

TOMASZ ZAJĄC  
University of Warsaw

MIKOŁAJ JASIŃSKI  
University of Warsaw

MAREK BOŻYKOWSKI  
University of Warsaw

## **Early Careers of Tertiary Graduates in Poland: Employability, Earnings, and Differences between Public and Private Higher Education**

*Abstract:* Poland's system of higher education has expanded rapidly in the last quarter century. Not all graduates of the massified educational system have succeeded in the labor market. Part of the public debate regarding the labor market performance of graduates focuses on the performance of graduates who attended private institutions and part-time programs. As yet, there has been no detailed research into the career paths of recent university graduates in Poland, let alone a comprehensive investigation of the differences between the performance of graduates of various types of studies. In this paper, we present the newly created Polish Graduate Tracking System. We use data from the system to evaluate the labor market performance of recent graduates and to demonstrate the differences between graduates of public and private education. Overall, the privately educated graduates fare better on the labor market, but a more in-depth analysis shows that this could be attributed to their strategy of early entry into the labor market.

*Keywords:* higher education, labor market, graduate tracking, administrative data, Poland

### **Introduction**

One of the goals of institutions of higher education (as well as lower level schools) is to prepare students for their roles in the economy. After graduation, former students are generally expected to find a job, start a company, or enter the labor force in some other way. The problem of the employability of graduates of higher education has been gaining importance in many European countries in recent years, especially after the financial crisis of 2008 (European Commission/EACEA/Eurydice & European Commission 2014; Gaebel, Hauschildt, Mühleck, & Smidt 2012). Poland belongs to the group of countries that has experienced lively public debate regarding the labor market performance of graduates and the need to assess the quality of tertiary education over the last decade. Rapid expansion of higher education in the 1990s and at the beginning of the new millennium was followed by a rise in the number of unemployed graduates. This sparked a debate about the employability of graduates and the quality of higher educa-

tion in Poland. One of the results was the creation of the Polish Graduate Tracking System in 2015.

This paper has three main goals. First, we would like to introduce the Polish Graduate Tracking System and describe the data it uses. The system is meant to fill the gap in research on the labor market performance of graduates in Poland. Before the creation of the system the issue was largely under-researched. Researchers analyzed official statistics (for instance, on the number of unemployed persons with university degrees), or data collected in one-off research projects (e.g., [Grotkowska 2011](#); [Pańków 2012](#)). Apart from a few institutions like AGH [University of Science and Technology] in Kraków, Polish universities have not conducted systematic research on their graduates' labor market performance. The Polish Graduate Tracking System utilizes administrative records on entire cohorts of graduates and provides the public and policy makers with a detailed analysis of graduates' labor market trajectories on a program-by-program basis.

Second, we summarize the findings of research based on data from the Polish Graduate Tracking System and discuss the hotly debated topic of the labor market performance of recent graduates in Poland. We focus on issues that appear to be of great concern both to the public and the government: the employability of graduates; the quality of employment (understood as the type of work arrangement); and earnings during the first year after graduation. The unique structure of the available data—that is, records collected monthly—allows much more detailed analysis than in any previous study on the topic. Our study shows that graduates by and large—if not without difficulty—manage to find a job after graduation and to avoid unemployment. They are mostly employed with full benefits and their employment does not fall into the category of so-called junk jobs or junk contracts.

Third, we discuss the differences between the labor market performance of graduates of different modes of study (full-time versus part-time) and types of institutions (public versus private). We hypothesize that graduates of part-time studies or private institutions that are viewed as offering lower quality education ([Herbst & Rok 2014](#)) may be treated differently by employers. Our results show that graduates of private institutions perform better on the labor market, but when other factors are taken into account—for instance, pre-graduation work experience—it appears that actually it is the public institutions' graduates who outperform their peers from private institutions.

The paper is structured as follows. First, we start with a background section on educational expansion and the significance of research on graduates' labor market outcomes. Second, we discuss theories linking education and labor market outcomes. Third, we present the methodology of the present study: we describe data sources, outline the main advantages and disadvantages of using administrative data in social research, analyze data reliability, and present the characteristics of the research population relevant for further analysis. Fourth, we move on to discuss the labor market performance of graduates in general, focusing on employability and earnings. Then, we analyze the impact of pre-graduation work experience on post-graduation careers. The final section contains a description of the differences in labor outcomes between graduates from public and private institutions, followed by our conclusions.

## Background

In recent decades higher education has expanded across the world and particularly in the developed countries (Lee & Lee 2016; OECD 2015). There is plenty of evidence that educational attainment improves individual economic prospects as well as other aspects of life (Card 1999; Hout 2012; McMahon 2009; Pascarella & Terenzini 2005). A World Bank study of 139 economies documents substantial private returns to tertiary education (Montenegro & Patrinos 2014).

However, the expansion of higher education has gone hand in hand with growing concern about the labor market prospects of the ever-growing number of graduates. For example, in Germany in the 1970s, the term “academic proletariat” was in use and suggested that superfluous graduates were doomed to economic and social misery (Teichler 2009). “Credential inflation,” which is associated with educational expansion, (Dore 1976) is yet another example of a less optimistic view of the increased supply of graduates. More recently, there have been warnings that Western graduates may be deprived of their good labor market prospects by growing global competition, mainly from India and China (Brown, Lauder, & Ashton 2011). The massification of education is seen as hampering graduates’ chances to find appropriate employment easily (Tomlinson 2017). Multiple studies raise the issue of graduate under-employment or over-education (for a review of the literature, see: Scurry & Blenkinsopp 2011).

Although there have been debates over graduate employability or work readiness in the past, interest in this question has exploded since the start of the century (Tomlinson 2017: 13). Graduate employability has become more important in assessing higher education. This—along with new trends in public governance, such as evidence-based policy-making, and with increasing capacities for data collection and processing—has led to the creation of graduate tracking systems in many countries (Gaebel et al. 2012).

Poland has witnessed a similar rise in interest in graduates’ employability following the massification of higher education. Like many other OECD countries (OECD 2015), it has undergone a significant transformation of its higher education in the past quarter century. One of the most important changes was the steep rise in the number of students. At the beginning of the 1990s, after the fall of communist rule, there were around 400,000 students at Polish universities. Over the following fifteen years, the number of people enrolled in higher education grew rapidly and peaked at nearly two million in the academic year 2005/2006. Since then the number of students has decreased, mostly for demographic reasons. In effect, the Polish higher education system turned from being elitist to being massified. Over twenty-five years ago only around 10% of the youth completing upper secondary school were admitted to universities each year. Currently, about half of each year’s upper secondary school graduating class enrolls in higher education (Marciniak, Chmielecka, Kraśniewski, and Saryusz-Wolski 2014). According to the Central Statistical Office of Poland [GUS], the net enrolment ratio reached the threshold of 40% in the mid 2000s and has stayed at about that level since then (GUS 2015a).

The huge expansion of Poland’s higher education system in the last quarter of a century has been possible thanks to the introduction of private institutions of higher education and the rise of part-time programs at public institutions at the beginning of the 1990s

(Kwiek 2009). In effect, Poland has a very high proportion of part-time students in comparison to other OECD countries (OECD 2013). Full-time students at public institutions make up about half the student body in Poland. Another fifth studies part time at public institutions. The rest consists of students of private institutions offering mostly part-time programs (Ministerstwo Nauki i Szkolnictwa Wyższego 2013).

The rapid expansion of the higher education system has led to the quality of education being questioned (Piróg 2013) and graduate employability has become an important issue in the public debate. By and large, educational attainment still improves graduates' labor market performance regardless of the aforementioned massification of tertiary education. In 2015, the unemployment rate among recent graduates of higher education<sup>1</sup> was estimated to be 23.2%, compared to more than 30% among all school leavers and 48.4% among the recent graduates of general upper secondary education (GUS 2015b). Moreover, due to relatively favorable labor market conditions, unemployment among recent graduates in Poland is lower than the EU average (Rokicka, Kłobuszewska, Palczyńska, Shapoval, and Stasiowski 2015). However, despite the fact that the Polish economy has fared well compared to other European economies and has kept growing even in the years following the 2008 crisis, the labor market has not improved significantly at the same time (Boulhol 2014). After the decline observed between 2004 and 2007, the unemployment rate among tertiary education graduates and young people in general rose between 2007 and 2013 (Rokicka et al. 2015), which may give the impression that the competitive advantage of higher education graduates has decreased. According to the Public Opinion Research Center (CBOS), the majority of respondents in a nationwide study see higher education as not particularly valuable from the labor-market point of view (2013).

The quality of employment was part of the debate, too. The Polish labor market shows symptoms of duality. The first, more privileged segment consists of people with stable employment. People belonging to the second segment earn less and more often experience non-standard forms of employment, which are often called "junk contracts" (Arak, Lewandowski, & Żakowiecki 2014). The belief that graduates are doomed to junk contracts is quite widespread and is often repeated in the public debate.

Over-education is yet another labor market issue related to the expanded system of higher education in the discussion of higher education in Poland. The share of university graduates having jobs that do not require a university degree is rising, and young people at the beginning of their careers are most prone to over-education (Baran 2016; Kiersztyn 2013).

In the debate, the new types of fee-based programs have been blamed for an oversupply of graduates lacking the skills necessary to succeed in the labor market. Private institutions are often perceived as less prestigious and as offering lower quality education than the public ones (Herbst & Rok 2014). Despite the fact that private institutions greatly outnumber public ones, only four private HEIs are listed among the top 50 in rankings of higher education institutions in Poland (for rankings see: Perspektywy 2016).

The heated debate over graduates' employment and its quality led the Polish government to introduce a system of graduate tracking. The first attempt to create a nationwide

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

system of graduate monitoring took place in 2011. The new Law on Higher Education obliged higher education institutions (HEIs) to monitor graduates' performance on the labor market. However, the regulation did not specify *how* the HEIs should fulfill the obligation, that is, how they were to measure graduates' employability. The regulation led to the uncoordinated development of multiple systems of graduate tracking. A real milestone was reached in July 2014 when another amendment to the Law on Higher Education established a uniform Polish Graduate Tracking System. The Polish system was designed to provide reliable and comparable data on the employment of graduates from nearly all the programs offered by the Polish system of higher education.<sup>2</sup> However, the Polish Graduate Tracking System does not entirely replace preexistent graduate tracking systems operated by institutions of higher education. HEIs are encouraged to supplement data coming from the national study with their own tailored research.

The methodology of the study was first developed by researchers from the University of Warsaw for tracking the careers of their institution's graduates (Bożykowski, Izdebski et al. 2014) and was later adapted for the purposes of a nationwide program. The data used in the system come from two national administrative registers: POL-on operated by the National Information Processing Institute [OPI], and the registers of the Social Insurance Institution [ZUS].

### Theoretical considerations

It is generally agreed among social scientists that there is a strong association between education and social destination, although there has been some research suggesting that the link is weakening (Goldthorpe 2014). What exact mechanism links education and careers has not yet been determined.

Human capital theory, which was developed in the late 1950s and early 1960s (Becker 1962; Mincer 1958; Schultz 1961), is considered to be the mainstream economic theory explaining the relationship between education and the labor market (Goldthorpe 2014: 269). According to this theory, education is a means of acquiring new skills to enhance one's productive capacities. The increased productivity is recognized by employers and rewarded with higher earnings. In other words, education is a means of enhancing human capital. On the other hand, education requires investment in terms of time, effort, and financial resources. The earnings foregone during education should also be factored in. Individuals are seen as rational actors who maximize their expected lifetime earnings. A decision to pursue education is similar to any other investment decision. Both the costs of education and the expected earnings are taken into account.

In a summary of the possible theoretical inspirations for sociologists interested in developing micro-social foundations that would better explain the macro-level relations between social origin, education, and social destination (the OED triangle), Goldthorpe discusses alternatives and writes that screening and signaling theory "could be regarded as the most influential response to human capital theory" (Goldthorpe 2014: 272). Proponents of signaling and screening theory note that employers have access to very limited information

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<sup>2</sup> Only soldiers studying at military institutions were excluded.

about the productive capacities of the individuals they hire, especially in the case of new entrants to the labor market. Employers learn about individuals' productivity later, as the new employees work for them. Therefore, in the recruitment process, employers rely on various signals of the potential employees' crucial but non-observable personal traits affecting productivity (e.g., [Stiglitz 1975](#)). In Spence's model ([Spence 1973](#)), previous experience provides an employer with "conditional probability assessments over productive capacity given various combinations of signals and indices" (p. 357). These conditional probability assessments are used in hiring decisions. Employers update these conditional distributions over time as they observe the actual productivity of the employed individuals and adjust the remunerations offered to new employees. The process of updating the conditional distributions continues until the employer learns to assess productivity based on the available signals. Individuals act accordingly and, based on the offered earnings, decide whether to invest in the acquisition of signals. A key assumption here is that the cost of acquiring a signal must be smaller for individuals with higher productivity. Educational attainment is one of such signals indicating productive potential, which cannot be easily demonstrated otherwise. In contrast to human capital theory, signaling and screening theory does not assume that education enhances the productive potential of an individual. Its role is rather to identify people with such potential.

Empirical testing of the rival models poses a serious difficulty as the theories imply that educational attainment increases earnings ([Chevalier, Harmon, Walker, and Zhu 2004](#)). However, such testing is not necessary here. Some scholars (e.g., [Goldthorpe 2014](#); [Rose 2013](#)) note that human capital theory and alternative approaches are not necessarily mutually exclusive because different models may be more applicable depending on factors such as the stage of career, type of employment, and so forth. In the case of early careers, signaling theory may seem more appealing as graduation is often seen as marking the starting point of a job hunt. At this stage, graduates who are fresh out of school often lack extensive work experience that could indicate their skills or other characteristics. Education is therefore one of the signals that might be used to screen job applicants. However, both signaling theory and human capital theory assume a link between earnings and productivity and both predict private returns to education. In each of these theories, differences in the labor market performance of various types of graduates reflect the differences in productivity and their value to employers.

### **Data and methodology**

Poland is not the first country to seize the opportunity to use its administrative data for policy-supporting research. Most notably, the Nordic countries have a decades-long tradition of register-based analysis ([Bakker and Daas 2012](#); [United Nations Economic Commission for Europe 2007](#)). Researchers from these countries routinely use administrative data for graduate tracking. Aside from national systems supporting policy-making, there is an extensive body of research on graduates' labor market performance that utilizes administrative data. The national statistical agencies use register records to create a whole set of databases that can be used later by researchers. In Denmark, these include, among



other databases, the Integrated Database for Labor Market Research (IDA) and Register-Based Work Force Statistics (RAS) (Danish Agency for Science Technology and Innovation 2012; Frederiksen & Kato 2011; Timmermans 2010). In Finland, the main data sources for graduate tracking are Statistics Finland's Register of Completed Education and Degrees, Population Information System, tax records, and social security records (Statistics Finland 2017). Norwegian researchers have access to individual data on education stored in the Norwegian Educational Database (NUDB), income data, and social security data (Bhuller, Mogstad, & Salvanes 2011, 2014; Reisel 2013). In the case of Sweden, the Longitudinal Integration Database for Sickness Benefit and Labor Market Studies (LISA) is now a major source of data for researchers, including the Swedish Higher Education Authority (UKÄ), which is responsible for graduate tracking. The database is maintained by Statistics Sweden (SCB) and contains data on employment, education, and income (Statistics Sweden 2017). There are numerous studies based on different registers administered by SCB (e.g., Ahlin, Andersson, and Thulin 2014; Gartell 2012; Kramarz and Skans 2014).

Nordic countries are not the only ones relying on administrative data to monitor graduates' labor market performance. Administrative registers are used, or will soon be used, by many European countries for the systematic evaluation of the labor market performance of higher education graduates and there are multiple one-off research projects. Register-based research on graduates employability and income (including in the long term) is performed in Austria (Guggenberger, Keplinger, & Unger 2011), Canada (Oreopoulos, von Wachter, & Heisz 2006), and the United States (Chetty et al. 2017; Davis and Mazumder 2011; McNabb, Timmons, Song, and Puckett 2009; Tamborini, Kim, and Sakamoto 2015).

Thanks to decades of experience, the merits of using administrative data for research are well known. Administrative data are often a "by-product" of routine administrative actions and this has profound consequences for research based on that data. The most important advantage of such data is the access to individual-level information on the entire recorded population. If any group is missing from the registers, most probably a systemic error can be identified. This increases the precision of analysis and simplifies research by eliminating the need for sampling and statistical inference.

At the same time, relying upon administrative data also has significant drawbacks. The most important seems to be the fact that researchers have no control over the process of data collection and usually cannot alter the set of collected variables—they have no say in defining variables and cannot introduce new variables into the dataset (Jasiński, Bożykowski, Zajac, Styczeń, and Izdebski 2015; Statistics Finland 2004; Wallgren & Wallgren 2007).

### Data Sources

The Polish Graduate Tracking System is run by OPI [National Information Processing Institute] on behalf of the Ministry of Science and Higher Education. OPI prepared the dataset of graduates who finished their studies in 2014 and later delivered it to ZUS [Social Insurance Institution]. The data comprise information on the study program; the institution and its characteristics, including the control (public versus private); the mode of study (full-time versus part-time); and the month of graduation.

ZUS is responsible for exporting data on graduates' monthly social insurance contributions. These include two important types of information:

- status in the labor market (i.e., salaried worker, self-employed, unemployed, on maternity or parental leave),
- contribution calculations basis [podstawa wymiaru składki]—the amount used to calculate the contributions due. For the employed, this figure equals the remuneration in PLN in each month. For the self-employed, the amount is fixed in most cases and is thus not indicative of income.

Data used in this paper were exported in October 2015<sup>3</sup> and cover the period between January 2014 and September 2015.

Both registers use PESEL<sup>4</sup> numbers to identify individuals. During the process of data preparation, PESEL numbers are replaced with generic IDs to prevent the researchers from having access to the PESEL IDs, which are unique, and thus to protect the graduates' privacy. As ZUS is the institution responsible for data anonymization, the research team has access only to the anonymized data.

The system also protects graduates' privacy by stripping the data of some of their precision. To some extent, the privacy-enhancing measures restrict the analysis. For example, the lack of precise dates makes it impossible to indicate which of two events occurring in the same month took place first or to determine whether a labor market status lasted just for one day or for a whole month.

### Data Coverage

This paper focuses on master's degree holders because the majority of graduates of first-cycle programs (63%) continue education whereas obtaining a master's degree usually marks the end of tertiary education. The pursuit of further education significantly reduces the labor market activity of graduates from BA programs.

The trend is clearly visible in ZUS data as well. Since the very beginning of the period analyzed the share of BA graduates present in ZUS registers is smaller than that of MA graduates. The distance between the two groups is modest at first (around 15 percentage points) but widens to around 30 percentage points by October 2014. The share of graduates who were present in ZUS's data at least once, that is, at least one contribution was registered, is respectively 66% and 92% for BA and MA graduates (Figure 1).

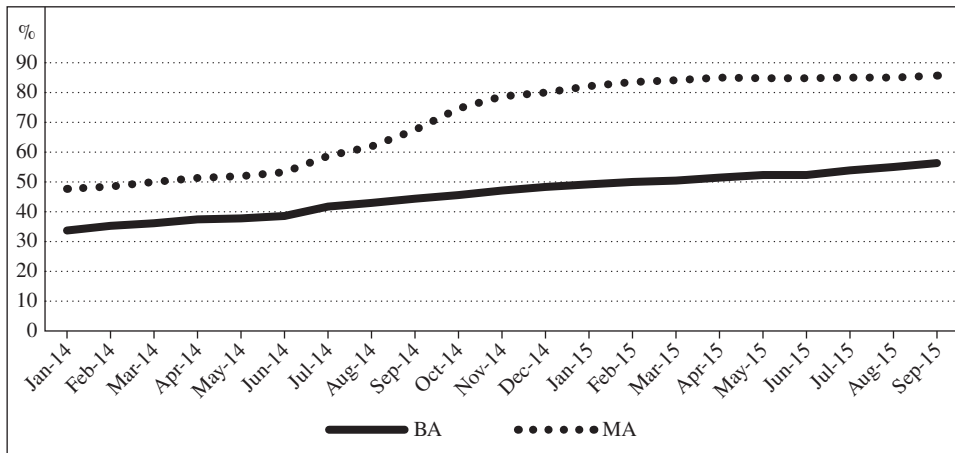
Reliance on ZUS's data may lead to a slight underestimate of the share of working graduates. ZUS does not cover farmers, who are insured by KRUS [the Agricultural Social Insurance Fund] nor Polish citizens employed abroad, and not all types of contracts are reported to the institution. However, the underestimate should not be large. First, only a relatively small proportion of the population is registered in KRUS. By the end of 2015, the number of persons insured by KRUS was around 1.3 million (KRUS 2016) compared with almost 15 million citizens insured by ZUS (ZUS 2016). Second, employment by a contract to perform a specific task, [umowa o dzieło], which is not registered by ZUS, is rela-

<sup>3</sup> The timing of the export was determined by the Law on Higher Education Act.

<sup>4</sup> PESEL [Powszechny Elektroniczny System Ewidencji Ludności] is the national personal identification number. It is widely used in Polish administrative registers.



Figure 1  
Share of BA and MA Graduates Recorded by ZUS



tively rare. It is the main form of employment for less than 0.5% of the working population (GUS 2016d).

### Population

The study defines the unit of observation in a slightly unconventional manner. The national tracking system concerns university graduates and aims at the evaluation of study programs. This goal determines the design of the database. The unit of observation is not a person but rather a diploma, a graduate of a specific program. As it is feasible to graduate from more than one study program, a person graduating from multiple programs in the period under examination will occur in the database more than once. Although all observations referring to the same person will share the same professional history registered by ZUS, differences in graduation date affect the values of indicators (e.g., time between graduation and beginning of employment).

The study includes 155,476 such observations. However, the number of graduates is not much smaller, as only a tiny proportion (around 1%) obtained more than one diploma. Most graduated from second-cycle programs. Only about 11% of recorded degrees were awarded to students of long-cycle programs, which last five years.

Over three-quarters (77%) of graduates attended public institutions. A majority (53% of the total number of graduates) studied full time. Graduates of private institutions make up 23% of the total. More than 90% of them studied part time.

It is worth noting that not all graduates finished their studies at the same time. A substantial group of students graduated each month but the number of graduates peaks around the end of the spring semester, that is, in June and July (57% of all graduates). Another spike in the number of graduates is visible after the summer holidays, that is, in September and October (21% of all graduates).

### Employability

Polish legislation permits a variety of types of work contracts, but for the sake of clarity we have decided to distinguish just three categories of work arrangements.<sup>5</sup> One is the employment contract. It comes with benefits such as paid leave, regulated working time, a required notice period in case of dismissal, the requirement that the employer state reasons for a dismissal (which can be challenged in courts), and so forth. This is the most stable and sought-after form of employment. Another arrangement involves civil law contracts. This type of employment includes mostly, but not exclusively, work performed under contracts of mandate [umowa zlecenie]. This is a much more flexible form of work, without most of the benefits of standard employment. Civil law contracts are the main component of “junk contracts,” a key concept in the public debate regarding the condition of the Polish labor market. Third, there is self-employment, which does not entail any benefits from the employer as no formal employment relationship exists (Arak et al. 2014). However, in this study we have treated all three of the above-described labor market arrangements as work, in accord with the widespread understanding. We distinguish one more category in our study: namely, the unemployed, that is, graduates who were registered as unemployed, regardless of whether they intended to seek work or not. It is worth noting that a person’s status could change within a month and thus more than one type of contribution could be made during that period. Moreover, it is possible to be employed with more than one company or even have more than one type of contract with the same employer.

### Labor Market Participation

Not all graduates enter the labor market immediately after finishing their studies. Table 1 presents the share of graduates with various labor market statuses in the twelve consecutive months after their graduation. In the first month after graduation, less than 64% of graduates were recorded by ZUS as either working or unemployed. Another four months was required before the share of graduates registered at ZUS reached 80%. After that time, the pace of growth decreased significantly. It took another six months for the share of graduates recorded by ZUS to rise to the level of 85%.

Table 1

**The Share of Graduates of Various Labour Market Statuses Amongst All Graduates in Consecutive Months after Graduation (%)**

	Month after graduation											
	1	2	3	4	5	6	7	8	9	10	11	12
Working	53	58	63	68	70	72	73	75	76	77	78	78
Employment contract	43	47	51	54	56	58	59	60	62	62	63	63
Civil law contract	10	12	14	15	16	15	15	16	16	16	16	16
Self-employed	4	4	4	4	5	5	5	5	5	5	5	5
Unemployed	11	13	13	13	13	12	12	11	10	9	8	7

<sup>5</sup> The actual number of ZUS’s codes referring to types of contributions is near 150. Among other things, ZUS uses special codes to describe very narrow professional groups, for example, lawyers or members of the armed forces.

The share of working graduates (employed, hired under a civil law contract, or self-employed) among all graduates was 53% in the first month after graduation, but rose rapidly during the first four months. By the end of the observation period it had reached 78%. On average, working graduates had needed 1.93 months<sup>6</sup> to find their first job and those who worked spent an average of 9.6 months at their jobs out of the 12 months observed.

Unfortunately, we do not have access to ZUS data on the rest of the Polish population for comparison with recent graduates. However, the Labor Force Survey in Poland [Badanie aktywności ekonomicznej ludności Polski, BAEL] may provide some background. According to the latest study, the employment rate among people aged between 25 and 34 was 78.6% in 2015. This would mean that recent graduates seem to fare as well as their entire age group, most of whom have had enough time to establish themselves on the labor market. It is also worth noting that the definition of employment used by GUS is slightly broader than the one used in this paper (GUS 2016b).<sup>7</sup>

The data contradict the popular belief that graduates are doomed to “junk contracts,” that is, non-standard forms of employment. Over the whole period under our scrutiny, the employment contract was the most popular type of work arrangement. 70% of graduates were employed for at least one month. The share of persons with an employment contract among all working graduates was stable over time and oscillated around 80%. The average employee worked for 9.4 months out of 12, although not necessarily for a single employer. Unsurprisingly, obtaining an employment contract took graduates slightly more time than finding any job (getting employed, beginning work under a civil law contract, or starting a company), on average 2.15 months.

Self-employment, although far less common, is an equally long-lasting work arrangement. In any given month, the share of the self-employed among graduates did not exceed 5% and only 7% of graduates tried self-employment during the first year following graduation. On average, the self-employed retained that status for 8.5 months.

Civil law contracts are not as ubiquitous as the employment contract among graduates but are much more widespread than self-employment. Around a third of graduates (32%) were employed at least once under a civil law contract. The share of graduates working under this type of contract never exceeded 16%. It is unexceptional that graduates combine civil law contracts with other forms of employment. The percentage of those working under a civil contract only varies from 7% to 11% in consecutive months, which translates to 13%–16% of all working graduates. Work under a civil law contract is rather temporary than permanent. During the twelve months studied, the average combined duration of employment under a civil law contract was 5.5 months.

### Unemployment

The share of graduates who were registered as unemployed at least once is considerable. Over a quarter of the graduates experienced unemployment, although it was usually a tem-

<sup>6</sup> We assigned 0 as the number of months spent job hunting in the case of a student working in the month of graduation, unless the student lost the job in the next month. In the latter case, we counted the number of months needed to find the next job.

<sup>7</sup> According to the methodology used by GUS, the employed are defined as those who worked for at least one hour during the reference week, including those employed in farming.

porary situation. Cases of unemployment lasting throughout the entire year were rare. Less than a quarter of the unemployed retained the status for more than 6 months. Most often unemployment lasted from 2 to 4 months (43% of cases of unemployed graduates) and the average duration was 4.9 months. The share of unemployed graduates was highest between the second and sixth month after graduation. Over time it steadily decreased: from 13%, to 7% in the last month.

Again, a direct comparison of the results with official statistics is not possible. The official unemployment rate in Poland was 11.4% in December 2014 and 9.8% in December 2015 (GUS 2016c). Among other matters, the GUS statistics include data on employment in farming, which are unavailable to us. Thus we decided to approximate the unemployment rate by dividing the number of the unemployed by the number of persons who are either working or unemployed. The rate reached 19% in the second month of observation, but after that it steadily decreased over the rest of the analyzed period, to 8%.

### **Earnings**

Having discussed graduates' employability, we shall now turn to the earnings of graduates working under employment contracts—an equally important indicator of graduates' labor market performance. ZUS does not collect data on earnings per se; it records the so-called contributions calculation basis. The self-employed pay a flat contribution, which means that data on their earnings are not collected by ZUS. In the case of those working under both employment and civil law contracts, the basis equals their gross earnings. However, the short duration of many civil law contracts is problematic. It is technically possible to hire a worker for just one day under this type of contract. Unfortunately, data on the exact duration of contracts are not available. Hence, we are not able to estimate the monthly wage rates of these contracts.

The average earnings of employed graduates (calculated for months of employment only) was PLN 2,860. This means that graduates' salaries are, on the one hand, considerably smaller than average compensation in the country, which was PLN 3,777 in 2014 and PLN 3,899 in 2015 (GUS 2016e). On the other hand, such compensation is much higher than the minimum wage, which amounted to PLN 1,680 in 2014 and to PLN 1,750 in 2015. The smaller than average income should not be a surprise. After all, for a large number of graduates, the first year after leaving university constitutes the beginning of their professional careers. Under ordinary circumstances, new entrants to the labor market cannot command the salaries of their more experienced peers.

### **Job Experience Prior to Graduation**

While some graduates take time after graduation before they enter the labor market, others are already there when they finish their education. As available ZUS data go back to January 2014, it is possible to determine the labor market status of most of the graduates during the several months' period preceding their graduation. Depending on the month of graduation

the available data cover up to eleven months. In most cases, it is at least six months. The records show that for nearly half (47%) of graduates, graduation did not mark the beginning of the job hunt. This contradicts the assumption of signaling theory that employers lack knowledge of graduates' productivity.

Pre-graduation work experience profoundly affects after-graduation employability. Having worked for at least one month between January 2014 and graduation boosted all employability indicators. Among other things, pre-graduation work experience cuts both the average time spent job hunting and the average time spent getting an employment contract. Those who worked before graduation needed on average 0.34 of a month to get a job and 0.60 of a month to secure an employment contract, whereas graduates who did not have a job before finishing their studies spent an average of 3.84 months looking for a job and 4.52 months getting an employment contract.

Moreover, pre-graduation employment decreases the probability of experiencing unemployment. On the one hand, nearly two-fifths of graduates who had not worked before finishing their studies registered as unemployed at some point within the first year after leaving the university. On average, they were unemployed for 16% of the first year after graduation. On the other hand, only 12% of those persons who worked before graduation experienced unemployment during the first year after their studies. On average, members of this group were registered as unemployed for just 4% of the first year after graduation.

An entry into the labor market prior to graduation boosts earnings as well. Those who worked before graduation earn on average 3,219 PLN after finishing their education. The average salary of those who waited to enter the labor market until after graduation was nearly 30% smaller, that is, 2,312 PLN.

Previous research suggests that combining studies and work lets students gain knowledge of possible employment arrangements and makes them more confident about entering the job market (Oliver 2011). However, this seems not to be the underlying mechanism of the differences observed. The graduates with records of employment preceding graduation mostly continued working for the same employer after completing their education (nearly nine in ten of those having pre-graduation work experience did so). They did not have to look for a position, take part in recruitment processes, or prove their value to an employer. Moreover, an already employed worker might be rewarded by the employer for the newly acquired credentials.

The apparent advantage of graduates who worked before graduating should be taken with a grain of salt. It should not be treated as proof of the positive impact of work experience acquired during studies on professional careers. The available data cover only a relatively brief period before graduation. A proper investigation of the impact of work during studies would require a broader study that includes the entire work experience during studies and even the employment history prior to admission.

### **The Mode of Studies and Institutional Control**

As we noted in the theoretical section, both human capital and signaling theories assume a link between education and productivity, which in turn determines labor market outcomes.

Under each of these theories, differences in the labor market performance of various types of graduates reflect differences in productivity and the graduates' value to their employers. Given the perception of private institutions and part-time programs as less prestigious and offering lower quality education than public institutions and full-time programs respectively, it should be expected that those who graduate from full-time programs and from public institutions outperform others. However, the reality is different.

Contrary to expectations, graduates from private institutions fare better in the labor market. They tend to find jobs faster. The average periods needed to get a job and an employment contract are respectively 0.93 and 1.04 of a month in the case of graduates from private institutions. By contrast, graduates of public institutions spent on average 2.24 months looking for a job and 2.52 months before starting work under an employment contract. The graduates of private institutions are less likely to be unemployed. On average, they were unemployed for 1.07 months, whereas the graduates of public institutions stayed unemployed for about 1.34 months. Moreover, graduates of private institutions earn slightly more, namely, 2,982 PLN compared to 2,820 PLN earned by the average public institution graduate.

The effects of early entry into the labor market are crucial for understanding these seemingly counterintuitive results. Part-time study programs are designed mostly for people who work and cannot attend classes during standard working hours. Large-scale surveys among students show that part-time students are indeed more likely to work during their studies (Bożykowski, Dwórznik, et al. 2014; Hauschildt, Gwosć, Netz, & Mishra 2015). Our data are consistent with the results of previous research. Table 2 presents the share of graduates working before finishing their studies, broken down by the mode of studies and institutional control. More than three-quarters of graduates from part-time programs worked before finishing their studies, whereas among graduates from full-time programs the share of those working before graduation was three times smaller. As private institutions offer almost exclusively part-time programs, the share of graduates employed before finishing their studies is very high at those institutions—74% compared to 41% at public institutions.

Table 2

**The Percentage of Graduates Who Worked Before Finishing Studies**

Institutional control	Mode of studies	% of working before graduation
Public	Full-time	25
	Part-time	74
	Total	41
Private	Full-time	33
	Part-time	78
	Total	74
Total		47

Much of the advantage of private institutions disappears once pre-graduation work experience and mode of studying are taken into account. Table 3 presents the indicators of labor market performance broken down by institutional control and job status before finishing studies.

First, let us outline the situation of those who worked before the end of their studies. There is not much difference in terms of the employability of graduates between public and private institutions when the results are controlled for the mode of studying. In other words, graduates of full-time studies at private and public institutions are almost equally likely to be employed; they spend similar amounts of time looking for a job and have comparable chances of being unemployed. The same applies to former part-time students. In terms of earnings, public institutions' graduates have a slight advantage. Their salaries are a few percent higher on average than those of graduates of private institutions.

Table 3

**Indicators of Labour Market Performance**

Pre-graduation work experience	Institutional control	Mode of studies	Time to first job (months)	Time to first employment contract (months)	Share of grad. working at least 1 month (%)	Share of grad. employed at least 1 month (%)	Average salary	Share of grad. unemployed at least 1 month (%)	Average share of time on unemployment (%)
Yes	Public	Full-time	0.52	0.91	97	87	3254	13	4
		Part-time	0.28	0.51	98	90	3274	13	5
		Total	0.38	0.67	98	89	3266	13	4
	Private	Full-time	0.48	0.86	96	82	3081	13	4
		Part-time	0.26	0.46	98	91	3137	12	5
		Total	0.27	0.48	98	90	3135	12	5
No	Public	Full-time	3.89	4.58	76	56	2331	38	15
		Part-time	3.50	4.03	68	49	2398	39	19
		Total	3.84	4.51	75	55	2340	38	16
	Private	Full-time	4.31	5.35	62	37	2086	36	16
		Part-time	3.68	4.38	60	39	2000	43	22
		Total	3.84	4.61	60	39	2020	41	21

Second, let us now move on to those who waited until after graduation to enter the labor market. Graduates of both part-time and full-time programs at public institutions spent less time looking for a job than their peers from private institutions and are more likely to find employment. Moreover, public institutions' graduates earn more compared to those of private institutions.

The above results are confirmed by regressions analysis. We created six OLS regression models, one for each of the indicators of labor market performance: 1) the number of months needed to find the first job after graduation; 2) the number of months needed to start the first employment after graduation; 3) the share of time after graduation spent working; 4) the share of time after graduation spent in employment; 5) the average monthly earnings derived from work under a civil law or employment contract; and 6) the average monthly earnings derived from work under an employment contract. Aside from the type of higher education institution and the mode of studying, the models include other factors affecting the job market outcome, that is, gender, age in 2014, job experience before graduation, con-



Table 4

**Parameters of Regression Models**

Areas of academic study	Academic disciplines	Time needed to find a job	Time needed to find employment	Share of time spent working	Share of time spent in employment	Av. salary from work	Av. salary from employment
	Constant	5.56	9.75	63.31	57.33	-1002	-736
	Full-time studies	0.10	0.00	-0.16	0.32	183	206
	Private HEI	0.09	0.13	-1.17	-2.26	-222	-220
	Further studies	0.93	0.50	-5.51	-3.39	-14	-11
	Work before graduation	-3.83	-6.61	21.43	35.27	1107	825
	Female	-0.04	0.23	0.02	1.85	-619	-648
	Age	0.00	-0.02	0.14	0.13	77	75
	Average salary in the place of residency	-0.14	-0.25	0.57	-1.45	0	0
	Average unemployment rate in the place of residency	-0.01	0.02	-0.11	-0.20	-10	-8
Science	Mathematics	-0.49	-1.21	4.28	7.67	990	985
	Physical sciences	0.39	-1.01	-3.37	-3.40	351	445
	Chemical sciences	0.10	0.07	-1.71	0.61	61	44
Biological sciences	Biological sciences	0.48	0.57	-3.81	-4.39	-138	-137
	Earth sciences	0.14	0.43	-1.18	-2.16	-220	-199
Technological sciences	Technology	-0.51	-0.95	5.07	7.57	696	657
Agricultural, forestry and veterinary sciences	Agricultural sciences	0.16	0.21	-1.18	-0.93	-76	-56
	Forestry science	-0.50	-1.54	4.31	12.89	1515	1463
	Veterinary science	-1.00	0.52	6.47	-4.76	-285	-349
Medical, health and sport sciences	Medical science	-1.20	-3.04	8.64	16.89	187	-85
	Pharmaceutical science	-2.18	-3.89	14.95	24.19	1137	902
	Health science	-0.50	-0.23	4.49	-1.61	-80	-199
	Sport science	-0.38	0.22	0.74	-4.91	-346	-465
The arts	Film studies	1.31	0.60	-8.97	-26.09	-414	-398
	Music studies	0.10	-0.29	1.25	2.73	-63	-148
	Fine art	1.16	0.80	-7.63	-14.89	-446	-368
	Drama and theatre studies	1.63	1.11	-9.14	-12.91	-297	5
Humanities	Theology	-0.44	-1.29	2.97	10.50	-598	-656
Social studies	Social studies	-0.19	-0.20	1.38	2.15	-47	-81
	Economics	-0.46	-0.54	3.82	5.05	427	405
	Law	0.20	0.33	-0.18	-0.78	-51	-52
	R <sup>2</sup>	0.267	0.344	0.238	0.265	0.271	0.245

tinuation of education, average income in the place of residency, average unemployment rate in the place of residency, and academic field (coded as a series of dummy variables with humanities being the reference category). The last variable is important as there is plenty of evidence that labor market outcomes depend on the field of study. Researchers have analyzed the relationship in many countries, including the USA (Kim, Tamborini,

and Sakamoto 2015), Italy (Ballarino and Bratti 2009), the UK (Blackaby, Murphy, and O’Leary 1999), Germany (Görlitz and Grave 2012), the Netherlands, Norway, and Australia (van de Werfhorst 2004). In Poland, there is a relationship between the field of study and the type of academic institution because private institutions are far less likely to offer programs in science or technology (GUS 2016a).

Table 4 presents the estimated parameters of the models. Each of the models shows that the graduates of private institutions perform worse than their peers from public institutions. The effect of the type of institution on the time needed to find a job or the share of time spent working is not large. The effect is even more visible in the case of salaries. Graduating from a public institution results in 220 PLN higher earnings compared to those of graduates of private institution, after controlling for other variables in the model.

The mode of study has a rather negligible effect on both the share of time in employment and the share of time spent working but impacts earnings. Studying full time results in 206 PLN higher earnings, after controlling for other variables in the model.

## Conclusions

The aim of this paper has been to outline the labor market situation of higher education graduates in Poland and to fill an important gap in the research on higher education. Thanks to the creation of the Polish Graduate Tracking System, the labor market performance of the population of Polish graduates was assessed with individual-level administrative data of the Social Insurance Institution for the first time.

This paper focused on the graduates of either second-cycle or long-cycle studies, who are rather unlikely to pursue further education after getting their master’s degrees and are thus expected to enter the labor market. It appears that Polish graduates do not have any particular difficulties with entering the job market. By the end of the first year after graduation, the employment rate among recent graduates was comparable to that of Polish people aged from 24 to 35. Furthermore, the quality of employment was not a huge problem. “Junk contracts” exist but are far from ubiquitous, which is a finding contradicting the prevalent media discourse. The employment contract, with all its benefits and privileges, is still by far the most popular work arrangement.

However, the school-to-work transition was not frictionless. There are unemployed graduates. The risk of unemployment was highest just after graduation and decreased in the following months. It is worth noting that unemployment among graduates is rather temporary. Nevertheless, there is still room for improvement.

The design of the Polish Graduate Tracking System offers a glimpse of pre-graduation job histories. The study proves that in many cases graduation does not mark the beginning of the job hunt. Working before finishing studies greatly improved graduates’ labor market performance as those who worked tend to continue their relationship with the same employer after graduation. Thanks to early entry into the labor market, graduates do not have to spend time looking for a job, to take part in recruitment processes, and so forth. Moreover, as more experienced workers, they can expect higher earnings, which demonstrates the significance of on-the-job training.

On the whole, graduates of private institutions find jobs faster and earn more than their peers from public institutions. This can be attributed to their earlier entrance into the labor market. Part-time students, who dominate at private institutions, are far more likely to work during their studies than full-time students. When other factors are taken into consideration, it appears that studying at a private institution or in part-time studies has a negative effect on labor market outcomes, most visibly on earnings. From the perspective of both human capital and signaling theory, this would mean that employers perceive graduates of full-time programs at public institutions as more productive. At this point, it is impossible to determine whether this is because full-time programs and public institutions indeed offer better education, or if choosing part-time studies and a private institution signals lower productivity. It is also worth noting that this research is limited to early careers. A study of life-time incomes and earnings in multiple periods after graduation, like those of Dale and Krueger (2011) or Bhuller, Mogstad and Salvanes (2014), could lead to an utterly different conclusion.

The period covered in this study was largely determined by the design of the Polish Graduate Tracking System. In the near future, the system will extend and cover the next cohorts of graduates; the observation period for each cohort will expand to up to five years after graduation. This will allow the dynamics of the labor market performance of graduates to be investigated. Having the data on a longer period will not only allow us to monitor the employability of graduates (defined as the share of those who found a job, or their salaries in the first months of employment) but also to analyze employment stability or the pace of income growth.

We hope that this analysis demonstrates some of the potential of social research based on administrative data in Poland and that the success of the Polish Graduate Tracking System will inspire the development of a more advanced and larger system comprising data from more administrative resources. The first step in achieving this goal might be to extend the period of observation in the study to include full employment histories, that is, data for the period before graduation and even prior to admission. The next steps might involve adding the data on study success collected by higher education institutions, as was intended in the initial design of the tracking system (Jasiński, Zajęc, Styczeń, and Izdebski 2012). The creation of an entire system of routinely gathered and linked data would constitute a real breakthrough. Poland already has a large collection of administrative registers and all those registers use PESEL numbers as identifiers, which makes linking data a relatively easy task. Combining these recourses could lead to the creation of a Polish equivalent of databases such as the Danish Integrated Database for Labor Market Research (Timmermans 2010) or Swedish LISA (Statistics Sweden 2017). Such a system of register-based data would lead to much more in-depth studies than the one presented in this paper.

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*Biographical Notes:*

Tomasz Zajac (Ph.D.) is an assistant professor at the Institute of Sociology (Chair of Sociology of Education and Development) and a researcher at the Education Quality Evaluation Unit at the University of Warsaw. He is also one of the creators of the Polish Graduate Tracking System. He specializes in educational research and in the use of administrative data for social sciences. His research revolves around students' educational and professional paths.

E-mail: [t.zajac@uw.edu.pl](mailto:t.zajac@uw.edu.pl)

Mikołaj Jasiński (Ph.D.) is an associate professor at the Institute of Sociology at the University of Warsaw (Chair of Statistics, Demography and Mathematical Sociology). He is the founder and the head of the Education Quality Evaluation Unit at the University of Warsaw. He is also the head of the expert team that created the Polish Graduate Tracking System. His research interests include social choice theory, statistics, social research methodology, register-based analysis, evaluation, educational research, and graduates' labor market performance.

E-mail: [mikolaj.jasinski@uw.edu.pl](mailto:mikolaj.jasinski@uw.edu.pl)

Marek Bożykowski is a Ph.D. candidate at the Institute of Sociology (Chair of Statistics, Demography and Mathematical Sociology) and a researcher at the Education Quality Evaluation Unit at the University of Warsaw. He is also one of the creators of the Polish Graduate Tracking System. His academic interests include statistics, social choice theory, fair distribution, register-based analysis, educational research, and graduates' labor market performance.

E-mail: [mbozykowski@uw.edu.pl](mailto:mbozykowski@uw.edu.pl)