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DOES IT PAY TO STUDY ABROAD? EVIDENCE FROM POLAND

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Does it pay to study abroad? Evidence from Poland

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Abstract

Tertiary education has been perceived in Poland as a key determinant of success in the labour market, as clearly shown by the increase of the net enrolment ratio in tertiary education from 9.8% in 1990 up to 40.9% in 2009. However, as tertiary education becomes more and more popular, it does not signal skills as well as before. It seems that employers may treat students' participation in international exchange programs as a new signaling tool since according to them international students' skills – both cognitive and non-cognitive – are well above the average. On the other hand, students participating in exchange programs underline a positive impact of studying abroad on their personal development, i.e. on their general skills. Thus, from a theoretical point of view we may expect a positive correlation between studying abroad and wages, which follows from both signaling theory and human capital theory. On the average, 16% of European students report a positive impact of participation in Erasmus exchange program on their incomes, but interestingly, those from the CEE countries, including Polish students, report it much more often.

The aim of this paper is to determine whether studying abroad for at least one semester has an impact on wages of higher education graduates in Poland. To answer this question, an extended Mincer wage equation was estimated using OLS on the basis of data from the nationwide tracer survey of Polish graduates conducted in 2007 (Graduate Tracer Study 2007). The hourly net wage rate in the first job after graduating from a higher education institution was the dependent variable in the wage equation. In order to reduce the selection bias, a number of variables were included in the model to reflect students' abilities and skills, as well as their previous international experience.

The results of the analysis show that Polish students who completed at least one semester of studies abroad, enjoy a wage premium of 28% in their first workplace after graduation. Interestingly, this wage premium is particularly high in case of graduates with low abilities and skills and – consequently – of a low social and economic status. This may indicate that studying abroad contributes to a reduction of social inequality.

Keywords:

investment in human capital, studying abroad, international exchange programs, wage premium, wage equation

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Introduction

Tertiary education has been perceived in Poland as a key determinant of success in the labour market, as clearly shown by the increase of the net enrolment ratio in tertiary education from 9.8% in 1990 up to 40.9% in 2009 (GUS 2010; GUS 2015). However, as tertiary education becomes more and more popular, it does not signal skills as well as before. It is not surprising then, that Polish students readily decide to complete a part of their studies abroad, since they regard it as an additional investment in their professional development, which may be rewarded in the future by their employers (Vossensteyn et al. 2010; Szubert i Skrętowska 2013). They have had a special opportunity for doing this since 1998, when Poland accessed the Erasmus international exchange program. In the first year of its operation 1,426 Polish students decided to go on an exchange, and over the next 14 years the number has increased more than 10-fold, reaching 16,219 in the academic year 2012/13 (FRSE 2014). In fact, the scale of studying abroad is even larger, since the mobility associated with the Erasmus program is only about a half of the entire international educational mobility of students in Europe (European Commission 2014).

If we regard studying abroad as an investment in human capital, we can expect that it will bring economic benefits to students, including, among other things, higher wages. This follows from the theory of human capital (Schultz, 1961; Becker 1964; Mincer 1974), which assumes that acquired skills increase productivity, and that, on the assumption of perfect competition in the labour market, translates into increased wages. Furthermore, given that the decision to study abroad is a result of a selection process, in which innate abilities and acquired skills (cognitive and non-cognitive) are the key determinant of going to study abroad, studying abroad may give employers a signal of high abilities. So we can expect higher wages also on the grounds of the signaling theory (Spence, 1973).

Former Erasmus students mention the development of their personality as the basic benefit from studying abroad, but 16% of them also believe that by participating in an exchange they are able to earn more. In the Central and Eastern European (CEE) countries, the percentage of students who recognize the positive impact of studying abroad on their wages is significantly higher - in Poland it amounts to 26% (Janson, Schomburg, Teichler 2009). These numbers are based, however, on a subjective assessment of the Erasmus program participants, so they do not prove the existence of such a relationship. Nevertheless, the correlation between studying abroad and graduates' wages has not been analyzed in Poland so far.

The aim of this paper is to determine whether studying abroad for at least one semester is correlated with the first wages of higher education graduates in Poland. To answer this question, an extended Mincer wage equation was estimated using OLS on the basis of data from the nationwide tracer survey of Polish graduates conducted in 2007 (Graduate Tracer Study 2007). The hourly net wage rate in the first job after graduating from a higher education institution (HEI) was the dependent variable in the wage equation. The main methodological challenge in analyzing the outcomes of participation in an educational program is to minimize

the selection bias.¹ Assuming that students' innate abilities and acquired skills are the key determinants of studying abroad, three groups of variables depicting individual abilities and skills were included in the model: each parent's education level, the average grade on the graduation diploma and participation in various extra-curricular activities during studies.

The paper is structured into three sections. In the first one, we discuss the theoretical basis for the impact of studying abroad on earnings. The second section presents the results of previous empirical studies, while the third presents the results of our own empirical analysis of the correlation between studying abroad and graduates' wages of in Poland. The paper ends with a summary containing the most important conclusions.

1. Theoretical background

The theoretical justification for the impact of studying abroad on graduates' wages is provided by both the theory of human capital and the signaling theory.

In terms of the human capital theory (Schultz, 1961; Becker 1964; Mincer 1974), a trip abroad for educational purposes can be treated as an investment in human capital, since it allows to acquire knowledge and skills. While studying abroad, students acquire not only academic knowledge but also the skills necessary to function in a new environment, such as communication skills, command of foreign languages, activity, courage, resourcefulness, ability to cope with stress, openness to other cultures. According to the theory of human capital, the acquired skills result in an increased productivity and this translates into a higher graduate's wage.

In turn, according to the signaling theory (Spence 1973; Arrow 1973; Stiglitz 1975), a higher education graduate will receive a wage premium from studying abroad even if he or she has not acquired any knowledge or skills while abroad, because employers regard studying abroad as a signal of high innate abilities. In such a case, studying abroad would only play the role of a tool for selecting candidates according to their innate abilities, and it would not be a source of any additional knowledge or skills.

It seems that using information about studying abroad as a screening tool might be justified, provided that the process of awarding scholarships is based on student's abilities. In fact, in the early years of the Erasmus program (1998-2006), when the number of scholarships was relatively small, this condition was met in Poland - only very good students went to study abroad. Later, not only very good, but also good students were allowed to participate in the exchange program.

To sum up, in the light of both the human capital theory and the signaling theory, we can expect a positive relationship between studying abroad and graduates' wages.

¹ In our case it is a bias of the estimator of the wage premium from studying abroad which results from non-random selection of students to study abroad.

2. Overview of empirical literature

Some information about the potential relationship between studying abroad and the wage level can be found in evaluation studies of the Erasmus program (Bracht et al 2006; Janson, Schomburg, Teichler 2009; European Commission 2014). These studies present data from surveys conducted with former Erasmus students and their employers, in which respondents were asked to assess the impact of studying abroad on students' wages after graduation. Former Erasmus students from 26 European countries, who were interviewed in the VALERA evaluation study in 2005-2006, most often stated that participation in the exchange helped them develop their personality (89%), less frequently they mentioned that it helped them find the first job (54%) or develop their career (53%) (Bracht et al 2006).² Only 16% of them believe that the exchange helped them to earn more. Interestingly, the positive impact of studying abroad on wages is much more often reported by students from the CEE countries, including Bulgaria (30%), Romania (30%), Poland (26%), the Czech Republic (26%) or Hungary (24%) (Janson, Schomburg, Teichler 2009).

Since employers require good command of foreign languages from candidates more often in the CEE countries (87%) than in the Western Europe (62%) (Janson, Schomburg, Teichler 2009), one can presume that higher wage benefits from studying abroad reported by the CEE students may result from an improvement in language skills. While staying abroad, a student can both improve his or her primary foreign language which is used during lectures and classes (usually English), but also he or she can learn a second language – the one spoken in the country of his or her stay – which could be a big advantage in the labour market upon return to the home country. The results of the evaluation of the Erasmus program in Poland in the academic year 2010/2011 confirmed that Polish students significantly improved their command of the languages spoken in the countries of their stay (Szubert and Skrętowska 2013).

A positive relationship between studying abroad and the wage level is also indicated by employers. 10% of employers surveyed in the VALERA study in 2005 stated that graduates who had studied abroad received higher wages in their first jobs than other candidates with tertiary education, while in the Erasmus Impact Study conducted in 2013, the percentage of such statements was even higher – it amounted to 20% (European Commission 2014).

As far as studies on the wage premium from studying abroad are concerned, there have been only a few conducted in Europe so far. Messer and Wolter (2007) used individual data from two rounds of surveys conducted in 1999 and 2001 with 3589 Swiss university graduates. The authors estimated an extended Mincer wage equation using both OLS and the

² The study covered, among others, 4589 former students who had participated in the Erasmus exchange program in the academic year 2000/2001 and 312 employers (including 25% indicated by the students) from 26 EU countries.

instrumental variable method (2SLS). They found that in case of using OLS, studying abroad was positively correlated with graduates' first wages (each additional semester is associated with wages higher by 3%), but when they used the instrumental variable method, this relationship ceased to be statistically significant.

Rodrigues (2013) based on data from two surveys of university graduates from 19 European countries³ and using the PSM method (propensity score matching), proved that international education-related mobility in the period of tertiary education had a positive effect on wages in five of the countries covered by the analysis. Interestingly, this impact was found to be strongest in Poland, where the wage premium from studying abroad in the period of tertiary education amounted to 16% after five years of the graduation.

Camelli et al. (2008), on the other hand, having analysed panel data on 250,000 graduates of Italian universities, determined that the wage premium from participation in international student exchange programmes reached 4-5% one year after graduation and ca. 10% after five years. Kratz and Netz (2016) report a similar result for graduates of German universities. They found former participants of international exchange programs to have a steeper wage curve and the wage premium from studying abroad to reach 8% after five years of graduation.

3. The impact of studying abroad on graduates' wages in Poland

The aim of the empirical analysis is to determine whether the experience of studying abroad for at least one semester is correlated with wages of Polish higher education graduates in the first job after graduation.

Data

The analysis is based on data from the nationwide tracer survey of Polish graduates conducted by the Central Statistical Office of Poland (GUS) in the years 2006-2007. The focus of the survey was on the economic activity of graduates of various school types over the period of the first three years after the completion of formal education, with a special attention to the first job after graduation. The nationwide survey was conducted on a sample of 20 251 persons who completed their formal education between 1 January 1998 and 31 December 2005 (at basic vocational schools, technical upper secondary schools, general upper secondary schools, post-secondary non-tertiary schools, higher education institutions).⁴ The population was limited to individuals who did not exceed 27 years of age at the time of graduation and

³ These were: 1) the REFLEX project, carried out in 2005 in fourteen countries (Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Italy, Japan, The Netherlands, Norway, Portugal, Spain, United Kingdom) on a sample of 70,000 respondents who graduated in the academic year 1999/2000, and 2) the HEGESCO project, conducted in 2008 in five other European countries (Lithuania, Poland, Hungary, Slovenian and Turkey), with a gross sample size of 30.000 graduates in the academic year 2002/2003.

⁴ A description of the system of education in Poland can be found in Eurydice (2006).

the break between the next-to-last and the last stage of education was not longer than 12 months.⁵

The database provides information on studying for at least one semester abroad at various stages of education - from primary school to tertiary education. In addition, it is possible to identify shorter stays abroad for educational purposes. There are also some variables in the database which can depict the respondents' innate abilities as well as skills acquired as a result of parents' investments. These variables include: the average grade on the certificate of completion of the last school, each parent's education level, the participation in various types of extracurricular activities during formal education (e.g. foreign language classes, IT classes, sports and tourism, artistic and technical activities, scouting).

The empirical analysis refers to the determinants of the wage level of higher education graduates in the first job after graduation from a HEI, provided that the respondent undertook employment within a year after the graduation. Consequently, the following respondent categories have been eliminated from the database: 1) individuals who did not undertake or complete studies at a HEI, 2) individuals who did not work within the first year after ending formal education, 3) self-employed and family members supporting them, since none of these groups was asked about earnings, 4) hired workers who did not disclose their wages. Eventually, the sample used for the analysis comprised 1902 observations.

Method of analysis

The fundamental methodological problem in the analysis of the effects of studying abroad is the potential endogeneity of participation in this form of education, i.e. the probability of studying abroad and the wage level being determined by the same factors.

Many empirical studies report that participants of international exchange programs come from families of a higher social and economic status, represented by parents' educational attainment (Cammelli et al. 2008; Salisbury et al. 2009; Orr et al. 2011; Wiers-Jenssen 2011; Kratz 2012; Rodrigues 2013). Furthermore, the following factors are conducive to decisions to study abroad: previous experience with travelling abroad (Saarikallio-Torp and Wiers-Jenssen 2010; Finger 2011; Weenink 2014; Lorz et al. 2015), high abilities and skills demonstrated by, among others, educational achievements, good command of foreign languages and educational pro-activeness (Souto Otero and McCoshan 2006, Salisbury et al. 2009; Lorz and Krawietz 2011; Rodrigues 2013; Lorz et al. 2015), as well as the benefits expected, including experience to be gained in an international environment and improved command of foreign languages (Krupnik and Krzaklewska 2006; Brooks and Waters 2010; Saarikallio-Torp and Wiers-Jenssen 2010; Lorz et al. 2015).

All of the above factors may influence not only a decision to study abroad but also the wage level and consequently, if they are not controlled for in the wage equation, our estimator of the wage premium from studying abroad will unfortunately be biased. Therefore, a number

⁵ A detailed description of the methodology can be found in ASM (2008).

of variables depicting students' abilities and skills, as well as their previous international experience, were included in the model.

Based on the above overview of theoretical and empirical literature, the following wage equation was formulated:

$$(1) \quad w_i = IE_i\beta_1 + HEI_i\beta_2 + AS_i\beta_3 + E_i\beta_4 + X_i\beta_5 + \varepsilon_i$$

where dependent variable (w_i) represents the natural logarithm of the first net hourly rate earned by graduates in the first job after completing a HEI, provided that they undertook employment within the first year after graduation.⁶

Independent variables include:

- variables depicting student's **international experience** with respect to education or paid work (IE_i): learning abroad for at least one semester in the course of education at primary school, secondary school or HEI, learning abroad for up to three months during formal education, undertaking paid work abroad in the course of formal education.
- **characteristics of studies** (HEI_i): type of HEI (public, non-public), form of studies (full-time, part-time), the professional degree obtained from a HEI (Bachelor, Master),
- variables depicting individual's **abilities and skills** (AS_i): the average grade on the graduation diploma, each parent's education level, the participation in various types of extracurricular activities during formal education (e.g. foreign language classes, IT classes, sports and tourism, artistic and technical activities, scouting), volunteering, internship,
- **characteristics of graduate's first employment** (E_i): firm size, firm ownership (public, private), economic sector (agriculture, industry, services), occupation,
- variables depicting **other individual traits** of a graduate and the local labour market (X_i): gender, age when first employed, place of residence, region (voivodeship), year of graduation.

The above linear regression model was estimated using OLS, by computing heteroscedasticity-resistant variance estimations.⁷

⁶ For the sake of comparability of the initial earnings of graduates who started their first job in different years (1998-2005), initial hourly rates were adjusted by the Consumer Price Index, with 2005 as the base year.

⁷ Initially, due to the suspected self-selection of the sample, the wage model was estimated using Heckman's two-step approach (Heckman 1979). Besides variables present in the wage equation, three additional variables were used in the selection equation: marital status, number of children, family model (both / one of the parents working). Yet, since the results did not show any self-selection bias, we finally decided to estimate the linear regression model using OLS.

Results

To analyze the impact of each variable depicting graduates' abilities and skills on the wage premium from studying abroad, a few specifications of the model were estimated. The first specification, apart from control variables (gender, age when first employed, place of residence, region, year of graduation), included only studying abroad, and then gradually other groups of explanatory variables were added to the model (Table 1).

If only the basic group of control variables are included in the model, the wage premium from studying abroad for at least one semester amounts to 47% (specification 1).⁸ This premium is gradually decreasing, as subsequent groups of control variables – i.e. other international experiences, characteristics of studies, abilities and skills, and characteristics of graduate's first employment – are added one by one to the model (specifications 2-5). Nevertheless, in the most extensive specification the wage premium from studying abroad is still very high and strongly significant – it amounts to 28% (specification 5).⁹ It is worth noting that this wage premium is much higher than the one obtained by Rodrigues (2013), which amounted to 16%.

Interestingly, the first wage of higher education graduates is negatively correlated with learning abroad for at least one semester during secondary school, although it should be noted that this variable is significant only at a 10% level. Perhaps, secondary schools in other countries did not provide Polish pupils with all the knowledge and skills that were required at entrance exams to HEIs in Poland and as a result these candidates were not able to get to the best ones.

Table 1. Estimations of the HE graduate's first wage equation

<i>Model specification</i>	(1)	(2)	(3)	(4)	(5)
Learning abroad at least one semester: primary school		-0.071	-0.059	-0.125	-0.113
Learning abroad at least one semester: secondary school		-0.252	-0.244	-0.303*	-0.311**
Learning abroad at least one semester: HEI	0.384***	0.340***	0.325***	0.269***	0.249***
Learning abroad 0-3 months		0.134	0.115	0.096	0.025
Characteristics of studies	no	no	yes	yes	yes
Graduate's abilities and skills	no	no	no	yes	yes
Characteristics of graduate's first employment	no	no	no	no	yes
Number of observations	1,902	1,902	1,902	1,902	1,902
R2	0.089	0.096	0.114	0.130	0.180
p-value of F-statistics	0	0	0	0	0

Notes: Each specification includes additionally: employment abroad during studies; gender, age at employment, place of residence, region (voivodship), year of graduation; ***/**/* stand for 1%, 5% and 10% significance respectively.

Source: Author's own analyses based on unit data from the nationwide tracer survey of Polish graduates conducted in 2007.

⁸ Percentage increments were computed using the coefficients presented in Tables 1-3, according to the following formula: $\Delta\% = \exp(\beta) - 1$.

⁹ Bedyk and Liwiński (2016), based on the same database, found that the wage premium of Polish graduates holding master's degree, compared to graduates from basic vocational schools, amounts to 33 logarithmic points, which is only slightly more than the wage premium from studying abroad.

Using the most extensive specification of the model (specification 5), we examined whether the wage premium from studying abroad varies by gender, characteristics of studies, characteristics of the first employment after graduation, and social status.

It turns out that both males and females enjoy a wage premium from studying abroad, but it is much higher in case of the former group – the premium amounts to, respectively, 33% and 18% (Table 2).

Table 2. Estimations of the HE graduate's first wage equation by gender

<i>Model specification</i>	Total	Females	Males
Learning abroad at least one semester: primary school	-0.113	-0.016	-0.108
Learning abroad at least one semester: secondary school	-0.311**	-0.260	-0.308
Learning abroad at least one semester: HEI	0.249***	0.165*	0.285*
Learning abroad 0-3 months	0.025	0.098	0.007
Characteristics of studies	yes	yes	yes
Graduate's abilities and skills	yes	yes	yes
Characteristics of graduate's first employment	yes	yes	yes
Number of observations	1,902	1,234	668
R2	0.180	0.218	0.232
p-value of F-statistics	0	0	5.88e-09

Notes: Each specification includes additionally: employment abroad during studies; age at employment, place of residence, region (voivodship), year of graduation; ***/**/* stand for 1%, 5% and 10% significance respectively.

Source: Author's own analyses based on unit data from the nationwide tracer survey of Polish graduates conducted in 2007.

Interestingly, only graduates holding a Master's degree and those graduating from non-public HEIs as well as from part-time studies receive a wage premium from studying abroad – it amounts to 22%, 47% and 53% respectively (Table 3). The last two findings are particularly puzzling, since one might expect that in Poland students attending public HEIs or full-time programs show a higher level of abilities, while according to the model designed by Cuhna and Heckman (2007), investing in skills of more able persons should be more productive. This may mean that the group of students who attend non-public HEIs or part-time programs and choose to study abroad is mainly represented by high-achievers showing outstanding, unobservable skills and abilities, or that in case of these two groups, studying abroad results in acquiring skills that are useful at work.

The findings reported above are consistent with the results of the analysis of the wage premium from studying abroad according to the features depicting graduates' abilities and skills. Thus, the highest wage premium is received by persons showing the lowest level of skills and abilities. This group includes: individuals whose father had a basic vocational education, which signalizes a low social and economic status; individuals with a relatively low grade point average on the university graduation certificate and individuals who did not attend any extracurricular activities while at the university (Table 4).

Furthermore, the wage premium from studying abroad is strongly diversified by the characteristics of the first workplace (Table 5). Firstly, wage premium grows together with the size of the company where the graduate took his or her first job – while it does not exist in micro-businesses, in companies employing more than 250 workers it amounts to as much as 78%. Secondly, wage premium is received in private corporations only – it amounts to 32%. Thirdly, the premium is higher in industrial companies than in the service sector (77% versus 35%).

It is worth noting, by the way, that in case of graduates holding a Bachelor's degree, there is a strong positive correlation between the level of the first wage and a short stay abroad (up to 3 months) for educational purposes the period of formal education – the wage premium is as high as 77% (Table 3). It seems that the knowledge and skills acquired by students of first-cycle degree programs through participation in training or internships abroad are of great value to Polish employers.

Table 3. Estimations of the HE graduate's first wage equation by characteristics of studies

<i>Model specification</i>	Total	Degree obtained		Type of HEI		Form of studies	
		BA	MA	public	non-public	full-time	part-time
Learning abroad at least one semester: primary school	-0.113	-0.290	-0.113	-0.118	-0.486	-0.357	-0.103
Learning abroad at least one semester: secondary school	-0.311**	-0.238	-0.294	-0.299*	0.102	0.108	-0.621**
Learning abroad at least one semester: HEI	0.249***	0.229	0.195**	0.149	0.384*	0.109	0.425**
Learning abroad 0-3 months	0.025	0.569**	-0.068	0.022	-0.173	-0.005	-0.068
Type of HE degree (BA/MA)	yes	no	no	yes	yes	yes	yes
Type of HEI	yes	yes	yes	no	no	yes	yes
Form of studies	yes	yes	yes	yes	yes	no	no
Number of observations	1,902	513	1,389	1,451	300	1,136	632
R2	0.180	0.314	0.190	0.170	0.470	0.202	0.198
p-value of F-statistics	0	1.53e-10	0	0	1.84e-09	0	3.84e-05

Notes: Each specification includes additionally: average grade, each parent's education level, participation in extracurricular activities, employment abroad during studies; volunteering, internship, firm size, firm ownership, economic sector, occupation, gender, age at employment, place of residence, region, year of graduation; ***/**/* stand for 1%, 5% and 10% significance respectively.

Source: Author's own analyses based on unit data from the nationwide tracer survey of Polish graduates conducted in 2007.

Table 4. Estimations of the HE graduate's first wage equation by skills and abilities

<i>Model specification</i>	Total	Father's education			Average grade		Extracurricular activities (total number)		
		primary or basic vocational	secondary	tertiary	3,6-4,5	4,6 and above	0	1	>1
Learning abroad at least one semester: primary school	-0.113	-	-0.198	0.251	-0.206	0.061	-0.086	-0.595	-
Learning abroad at least one semester: secondary school	-0.311**	-0.332	-1.243**	-0.149	-0.273	-0.257	-0.368	-0.665**	0.405
Learning abroad at least one semester: HEI	0.249***	0.376*	0.218*	0.322**	0.310***	0.157	0.327***	0.211	0.208
Learning abroad 0-3 months	0.025	0.086	0.037	0.037	0.129	-0.063	0.219*	-0.186	-0.020
Father's education	yes	no	no	no	yes	yes	yes	yes	yes
Average grade	yes	yes	yes	yes	no	no	yes	yes	yes
Extracurricular activities	yes	yes	yes	yes	yes	yes	no	no	no
Number of observations	1,902	698	821	383	1,306	486	1,222	455	225
R2	0.180	0.233	0.178	0.312	0.198	0.306	0.199	0.285	0.440
p-value of F-statistics	0	1.72e-10	8.69e-08	4.73e-05	0	7.65e-10	0	6.95e-06	0.00500

Notes: Each specification includes additionally: type of HE degree (BA/MA), type of HEI, form of studies, employment abroad during studies; firm size, firm ownership, economic sector, occupation, volunteering, internship, gender, age at employment, place of residence, region, year of graduation; ***/**/* stand for 1%, 5% and 10% significance respectively.

Table 5. Estimations of the HE graduate's first wage equation by characteristics of the first employment

<i>Model specification</i>	Total	Firm size				Firm ownership		Economic sector	
		1-9 employees	10-49 employees	50-249 employees	250+ employees	private	public	industry	services
Learning abroad at least one semester: primary school	-0.113	-0.943	-0.200	0.113	0.414	-0.411	-0.050	-	-0.094
Learning abroad at least one semester: secondary school	-0.311**	-0.357	-0.279	-0.184	-0.222	-0.440**	-0.192	-1.024**	-0.197
Learning abroad at least one semester: HEI	0.249***	0.253	0.221*	0.301*	0.575**	0.278***	0.045	0.570**	0.299***
Learning abroad 0-3 months	0.025	0.147	-0.142	0.207	-0.082	0.052	0.042	-0.052	0.038
Firm size	yes	no	no	no	no	yes	yes	yes	yes
Firm ownership	yes	yes	yes	yes	yes	no	no	yes	yes
Economic sector	yes	yes	yes	yes	yes	yes	yes	no	no
Number of observations	1,902	375	751	462	194	1,120	716	253	1,528
R2	0.180	0.334	0.266	0.243	0.528	0.220	0.229	0.419	0.216
p-value of F-statistics	0	3.21e-06	0	0.000207	7.57e-05	0	1.15e-10	0.000471	0

Notes: Each specification includes additionally: type of HE degree (BA/MA), type of HEI, form of studies, employment abroad during studies; average grade, each parent's education level, participation in extracurricular activities, occupation, volunteering, internship, gender, age at employment, place of residence, region, year of graduation; ***/**/* stand for 1%, 5% and 10% significance respectively.

Source: Author's own analyses based on unit data from the nationwide tracer survey of Polish graduates conducted in 2007.

4. Conclusions

The results of the above analysis indicate a strong, positive correlation for Polish students, between studying abroad for at least one semester and the level of their first wage after completing formal education. Interestingly, this correlation is particularly strong in case of graduates with a low level of abilities and skills, and – consequently – of a low social and economic status. This may indicate that studying abroad contributes to a reduction of social inequality.

The strength of the relationship between studying abroad and the wage level decreases after the variables depicting graduates' abilities and skills are included in the model. This demonstrates that selection to studying abroad is a positive one, or, in other words, that studying abroad is undertaken by students whose abilities and skills are above the average. This may be a result of public and private decisions as regards spending money for educating the youth abroad. In the public sphere, the key factor may be the selection criteria used by HEIs for granting international exchange scholarships, where good academic performance is rewarded. As for the private sphere, there is some evidence showing that parents tend to invest more in educating more able children.¹⁰ The financial status of the household is also an important aspect, because studying abroad, even if subsidized from public funds, requires supplementary private financing.¹¹ Carneiro, Crawford and Goodman (2007) showed that the social status of parents, which determines the level of household income, is strongly positively correlated with their child's skills, which further suggests that the skills of students studying abroad are above the average.

After the variables depicting students' skills and abilities are included in the model, the selection bias decreases and so does the estimator of the wage premium from studying abroad, the premium still remaining high and statistically strongly significant. However, if the three groups of variables do not jointly reflect all of the heterogeneity of students in terms of their skills and abilities, the estimator of the wage premium may still be biased. Unfortunately, when using data from quasi-experimental studies – and such was the nature of the study of graduates used for this analysis – it is not possible to completely eliminate the selection bias. The best one can do, is to reduce the bias by augmenting the specification of the model with other factors decisive of the selection process or by using the method of instrumental variables. The selection bias could be entirely eliminated only if using data from an experimental study, where random selection of participants going to study abroad is ensured. Yet, the author of this study does not have access to any database like this.

¹⁰ According to Becker and Tomes (1976), parents seeking to maximize the utility of investing in children, provide able children with human capital, while those less able with other capital types (financial, physical).

¹¹ In the academic year 2010/11, the total costs of the stay abroad exceeded the amount of the grant for 96% of Polish students going on international exchanges under the Erasmus program, while for 64% of students, these costs were at least two times higher than the grant. Therefore, 78% of students benefited from financial support of the family during their stay abroad and 64% relied on their own savings (Szubert and Skrzętkowska 2013).

Although in the light of the above reservations we should be cautious when interpreting the results, they seem to be consistent with the theory of human capital, giving basis to an assumption that studying abroad provides additional skills that Polish employers are willing to pay for.

Besides, we should have in mind two other limitations of the results. Firstly, they apply to studying abroad for at least one semester, which means that they cover both the participants of international exchange programs, like Erasmus, as well as those who completed regular studies abroad. Unfortunately, the data do not allow for a separate analysis of each of these two categories. Secondly, the results refer only to the first wage of graduates who undertook employment within a year after the graduation in the period of 1998-2005. The data do not allow for an analysis of the correlation between studying abroad and graduates' wages earned later in their careers.

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