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The skills of Polish
emigrants: Evidence from
PIAAC

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Patrizio Sicari**

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ABSTRACT/RÉSUMÉ**The skills of Polish emigrants – evidence from PIAAC**

Based on the OECD data from the Survey of Adult Skills (PIAAC) this paper sheds light on the skills of migrants. In line with earlier research the data show that migrants from Poland are more likely to have a tertiary degree than peers at home, but they often work in elementary professions abroad that do not match these high qualifications. This may well be at least partly a language issue, as migrants from Poland resemble migrants from other low-income countries in that their numeracy and literacy skills in the language of their host country is markedly lower than the average across all PIAAC participants, migrants or not. This gap is smaller, though, when looking only at migrants who report having been tested in a language that they use often and master well. The data reveal an interesting difference with migrants from higher-income countries, as their test results do not differ from the average, although they face the same language issues as other migrants. The reason may well be that only migrants from low-income countries can hope to earn higher wages abroad even if they work in low-skill professions, while migrants from higher-income countries need to master the language of their host country to do well. In fact, Polish migrants earn higher wages than their peers who stayed at home, even though they are particularly often overqualified.

This Working Paper relates to the 2016 OECD Economic Survey of Poland (www.oecd.org/eco/surveys/economic-survey-poland.htm)

JEL classification codes: F22; J24

Keywords: Skills, migration

Les compétences des émigrants polonais – résultats de l'enquête PIAAC

Sur la base des données de l'Évaluation des compétences des adultes (PIAAC) ce papier illustre les compétences des migrants. Conforme à des recherches antérieures, les données montrent que les migrants de la Pologne ont plus souvent un diplôme de l'enseignement supérieure que leurs pairs qui sont restés dans leur pays, mais souvent ils travaillent dans des professions élémentaires qui ne requièrent pas un tel niveau de qualifications. Ceci pourrait être dû, pour le moins en partie, à des problèmes linguistiques, dans la mesure où les migrants polonais ont, dans les langues des pays d'accueil, des compétences en littératie et numératie qui sont bien plus basses que pour la moyenne de tous les participants au test PIAAC, migrants ou non, ce qui les rapproches des migrants d'autres pays à bas revenus. Cependant, cette différence est plus petite quand on considère uniquement les migrants qui affirment avoir été testé dans une langue qu'ils utilisent souvent et qu'ils maîtrisent bien. Les données révèlent une différence intéressante avec les migrants des pays à hauts revenus, dont les résultats dans les tests de littératie et numératie ne sont pas différents de la moyenne, même s'ils sont confrontés aux mêmes difficultés de langage que d'autres migrants. Ceci pourrait être dû au fait que seul les migrants des pays à bas revenus peuvent espérer de gagner mieux à l'étranger que dans leur pays, même s'ils travaillent dans des professions peu qualifiés, alors que les migrants des pays à haut revenus doivent maîtriser la langue de leur pays d'accueil pour avoir un meilleur niveau de vie que dans leur pays d'origine. Au fait, les migrants polonais gagnent des salaires plus élevés que leurs pairs qui sont restés en Pologne, même s'ils sont souvent surqualifiés.

Ce Document de travail se rapporte à l'Étude économique de l'OCDE de la Pologne 2016 (www.oecd.org/fr/eco/etudes/etude-economique-pologne.htm)

Classification JEL: F22 ; J24

Mots clef: Compétences, migration

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THE SKILLS OF POLISH EMIGRANTS – EVIDENCE FROM PIAAC

By Nicola Brandt and Patrizio Sicari¹

Introduction

Poland has a long tradition of emigration, which intensified after the accession to the European Union, when increasingly younger and well-educated people left to look for work in other EU countries (Kaczmarczyk, 2012). Like in other sending countries this has sparked a fear of brain drain – emigration leading to a loss of highly skilled workers with negative consequences for the countries' economic development. There is an ample literature about the skills of migrants compared to non-migrants in their home country. Cross-country data does reveal that tertiary educated individuals are overrepresented among migrants in most countries (OECD, 2015), but when using other measures of skills the evidence is more mixed.

This paper explores the issue of migrants' skills using data from the International Survey of Adult Skills (PIAAC), which includes literacy and numeracy test scores as a direct skills measure, whereas the existing literature on migrants' skills uses mainly indirect measures, such as formal qualifications or wages. The data cover 22 mainly OECD countries, allowing for an assessment of the education, employment and skill test scores of migrants from a wide range of origins. Polish migrants are an interesting case to study, because owing to the country's recent migration experience the number of Poles who took the test in another country is relatively high.

The analysis confirms some conclusions from the previous literature, but thanks to the specific features of the dataset it adds interesting findings that have not been uncovered before. On average across investigated countries migrants are found to be more highly educated than the general population in their home countries. This also holds for Poland. When skills are measured more directly, using PIAAC numeracy and literacy test scores, the data reveal an interesting difference between higher and lower-income countries. In general, migrants tend to have lower skill test scores on average than the population in their destination countries, as discussed in Bonfanti and Xenogiani's (2014) paper, which is based on the same PIAAC dataset. However, this does not hold for migrants from higher-income OECD countries. They tend to have similar and often higher skill test scores than the average non-migrant. Emigrants from Poland resemble those from lower-income countries in that their skill test scores are low compared to the average non-migrant. Several explanations are possible. The data may reflect relatively low quality of education systems and, in particular, language training in lower-income countries. Another explanation could be that individuals from higher-income countries have stronger language skills, because they had stronger incentives to invest in them. Migrants from lower-income countries can expect to earn higher wages in a country with much higher average income, even if their language skills allow them only to work in low-skilled professions. But migrants from higher income countries are likely to earn lower wages if they took a job that does not match their skills and qualifications, so they would not migrate without sufficient language skills.

The paper is organised as follows. The next section summarises a few theoretical and empirical results from the literature on migrants' skills. The following section describes the PIAAC data. Next migrants'

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socio-economic characteristics, their education and their employment situation in their destination country are discussed with a special emphasis on Polish migrants. The section thereafter discusses the skill test scores of migrants and how they compare to those of non-migrants. The final section concludes.

A brief review of the literature on migrants' skills

Human capital migration models, going back to Sjaastad (1962), treat migration as an investment. Migrants choose their destination so that they can earn a particularly high return on their skills and they compare the difference in expected lifetime earnings in their home and destination countries to the costs of migration. These models predict that migrants are likely to be young, because a longer remaining working life increases the expected gains in earnings due to migration. In addition, migration costs may increase with age, because younger people have not had as much time to build personal (Vermeulen, 2003) and professional ties (Hunt, 2006) that are costly to leave behind.

An important strand of the modern literature on migrants' skills and how they compare with those of non-migrants, often referred to as "selection" or "self-selection" of migrants, goes back to Borjas (1987). He applies Roy's (1951) model to argue that the selection of migrants depends on the relative returns to skills or education as long as these are positively correlated across countries. The higher are the returns to skills –which translate in higher earnings inequality - in the sending compared to the receiving country the lower will be the skills of migrants compared to those who stay at home (negative selection). Since many lower-income countries tend to have relatively high returns to skills - or high inequality - the model would predict that relatively low-skilled people migrate from lower to higher income countries.

However, introducing fixed costs of migration into the theory, such as for transport, and assuming that some costs of migration are lower for higher-skilled individuals, as in Chiswick (1999) and Chiquiar and Hanson (2005), can lead to different results. Higher-skilled individuals can cover fixed migration costs at lower borrowing and opportunity costs, because they typically have higher wealth, easier access to capital markets and they need fewer hours to earn the same amount as low wage workers. Lower-income individuals may be unable to earn or borrow enough to cover migration costs. Some migration costs may be lower for higher-skilled individuals because it is easier for them to organise moving to another country, learn a foreign language or adjust to an unknown environment and find a job. All of this would favour the migration of higher-skilled workers. Policy filters favouring high-skilled workers can re-inforce this effect. On the other hand, migrant networks can lower the costs of migration by facilitating paperwork and the search for housing and work (Özden and Schiff, 2006), favouring the migration of lower skilled migrants, as argued by some authors (McKenzie and Rapoport, 2010; Beine et al., 2011).

Grogger and Hanson (2011) base their predictions on absolute rather than relative skill-related earnings differences. In their model relatively highly-skilled individuals will migrate if the absolute skill-related difference in earnings is higher in the destination country. Since the absolute difference in high-skilled to low-skilled wages tends to be higher in richer country (Hanushek and Zhang, 2009), this model predicts that relatively high-skilled people would chose to emigrate from lower-income countries.

Much of the empirical literature on the "selection" of migrants' skills focuses on migration from Mexico to the United States. Findings are conflicting. Chiquiar and Hanson (2005) find that Mexican migrants have intermediate to high earnings and schooling, which is inconsistent with Borjas's theory given that returns to skill and inequality are higher in Mexico than in the United States. They rationalize this finding with migration costs that decrease in skills and wealth constraints for the poorest. Orrenius and Zavodny (2005), as well, find that the probability for Mexicans to emigrate is highest for upper to middle levels of education. Fernandez-Huertas Moraga (2011), based on Mexican data that show the attributes of migrants before they leave, finds instead that relatively low-skilled people are most likely to migrate from

Mexico to the United States. He attributes the difference with previous findings to underreporting of low-skilled immigrants in the US datasets used by other researchers.

Regarding results for other countries, Abramitzky et al. (2012), as an example, show that in the period of mass migration to the United States between 1850 and 1913, when American borders were almost completely open, Norwegian emigrants were negatively selected from the home country population in terms of their occupation. A number of cross country studies find that tertiary educated individuals are overrepresented among migrants from most countries (Grogger and Hanson, 2011; Belot and Hanson, 2012; OECD, 2015). For Poland, the data generally confirm that tertiary educated individuals are overrepresented among migrants (Chmielewska, 2015; Kaczmarczyk and Tyrowicz, 2015; OECD, 2015). Yet, as to emigration of Poles to the United Kingdom, Rosso (2013) finds that the picture is different when looking at unobserved skills, as measured by the residuals in a regression of wages on observed characteristics, including formal education. Results imply that individuals with lower earnings possibly reflecting lower unobserved skills are more likely to emigrate to the United Kingdom, which would be consistent with Borjas' (1987) model as returns to unobservable skills are lower in the United Kingdom than in Poland according to Rosso's data.

More recently, Bonfanti and Xenogiani (2014) compared immigrants' literacy and numeracy skill tests scores to PIAAC participant countries with those of the general population in their host countries based on the same data that is used in this paper. The gap is narrower for migrants who were tested in a language that they have learned as a child and for those who acquired their highest educational degree in their destination country according to that study. Possible explanations include that finishing ones education in the destination country may improve language proficiency or that the quality of education in origin countries is lower.

The PIAAC dataset

The Survey of Adult Skills (PIAAC) is a unique dataset that allows for a skills assessment in addition to the formal qualifications of migrants from Poland and other destinations in 2011-12. The data include proficiency test scores of adults (aged 16-65) in literacy, numeracy and – as an additional option in some countries - problem solving in technology-rich environments, covering 20 OECD countries as well as Russia and Cyprus². In addition, there is a large amount of information on respondents' personal characteristics, including the place of birth, time spent in the foreign country, formal education, employment status and earnings. That way, it is possible to explore migrants' skills, education and work experience.

Nevertheless, there are limitations. The sample size is limited to 5000 observations in most countries (Table 1), implying a small number of observations for migrants, in particular when they are broken down into smaller groups, such as their country of birth. Table 1 provides an overview over the sample sizes for each participating country, the share of foreign-born respondents and the number of people born in this country who participated in the Survey in another country – in other words emigrants. Close to 700 Poles can be identified in the dataset that were tested in another country and there are probably more, since the birthplace of immigrants in Germany – an important destination country for Poles – is not identified in the

² Note by Turkey:

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Note by all the European Union Member States of the OECD and the European Union:

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dataset. In contrast, the number of Austrian or Danish emigrants, for example, is too low for reliable statistical inference. Likewise, the number of immigrants to Poland is negligible and cannot be used to draw any conclusions.

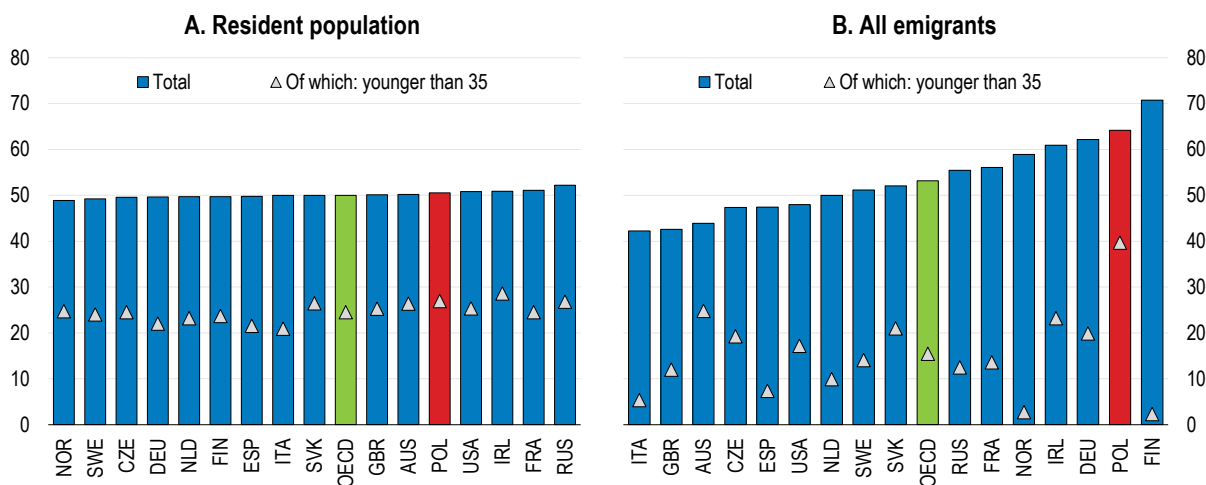
Table 1. Migrants in the OECD dataset

Country	Observations	Immigrant share	Number of emigrants
Australia	7 430	0.27	88
Austria	5 130	0.16	34
Belgium	5 463	0.07	63
Canada	27 285	0.25	70
Czech Republic	6 102	0.04	157
Denmark	7 328	0.12	50
Estonia	7 632	0.13	49
Finland	5 464	0.06	128
France	6 993	0.13	244
Germany	5 465	0.14	621
Ireland	5 983	0.21	267
Italy	4 621	0.09	166
Japan	5 278	0.00	72
Korea	6 667	0.02	54
Netherlands	5 170	0.13	236
Norway	5 128	0.13	86
Poland	9 366	0.00	676
Slovak Republic	5 723	0.02	187
Spain	6 055	0.13	94
Sweden	4 469	0.18	191
United Kingdom	17 784	0.15	1 060
United States	5 010	0.14	428
Russian Federation	3 892	0.06	931
Average	-	0.11	-

Socio-economic characteristics and labour market experience of emigrants

According to PIAAC data women are often overrepresented among emigrants. This holds in particular for Poland, where a large part of women who emigrated are younger than 35 (Figure 1). More generally, the share of people under 35 is large among migrants, particularly so for Poles (about 55%). This is in line with the notion of the human capital model of migration that younger people are more likely to migrate because they have more time left to benefit from their earnings abroad.

Figure 1. PIAAC Database: the share of women

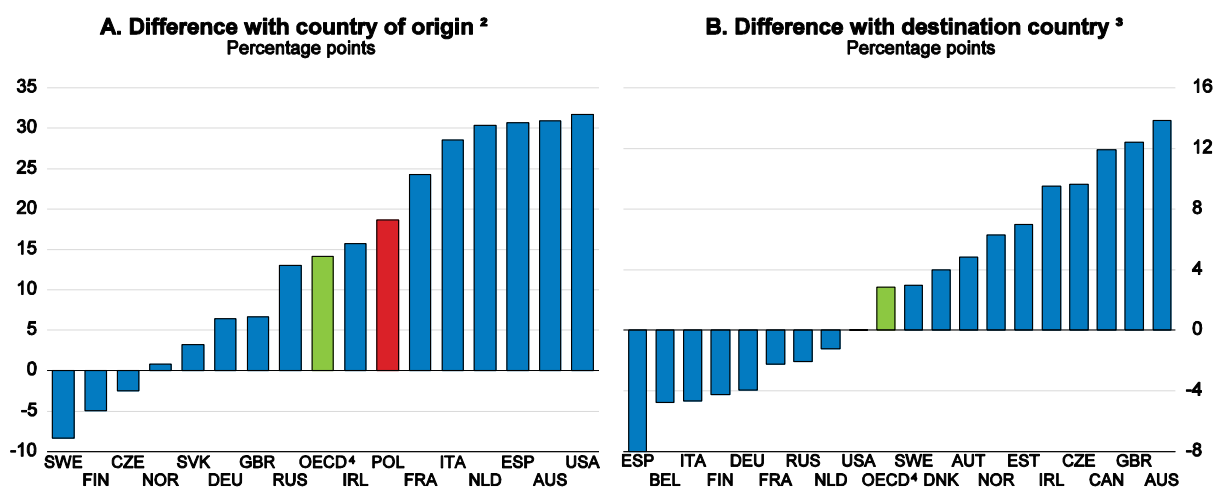


Source: OECD, OECD Skills Outlook 2013 and OECD calculations.

Emigrants from PIAAC participant countries tend to be particularly qualified. In many countries, the share of tertiary graduates among emigrants is decisively higher than among the general population in their home countries (Figure 2, Panel A). This also holds for Poland. Comparing the education of all immigrants – whether they come from a PIAAC participant country or not – shows that they also tend to be more educated on average than the population in their destination countries in many cases (Panel B). That is an even stronger result, as many immigrants come from low-income countries where tertiary attainment rates are usually much lower than in most PIAAC participant countries.

Figure 2. Difference in tertiary graduate shares among migrants and non-migrants

2012

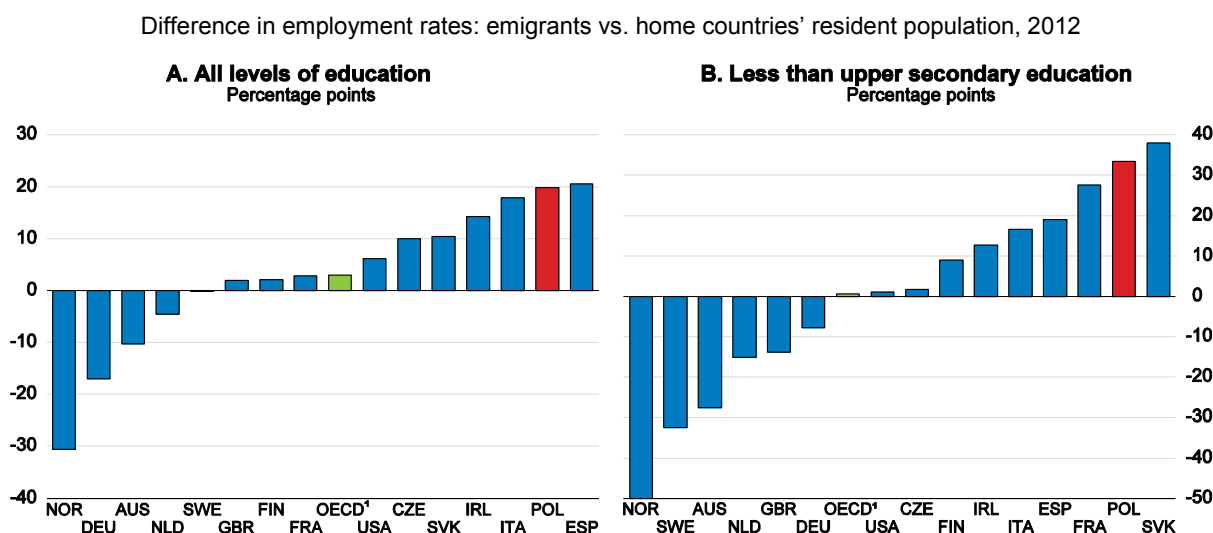


1. The figure shows the difference in the tertiary graduate share among migrants and non-migrants in their country of origin (Panel A) and their country of destination (Panel B).
2. Austria, Belgium, Canada, Denmark, Estonia, Japan and Korea are excluded due to limited sample size in the case of emigrants.
3. Japan, Korea, Poland and the Slovak Republic are excluded due to limited sample size in the case of immigrants.
4. Simple average across countries with available observations.

Source: OECD calculations based on PIAAC data.

Emigration is a successful strategy to improve employment chances, in particular for Poles. Polish emigrants are much more likely to be employed than their peers who stayed at home (Figure 3). This goes above all for those with low educational attainment

Figure 3. Polish emigrants are more likely to be employed than their peers who stayed at home



1. Simple average across countries with available observations.

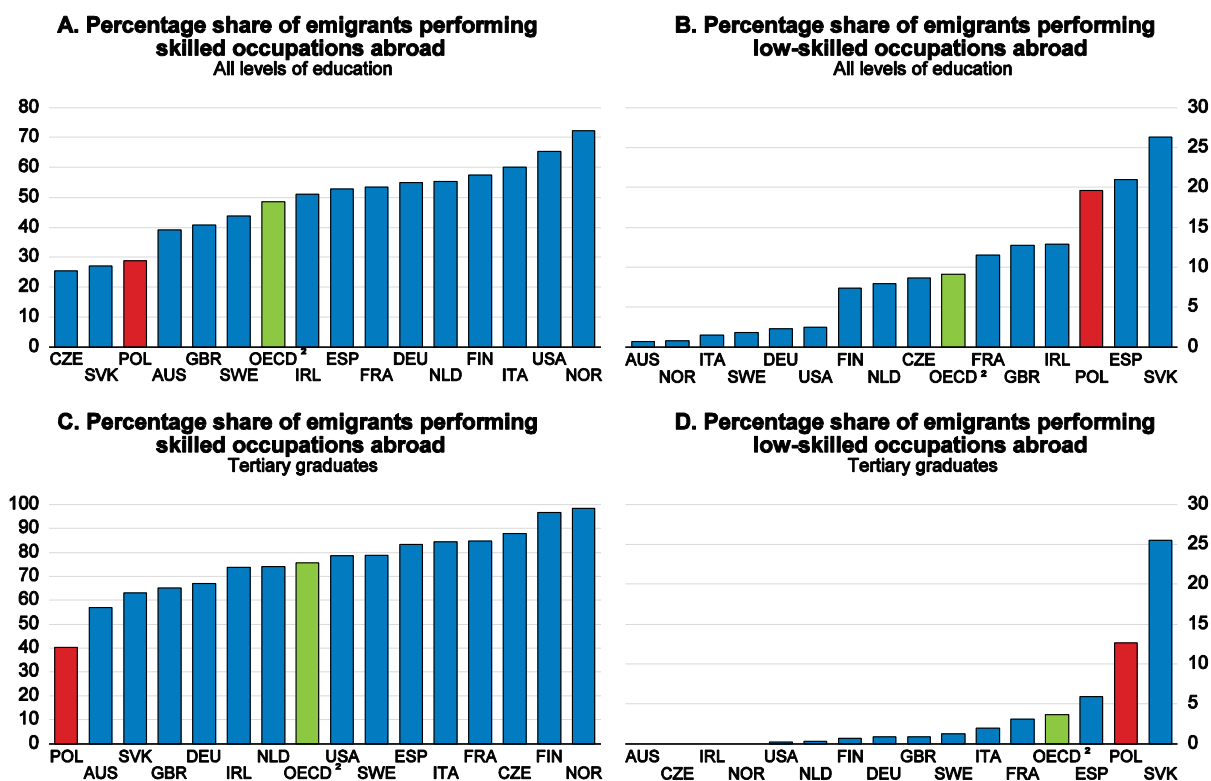
Source: OECD calculations based on PIAAC data.

However, many Polish emigrants work in occupations that require only low skills according to PIAAC data. While a little over 9% of Poles who live in Poland perform such jobs - very close to the average across participating countries - this share is more than twice as high among Polish emigrants. Emigrants from most other countries are a lot less likely to do a low-skilled job than Poles. More than half of all emigrants from most participating countries work in high-skilled professions. Yet, among emigrants from central and eastern European countries, this share is much lower (Figure 4). As to Poland even the share of emigrants with tertiary education who work in high-skilled professions is low in international comparison, while more than 10% work in elementary professions. Among male tertiary graduates under 35 a staggering 45% of Polish emigrants work in elementary occupations.

Nevertheless, comparing average wages between Polish emigrants and those who stayed in Poland suggests that migrating should pay off in terms of higher income at least on average, even though many work in low-skilled professions abroad. This holds for tertiary graduates as well (Figure 5). The fact that emigrants from some countries have lower wages than their peers in their home country does not necessarily contradict human capital models, though, because it could be that owing to their personal characteristics these workers would earn even less than the average wage at home had they not migrated. Moreover, there may be non-monetary benefits of migration for them, such as a better climate, a better balance between work and leisure or re-union with family members who migrated before them. These benefits can in principle all be integrated into a human capital model of migration.

Figure 4. Polish migrants are more likely than many others to perform low-skilled jobs abroad ¹

2012

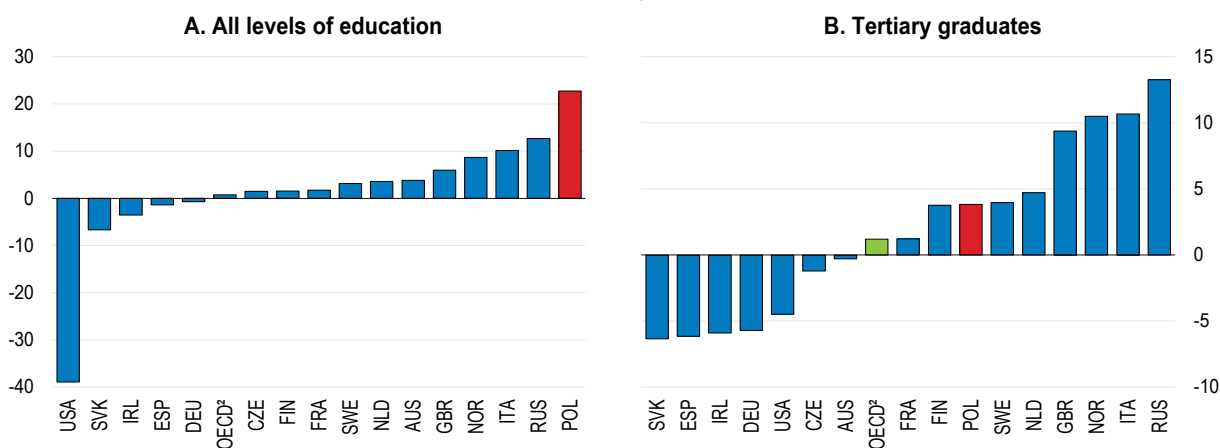


- Jobs' skills content is defined based on the International Standard Classification of Occupations (ISCO).
- Simple average across countries with available observations.

Source: OECD, OECD Skills Outlook 2013 Database and OECD calculations.

Figure 5. Difference in gross hourly earnings¹, emigrants vs. resident population

USD PPPs, 2012



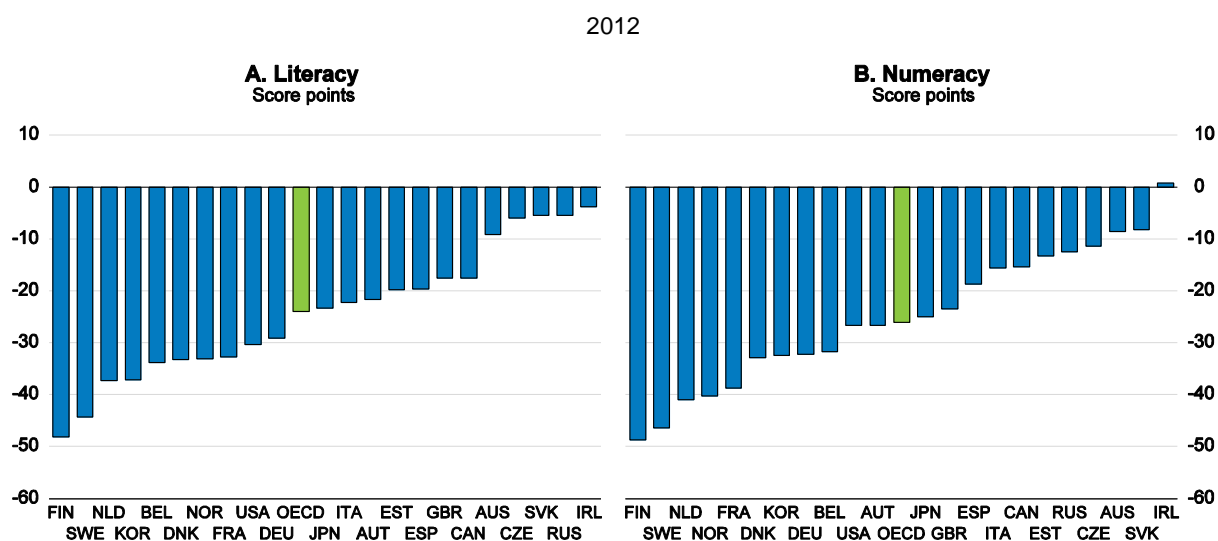
- Hourly earnings excluding bonuses for wages and salary earners.
- Simple average across countries with available observations.

Source: OECD, OECD Skills Outlook 2013 Database and OECD calculations.

Migrants' skill test scores

Despite their young age and relatively high level of education, migrants in general tend to have lower average literacy proficiency scores than the population in their host country (Figure 6). Not surprisingly, a good part of this skills gap is explained by the fact that most immigrants are tested in a foreign language, as discussed in Bonfanti and Xenogiani (2014).

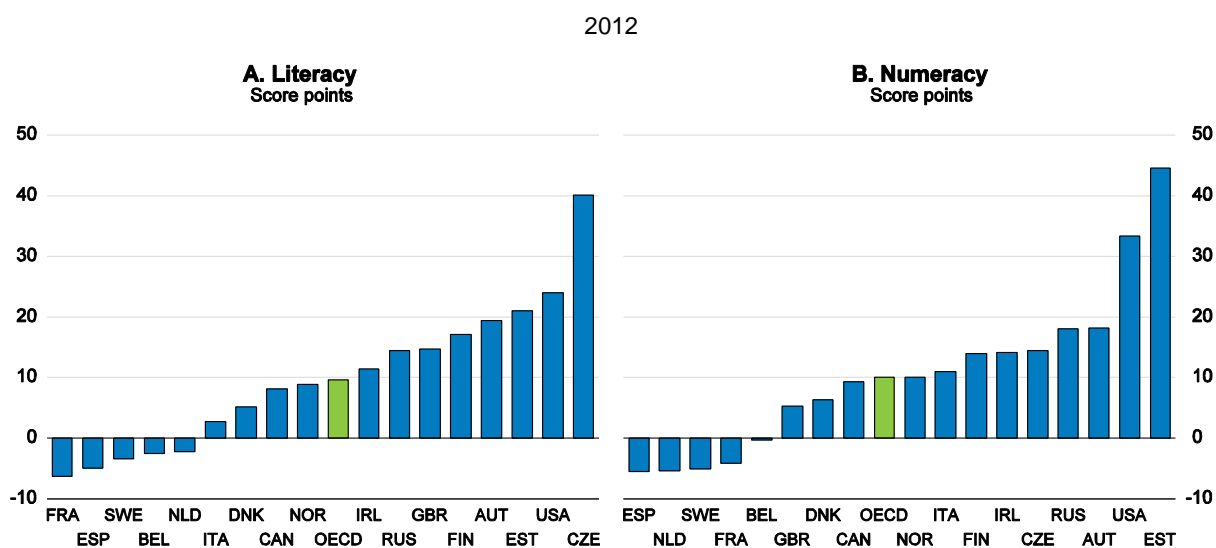
Figure 6. Differences in mean adult proficiency scores between migrants and destination country population



Source: OECD calculations based on PIAAC data.

Nevertheless, immigrants from richer OECD countries have similar skill test scores as the population in their destination country. To illustrate this, the PIAAC sample can be divided into lower-income countries –the Slovak and Czech Republic, Poland, Estonia and Russia – and the rest. When looking only at migrants from higher-income countries who participated in PIAAC it turns out that in general their test scores tend to be if anything higher than those of the population in their destination countries (Figure 7). Only a few countries, such as France and Spain, host immigrants from other PIAAC participant countries who have slightly lower test scores than the average in these countries.

Figure 7. Difference in mean adult proficiency scores between migrants from high-income countries and the population in their destination countries ¹



1. Excluding migrants with the following countries of birth: Czech Republic, Estonia, Poland, Russia and the Slovak Republic.

Source: OECD, *OECD Skills Outlook 2013 Database* and OECD calculations.

Table 2 shows results of a regression of PIAAC literacy scores on socio-economic characteristics, such as age, gender, educational attainment, labour market status, work experience and recent participation in training initiatives as well as fixed effects for the country where the test was taken. Results show that skill scores decrease with age. They increase with the educational attainment of respondents and of their parents, as well as with training attended in the year preceding the survey. Gender, the labour market status and work experience have only a small and in several cases an insignificant effect on skill test scores. Polish migrants were singled out as an extra group, because Poland is the only lower-income country in the sample with a meaningful number of observations for migrants from this country.

The relative low skill test score of migrants from low-income countries seems to reflect mainly a language issue. Migrants' skill gap is much lower for native speakers of the test language and those who use it frequently at home or learned it in childhood. In fact, migrants who were tested in their native language or the language they speak most frequently at home attain scores that are much closer to those of non-migrants. Migrants, who attained their highest qualification in their country of destination, also have a lower skills gap compared to other migrants, as evidenced by the positive coefficient of the corresponding dummy variable. These results are in line with Bonfanti's and Xenogiani's (2014) findings. However, the results for migrants from higher-income countries are very similar to those of non-migrants, independently of whether or not they are native speakers. This is indicated by the small negative coefficient for this group, which is not statistically significant. Linear hypothesis tests confirm that migrants from lower-income countries are different than those from higher-income countries. The hypothesis that the skills of Polish migrants and those from other lower-income countries do not differ cannot be rejected (see Table 2).

Table 2. Regression results: Literacy test scores – Difference between migrants and non-migrants

Independent variable	Coefficient	Standard error
Age	-0.28	0.05
Gender	-1.78	0.54
Upper secondary education	18.74	0.85
Post-secondary non-tertiary	20.46	1.92
Tertiary education	41.26	1.08
Parents have upper secondary education	12.53	0.84
Parents have tertiary education	22.45	0.94
Unemployed	-5.17	1.14
Inactive	-0.35	0.80
Years of work experience	-0.14	0.05
Received training recently	8.50	0.69
Migrant from higher-income country ¹⁾	-1.59	2.31
Migrant from lower-income country ²⁾	-31.70	2.26
Migrant from Poland	-29.32	5.97
Knowledge of the PIAAC test's language ³⁾	19.31	2.34
Migrant with highest qualification from the destination country	8.54	1.92
R ²		0.33
Number of observations		151 002
Test on coefficients:	Chi2	Prob > chi2
Migrant from higher-income country = Migrant from lower-income country	147.46	0.000
Migrant from Poland = Migrant from lower-income country	0.13	0.714

¹⁾ From PIAAC participant country except Poland, Slovakia, the Czech Republic or Estonia.

²⁾ Excluding Poland.

³⁾ Dummy variable taking the value 1 when the test language corresponds to the language most often spoken at home or to the one learned in childhood, and still understood.

NOTE: Australia and Germany are excluded from the sample as national data do not provide information on migrants' country of birth; Russia is excluded due to the unavailability of any information related to knowledge of the PIAAC test's language.

Source: OECD estimates, based on the *OECD Skills Outlook 2013 Database*.

The result that migrants from higher and lower-income countries differ in terms of their numeracy and literacy skills in the language of their destination country is striking. It may reflect a lower quality of education systems and in particular foreign language training in lower-income countries. An alternative explanation would be that people from lower-income countries can benefit from migration without investing as much in their language skills as people from higher-income countries, because when moving to a country with significantly higher income per capita they can earn higher wages even in jobs where only limited language skills are needed. The data for Polish emigrants would fit this idea, as emigrants earn more on average than their peers in Poland, although they work frequently in low-skilled professions.

Conclusion

Exploring the skills of Polish emigrants with PIAAC data confirms results from the literature. Polish emigrants are young and well-educated. Yet, many Polish emigrants work in professions that do not match their high level of education.

Thanks to its direct measures of literacy and numeracy skills and the wide range of countries it covers, the PIAAC data also reveal interesting new results. While migrants from most high income countries tend to have similar and often higher literacy and numeracy skill test scores than non-migrants on average, migrants from Poland resemble those from other lower-income countries in that their skill test scores are lower than those of non-migrants on average. Tentative, not necessarily mutually exclusive, explanations would be that the quality for education systems is lower in lower-income countries or that migrants from lower-income countries have incentives to leave even if their skills in the language of their destination country are limited. By moving to a country with a significantly higher income level, migrants can expect to earn higher wages even if they work in simple low-skilled professions that require only limited language skills. In contrast, migrants from higher income countries can generally only hope to earn higher wages abroad when they are able to work in a profession that requires similar or higher skills than the job they perform in their home country. For that reason, people from high income country are likely to move abroad only if they have acquired good language skills before.

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