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Institutional efficiency of universities in shaping the position of graduates in the labour market

Sprawność instytucjonalna uczelni wyższych w kształtowaniu pozycji absolwentów na rynku pracy

Summary of doctoral dissertation

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Poznań 2021

1. Introduction and motivation to the research

The institutions of the higher education system (HEIs) are organized forms of activity that respond to the needs and aspirations of people who seek the development of intellectual abilities and competencies according to their own predispositions and the opportunities provided by the environment. In other words, institutions build human capital, increasing the productivity of students, who later become graduates. The beneficiaries of this system are both the state, society and the graduates themselves. However, these are complex relationships often resulting from the expectations of human actors, on the one hand, and the state, on the other, towards the education process (Benabou, 2008; Knight, 1952).

Under technological and social advances, everchanging norms, and scientific discoveries, the goals and foundations of an institution may become obsolete. This raises the question of how to describe the performance of higher education institutions so that they can achieve their intended goals. The process of defining and framing the issue of institutionalism and occurring inertia was developed through the research of Ronald Coase in the 1930s, followed by the work of Oliver E. Williamson and Douglass C. North, which lead to the, already strongly developed, New Institutional Economics. It brings together many different theories, among which transaction cost theory plays an important role (Coase, 1937; Williamson, 1979; North, 1993; Williamson, 1999).

New institutional economics currently presents one of the best attempts to describe the institutions of the higher education system in terms of its efficiency in shaping the position of the graduate in the labor market. The government's outsourcing of the task of higher education to public institutions draws attention to the problem of verifying the results obtained, i.e., determining the efficiency of the system, by attempting to estimate both the effectiveness and the durability of a given institution. Obtaining such hard measures is the basis of evaluation in the new institutional economics, and in practice verification of the level of implementation of the contract between the government and the higher education institution and the student, the later graduate.

However, trouble comes from inertia and resistance to change which can lead to the opposite effect, namely, increasing these costs (Simon, 1991; Kahneman, 2003). Assessing the relationship between higher education institutional efficiency and a graduate's position in the labor market may therefore be necessary to minimize transaction costs and determine institutional survival. This requires maintaining the high value of educational outcomes evidenced by graduate degrees (Hodgson, 2006; Ashford and Biswas, 2010). It is worth mentioning that also labor markets may be characterized by the principle of limited information. As they are not perfect in themselves, thus they do not minimize transaction costs to zero.

In an attempt to define what the efficiency is, the author sought in answers to the questions: How can the graduate's position on the labour market be improved? To what extent is it possible to do this by improving the functioning of the system of higher education institutions? While searching for relevant economic theories, the author came across an interesting way of trying to describe the mechanisms that can be observed in reality and that can explain the system's imperfections and numerous frictions. The results of the preliminary analyses indicated the existence of a significant relationship between the elements that can form the institutional efficiency of universities and the labor market, as well as differences between different types of universities and fields of study. Institutional efficiency of higher education units is correlated with the situation of a graduate on the labour market and positively affects the salary of graduates. The main measures involved in shaping the institutional efficiency of HEIs include: number of publications, graduation rate, costs of teaching activities, employment structure of teaching staff, number of projects carried out, number of awards, number of research staff.

At the same time, Polish literature lacks practical answers and attempts to identify reasons and solutions for this situation. The reason for the lack of in-depth research on similar issues should be seen in the lack of availability of source data on the detailed description of the personnel potential of universities, relations with the administration, management and its financial sphere and which could be linked directly to the fate of their graduates (Ćwiąkała-Małys, 2010; Kwiek, 2016; Wolszczak-Derlacz, 2019). This is because it requires the development of a research methodology especially in the context of formulating and specifying transaction costs in education systems. The author noted a gap that could be filled at the present time with the application of transaction cost theory in practice. He explained the lack of success of graduates as the result of frictions between the unreliable market, the student and the graduate, the system of higher education institutions and the government, who are bound by a kind of contract. In the context of the new institutional economics, the focus is on measurable and useful methods of framing issues, in this case the institution of higher education in the context of the environment in which it is situated. In approaching the topic, therefore, the author wanted to see for himself to what extent it was possible to obtain at least a minimum of relevant information and whether this would be sufficient for conclusions that might help to determine what might be a measure of institutional performance of higher education institutions.

2. Purpose and scope of the study

The main objective of the dissertation is to assess the relationship between the institutional efficiency of higher education and the position of a graduate on the labour market in Poland. The realization of the main objective is served by the following set of specific objectives:

1.1. To determine the determinants that shape the institutional efficiency of HEIs.

1.2. To determine the position of a graduate in the labour market.

1.3. To develop a methodology of research on institutional efficiency in relation to the labour market.

1.4. Comparison of the institutional efficiency of HEIs in relation to different types of HEIs, areas of science and disciplines.

1.5. To define proposals for introducing changes in HEIs.

The paper seeks to verify the main hypothesis H 1., according to which the institutional efficiency of higher education is expressed through a strong correlation between the potential of the university and the situation of the graduate on the labor market. In addition, attempts were made to verify a number of specific hypotheses - the determination of indicators of latent variables of the potential of the university and the labor market. Determining feasible and operational measures to infuse changes on institutions of higher educations.

The subject scope of the research includes HEIs in Poland covered by the unit evaluation questionnaire and the SEDN (System of Evaluation of Scientific Output – pol. *System Ewaluacji Dorobku Naukowego*) and ELA (a nationwide system for monitoring the Economic Fate of Graduates of Universities) surveys. The analysis at the level of the entire data set, distinguishing between types of universities and comparing groups of fields of study, is consistent with the objectives of the survey, which relates the position of a graduate on the labour market to the specific nature of the university (e.g. polytechnic, university) and the field of study itself. The adopted sample consists of 135 universities meeting the criteria mentioned above**.**

The time scope of the research covers the years 2013-2017.This is due to the limitations dictated by the availability of source data, as the universities analysed were those that both submitted the unit questionnaire for the 2013-2016 evaluation and appeared in the 3rd Edition of the ELA survey for graduates of the 2016. At the same time, data from the Central Statistical

Office (CSO – BDL – pol. *Bank danych lokalnych*) database on salaries in a given section of the PKD in 2017 were used.

The spatial scope of the study covers the whole of Poland.

3. Research sources and methods

In order to achieve the goal, it was necessary to determine in a measurable way the relationship between the performance of higher education institutions and the labour market of graduates. The next one is to link the databases and variables concerning the fields of study in the analysed university with the data concerning the labour market. The reference to the affiliation of the analysed field of study to disciplines and then the reference (also supporting the grouping of ISCED-F 2013) to PKD Sections was applied here. Another is the analysis of data at the level of higher education, also in relation to the fields of study and types of universities, in connection with the labour market. The last aspect is the use of unobservable variables in structural equation modeling, which allows for the evaluation of hard-to-define concepts such as the potential of a university or the position of a graduate in the labour market, which can be used in future work on the economics of education.

The following data sources were used in this research:

- POL-on: Integrated Information System on Science and Higher Education

- ELA: National System for Monitoring the Economic Fate of Graduates of Higher Education Institutions, Edition 3 - year after obtaining the diploma (year of graduation: 2016). The average monthly salary from all sources after obtaining the diploma and the relative unemployment rate of graduates in the first year after obtaining the diploma when the graduate did not study after obtaining the diploma are included.

- BDL: Bank of Local Data - average monthly gross wages and salaries in the national economy by PKD 2007 for 2017 for the level of provinces within the specified Employment Sections.

- OPI: Information Processing Centre at the National Research Institute - data made available at the request of the author.

- Employees - data from the questionnaire of the unit submitted for the evaluation for 2013-2016 from Section B1 - Employment in the implementation of scientific research or development .

- Employees - data on administration and teaching staff from unit reports to POL-on system.

- Publications - data from the questionnaire of the unit submitted for evaluation for the years 2013-2016 with a breakdown by each part of the list of journals (A,B,C), credits (numbers, totals) and number of employees from the unit.

- For 2017 - expenditures and financial result of the scientific unit, costs of teaching activities, costs of research activities, list of scientific projects, list of patents and protection rights.

The Information Processing Centre (OPI – pol. *Ośrodek Przetwarzania Informacji*) made available for research previously unpublished detailed data on higher education institutions in Poland regarding, among others, costs of teaching and research activities, outlays, numbers of publications and employment structure.

The study used statistical and econometric methods, including structural equation modeling (SEM). SEM method allows to define latent variables - not directly observable, but hidden in concepts that we can explain but not necessarily measure directly. These variables described by the factor loadings that construct them form relationships (regressions) with them, each of which can be a potential hypothesis or assumption (Weston and Gore, 2006; Tarka, 2018). The SEM method has been successfully used in the social sciences, especially for concepts (for example, intelligence) that cannot be described by a single measure. In the model obtained through the analysis, correlations potentially occur between both unobservable and observable variables, thus forming further hypotheses or assumptions. For example, models with two unobservable variables bound by a correlation involving a shared observable variable belong to the group of non-standard models with complex indicators (Kline, 2011). It is therefore possible to create numerous hypotheses, separate at least for each regression (or lack thereof), whereby the correlations are not necessarily related to the sign of the relationship, but can account for the level of factor loading (strength of influence) when a path is described by a parameter (factor loading) significantly different from zero (for example, >0.3) (Weston and Gore, 2006; Wang and Wang, 2012; Ullman and Bentler, 2012).

The introduction of a quantitative method for determining efficiency and its valuation can significantly assist university management by removing friction and reducing transaction costs. Thus, it is potentially possible to point out specific places where performance can be improved or where certain solutions should be abandoned. Not necessarily by reducing costs, but more by redistributing them skillfully. For example, to reduce the burden of redundant responsibilities of employees and to support the implementation of statutory goals. Conclusions from the conducted research may be practical reasons to change the management policy of higher education institutions both at the central level and at the level of the higher education unit itself. At the same time, the author's contribution is the description of the places of formation of transaction costs in Polish institutions of higher education, their types and characteristics (frequency, uncertainty, resource specificity), which are not fully defined in the current Polish literature.

Qualitative research based on in-depth interviews was also conducted. The group of respondents included members of university committees, the student ombudsman, as well as staff from deans' offices, student services offices, the bursar's office, the educational quality department, career and internship offices, and the legal department. The results were related to the literature of the subject. It concluded in finding close parallels regarding the needs of the parties and the frictions that exist between them. The synthesis of the results identified areas where costs could be minimised, often resulting in a reduction in employee workload.

4. Structure and content of the thesis

The layout and content of the dissertation are subordinated to the implementation of the main objective and specific objectives. The dissertation consists of five chapters, an introduction and a summary, supplemented by a literature list, a list of tables and figures.

The first chapter is theoretical and arose on the basis of a review of the subject literature. It presents the role of the education system as a determinant of shaping human capital, referring to the paradigm of the new institutional economy as the theory explanatory phenomenon. The genesis and evolution of this field of economic sciences and the role in the area of education economics was presented. In addition, it was indicated on the relationship between institutions and students and students and their connection to the education system, and finally interpreted the deadline for transaction costs in relation to the education institution and examples were presented.

The second chapter describes individual education levels in the context of the institution's activities through the prism of institutionalism and new institutional economics, including in relation to the theory of transaction costs. It contains reflections resulting from both literature review and from published own research on the quality of education, inherence of education systems, their relationship with the labour market and a possible source of financial losses. The legitimacy of the theory of transaction costs in education systems at higher level was also shown.

The third chapter is methodical. In this part of the work, subsequent stages of preparations for empirical testing are described above the efficiency of the higher education institution. It contains a description of the methods used, i.e. modeling of structural equations and incorrecting factor analysis. It also presents goals, hypotheses and research ranges, data sources, as well as justifying the selection of individual measures to determine the graduate position on the labour market (among others, the average remuneration of the graduate, average remuneration within the PKD section, relative unemployment) and university efficiency (between Other numbers of publications, the number of students, the number of academic staff, didactic activities). The methods of creating the final data set and non-observable variables were also explained.

The fourth chapter is empirical. It has been described in the specifications of the achieved models of structural equations, taking into account the types of universities, science and education areas. The abbreviated characteristics of the collection of universities and education directions are presented, and then the model of regression and variable regression analysis was verified and the results were interpreted.

Chapter Fifth presents suggestions and recommendations on the possibility of improving the institutional efficiency of education system at a higher level in Poland. In a synthetic way, it uses the theoretical knowledge collected during research and the results of empirical analyses, in a clear and detailed way, outline the path of the development of the higher education sector in Poland by feasible minimisation of the transaction costs.

5. Result of dissertation

Despite the complicated nature of the issue and a large heterogeneity of the set of observations, it was possible to justify the selection of the majority of determinants of institutional efficiency of higher education and the applied methodology of research on efficiency of institutions in relation to the labour market, thus realising objectives 1.1, 1.2 and 1.3 of the dissertation. The confirmed definition of institutional efficiency of higher education is expressed by a strong correlation between the potential of the university and the situation of the graduate on the labor market (PU ↔ RP). At the same time, variables describing remuneration as an accurate feedback of the labor market and university potential were included. The differences between disciplines with the applicable specifics resulting from the educational program, relations with the environment, specifics of the profession, administrative, teaching and research staff and resulting from different ways of organisation and management of the university were justified. Then enriched by qualitative analysis of the problem of institutional efficiency introducing definitions and classification of transaction costs in institutions of higher education. In this context, the concluded contracts as well as specific examples of indicating frictions in the relationship and determining the needs of the parties were explained. The presented conclusions confirm realisation of the main objective and specific objectives of the work. At the same time, they highlight the strong inertia characterising the system of higher education institutions in Poland, but also the possibility of its gradual change.

The level of complexity of the contracts discussed here requires consideration of the relationships of individuals, faculty and students, as well as the institutions themselves with the labour market and government. The presented suggested solutions are supposed to result in gradual improvement of graduates' results and reduction of transaction costs in the university's activity, as opposed to complex and invasive reforms, which are often resisted. Since there can be losses in any of the mentioned spheres, overall efficiency also encompasses all these aspects. The smoother and faster the transition, the less friction that may occur, the less energy is dissipated and thus the transaction costs in each of these spheres decrease. It consists of a lower number of working hours of university employees, reduced losses of university and state budgets, less stress, enhances cooperation, as well as the possibility of finding a good job with good salary by a graduate.