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Paper

Title: Valuation of graduates by the labour market as a measure of quality

Abstract

The measure of quality related not to the teaching processes themselves, but to their effects is the employability of graduates. Data on the job search time and salaries of all university graduates have been made available in Poland since 2017 by the system for monitoring the economic fate of graduates, run on behalf of the Minister of Higher Education. The data comes from the state social security system. The time spent looking for a job and the salary obtained after graduation can be a synthetic measure of the quality of education. This makes it possible to compare the quality of the same field of study at different universities, look for reasons for differences in quality. The paper uses data on the situation for second-cycle graduates of the **2014 and 2018 cohorts five years after graduation**. The results of analyses for selected fields of study are presented.

Introduction

Assessment of the quality of education in higher education institutions is most often associated with two elements. First of them the analysis of the internal system for ensuring and improving the quality of education. Second the examination of the effects of the external system for ensuring the quality of education.

The assessment criteria defined in ESG (The Standards and guidelines for quality assurance in the European Higher Education Area) indicate in this context external stakeholders, including employers. For example, standards 1 and 2 indicate stakeholders in connection with the creation and improvement of programs and quality assurance. In particular, standard 2.2 states that for external quality assurance it is extremely important to have clear goals agreed to by stakeholders, including

employers¹. However, one may ask how real (actual) cooperation between employers and universities is. Potentially, this is possible in the case of a small university operating for the needs of the local labour market. In practice in the case of large universities, such a cooperation is only symbolic. This is due to the fact that students come from different regions and even Countries and a significant proportion of graduates is taking up employment with different employers and also outside the city of study. For instance in Poland this is over 20%². In ESG we can read that "quality, although not easy to define, is mainly the result of interactions between teachers, students and the institutional learning environment". For graduates, it seems however, that the result of this quality understood as their situation on the labour market is important.

This text indicates the possibility of assessing quality using data from the graduate tracking system.

Graduate tracking system

The system was created at the request of the Polish Ministry of Science and Higher Education. Graduate data is administrative. It comes from the State Social Insurance System (Zakład Ubezpieczeń Społecznych - ZUS) and the POL-on system. POL-on system is an IT system of the Ministry that collects data on science and higher education in Poland) and is of an administrative nature. The authors call the system Economic Fate of Graduates (Ekonomiczne Losy Absolwentów – ELA).

In ELA data is collected for five years from graduation. Currently (October 2024), ELA includes data on 3,006,853 graduates from 2014 – 2022. For the period of 2014-2017 there is data on 1,415,930 graduates which covers information from five consecutive years on the labour market.. Data is available on graduates registered with ZUS, and they constitute 94.32% of the total³. The system automatically generates a number of standard reports for Poland for each operating university and for each field of study. ELA also provides this data in the form of a spreadsheet. This form provides data on approximately 700 indicators characterizing, among others, unemployment, job search time, and wages.

The information is made available per group of people who received the same diploma in a given year from a given university and its organizational unit in a given field, a specific level and specific mode of study⁴. This means that for a given field of study (for example economics) at a given university and year, data on several groups of graduates may be available (for economics: four groups). It should be emphasized that although data is collected on all graduates registered with ZUS from all universities, information on groups of fewer than 10 people is not made available for anonymity reasons. Currently data is available on nearly 93 thousand groups.

Data sharing begins two years after obtaining diplomas. For example for the 2022 graduates information on the situation one year after graduation was made available in 2024. Schematically the structure of the data is illustrated in Table 1.

¹ For this reason, but also in connection with standard 3.3., representatives of employers – PKA experts – participate in visits carried out by the Polish Accreditation Committee (PKA).

² More precisely for the 2014-2022 groups: 23.81% of graduates took up employment in the district where they studied, 39.75% in another district of the province where they studied, and 20.87% in another province. There is no information in this regard for 15.58% of graduates. Among the latter are people not registered with ZUS.

³ In particular, there is no data on foreigners who left Poland after completing their studies or on people who obtained diplomas from Polish universities operating outside Poland (for example graduates of the faculty of the University of Białystok operating in Vilnius, Lithuania).

⁴ This is in first-cycle studies, second-cycle studies or uniform master's studies.

⁵ This is for full-time or part-time studies.

Table 1. Data structure in the system for monitoring the graduate tracking system.

Class	year for which data is available								
	2015	2016	2017	2018	2019	2020	2021	2022	2023
2014									
2015									
2016									
2017									
2018									
2019									
2020									
2021									
2022									

Providing data on groups of graduates allows for their aggregation and obtaining information on graduates of the university, its faculties, groups of universities, groups of fields of study (for example technical or natural sciences).

For the analysis of data from ELA system, it is important that the data from ZUS do not contain information on the profession performed. Therefore, it is impossible to determine whether there is a connection between the field of the study and the work.

The analyses omits groups in which the share of graduates registered with ZUS was less than 60%. Due to the small number of graduates in such groups this does not affect the conclusions. In the analyses presented below only graduates of full-time second-cycle studies were taken into account. That is for two reasons. First of all most cases, graduates of first-cycle studies undertake further studies. Second in most cases students of part-time studies worked during their studies, which burdens the inferences. In particular their salaries immediately after graduation are on average higher than the salaries of graduates of full-time studies.

The total data on the situation on the labour market in the five years after obtaining diplomas by graduates of the 2014 and 2018 were taken into account.

Assessment of graduates by the labour market

The quality of education results from the composition, commitment and competence of academic staff, the quality and scope of research conducted, the comprehensiveness, structure, style of implementation and quality of teaching programs, university infrastructure, the functioning of study support systems, as well as the effectiveness of the internal quality assurance system. All of them together constitute a set of variables that in econometrics, in soft modelling are known as creating indicators for example. On the other hand, there are also reflecting indicators that indicate the effects of the quality of education. These can be information collected in ELA system, such as: the average time spent on looking for the first job, the average number of months in which graduates were registered as unemployed, the share of unemployed graduates, the average monthly salary, etc.

Two synthetic indicators characterizing the situation of graduates on the labour market in ELA system were selected for the analyses:

WWB - relative unemployment rate, calculated in such way that for individual graduates in the period covered by the study: an individual proportion of the risk of unemployment⁶ to the average registered

⁶ The risk of unemployment in the ELA system is the average percentage of months after the month of obtaining the diploma in which graduates were registered as unemployed. For each graduate, the percentage of months after the month of obtaining the diploma in which they were registered as unemployed is determined. In order to determine the risk of unemployment for a group of graduates, e.g. graduates of a specific field of study, the average value of the individual percentages of months of unemployment is determined.

unemployment in the county of residence or counties, if the place of residence has been changed) is determined. The value of the indicator is the average of these proportions. Values less than 1 mean that on average the risk of unemployment among graduates is lower than the unemployment rate in their counties of residence. Values above 1 mean that on average the risk of unemployment among graduates is higher than the unemployment rate in their counties of residence.

WWZ - relative wage rate indicator calculated by determining for each graduate the proportion of their average wage to the average wage in the county (counties) of residence in the period under study. The value of the indicator is equal to the average of these proportions.

It should be emphasised that the definition and method of calculating relative unemployment and wage rates allow the analyses to ignore the differences in economic development between the country's regions. This affects absolute wages.

These two indicators analysed together characterize the employability of graduates: the probability of finding a job and a satisfactory salary. The main analyses concern the values of WWB and WWZ over five years after obtaining diplomas.

The analyses concern several fields of study which are selected among the most popular and they are cross-sectional in nature (comparing the situation of graduates of a given year of the same fields of study from different universities). So the results are not influenced by data from the period of the economy's recovery from the pandemic.

Since the values of selected indicators will be confronted with the assessments of the quality of education made by the Polish Accreditation Committee (Polska Komisja Akredytacyjna - PKA), it is worth mentioning that until 2018, PKA issued the following assessments: negative, positive, distinguished and conditional. The latter two will be used in the analyses.

Detailed results

The following fields were selected for preliminary analysis: construction, economics, computer science and management. In Table 2, in addition to the WWB and WWZ values for these fields, the following are given:

- the average time (in months) from obtaining a diploma to taking up the first job after obtaining a diploma,
- the percentage of months worked after the diploma in any form,
- the average monthly salary of graduates from all sources in the five years after obtaining a diploma (converted into euros).

As can be seen from Table 2, the values of the indicators for the 2014 cohort are significantly differentiated for graduates of selected fields of study: from a very short time of job search to a dozen or so months, from less than 50% of months of work (within five years of obtaining the diploma) to almost 100%, from WWB values close to zero (indicating no threat of unemployment) to a threat greater than average in the counties of residence, etc.

Table 2. Minimum and maximum values of selected indicators for 2014 graduates

Field of study	Number of groups	Number of graduates		Job search time in months	Percentage of months worked (%)	WWB	WWZ	Average salary (EUR)
Management	67	5510	min	0,6	48,5	0,09	0,5	496
			max	10,57	92,3	1,82	1,55	1725
IT	58	2330	min	0	41,9	0	0,52	488
			max	16,2	98,8	1,43	2,2	2417
Economy	43	2960	min	1,82	50,6	0,03	0,6	535

			max	8,06	90,3	1,49	1,37	1631
Construction	30	2680	min	1,9	75,6	0,18	0,74	634
			max	7,71	94,8	1,05	1,29	1282

This differentiation also applies to other years of graduates of these fields of study.

Construction (3.36% of all graduates of full-time second-cycle studies) and management (6.84%, respectively) were selected for a more detailed analysis. It should be added here that construction is conducted by technical universities, while management is conducted by various types of universities (economic, technical, natural etc.).

Chart 1 presents the values of WWB (horizontal axis) and WWZ (vertical axis) for management graduates from the 2014 year group. Each point corresponds to a group of graduates from a given university. As can be seen, the greater the risk of unemployment, the lower the relative earnings. A similar conclusion can be drawn from Chart 2, presenting the values of WWB and WWZ for construction graduates.

Chart 1. Dependence of WWZ on WWB for management graduates from the 2014 graduates

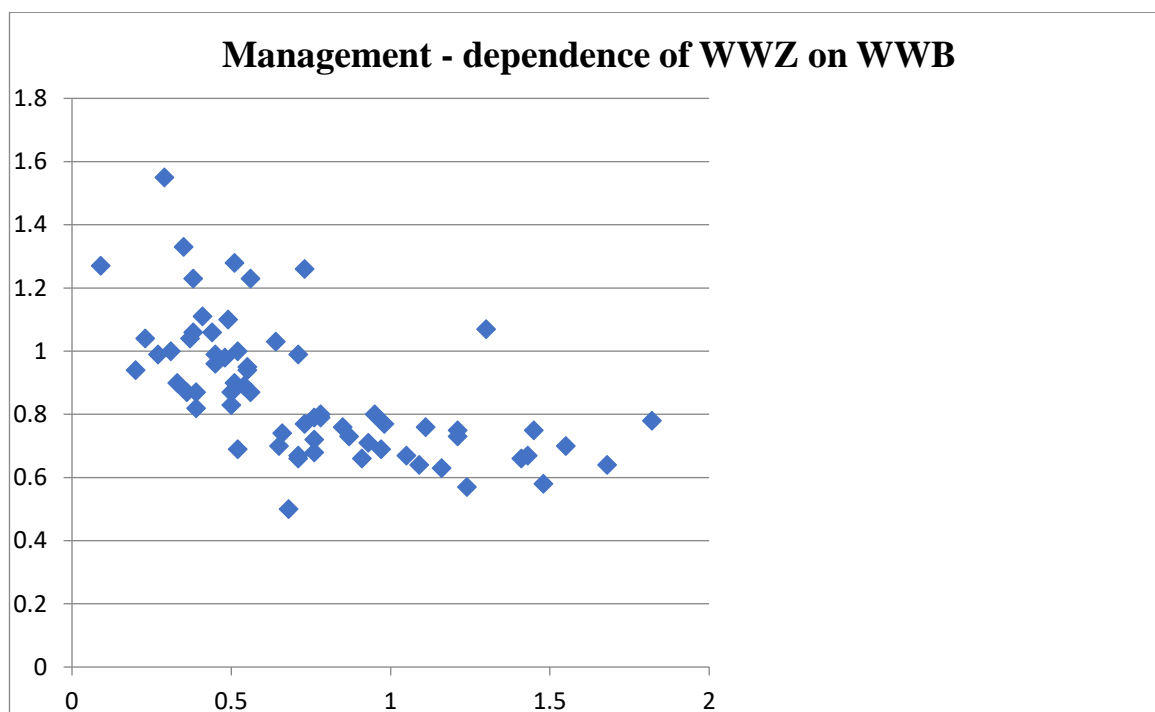
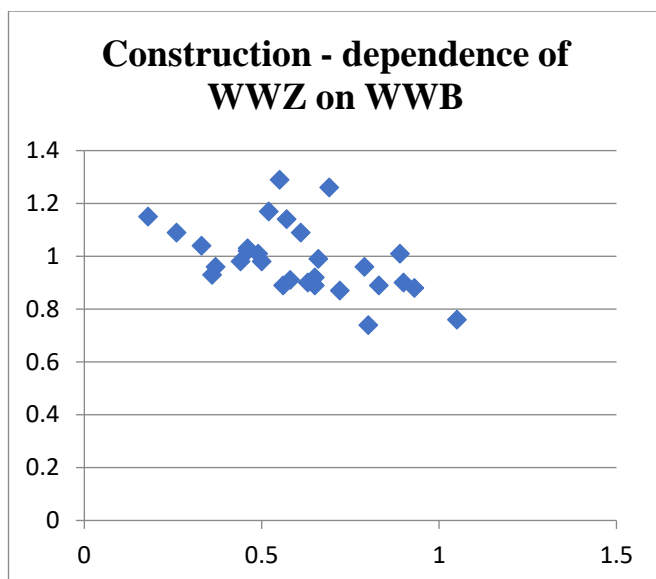


Chart 2. Dependence of WWZ on WWB for construction graduates from the 2014 graduates



If the values of WWB and WWZ are so diverse, this should be reflected in the assessments of the quality of education. The following charts 3 and 4 distinguish groups that graduated from universities that have ever received distinguished (green stars) or conditional (red stars) assessments from the Polish Accreditation Committee (in the program assessment).

Chart 3.

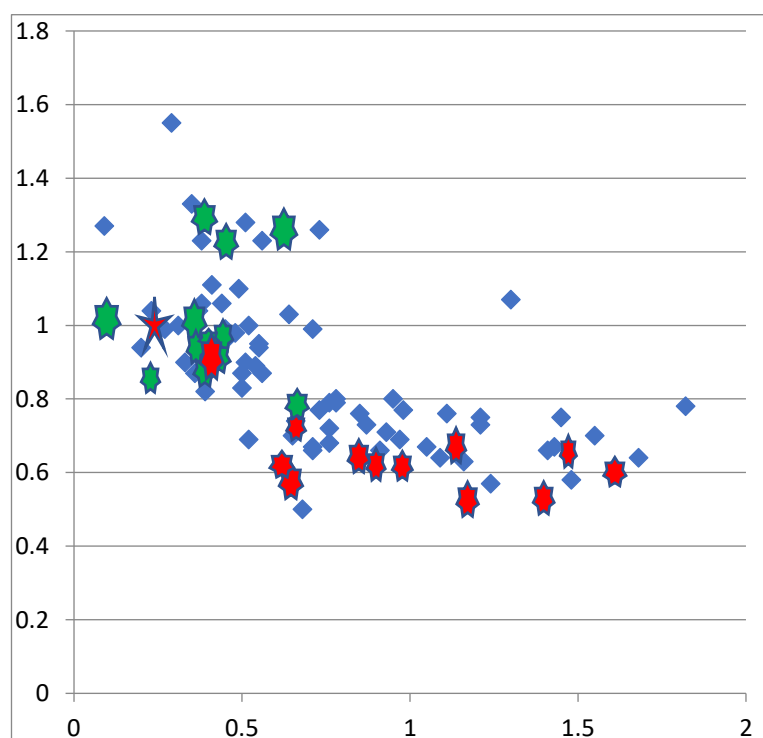
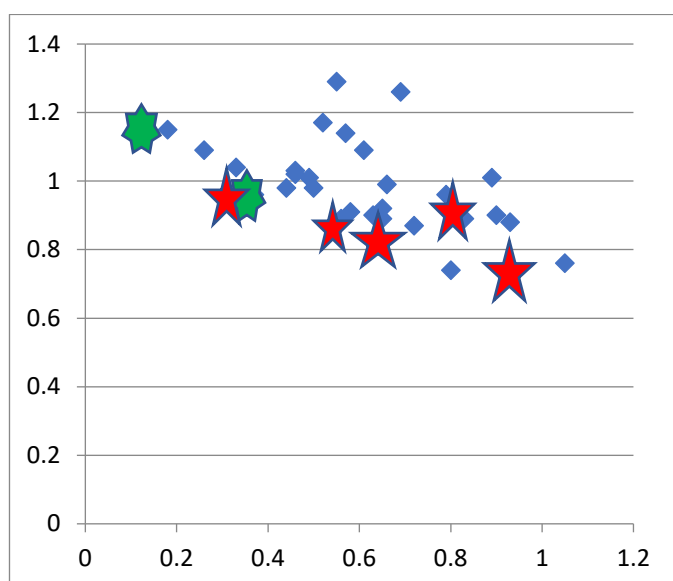


Chart 4.



As can be seen, there is a relationship between the assessments made by PKA and the situation of graduates on the labour market: on average, graduates of courses that received distinguished assessments are rated better by employers than graduates of courses that received conditional assessments.

The appearance of a green star among red ones (or a red among green ones) can be interpreted as a special case requiring additional explanation. Assuming that the data from the ZUS (which constitutes the basis for calculations) are objective, explanations should be sought in the inspection reports, which are related to the assessment of the quality of education. For example it may mean that although the university did not meet a certain quality criterion in the expected manner, the labour market evaluates the graduates well. In one of the cases illustrated in Chart 3, the conditional assessment was related to the lack of appropriate academic staff (which was corrected in a short time). The differentiation of the situation of graduates of the analysed courses depending on the assessment of the quality of education is also indicated in Table 3.

Table 3. WWB and WWZ values for 2014 and 2018 graduates

assesment	WWB		WWZ	
	2014	2018	2014	2018
Management				
Conditional	1,0606	0,9698	0,6882	0,7123
Positive	0,6883	0,8120	0,8361	0,8213
Distinguished	0,5573	0,5727	0,9515	0,9102
Construction				
Conditional	0,7576	0,4965	0,8875	0,9748
Positive	0,5779	0,3993	0,9853	0,9773
distinguished	0,3682	0,3238	1,0270	1,0514

As can be seen from Table 3 – similarly to Charts 3 and 4 – graduates from fields of study which were awarded a distinguished grade by PKA are in an average better situation on the labour market.

This compared with graduates from fields of study which were assessed positively and the latter are in turn assessed better than graduates of fields of study which received conditional grades.

Conclusions and discussion of results

The data from the graduate tracking system show that the labour market evaluates graduates of identical courses conducted at different universities in a significantly different way. Such significant differentiation is not reflected in the assessments made by PKA, which is related to the criteria used. The analyses conducted clearly indicate a relationship between the assessments of the accreditation committee and the situation of graduates on the labour market. Moreover, on one hand the data from the monitoring system provides more quantitative information indicating the effects of a specific state of education quality than the reports from the assessments made by accreditation committees (which by their nature contain rather qualitative information). On the other hand descriptive reports from inspections give the opportunity for a better interpretation of what results from the graduate tracking system.

When assessing the possibility of using data from the graduate tracking system in assessing the quality of education, it should be noted that:

- the use of data related to employability is more consistent with the classification of better/worse than good/bad. In the case of many universities (fields of study) the worst does not mean bad, but research indicates that there are fields of study with a distinguished rating, whose graduates have significant difficulties on the labour market. On the other hand, the persistent, unfavourable values of the indicators ($WWB > 1$ and $WWZ < 1$) should encourage the university authorities to take action, because they indicate a poor situation of graduates on the labour market;
- in the Polish higher education system, there is freedom in naming fields of study. This means that fields of study with similar substantive content may have different names (for example: "finance and accounting", "finance, audit, investments"). The same time fields of study with the same name may as well differ in their programs and specializations offered. This obviously affects the assessment of the quality of education, as well as the situation of graduates on the labour market;
- in the Polish higher education system there are many fields of study that have not been assessed by PKA because they are launched by universities that have the authority to create fields of study without the approval of the minister (that is without ex ante accreditation), and are often incidental in nature (that is they exist only at one university). The monitoring system allows for ex post assessment. For example for the field of study: trusted artificial intelligence systems (Wrocław University of Science and Technology, 21 people) $WWB = 0.4$; $WWZ = 1.21$ and salary of 2023 EUR indicate a very good situation of graduates on the labour market, the same is true for the field of study: financial management of an enterprise (Warsaw School of Economics, 47 people): $WWB = 0$, $WWZ = 1.86$, salary 2971 EUR, while for the field of study: knowledge of film and audiovisual culture (University of Gdańsk, 22 people) $WWB = 2.09$; $WWZ = 0.38$ and average salary 651 EUR indicate a very bad situation of graduates;
- data from the graduate tracking system are of an administrative nature, so they carry objective information and cover practically all graduates, unlike information from surveys;
- because data in the graduate tracking system are published annually, they provide more up-to-date information than the system for assessing the quality of education conducted by accreditation committees.

To sum up: internal and external assessment of the quality of education should use information from the graduate tracking system to make comparison between studies more quantitative transparent.