

THE EFFICIENCY OF PUBLIC PROCUREMENT IN THE REPUBLIC OF KOSOVO: AN ECONOMETRIC APPROACH

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Abstract. *This study aims at investigating and assessing the efficiency of the public procurement system and its main factors in the Republic of Kosovo. For this purpose, we collect data for a random sample of 243 economic operators (companies) eligible to benefit from public funds. We analyzed the data using descriptive analysis as well as econometric modeling, and we have used classical and ordinal logistic (o-logit) econometric models. In the absence of a direct indicator, the efficiency of procurement is measured by two proxy variables, discrimination-tendering criteria and a favor made to specific companies to win tenders, by their average as a third optional variable. Discrimination and favor are found to be present to a large extent, meaning that efficiency is very low. Among the major factors of the low efficiency of public procurement were political intervention, the non-transparency of the procurement process, a lack of capacity to implement procurement legislation and manage contracts, corruption and insufficient knowledge about procurement. Based on these results, important implications would lie in introducing measures for enhancing transparency, improving legislation, recruiting especially qualified staff or providing continuous training for the current procurement staff as well as improving the motivation of the staff to properly implement legislation and manage the procurement contracts.*

Keywords: *efficiency, public procurement, classical regression model, ordinal logistic (o-logit) model, economic operator.*

1. Introduction

Kosovo is a small country located in southeast Europe. It is categorized as a low-middle income country with around \$3500 income per capita. Administratively, it strives to improve the rule of law and establish efficient administrative standards. Socially, it faces a high level of unemployment and a frequent movement of citizens crossing over to countries within the European Union, looking for better employment alternatives.

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Public procurement refers to the process of purchasing goods and services from another party in order to fulfill the needs and obligations of an institution. Generally speaking, public procurement includes three types of transactions: goods, works and services. Goods include tangible products, such as office furniture. Work includes construction, while services include but are not limited to the provision of legal and consultancy services. Arrowsmith et al. (2011) argue that public procurement is an activity of acquiring goods and services from an outside source, and the economic operator is selected by following the procurement procedures. Public procurement plays certain key functions. According to Coggburn and Rahm (2005), the procurement process is crucial for the government as a way of purchasing the necessary goods and services through a competitive tendering. The fundamental objective of public procurement is to deliver specific services by complying with the following criteria: accountability and transparency, integrity, fair competition and value of money. One of the main obligations of the public procurement system is to make sure there is no conflict of interest and that the contracting authorities are not involved in any illegal activities. Violations of any of the above-mentioned objectives would reduce efficiency and potentially impair social welfare.

Public procurement is regulated by law and is subject to formal regulatory rules. Broadly speaking, it is constructed in phases: the first phase includes the planning of procurement; the second phase includes the preparation of a tender dossier and setting up terms and conditions, while at the same time making sure that the decisions are made in full compliance with formal procedures and time limits; the third phase includes selecting winners, signing and managing the contract; the last phase includes auditing. Highly regulated public procurement aims at reducing risks and any potential negative influences from specific groups of interests.

The European Union has established directives as legal acts that serve as a base for the legislation. The legislation of public procurement in the European Union states has been adopted by fulfilling the obligations that arise from the Directives of the European Union. The system of public procurement in EU is present for more than 50 years and it is dynamic. The Directive of Public Procurement in the EU dates back to 1964 and has been amended on continuous bases. The last directives in relation to public procurement have been in force from 2014 (see more Kashta 2015).

One of the Model Laws of Procurement is the UNCITRAL (United Nations Commission on International Trade Law), which was developed in 1994 (Asia-Pacific Economic Cooperation-APEC 1999). The system of public procurement in Kosovo is regulated by law, which has been developed in accordance with the European Directives, which are in turn adopted by the Council of the European Union and the European Parliament.¹ Public procurement strategies, adopted by the European Union, are aimed at improving the performance of public procurement.

¹ Public Procurement Regulatory Commission in Kosovo. <https://krpp.rks-gov.net/>

Public procurement in Kosovo began in 1999 and is governed by the Administrative Instruction (Duli 2011). In 2004, the Government of Kosovo introduced the first procurement Law (Law No. 2003/17), which has been amended on a continuous basis. The latest changes were introduced with the approval of the Parliament of Kosovo of Law No. 04/L-237, Law No. 05/L-068 and Law No. 05/L-092.² The public procurement system in Kosovo is designed in accordance with the directives of the European Council and establishes that all procurement procedures must comply with the EC-Treaty and the free movement of goods, capital and people, a fair treatment of economic operators, promotion of competition and non-discrimination on national, social and environmental grounds (2004/17/EC; 2004/18/EC).

Each public institution in Kosovo is a contracting authority and operates in compliance with the Public Procurement Legislation (Law No. 04 /L-042, 2016). Public procurement in Kosovo is partially centralized and, as demonstrated by experience, this aspect can bear positive effects. Šerpytis et al. (2011) have investigated the financial effects of centralized public procurement. As they show, in year 2010, the level of public procurement centralization was reduced, and this was associated with an immediate and significant increase in financial savings at the state level.

According to the European Commission, the improvement of the efficiency of public procurement hinges on the professionalism of the staff and the de-politicization of the procurement system as well as increased transparency and accountability (EC 2015). One of the main objectives of the Strategy for South Eastern Europe is to improve competitive procedures and integrate regional countries in the European Union public procurement market (RCC 2013).

The countries of this particular region, including Kosovo, share a similar legal and institutional environment and the same concerns regarding how public contracts are awarded. According to the European Commission Reports in 2016, Montenegro, Serbia, Turkey and the Former Yugoslav Republic of Macedonia have achieved a moderate level of development in the field of procurement. For Bosnia and Herzegovina, there has been progress. Albania and Kosovo have scored some results. For all these countries, much remains to be done in the field of further approximation with European standards, transparency and prevention of corruption. New procurement framework implemented by the World Bank aims at maximizing the strategic role of procurement in order to achieve the goals of development effectiveness (World Bank Annual Report 2017).

The standardization of rules and the modernization of public procurement ensures a more efficient use of public funds (EC 2010). The current loopholes that allow for the misuse of public resources and generate uncompetitive forces would be alleviated by the advancement and wider use of the electronic procurement system.

² https://krpp.rks-gov.net/Default.aspx?PID=Legislation&LID=1&PPRCMenu_OpenNode=61

Unfortunately, given our knowledge, research specifically addressing public procurement efficiency in Kosovo is missing. This paper is important in that we intend to shed light on the current situation of the public procurement system in Kosovo.

Procurement in Kosovo is in its novice stages, and its development path has been predominated by the country's difficult political environment. Lacking institutional, financial and management capacities, Kosovo has not been able to modernize and improve the efficiency of procurement and raise its procurement processes up to the standards set by its European peers. Although Kosovo has passed a Procurement Law and the accompanying documentation that treats the theoretical and normative aspects of the procurement area well, it lags behind in practical application. According to the Stabilization and Association Agreement, Kosovo is obliged to harmonize its legislation of public procurement with the European Union and the regulations of the World Trade Organization. After more than a decade having passed since the establishment of the first procurement units in Kosovo, the procurement process in the country has been characterized by a lack of efficiency, exemplified by poor handling of bidding and delivery of services and mismanaged in terms of evaluating tenders and selecting preferred bidders. In a recent evaluation report, the European Commission concluded that Kosovo has made progress in the adoption of the procurement strategy and introduction of electronic procurement but lags behind in the improvement of the institutional capacity and in harmonizing its legislation with the European directives on public procurement. The Public Procurement Strategy in Kosovo of 2017–2021 emphasizes the need to go beyond normative theory, by ensuring a consistent application of the Law across actors in the national and international procurement market.

There are examples of violations of the procurement process in Kosovo and they are numerous. A great number of amortized equipment with an astonishing monetary worth was sold to the Kosovo Energy Corporation at prices higher than the market price, where about 200 private companies have benefited from 500 public bids worth over 500 and 50 million Euros for 10 years (Forum 2015).

One of the mechanisms introduced more recently for improving the system of public procurement has been the platform of integrated systems for electronic communication in public procurement in Kosovo. The advancement of the public procurement system and the implementation of the electronic procurement platform, as a mechanism for combating abuses, increasing transparency and accountability, is a priority of the National Development Strategy in Kosovo (2016–2021). An integrated computer system for planning, purchasing, controlling, managing and maintaining assets helps to improve the efficiency and effectiveness of procurement (Efficiency Unit 2010). E-procurement enables governments to better monitor the process and ensure more transparency and accountability (Commonwealth of Australia 2005). According to the Government Decision No. 12/79, starting in January 2017, electronic procurement became mandatory for all budget organizations in Kosovo (Public Procurement Regulation Commission 2017).

Goals and Objectives

The main objective of our study is to assess the key factors of efficiency of the public procurement system in the actual socioeconomic development context of Kosovo.

The specific objectives of the study are:

- 1) To evaluate the level of efficiency in the public procurement system as perceived by economic operators;
- 2) To identify the major factors that affect the efficiency of public procurement;
- 3) To derive some policy implications.

2. Literature Review

The key principles of public procurement are transparency, competition, equality (e.g., treating economic operators fairly) and the value of money.³ In line with this, in 1999, countries part of the Asia-Pacific Economic Cooperation (APEC) have agreed on the core principles of public procurement. Among others, they include VfM, accountability, fair competition and transparency (APEC 1999). The public funds are spent using procedures that are based on the national legislation regarding public procurement. Under World Trade Organization, spending through public procurement is estimated to be 1.3 trillion Euros (EC 2018). The total spending through public procurement makes up a substantial amount of total GDP in many countries. The role of public procurement could be stated in terms of GDP. In the OECD countries, public procurement is estimated to account for 10–15% of the total GDP. This estimate is even higher in the developing nations, where their spending accounts to be around 25% of their GDP (OECD 2009). This percentage in Kosovo is roughly 8.09% of the total GDP (Public Procurement Regulatory Commission 2014).⁴ Given this considerable amount of the public funds spent through the public procurement system, many policymakers, governments and world organizations consider this a topical issue.

Given this fact and the aim of governments to use public funds more efficiently, public procurement has been in the central debate for many years and has raised the attention of many scholars, researchers and public officials. In this paper, we will explore the closely related literature and present the main findings and results related to the question we address. Using the technique of benchmarking, the functionality of public procurement can be enhanced (Raymond 2008). He argues that the core public procurement principles are value for money (VfM), ethics, competition, transparency and accountability. He argues that VfM is the most important principle among others, given that it aims at fulfilling the needs and achieving the best performance while at the same time respecting priorities and accounting for the budget constraints.

Though literature on public procurement is abundant, little is known, at least to our

³ https://ec.europa.eu/growth/single-market/public-procurement_en

⁴ <https://krpp.rks-gov.net>

knowledge, about Kosovo's specific context in terms of the efficiency of public procurement. According to Gavurová et al. (2017), public procurement is a crucial tool for using public resources efficiently. Similarly, Maina (2018) highlights the importance of the good practices of management on improving efficiency.

The efficient use of public funds has also important implications for economic development and growth. Poor performance in public procurement is a consequence of not following the necessary procedures and processes (Kakwezi and Nyeko 2010). The implementation of standardized regulations in public procurement aims at minimizing irregularities. It is an attempt to reduce risks of potential political influence and prevent corruptive affairs. However, the procurement process experiences frequent irregularities. Hamza et al. (2017) argue that the public procurement process sometimes suffers from a lack of open competition and transparency, poor coordination as well as a lack of trained and qualified procurement professionals competent at managing procurement processes. Public procurement officials can also get involved in corruptive affairs and other illegal activities. Other authors argue that promoting the rule of law and limiting the abuses of public officials is a prerequisite for achieving efficiency in public procurement (O'Donnell 2004). Similarly, Dastidar and Mukharjee (2014) argue that reducing opportunities for corruptive behavior would significantly improve the rule of law and thus the use of public funds. Denmark and New Zealand are one of the best examples of having achieved low levels of corruption and high levels of transparency in public procurement. Despite this, not even the best examples are perfect at fighting corruptive affairs (Rožāns 2016). According to the World Bank, it has been estimated that around \$1.5 trillion is paid by businesses and individuals annually in bribes, and this is estimated to be roughly 2% of the GDP in the world. This, in turn, imposes negative consequences on the economic development and growth (World Bank 2017). Fair and open competition is another important factor that influences the public procurement processes. The OECD argues that ensuring fair competition among potential contractor companies and eliminating any potential corruptive behavior by the responsible actors in state agencies would enhance efficiency in the system of public procurement (OECD 2016). Similarly, Estache et al. (2011) claim that a model of procurement with competitive bids and public-private partnerships could lower the unit cost and enhance the efficiency of public funds. Transparency and accountability are other important factors that affect the efficiency of the system. They are crucial to reducing poverty, boosting economic growth and improving social welfare. The World Bank's spending amounts to \$3.9 billion for helping countries improve the performance and accountability in their public sectors.

Electronic procurement is considered to be very important in achieving a higher level of efficiency in the public procurement system. It has been argued by many authors and organizations that the electronic platform improves the process of purchasing, negotiations and selection of contractors (Croom and Brandon 2007). Electronic procurement promotes competition and makes the selection process of the economic operator from

the contracting authorities more efficient (EBRD 2015). Similarly, other authors argue that electronic procurement creates conditions for a more competitive and efficient environment for economic operators by reducing bureaucracy throughout the stages of procurement, increasing transparency, improving the documentation of procedures, removing the geographic barrier as well as allowing for a large pool of bidders in the spirit of higher competition (Kashta 2014). What electronic procurement also does is help save a substantial percentage of procurement funding. In the European Union procurement market, savings estimated from switching to electronic procurement range between 5 to 20 percent in 2010. Based on these estimates, as much as 100 billion Euros in savings could be added to the public budget annually, which is equivalent to the construction of 150 major hospitals. Based on Kosovo's approximately 500 million Euro budget spent on public procurement (Report, PPRC 2007–2017), if 5 percent of this amount were to be saved every year by using electronic procurement, the country's budget would increase by as much as 35 million Euros annually. Similarly, research shows that benefits accruing from electronic procurement could range anywhere between 6 and 13.5 percent of total public expenditure (Hunja 2012).

Research Hypotheses

Based on findings presented in literature and our own objectives, we formulate the following research hypotheses:

1. Given that Kosovo is a new state with a fragile government and institutional framework as well as an unconsolidated rule of law and institutions, we expect a substantial level of inefficiency in the public procurement system.
2. A lack of transparency during the procurement process, the corruption of procurement officials through bribery, political pressure and a lack of capacities for implementing the relevant legislation and managing procurement contracts, as well as a lack of procurement-related knowledge in the procurement staff, are expected to be the major determinants of the efficiency of the procurement system in Kosovo.
3. We expect political intervention, non-transparency and corruption to be the most important in the hierarchy of the factors of efficiency.

3. Data and Methodology

In this study, primary data are used. A simple random sampling technique is used to select economic operators from their population. Kosovo is a small country and as such, the population of economic operators is relatively small. For an economic operator to be possibly selected, we put one criterion: it should have participated in public bids at least three times and from these it should have announced a winner in at least one case. From a total of 554 economic operators, we randomly selected 262, but only 243 of them have been considered correct, which is 43.9% of the total number of operators. In addition,

based on the official statistics of the Republic of Kosovo, in year 2015, the total value of contracts signed by the economic operators was 401,843,625.10€. The money value that 243 economic operators received is about 44% of this total value.

Randomness, experience in public bidding and a large number of respondents guarantee a highly representative research sample.

To collect data, we have used a face-to-face survey with our respondents. We measure all data variables with a Likert scale, as shown in Table 1.

TABLE 1. The variables and their measurement scale

Full name of the variable	Short Name	Measurement Scale	Symbol
Lack of knowledge about procurement	Knol	Likert, 1 to 5 ⁵	X ₁
Lack of capacity to manage tender contracts	Contr	Likert, 1 to 5	X ₂
Lack of capacity to implement procurement legislation	Legisl	Likert, 1 to 5	X ₃
Discrimination criteria in procurement	Discr	Likert, 1 to 5	Y ₁
Corruption of procurement officials	Corr	Likert, 1 to 5	X ₄
Non-transparency of procurement	Nontr	Likert, 1 to 5	X ₅
Political intervention in procurement	Polin	Likert, 1 to 5	X ₆
Favor to specific operators to win tenders	Favor	Likert, 1 to 5	Y ₂
Efficiency of the procurement system	Effect	Ratio scale	Y ₃

Source: data surveyed by the authors.

The five categories of the ordinal variables are “1 = not present,” “2 = a little present,” “3 = present enough,” “4 = present” and “5 = very present.” In addition, we include efficiency of the procurement system in Table 1 as a ratio data variable under the name “effect,” which, as we explain in the methodology section below, it is the arithmetic average of the variables *favor* and *discrimination*.

The research methods used in this study are descriptive (statistical) analysis and econometric modeling. As highlighted in literature, it is rather challenging to directly measure the degree of efficiency of the public procurement system. In this paper, we use *favor* given to specific operators to win tenders and *discriminating* tender criteria as two proxies for the efficiency of the procurement system as dependent variables (see Table 1). Note that higher levels of these variables mean higher degrees of inefficiency, so the efficiency level would be the difference between 5 and the level of inefficiency as represented by the scores of these variables.

Favoring could serve as an indicator of possible abuse of power, misuse of funds and low public procurement efficiency. Favoring potential contracting companies means disregarding merits and the quality of offers as a basis for selecting the right economic

⁵1 = not present, 2 = a little present, 3 = present enough, 4 = present, 5 = very present.

operator. Favoring might occur due to corruptive behavior, such as bribes given to procurement officials or the political affiliation of competing companies.

We argue that there can be a certain degree of complementarity between these two variables, because essentially, one cannot favor specific companies without discriminating against others. Thus, they may measure the same phenomenon – in this case, the level of efficiency. Given this, we use the mean of the two above proxies, under the name *effect*, as a third dependent variable alternative.

The variables “a lack of knowledge,” “a lack of capacity to manage contracts,” “a lack of capacity to implement legislation,” “non-transparency” and “political intervention” are posited in the procurement process as potential factors or determinants of the efficiency level. Using three different variables and by comparing the findings of each case helps to obtain better results and understand how reliable and consistent they are.

The types of econometric models that are used are the classical and ordinal multinomial logit (o-logit) econometric models.

The classical linear model we use with the variable *effect* is a dependent variable, which is non-ordinal. In this case, the independent variables are ordinal. Two options may be applicable here (Wooldridge 2013).

The first option is when ordinal independent variables are used directly in the model as if they were continuous and then estimating the model using OLS. The general form of this model is:

$$Y = b_0 + b_1X_1 + b_2X_2 + \dots + b_kX_k + e \quad (1)$$

Where Y is the dependent variable, X_i are factors or independent variables and b_0 is a free parameter that shows the expected value of Y when all factors are equal to zero. Parameters a_i for $i=1, 2, 3, \dots, k$, are partial regression coefficients. Each coefficient shows the marginal increase of Y for a given independent variable when all other factors are held constant. The variable *effect*, being an average of two ordinal variables, is essentially a quantitative, continuous variable, whereas the independent variables are ordinal. There is an additional assumption taken when the independent variable is ordinal – that the categories of the ordinal variable (or variables in multiple regression models) should be equidistant; otherwise, the interpretation of the regression coefficient may have no sense, because, as Wooldridge argues, the regression coefficient is a constant change of effect for one unit’s change of the ordinal variable. This would be correct if the distance between any two adjacent categories is the same. Usually, not only in our case, one cannot be sure about the fulfillment of this supposition; thus, it is better not to interpret the regression coefficient. But the model could serve in assessing whether the relationship between the effect and the ordinal variable is positive or negative and whether it is significant or not.

Another modeling option, or the best option as Wooldridge recommends, is to replace the ordinal variables by dummy variables. If an ordinal variable has m categories, then,

instead of this ordinal variable, we can include dummy variables in the regression model ($m-1$). In this case, the first category serves as a base, and for that reason no dummy has to be assigned to the first category. Since, in our case, we have $m=5$ categories for each of the independent variables, we need 4 dummies for each ordinal variable. The way we construct the dummy variables is as follows:

$D_2=1$ if category 2 and 0 otherwise (1, 3, 4, 5), $D_3=1$ if category 3 and 0 otherwise (1, 2, 4, 5)

$D_4=1$ if category 4 and 0 otherwise (1, 2, 3, 5), $D_5=1$ if category 5 and 0 otherwise (1, 2, 3, 4)

In the case of one ordinal independent variable with five categories, this model would look like this:

$$Y = c_1 + c_2D_2 + c_3D_3 + c_4D_4 + c_5D_5 + e \quad (2)$$

In a model with these dummies, the coefficient c_1 is the expected value of Y for the first category of the independent variable; the coefficient in front of dummy D_2 is simply the difference between the expected values of the dependent variable *effect*, between the independent variable category 2 and the first category; the coefficient in front of dummy D_3 is simply the difference between the expected values of the dependent variable *effect*, between the independent variable category 3 and the first category.

It is possible to include all dummies for all independent variables in one model, but the problem of collinearity may occur. In this case, simpler, one-factor models can be estimated. For all models, we can calculate the total variance TSS of Y and residuals, or unexplained variance, as follows:

$$TSS = \sum_i (Y_i - \bar{Y})^2 \quad RSS = \sum_i e_i^2 \quad (3)$$

They are used to calculate the coefficient of determination:

$$R^2 = 1 - \frac{RSS}{TSS} \quad (4)$$

This coefficient is the percentage of the total variance of Y , explained by the variance of the factors included in the model. For the model to be acceptable, it should be statistically significant; the parameters need to be significant as well. In addition, the normality of the model residuals, a lack of co-linearity among independent variables and the constant variance of residuals (called homoscedasticity in econometric terminology) need also be tested for a model to be accepted.

To test whether a set (or all) of the coefficients for a specific ordinal variable have a jointly significant effect on efficiency (favor or discrimination), the LR or F tests can be used. To conduct a LR test, the LR statistics should first be calculated:

$$LR = -2(L_r - L_u) \quad (5)$$

Here L_u is the Log likelihood (LogLik for short) for the unrestricted model. The unrestricted model is model (2) with both constant c_0 and four dummies. L_r is LogLik for the restricted model. The restricted model is model (2) containing only the constant c_0 . LogLik for each model can be calculated using their respective RSS using the formula:

$$\text{LogLik} = -\frac{n}{2}[1 + \ln(2\pi) - \log(n)] - \frac{n}{2}\ln(\text{RSS}) \quad (6)$$

The null and the alternative hypotheses we test against are:

$$\mathbf{H}_0 = c_2 = c_3 = c_4 = c_5 = 0, \mathbf{H}_1 = \text{Not all } c \text{ coefficients are zero} \quad (7)$$

The LR statistics have a χ^2 distribution with s degrees of freedom, where s is the number of restrictions in the null hypothesis (4 in the above H_0). If $P(\chi^2 > LR) < \alpha$, then the null hypothesis is not accepted, which means that the ordinal variable in consideration has a significant effect on efficiency. Since we have many models (as many as the number of independent variables) to choose from, the best model to use for us is the AIC criterion. AIC can be calculated for each model by the formula:

$$\text{AIC} = -2(\text{LogLik}) + 2k \quad (8)$$

The best model is the one with smaller AIC.

We also use the ordered logit model (o-logit model). The ordered logit model does not make assumptions about the distance between the adjacent levels of the ordinal variable and takes the ordering into account at the same time. In a multinomial model, the dependent variable is multi-category, such as level of efficiency as represented by the proxy variables of *favor* and *discrimination*. The general form of the ordered multinomial model with m categories of the dependent variable, if the first category is set as a base category, is:

$$P_j = \frac{\exp(a_j - BX)}{1 + \exp(a_j - BX)} \quad \text{for } j=1, 2, 3, \dots, m-1 \quad (9)$$

The left-hand side variables P_i are cumulative probabilities for an individual to be in the i^{th} or lower categories for given values of factors X . Thus, for example, P_1 denotes the probability or chances for the effectiveness to be at level 1 for the given values of X . P_2 denotes the probability or chances for the effectiveness to be at level 1 or 2 for the given values of X . P_m is one. The regression coefficients are the same for each category, but the free parameter is specific for each category. Free parameters a_j are called *cut points*; they are hurdles or thresholds for outcomes of BX for the given values of variables X . For an ordinal variable of five categories, we have four cut points, cp_1 , cp_2 , cp_3 and cp_4 . If, for an individual, (economic operator) $BX \leq cp_1$, then for this individual, the efficiency is expected at level 1; if $cp_1 < BX \leq cp_2$, then efficiency is expected at level 2; if $cp_2 < BX \leq cp_3$, then efficiency is expected at level 3; if $cp_3 < BX \leq cp_4$, then efficiency is at level 4. If $BX > cp_4$, then efficiency is expected at level 5.

As independent variables in the o-logit model, we use the ordinal variables or their dummies, as in the case of the classical linear model. The logistic model is estimated using the maximum likelihood estimator. Again, some caution is needed when using this model, because co-linearity among dummies might be a serious problem in this. If this is the case, a simpler, one-factor (or one with four dummies) model can be used. Testing for any significant effect of the independent variables can be done similarly as for the linear model using the LR test.

For more technical details about the classical descriptive statistics, regression models and multinomial modeling, one might refer to Gujarati (2003), Wooldridge (2013), Osmani (2017) and Verbeek (2008). We use GRETl econometric software to estimate the logistic models. SPSS and EViews can also be used as alternatives.

4. Results

In this section, we present the results of our research. First, we have conducted a restricted descriptive analysis for all variables. The results drawn from this analysis are presented in Table 2.

TABLE 2. Descriptive statistics

	Knol	Discr	Corr	Nontr	Polln	Favor	Legisl	Contr
Average	3.9587	3.9753	4.1564	4.1297	4.1303	4.1814	3.9380	3.9547
Standard deviation	1.0177	1.1568	1.3049	1.2915	1.2909	1.1108	1.0664	1.1400
Coefficient of variation	0.25707	0.29100	0.31395	0.31273	0.31256	0.26565	0.27080	0.28826

Source: data surveyed by the authors.

It is evident that all variables resulted in high, close to maximum levels of averages (present and very much present levels). Based on the level of corruption, these findings tell us that it is more than present (average $4.1564 > 4$). In comparing averages, we can say that corruption and favors during the process procurement are the most problematic phenomena in public procurement in general. If observed, the standard deviations or the coefficients of variation show that the economic operators are not very heterogeneous in terms of their opinion about the level of the variables and the phenomena they represent.

To obtain a first impression about the association between efficiency in public procurement and its factors, we calculated the averages of variables by the level of discrimination and favor as alternative variables of efficiency (Tables 3 and 4). Figures in the tables are the inefficiency scores; thus, to calculate the efficiency levels, we should subtract them from one.

Based on Table 3, it can be easily assessed that higher levels of discrimination are associated with higher average levels of all variables, which means that a positive association may exist between discrimination as a proxy of procurement efficiency on the

one side, and knowledge, political intervention, non-transparency, corruption and a lack of capacity to manage procurement contracts on the other. A positive association also seems to exist between the two variables of efficiency (favor and discrimination).

TABLE 3. The average of variables by Discrimination as a variable of efficiency

Discr	Knol	Favor	Polln	Legisl	Nontr	Corr	Contr
1	2.91	2.58	2.17	2.08	2.00	2.08	2.50
2	3.53	3.43	3.29	3.60	3.21	3.53	3.47
3	3.65	3.65	3.68	3.58	3.69	3.63	3.54
4	3.92	4.14	4.22	3.93	4.32	4.23	3.88
5	4.29	4.74	4.61	4.35	4.58	4.67	4.41
Average	3.96	4.18	4.13	3.94	4.13	4.16	3.95

Source: data surveyed by the authors.

The same association seems to also exist between favor as a variable of efficiency and all the other variables (Table 4).

TABLE 4. The average of variables by Favor as a variable of efficiency

Favor	Knol	Discr	Polln	Legisl	Nontr	Corr	Contr
1	2.56	2.10	1.00	2.20	1.50	1.00	2.20
2	2.77	3.23	2.00	2.85	2.23	2.00	2.77
3	3.66	3.14	2.96	3.59	2.83	3.03	3.69
4	4.16	3.77	4.28	3.98	4.26	4.32	4.05
5	4.14	4.46	4.77	4.21	4.76	4.77	4.19
Average	3.96	3.98	4.13	3.94	4.13	4.16	3.95

Source: data surveyed by the authors.

Based on the above results, the favor and discrimination that were evaluated at 4.18 and 3.98, respectively, in public procurement are almost at the “present” level, which means that the level of inefficiency is rated to be high (while the level of efficiency is rated to be low, if not very low).

Following econometric modeling, we estimated separate efficiency logistic models with *favor* and *discriminations* as ordinal dependent variables, as shown in Table 5.

Taking the first category as a base, we denote four dummies by DK2 to DK5 for the variable Knowledge. We have similarly denoted four dummies by DC2 to DC5 for the variable Contracts, four dummies by DL2 to DL5 for the variable Legislation, four dummies by DN2 to DN5 for the variable Non-transparency and four dummies by DP2 to DP5 for the variable Political intervention.

First, we try the multiple econometric modeling including in it all dummies for all variables. For this model, we calculated the VIF (Variance Inflation Factors), which have showed high collinearity levels among the dummies of different ordinal variables (not presented here). Collinearity affects both signs and values of the regression coefficients and the whole inference process; therefore, we preferred to estimate the simple dummy regression models. These models for both variables of efficiency are presented in table 5.

There are ten models altogether in Table 5, five for each efficiency variable. Each equation could be used to calculate probabilities or chances for the efficiency to be in one or another level for the specific values of the dummies. For every equation, we performed the LR test, which shows that all factors – from a lack of knowledge to political intervention – significantly and positively affect the levels of both variables of inefficiency; their effect on efficiency is otherwise negative. These results are the same for each of the efficiency variables.

TABLE 5. Ordered logistic, dependent variables of *favor* and *discrimination*

Favor as an efficiency variable					Discrimination as an efficiency variable				
Variables	Coeff.	Std. Error	P-value	Sign.	Variables	Coeff.	Std. Error	P-value	Sign.
Lack of knowledge about procurement									
LogLik=-272,6; LR=65,4, P=0,00, AIC=559,2					LogLik=-307,07, LR=74,6; P=0,00, AIC=628,1				
DK2	-1,797	0,589	0,0023	***2	-1,849	0,533	-3,472	0,001	***
DK3	0,197	0,335	0,5576		-0,417	0,316	-1,320	0,187	
DK5	1,105	0,305	0,0003	***	0,910	0,292	3,114	0,002	***
cp 1	-3,159	0,391	<0,0001	***	-3,179	0,362	-8,792	<0,0001	***
cp 2	-2,113	0,278	<0,0001	***	-2,195	0,272	-8,070	<0,0001	***
cp 3	-1,012	0,218	<0,0001	***	-0,767	0,211	-3,632	0,000	***
cp 4	0,207	0,206	0,316		0,391	0,205	1,906	0,057	*
Lack of capacity to manage contracts									
LogLik=-274,2; LR=68,3, P=0,00 AIC=564,5					LogLik=-302,92; LR=88,7, P=0,00 AIC=621,8				
DC2	1,242	0,856	0,147		-0,256	0,831	-0,3077	0,758	
DC3	1,087	0,746	0,145		0,600	0,747	0,803	0,422	
DC4	2,168	0,755	0,004	***	1,468	0,749	1,961	0,050	**
DC5	2,608	0,740	0,000	***	2,312	0,740	3,122	0,002	***
cp 1	-1,410	0,720	0,050	*	-1,834	0,739	-2,482	0,013	**
cp 2	-0,434	0,711	0,542		-0,888	0,721	-1,232	0,218	
cp 3	0,631	0,710	0,374		0,540	0,712	0,758	0,448	
cp 4	1,849	0,715	0,010	***	1,753	0,717	2,446	0,014	**

⁶ (***) means significant at level 1%, (**) means significant at 5% and (*) means significant at 10% level of significance.

TABLE 5 (continuation). Ordered logistic, dependent variables of *favor* and *discrimination*

Favor as an efficiency variable					Discrimination as an efficiency variable				
Variables	Coeff.	Std. Error	P-value	Sign.	Variables	Coeff.	Std. Error	P-value	Sign.
Lack of capacity to implement legislation									
LogLik=-268,2; LR=78,9, P=0,00 AIC=552,5					LogLik=-298,86, LR=93,7, P=0,00 AIC=613,7				
DL2	1,250	0,959	0,192		1,022	1,033	0,989	0,323	
DL3	1,399	0,884	0,113		1,721	0,988	1,741	0,082	*
DL4	2,528	0,879	0,004	***	2,540	0,979	2,595	0,009	***
DL5	3,316	0,887	0,000	***	3,657	0,988	3,701	0,000	***
cp 1	-1,046	0,840	0,213		-0,723	0,933	-0,775	0,439	
cp 2	-0,048	0,844	0,955		0,268	0,952	0,281	0,778	
cp 3	1,051	0,852	0,217		1,714	0,960	1,785	0,074	*
cp 4	2,318	0,858	0,007	***	2,914	0,966	3,016	0,003	***
Non-transparency									
LogLik=-221,05; LR=174,6 P=0,00 AIC=458,1					LogLik=-293,93; LR=94,3, P=0,00 AIC=603,9				
DN2	1,344	0,649	0,038	**	-0,075	0,647	-0,1164	0,907	
DN3	2,181	0,634	0,001	***	0,561	0,606	0,927	0,354	
DN4	4,565	0,690	<0,0001	***	1,569	0,589	2,666	0,008	***
DN5	5,360	0,634	<0,0001	***	2,423	0,531	4,565	<0,0001	***
cp 1	-0,594	0,491	0,226		-1,625	0,531	-3,061	0,002	***
cp 2	0,672	0,503	0,182		-0,687	0,503	-1,365	0,172	
cp 3	2,380	0,561	<0,0001	***	0,874	0,502	1,741	0,082	*
cp 4	4,351	0,613	<0,0001	***	2,099	0,514	4,086	<0,0001	***
Political intervention									
LogLik=-207,2; LR=197,8, P=0,00 AIC=430,4					LogLik=-293,51; LR=91,6, P=0,00 AIC=603,01				
DP2	1,128	0,683	0,099	*	0,603	0,653	0,924	0,356	
DP3	2,435	0,690	0,000	***	0,658	0,576	1,143	0,253	
DP4	4,607	0,715	<0,0001	***	2,138	0,544	3,931	<0,0001	***
DP5	6,200	0,704	<0,0001	***	2,623	0,492	5,336	<0,0001	***
cp 1	-0,539	0,492	0,273		-1,339	0,484	-2,769	0,006	***
cp 2	0,916	0,546	0,093	*	-0,403	0,456	-0,8839	0,377	
cp 3	2,856	0,625	<0,0001	***	1,122	0,458	2,449	0,014	**
cp 4	4,997	0,681	<0,0001	***	2,354	0,474	4,969	<0,0001	***

Source: Authors' survey data

Based on LR probabilities, we can say that every model is significant. Based on the coefficients' probabilities, we understand which of the coefficients are significant and which are not. The effect of all factors on efficiency is significant. Based on the AIC values, which are lower in the case of political intervention and non-transparency, we conclude that for both efficiency variables, the models for political intervention and non-transparency are the best ones as regressors, which also means that the most in-

fluencing factors on the efficiency of public procurement are political intervention and non-transparency.

Following Wooldridge, the last step of our analysis is to take the variable “effect” as the dependent efficiency variable, while taking Knol, Contr, Nontr, PolIn and Legisl as independent ordinal variables. The dependent variable is not multinomial, so we are able to estimate a classical regression model using an OLS estimator (Table 6).

TABLE 6. Models for the dependent variable *Effect* with dummies for each explanatory variable

Base category = *Not present*

	Coefficients	Std. error	t-value	P-value	
Lack of knowledge about procurement ($R^2=0.153$, $P = 1.34e-08$)					
Const	3.93750	0.0999336	39.40	<0.0001	***
DK2	-1.15179	0.269741	-4.270	<0.0001	***
DK3	-0.0528846	0.163974	-0.3225	0.7473	
DK5	0.494318	0.141327	3.498	0.0006	***
Lack of capacity to manage contracts ($R^2= 0.176$, $1.34e-08$)					
const	2.95000	0.297826	9.905	<0.0001	***
DC2	0.314706	0.375336	0.8385	0.4026	
DC3	0.665385	0.325205	2.046	0.0419	**
DC4	1.19407	0.322079	3.707	0.0003	***
DC5	1.44048	0.311686	4.622	<0.0001	***
Lack of capacity to implement legislation ($R^2=0.2196$, $P = 4.67e-12$)					
Const	2.64286	0.346914	7.618	<0.0001	***
DL2	0.567669	0.405818	1.399	0.1632	
DL3	0.889752	0.372375	2.389	0.0177	**
DL4	1.46964	0.361773	4.062	<0.0001	***
DL5	1.83492	0.360152	5.095	<0.0001	***
Non-transparency ($R^2=0.463$, $P= 1,48e-30$)					
const	2.52778	0.174182	14.51	<0.0001	***
DN2	0.354575	0.249926	1.419	0.1573	
DN3	0.779915	0.226591	3.442	0.0007	***
DN4	1.59343	0.216536	7.359	<0.0001	***
DN5	1.98257	0.184677	10.74	<0.0001	***
Political Intervention ($R^2=0.487$, $P=1,07e-32$)					
const	2.42500	0.161500	15.02	<0.0001	***
DP2	0.467857	0.251680	1.859	0.0643	*
DP3	0.847727	0.223145	3.799	0.0002	***
DP4	1.73354	0.196991	8.800	<0.0001	***
DP5	2.08564	0.172575	12.09	<0.0001	***

Source: data surveyed by the authors.

From the table, we can conclude that all variables in general have a significant effect on the efficiency of public procurement. We can also assess that for each variable, the regression coefficients of the dummies are moving upward. Just for an illustration of how these coefficients can be interpreted, we could take the case of the coefficient for dummy DC5 of 1.44048. This is the difference in the efficiency score of an operator with a *contract* score 5 and an operator with a contract score 1. The coefficient 0.779915 for DN3 is the difference in the efficiency score of an operator with a *non-transparency* score 3 and an operator with a non-transparency score 1.

Results obtained by different approaches (descriptive and econometric) support each other *inter alia*, as they provide similar results – this tells much about their consistency.

Finally, we have estimated a model of effect regressed on corruption. There is a significant positive relationship between the level of corruption and the level of efficiency, as shown in Table 7.

TABLE 7. The heteroscedasticity-corrected model, dependent variable *Effect*

Variable	Coefficient	Std. Error	t-ratio	p-value	Sign.
Corr	0.924515	0.00946009	97.7279	<0.00001	***
R-squared	0.211534		Adjusted R-squared	0.211534	
F(1. 236)	63.31529		P-value(F)	7.35e-14	

Source: data surveyed by the authors.

It is evident that higher levels of corruption are associated with higher levels of inefficiency, as measured by the variable effect.

5. Discussion

Generally speaking, the results that we have obtained are in line with findings from other literature sources and research hypotheses. As expected, the level of the efficiency of public procurement is very low. Speaking on efficiency in terms of the levels of corruption, we find that the aggregate corruption level is 4.16. In terms of favoring certain operators, the aggregate level is 4.18, while in terms of discrimination, the average level is 3.97. As such, these results show high levels of inefficiency or a very low level of efficiency in the public procurement system. They are also in line with the findings of the Kosovo Democratic Institute (KDI). Thus, the hypothesis of the low efficiency of the procurement system in the Republic of Kosovo is accepted.

If we now discuss our general findings in terms of the factors of efficiency, these are also in line with findings in literature and have coincided with our expectations. Thus, a lack of transparency and open competition, as well as a lack of trained procurement staff, are the major factors of the inefficiency of public procurement (Raymond 2008; Hamza

et al. 2017; O'Donnell 2004; Estache et al. 2011). Good legislation, in terms of the law and procurement regulations, also plays a crucial role in achieving an efficient use of public funds (OECD 2009). As it is expected and supported by the literature, accepting bribes and the generally corrupt behavior of procurement officers are the major factors of the low efficiency of procured public funds (Dastidar and Mukherjee 2014). We find that political intervention and non-transparency are one of the main determinants of the low efficiency in the public procurement system. This is followed by a poor implementation of procurement legislation, a lack of capacity for managing procurement contracts and an insufficient knowledge of how should procurement procedures should be properly implemented. The overall results from alternative models show us that the research hypotheses about the factors of the efficiency of the procurement system are accepted.

6. Conclusion

We have analyzed in this paper the current situation and the main determinants of efficiency in the public procurement system in Kosovo. We conducted a survey with 243 economic operators in our research study. We use a mixed research approach consisting of a descriptive analysis and a multinomial and classical regression. In addition, we use discrimination tendering criteria and favoring to win tenders as well as their average to measure the level of efficiency in public procurement. Our results indicate that efficiency in public procurement is low. In terms of corruption, the level of inefficiency is around 4.2 out of 5. This is consistent with the findings of the Kosovo Democratic Institute (KDI) in 2016.

In terms of what impacts more the level of efficiency of public procurement in Kosovo, we conclude that among the major factors that impair the efficiency of public procurement are political intervention, non-transparency, corruption, a lack of capacity for implementing legislation and managing contracts as well as a lack of knowledge.

To raise the level of efficiency in public procurement, we recommend introducing measures aimed at enhancing transparency, improving legislation, recruiting highly qualified staff, raising awareness about the potential risks and consequences of illegal activities, providing continuous trainings to the procurement staff, introducing specific tracking techniques, enforcing sanctions and other specifications that would aim at combating illegal and corruptive activity.

Generally speaking, achieving these objectives requires a highly regulated procurement. This does not come without costs and sometimes has little success in preventing corruptive affairs (Schapper et al. 2006). A limitation of this paper is that it is based on the perceptions of economic operators. As such, it is only a beating pulse and provides only a general assessment of the efficiency of public procurement. A document-based study is recommended to alternatively assess the situation by an investigation based on monitoring, controlling and evaluating the documents for selected procurement contracts.

As recommended in other literature (Kumar et al. 2015), in order to find the sources of the inefficiency of public procurement, one needs to collect data on the steps of the procurement processes and possibly utilize the information in identifying the best procurement outcome practices and, consequently, use these practices as benchmarks for improving the overall processes.

Future studies might also focus on a comparison of different public procurement systems across countries and compare the results of the efficiencies with those in the region as well as the respective implications to transparency, accountability and corruption.

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