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DOES IT PAY TO BE A STEM GRADUATE?
Evidence from the Polish Graduate Tracking System

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ABSTRACT

Returns to education have received much attention from scholars as well as policy makers and the media. It is a well-established fact that educational attainment improves employability and wages and that university graduates better than their less educated counterparts. However, the educational expansion rises the importance of the horizontal dimension in explaining social stratification. The field of study has proved to be an important factor for graduates' labor market performance in many countries. This paper discusses the differences in the labor market outcomes in early careers of graduates of various disciplines in Poland where the topic has been hotly debated for many years but remained under researched. We use data from the second measurement of the recently established Polish National Graduate Tracking System (ELA). The system uses administrative data exported from the national register of students and graduates as well as monthly records on employment status and earnings fetched from the Social Insurance Institution registers. The data cover entire population of recent higher education graduates in Poland and enables tracking for twenty-one months after graduation. We focus particularly on the fields of Science, Technology, Engineering, and Mathematics which are presumed to lead to the best labor market positions. We demonstrate that, contrary to popular opinion, only some of the STEM disciplines give their graduates an edge on the labor market while the rest struggle to achieve results comparable with those of graduates of Humanities and Social Sciences.

Keywords: STEM Education, Graduate Tracking, Labor Market, Poland Higher Education

The labor market outcomes of education have received much attention from scholars as well as policy makers and media. It is a well-established fact that education is strongly related to earnings and that university graduates fare better than their less educated counterparts (Card, 1999; Hout, 2012; Pascarella & Terenzini, 2005). However, educational expansion observed in developed countries makes the horizontal dimension – that is, the field of studies – more important in explaining social stratification (Ballarino & Bratti, 2009).

The field of study is a one of the key characteristic differentiating higher education graduates. There is ample evidence demonstrating the variation of employment returns to fields of study in many countries, including: USA (Kim, Tamborini, & Sakamoto, 2015), Italy (Ballarino & Bratti, 2009), UK (Blackaby, Murphy, & O'Leary, 1999), Germany (Görlitz & Grave, 2012), as well as Netherlands, Norway, and Australia (van de Werfhorst, 2004).

Poland is one of the countries which experienced rapid educational expansion in the last quarter of a century (Marciniak, Chmielecka, Kraśniewski, & Saryusz-Wolski, 2014). The rise in the unemployment rate among graduates (Rokicka, Kłobuszewska, Palczyńska, Shapoval, & Stasiowski, 2015) has sparked the debate on graduates' employability and the quality of higher education in Poland. Part of the discussion was the difference in labor market outcomes of graduates of various programs. Humanities and social sciences programs were often blamed for not preparing students for the job market and were perceived as responsible for the rise in graduate unemployment.

Studies on the role of the field of study in graduates' careers conducted so far in Poland (Baranowska-Rataj & Unt, 2012; Szreder, Kalisiak, Białowąs, & Szapiro, 2012) were based on survey data. The recent establishment of the Polish Graduate Tracking System (Polish acronym ELA) creates an opportunity to further advance research. The ELA system was established by the Ministry of Science and Higher Education (MNiSW) in 2015. It utilizes data on the entire population of Polish graduates extracted from two national administrative registers: 1) the national register of students and graduates which is a part of the POL-on system operated by the National Information Processing Institute (OPI), 2) the registers of the Social Insurance Institution (ZUS).

In this study, we use the ELA data to investigate the differences in the early careers of graduates of different fields of study in Poland. We demonstrate that contrary to the popular belief neither social sciences nor humanities graduates have any particular difficulties with entering the labor market and that they outperform graduates of some STEM disciplines.

The paper is structured as follows. First, we present background information on the development of the Polish higher education system in last decades. The third section describes the data used in the study. The fourth section lists the measurements of labor market outcomes. In the final section, we analyze the role of academic discipline in the graduates' labor market performance, first using simple indicators and then with a regression model.

A. Background

The transformation of the Polish higher education system begun in the early 1990, after the end of communist rule. Since then the number of students has grown fourfold (MNiSW, 2013). The elitist system serving ca. 10% of upper secondary leavers has become massified and now over half of each year's upper secondary school graduating class pursues higher education (Marciniak, 2014).

The expansion of the system was possible thanks to the reorganization of higher education sector in Poland in the beginning of 1990's. Two changes are particularly significant: the introduction of private higher education institutions and the rise of part-time programs at public institutions (Kwiek, 2009). New private higher education institutions mushroomed all over the country: they exceeded in number the public ones in the second half of 1990's and now account for over two thirds of higher education institutions in the country, albeit they are usually small in terms of the numbers of students they admit and together they educate less than 25% of all students (GUS, 2016).

These changes affected the composition of the student body as well. The proportion of part-time students increased from 23% in academic year 1990/91 to 55% in early 2000's (MNiSW, 2013). Since then it has been steadily declining. In academic year 2015/16 it was slightly more than one third (GUS, 2016). The proportion of part-time students is high compared to other developed countries (OECD, 2013).

Another change concerned fields of studies. New institutions rarely offered programs in science, technology, engineering, and mathematics (STEM). Their rise reshaped the distribution of students by the field of study. In early 1990's, engineering and technical studies were the most popular. Their popularity measured by the share of students diminished over 1990's and early 2000's. A similar decline was apparent in the case of life sciences. At the same time, economics, business, and social sciences were gaining popularity among students (GUS, 2005). Nowadays the distribution of the new entrants into tertiary education by the field of study in Poland is not significantly different from the average for OECD countries (OECD, 2014).

The rapid expansion of the higher education system and rising unemployment among graduates lead to questioning the quality of education (Piróg, 2013), which was one of the reasons for the creation of ELA. Polish policy makers appreciated the rise of the number of students but were not satisfied with the dynamics of the composition of student population in terms of academic discipline. They emphasized the need to increase enrolment in STEM fields in order to better align higher education to the needs of the labor market, increase the returns to tertiary education, and boost the economy (MNiSW, 2009). The government decided to intervene and created a program of financial incentives for students and higher education institutions to increase enrolment in STEM study programs. The program was not effective and has been discontinued but the topic of not sufficient proportion of STEM students is still present in public debate.

This clearly demonstrates that the question of the different labor market outcomes of academic fields is not only a theory-related one. This is an important issue both for policy makers as well as the general public.

B. Data

The system adapts the methodology of using ZUS's records for graduate tracking at institutional level which was first developed by researchers from the University of Warsaw (Bożykowski et al., 2014), including the authors of this paper. The system uses individual data extracted from two administrative registers: the POL-on system and the register of ZUS. Relying on administrative data allows the system to cover the entire population and greatly reduces the cost of such an endeavor, but it also limits the analysis to the kinds of information collected by the administration (Jasiński, Bożykowski, Zając, Styczeń, & Izdebski, 2015; United Nations Economic Commission for Europe, 2007; Wallgren & Wallgren, 2007).

The POL-on system gathers data on all students and graduates of Polish higher education institutions. The ELA system uses data on graduates: study program, level of studies (Bachelor vs. Master), the mode of studies (full-time vs. part-time), the date of graduation, higher education institution, department or faculty, information on subsequent enrolment in a different study program along with its characteristics. In Poland, academic programs are classified on three levels: broad areas of academic study (e.g. Science, Social Studies), academic disciplines (e.g. Economics, Chemical Sciences), and specific fields of study

(e.g. Management, Astronomy)[1]. In this paper, we focus on academic disciplines as the areas are very broad and the fields of study too narrowly defined, which leads to small groups sizes.

ZUS provides data on graduates' monthly contributions to the national social security system. The contributions are mandatory for most of economically active. Records of contributions include two important types of information. First, one's status in the labor market, including the type of work arrangement (i.e. salaried worker, self-employed, unemployed, on maternity or parental leave). Second, the contribution calculations basis (Pol. *podstawa wymiaru składki*), i.e., the amount used to calculate the due contributions. For the employed, this figure equals the remuneration in PLN in each month. For the self-employed, the amount is in most cases fixed and thus not indicative of their incomes.

Poland has followed the Nordic countries and uses a common ID in its national registers (Poulain & Herm, 2013). In both POL-on and ZUS, the PESEL number serves as ID. PESEL was primarily used in The Common Electronic System of Population Register. The shared ID greatly simplifies the process of merging data and helps avoiding issues with missed links and mis-links common in studies using a combination of variables such as gender, address, and date of birth for matching (Chowdry, Crawford, Dearden, Goodman, & Vignoles, 2013; Kim et al., 2015; Oreopoulos, von Wachter, & Heisz, 2006).

In this paper, we use data from the second measurement of the ELA. We concentrate on the graduates of master's programs (second-cycle or long-cycle studies). The reason for our choice is informed by some country-specific characteristics of the higher education institutions. Bachelor's degree is still perceived as incomplete higher education in Poland (Grotkowska, 2011; Piróg, 2013). It is rather a transitional degree (Teichler, 2011) and a large share of graduates of first-cycle programs pursue further education instead of entering the labor market (Zając, Jasiński, & Bożykowski, 2017).

The final database comprises records of 171 751 master's degree holders who graduated in 2014, for whom the dataset covers records on labor market situation between January 2014 and September 2016. However, not all data in ELA were used in this study. Some study programs have not been assigned to an academic discipline in POL-on, which resulted in the exclusion of over 13 600 observations from the study. Further 8 649 were excluded due to missing ZUS records[2].

C. Measurements of Labor Market Outcomes

In this study, we focus on three questions representing different aspects of graduate's labor market performance: how quickly does the graduate find a job, for how long does the graduate work, and how much does the graduate earn. Due to the complexity of Polish labor market regulations (Boulhol, 2014), the answer to the above questions depends largely on the definition of a job. In this study, we take the same approach as in the ELA system. We coin a broad and a narrow definition of work. The first one includes all possible arrangements i.e. all forms of employment contracts governed by the Labor Code, work under civil law contracts (which technically is not employment) as well as self-employment. The second definition confines to employment contracts only. The reason for the distinction is the ongoing discussion on the quality of employment of young people in Poland, especially in the context of the long-term consequences of the 2008 financial crisis, and the abuse of more flexible work arrangements. This distinction leads to the creation of six measures of graduate's labor market performance:

- The number of months needed to find the first job after graduation. This includes all types of jobs, i.e. those under a civil law contract, under an employment contract, or self-employment. Graduates who entered the labor market before the end of the studies and retained their positions after that were assigned zeros.
- The number of months needed to start the first employment after graduation which is computed analogically to the previous measure except that only employment contracts are taken into account.
- The share of time after graduation spent working which is the number of months in which the graduate was working divided by the length of the total period of observation.
- The share of time after graduation spent in employment which is the number of months in which the graduate was employed (that is, worked under the employment contract) divided by the length of the period of observation.
- The average monthly remuneration derived from work under a civil law or employment contract. The calculation excludes incomes of self-employed, because it is not recorded by ZUS.
- The average monthly remuneration derived from work under an employment contract.[3]

In order to retain comparability between students graduating in different months, we limited the period of observation to twenty-one months, which is the maximal possible duration in case of the graduates from December 2014.

[1] The List of Areas of Academic Study, Academic Disciplines and Fields of Study in The Arts and Sciences in Poland http://www.nauka.gov.pl/g2/oryginal/2013_05/9e30526898a1faea585252c8104727c8.pdf

[2] There are many potential reasons for missing records. The graduate could have emigrated, continued education e.g. enrolled in a doctoral program, or been a stay-at-home spouse. Nevertheless, the lack of record carries important information. It clearly indicates that the graduate was not economically active i.e. neither worked nor was unemployed.

[3] Income is measured in Polish Zloty. On Aug 31 2017 1 USD=3.57 PLN

D. The Role of Academic Disciplines

Table 1 presents the means of the six indicators along with the information on the share and number of observations with records in ZUS as well as the share of those who have any working experience during the twenty-one month period of observation. The disciplines differ vastly in the number of graduates. In 2014, close to 35 600 students earned a degree in the most popular discipline, namely Economics. Next were Social Studies[4] with over 28,1000 graduates and Technology Studies with about 300 fewer graduates. At the same time the numbers of graduates in the least popular disciplines of Drama and Theatre and film studies were respectively 127 and 152.

The disciplines vary in the share of graduates with any records in ZUS but the differences are not as stark as in the case of student numbers. The share of graduates recorded by ZUS is lowest amongst those who finished Music Studies – 87%. In most cases, it exceeds 90% and reaches 98% among Forestry Science and Health Science graduates. The share of those registered by ZUS who had any experience of work after graduation is high as well. It is lowest among Fine Art and Physical Sciences graduates – 86% and highest among graduates of Forestry Science of whom 99% worked after graduation.

See Table 1 in Appendices.

The analysis of the six labor market performance indicators leads to some surprising conclusions. It is immediately apparent that graduates of Forestry Science are a distinct group. They are small in number and fare exceptionally well on the labor market. The disparity between Forestry Science graduates and the other groups is most apparent in income. With average income from all sources at 4544 PLN, Forestry Science graduates earn 60% more than the average graduate. In case of income from employment the advantage is only slightly smaller – 55%. The exceptional performance of this group can be explained by their peculiar career path. Many of the former Forestry students find themselves working for the Polish State Forests (Pol. *Lasy Państwowe*), a resourceful state-owned company known for generous pay packages.

The good performance in terms of the speed of acquiring a job, staying in employment, and remuneration of Mathematics (including Informatics), Technology, and Pharmaceutical Science graduates should not come as a surprise. But the disappointing labor market position of the graduates from other disciplines that usually are considered as belonging to the STEM group, namely Chemical Sciences, Biological Sciences, Veterinary Science and Earth Sciences is rather counterintuitive. Graduates of these disciplines, together with graduates of the Arts, are the worst labor market performers.

The results of Social Studies and Economics graduates are yet another surprise. Both disciplines have been long blamed for creating an oversupply of social scientists, marketing specialists etc. by educating too many people as well as for failing to provide students with skills suitable for the labor market. Yet the graduates of these disciplines fare rather well, and Economics graduates are even among highest earning groups. That is a particularly important result, given the fact that these groups, taken together, constitute more than 40% of the entire graduate population.

E. The Model

The above results summarize the labor market outcomes of Polish graduates. However, for a better insight into the academic discipline's role in the entry into the labor market, a more sophisticated approach is necessary. In order to evaluate the effect of academic discipline on labor market performance we created six OLS regression models, one for each of the indicators of labor market performance. In the models, twenty-one dummy variables denote academic disciplines. Humanities are the reference category and the corresponding variable was excluded.

The models include other factors possibly affecting the job market outcome as well. The available data allow us to evaluate the relationship between the labor market performance of graduates and the discipline of their studies while controlling for a wide range of factors. These include: 1) attributes of the higher education institution and study program, 2) demographic characteristics of the graduate, 3) elements of graduates' educational and professional trajectories 4) the quality of the local labor markets. All have proved to be related to the graduates' employability and earnings.

The first group consists of two variables characterizing the study program:

- Type of higher education institution – whether the institution is public or private. Private institutions were introduced in Poland during the liberalization of higher education at the beginning of 1990's (Kwiek, 2009). They are often smaller, more likely to offer part-time programs, and far less likely to open programs in science or technology (GUS, 2016). Furthermore, private institutions are broadly perceived as less prestigious and as offering lower quality education than the public ones (Herbst & Rok, 2014).
- Mode of study – whether the student studied full-time or part-time. The creation of many part-time programs was part of change is the Polish higher education and the rapid increase in the number of students. Poland has one of the highest shares of part-time students compared to other OECD countries (OECD, 2013). The mode of study is important for

[4] The area of Social Studies comprises the discipline called Social Studies as well as the disciplines of Law and Economics.

various reasons. First, part-time studies are often seen a way to work while pursuing studies. Part-time students are more likely to work before graduation, meaning that the graduation does not mark the beginning of their job hunt. Furthermore, work experience gained during studies improves the labor market performance after graduation (Zając et al., 2017). Second, full-time studies are almost exclusively offered by public institutions. Third, part-time programs in science and technology are virtually non-existent. Fourth, previous research demonstrates that due to both self-selection and selection in the admission process students enrolling in part-time programs tend to perform worse on average on standardized tests (Zając, 2014).

The second group comprises two basic demographic characteristics:

- Gender. Although gender pay gap in Poland is smaller than in most EU countries, it still has not been completely eradicated (Cukrowska-Torzewska, 2014). In addition, educational decisions vary between genders. Many programs fail to recruit an equal number of men and women.
- Age in 2014. The likelihood of having job experience is higher among older graduates.

The third group comprehends two variables concerning educational and professional situation of the graduate:

- Job experience before graduation. The ZUS records allow to reliably identify which graduates were employed or self-employed during up to eleven months before finishing studies (the length of the observation period depends upon the month of graduation). Most working students continue to work for the same employer as graduates which greatly improves the labor market performance indicators (Zając et al., 2017).
- Further education. The POL-on database lets us identify cases of continued education. Enrolling in another program (or even consideration of it) limits job opportunities as students may not be able to devote enough time and energy to pursue their professional careers.

The fourth group is made up of variables depicting the local labor market of each graduate:

- The average income in the place of residency
- The average unemployment rate in the place of residency

Polish labor market is geographically differentiated (Boulhol, 2014). Graduates may live in a region struck with sky-high unemployment rates as well as in a prosperous region offering bright career prospects. The condition of the local labor market may affect their college-to-work transition. To account for that, the ELA system uses zip codes to identify the *powiat* (an administrative region roughly equivalent to a US county) of each graduate in any month. Then the data published by Central Statistical Office of Poland on economic situation in each *powiat* are used to create two variables: 1) the salary of an average "working neighbor" of a graduate 2) the unemployment rate in graduate's place of residency. This study uses the means of these variables in the twenty-one months after graduation. In models concerning time between graduation and the beginning of work, we use the logarithm of the average salary.

F. The Results

Before we proceed with discussion of the results for academic discipline, let us first comment on the additional variables and on the pre-graduation work experience in particular. All of the variables contribute to the models and help in identifying the effect of academic discipline, however the pre-graduation work experience seems the most important. All six models (presented in Table 2) make clear the tremendous importance of the experience for the graduate labor market outcomes. This requires some clarification: previous research suggests that combining studies and work lets students gain knowledge of possible employment arrangements and make them more confident about entering the job market (Oliver, 2011). However, this seems not to be the underlying mechanism of the observed differences.

The graduates with records of employment preceding graduation mostly continue working for the same employer after completing their education. Nearly nine in ten of those having pre-graduation work experience did so (Zając et al., 2017). They do not have to look for a position, take part in recruitment process, or prove their value to the employer. Moreover, an already employed worker may be rewarded by the employer for the newly acquired credentials. It is also worth noting that the available data cover only a relatively brief period before graduation. Therefore, the result is not a sufficient proof that work during studies is always beneficial for a professional career.

See Table 2 in Appendices.

As for the role of academic discipline, the models confirm most of the conclusions from the previous section, although with some amendments. In terms of employability, i.e. the length of the job search and the share of months in employment, Arts graduates (except for Music Studies graduates) fare worst. Moreover, Art graduates commend compensations smaller than most other groups (again, with the exception of Music Studies graduates), although Theology graduates perform even worse in this aspect.

On the other end of the spectrum, Pharmaceutical and Medical Sciences graduates are the fastest to get employed. Their advantage is even more apparent than in the previous section, especially when it comes to work under the employment contract. Both groups compare well to others in terms of the share of months spent in employment, however Pharmaceutical Science graduates fare considerably better then Music Studies graduates in that matter. The models for income show that Pharmaceutical Science graduates earn significantly more than most other groups, however there are not the top performers. First, the predictions for Mathematics graduates are not very different. Second, the earnings of Forestry Science graduates easily surpass those of Pharmaceutical Science graduates or any other group.

The analysis of regression parameters confirms that there is a significant division among STEM disciplines. Graduates of Mathematics, Technology as well as Medical and Pharmaceutical Sciences clearly outperform other groups, whereas graduates of the remaining STEM disciplines fare similarly or even worse than graduates of Humanities or Social Sciences. Furthermore, graduates of the latter subgroup of STEM disciplines far less successful than Economics graduates.

G. Concluding Remarks

This paper focuses on an important issue in the Polish debate on higher education, namely on the differences in labor market performance of graduates of various disciplines. We used administrative records gathered in the Polish Graduate Tracking System to scrutinize second cycle graduates' entry into the labor market and the first twenty-one months of their careers. Our analysis focuses on three aspects of labor market success: the time needed to get a job, the time spent working, and the remuneration. Moreover, we distinguish the employment contract from other types of work arrangements. Therefore, each of the indicators has two versions: for all types of work arrangements as well as for work under employment contract only.

We have found large differences in the performance of graduates between academic disciplines and some of our results may come as a surprise to readers familiar with the media discourse on the subject matter. For example, the outstanding performance of the Forestry science graduates may seem counterintuitive. More importantly, the analysis contradicts the common belief that the graduates of STEM fields fare much better in the labor market than their peers with degrees in Social sciences or Humanities.

While graduates of disciplines such as Mathematics, Technology, and Pharmaceutical science indeed outshine others in the labor market, the graduates of Biological, Chemical, and Earth sciences, also belonging to the STEM category, do not perform significantly better than those who studied disciplines such as Humanities or Social Studies. In fact, by many measures holders of a degree in Humanities or Social Studies fare slightly better than graduates of Biological, Chemical, and Earth sciences. Moreover, the graduates of Economics, which is part of the broader area of Social Studies, are almost as successful as graduates of Technology.

Due to the recent introduction of the ELA system, this study is limited to just one cohort of students and a relatively short period after graduation. Further studies are necessary to see if the differences in labor market performance persist in a longer term and if they are observable in the case of future cohorts of graduates. Ideally, the study should include also the yet unavailable data on the socio-economical background and previous education of graduates to better grasp the "added value" of education in certain fields.

Despite these relative shortcomings, this study should contribute to the public debate on higher education as well as policy-making in Poland. Some of the STEM disciplines are not different from Social Sciences and Humanities in terms of graduates' labor market performance. The unimpressive performance of the graduates of Biological, Chemical, and Earth sciences demonstrates that the demand for specialists in those field may be smaller than previously thought. The policy makers should note that before introducing any further policies aiming at increasing the enrolment in these disciplines.

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Table 1.

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	Number of cases	% in ZUS	% of those in ZUS with the experience of work
Science	Mathematics	2.5	3.7	82	69	3520	3736	1751	94	95
	Physical sciences	3.5	3.8	74	57	3012	3336	483	89	86
	Chemical sciences	3.9	6.5	71	55	2144	2390	1435	92	89
Biological sciences	Biological sciences	4.0	6.5	70	52	2058	2332	3604	92	89
	Earth sciences	3.5	5.9	74	56	2138	2404	2311	93	94
Technological sciences	Technology	2.1	3.3	85	72	3507	3669	27799	96	96
Agricultural, forestry and veterinary sciences	Agricultural sciences	3.4	5.8	75	58	2223	2487	4161	91	93
	Forestry science	1.5	2.0	87	81	4544	4639	554	98	99
	Veterinary science	3.1	7.8	78	45	1864	2094	469	94	93
Medical, health and sport sciences	Medical science	2.2	2.8	84	75	2632	2598	6692	89	98
	Pharmaceutical science	1.0	1.7	91	83	3419	3399	1298	97	98
	Health science	1.4	3.0	88	69	2659	2694	4833	98	97
	Sport science	2.5	4.8	79	57	2186	2296	4434	94	95
The arts	Film studies	4.2	5.0	70	36	2532	2789	152	90	88
	Music studies	2.9	4.1	80	66	2630	2752	948	87	90
	Fine art	4.6	6.4	68	42	1966	2316	1720	91	86
	Drama and theatre studies	4.6	5.3	69	48	2510	3164	127	90	92
Humanities	Humanities	2.8	4.6	79	63	2446	2644	17124	94	93
	Theology	1.7	2.3	85	78	2520	2615	874	88	95
Social studies	Social studies	2.2	3.7	82	69	2519	2656	28104	95	95
	Economics	1.5	2.8	87	75	3168	3284	35625	95	97
	Law	3.0	5.0	78	61	2472	2688	13616	96	95

Table 2.

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
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
	Part-time studies	0.10	0.00	-0.16	0.32	183	206
	Public 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
	R^2	0.267	0.344	0.238	0.265	0.271	0.245

Academic discipline of humanities is the reference category.