



12th European Quality Assurance Forum

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Hosted by the University of Latvia
Riga, Latvia

23-25 November 2017

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"Graduate tracer study using the administrative data of the Social Insurance Institution" (2011-2014)

"Graduate tracer study using the administrative data of the Social Insurance Institution. Continuation" (2015)

Proposal

Title: Graduates' Tracking with Administrative Data – How it is Done in Poland

Abstract

The massification of higher education in Poland means that labour market outcomes of graduates are an important perspective for future students, higher education institutions as well as the managers of higher education at national level. The new graduate tracking system, based on the administrative data, allows for monitoring of graduates' outcomes on the labour market by type of studies, the higher education institution as well as individual curricula. The absolute and relative measures allow assessing the outcomes taking into account the local labour market perspective. Results of the first two waves of graduate tracking show that the outcomes vary by study area, but also change in time. While in the short



run, aspects such as prior experience on the labour market and the place of residence affect employment chances, in the longer run the labour market processes become more important.

The paper is based on: research / policy / practice (select one)

Has this paper previously been published/presented elsewhere? If yes, give details.

Yes, the paper is submitted and accepted for presentation on the XXVIII International Population Conference in Cape Town, South Africa

Text of paper (3000 words max):

Introduction

The national system of graduates' tracking in Poland was introduced in 2014 by the rule of the Law on Higher Education. This followed the need to have better knowledge on the transition of graduates' from school to work in Poland.

In the past years, Poland has undergone significant changes of its educational system, including higher education. In early 1990s, only about 10% of youth completing upper secondary school were admitted to university each year. Today, over half of each year's upper secondary school graduating class pursues higher education studies, and the net enrolment ratio reached around 40% in the middle of 2000s and stayed at that level since then (GUS 2015). The increase in academic enrolment was accompanied by significant changes in the entire system of higher education in Poland. Until 1990, all higher education institutions were state-owned, but in 1990 a new Law on Higher Education allowed creation of private higher education institutions and introduction of paid part-time study programmes at public schools. The 'massification' of higher education induced in recent years a vivid public debate pointing out the need to assess the quality of ever more accessible tertiary education.

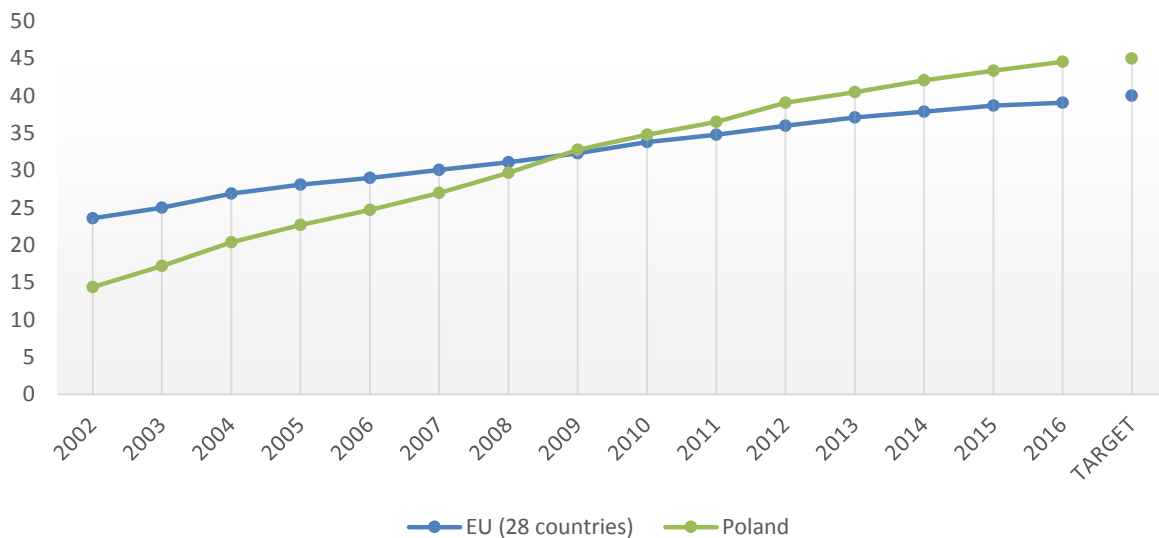
The all-national gradual tracking system introduced in Poland allows for a unified monitoring of the outcomes of higher education, with regards to the economic outcomes understood as employment and earnings of graduates. In the paper, we present the main assumptions of the graduate monitoring as well as its results, after the first two waves of the monitoring.

1. Education system in Poland, including higher education

The Polish higher education system is affected on the one hand, by demographic and social processes, related to the increased demand for the higher education and by the reforms of the higher education system on the other hand.

The most important social development was related to the increased aspirations of young Poles. High share of school leavers from secondary schools enrol to higher education programmes. The number of students in higher education institutions increased rapidly from about 400,000 in early 1990s to reach a peak in 2006 at the level of 1.93 million people. After 2006, the number of students started to fall, following the demographic changes, including drop in fertility from early 1990s. (Kotowska 2014). The number of students in 2016 dropped to 1.35 million, which is still more than 4 times more compared to the early 1990s. Overall, the share of young people with higher education attainment in Poland between 2002 and 2016 tripled, from 14.4% to 44.6%.

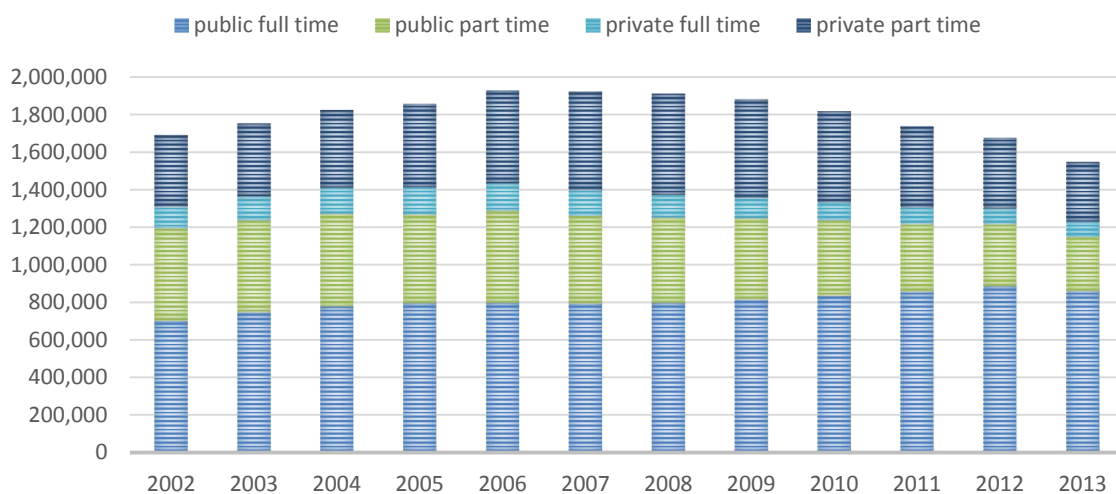
Figure 1. Tertiary education attainment in Poland and EU-28, 30-34 age group.



Source: Eurostat

The rise of the number of students was accompanied by a change in the composition of the student population. Increased demand for higher education was met by newly established private institutions and the introduction of part-time programmes at public institutions. In 2008, the share of students in private higher education institutions was 34.5%, while the share of students in public full time studies was 41.7%. The decline in the number of students led to the reduction of the students studying in private institutions as well as part time and the leading role of public full-time studies increased again (Figure 2).

Figure 2. Number of students by ownership of the higher education institution and form of studies, 2002-2016.

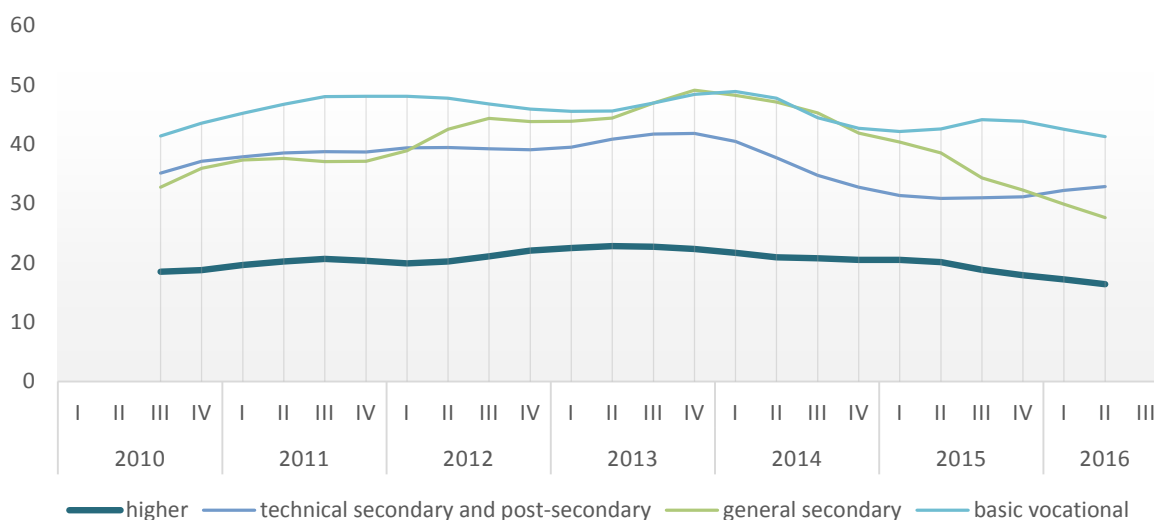


Source: Local Data Bank, Central Statistical Office

The rapid development of the paid higher education studies in the part-time form as well as in private institutions raised some concerns. One of them is the suspicion that quality of education depends on the type of the institution (public vs non-public) and the type of the studies (full-time vs part-time). It is argued that students of part-time programs receive education of lower quality (Herbst and Rok 2011). There are also concerns regarding equity as students with privileged backgrounds are more likely to be enrolled for a state-subsidized program at a public institution (Herbst and Rok 2014). On the other hand, the emergence of the private higher education institutions allowed young people from rural areas and smaller towns to access higher education (Kotowska, Chłoń-Domińczak, and Saczuk 2014).

What seems to concern both the public opinion and politicians most about tertiary education is the graduates' prospective employability. Although Polish economy fared well compared to other European economies and kept growing even in the years following the 2008 crisis, the labour market did not improve significantly at the same time (Boulhol 2014) and the unemployment rate among tertiary education graduates has risen between 2007 and 2013, though it remains below EU level (Rokicka et al. 2015). It falls gradually since then. In the four quarter of 2016 the unemployment among HE graduates was 12,6% (Central Statistical Office 2017)

Figure 3. Unemployment rate among recent graduates by type of education, moving average of quarterly data, 2010-2016



Source: authors' calculations based on the Labour Force Survey data

Labour market perspective becomes important in assessing the outcomes of higher education. The education system in Poland shifted from a purely elitist model to a model of diversified learning, taking into account to a much greater degree the diversity in the level of students' abilities, as well as their interest and goals in life. While some students are interested and capable of pursuing and participating in more research-oriented studies, the vast majority are seeking an education that offers a solid base and is flexible, enabling them to perform a variety of jobs and different social roles (Marciniak et al. 2013, p. 2). Given such goals, the monitoring of the economic outcomes of higher education studies is an important aspect of the quality assessment of higher education outcomes in Poland.



2. Graduate monitoring using registers in Poland

The Polish Graduate Tracking System is a centralised system run by the Ministry of Science and Higher Education. The system was established in 2014. Its goal is to provide a detailed description of graduates' labour market performance for up to five years after they leave universities.

The system uses individual data extracted from two administrative registers: 1) national register of students and graduates which is part of POL-on system 2) the register of Social Insurance Institution. Relying on administrative data allows to cover the entire population and greatly reduces the cost of research (United Nations Economic Commission for Europe 2007; Wallgren and Wallgren 2007).

Data exported from POL-on include such details of graduates as: higher education institution, department or faculty, study programme, cycle of studies, full-time vs. part-time, the date of graduation, information on subsequent enrolment into a different study programme.

Social Insurance Institution provides data on graduates' monthly contributions to the social security system. The contributions are mandatory for the majority of the economically active population. Records of contributions include two types of information:

- Status in the labour market, including the type of work arrangement (i.e. salaried worker, self-employed, unemployed, on maternity or parental leave),
- Contribution calculations basis, that is the remuneration in PLN in each month for employed. For self-employed the amount is in most cases fixed and thus not indicative of the income.

Data from these registers can be accurately ssly linked due to the adoption of the national identification number PESEL as an ID. Poland has adopted an approach similar to the one taken by the Nordic countries (Poulain and Herm 2013) and has been using the PESEL number as an ID in multiple administrative registers. Using PESEL number makes the process of merging data simple and helps avoid problems with data linking experienced by other researchers who have to rely on combination of variables such as sex, address, and date of birth (Chowdry et al. 2013; Kim, Tamborini, and Sakamoto 2015; Oreopoulos, von Wachter, and Heisz 2006).

The process of graduate tracking in Poland is organised as follows. The Ministry extracts the list of graduates from POL-on. The list is then delivered to ZUS which exports data on the social insurance contributions. ZUS is also responsible for data anonymization. Data are subsequently transferred to the Ministry's research team which computes the analytical database and oversees the production of reports. There are three types of reports: at the level of the programme, the higher education institution and the national level. The reports are published on a publicly available website.

3. Relative indicators and labour market outcomes and their use in the graduate monitoring

Polish regions are economically diverse and the place of residency may affect graduates' labour market outcomes. A fair evaluation of higher education institutions should take that into account. Therefore, we



decided to introduce a necessary correction and created relative indicators of unemployment and remuneration.

Relative Indicator of Unemployment (RIU)

For every graduate the proportion of his or her individual risk of unemployment (i.e. the percentage of months being registered as unemployed) to the average unemployment rate or registered unemployment rate in his or her county (or counties) of residence in the analysed period is calculated. The RIU for the group of graduates is the average of these proportions.

The indicator has an intuitive interpretation. Values below 1 mean that on average the graduates' risk of unemployment is lower than the unemployment rate in their counties of residence, while values above 1 means that their risk of unemployment is higher.

Relative Indicator of Remuneration (RIR)

For each graduate, the relative indicator is calculated dividing his average wage to the average wage in the county of their residence at the time of measurement. The value of indicator presented in the reports from monitoring is equal to the average of individual relative remunerations.

In this case, the values above 1 mean, that the graduates earn more than average wages in their counties, while those below 1 mean that graduates earn less than county average.

Dynamic analyses with relative indicators

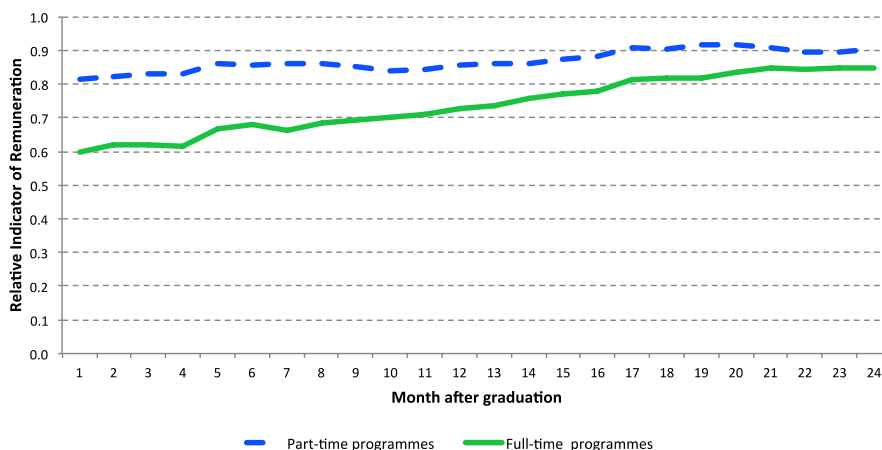
The use of relative indicators also allows for a precise account of changes in the economic situation in different regions over time - both in long, multi-annual periods and seasonal.

Results based on the ELA system

As it was presented in Section 1, in Poland part-time studies are popular and the share of graduates is 44%. Initially, graduates from part-time studies tend to achieve better results on the labour market than their full-time counterparts. The dynamics of the RIR in both groups are presented on the figure 9 below.

Figure 4. Dynamics of the RIR among Polish graduates by mode of studies, 2014

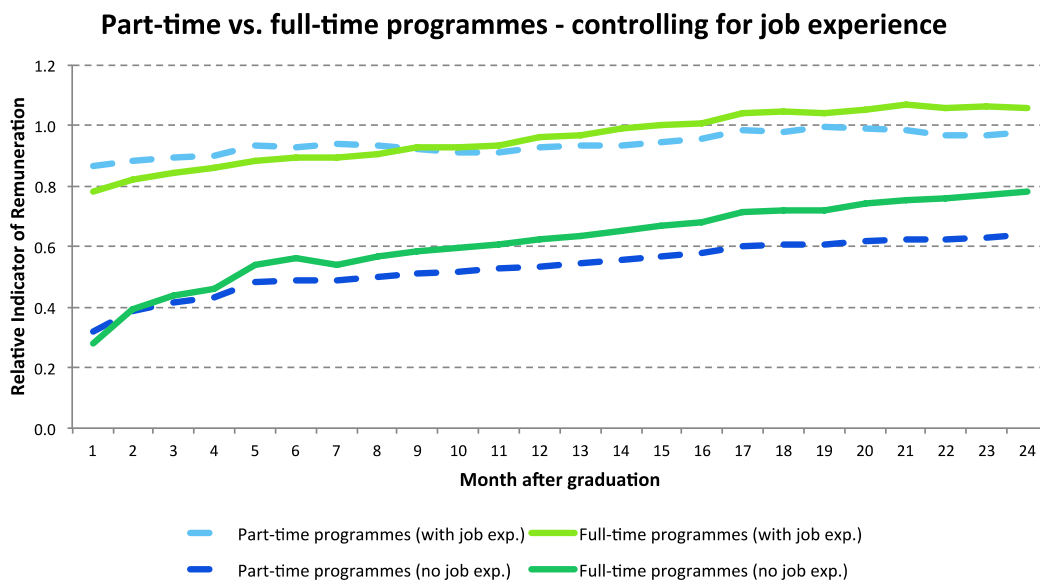
Part-time vs. full-time programmes



This may lead to a conclusion that part-time studies prepare their students better for the job market than full-time studies. However, the part-time students are much more likely to work during their studies, or even to have a job before entering the HEI. Only 25% of full-time studies graduates had a job experience before graduation, while among part-time studies graduates it was almost 75%. Previous job experience leads to higher pay, lower risk of unemployment, and shorter job search.

That is the reason why part-time studies graduates achieve better results on the labour market. Figure 10 shows the impact of pre-graduation job experience on the RIR.

Figure 5. Dynamics of the RIR among Polish graduates of second cycle by form of studies and job experience in 2014

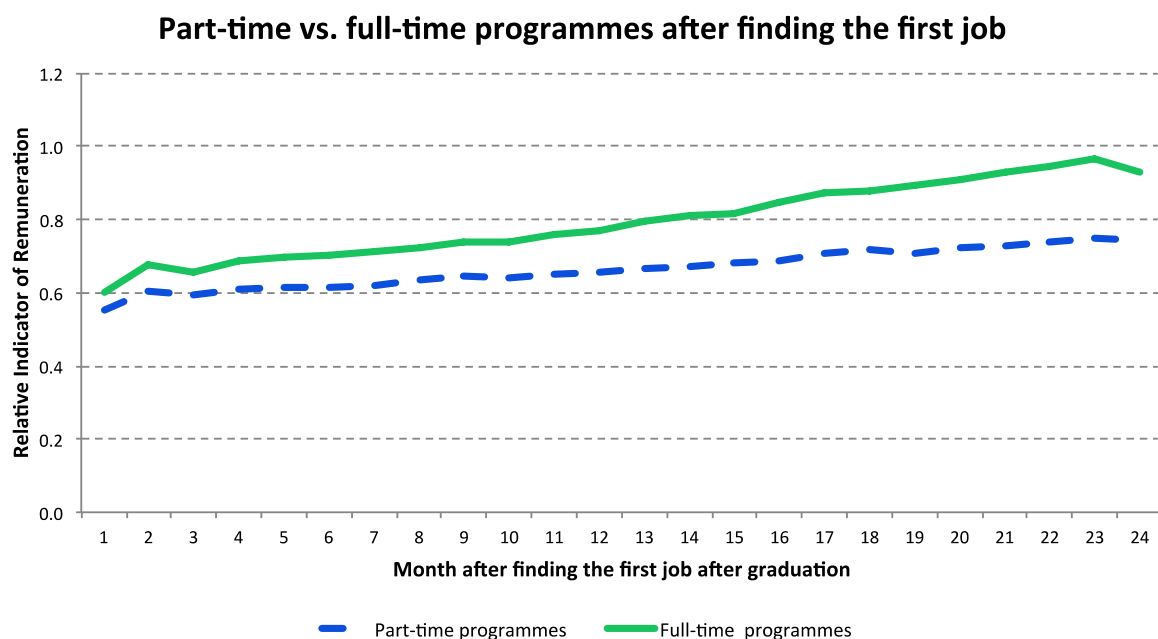


As the figure 10 shows, among the graduates both with and without job experience the part-time studies graduates starts with higher remuneration but the full-time studies graduates within 9 months in the case of the group with job experience and within only 2 months in the case of the group with no such experience have on average higher wages. The explanation is that the full-time programmes graduates

acquire higher competences than the part-time programmes graduates (or employers believe so). Their position on the labour market improves quickly. The part-time programmes graduates tend to have richer job experience and it results in higher payment at the beginning, which wears off in time.

The differences between full-time and part-time programmes graduates are even bigger in the case of graduates with no previous job experience (Figure 11)

Figure 6. Dynamics of the RIR in consecutive months after finding a first job among Polish graduates with no previous job experience by mode of studies studies in 2014



4. What affects chances of the Polish graduates on the labour market?

Method and model specification, independent variables

The data from the ELA system can be the basis for far more through research. In this section, we present the results of the model that explores determinants of the graduates' employability in two years after graduation. The data covers the entire population of Polish graduates who got their master's degree in 2014. The employment status is checked every three months after graduation.

The dependent variable in the model is having a steady job, i.e. an employment contract or self-employment. Polish regulations allow also other forms of job contracts, like civil contracts or specific-task contracts. These contracts do not always provide contribution for workers' future pension (in the case of specific task contract) and are not always registered in the Social Insurance Institution (Chłoń-Domińczak, Sowa, and Topińska 2017; Lewandowski and Keister 2015). All employment contracts and self-employments are registered.



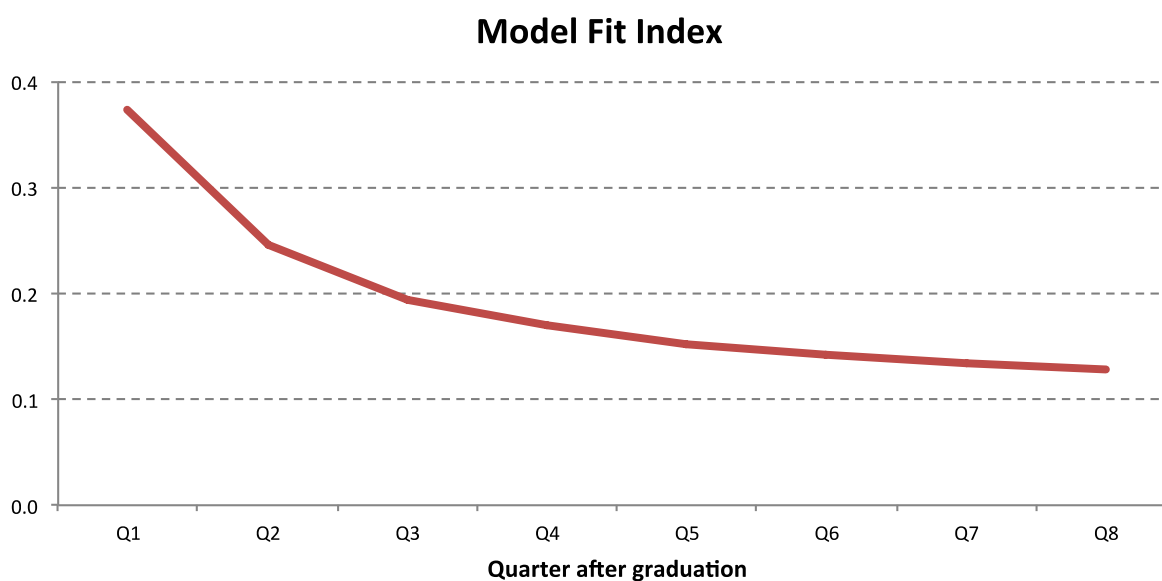
We use a probit model to predict the employment status of the graduates. The prediction is based on the independent variables:

- Job experience – a dummy variable; informs if the graduate had any employment contract or was self-employed before graduation.
- Form of studies – informs if the graduate used to study full-time or part-time.
- City size – the category of the size of the city of residence: over 500k citizens; smaller than 500k but the city is a separate county; others; unknown place of residence. For some of the graduates the place of residence has not been noted in SII records, more often if that person were not employed.
- Type of HEI: public HEI, non-public HEI or ecclesiastical HEI.
- Field of study – informs to what field of study belongs the programme in one of 8 fields: humanities; medical and health sciences; natural sciences; agricultural sciences; social sciences; exact sciences; technical sciences; arts.
- Sex.
- Studying after graduation – a dummy variable; informs if the graduate studied on some other study programme after graduation.
- Age category – informs on age category in the year of graduation; categories are 25 or less and 26 or more.

Results

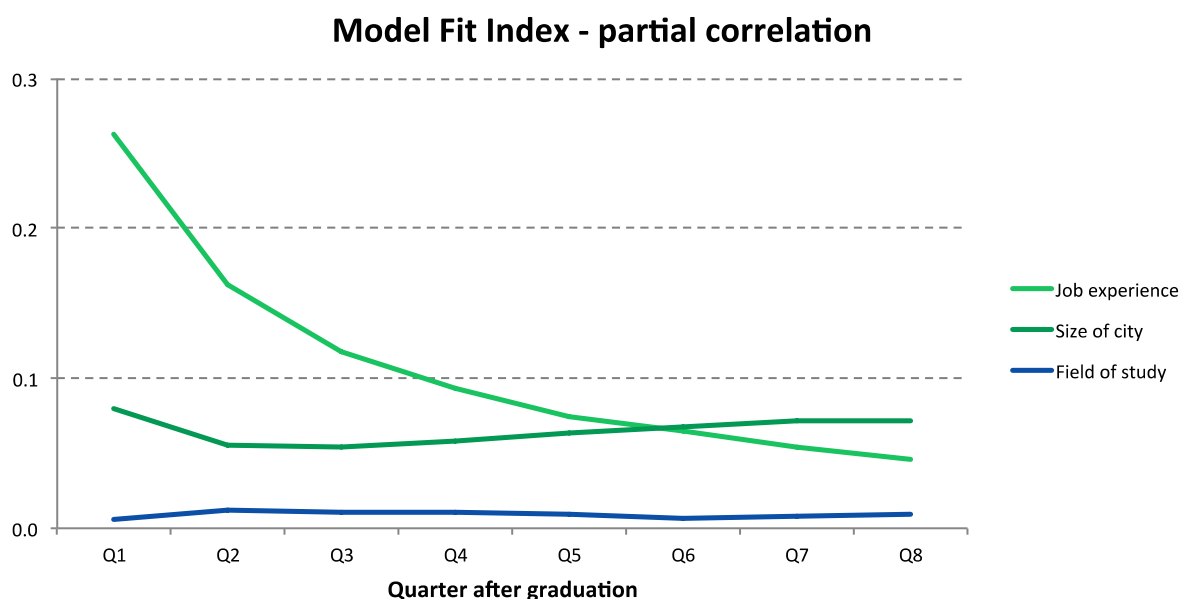
The model is well fitted for the first quarter after graduation, but the fit declines with every quarter of the year. The more time passed from the moment of graduation, the smaller should be the impact of these features related to the study programme on the labour market performance (Figure 12).

Figure 7. Dynamics of the Model Fit Index every three months for two years after graduation



To examine how much does every single independent variable partial correlation index for the Model Fit Index was calculated for each independent variable.¹ The main results are presented in the figure 13.

Figure 8. Dynamics of the partial correlation index for the chosen independent variables every three months for two years after graduation



The most important factor was pre-graduation job experience. It is a noticeable factor in two years after graduation but its impact decreases over time. In the case of other variable, the the noticeable contribution to the model is the city size and its impact is not changing significantly over the analysed period. The third factor is the field of study, but its influence is much weaker than of the previous two.

The impact of all the other factors, i.e. form of study, type of HEI, sex, age and further studying has barely any effect on the prediction of employment – they adds little to the model with the three formerly mentioned factors that have the most important influence. Apparently, in Poland these features have no influence on one’s chances to find a job.

4. Conclusions

The graduate monitoring system in Poland provides a new insight on the labour market outcomes of the higher education graduates in Poland. While the up-to-date information gave some insight on the overall performance of graduates, more detailed assessment of particular curricula or types of studies was

¹ The partial correlation index for MFI of the variable controlling for remaining variables shows how much better is the full model in comparison to the model lacking that variable (to what extend the likelihood ratio has increased after adding that variable to the model).



difficult. Merging administrative data from two major administrative registers: of higher education institutions graduates and Social Insurance Institution graduates allows for more effective and cost-efficient assessment of the labour market outcomes of graduates. The results of the monitoring can support the decisions on the choice of curricula for the secondary school leavers. It also provides a very rich source of information for deans, rectors and other representatives of higher education institutions, as well as the Minister of Higher Education. The design of the monitoring system, including the set of indicators used to monitor the labour market outcomes allow comparing the situation of graduates, taking into account also local labour market characteristics. The further waves of the ELA system will shed more light on the outcomes, not only right after graduation, but also in further months. The Polish approach is also very cost-effective. As administrative register data is used, the data collection costs are non-existent, while the coverage is very high.

While the official monitoring portal allows for observing automatic reports, the dataset generated in the monitoring allows for a more in-depth assessment. Results of the probit model indicate that with time the impact of individual characteristics diminishes. This is in particular related to the earlier job experience as well as the place of living. This means that the study content and work experience prior to graduation are important at the start of economic activity, while other factors – related to gathering more job experience become more important.

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Discussion questions:

How graduates in Poland perform on the labour market?

How to measure labour market outcomes of the studies?

What affects employability of Polish graduates?

Please submit your proposal by sending this form, in Word format, by 24 July 2017 to QAForum@eua.be. The file should be named using the last names of the authors, e.g. Smith_Jones.doc. Please do not send a hard copy or a PDF file.