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Michał Pietrzak
Warsaw University of Life Sciences – SGGW, Warsaw, Poland
e-mail: michal_pietrzak@sggw.pl

DOES IT PAY TO STUDY ECONOMIC SCIENCES? DIFFERENCES IN SALARIES AMONG GRADUATES OF DIFFERENT FACULTIES – EVIDENCE FROM POLAND

CZY OPŁACA SIĘ STUDIOWAĆ NAUKI EKONOMICZNE? ZRÓŻNICOWANIE ZAROBKÓW ABSOLWENTÓW RÓŻNYCH WYDZIAŁÓW NA PRZYKŁADZIE POLSKI

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Summary: This paper investigates differences in salaries among 35 th. of graduates of 99 faculties (or equivalent units) in Poland specialized in the field of study "economic sciences" (economics, management, finance, etc.). The study, which is based on data from the Polish Graduates Tracking System (GTS), covers the entire population. First, the ranking of faculties was prepared. It proved that the noticeable differences exist in financial success at the early stage of career of graduates of different faculties. The hypothesis about poorer chances for financial success of graduates from private business schools was denied. Finally the hypothesis about advantage of graduates of faculties located in bigger cities was confirmed. The correlation between city size and salaries is moderately strong.

Keywords: tertiary education, return on education, economic sciences, graduates, early career.

Streszczenie: W artykule przeanalizowano zróżnicowanie zarobków 35 tys. absolwentów 99 wydziałów (lub równoważnych jednostek) w Polsce kształcących w zakresie nauk ekonomicznych (ekonomia, zarządzanie, finanse itp.). Badaniem opartym na danych ogólnopolskiego systemu monitorowania ekonomicznych losów absolwentów szkół wyższych (ELA) objęto całą populację.Na podstawie badań przygotowano ranking wydziałów. Odnotowano znaczące różnice pomiędzy absolwentami różnych wydziałów w zakresie sukcesu finansowego na wczesnym etapie kariery zawodowej. Hipoteza zakładająca mniejsze szanse na sukces finansowy absolwentów szkół prywatnych została odrzucona. Potwierdziła się hipoteza o korelacji między wielkością miasta, w którym zlokalizowany jest wydział, a zarobkami. Korelację tę można określić jako średnio silną.

Słowa kluczowe: szkolnictwo wyższe, stopa zwrotu z edukacji, nauki ekonomiczne, absolwenci, wczesny etap kariery.

1. Introduction

Knowledge is seen as a key resource to ensure sustained competitive advantage of nations [Porter 1990], firms [Boulton et al. 2001; Drew 1999; Lin 2007; Wen 2009] and even individuals [Russ 2017] in the highly competitive environment of the knowledge based economy. Following Drucker's definition I understand knowledge as the effective use of information in action [1994]. The important source of such knowledge could be the higher education system. The role of tertiary education, measured by the participation rate increased in almost all OECD countries in the late nineties. According to this massification process there are rising concerns about quality of more and more accessible higher education and about university-to-work transition [Jasiński et al. 2017]. In European countries higher education institutions (HEIs) are financed mainly publicly from governmental budgets [Paliszkiewicz 2010]. In such situation general public and policy makers put the pressure on performance measurement and accountability of HEIs.

There is the growing stream of research about efficiency of HEIs recently observed. Important part of this literature focuses on using Data Envelopment Analysis (DEA) method in measuring efficiency of HEIs. Such approach was used to study performance of HEIs, for example: in Germany [Warning 2004], in South Africa [Taylor, Harris 2004], in Austria [Leitner et al. 2007], in China [Jones, Yu 2008], in Iran [Monafared, Safi 2011], in UK [Nazarko, Šaparauskas 2014] and in Poland [Baran et al. 2015; Ćwiąkała-Małys 2009; Nazarko et al. 2008; Świtłyk, Pasewicz 2009; Wolszczak-Derlacz, Parteka 2011]. Usually, variables used in DEA models covers: number of academic staff, number of supporting staff, assets, operating costs, funding and donations etc. (inputs) and number of students or graduates, number of PhD degrees, number of higher degrees awarded, number of publications in internationally or nationally refereed journals, citation indexes, weighted research rating, etc. (outputs).

It is obvious that such variables as mentioned above, represent supply-side oriented approach to the performance of HEIs. One could be, however, interested in the more demand-side oriented approach. How successful are graduates in their careers' development? Do they fit to the needs and requirements of labour market? Do they find job easily and quickly? Are they satisfied with the remuneration received? This approach is focused more on efficacy or effectiveness ("do we educate successfully or not?") than efficiency. In the long run, however such knowledge about career tracks of graduates could help to better allocate rare resources – "understanding the university-to-work transition is vital to improve the efficiency of the use of resources spent on higher education" [Jasiński et al. 2017]. The problem of such demand oriented approach is that it relays on data which is often poor available – the majority of those studies was done by surveys. Nevertheless some countries (Spain, Austria, Scandinavian countries, Hungary, Lithuania) start to track careers of graduates by combining administrative data from many sources. In 2014 Poland joined these

countries by establishing Polish Graduates Tracking System – GTS [Jasiński et al. 2017; *Polish Graduates*… 2018].

After political and economic transition at the beginning of the 1990s, the Polish higher education system experienced rapid growth. During the first two decades after transition the number of students raised from 0.39 to 1.76 million [*Szkolnictwo wyższe*... 2013]. As a result the net enrolment ratio increased from 8.9 to 40.8% [Moskwa-Bęczkowska 2012]. Such growth induced the concerns about the quality of higher education, which in common opinion felt down as a result of massification [Pietrzak 2013]. Despite the demographic changes which led to the decrease in the number of students to 1.35 million in 2016 [Jasiński et al. 2017], the problem of educational quality is still on the agenda of the public discussion. Many commentators lamented the negative influence of the private HEIs on the quality of higher education.

Until 1990 all HEIs but one (ecclesiastical) were state owned. The structure of education units rapidly changed after introduction of new Law on Higher Education. After this number of HEI increased from 112 to 456 till the end of first decade of present century [Herbst, Rok 2011]. Privately held higher education institutions, which played crucial role in this growth, achieve about one third share in total students' number in Poland [Pietrzak 2013]. The fields of study at private universities are dominated by social sciences (economic sciences, law, political sciences, sociology etc.) and in such number mostly by economic sciences (economics, management, finance, logistics, commodity science).

This skew of academic profile is due to the costs of different curricula. For example in 2009 the costs of educating one student at University of Warsaw at Faculty of Journalism and Political Sciences were 11 times lower than at Faculty of Physics at the same University [*Ekonomiczno-finansowe*... 2009]. Most of the increase in the number of students was noticed at fields of study which are cheap to conduct. This was true particularly in the case of private HEIs (costs of education at private tertiary school are on average two times lower than on public HEIs) [*Diagnoza stanu*… 2009]. Public schools were focused on fields which are characterized by low requirements of investments in capacity and low operating costs. One of such fields, which perfectly met such criteria, are economic sciences.

To sum up, there are typically two basic concerns about quality and effectiveness of higher education formulated in discussions. Firstly, private HEIs are often blamed for decreasing quality. Secondly, it is often claimed that the distribution of Polish graduates among academic profiles skewed towards social sciences (in such number economics) and humanities. This last concern is in fact strongly connected with the first one. However, data available until recently do not allow for a reliable verification of the quality of the different types of HEIs and of the different fields of study.

Newly introduced GTS system helps to move this limitation away. For example according to the recent results obtained by M. Jasiński et al. [2017], economics is one of the most gainful academic disciplines. Among 22 academic disciplines it occupies 4th

position with regard to the height of average salary during two years after graduation. Those results proved the important role of new possibilities secured by GTS.

However, I will use GTS in a different manner, not comparing disciplines (fields of study), but objects within one discipline. The aims of this paper are twofold. The first one is to measure performance of the Polish HEIs specialized in economic sciences (faculties of universities or entire HEIs if they are focused on economic sciences). Performance is defined here correspondingly to the demand-side oriented approach discussed above, as successfulness of graduates on the labour market. This successfulness is measured by the salary received by the graduates in the early stage of their career. According to such performance the ranking of 99 academic units from Poland was prepared. The second aim is the verification of some preliminary hypotheses about determinants of the graduates' monetary success. I have formulated the following hypotheses:

H1: The remuneration received by graduates of particular faculties (or equivalent units) is noticeably differentiated.

H2: Important factor of salaries differentiation is faculties' (or equivalent units') type of ownership – the graduates of private HEIs are less successful than their counterparts from public HEIs.

H3: Important factor of salaries differentiation is localization of the faculties (or equivalent units), in other words, the graduates of HEIs localized in big cities are more successful than their counterparts from HEIs from smaller cities[1].

2. Materials and methods

The study is based on the data from the Polish Graduates Tracking System (GTS), which was established in 2014. GTS collects data from the Social Insurance Institution (Polish acronym ZUS) – and national register of students and graduates, which supports the Ministry of Science and Higher Education (POL-on) [Polish Graduates… 2018]. Both are reliable sources of administrative data, which are based on objective facts instead of subjective opinions (like in surveys) and therefore they are not biased by speculative interpretations, memory failures etc. Moreover, GTS covers an entire population instead of sample studies done in surveys.

Typically, studies about HEIs take into account the university or others type of tertiary school as a basic unit of analysis. However, some authors treat faculty as an analytical unit [Baran et al. 2015; Pietrzak, Pietrzak 2016, 2017]. In the business strategy literature exist important demarcation between the strategy on the corporate level and the strategy on the business unit level [De Wit, Meyer 2010]. Analogously,

[1] This hypothesis corresponds to the fact that Polish labour market is geographically differentiated. H. Boulhol states that "regional differences in employment outcomes persists" [2014, p. 10]. In addition to this, it could be observed that bigger cities agglomerate more firms and other organizations, what creates more opportunities of employment for graduates.

the university could be treated as a kind of quasi-corporation, which consists of different strategic business units (faculties) with their own markets, customers and competitors. According to the such perspective, the real competition occurs between faculties specialized in a given field of study. There are some exceptions, for example in the case of entire schools focused on any discipline of science. Nevertheless, they could be treated analogously to the specialized corporations with only one strategic business unit (I will call such cases unit equivalent to the faculty). This is the reason why in this research I take into account rather faculties as the basic analytical unit.

As was mentioned above, the research is focused on the area of economic sciences. Therefore the data about graduates of faculties representing this area was drawn from GTS. All faculties with the words: "economics", "management", "business", "commerce", "logistics", "commodity sciences" in the name of the faculty were taken into account. There are some questionable cases, when the name of faculty consists of words signalling different field of study like "management" and "engineering" or "economics" and "sociology". In such cases decisive factor was the sequence of the words used in the name of faculty, which was treated as a proxy of the significance of given field of study. For example the faculty of "Economics and Sociology" was included into the set, but faculty of "Engineering and Management" was excluded. There are some numerous cases in which the faculties are not extracted. But if they are specialized in "economic sciences" they are also included into the data set. In such cases decisive factor was the dominance of curricula of economic character in the structure of the educational offer. According to this procedure the final data set represent 99 faculties or equivalent units competing in area of "economic sciences".

In the Polish higher education system the curricula are usually divided into bachelor degree and master degree. However, most of graduates of bachelor degree used to directly continue their education for master degree. Therefore, the study focused on people who graduate master degree (regardless if it was achieved during divided into two degree procedure or just in one unitary curriculum). There were 171,030 of such graduates in 2014 in Poland, from whom data are available for 157,298 people (92% availability). The set of selected 99 faculties or equivalent units competing in the area of "economic sciences" represents 37,478 graduates, namely 22% of all master degree graduates. The data are available for 35,368 of them (94% availability). One should note that this study covers practically the entire population of graduates of faculties or equivalent units specializing in the area of "economic sciences". Therefore in statistical tests used in the study the statistical significance was not calculated (such calculation will be pointless).

The hypotheses conjectured were verified by some statistical test: range, standard deviation, coefficient of variation, chi-square, contingency coefficient *C*, and finally by Spearman's rho and Kendall's tau as measures of rank correlation. In calculations software packages: STATISTICA 7.0 and MS Excel 2013 were used.

3. Results

Table 1 presents the ranking of faculties or equivalent units competing in the field of "economic sciences" according to average monthly gross salary of their graduates received during two years after graduation. The mean from this averages amounts to 3,049 PLN, while the median – 2,985 PLN. The range of average salary amounts to 4,035 PLN, what is value equivalent for 243% of the lowest remuneration (1,662 PLN) and 71% of the highest one (5,697 PLN). The standard deviation is 736 PLN, therefore the coefficient of variation amounts to 24%. This indicates moderate variability of salaries within graduates of studied units. Therefore the hypothesis H1 is confirmed.

46 out of 99 considered units are privately held schools. 12,127 people graduated from them (34% of all graduates from data set) in 2014. According to the common opinion it was hypothesized that they are less successful on the labour market. However, such dependency between salaries and type of ownership is not confirmed. In fact graduates of private HEIs earn on average slightly more (mean – 3,130 PLN; standard deviation – 616 PLN; median – 3,093 PLN) than graduates from public tertiary schools (mean – 2,978 PLN; standard deviation – 826 PLN; median – 2,762 PLN). So, direction of dependence is quite different than conjectured in H2. The salary was transformed into rank variable by establishing of tree ranks: 1 for relatively low salary (up to 33 percentile), 2 for medium salary (between 34 and 66 percentile) and 3 for relatively high salary (67 percentile or more). Then the contingency analysis was done basing on cross-table of such ranks and types of ownership: private vs. public. For χ^2 value of 5.44135, the contingency coefficient C amounts to 0.23. Therefore the differences in salaries between type of ownership of HEIs graduated is weak, nevertheless such differences are in opposition to those hypothesized. Those results are striking.

Thirdly, the localization issue was taken into account. The cities in which tertiary schools are located ranges have 23–1,754 thousand of inhabitants. They were divided correspondingly to their size into three categories according to values of 33^{th} and 66^{th} percentiles: relatively small cities (up to 226 thousand of inhabitants) – ranked as "1", medium cities (between 226 and 637 thousand of inhabitants) – ranked as "2" and big cities (638 thousand of inhabitants or more) – ranked as "3". Even simple visual analysis of Figure 1 shows that salaries are higher in the cohort of graduates from units located in cities "2" than those from cities "1". Moreover, salaries are even more higher in cities "3". This observation is confirmed by the tests of correlations. Rank correlation measured by Spearman's coefficient ρ amounts to 0.48 and Kendall's τ to 0.44, what indicates moderately strong correlation. So, the graduates of HEIs localized in big cities are more successful than their counterparts of HEIs from medium and even more than those from smaller cities. Therefore the hypothesis H3 is confirmed.

Table 1. Ranking of faculties or equivalent units specializing in area of "economic sciences" according to average monthly gross salary of their graduates received during two years after graduation (PLN)

Rank	Higher Education Institution	Faculty of	City	Salary
1	2	3	4	5
1	University of Warsaw	Economic Sciences	Warszawa	5 697
2	Warsaw School of Economics	*no faculty*	Warszawa	5 428
3	Wrocław University of Economics	Management, IT and Finance	Wrocław	4 779
4	Warsaw University of Technology	Management	Warszawa	4 730
5	Warsaw School of Management	Management	Warszawa	4 608
6	University of Ecology and Management	Management	Warszawa	4 336
7	University of Warsaw	Management	Warszawa	4 304
8	Koźmiński University	*no faculty*	Warszawa	4 302
9	International University of Logistics and Transport	Logistics and Transport	Wrocław	4 093
10	ALMAMER University	Economics	Warszawa	3 908
11	Lazarski University	Economics and Management	Warszawa	3 828
12	Academy of Finance and Business Vistula	*no faculty*	Warszawa	3 743
13	Poznań University of Economics and Business	International Economics	Poznań	3 706
14	Tertiary School of Finance and Management in Warsaw	Management and Finance	Warszawa	3 700
15	Sopot University of Applied Sciences	Economics and Sociology	Sopot	3 656
16	Tertiary School of Management and Banking in Poznań	Management and Marketing	Poznań	3 636
17	Wrocław University of Economics	Economic Sciences	Wrocław	3 631
18	AGH University of Science and Technology	Management	Kraków	3 628
19	Tertiary School of Management and Entrepreneurship in Wałbrzych	*no faculty*	Wałbrzych	3 626
20	Tertiary School of Logistics in Poznań	Management and Logistics	Poznań	3 563
21	Chodkowska Tertiary School in Warsaw – UTH	*no faculty*	Warszawa	3 560
22	Wlodkowic Tertiary School in Płock	Management	Płock	3 515
23	University of Gdańsk	Economics	Gdańsk	3 500
24	Poznań University of Economics and Business	Management	Poznań	3 494

Table 1, cont.

1	2	3	4	5
25	University of Gdańsk	Management	Gdańsk	3 483
26	Warsaw University of Life Sciences – SGGW	Economic Sciences	Warszawa	3 419
27	Cracow University of Economics	Economics and International Relations	Kraków	3 355
28	Janski Tertiary School in Warsaw	Management w Warszawie	Warszawa	3 342
29	WSB University in Toruń	Subsidiary F. of Finance and Management	Bydgoszcz	3 322
30	Cracow University of Economics	Finance and Law	Kraków	3 314
31	University of Social Sciences	Management	Łódź	3 294
32	Poznań University of Economics and Business	Economics	Poznań	3 187
33	Gliwice University of Technology	Organization and Management	Gliwice	3 186
34	Cracow University of Economics	Commodity science	Kraków	3 181
35	Tertiary School of Management and Banking in Kraków	*no faculty*	Kraków	3 173
36	Gdansk University of Technology	Management and Economics	Gdańsk	3 165
37	WSB University in Gdańsk	Finance and Management	Gdańsk	3 163
38	Katowice School of Economics	Management	Katowice	3 145
39	WSB University in Poznań	Subsidiary Faculty	Chorzów	3 144
40	University of Economics in Katowice	Management	Katowice	3 144
41	Poznań University of Economics and Business	Commodity science	Poznań	3 131
42	Tertiary School of Marketing, Media and Show Business	Management	Warszawa	3 121
43	Tertiary School of Finance and Management in Białystok	*no faculty*	Białystok	3 100
44	Tertiary School of Marketing Management and Foreign Languages	Economics and Engineering	Katowice	3 086
45	University of Szczecin	Economic Sciences and Management	Szczecin	3 083
46	Tertiary School of Economics in Białystok	*no faculty*	Białystok	3 081
47	University of Science and Technology in Bydgoszcz – UTP	Management	Bydgoszcz	3 069
48	Military University of Land Forces	Management	Wrocław	3 058
49	Cracow University of Economics	Management	Kraków	3 025

1	2	3	4	5
50	Business School in Dąbrowa Górnicza	Subsidiary Faculty	Cieszyn	2 985
51	Markowski Tertiary School of Commerce in Kielce	*no faculty*	Kielce	2 984
52	Tertiary School of Finance and Law in Bielsko-Biala	Finance and IT	Bielsko--Biała	2 973
53	WSB University in Toruń	Finance and Management	Toruń	2 956
54	Tertiary School of Administration and Business in Gdynia	Management	Gdynia	2 942
55	Jagiellonian University in Kraków	Management and Social Communication	Kraków	2 899
56	Collegium Mazovia	*no faculty*	Siedlce	2 872
57	WSB University in Wrocław	Subsidiary F. of Economics	Opole	2 852
58	University of Toruń	Economic Sciences and Management	Toruń	2 824
59	Business School in Szczecin	Economics and IT	Szczecin	2 809
60	University of Szczecin	Management and Economics of Services	Szczecin	2 761
61	Gdynia Maritime University	Entrepreneurship and Commodity science	Gdynia	2 758
62	Tertiary School of Management in Wroclaw	Management	Wrocław	2 749
63	Tertiary School of Economics and Humanities in Bielsko-Biała	*no faculty*	Bielsko--Biała	2 741
64	WSB University in Poznan	Finance and Banking	Poznań	2 697
65	University of Economics in Katowice	Economics	Katowice	2 680
66	Częstochowa University of Technology	Management	Częstochowa	2 663
67	WSB University in Wrocław	Finance and Management	Wrocław	2 659
68	University of Bielsko-Biała	Management and Transport	Bielsko--Biała	2 647
69	Tertiary School of Management and Administration in Opole	Economics	Opole	2 636
70	University of Economics in Katowice	Finance and Insurance	Katowice	2 634
71	Lipiński Tertiary School in Kielce	*no faculty*	Kielce	2 592
72	Military Academy	Management and Commanding	Warszawa	2 565
73	University of Szczecin	Subsidiary F. of Economics	Wałcz	2 527
74	Tertiary School of Commerce in Wrocław	Economics and Management	Wrocław	2 527

Table 1, cont.

1	2	3	4	5
75	University of Olsztyn	Economic Sciences	Olsztyn	2 522
76	Koszalin University of Technology	Economic Sciences	Koszalin	2 466
77	Lublin University of Technology	Management	Lublin	2 444
78	University of Opole	Economics	Opole	2 441
79	Wrocław University of Economics	Economics, Management and Tourism	Jelenia Góra	2 415
80	Tertiary School of IT and Management in Rzeszow	Economics	Rzeszów	2 413
81	University of Lublin	Economics	Lublin	2 396
82	West Pomeranian University of Technology	Economics	Szczecin	2 394
83	Rzeszów University of Technology	Management	Rzeszów	2 372
84	Tarnów School of Economics	Management and Tourism	Tarnów	2 370
85	Poznań University of Life Sciences	Economics and Sociology	Poznań	2 364
86	University of Zielona Góra	Economics and Management	Zielona Góra	2 332
87	University of Lodz	Management	Łódź	2 303
88	Siedlce University of Natural Sciences and Humanities	Economic Sciences and Law	Siedlce	2 297
89	University of Bialystok	Economics and Management	Białystok	2 220
90	Tertiary School of Economics and Innovations in Lublin	*no faculty*	Lublin	2 189
91	Business School – National Louis University in Nowy Sącz	*no faculty*	Nowy Sącz	2 188
92	University of Lodz	Economics and Sociology	Łódź	2 163
93	Kielce University of Technology	Management and Computer Modeling	Kielce	2 158
94	Kazimierz Pulaski University of Technology and Humanities in Radom	Economic Sciences and Law	Radom	2 151
95	Old Polish University	Economics	Kielce	2 138
96	Bialystok University of Technology	Management	Białystok	2 119
97	University of Rzeszów	Economics	Rzeszów	1 966
98	Tertiary School of Socio-Economics in Środa Wlkp.	Economics	Środa Wlkp.	1 683
99	Opole University of Technology	Economics and Management	Opole	1 662

1 $ = 3,39 PLN; 1 EUR = 4,20 PLN (7.03.2018)

Source: own calculations based on data from GTS.

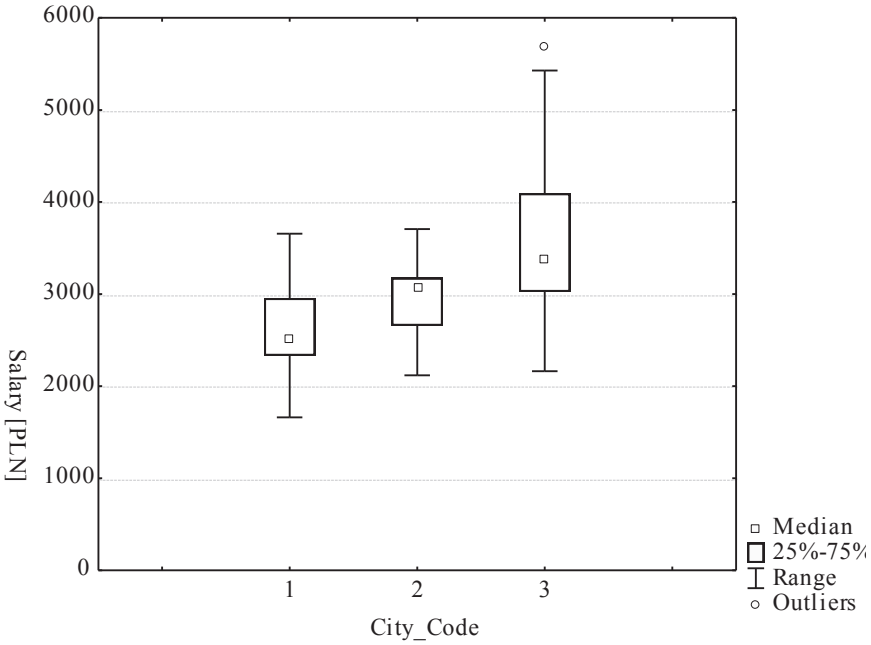

Figure 1. The salaries differentiation according to the city size (1 – small, 2 – medium, 3 – big) in which HEI is located

Source: own elaboration based on data from GTS.

4. Conclusions

Universities became particularly important institutions in the age of knowledge based economy. On the other hand, the massification of the higher education challenges university-to-work transition and raises the question of teaching quality. The crucial issue is therefore assessment of both efficiency and effectiveness of such organizations. In, particular important indicator of effectiveness could be success of graduates in the labour market. This paper is an attempt to rank 99 Polish tertiary schools specialized in "economic sciences" according to the differences in returns from education earned by their graduates in the early stage of career. Results show the moderate differentiation of graduates' salaries among analysed faculties. In opposite to the popular opinion, about the poor quality of the education offered by private tertiary schools, their graduates earn salaries comparable (in fact a little bit higher) on average to their counterparts from public universities. Next important result is that graduates of tertiary schools localized in the big cities earn on average distinctively more than those from medium cities and even more than their counterparts from the smallest cities.

One should be aware about limitations of this research. Firstly, the level of salaries is only the one (but very important) of many aspects of the educational success. Moreover, the salary of graduates do not directly measure the educational quality, but it is only a proxy of quality, which is in fact difficult to observe and even more difficult to measure. For example, one of the possible explanations of striking results concerned private business school could be, that relatively rich parents who are able to finance private education, have also strong social capital, which is used in supporting children to find a post. Another one, is that students of such schools started early to work (during the study) and compensate the possible gaps in quality of educational offer obtained. However, we can only speculate. This calls for the future research on this topic. Another limitation is relatively short period of the study – only two years of work after graduation (caused by data availability). Nevertheless, preliminary exploration was done. Thus, further studies are welcome.

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