rate of about two-third between the first two waves. While this rate is fairly high, the resulting retention rate (around one-third) corresponds to the average response rate for the first survey in 2016 (cf. Steiner & Landös, 2019). Nevertheless, these attrited individuals (= 1 in case of attrition, 0 otherwise) are significantly less likely to be satisfied with their life in general ($r = -0.079$) or with their decision to move to Switzerland ($r = -0.083$), both satisfaction variables ranging from 0 (not at all satisfied) to 10 (completely satisfied). In the Results section, we discuss how this problem might affect our baseline estimates.

8-point Likert-type scale, ranging from 0 “your knowledge and overall skills are not utilized at all” to 7 “your knowledge and overall skills are utilized to a very high extent”. The empirical model is summarised by:

$$U_{it}^* = \alpha R_{it} + \mathbf{X}_{it}\beta + c_i + \epsilon_{it} \quad (1)$$

where U_{it}^* is the unobserved latent variable that reflects the degree of skills utilization among individual i at time t , and R_{it} captures our explanatory variable of interest measuring the place of education along with the recognition of the foreign-acquired education. We carry out the empirical analysis in two steps. First, we consider whether or not the highest level of education was acquired in Switzerland, in a EU28/EFTA country or in a non-EU28/EFTA country,⁹ and then whether the foreign qualifications have been recognized through the Certificate of Equivalence.¹⁰ Then, we specify whether a Certificate of Equivalence was requested but not obtained.

\mathbf{X}_{it} is a vector of observed personal characteristics, namely: the highest level of education, gender, age, age squared, years since migration (ysm), ysm squared, the level of comprehension in terms of local language, the level of speaking in terms of local language, the region where the immigrant was born, an indicator identifying whether the immigrant had a job contract or a job offer in Switzerland at the time of immigration, and year/round fixed effects, as well as a constant. The above specification also includes a term to account for unobserved heterogeneity c_i , while ϵ_{it} are the independent and identically distributed (i.i.d.) errors. The description of the variables and summary statistics by certification types are provided in Tables 5 and 6 in the Appendix.

To account for the ordinal nature of the observed outcome variable U_{it} , we use panel ordered probit estimations. The continuous latent variable U_{it}^* can be thought of as the ‘propensity’ to utilize an immigrant’s skills. Respondents were asked “To what extent are your knowledge and overall skills utilized in your current work? By knowledge and overall skills we mean your formal education as well as the skills you obtained while working (on-the-job training)”.¹¹ The observed response categories are tied to the latent variable as follows (where μ_j with $j = 1, \dots, 7$ are cut points):

$$U_{it} = \begin{cases} 0 & \text{not at all} & \text{if } U_{it}^* \leq \mu_1 \\ 1 & & \text{if } \mu_1 < U_{it}^* \leq \mu_2 \\ 2 & & \text{if } \mu_2 < U_{it}^* \leq \mu_3 \\ 3 & & \text{if } \mu_3 < U_{it}^* \leq \mu_4 \\ 4 & & \text{if } \mu_4 < U_{it}^* \leq \mu_5 \\ 5 & & \text{if } \mu_5 < U_{it}^* \leq \mu_6 \\ 6 & & \text{if } \mu_6 < U_{it}^* \leq \mu_7 \\ 7 & \text{to a very high extent} & \text{if } \mu_7 < U_{it}^* \end{cases}$$

⁹ The abbreviation *EU* is used hereafter to denote the European Union of 28 countries along with the EFTA countries; therefore, *non-EU* includes all the other countries in the world.

¹⁰ Respondents with foreign qualifications were asked “Did you make an official request in Switzerland in order to obtain a certificate of equivalence for your educational qualifications?” with five possible answers (after omitting nonresponse items): 1. yes, the certificate was obtained; 2. yes, but the certificate was not obtained; 3. yes, but the procedure is not yet complete; 4. no, it was not necessary; 5. no, other reasons. It should be noted that immigrants are classified as not having a certificate of equivalence for their foreign qualifications if they responded one of the last four answers.

¹¹ Most indicators of skills utilization are in general subjectively derived (McGuinness et al., 2018).

This empirical strategy allows us to address the potential problem of omitted variables. For instance, unmeasured components of an immigrant's human capital—such as the quality of foreign-acquired qualifications, the level of motivation, or other unobserved productive characteristics—are likely to be correlated with the propensity to obtain recognition from the Swiss authorities. Omitting these worker attributes would lead to biased estimates of when derived from a pooled ordered probit model. This type of endogeneity can be addressed by using the panel structure of the data.

We therefore estimate a random effects (RE) ordered probit model first, where unobserved heterogeneity c_i and the covariates are assumed to be independent. Then, we estimate a RE ordered probit model in which we add the individual group means of time-variant control variables to filter out the correlation between the error term and the predictor variables (Greene, 2018; Mundlak, 1978). By doing so, we relax the strong assumption of the conventional RE model that unobserved heterogeneity and the covariates are independent, allowing for correlation between the likelihood of certification and unmeasured productive attributes as in a linear fixed effects analysis.

5 Results

5.1 Baseline Results

The RE ordered probit estimates from Eq. (1) are presented in the first column of Table 1.¹² In line with prior research on the imperfect international transferability of human capital, coefficient estimates show that foreign qualifications relative to a Swiss education (the reference category) are negatively and significantly associated with the degree of skills utilization. In addition, the imperfect portability of foreign qualifications seems to be particularly relevant when the highest education has been acquired in a non-EU country.

These results are in part confirmed by coefficient estimates derived from the Mundlak specification, which includes the individual means of time-variant variables. Following Greene (2018), we test the null hypothesis of the random effects model in which the means of the time-variant predictor variables do not add any explanatory power. This hypothesis is rejected according to the F statistic provided at bottom of Table 1, suggesting that the random effects model with the Mundlak correction yields consistent results relative to the conventional random effects approach. Put differently, the random effects model can be rejected against the Mundlak-type random effects model.

As shown in the second column, the coefficient estimate associated with foreign qualifications acquired in a EU country is not statistically significant. Accordingly, recent immigrants with a EU education have unobserved traits, which allow them to utilize their skills as their equivalents with a Swiss education. This result is also consistent with Switzerland being part of the Schengen Area, where free movement of EU workers is guaranteed without fixed quotas or a national priority—the latter having been abolished since 2004 through the first bilateral agreement with the EU. In line with this principle, the results obtained with the Mundlak correction remain consistent with the imperfect transferability

¹² The null hypothesis that the proportion of the total variance contributed by the panel-level variance component is zero – or unimportant, meaning that the panel estimator is not different from the pooled estimator – is rejected here and also in all the other subsequent RE ordered probit estimation results, using a likelihood-ratio (LR) test.

Table 1 RE Ordered Probit regressions of the degree of skills utilization on foreign qualifications and their certification. *Source:* Migration-Mobility Survey, rounds 1 (2016), 2 (2018) & 3 (2020)

	1st version of Eq. (1)		2nd version of Eq. (1)		3rd version of Eq. (1)	
	RE ordered probit	Mundlak RE ordered probit	RE ordered probit	Mundlak RE ordered probit	RE ordered probit	Mundlak RE ordered probit
	(1)	(2)	(3)	(4)	(5)	(6)
R_{it}						
Swiss education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
EU education	-0.230* (0.118)	-0.0979 (0.194)	0.341** (0.173)	0.114 (0.279)	0.345** (0.173)	0.153 (0.281)
A certificate of equivalence for the EU education was obtained						
No certificate of equivalence for the EU education (certification was requested but not obtained, the request is pending, or no request has been submitted)						
A certificate of equivalence for the EU education was requested but not obtained					-0.236 (0.214)	0.0803 (0.292)
No certificate of equivalence for the non-EU education (the request is pending or no request has been submitted)					-0.321** (0.118)	-0.201 (0.199)
Non-EU-acquired education	-0.416** (0.144)	-0.576** (0.268)				
A certificate of equivalence for the non-EU education was obtained			0.269 (0.265)	-0.136 (0.380)	0.270 (0.265)	-0.141 (0.380)
No certificate of equivalence for the non-EU education (certification was requested but not obtained, the request is pending, or no request has been submitted)			-0.509** (0.145)	-0.706** (0.275)		
A certificate of equivalence for the non-EU education was requested but not obtained					-0.464 (0.331)	-1.689** (0.605)

Table 1 (continued)

	1st version of Eq. (1)		2nd version of Eq. (1)		3rd version of Eq. (1)	
	RE ordered probit	Mundlak RE ordered probit	RE ordered probit	Mundlak RE ordered probit	RE ordered probit	Mundlak RE ordered probit
No certificate of equivalence for the non-EU education (the request is pending or no request has been submitted)	(1)	(2)	(3)	(4)	(5)	(6)
Control variables	Yes	Yes	Yes	Yes	-0.511** (0.145)	-0.719** (0.275)
Year/Round fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Means of the time-variant predictor variables	No	Yes	No	Yes	No	Yes
Number of <i>i</i>	1400	1400	1400	1400	1400	1400
Number of observations	3577	3577	3577	3577	3577	3577
<i>LR test versus pooled ordered probit regression</i>	588.06**	601.30**	566.74**	580.39**	565.22**	579.48**
<i>Chi-squared statistic</i>						
Test for joint significance of the means of the time-variant predictor variables						
<i>F statistic</i>		36.61**		40.51**		48.07**

Conventional and Mundlak Random Effects Ordered Probit, coefficient estimates, standard errors in parentheses (data are unweighted). Significance: ** $p < 0.05$, * $p < 0.10$. The dependent variable *degree of skills utilization* is an ordinal variable, ranging from 0 (not at all) to 7 (to a very high extent). The certification variable in the third version of Eq. (1) relies on seven categories: Swiss education (the reference category), EU education certified, certification of EU education was requested but not obtained, EU education not certified (certification is pending or no certification has been requested), non-EU education certified, certification of the non-EU education was requested but not obtained, non-EU education not certified (certification is pending or no certification has been requested). Other control variables: Sex, age, age squared, years since migration (ysm), ysm squared, the level of education, the level of comprehension in terms of local language, the level of speaking in terms of local language, the region where the immigrant was born, an indicator identifying whether the immigrant had a job contract or job offer in Switzerland at the time of immigration. The null hypothesis that the proportion of the total variance contributed by the panel-level variance component is zero is always rejected using a likelihood-ratio (LR) test. The null hypothesis of the random effects model in which the means of the time-variant predictor variables do not add any explanatory power is always rejected according to the *F* statistic

hypothesis: as the negative association with the degree of skills utilization is only significant among recent immigrant workers with non-EU qualifications for whom a system of quotas is in place.

The results in the third and fourth columns are based on an alternative version of Eq. (1) which considers whether a foreign-acquired education from a EU- or non-EU country has been certified or not. For this second specification, the F test result indicates again that the random effects model is rejected against the Mundlak-corrected random effects model.

Notwithstanding these results, it is interesting to notice that coefficient estimates in the third column, which are derived from the RE ordered probit, reveal a negative relationship between the degree of skills utilization and the non-certification of foreign qualifications regardless of the country of education. They also indicate that there is no significant relationship between certification of a non-EU education and the degree of skills utilization, implying that the foreign qualification is effectively made equivalent to the corresponding Swiss qualification.

Once unobserved heterogeneity is accounted for via the Mundlak correction terms, all the coefficient estimates related to the certification or the non-certification of a EU education, as shown in the fourth column, are no longer statistically significant. On the other hand, there is still a significantly negative relationship with the degree of skills utilization among immigrants without a certificate of equivalence for their non-EU education. That is, relative to immigrants with a Swiss education, those with a non-EU education experience a lower degree of skills utilization, *ceteris paribus*.

In the last two columns of Table 1, we further test whether an immigrant who did not have a certificate of equivalence sent a request and did not obtain the certification of her/his foreign qualifications versus the situation in which the certification is pending or simply no certification was requested. Here we mainly discuss the results from the last column, since once again the random effects model is rejected against the Mundlak-type random effects model according to the F test result. Interestingly, both new coefficient estimates associated with the two forms of non-certification are significantly negative, confirming the significant and negative relationship between the degree of skills utilization and the non-certification of foreign qualifications. The results also indicate that the certification is effective in screening out immigrants with a non-EU education whose skills are not transferable in the Swiss labour market.

Given the negative correlation between recent immigrants' satisfaction and their attrition status (see footnote 9), we further examine how this issue might affect our baseline estimates. To that end, we focus on the first wave, and we replicate the analyses from Table 1 using the cross-sectional ordered probit procedure on three samples which consist of immigrants present at least two times over the 3-year panel ($n=1339$), those present only once ($n=2830$) and the latter samples together ($n=4169$), respectively. The results of these checks (reported in Table 7 of the Appendix) show more significant and negative relationships between the degree of skills utilization and most categories of (non-)certification for the second sample of immigrants than for the first sample based on immigrants with at least two observations in the panel. In other words, it appears that non-Swiss educated immigrants who left the survey after the first interview were more likely to under-utilize their skills than their counterpart who participated more than once over the 3-year panel. As a result, our estimates of under-utilisation represent a lower bound. However, it should be noted that the coefficient estimates derived from the whole sample are somewhat similar to those obtained from the RE ordered probit model in Table 1. Since these cross-sectional estimates may be misleading due to omitted variable bias, and the conventional

RE approach produces less consistent results compared to the RE model with the Mundlak correction, we consider the latter estimator as our preferred one.

5.2 Heterogeneity and Additional Results

We further investigate if our baseline results might differ across dimensions that are likely reinforce or mitigate the statistical associations between the degree of skills utilization and (non-)certification. To do so, we replicate estimations based on the third (and most complete) version of Eq. (1) using the Mundlak approach while interacting the certification types with the dimensions of interest: (a) the job status at the time of immigration, (b) the level of education, and (c) gender. It should be noted that all the F test results derived in the context of this subsection indicate that the RE model is rejected against the Mundlak-type RE model.

Let's first consider the average marginal effects (AME) of (non-)certification according to different job statuses at the time of immigration, which are computed for each degree of skills utilization. As reported in Table 2, most of the AME estimates related to certification or non-certification of a EU-acquired education are not statistically significant at the 5 percent level. One exception is the AME estimates of non-certified EU qualifications (displayed graphically at the bottom left of Fig. 1), due to the facts that the request is pending or that no request was submitted, among immigrants who arrived in Switzerland without a job contract or job offer. In this case, immigrants have a 1.17 percentage point higher probability of reporting that they do not utilize their skills at all (i.e., $U_{it}=0$); at the same time, they have 12 percentage points lower probability of utilizing their skills to a very large extent (i.e., $U_{it}=7$).

Non-certification of non-EU qualifications, arising because the request is pending or no request has been submitted, is also associated with a lower degree of skills utilization relative to having a Swiss education among immigrants who had no job contract or job offer at the time of immigration. As shown in Fig. 2, the AME estimates in this context are even higher than those depicted for immigrants with EU qualifications: the probability of not utilizing skills at all increases by 4.13 percentage points, while the probability of utilizing skills to a very large extent decreases by 24.9 percentage points. Last but not the least, the AME estimated for denied certification of non-EU qualifications are the highest in magnitude among immigrants without a job contract or job offer when arriving in Switzerland: in fact, the probability of utilizing skills to a very large extent decreases by 38.2 percentage points.

All in all, those findings highlight the importance of having a job contract or job offer before entering the Swiss labour market, either for immigrants with EU qualifications or for those with non-EU qualifications, to keep the degree of skill utilization as high as it would be if the immigrants held a Swiss education. In this context, immigrant workers are less likely to face discrimination based on their education and thus have a clear labour market advantage relative to those without any employment arrangement prior to migration.

The AME estimates of (non-)certification at two broad levels of education—tertiary education versus less than tertiary education—are presented in Table 3. Interestingly, and in line with baseline results, the estimates related to certification or non-certification of a EU education are weakly or not statistically significant. On the other hand, the results for non-certification of non-EU qualifications are mixed.

As shown in Fig. 3, most of the AME estimates for denied certification of non-EU qualifications—when certification was requested but not obtained—are statistically significant

Table 2 Mundlak RE Ordered Probit regressions of the degree of skills utilization on foreign qualifications and their certification, interacted with the job status at immigration. *Source:* Migration-Mobility Survey, rounds 1 (2016), 2 (2018) & 3 (2020)

Scale value of U_{it} =	0	1	2	3	4	5	6	7
Not at all								
Swiss education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>A certificate of equivalence for the EU education was obtained</i>								
> No job	0.000301 (0.00598)	0.000237 (0.00471)	0.000400 (0.00794)	0.000606 (0.0120)	0.000975 (0.0193)	0.00150 (0.0297)	0.000509 (0.00998)	-0.00453 (0.0896)
> Job in a new company	-0.00676 (0.00563)	-0.00537 (0.00437)	-0.00910 (0.00730)	-0.0139 (0.0110)	-0.0226 (0.0179)	-0.0355 (0.0287)	-0.0133 (0.0135)	0.106 (0.0854)
> Job in the same company as before immigration	0.00536 (0.0185)	0.00438 (0.0143)	0.00755 (0.0239)	0.0117 (0.0360)	0.0195 (0.0574)	0.0321 (0.0880)	0.0141 (0.0325)	-0.0946 (0.267)
<i>A certificate of equivalence for the EU education was requested but not obtained</i>								
> No job	0.00910 (0.00999)	0.00660 (0.00690)	0.0106 (0.0108)	0.0153 (0.0151)	0.0230 (0.0219)	0.0311 (0.0280)	0.00437 (0.00660)	-0.100 (0.0930)
> Job in a new company	-0.00799 (0.00579)	-0.00646 (0.00456)	-0.0111 (0.00770)	-0.0171 (0.0118)	-0.0282 (0.0197)	-0.0460 (0.0335)	-0.0197 (0.0193)	0.137 (0.0985)
> Job in the same company as before immigration	-0.00491 (0.00539)	-0.00487 (0.00494)	-0.00947 (0.00917)	-0.0169 (0.0158)	-0.0335 (0.0306)	-0.0751 (0.0700)	-0.0709 (0.0780)	0.216 (0.206)
<i>No certificate of equivalence for the EU education (the request is pending or no request has been submitted)</i>								
> No job	0.0117** (0.00507)	0.00833** (0.00378)	0.0133** (0.00604)	0.0189** (0.00876)	0.0279** (0.0135)	0.0366* (0.0195)	0.00338 (0.00618)	-0.120** (0.0602)
> Job in a new company	-0.00267 (0.00526)	-0.00202 (0.00389)	-0.00334 (0.00634)	-0.00492 (0.00924)	-0.00765 (0.0141)	-0.0110 (0.0197)	-0.00262 (0.00386)	0.0343 (0.0621)
> Job in the same company as before immigration	0.000795 (0.00527)	0.000691 (0.00463)	0.00123 (0.00831)	0.00199 (0.0135)	0.00348 (0.0239)	0.00624 (0.0435)	0.00354 (0.0258)	-0.0180 (0.125)
<i>A certificate of equivalence for the non-EU education was obtained</i>								
> No job	0.00940 (0.0122)	0.00680 (0.00824)	0.0110 (0.0127)	0.0157 (0.0175)	0.0236 (0.0248)	0.0318 (0.0302)	0.00429 (0.00748)	-0.103 (0.104)

Table 2 (continued)

Scale value of U_{it} =	0	1	2	3	4	5	6	7
> Job in a new company	-0.0111* (0.00625)	-0.00951* (0.00544)	-0.0169* (0.00991)	-0.0273 (0.0170)	-0.0479 (0.0331)	-0.0880 (0.0751)	-0.0551 (0.0757)	0.256 (0.216)
> Job in the same company as before immigration	-0.00113 (0.00814)	-0.00101 (0.00735)	-0.00185 (0.0134)	-0.00305 (0.0223)	-0.00549 (0.0403)	-0.0103 (0.0769)	-0.00666 (0.0510)	0.0295 (0.219)
<i>A certificate of equivalence for the non-EU education was requested but not obtained</i>								
> No job	0.142 (0.0916)	0.0612** (0.0256)	0.0769** (0.0240)	0.0832** (0.0170)	0.0844** (0.0129)	0.0343 (0.0427)	-0.101* (0.0534)	-0.382** (0.0785)
> Job in a new company	0.0468 (0.0687)	0.0264 (0.0317)	0.0374 (0.0398)	0.0463 (0.0424)	0.0566 (0.0408)	0.0471** (0.0183)	-0.0344 (0.0642)	-0.226 (0.168)
> Job in the same company as before immigration	No	Observation						
<i>No certificate of equivalence for the non-EU education (the request is pending or no request has been submitted)</i>								
> No job	0.0413** (0.0156)	0.0248** (0.00822)	0.0364** (0.0108)	0.0469** (0.0126)	0.0611** (0.0154)	0.0607** (0.0180)	-0.0221 (0.0149)	-0.249** (0.0658)
> Job in a new company	-0.00259 (0.00705)	-0.00196 (0.00533)	-0.00323 (0.00880)	-0.00477 (0.0130)	-0.00740 (0.0202)	-0.0107 (0.0292)	-0.00251 (0.00729)	0.0331 (0.0905)
> Job in the same company as before immigration	0.00591 (0.00721)	0.00479 (0.00591)	0.00824 (0.0102)	0.0127 (0.0160)	0.0211 (0.0272)	0.0344 (0.0470)	0.0146 (0.0258)	-0.102 (0.137)
Control variables			Yes		Number of i			1400
Wave dummies			Yes		Number of observations			3577
Means of the time-variant predictor variables			Yes					
<i>LR test versus pooled ordered probit regression</i>								
<i>Chi-squared statistic</i>			565.28**					
<i>Test for joint significance of the means of the time-variant predictor variables</i>								
<i>F statistic</i>			44.71**					

Table 2 (continued)

Mundlak Random Effects Ordered Probit, average marginal effects by scale value of U_{it} , standard errors in parentheses (data are unweighted). Significance: $**p < 0.05$, $*p < 0.10$. The dependent variable *degree of skills utilization* is an ordinal variable, ranging from 0 (not at all) to 7 (to a very high extent). The certification variable relies on seven categories: Swiss education (the reference category), EU education certified, certification of the EU education was requested but not obtained, EU education not certified (certification is pending or no certification has been requested), non-EU education certified, certification of the non-EU education was requested but not obtained, non-EU education not certified (certification is pending or no certification has been requested). The indicator identifying whether the immigrant had a job contract or a job offer in Switzerland at the time of immigration consists in the following: no job, job in a new company, job in the same company as before immigration. Other control variables: Sex, age, age squared, years since migration (ysm), ysm squared, the level of education, the level of comprehension in terms of local language, the level of speaking in terms of local language, the region where the immigrant was born. The null hypothesis that the proportion of the total variance contributed by the panel-level variance component is zero is rejected using a likelihood-ratio (LR) test. The null hypothesis of the random effects model in which the means of the time-variant predictor variables do not add any explanatory power is always rejected according to the F statistic

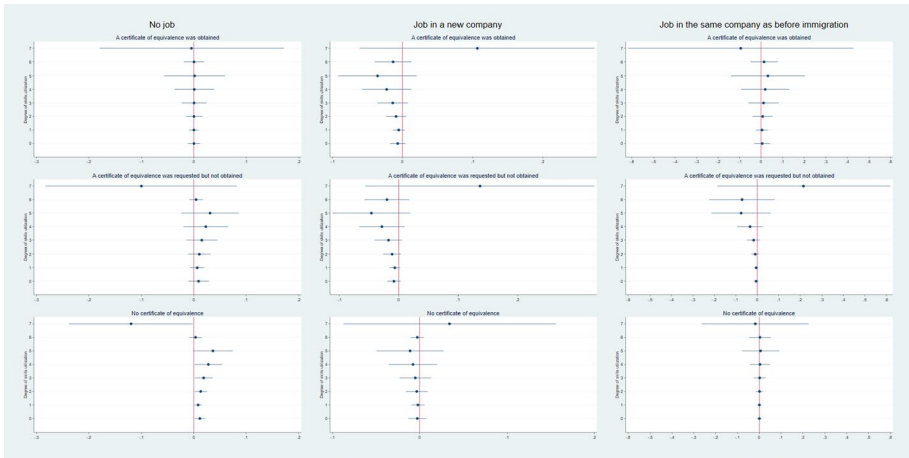


Fig. 1 Average marginal effects of certified EU qualifications by job statuses at immigration. Notes: Calculation from Table 2 for immigrants with a EU education. The average marginal effects are plotted with the 95 percent confidence intervals. The dependent and control variables are described in the notes to Table 2

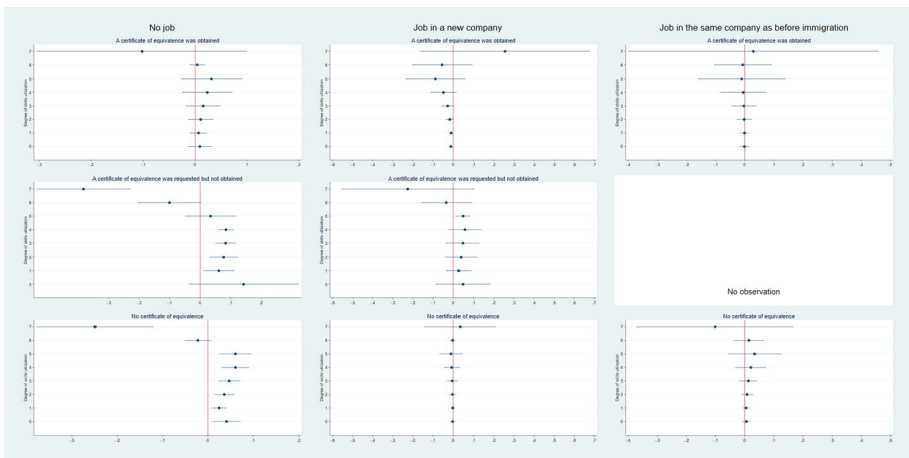


Fig. 2 Average marginal effects of certified non-EU qualifications by job statuses at immigration. Notes: Calculation from Table 2 for immigrants with a non-EU education. The average marginal effects are plotted with the 95 percent confidence intervals. The dependent and control variables are described in the notes to Table 2

for both levels of education. For instance, relative to having a Swiss education, denied certification is associated with a decrease in the probability of utilizing skills to a very large extent corresponding to 30.1 and 26 percentage points among immigrants with less than tertiary education and those with tertiary education, respectively. Second, the AME estimates for non-certification of a non-EU education—when the request for certification is pending or no certification has been requested—is only significant among immigrants with less than tertiary education. Thus, these immigrants emerge as being more likely to

Table 3 Mundlak RE Ordered Probit regressions of the degree of skills utilization on foreign qualifications and their certification, interacted with the tertiary-level education. Source: Migration-Mobility Survey, rounds 1 (2016), 2 (2018) & 3 (2020)

Scale value of U_{it} =	0	1	2	3	4	5	6	7
Not at all								To a very high extent
Swiss education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>A certificate of equivalence for the EU education was obtained</i>								
> Lower than a tertiary education	-0.00877 (0.00590)	-0.00717 (0.00450)	-0.0126* (0.00752)	-0.0199* (0.0114)	-0.0344* (0.0190)	-0.0626* (0.0341)	-0.0400 (0.0254)	0.185* (0.102)
> Tertiary education	0.000273 (0.00647)	0.000196 (0.00463)	0.000318 (0.00751)	0.000460 (0.0109)	0.000706 (0.0167)	0.00103 (0.0242)	0.000291 (0.00680)	-0.00327 (0.0771)
<i>A certificate of equivalence for the EU education was requested but not obtained</i>								
> Lower than a tertiary education	-0.00943 (0.00600)	-0.00781* (0.00463)	-0.0138* (0.00783)	-0.0221* (0.0121)	-0.0387* (0.0207)	-0.0725* (0.0399)	-0.0496 (0.0347)	0.214* (0.119)
> Tertiary education	0.00144 (0.00713)	0.00102 (0.00503)	0.00164 (0.00809)	0.00237 (0.0116)	0.00360 (0.0176)	0.00514 (0.0250)	0.00132 (0.00618)	-0.0165 (0.0805)
<i>No certificate of equivalence for the EU education (the request is pending or no request has been submitted)</i>								
> Lower than a tertiary education	0.00273 (0.00603)	0.00194 (0.00436)	0.00314 (0.00710)	0.00452 (0.0103)	0.00689 (0.0160)	0.00990 (0.0237)	0.00262 (0.00752)	-0.0317 (0.0749)
> Tertiary education	0.00299 (0.00464)	0.00209 (0.00329)	0.00335 (0.00530)	0.00477 (0.00762)	0.00718 (0.0116)	0.0100 (0.0167)	0.00225 (0.00447)	-0.0327 (0.0534)
<i>A certificate of equivalence for the non-EU education was obtained</i>								
> Lower than a tertiary education	0.00294 (0.0127)	0.00209 (0.00884)	0.00337 (0.0141)	0.00485 (0.0201)	0.00738 (0.0302)	0.0106 (0.0422)	0.00275 (0.00985)	-0.0340 (0.137)
> Tertiary education	-0.00471 (0.00663)	-0.00356 (0.00512)	-0.00594 (0.00868)	-0.00890 (0.0132)	-0.0143 (0.0218)	-0.0226 (0.0364)	-0.00945 (0.0185)	0.0695 (0.110)
<i>A certificate of equivalence for the non-EU education was requested but not obtained</i>								
> Lower than a tertiary education	0.0752 (0.0636)	0.0374 (0.0242)	0.0508* (0.0280)	0.0601** (0.0270)	0.0702** (0.0238)	0.0541** (0.0266)	-0.0465 (0.0507)	-0.301** (0.118)
> Tertiary education	0.0562	0.0297	0.0414	0.0504	0.0614**	0.0530**	-0.0326	-0.260**

Table 3 (continued)

Scale value of U_{it} =	0	1	2	3	4	5	6	7
Not at all								To a very high extent
<i>No certificate of equivalence for the non-EU education (the request is pending or no request has been submitted)</i>	(0.0580)	(0.0245)	(0.0299)	(0.0307)	(0.0285)	(0.0150)	(0.0479)	(0.128)
> Lower than a tertiary education	0.0223*	0.0139**	0.0209**	0.0278**	0.0382**	0.0445*	-0.00297	-0.165**
	(0.0118)	(0.00695)	(0.0101)	(0.0131)	(0.0179)	(0.0231)	(0.0126)	(0.0795)
> Tertiary education	0.0105	0.00695	0.0108	0.0149	0.0214	0.0274	0.00224	-0.0941
	(0.00887)	(0.00570)	(0.00867)	(0.0117)	(0.0165)	(0.0207)	(0.00464)	(0.0725)
Control variables	Yes							
Wave dummies	Yes							
Means of the time-variant predictor variables	Yes							
Number of i	1400							
Number of observations	3577							
<i>LR test versus pooled ordered probit regression</i>								
<i>Chi-squared statistic</i>		563.94**						
Test for joint significance of the means of the time-variant predictor variables								
<i>F statistic</i>								39.97**

Mundlak Random Effects Ordered Probit, average marginal effects by scale value of U_{it} , standard errors in parentheses (data are unweighted). Significance: ** $p < 0.05$, * $p < 0.10$. The dependent variable *degree of skills utilization* is an ordinal variable, ranging from 0 (not at all) to 7 (to a very high extent). The certification variable relies on seven categories: Swiss education (the reference category), EU education certified, certification of the EU education was requested but not obtained, EU education not certified (certification is pending or no certification has been requested), non-EU education certified, certification of the non-EU education was requested but not obtained, non-EU education not certified (certification is pending or no certification has been requested). The level of education is transformed in a dummy variable, equal to 1 for a tertiary-level education (zero otherwise). Other control variables: Sex, age, age squared, years since migration (ysm), ysm squared, the level of comprehension in terms of local language, the level of speaking in terms of local language, the region where the immigrant was born, an indicator identifying whether the immigrant had a job contract or job offer in Switzerland at the time of immigration. The null hypothesis that the proportion of the total variance contributed by the panel-level variance component is zero is rejected using a likelihood-ratio (LR) test. The null hypothesis of the random effects model in which the means of the time-variant predictor variables do not add any explanatory power is always rejected according to the F statistic

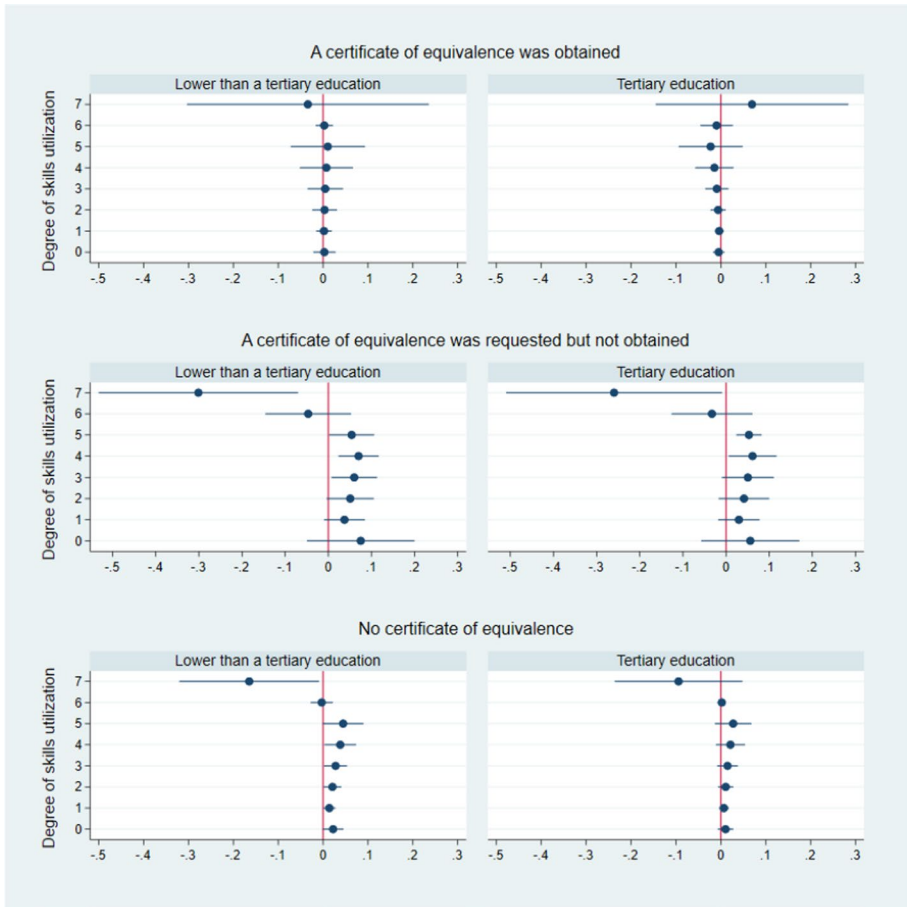


Fig. 3 Average marginal effects of certified non-EU qualifications by levels of education. Notes: Calculation from Table 3 for immigrants with a non-EU education. The average marginal effects are plotted with the 95 percent confidence intervals. The dependent and control variables are described in the notes to Table 3

underutilize their skills relative to immigrants with a Swiss education or their peers with a tertiary-level education.

While the heterogeneous results by education level suggest caution in interpreting the results, common paths do clearly emerge. Some segments of the Swiss economy face labour market shortages, particularly in terms of skilled labour (SECO, 2016). In such an environment, where the pool of indigenous workers is not large enough to satisfy the demand for skilled labour, immigration seems to be a key measure to overcome labour market shortages. Accordingly, highly educated immigrants are expected to face fewer barriers in terms of human capital transfer and integrate faster in the Swiss labour market than other immigrants.

Regarding the heterogeneous results by gender, which are illustrated in Table 4, most of the AME estimates do not show important differences between female and male immigrants and are in line with baseline results. For instance, as shown in the middle of Fig. 4,

both women and men whose non-EU qualifications was not certified after having requested recognition have a lower the probability of utilizing their skills to a very large extent compared to those with a Swiss education. While the decrease in terms of probability ranges from 26.9 (for women) to 49.7 (for men) percentage points, it should be noted that the difference between these AMEs is not statistically significant (with 95 percent confidence intervals overlapping). The main difference between women and men is found when non-EU qualifications were not certified. In this context, men are less likely to utilize their skills to a very large extent while the corresponding AME for women is not statistically significant (cf. the bottom of Fig. 4). However, the difference between these AMEs is again not statistically significant (with 95 percent confidence intervals overlapping).

6 Concluding remarks

The degree of skills utilization among recent immigrants in the Swiss labour market varies in relation with the certification of their foreign-acquired education. Using panel data models to limit possible omitted variable bias, our findings support the view that the Certificate of Equivalence enables immigrants to enjoy the same degree of skills utilization as those with Swiss education. This result suggests that recognising foreign education can effectively remove the statistical discrimination arising from education completed abroad, and improve the international transferability of human capital.

This outcome is reinforced finding that non-certification is associated with a 'penalty' in terms of skills utilization, especially when immigrants acquire their education in a non-EU country. Such penalty also emerges in case of a failed attempt to obtain the certification of non-EU qualifications, suggesting that the Certificate of Equivalence is effective in screening out immigrants whose skills are not transferable in the Swiss labour market.

While our empirical analysis provides compelling evidence on the transferability of certified education acquired abroad, the data source we rely on has limitations that should be considered in future research. First, attrition is a common threat not only when relying on panel data drawn from surveys but also in the longitudinal analysis of highly mobile populations such as recent immigrants. While this issue has been shown to have limited implications on our main results, it may be more problematic when studying the long-run trajectories of migrant workers in the host labour market. A straightforward way to circumvent the risk of attrition would be to rely on administrative sources of information which ensure the comprehensiveness and accuracy of individual trajectories. On the other hand, this kind of data source often does not cover specific topics such as certification. Another important limitation relates to the lack of information on occupational groups, which prevents us from identifying whether immigrants work in regulated occupations or not. The use of this additional dimension would shed light on the effects of voluntary certification as opposed to mandatory certification.

From a policy perspective the results support the use of certification of foreign education not only as a tool to enhance migrants' skill transfer in the host country labour market, and the associate private benefits for migrants and their families. But also, as a tool with relevant public benefits as the cost of certification, which is mainly covered by the Swiss taxpayer, is likely to be more than covered by the long-term benefits that a better use of migrants' skills does to Switzerland's productivity and economic growth.

Table 4 Mundlak RE Ordered Probit regressions of the degree of skills utilization on foreign qualifications and their certification, interacted with gender. *Source: Migration-Mobility Survey, rounds 1 (2016), 2 (2018) & 3 (2020)*

Scale value of U_{it}	0	1	2	3	4	5	6	7
Not at all								
Swiss education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>A certificate of equivalence for the EU education was obtained</i>								
> Men	-0.000434 (0.00391)	-0.000362 (0.00326)	-0.000636 (0.00574)	-0.00102 (0.00922)	-0.00177 (0.0160)	-0.00321 (0.0291)	-0.00200 (0.0183)	0.00944 (0.0856)
> Women	-0.00536 (0.00699)	-0.00380 (0.00497)	-0.00610 (0.00797)	-0.00882 (0.0116)	-0.0134 (0.0177)	-0.0190 (0.0257)	-0.00480 (0.00825)	0.0614 (0.0820)
<i>A certificate of equivalence for the EU education was requested but not obtained</i>								
> Men	-0.00263 (0.00351)	-0.00228 (0.00306)	-0.00409 (0.00552)	-0.00674 (0.00914)	-0.0121 (0.0166)	-0.0232 (0.0327)	-0.0166 (0.0250)	0.0677 (0.0950)
> Women	0.00140 (0.00955)	0.000938 (0.00637)	0.00146 (0.00988)	0.00203 (0.0137)	0.00294 (0.0198)	0.00377 (0.0252)	0.000336 (0.00215)	-0.0129 (0.0866)
<i>No certificate of equivalence for the EU education (the request is pending or no request was submitted)</i>								
> Men	0.00558* (0.00314)	0.00430* (0.00251)	0.00724* (0.00426)	0.0111* (0.00662)	0.0181 (0.0112)	0.0294 (0.0193)	0.0135 (0.0109)	-0.0892 (0.0572)
> Women	0.00214 (0.00624)	0.00142 (0.00420)	0.00220 (0.00654)	0.00306 (0.00914)	0.00441 (0.0133)	0.00559 (0.0171)	0.000412 (0.00185)	-0.0192 (0.0583)
<i>A certificate of equivalence for the non-EU education was obtained</i>								
> Men	0.0159 (0.0140)	0.0112 (0.00880)	0.0179 (0.0131)	0.0259 (0.0176)	0.0396 (0.0243)	0.0569* (0.0296)	0.0162 (0.0115)	-0.184* (0.106)
> Women	-0.0114* (0.00663)	-0.00869* (0.00508)	-0.0145* (0.00854)	-0.0221* (0.0134)	-0.0360 (0.0229)	-0.0583 (0.0424)	-0.0271 (0.0306)	0.178 (0.125)
<i>A certificate of equivalence for the non-EU education was requested but not obtained</i>								
> Men	0.248 (0.179)	0.0820** (0.0280)	0.0945** (0.0182)	0.0940** (0.00985)	0.0856** (0.0299)	0.0184 (0.0738)	-0.125* (0.0661)	-0.497** (0.0737)

Table 4 (continued)

Scale value of U_{it}	0	1	2	3	4	5	6	7
> Women	0.0832 (0.0664)	0.0388* (0.0235)	0.0506* (0.0260)	0.0576** (0.0238)	0.0626** (0.0185)	0.0358 (0.0226)	-0.0594 (0.0479)	-0.269** (0.0992)
<i>No certificate of equivalence for the non-EU education (the request is pending or no request was submitted)</i>								
> Men	0.0238** (0.0102)	0.0158** (0.00609)	0.0247** (0.00868)	0.0347** (0.0113)	0.0509** (0.0154)	0.0682** (0.0202)	0.0123 (0.0120)	-0.230** (0.0700)
> Women	0.0177 (0.0126)	0.0107 (0.00726)	0.0158 (0.0104)	0.0207 (0.0132)	0.0275 (0.0172)	0.0292 (0.0183)	-0.00644 (0.00782)	-0.115 (0.0727)
Control variables	Yes							
Wave dummies	Yes							
Means of the time-variant predictor variables	Yes							
Number of i	1400							
Number of observations	3577							
<i>LR test versus pooled ordered probit regression</i>								
<i>Chi-squared statistic</i>								
<i>Test for joint significance of the means of the time-variant predictor variables</i>								
<i>F statistic</i>								

Mundlak Random Effects Ordered Probit, average marginal effects by scale value of U_{it} , standard errors in parentheses (data are unweighted). Significance: ** $p < 0.05$, * $p < 0.10$. The dependent variable *degree of skills utilization* is an ordinal variable, ranging from 0 (not at all) to 7 (to a very high extent). The certification variable relies on seven categories: Swiss education (the reference category), EU education certified, certification of the EU education was requested but not obtained, EU education not certified (certification is pending or no certification has been requested), non-EU education certified, certification of the non-EU education was requested but not obtained, non-EU education not certified (certification is pending or no certification has been requested). Control variables: Age, age squared, years since migration (ysm), ysm squared, the level of education, the level of comprehension in terms of local language, the level of speaking in terms of local language, the region where the immigrant was born, an indicator identifying whether the immigrant had a job contract or a job offer in Switzerland at the time of immigration. The null hypothesis that the proportion of the total variance contributed by the panel-level variance component is zero is rejected using a likelihood-ratio (LR) test. The null hypothesis of the random effects model in which the means of the time-variant predictor variables do not add any explanatory power is always rejected according to the F statistic

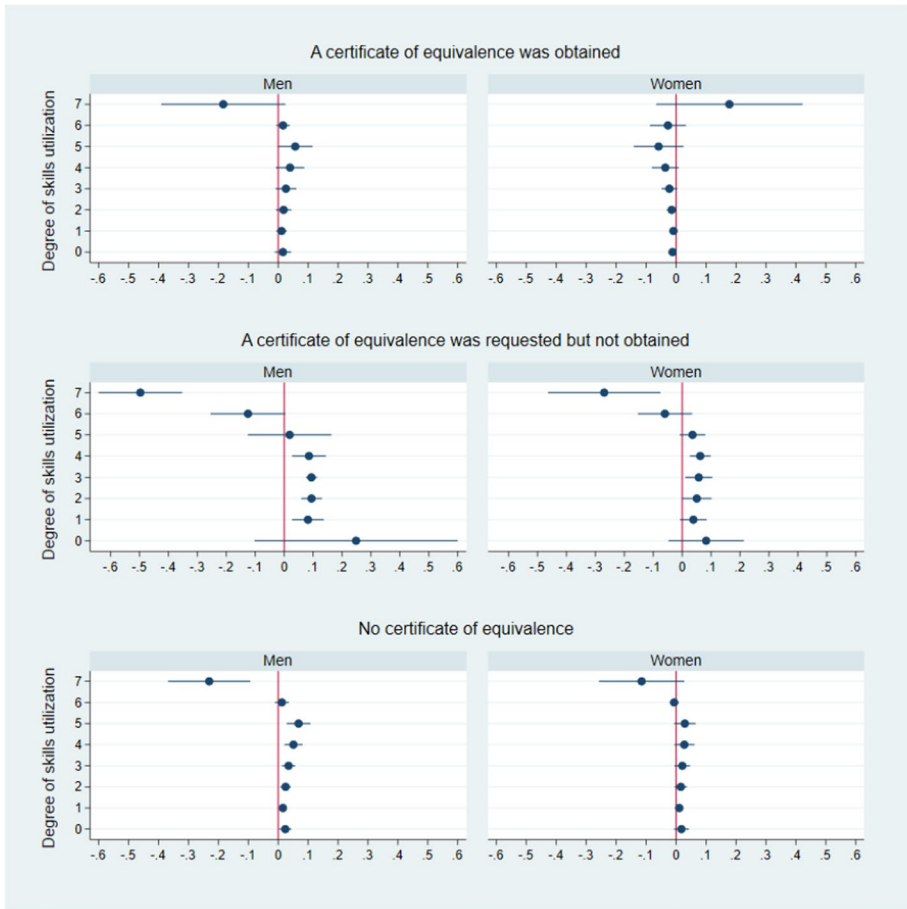


Fig. 4 Average marginal effects of certified non-EU qualifications by gender. Notes: Calculation from Table 4 for immigrants with a non-EU education. The average marginal effects are plotted with the 95 percent confidence intervals. The dependent and control variables are described in the notes to Table 4

Appendix

See Tables 5, 6 and 7.

Table 5 Explanatory variables included in the empirical analysis

Continuous variables	Dummy variables
Age in years (at the time of the interview)	<i>Levels of education</i>
Age squared	Compulsory education
Years since migration (ysm)	Higher secondary education not giving access to universities (or similar)
ysm squared	Vocational education and/or training (ref.)
	High school-leaving certificate giving access to universities (or similar)
	Advanced technical and professional training
	Bachelor or equivalent
	Master or equivalent
	<i>Gender</i>
	Male (ref.)
	Female
	<i>How well do you understand the local language?</i>
	Everything (ref.)
	Most of a conversation
	Parts of a conversation
	Some words and phrases
	Nothing at all
	<i>How well do you speak the local language?</i>
	Speak fluently (ref.)
	Speak somewhat fluently
	Speak not very well
	Know some vocabulary
	Not speak the language at all
	<i>In which country were you born?</i>
	Italy, Germany, France, Austria (ref.)
	Other EU28/EFTA
	Other Europe
	Other OECD
	Africa
	South America
	Asia and other
	<i>Job contract or job offer in Switzerland at the time of immigration</i>
	None (ref.)
	Yes, in a new company
	Yes, in the same company as before immigration
	<i>Year/round dummies</i>
	Wave 1 (ref.)
	Wave 2
	Wave 3

Table 6 Summary statistics by certification types, for 2016–2020. *Source:* Migration–Mobility Survey, rounds 1 (2016), 2 (2018) & 3 (2020)

Key variables	Total	Swiss education			Certification of foreign education		
		Certified	Requested but not obtained	Other non-certified	Certified	Requested but not obtained	Other non-certified
<i>Place of education</i>							
Switzerland	0.09 (0.28)	1.00	0.00	0.00	0.00	0.00	0.00
EU	0.65 (0.48)	0.00	0.79 (0.41)	0.65 (0.48)	0.71 (0.45)	0.71 (0.45)	0.71 (0.45)
non-EU	0.26 (0.44)	0.00	0.21 (0.41)	0.35 (0.48)	0.29 (0.45)	0.29 (0.45)	0.29 (0.45)
<i>Levels of education</i>							
Compulsory education	0.03 (0.18)	0.00 (0.06)	0.01 (0.11)	0.02 (0.14)	0.04 (0.19)	0.04 (0.19)	0.04 (0.19)
Higher secondary education not giving access to universities (or similar)	0.04 (0.19)	0.02 (0.12)	0.03 (0.18)	0.07 (0.25)	0.04 (0.19)	0.04 (0.19)	0.04 (0.19)
Vocational education and/or training	0.07 (0.26)	0.10 (0.30)	0.07 (0.25)	0.10 (0.30)	0.07 (0.25)	0.07 (0.25)	0.07 (0.25)
High school-leaving certificate giving access to universities (or similar)	0.08 (0.27)	0.02 (0.15)	0.07 (0.26)	0.08 (0.27)	0.09 (0.28)	0.09 (0.28)	0.09 (0.28)
Advanced technical and professional training	0.11 (0.31)	0.10 (0.30)	0.17 (0.37)	0.15 (0.36)	0.10 (0.30)	0.10 (0.30)	0.10 (0.30)
Bachelor or equivalent	0.21 (0.41)	0.18 (0.38)	0.29 (0.46)	0.22 (0.42)	0.21 (0.41)	0.21 (0.41)	0.21 (0.41)
Master or equivalent	0.46 (0.50)	0.58 (0.49)	0.35 (0.48)	0.37 (0.48)	0.45 (0.50)	0.45 (0.50)	0.45 (0.50)
<i>Job contract or job offer in Switzerland at the time of immigration</i>							

Table 6 (continued)

Key variables	Total	Certification of foreign education			
		Swiss education	Certified	Requested but not obtained	Other non-certified
No	0.42 (0.49)	0.63 (0.48)	0.53 (0.50)	0.63 (0.49)	0.38 (0.48)
Yes, in a new company	0.41 (0.49)	0.32 (0.47)	0.43 (0.50)	0.33 (0.47)	0.42 (0.48)
Yes, in the same company as before immigration	0.18 (0.38)	0.05 (0.22)	0.04 (0.19)	0.05 (0.21)	0.21 (0.49)
<i>Gender</i>					
Male	0.59 (0.49)	0.52 (0.50)	0.42 (0.49)	0.36 (0.48)	0.62 (0.49)
Female	0.41 (0.49)	0.48 (0.50)	0.58 (0.49)	0.64 (0.48)	0.38 (0.49)
Number of observations	3577	318	238	104	2917

Mean values presented with standard deviations in parenthesis

Table 7 Cross-sectional Ordered Probit regressions of the degree of skills utilization on foreign qualifications and their certification. *Source:* Migration-Mobility Survey, round 1 (2016)

	1st version of Eq. (1)			2nd version of Eq. (1)			3rd version of Eq. (1)		
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
R^2_{it}	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Swiss education	-0.187 (0.126)	-0.329** (0.0965)	-0.275** (0.0763)	0.289 (0.185)	-0.110 (0.140)	0.0349 (0.111)	0.291 (0.185)	-0.109 (0.140)	0.0348 (0.111)
EU education				-0.238* (0.127)	-0.345** (0.0968)	-0.302** (0.0766)			
A certificate of equivalence for the EU education was obtained							-0.346 (0.272)	-0.344** (0.172)	-0.326** (0.144)
No certificate of equivalence for the EU education (certification was requested but not obtained, the request is pending, or no request has been submitted)							-0.237* (0.127)	-0.342** (0.0970)	-0.300** (0.0768)
A certificate of equivalence for the EU education was requested but not obtained									
No certificate of equivalence for the non-EU education (the request is pending or no request has been submitted)									
Non-EU-acquired education	-0.329** (0.148)	-0.286** (0.105)	-0.291** (0.0848)	0.211 (0.289)	-0.408** (0.185)	-0.234 (0.155)	0.207 (0.289)	-0.408** (0.185)	-0.234 (0.155)
A certificate of equivalence for the non-EU education was obtained									
No certificate of equivalence for the non-EU education (certification was requested but not obtained, the request is pending, or no request has been submitted)									
A certificate of equivalence for the non-EU education was requested but not obtained							0.0141 (0.328)	-0.523** (0.195)	-0.397** (0.166)
No certificate of equivalence for the non-EU education (the request is pending or no request has been submitted)									

Table 7 (continued)

	1st version of Eq. (1)			2nd version of Eq. (1)			3rd version of Eq. (1)		
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
1339	2830	4169	1339	2830	4169	1339	2830	4169	
Control variables									
Number of observations									

Cross-sectional Random Effects Ordered Probit, coefficient estimates, standard errors in parentheses (data are unweighted). Significance: $**p < 0.05$, $*p < 0.10$. The dependent variable *degree of skills utilization* is an ordinal variable, ranging from 0 (not at all) to 7 (to a very high extent). The certification variable in the third version of Eq. (1) relies on seven categories: Swiss education (the reference category), EU education certified, certification of EU education was requested but not obtained, EU education not certified (certification is pending or no certification has been requested), non-EU education certified, certification of the non-EU education was requested but not obtained, non-EU education not certified (certification is pending or no certification has been requested). Other control variables: Sex, age, age squared, years since migration (ysm), ysm squared, the level of education, the level of comprehension in terms of local language, the level of speaking in terms of local language, the region where the immigrant was born, an indicator identifying whether the immigrant had a job contract or job offer in Switzerland at the time of immigration. Sample 1 consists of immigrants present at least two times over the 3-year panel, Sample 2 is based on immigrants present only once and Sample 3 is composed of Sample 1 and Sample 2

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References

- Altonji, J. G., & Pierret, C. (2001). Employer learning and statistical discrimination. *Quarterly Journal of Economics*, 116, 313–350.
- Arrow, K. J. (1974). *The theory of discrimination* Discrimination in Labor Markets (pp. 1–33). Princeton: Princeton University Press. <https://doi.org/10.1515/9781400867066-003>
- Auer, D., & Fossati, F. (2019). The absent rewards of assimilation: How ethnic penalties persist in the Swiss labour market. *The Journal of Economic Inequality*, 17(2), 285–299.
- Barker, E., & Bijak, J. (2020). Conceptualisation and analysis of migration uncertainty: Insights from macroeconomics. QuantMig Project Deliverable D9.1. Southampton: University of Southampton. <http://quantmig.eu/res/files/QuantMigD9.1AnalysisofMigrationUncertaintyV1.1.pdf>.
- Becker, G. S. (1964). *Human Capital: A theoretical and empirical analysis with special reference to education*. National Bureau of Economic Research.
- Bertoli, S., & Rapoport, H. (2015). Heaven's swing door: Endogenous skills, migration networks, and the effectiveness of quality-selective immigration policies. *Scandinavian Journal of Economics*, 117(2), 565–591.
- Betts, J.R., & Lofstrom, M. (2000). The educational attainment of immigrants: Trends and implications. In *Issues in the economics of immigration* (pp. 51–116). University of Chicago Press.
- Bratsberg, B., & Terrell, D. (2002). School quality and returns to education of US immigrants. *Economic Inquiry*, 40(2), 177–198.
- Borjas, G. J. (2015). The slowdown in the economic assimilation of immigrants: Aging and cohort effects revisited again. *Journal of Human Capital*, 9(4), 483–517.
- Borjas, G. J. (1987). *Self-selection and the earnings of immigrants* (No. w2248). National Bureau of Economic Research.
- Boski, P. (2013). A psychology of economic migration. *Journal of Cross-Cultural Psychology*, 44(7), 1067–1093.
- Burton-Jones, A., & Spender, J. C. (Eds.). (2012). *The Oxford handbook of human capital*. Oxford: OUP.
- Brücker, H., Glitz, A., Lerche, A., & Romiti, A. (2021). Occupational recognition and immigrant labor market outcomes. *Journal of Labor Economics*, 39(2), 497–525.
- Chiswick, B. R., & Miller, P. W. (2010). Occupational language requirements and the value of English in the US labor market. *Journal of Population Economics*, 23(1), 353–372.
- Chiswick, B. R., & Miller, P. W. (2009). The international transferability of immigrants' human capital. *Economics of Education Review*, 28(2), 162–169.
- Chiswick, B. R., & Miller, P. W. (2008). Why is the payoff to schooling smaller for immigrants? *Labour Economics*, 15(6), 1317–1340.
- Chiswick, B. R., & Miller, P. W. (1995). The endogeneity between language and earnings: International analyses. *Journal of Labor Economics*, 13(2), 246–288.
- Constant, A. F., & Zimmermann, K. F. (2011). Migration, ethnicity and economic integration. *International Handbook of Economic Integration*, 4620, 145–168.

- Duleep, H. O., & Regets, M. C. (1997). The decline in immigrant entry earnings: Less transferable skills or lower ability? *The Quarterly Review of Economics and Finance*, 37, 189–208. [https://doi.org/10.1016/S1062-9769\(97\)90065-X](https://doi.org/10.1016/S1062-9769(97)90065-X).
- Dustmann, C. (1999). Temporary migration, human capital, and language fluency of migrants. *Scandinavian Journal of Economics*, 101(2), 297–314.
- Friedberg, R. M. (2001). The impact of mass migration on the Israeli labor market. *The Quarterly Journal of Economics*, 116(4), 1373–1408. <https://doi.org/10.1162/003355301753265606>.
- Green, C., Kler, P., & Leeves, G. (2007). Immigrant overeducation: Evidence from recent arrivals to Australia. *Economics of Education Review*, 26(4), 420–432.
- Greene, W. H. (2018). *Econometric analysis* (8th ed.). Pearson Education Limited.
- Hartog, J. (2000). Over-education and earnings: Where are we, where should we go? *Economics of Education Review*, 19(2), 131–147.
- Hatton, T. J., & Leigh, A. (2011). Immigrants assimilate as communities, not just as individuals. *Journal of Population Economics*, 24(2), 389–419.
- Ispording, I. E. (2014). Disadvantages of linguistic origin—Evidence from immigrant literacy scores. *Economics Letters*, 123(2), 236–239.
- Lange, F. (2007). The speed of employer learning. *Journal of Labor Economics*, 25(1), 1–35.
- Leuven, E., & Oosterbeek, H. (2011). Overeducation and mismatch in the labor market. *Handbook of the Economics of Education*, 4, 283–326.
- Liebig, T., Kohls, S., & Krause, K. (2012). The labour market integration of immigrants and their children in Switzerland. *OECD Social, Employment and Migration Working Papers*, No. 128, OECD Publishing, Paris. <https://doi.org/10.1787/5k9fjjs1m2d2-en>.
- Lu, Y. (2012). Household migration, social support, and psychosocial health: The perspective from migrant-sending areas. *Social Science & Medicine*, 74(2), 135–142.
- Lundberg, S. J., & Startz, R. (1983). Private discrimination and social intervention in competitive labor market. *American Economic Review*, 73(3), 340–347.
- Mbaye, L. M. (2014). “Barcelona or die”: Understanding illegal migration from Senegal. *IZA Journal of Migration*, 3(1), 1–19.
- McCann, P., Poot, J., & Sanderson, L. (2010). Migration, relationship capital and international travel: Theory and evidence. *Journal of Economic Geography*, 10(3), 361–387.
- McGuinness, S. (2006). Overeducation in the labour market. *Journal of Economic Surveys*, 20(3), 387–418.
- McGuinness, S., Pouliakas, K., & Redmond, P. (2018). Skills mismatch: Concepts, measurement and policy approaches. *Journal of Economic Surveys*, 32(4), 985–1015.
- Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica*, 46(1), 69–85.
- O’Connell, P. G. (1997). Migration under uncertainty: “Try your luck” or “Wait and see.” *Journal of Regional Science*, 37(2), 331–347.
- Organisation for Economic Co-operation and Development. (2010). *Education at a glance 2010: OECD indicators*. OECD Publications.
- Pecoraro, M. (2011). Gender, brain waste and job-education mismatch among migrant workers in Switzerland. *International Migration Paper*, 111. Geneva: ILO.
- Pecoraro, M., Manatschal, A., Green, E. G., & Wanner, P. (2022). How effective are integration policy reforms? The case of asylum-related migrants. International Migration, First Online.
- Pecoraro, M., & Wanner, P. (2019). Does the recognition of foreign credentials decrease the risk for immigrants of being mismatched in education or skills? In I. Steiner & P. Wanner (Eds.), *Migrants and expats: The Swiss migration and mobility nexus* (pp. 161–186). Springer.
- Poot, J., & Stillman, S. (2010). *The importance of heterogeneity when examining immigrant education–occupation mismatch: Evidence from New Zealand*. IZA DP 5211.
- Riño, Y. (2021). Understanding brain waste: Unequal opportunities for skills development between highly skilled women and men, migrants and nonmigrants. *Population, Space and Place*, 27(5), e2456.
- Sanromá, E., Simón, H., & Ramos, R. (2015). Portability of human capital and immigrant overeducation in Spain. *Population Research and Policy Review*, 34(2), 223–241.
- SECO. (2016). Pénurie de main-d’œuvre qualifiée en Suisse - Système d’indicateurs pour évaluer la demande en personnel qualifié.
- Silver, A. (2014). Families across borders: The emotional impacts of migration on origin families. *International Migration*, 52(3), 194–220.
- Siniver, E. (2011). Testing for statistical discrimination: The case of immigrant physicians in Israel. *Labour*, 25(2), 155–166.
- Spence, M. (1976). Competition in salaries, credentials, and signaling prerequisites for jobs. *Quarterly Journal of Economics*, 90(1), 51–74.

- Steiner, I., & Landös, A. (2019). Surveying migrants in Europe. Experiences of the Swiss migration-mobility survey. In I. Steiner & P. Wanner (Eds.), *Migrants and expats: The Swiss migration and mobility nexus* (pp. 21–54). Cham: Springer.
- Sweetman, A. (2004). *Immigrant source country educational quality and Canadian labour market outcomes*. Analytical Studies, Statistics Canada.
- Tabor, A. S., & Milfont, T. L. (2011). Migration change model: Exploring the process of migration on a psychological level. *International Journal of Intercultural Relations*, 35(6), 818–832.
- Tani, M., Heaton, C., & Chan, G. (2013). The wage premium of foreign education: New evidence from Australia. *Australian Economic Review*, 46(4), 395–404.
- Tani, M. (2017). Local signals and the returns to foreign education. *Economics of Education Review*, 61, 174–190.
- Tani, M. (2021). Occupational licensing and the skills mismatch of highly educated migrants. *British Journal of Industrial Relations*, 59(3), 730–756.
- Wald, S., & Fang, T. (2008). Overeducated immigrants in the Canadian labour market: Evidence from the workplace and employee survey. *Canadian Public Policy*, 34(4), 457–479. <https://doi.org/10.3138/cpp.34.4.457>.
- Wang, S. Y. (2015). Statistical discrimination, productivity and the height of immigrants. *Industrial and Labor Relations Review*, 68(3), 529–557.
- Wanner, P. (2019). Integration of recently arrived migrants in the Swiss labour market—Do the reasons for migration matter? *Migrants and expats: The Swiss migration and mobility nexus* (pp. 103–122). Cham: Springer.
- Weins, C. (2010). Kompetenzen oder Zertifikate? Die Entwertung ausländischer Bildungsabschlüsse auf dem Schweizer Arbeitsmarkt / Skills or Certificates? The Devaluation of Foreign Educational Credentials in the Swiss Labor Market. *Zeitschrift für Soziologie*, 39(2), 124–139. <https://doi.org/10.1515/zfsoz-2010-0203>.
- Williams, A. M., & Baláž, V. (2012). Migration, risk, and uncertainty: Theoretical perspectives. *Population, Space and Place*, 18(2), 167–180.
- Zschirnt, E. (2020). Evidence of hiring discrimination against the second generation: Results from a correspondence test in the Swiss labour market. *Journal of International Migration and Integration*, 21(2), 563–585.

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