

Who gets a job after graduation? Factors affecting the early career employment chances of higher education graduates in Poland

MIKOŁAJ JASIŃSKI, MAREK BOŻYKOWSKI

Institute of Sociology, University of Warsaw*

AGNIESZKA CHŁOŃ-DOMIŃCZAK

Warsaw School of Economics

TOMASZ ZAJĄC

Center for Studies in Higher Education, University of California, Berkeley

MATEUSZ ŻÓŁTAK

Austrian Center for Digital Humanities

The massification of higher education in Poland means that many students choose this educational pathway to improve their chances for a good job. Therefore, the labour market outcomes of graduates provide an important perspective for future students, higher education institutions, as well as decision makers at the national level. The Polish Graduate Tracking System (ELA), based on administrative data, is designed to monitor graduates' outcomes in the labour market by type of studies, higher education institution, as well as individual curricula. Results of the first two years of graduate tracking show that the outcomes vary by study area, but also change over time. While in the first months after graduation, aspects such as prior experience in the labour market and place of residence have a substantial effect on employment chances, in the longer run, they lose their importance relative to other factors.

KEYWORDS: graduate tracking; labour market; employment chances; higher education; Poland.

In the past three decades, the education system in Poland, including higher education, has undergone significant changes. At the beginning of the 1990s, only about 10% of youth completing upper secondary school were admitted to university each year and

the Polish higher education institutions were considered elitist. 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 the 2000s and has remained at that level ever since (GUS, 2015).

* Adres: ul. Karowa 18, 00-927 Warszawa.
E-mail: mikolaj.jasinski@uw.edu.pl

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The “massification” of higher education has induced a vivid public debate in recent years, pointing out the need to assess the quality of the ever more accessible tertiary education. This phenomenon has had many consequences. Among others, it reduced the labour market advantage of higher education graduates. Higher education ceased to guarantee a good labour market position. The labour market outcomes failed to satisfy the raised aspirations of many young people leaving higher education institutions. The increasing number of graduates led to a rising number of unemployed among them. All this has sparked a discussion between many stakeholders on the quality of higher education in Poland and created a need for developing a nation-wide graduate tracking programme.

The discussion in Poland echoes the developments in OECD countries. Participation in tertiary education increased in almost all OECD countries in the late 1990s (OECD, 2005). In the context of higher education expansion, the transition from higher education institutions to the labour market is becoming a topic of attention, as new cohorts of recent graduates may have greater difficulties in finding a first “good” job compared to young people in the past. The transition period between education and work is lengthening and transition patterns are becoming less defined and less certain (OECD, 1999; 2000). Understanding the university-to-work transition is vital to improve the efficiency of the use of resources spent on higher education. At the same time, there is little research concerning the transition process of European university graduates, partially due to the poor availability of adequate longitudinal data (Salas-Velasco, 2007). The majority of research in this area is based on survey data, for example the CHEERS project investigating the transition from the educational system to employment in nine European countries (Italy, Spain, France, Austria, Germany, Netherlands,

UK, Finland, Norway). The results indicate that employability depends on the country’s economic situation, but also sex, age, and socio-economic background. The summary of the graduate tracking practices by Michael Gaebel, Kristina Hauschildt, Kai Mühleck, Hanne Smidt (2012) indicates that many EU countries engage in national-level graduate tracking on an occasional basis, while systematic tracking research is quite rare. In particular, combining data from higher education institutions and social security is possible from a legal perspective in Austria, Finland and – as of 2014 – in Poland.

The Polish Graduate Tracking System (ELA) introduced in Poland in 2014 creates new opportunities for research on the economic outcomes of higher education, understood as the employment and earnings of graduates. It utilises administrative records of the Social Insurance Institution containing detailed information on employment. Most notably, data are collected on a monthly basis, creating a rare opportunity to analyse early career trajectories month by month.

This paper investigates the factors affecting the employment chances of master’s degree holders who completed their education in 2014. This choice of subject is motivated by the fact that the vast majority of first cycle graduates (bachelor’s degree holders) continue education and do not yet intend to become economically active. The analysis relies on probit models, based on the unique data from the ELA system. The models explore various factors affecting graduates’ employment chances during two years after graduation. In order to explore the changing impact of the investigated factors on graduates’ employment, the study includes eight models, one for every three months.

The paper is structured as follows. First, we briefly outline the education system in Poland, including the developments in the higher education area and overall situation of higher education graduates in the labour market. The

second section describes the methodology of the study. It consists of two subsections: (a) on the data coming in to the Polish Graduate Tracking System that are used in the study, (b) on the probit models' specification. In section three, we present the results, while the final section presents the conclusions.

The higher education system in Poland and its labour market outcomes

The increase in the aspirations of young Poles was the most important social development driving the changes in higher education. As it was mentioned in the introduction, a greater share of secondary school leavers has been enrolling in higher education programmes. Following this trend, the number of students in higher education institutions rose rapidly from about 400 000 in the 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 demographic changes, i.e. a drop in the fertility level in Poland from over 2.0 in the early 1990s to 1.4 in 1999 (Kotowska, 2014). As a result, the number of persons in age group of 19–23 years started to gradually decline and the number of students in 2016 dropped to 1.35 million, with stable enrolment levels. The current number of students is still over four times that of the early 1990s.

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 but one were state-owned, but a new Law on Higher Education in 1990 allowed private higher education institutions to be established, as well as paid part-time study programmes to be introduced in the public institutions. This led to an increase in the total number of students, in particular in part-time courses at private institutions. The trend started reversing in the early 2000s. Since 2002, the proportion

of full-time students at public institutions has been gradually increasing again, as the result of, among others, demographic processes and the decline in the total number of students (Ministerstwo Nauki i Szkolnictwa Wyższego, 2013). In 2015, full-time students at public institutions made up 60% of all students (Główny Urząd Statystyczny, 2015).

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

As a result of the above described processes, the share of young persons with higher education attainment in Poland tripled between 2002 and 2016, from 14.4% to 44.6%. Thanks to this rapid expansion, the share of young people with university degrees in Poland is now above the EU average (Figure 1). Poland is close to reaching the EU 2020 target on the share of persons aged 30–34 with higher education of 45%, which is above the EU target of 40%. This also means that the availability of “good” jobs becomes an issue not only for individuals, but also for higher education policy in Poland.

Due to relatively favourable labour market conditions, the unemployment rate among recent graduates in Poland is also lower than the EU average (Rokicka, Kłobuszewska,

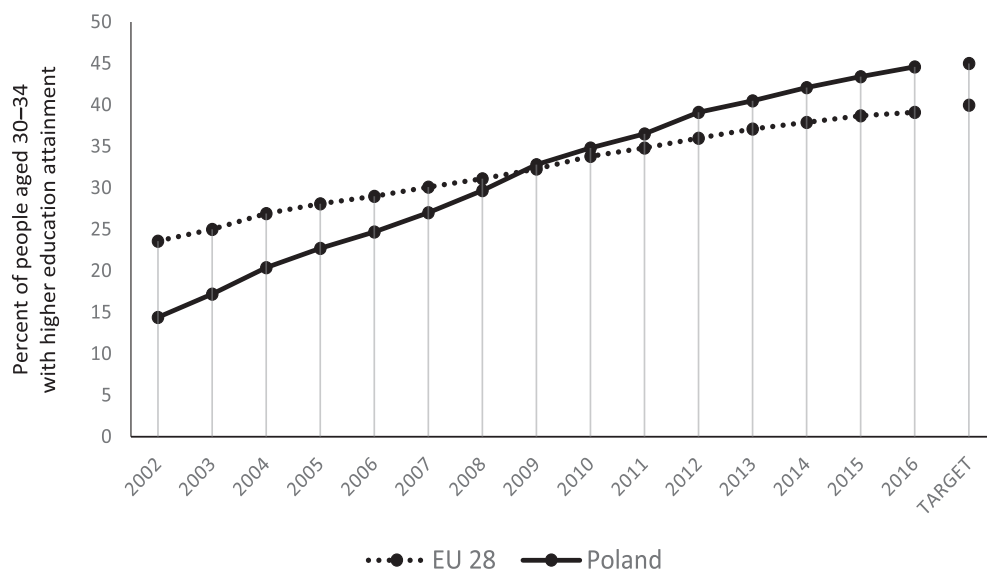


Figure 1. Tertiary education attainment in Poland and EU-28, 30–34 age group.

Source: Eurostat.

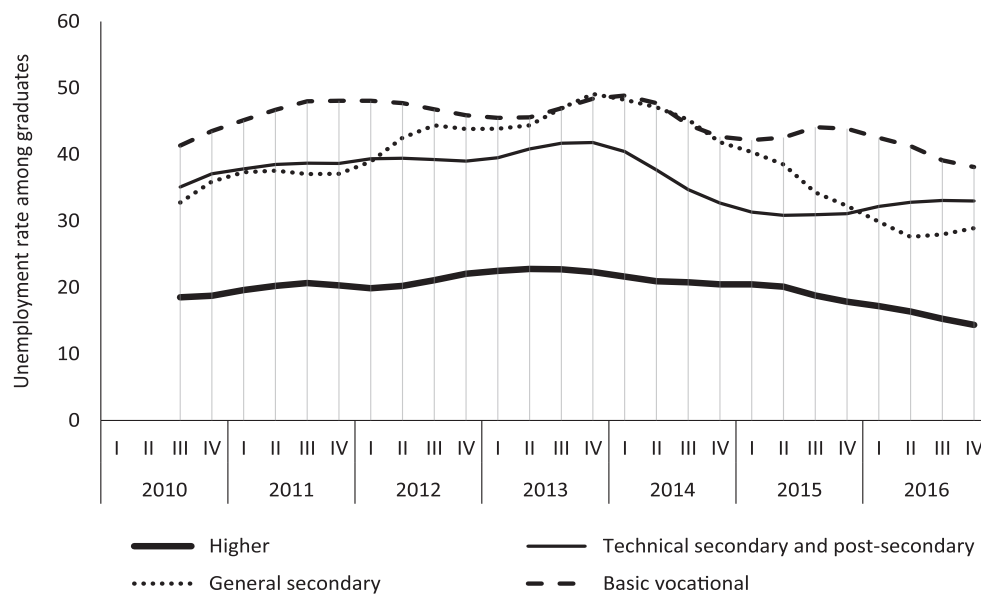


Figure 2. Unemployment rate among recent graduates by type of education, moving average of quarterly data, 2010–2016.

Based on the Labour Force Survey data (GUS, 2017).

Palczyńska, Shapoval and Stasiowski, 2015). However, both public opinion and politicians are concerned about tertiary education graduates' prospective employability. Although even in the years following the 2008 crisis, the Polish economy fared well compared to other European economies and kept growing, the labour market did not significantly improve (Boulhol, 2014). After the decline observed between 2004 and 2007, the unemployment rate among tertiary education graduates and young people generally rose between 2007 and 2013 (Rokicka et al., 2015) to fall again in later periods (Figure 2).

Despite the rise in the unemployment rate observed in the mid-2000's, there is much evidence showing that educational attainment improves labour market prospects. The unemployment rate among recent higher education graduates¹ in the fourth quarter of 2016 was estimated to be 12.6%, compared to more than 21.8% among all school leavers (Główny Urząd Statystyczny, 2017), which is a stable trend (Figure 2). The labour market situation of higher education graduates in Poland improves with time after graduation, particularly during the first two years after receiving a diploma, as data from the Labour Force Survey have shown (Federowicz and Sitek, 2011). In addition, compared to other educational groups, higher education graduates face a lower risk of not finding employment during times of economic slowdown (Jelonek and Kocór, 2015), they also find jobs faster if they are registered as unemployed².

Despite this overall positive assessment, the labour market situation of graduates is quite diverse, which can be partially attributed to the type of studies (full-time vs part-time) and higher education institution (public vs non-public). As pointed out

by Zbigniew Marciniak et al. (2013), the education system in Poland shifted from a purely elitist model to a model of diversified learning that needs to take into account the diversity in the level of students' abilities, as well as their interests and goals in life to a much greater degree. While some students are undoubtedly still interested in and capable of pursuing research-oriented studies, the vast majority seek an education offering a solid set of skills, as well as the flexibility that enables them to perform various jobs and social roles. One symptom of this is the falling age of labour market entry in Poland (Federowicz and Sitek, 2011). According to the results of the Study of Human Capital in Poland (*Bilans kapitału ludzkiego*, BKL; Jelonek and Szklarczyk, 2013), there are several determinants of the labour market position of higher education graduates. The first one is the level of studies. In general, second cycle graduates find jobs, however the situation of engineers is already very good after graduating from the first cycle of studies. Second, the type of higher education institution (leading vs peripheral academic) affects employment chances. Third, the field of study and specialisation also matter. Based on the Labour Force Data, Iga Magda et al. (2014) assess that graduates of the technology and health fields have the lowest risk of unemployment two years after graduation, while those graduating from pedagogy, social sciences, services and agriculture are still struggling to find jobs. By the same token, graduates of health, technology, natural sciences, computer science and the humanities have higher chances of employment in high-skilled occupations. These outcomes seem to have an impact on educational choices. As highlighted by the researchers, "the aforementioned trends are at least partially reflected in the recently observed educational choices of young Poles. Faculties providing poor career prospects have been losing popularity" (Magda et al., 2014, sp. 62). This

¹ People who graduated within 12 months before the survey and are not in education.

² However, this effect may be partially attributed to the situation of graduates of medical studies, which is discussed later in the article.

includes, in particular, social and economic faculties, as well as pedagogical studies. The popularity of technical faculties and the exact sciences is increasing, which can be also linked to the restoration of the obligatory *Matura* exam in mathematics.

In 2005, Poland introduced the Bologna system. The majority of students in Poland attend both cycle of studies to obtain a Master's degree before fully entering the labour market. Given the employment-related goals of students, as well as the large number of young people pursuing university degrees, monitoring the economic outcomes of higher education studies is an important aspect of assessing the quality of outcomes of higher education in Poland.

Methodology

Data

This paper is based on data from the second measurement of the ELA system. Before 2011, graduate tracking in Poland consisted of rather occasional research projects at some higher education institutions. The situation changed dramatically in 2011 with the introduction of the universal mandate for higher education institutions to track graduates 1, 3, and 5 years after graduation. At that time, a research team at the University of Warsaw designed a system for graduate tracking³ that would use administrative data from the Social Insurance Institution, encompassing information on every person working in the country. The system was ultimately not implemented at UW, but it was further developed into a national system. The ELA system was established by the Ministry of Science and Higher Education (Ministerstwo Nauki i Szkolnictwa Wyższego, MNiSW) in 2014.

The ELA system uses individual data

extracted from two administrative registers. The first register is the POL-on system, which is owned by the MNiSW. The second one is the register of the Social Insurance Institution (Zakład Ubezpieczeń Społecznych, ZUS). In principle, relying on administrative data allows the monitoring system to cover the entire population of graduates. However, it also limits the analysis to the information collected by the respective administrations (United Nations Economic Commission for Europe, 2007; Wallgren and Wallgren 2007).

The POL-on system serves, among others, as a national register of students and graduates. The data exported to the ELA system include the following information on graduates: higher education institution, department or faculty, study programme, level of studies (BA vs MA), the mode of delivery (full-time vs part-time), the date of graduation, information on subsequent enrolment into a different study programme along with its characteristics.

The ZUS register provides data on graduates' monthly contributions to the national social insurance system. The contributions are mandatory for the vast majority of the economically active population. Records of contributions include the following data:

- Labour market status, including the type of work arrangement (i.e. salaried worker, self-employed, unemployed, on maternity or parental leave);
- Basis for the amount of the social insurance contribution (*podstawa wymiaru składki*) – the amount used to calculate the contributions to be paid. For employed, this figure equals the wage in PLN in each month. For self-employed individuals, the amount declared in most cases is fixed at the minimum required level of 60% of the average wage in the economy and thus not indicative of income.

However, ZUS records cover only the Polish labour market and do not include any records of those who left the country

³ For a project financed by the Educational Research Institute, Poland.

after graduation. Moreover, there is a type of work contract that is not registered by ZUS, namely the specific-task contract. This kind of contract is relatively rare. Specific-task contracts are the main form of employment for less than 0.5% of the working population and 1.8% among people aged 15–24. The nonstandard forms of employment are less common among people aged 25–29, i.e. the category that a typical graduate joins soon after attaining a diploma (Główny Urząd Statystyczny, 2016). Information about these contracts does not appear in the data, while all employment contracts and self-employment arrangements are registered (Chłóń-Domińczak, Sowa and Topińska, 2017; Lewandowski, Stroński and Keister, 2015). Moreover, the analysis of the data clearly shows that the vast majority of higher education graduates enter the labour force in Poland and are present in the ZUS records.

Data from POL-on and ZUS registers can be accurately and effortlessly linked due to the adoption of the national identification number PESEL (Powszechny Elektroniczny System Ewidencji Ludności) as an ID in both databases. The implementation of the PESEL number makes the process of merging data simple and helps to avoid problems with data linking (mostly missed links and mislinks) experienced by other researchers who have to rely on a combination of variables such as sex, address, and date of birth (Chowdry, Crawford, Dearden, Goodman and Vignoles, 2013; Kim, Tamborini and Sakamoto, 2015; Oreopoulos, Wachter and Heisz, 2006). In order to protect the privacy of graduates, the PESEL number is replaced with a dummy ID in the process of data merging, which is administered by ZUS.

This study concentrates on the 171 751 graduates of master's programmes (second-cycle or long-cycle studies) who finished their studies in 2014. In Poland, the Bachelor's degree is still perceived as incomplete higher education (Grotkowska, 2011; Piróg, 2013).

It is rather a “transitional” degree (Teichler, 2011) and a large share of graduates of first-cycle programmes pursue further education instead of entering the labour market (Zajac, Jasiński and Bożykowski, forthcoming).

The model(s)

This paper investigates the factors affecting the employment chances of master's degree holders with not one probit model but with eight models, one for every three months after graduation, i.e. in the third, sixth, ninth month, etc. All models include the same set of variables. The aim is to study changes in model parameters over time.

The dependent variable in the model is a dummy variable indicating whether a graduate has a steady job, i.e. an employment contract or is self-employed. Polish regulations also allow other forms of job contracts, including civil contracts and specific-task contracts. In principle, these forms of contracts are meant for temporary work, but they have become very extensively used. Sometimes they are nicknamed “junk contracts”, as they do not guarantee employment stability. On top of this, some junk contracts, namely specific-task contracts, are not registered in ZUS.

We use a probit model to predict the employment status of the graduates. The model provides the probabilities of being in employment in a given month for every graduate.

The prediction is based on the independent variables listed below:

- Sex;
- Age category – the age category in the year of graduation. Categories are: 25 or less and 26 or more. In the Polish education system, if someone has had no break or delay in his or her education, he or she would obtain a master's degree at age of 25 or earlier;
- Size of place of residence – the category of the size of the place of residence: over 500 000 residents (large city); less than 500 000 but the city is a separate county

(medium-sized city); small town or village; unknown place of residence. Information on the place of residence is based on ZUS records. For some graduates, place of residence was not noted in ZUS records, usually when the person was not employed;

- Mode of studies – informs whether the graduate studied full-time or part-time;
- Type of HEI – informs whether the graduate studied at a public HEI, non-public HEI or ecclesiastical HEI. Only a small percent of graduates belongs to the last category. In general, public HEIs in Poland are considered more prestigious than non-public ones, and full-time studies in public HEIs are tuition-free;
- Field of study – informs on the field of study of the programme that a specific person graduated from. In Poland, study programmes are grouped into 8 fields: the humanities, medical and health sciences, natural sciences, agricultural sciences, social sciences, exact sciences, technical sciences, arts.
- Studying after graduation – a dummy variable; informs whether the graduate was enrolled in another study programme after graduation; it counts programmes started both before and after graduation.
- Job experience – a dummy variable; informs whether the graduate had any employment contract or was self-employed in the few months before graduation.⁴

As the data cover the entire population of graduates, there is no need for statistical inference. Therefore, no significance levels will be reported in the text.

The model fit index

In this paper, we use a model fit index designed by Marek Styczeń and Mikołaj Jasiński (2012). The Styczeń-Jasiński model fit index (MFI^{SJ}) is suitable for models using

a maximum likelihood estimation (MLE), including logit and probit models.

The MFI^{SJ} is one of the measures based on the comparison of likelihood ratios: for the full (unrestricted) model (L_{UR}) and for the null (restricted to an intercept) model (L_R). Its advantage over more popular measures, like Cox and Snell's pseudo R -squared (1989) or Nagelkerke's pseudo R -squared (1991), and McFadden's pseudo R -squared (1974), is that it can be interpreted as a measure of the model's lack of fit reduction. The MFI^{SJ} is provided by the following formula:

$$\begin{aligned} MFI^{SJ} &= \frac{(1 - L_R^{1/n}) - (1 - L_{UR}^{1/n})}{1 - L_R^{1/n}} = \\ &= \frac{L_{UR}^{1/n} - L_R^{1/n}}{1 - L_R^{1/n}}, \end{aligned} \quad (1)$$

where: n is the number of units in the population or sample size; L_{UR} is the likelihood for the model, i.e. the product of the probabilities of consistency of the model predictions with actual values, and L_R is the likelihood for the null model.

The $1/n^{\text{th}}$ power of likelihood ratios in the formula makes the result independent of the number of observations in the population or sample. It provides the geometric mean of the likelihood, i.e. the expected probability of the consistency of the model prediction with the actual value of a single observation.

Therefore:

- $1 - L_{UR}^{1/n}$ is the measure of the model's lack of fit, and
- $1 - L_R^{1/n}$ is the measure of the lack of fit of the null model.

The MFI^{SJ} formula is similar to well-known measures based on the method of least squares (Eta-squared and R -squared coefficients), which are also interpreted as measures of the model's lack of fit reduction. In the models estimated with the method of

⁴ The exact number of months taken into account depends on the date of graduation – it is the consequence of data export procedures. In most cases it is about 6 months.

least squares, the models' lack of fit is understood as Mean Squared Error.

Models using the method of least squares minimize the average square of the difference between the prediction and the actual value. The most optimal prediction is the one for which the average square is zero and *ceteris paribus*, the closer the measure is to zero, the better the model fitness. By analogy, the most optimal prediction for MFI^{SJ} would be one that assigns the probability of 1 to objects having the feature and the probability of 0 to those that do not have it. The closer the prediction gets to the optimal solution, the better the model fitness. The MFI^{SJ}, as well as the measures using the method of least squares, informs us of how close the model brings the result to the optimal prediction, with the null model being the starting point.

Results

The estimated model is well fitted to the data for the first quarter after graduation, but the fitness declines for models that are estimated for the following quarters. This is not surprising, since many of the independent

variables in the model relate to the study programme. The more time passes from the moment of graduation, the smaller the impact of these features should be expected on labour market performance. Figure 3 demonstrates the decrease in model fitness.

The model fit index decreases step by step from 0.37 three months after graduation to 0.13 after the eighth quarter (two years after graduation).

The following figures (4 and 5) present the most important parameters of the model (complete information on model parameters is available in Table A1 in the appendix).

Figure 4 shows that people with job experience before graduation had much better chance of being in employment. This "bonus" shrinks over time, dropping from 2.1 three months after graduation to 0.8 two years after graduation. However, even after the decrease, pre-graduation work experience was still the most important factor for graduates' employment chances after graduation.

Another factor improving the chances of being in employment was place of residence. Those living in a large city fared better in comparison with graduates living in small

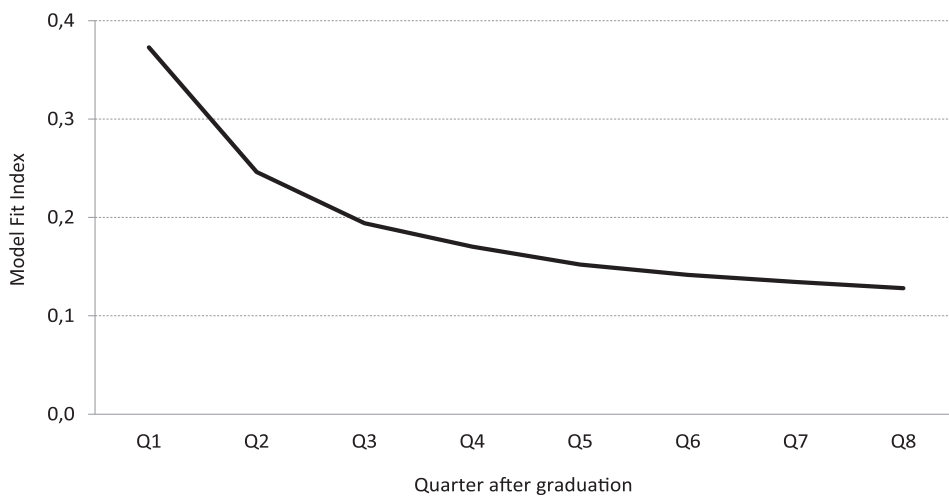


Figure 3. Model fit index every three months for two years after graduation.

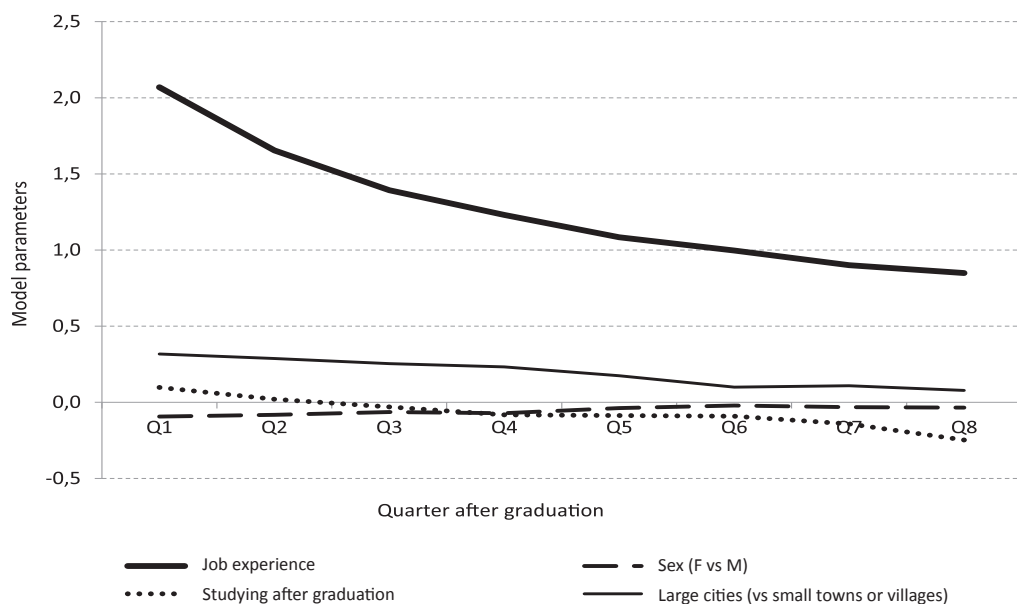


Figure 4. Parameters for the chosen independent variables every three months for two years after graduation.

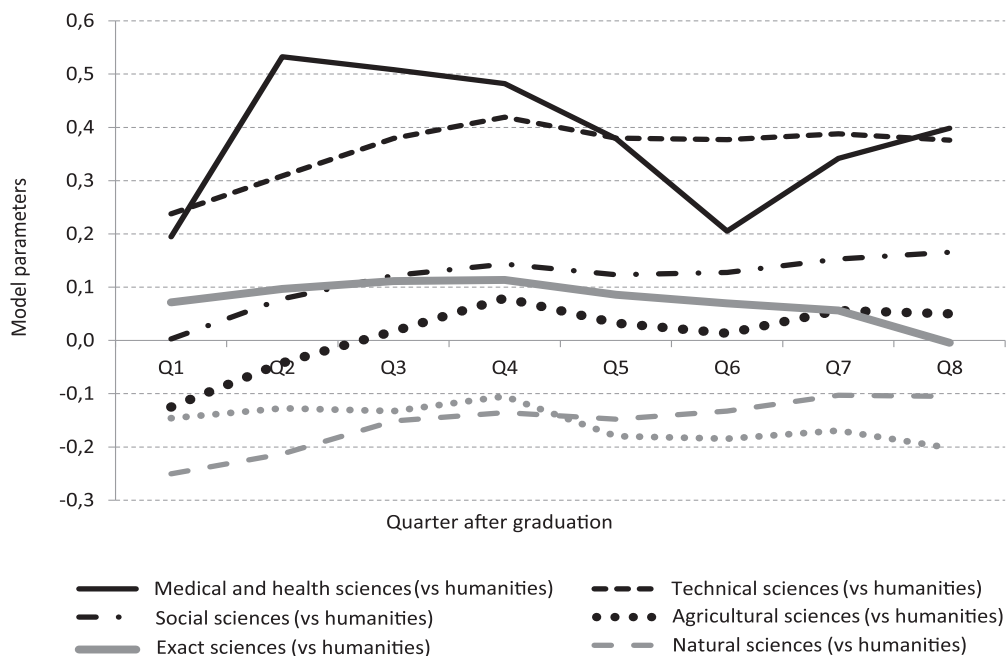


Figure 5. Parameters for the fields of studies every three months for two years after graduation.

towns or villages. Large cities offer more job opportunities, which goes hand in hand with a lower unemployment rate. The estimated bonus from residing in a large city decreases over time, as people from smaller localities eventually manage to find employment.

Women's chances of being employed were slightly smaller in the first year after graduation than those of men, while in the second year, they were roughly equal.

People pursuing further education were slightly more likely to be employed three months after graduation than others. This is later reversed. Initially pursuing further education most likely does not mean enrolling in a new programme, but rather continuing the programme started before the analysed graduation. Later, those who enrolled in a new programme after graduation constitute a majority. This may suggest that they are not confident that their education is sufficient to face the labour market.

All in all, the significance of the socio-demographic variables diminishes over time, as those who entered the job market accumulate more work experience.

A more detailed analysis of the impact of the field of study offers some counterintuitive results. Graduates of the natural sciences were among those who were least likely to be employed right after graduation. Their labour market performance was much closer to the one of graduates from art programmes than to the one of holders of a degree in the exact sciences.

The atypical shape of the curve for medical and health sciences shown in the Figure 5 requires some explanation. It starts with a strong increase, then after a while it decreases rapidly, reaching the lowest value 1.5 years after graduation, and then it rises again. This is the result of Polish regulations regarding physicians and dentists. In the 3-4 months after graduation, they all start a training period in a hospital (this is why the chance for being employed rises in the

2nd quarter), which lasts for 13 months. Then they have a gap in employment lasting several months (in the 6th quarter) during which they take licensure exams. If they pass, they start regular employment or residency. This is the reason for the increase of the coefficient observed in the 7th and 8th quarters.

The estimated parameters of other variables used in the model (see the appendix), that is the type of study (full-time vs part-time) as well as the type of higher education institution (public vs private) were close to zero, which indicates that these characteristics were not affecting employment chances.

While the socio-demographic characteristics tend to have systematically decreasing significance for graduates' employment chances, the influence of the field of study remains more or less stable. This could be explained by the fact that the available career paths largely depend on the field of study. For instance, only graduates holding degrees in medical sciences can work as physicians and it is highly unlikely that these graduates compete for jobs with the graduates of technical or social sciences.

Conclusions

This paper evaluates the role of different factors – including socio-economic, study characteristics as well as earlier job experience – on the employment chances of graduates during the two years after graduation. Overall results of the estimated models show that the explanatory power of the individual characteristics as well as the characteristics of the studies diminishes over time. This means that the study content and work experience prior to graduation are important at the start of economic activity. Other factors, most likely related to gaining experience and work-related skills after graduation, gain more relevance with time passing from graduation. This may indicate that maintaining high employability requires

equipping students with skills for lifelong learning that allow them to further develop their human capital after graduation.

Furthermore, our analysis indicates that the mode of studies as well as the type of higher education institution are not decisive factors for finding a job after graduation. Part-time study programmes as well as private institutions, despite being frequently discredited in the public debate on labour market outcomes, do not reduce the chances of employment of their graduates. In fact, many students in these types of institutions have jobs even before graduation, which boosts their chances of employment after they finish studying.

The results of the estimated probit models indicate that the impact of certain individual characteristics diminishes over time. This relates in particular to pre-graduation job experience as well as place of residence – the premium for living in a larger city with a better labour market becomes smaller. It is worth noting that the gender gap in the employment of graduates is small and decreasing.

Our results confirm the role of the field of study. As one could expect, technical and medical studies provide the greatest chances of finding employment. In the case of the latter field, the model also shows the consequences of administrative regulations regarding post-study training, certifying exams, and further residence employment. These regulations lead to a gap in graduate employment typically lasting about three months. During that period, many of the graduates register as unemployed, presumably to maintain access to health insurance. Introducing health care coverage after medical training and during the run-up to the exam could reduce the inefficiency of the current solution, since many of these graduates are not actually unemployed. (They do not satisfy the conditions to be called unemployed: they are neither looking for a job nor ready to begin a job – they are simply preparing for the medical exam).

Graduates of the arts and natural sciences have more difficulties in finding jobs. In the case of the latter group, the result is consistent with the findings from the international Survey of Adult Skills (PIAAC), showing that graduates of the natural sciences in Poland have lower literacy and numeracy skills compared to their peers from the OECD 22 countries participating in the survey (Rynko, 2013).

The models are but one example of an in-depth analysis of graduates' labour market performance made possible thanks to the introduction of the ELA system, which goes beyond the reports published by MNiSW. While the official monitoring portal plays an important role by offering public access to automatic reports summarising the labour market outcomes of various groups of graduates, the data allow a far more complex analysis of graduates' early careers.

This paper does not exhaust the potential of ELA data. It focuses on employment probabilities, which is just one dimension of labour market performance. The dataset in the ELA system also includes information on wages, which will be analysed in the future. As the ELA system develops and provides information for the period of five years after graduation as well as for further cohorts of graduates, it will play an increasing role in supporting young people in their decisions regarding areas of study and higher education institutions, aiding students in their choice of further working paths, assisting the managers of higher education institutions in study programme development as well as informing higher education policy making at the national level.

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Appendix

Table A1

Parameters of the model predicting the employment situation every three months for two years after graduation

Independent variables	Quarters after graduation							
	1	2	3	4	5	6	7	8
Job experience	2.1	1.7	1.4	1.2	1.1	1.0	0.9	0.8
Sex (F vs M)	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
Graduated at 26+	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Part-time	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
Non-public HEI (vs public)	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Ecclesiastical HEI (vs public)	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0
Studying after graduation	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2
Large cities (vs small towns or villages)	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1
Medium-sized cities (vs small towns or villages)	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0
Unknown residence (vs small towns or villages)	-0.8	-0.7	-0.7	-0.8	-0.8	-0.9	-0.9	-0.9
Medical and health sciences (vs. humanities)	0.2	0.5	0.5	0.5	0.4	0.2	0.3	0.4
Natural sciences (vs humanities)	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
Agricultural sciences (vs humanities)	-0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Social sciences (vs humanities)	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Exact sciences (vs humanities)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Technical sciences (vs humanities)	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Arts (vs humanities)	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2
Intercept	-0.4	-0.1	0.1	0.3	0.5	0.6	0.7	0.8