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EVALUATION OF THE PERCEPTION OF UNIVERSITIES' ROLE IN THE PUBLIC PROCUREMENT MARKET

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Abstract: The aim of the work is to examine how the role of universities in the public procurement market and in public-private partnership is perceived by both the contracting authorities and the contractors. It was verified whether the entities participating in public procurement and public-private partnership see the need for cooperation with universities, and whether there is a link between the declared need for cooperation and the assessment of real actions taken or provided by universities. The work is based on a survey conducted between March and May 2020 among 520 institutions representing contractors and procurers in public procurement. The highest evaluation was given to the activities of public universities in the field of public procurement and public-private partnership in Lubuskie and Śląskie (opinion of procurers) and Lubelskie and Warmińsko-Mazurskie (opinion of contractors). With the use of logistic regression models it was verified that there is a positive relation between the evaluation of the university's activities and the declared need for cooperation between the university and the analysed entity.

Keywords: public procurement, university, public-private partnership.

1. Introduction

Cooperation between universities and other entities representing both the private and public sector can manifest itself, inter alia, through public procurement (hereinafter referred to as PP or public procurement) or in the form of public-private partnerships (hereinafter referred to as PPP or public-private partnership). Such collaboration may be aimed both at the commercialization of research and development works carried out by universities, and at enabling the functioning of these institutions through the provision of supplies and services by entities cooperating with them.

Public procurement and public-private partnership are forms of cooperation between entities representing the public and private sectors. In accordance with Article 2 item 13 of the Public Procurement Law (*Prawo zamówień publicznych*, Pzp), public procurement is a form of cooperation where the contracting authority and the contractor conclude a contract for the paid service, delivery or construction works (Act of January 29, 2004). Another type of cooperation is public-private partnership (PPP), in which, pursuant to Art. 1 point 2. In the Act on public-private partnership, cooperation is established between the public entity and the private partner and is based on the division of the tasks and risks between them (Act of 19 December 2008). It can be also defined as a task fulfilled by a public entity in cooperation with one or more private entities, where the private partner provides public services, receiving own benefits through an optimal risk division (OECD, 2008). As stated by Rolfstam (2009), the primary purpose of public procurement is the fulfilment of a public task, while it can also contribute to the improvement in the functioning of economic and social mechanisms.

According to the Directive of the European Parliament (Directive 2014/24/EU, 2014), public procurement plays a crucial role in the Europe 2020 strategy as an instrument aimed at achieving smart, sustainable and inclusive growth while also providing the most effective allocation of public funds. Moreover, it underlines that universities are also understood as 'economic operators' in public procurement, furthermore, innovativeness also plays a crucial role. Innovative PP and PPP are specified in internationally followed documents, among which one can find those of the OECD (European Council, 2015) and the European Commission (European Commission, 2017).

The increasing interest in using PPP in public tasks arises from the increasing need of cooperation between entities representing public and private sectors (Hodge and Greve, 2007). As public-private partnerships are attracting more and more attention, not only from the partners aiming at realising a project, but also from the researchers, more analyses are being conducted on this topic. Cui et al. (Cui, Liu, Hope, and Wang, 2018) state, on the basis of the conducted text mining, that the most frequently used words in papers on PPP include, apart from "publicly" and "privatizing", the terms "risk", "develops", and "success". This may indicate that PPP constitutes a solution for projects aimed at development, with rational and effective risk division, hopefully resulting in the success of the project.

Wigger (2017) states that the purpose of the activities carried out in the PPP formula is to divide the risks, including financial and political ones, in order to manage them in the most efficient way. Therefore, the risk division between the partners ought to be agreed on before the beginning of the project. The PPP model should possess inherent features to be effective, such as legitimacy, trust and capacity (Casady, Eriksson, Levitt, and Scott, 2020). Furthermore, projects carried out in accordance with PPP, as agreements achieved between partners, tend to be less prone to result in legal disputes brought before the court. Rodionova (2020) proved that the

majority of entities cooperating in the public-private partnership are very likely to choose extrajudicial procedures, including mediation and negotiation.

The paper is devoted to the analysis of subjective evaluation of universities' activities in the PP and PPP market, as viewed by contractors and procurers.

2. Methodology and data

The paper is based on data derived from a survey conducted between March and May 2020 using the CATI technique, as part of the project entitled "Cooperation of science with public procurement stakeholders and PPP project participants and the innovation of offers" (*Współpraca nauki z interesariuszami zamówień publicznych i uczestnikami projektów PPP a innowacyjność ofert*) under the DIALOG programme, financed by the Polish Ministry of Science and Higher Education. The survey examined different aspects concerning public procurement and public--private partnership. The interviewed entities were sampled with the application of the stratified sampling method. The population of the entities participating in the public procurement was divided into two strata – voivodeship and the sector represented (public or private), thus ensuring the appropriate representation of the two subgroups in the sample. This enabled to achieve the structure of the analysed sample, mirroring the population structure of the entities participating in public procurement in Poland. The respondents included 213 public sector entities representing the contracting authority in public procurement and 307 entities representing the contractors. The paper is based on their evaluation of various activities undertaken or proposed by universities in terms of improving the quality of the public procurement market. Their marks were given on a 5 point scale, where the value of 1 was assigned to the answer "definitely no" and the value of 5 to the answer "definitely yes". The answer "hard to decide" was assigned the value of 3. Another aspect verified and included in the present research regarded the need declared by respondents of cooperating with university. The interviewed entities could answer yes or no, while for the purposes of the model estimation, the value of 1 was assigned to the answer "yes".

The methodology included the analysis of the frequency of particular answers as given by procurers and contractors. Next, the composite indicator, calculated as the average of the given marks, was computed for each of the sixteen Polish voivodeships. These indicators were then presented on maps. The subsequent step of the research included the estimation of logistic regression models, where the dummy variable representing the declared, subjectively perceived necessity of cooperation with universities was applied as a dependent variable. The regressors included different aspects of universities' activity on the public procurement market, both direct and indirect, as presented in Table 1. The regression models were fitted separately for these activities, as well as for contractors and procurers. Then, the odds ratio were calculated to obtain the relationship between assessing better the activities of universities and the perceived necessity for cooperation (Hosmer, Lemeshow, and Sturdivant, 2013).

3. Results and discussion

The data used in the study included seven (procurers) and eight (contractors) fields of activities undertaken, or possible to undertake by universities in the public procurement market in order to enable its better functioning. The list of these, along with frequency data, is shown in Table 1.

Table 1. Variables indicating universities' activity in the public procurement and public-private partnership market

Variable	Party in the public procurement	Answer given				
		Definitely no	Rather no	Hard to decide	Rather yes	Definitely yes
Participation of the potential contractors in postgraduate studies on public procurement will increase the quality of the tender	Contractor	14%	8%	26%	34%	18%
	Procurer	5%	4%	37%	29%	13%
Participation in conferences on public procurement will contribute to the exchange of the public procurement system's participants	Contractor	9%	9%	28%	37%	18%
	Procurer	4%	2%	25%	38%	18%
Participation in conferences on public procurement will universalise new legal solutions on the public procurement market	Contractor	9%	10%	27%	36%	18%
	Procurer	4%	3%	30%	33%	16%
Using university's expert assistance regarding legal and tax issues will decrease the frequency of occurrence of formal mistakes in tenders	Contractor	11%	9%	22%	36%	22%
	Procurer	Not verified				
Using university's expert assistance in indicating the innovation possibility will decrease entrepreneurs' R&D expenditure	Contractor	9%	6%	29%	37%	19%
	Procurer	5%	2%	44%	25%	11%
Using university's expert assistance regarding commercialising research results will improve the process of obtaining the intellectual property rights	Contractor	8%	8%	32%	36%	16%
	Procurer	5%	3%	48%	22%	10%
Recruiting employees among graduates of public procurement programmes will reduce staff training expenditure	Contractor	6%	11%	23%	40%	20%
	Procurer	5%	3%	39%	31%	13%
Recruiting employees among graduates of public procurement programmes will spin off the application of innovative public procurement and public-private partnership	Contractor	8%	7%	29%	40%	16%
	Procurer	6%	4%	37%	28%	10%

Source: own elaboration on the basis of a survey conducted under the DIALOG programme financed by the Polish Ministry of Science and Higher Education.

It is worth mentioning that high percentages were observed for the answer "hard to decide" which means that the entities interviewed do not perceive activities undertaken or provided by the universities as neither as helpful nor redundant. A satisfactory observation may be that only minority evaluate these activities as not having a positive impact on the functioning of the public procurement market. As far as the positive answers ('rather yes' and 'definitely yes') are concerned, the biggest groups regard contractors and their view on the beneficial impact of recruiting employees from among the graduates of the public procurement studies on the reduction of staff initial training expenses, and the wider application of innovative public procurement and public-private partnership. Using expert assistance from the universities also contributes to limiting the amount of formal mistakes found in PP tenders, along with the belief that it may lead to the decrease in entrepreneur's R&D expenses, was declared by more than the half of the questioned contractors. Moreover, a similar percentage was observed for those contractors who believe that participating in the conferences on public procurement can contribute to the more intensive exchange of the experience on public procurement among its market participants. As for the procurers, the highest fraction of positive marks on universities' activity was observed for the universities' ventures regarding the possibility to spread experience on public procurement during conferences – 56% shared this belief. The lowest marks are given to the statement regarding the participation in conferences that leads to universalising new legal solutions on the public procurement market and improve the quality of tenders along with the statement concerning the usage of universities' expert assistance resulting in limiting the frequency of formal mistakes occurrence in tenders – about 20 percent of the questioned. None of the statements presented to the respondents achieved more than 9% of the negative answers given by procurers.

Another verified aspect was whether the respondents perceived the need for cooperation between their entity and the university. About 57% of the contractors declared that they see the necessity for collaboration with the university, while 49.8% of the procurers declared the same. The spatial diversity of the perceived actual or potential activities of universities in the public procurement market can also be observed. Another part of the study was the analysis of the average composite evaluation of these activities as viewed by procurers and contractors. The marks given in the respective aspects were averaged in each voivodeship. The results are shown in Figures 1 and 2.

The highest average of the activities evaluated by contractors was observed in the Lubelskie and the Warmińsko-Mazurskie voivodeships – at 3.7987 and 3.7738, respectively. The lowest were found in the Pomorskie and Opolskie voivodeships – 2.9478 and 3.0417, respectively. This may lead to the conclusion that universities in Lubelskie and Warmińsko-Mazurskie seem to be using their abilities better in terms of collaboration with public and private entities within the public procurement and public-private partnership system than other voivodeships. This can be both a signal for them to invest more engagement and funds in this to improve those already

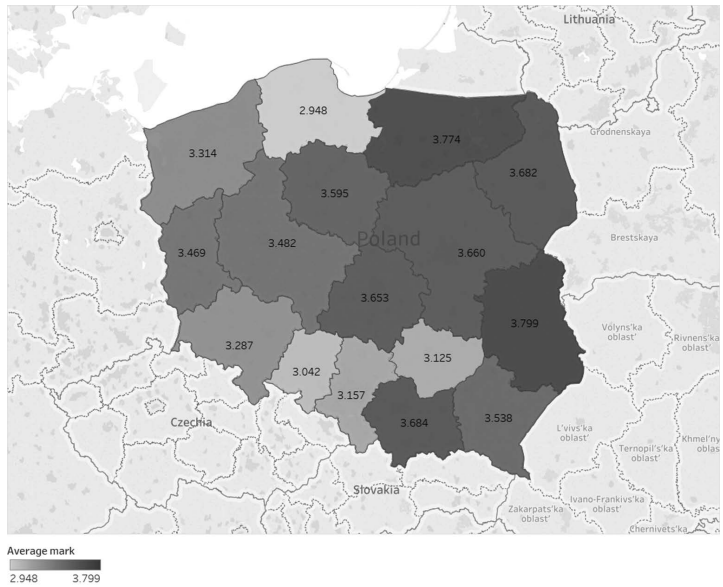

Fig. 1. The averaged evaluation of the activities undertaken or potentially undertaken by universities, as viewed by contractors

Source: own elaboration.

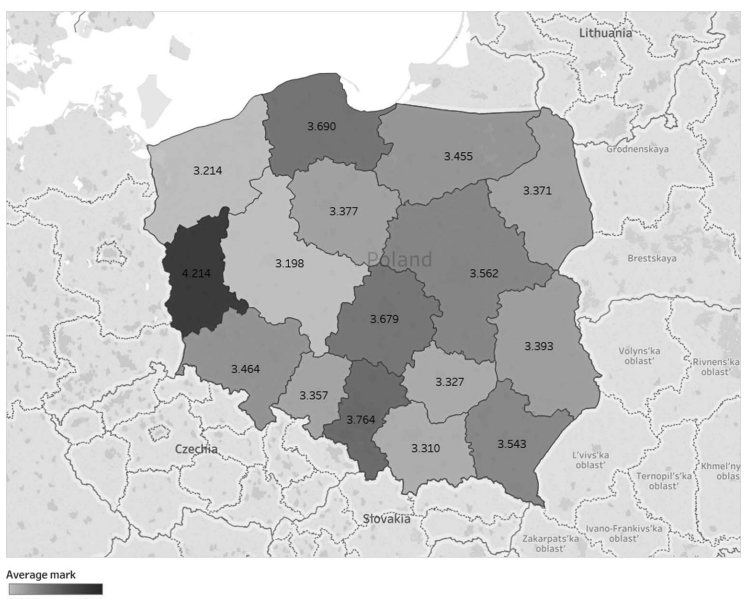

Fig. 2. The averaged evaluation of the activities undertaken or potentially undertaken by universities, as viewed by procurers

Source: own elaboration.

possessed, but also for the voivodeships in lower positions to balance the benefits arising from such a cooperation and the costs needed to be reimbursed, to achieve a better position.

Interestingly, a wider diversity was observed for procurers, as the highest averaged mark was noted for the Lubuskie voivodeship, at 4.214, and the lowest for the Wielkopolskie voivodeship – at 3.198. It is worth noting that the procurers averaged marks scored values lower than 3 in none of the voivodeships, which was not in accordance with the marks given by contractors. The conclusion derived from this phenomenon is that probably the university acts in the public procurement as a contractor, so therefore more procurers have previous experience of collaboration

Table 2. Estimated logistic regression models

Variable	Role in the public procurement	Odds ratio	Number of cases correctly predicted (%)	*p*-value in Wald's test
Participation of the potential contractors in postgraduate studies on public procurement will increase the quality of the tender	Contractor	1.322**	60.49%	0.0076
	Procurer	1.335*	59.20%	0.0434
Participation in conferences on public procurement will contribute to the exchange of the public procurement system's participants	Contractor	1.461**	62.75%	0.0009
	Procurer	1.702**	60.60%	0.0005
Participation in conferences on public procurement will universalise new legal solutions on the public procurement market	Contractor	1.384**	61.04%	0.0038
	Procurer	1.689***	62.40%	0.0004
Using university's expert assistance regarding legal and tax issues will decrease the frequency of the occurrence of formal mistakes in tenders	Contractor	1.556***	64.75%	0
	Procurer	Not verified		
Using university's expert assistance in indicating the innovation possibility will decrease entrepreneurs' R&D expenditure	Contractor	1.623***	64.80%	0
	Procurer	1.988***	66.53%	0
Using university's expert assistance regarding commercialising research results will improve the process of obtaining the intellectual property rights	Contractor	1.966***	67.60%	0
	Procurer	2.230***	65.96%	0
Recruiting employees among graduates of public procurement programmes will reduce staff training expenditure	Contractor	1.564***	62.40%	0.0004
	Procurer	1.704***	60.47%	0.0001
Recruiting employees among graduates of public procurement programmes will broaden the application of innovative public procurement and public-private partnership	Contractor	1.438**	63.40%	0.0025
	Procurer	1.726***	61.90%	0.0002

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Source: own elaboration on the basis of a survey conducted under the DIALOG programme financed by the Polish Ministry of Science and Higher Education.

with universities in this regard, and therefore value better their actual and potential activities in the public procurement market.

According to the results presented, there is a positive relationship between all the fields of universities' activities and the declaration of the perception of the necessity to cooperate with universities in all the cases for both procurers and contractors. Moreover, the relationship in all the models appeared to be significant at (at least) < 0.05 significance level. Interestingly, the highest odds ratio was observed for using universities' expert assistance concerning commercialising research results will improve the process of obtaining the intellectual property rights in the case of both the procurer and the contractor. Those procurers who assess the significance of this activity higher, see the need for cooperation with universities as more important by about 123%, while for contractors 96%. In all of these, the percentage of cases correctly predicted as a measure of the model's goodness-of-fit, exceeded 50% for all the models, while not exceeding 70%. This can be explained as being the result of including in the model only one regressor, namely a categorical one, and declaring the necessity of collaboration with universities is also dependent on other aspects. This may be a starting point for more in-depth research. The *p*-value for the Wald's χ^2 test did not exceed the value of 5%, indicating that the coefficients used are significant and the chosen model form is appropriate.

4. Conclusion

The conducted survey provided some interesting material for the research on the perception of universities' role in the public procurement market. The aspects analysed in the paper indicated that the evaluation of the universities' role in the PP and PPP market varies as far as the role in the procurement is concerned, as well as in terms of localisation. The procurers interviewed presented a better evaluation of the universities' possible and actually undertaken activities which aim at improving the quality of the functioning of the PP and PPP market. One should also mention the proven positive relationship between the better assessment of the universities' role and the declared perception of the need for collaboration with them.

The surveyed parties very often indicated that participation in thematic conferences organized by universities contributes to the exchange of experiences between the participants of the public procurement. Most of the surveyed contractors also believe that participation in such conferences contributes to the dissemination of new legal solutions among the market participants. They also believe that if potential contractors participate in public procurement studies, the impact of these experiences on the improvement of the quality of their bids is noticeable. The surveyed contractors mostly agreed that by recruiting employees from among graduates in public procurement education, they would reduce the costs of adapting new employees to their work.

It can be concluded that universities inspire the trust of the entities operating on the public procurement market and cooperating in the public-private partnership

formula, which in turn may be an opportunity for universities to commercialize their research and development works through cooperation with business.

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OCENA PERCEPCJI ROLI UNIWERSYTETÓW NA RYNKU ZAMÓWIEŃ PUBLICZNYCH

Streszczenie: Celem pracy jest zbadanie, w jaki sposób rola uniwersytetów w rynku zamówień publicznych i w partnerstwie publiczno-prywatnym jest postrzegana przez zamawiających i wykonawców. Zweryfikowano, czy podmioty uczestniczące w zamówieniach publicznych i partnerstwie publiczno-prywatnym widzą potrzebę współpracy z uczelniami oraz czy istnieje związek między deklarowaną potrzebą współpracy a oceną rzeczywistych działań podejmowanych lub oferowanych przez uczelnie. Źródłem danych jest badanie przeprowadzone między marcem a majem 2020 r. wśród 520 instytucji reprezentujących wykonawców i zamawiających w zamówieniach publicznych. Najwyżej oceniono działalność uczelni publicznych w zakresie zamówień publicznych i partnerstwa publiczno-prywatnego w województwach lubuskim i śląskim (opinia zamawiających) oraz lubelskim i warmińsko-mazurskim (opinia wykonawców). Za pomocą modeli regresji logistycznej zweryfikowano, że istnieje pozytywna zależność między oceną działalności uczelni a deklarowaną potrzebą współpracy między uczelnią a analizowanym podmiotem.

Słowa kluczowe: zamówienia publiczne, uczelnie wyższe, partnerstwo publiczno-prywatne.