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**THE AFTERMATH OF USING COMPETITIVE SEALED BIDS IN THE  
PUBLIC PROCUREMENT**

**REZULTATI UPORABE AUKCIJA SA ZATVORENIM PONUDAMA U  
JAVNOJ NABAVI**

***ABSTRACT***

*Relying on the transaction cost approach, this study examines some empirical evidence on public procurement in Croatia in order to clear some doubts on public procurement procedures. Public procurement procedures function as auctions: requiring bidders to compete against each other making auctions to be price and time efficient. The theoretical argumentation behind successful auctioning, when compared to bilateral negotiation, is that bidders tend to pay more attention towards potential actions of their competitors and are less focused on the bilateral arrangement with actual buyer or seller. For that reason, auctions are efficient in obtaining goods or services whenever the bidder believes that competition is fierce. This effect is likely in auctions with competitive sealed bids, where information about the presence and the identity of others bidders is hidden until the end of the bidding process. Another expected advantage of auctions with sealed bids is constricting corruption i.e., sealed bids auctions are mode of choice for organizing public procurement in EU. In this research we present the result of an empirical study about the public procurement processes in Croatian local administrative units (LGUs). Online survey was conducted containing 29 questions that gathered response from 201 LGU. Statistical analysis is deployed for establishing patterns and reaching conclusions. We were unable to statistically confirm the influence of either LGU capacity or object of transaction/bidding on the efficiency of the public procurement process which led us to conclusion that the dominant impact on public procurement durations is made by its strict regulation.*

**Key words:** *Public procurement, Auctions, Efficiency, Transaction Costs, LGUs*

**SAŽETAK**

*Oslanjajući se na teoriju transakcijskih troškova, u ovom se istraživanju putem empirijskog pristupa ispituje postupak javne nabave u Republici Hrvatskoj kako bi se razjasnile postojeće dvojbe vezane uz procedure javne nabave. Procedure javne nabave se provode kroz aukcije, što ih putem traženja prijavitelja da se međusobno nadmeću čini vremenski i cjenovno efikasnim. Teorijska potpora uspješnog licitiranja, u usporedbi s običnim pregovaranjem, nalazi se u činjenici da ponuđači nastoje biti više usredotočeni na potencijalne postupke svojih konkurenata, a manje na bilateralni dogovor s kupcem ili prodavateljem. Iz tog su razloga licitacije dobre za dobavljanje roba ili usluga dok god ponuditelji vjeruju da sudjeluju u intenzivnom nadmetanju. Taj je fenomen češći u aukcijama sa zatvorenim ponudama u kojima su informacija i identitet ostalih natjecatelja nepoznati do kraja procesa. Dodatna očekivana prednost zatvorenih ponuda jest očekivano smanjivanje korupcije tj. proces javne nabave u EU je osmišljen kroz provedbu aukcija s zatvorenim ponudama kako bi se smanjila opasnost od potkupljivanja javnih službenika. U ovom će se istraživanju predstaviti rezultati empirijskog istraživanja procesa javne nabave u jedinicama lokalne uprave (JLU) Republike Hrvatske. Online anketa je provedena kroz 29 pitanja i prikupljeni su odgovori od 201 jedinice lokalne uprave. Za utvrđivanje obrazaca i formuliranje zaključaka korištena je statistička obrada dobivenih podataka. Statistička značajnost utjecaja kapaciteta JLU ili objekta nabave na efikasnost transakcije/aukcije nije potvrđena. To je dovelo do zaključka da je čimbenik od najvećeg utjecaja na trajanje javne nabave stroga zakonska propisanost postupka.*

**Ključne riječi:** Javna nabava, licitacija, efikasnost, transakcijski troškovi, JLU.

## 1. Introduction

A raising prominence of public-procurement discussions indicates that historical developments in the functional demarcation between the public and private economic domain. The introductory part of the paper outlines the importance of understanding public procurement processes and in its economic implications.

The importance of public procurement for maintaining the efficiency and quality in providing public services is a central topic of perpetuated discussions. In fact the European Commission is presently supporting a wide debate on the issue as an introduction into a process of „major update to the public procurement standard“. This discussion represents only the latest in a series of steps designed to increase the transparency and efficiency of public procurement procedures (Targeted consultation on eForms - the next generation of public procurement standard forms). Converting this dilemma into economic discourse, positions this research along the path of directing EU economy to become more resource-efficient, allowing for sustainable economic growth, supported by a competitive economy. This goal, complemented by a request for fair distribution of the cost and benefits, is explicitly listed as broader EURO 2020 guidelines (p. 6).

An appraisal of efficiency of service provision requires defining service efficiency and service inside a technical system comprising of resources enabling operations (service provision) and resources engaged in administering processes.

## 2. Basic theoretical concepts

When it comes to theory, we revert to the basic Coase-an explanations of reasons why firms exist (and on the relative importance of administrative delimitations) and distinction among organizational modes, i.e. firm boundaries and control mechanisms over specific assets, as

these terms are understood by transactions cost theory (TCE) (Coase, 1937, Williamson, 1985, 2002). TCE, provided by Williamson, enabled economists to ponder on the economic consequences of the corporate. Perhaps the most important contribution of TCE has been that fact that it allowed us to disentangle technologically provided efficiencies from efficiencies in the control processes (organizational arrangements).

When we consider the administrative (governmental units) as legal entities, they are nevertheless parts of the same service provision process. The institutional border among two legal entities mainly signifies that a legal division has been created (allowing for divided appraisal of costs and earnings at the level of each legal subject); over a single value creation process, or technological process, and that *perhaps* even legal technological division of labor. If this administrative division of functions can allow for a more *intensive* control of efficient allocation on investments, then service users, i.e. the citizens, should benefit and theory would describe such a situation of control power detachment (allocation of power towards a public body/entity) as economically efficient.

The specification when public procurement occurs is essentially a situation where responsibilities of planners and “enablers”, or government units, have been separated from the activities of direct service “providers”, whether as independent private companies or publicly own facilities. The exact organizational arrangement to be found in a specific community is often a product of historical paths of institutional development. The question that comes out is: can society (citizens) expect to have lower costs (or higher quality of services) if the administrative and operative (service provision) functions are provided by distinct business entities.

Access to markets and the possibility of independent service providers to access a bidding process for public procurement contracts, in the TCE explanation, becomes a mechanism that allows for flexibility in service provision.<sup>1</sup> For the government body/public entity, contracting-out becomes itself a *governance tool* employed by the central government (society), its role being the reduction of allocation risks, and a design of *specific service* in accordance with specific local needs in a specific moment. On the other hand, separating administration from provision, is also a tool for allocating *technical* decisions to the better informed party, a specialized service provider. In the continuous process of social service provision, the specialized service provider is the contract party that has a better understanding of technology, operations and markets, and who, by being able to provide services to several principals, is definitely better positioned to achieve economies of scale.

So, by understanding public service provision as a single *technological* process, the question of organizational arrangements that control the efficiency of the bargaining process among the public and private sector can be reframed as a question of administrative capacity and performance capacity. The next question arising is what are the implications of standardizing or regulating public procurement procedures. In theory, the effect of regulation on markets relations is a shift in negotiation positions among parties on the supply or demand side.<sup>2</sup> In reality, the factors affecting process time in private sector market transactions depend on the

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<sup>1</sup> The implication of separating administrative tasks from operational activities is latter employed for distinguishing two levels of efficiency in the public-procurement process; one if process time (suggesting savings in administrative costs), the other being service functionality (suggesting gains in acquired value).

<sup>2</sup> However, public procurement regulation for the central government level enacting may also act signify as an *internal control* mechanism employed to streamline budgetary expenditures or curb self-seeking (perhaps corruptive) behavior of public servants. The social impact of laws and regulations has many facets that all impact on the efficiency of public procurement, yet have to restrict our discussion to the main topic of this paper.

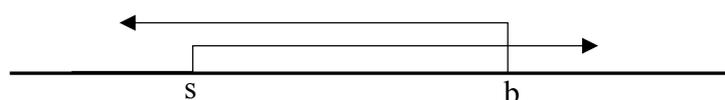
complexity of the transaction object or asset specificity, industry organization (available supply in the case of government contracting), specific contractual hazards depending on the institutional and regulatory environment (Menard, 2004). Munyon et al. (2011) suggest partnerships with longer duration, in geographical proximity, among others, reduce conflicts, a consequence of efficient relationship management that should be observed also in public procurement. Recent research of public procurement tends to stress the provision that promote transparency, shorter or reliable process time, are able to attract more bidders and, in conformance to economic theory, by enlarging the number of potential service providers, results in lower prices and higher quality of services.

For lack of space, we will refer on two recent empirical studies concerned with public procurement in Europe. One is a study of public procurement run on 7 European countries (Germany, Italy, Poland, Romania, Spain, Sweden, and the United Kingdom). This study suggested that the public procurement procedures reflect on the costs and quality of municipal waste management services, suggesting that the waste management system functioned better in those countries that maintained open competition and with transparent procurement procedures, rather than having service provisions by public waste operators (Municipal waste procurement in EU countries can be more efficient). The other study researched the impact of e-procurement (electronic auctions) for Slovak municipalities on number of bidders (Pavel, Sičáková-Beblavá, 2013). Here again, the authors come to the same conclusion. However, this study also stresses that in order to achieve the efficiency potential in the new system of rules, efforts should be made to enhance the qualification of public employees engaged in the tendering procedures.

An additional moment that made this study interesting is that it pointed to some of the concerns encountered in the process of designing efficient procurement procedures, such as: location specific processes (hindering EU cross-country competition among service providers), the importance of distinguishing between direct and indirect costs and a disadvantage of smaller providers competing against larger ones. The same concerns of leaving out smaller (local) providers from the bidding process has been voiced out by our earlier study on local government procurement procedures in Croatia (Kaštelan Mrak, Vretenar, Jardas Antonić, 2016, p. 56).

Auctions with sealed bids, as a mode of distributive negotiation, represent the theoretical concept behind the institutionalized public procurement mechanism. The idea behind the concept is that there is an additional value emerging from possible transaction if the negotiating process itself is conducted efficiently. The presence and the size of an possible additional value is ambiguous because in the usual institutional setting, featured by opportunism and hidden information, negotiating subjects are typically unaware of each other's exact reservation prices, i.e. last price acceptable for accepting transaction<sup>3</sup>. The dynamic of bargaining with estimations of reservation prices is shown in Figure 1.

**Figure 1** Price negotiation and hidden information



Source: Raiffa, H.

<sup>3</sup> In an attempt to maximize his value, every subject tries to estimate probable reservation price of the opposite side. These estimations can be based on assessment of costs, budget, time or other variables that could influence opposite party. With hidden information about reservation prices, the size of assumed additional value is also unknown so even transactions with acceptable additional value could create significant costs (time, resources needed for diligence) in negotiation process.

Although actually a mechanism of the distributive negotiations, auctions add additional ambiguity for involved parties. From the perspective of subject running an auction to procure goods, formality of procedures and legal obligations of auctions results are requiring adequate preparation. In auctions with sealed bids, which are used in public procurement, offers subjected in written form enable using detailed specifications, and therefore procurement of goods and services that are not necessary simple, arm's length deals.

From a perspective of a bidder, auctions are influenced by awareness of the possible competitions on the bidding side. In closed bid auctions bidders can be uncertain if they are sole competitors or just one of many. If they estimate that other bidders will engage the auction, they have the extra pressure in price (and other elements of offer) formulation because they need to try not only to assess the reservation price of subject running the auction but also possible offers subjected by other bidders (Raiffa, 2007, p. 165). That psychological difference is expected to shift bidders' attention towards the competition against other bidders rather than on distribution of additional value with the actual buyer (in case of public procurement), i.e. competitiveness among bidders is one of the expected sources of efficiency of the public procurement mechanism (this theoretical assumption has been statistically confirmed in research published by Coviello & Mariniello (2014)).

### **3. Methodology**

The research methodology was adjusted to using the descriptive form of data available. As no financial figures could be obtained, we settled for measuring procurement process efficiency by comparing the duration of distinct phases of the process. Under the assumption that the duration of some process phases is determined by regulation, a possible indicator of "inefficiencies" in the whole procedure was supposed to be found by looking at excess (additional) time required to review tender offers, and eventually the time needed to rerun the whole process. Inquirers were also directed towards establishing eventual complains being directed towards mediators or resulting in law suits.

As independent variables, for differentiation of individual transactions, we looked at capacity (no of employees and no. of business units), the implication being that better capacitated (higher counts) would have lower excess time or number of complaints, i.e. capacity of LGU dominantly relies on the number and vested competencies of employed staff. If they are considered as an administrative instrument, "designed" for contracting operational capacity (processed by private service providers); we much take into account the bargaining positions of administrative vs, performing business entities. Also, expecting process time to vary according to object of transactions, we compared total time and time structure by differentiating tenders related to building and maintenance of: communal infrastructure; sport-educational and cultural facilities and entrepreneurial infrastructure. Acknowledging the previously explained presumption that overall efficiency in service providing will be achieved with public procurement due to: first, the involvement of technically superior outside business entities (able to achieve specialization and economics of scale) and second, by competition among interested parties, further attempt to analyze public procurement efficiency from the side of the LGUs will be pointed towards examining process time.

### **4. Sample and data**

As a part of the broader research, data in this paper were extracted from a questionnaire conducted in the December of 2014. The questionnaire was originally composed of 29 questions and sent to all 577 LGUs in Croatia. Access to the questionnaire was enabled by on-line survey application and was anonymous for all respondents. In total, 201 respondent accessed, but the total number of respondents varied on specific questions' sets. Calculations were run only on those respondents that offered data on all questions required for this analysis, bringing down the analyzed sample to 57 units. Within the sample, 35 of them identified themselves as municipalities, and 22 as cities. A short overview of descriptive sample data is shown on **Table 1**; where LGUs are divided into four groups according to their size (represented by number of employees).

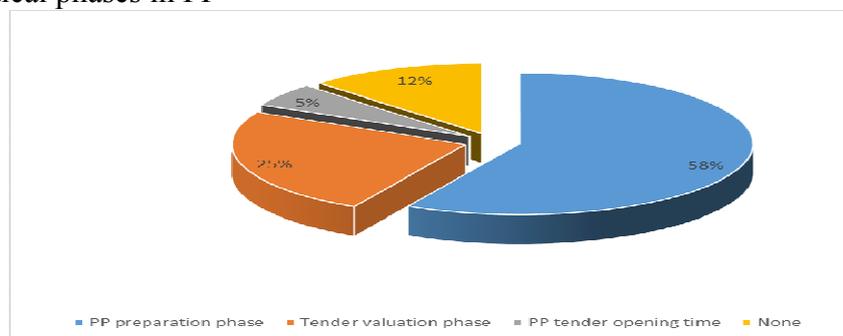
**Table 1.** LGUs by number of employees

No. of emp. in LGU	Cit/mun.	No. of org. units in LGU	Emp. on PP assign.	Duration of PP in days	% of prep. time - communal facilities	% of prep. time – edu., sport and cultur. facilities	% of prep. time – entrepr. infrastructure
		avg (stdev)	avg (stdev)	avg (stdev)	avg (stdev)	avg (stdev)	avg (stdev)
<10	0/28	1,32 (0,6)	1,64 (0,8)	51 (24)	35,3 (17,5)	36,1 (17,9)	40 (19,5)
10-19	10/6	2,18 (1,23)	2,19 (1,2)	42,6 (12)	35 (14,4)	31,8 (11,7)	33,8 (11,8)
20-40	4/1	3 (1,26)	3,4 (2,4)	42 (11,6)	31 (15,9)	35 (14,8)	43,7 (17,1)
>40	7/0	19 (9,28)	12,14 (10)	46 (11,4)	29,3 (17,8)	30 (17,7)	30 (19,1)

Source: authors' calculation

In line with our expectations, the majority of respondents identified preparation as a most challenging (consuming most time, and using more financial or organizational resources when compared to other PPP phases) phase of public procurement process (Figure 2). Public procurement is heavily regulated process and LGUs are obligated to launch it only when procurements exceeded HRK 200.000 for goods and services or HRK 500.000 for construction works (Official Gazette of the Republic of Croatia issue no. 120/2016). Therefore, the objects of PP is often of non-trivial complexity so diligence and contract preparation would increase chances of favourable outcomes in terms of purchases that will fulfil expectations and in lowering the risk of appeals by other bidders (which can substantially prolong the process). Same reasons and an attempt to diminish probability for ex-post difficulties can explain that the next ¼ of respondents identified tender valuation to be the most critical phase.

**Figure 2** Critical phases in PP

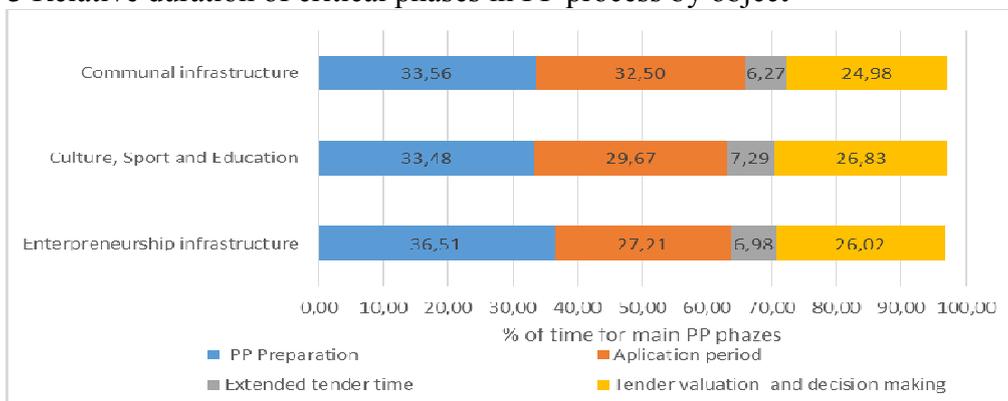


Source: authors' calculation

On the next set of questions, respondents were asked to estimate the relative time needed for PP preparation, application period, time extending and tender valuation for three quoted groups of procurement activities: creating and maintaining communal infrastructure (water supply, waste disposal, parks, roads in local jurisdiction etc.), infrastructure in facilities for

sport, cultural or educational usage, and infrastructure in enhancing entrepreneurial activities (Figure 3).

**Figure 3** Relative duration of critical phases in PP process by object



Source: authors' calculation

Although these activities are expected to differ in complexity, but our sample provided no evidence that relative time in those activities would be more dominant than in others.

We conducted a series of t-tests that showed no statistically significant differences between relative times reported in different set of activities. Taking into regard that most respondents identified preparation time to be crucial phase of PP, we have then conducted an additional t-test comparing reported preparation times for all activity sets with total number of days of PP duration (sample divided in two groups over median) but with the same result. Correlating preparation time for public utilities with total days of PP duration (some other variables were also tried out) showed negative correlation, as expected, but with very limited strength (Figure 4).

**Figure 4** Correlation matrix<sup>4</sup>

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. correlate Prepmun CM EmpLGU UnitLGU EMPPP Days
(obs=51)
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	Prepmun	CM	EmpLGU	UnitLGU	EMPPP	Days
Prepmun	1.0000					
CM	-0.0789	1.0000				
EmpLGU	-0.0379	0.4566	1.0000			
UnitLGU	-0.1237	0.5908	0.9224	1.0000		
EMPPP	-0.0630	0.4259	0.4232	0.5297	1.0000	
Days	-0.1099	-0.1634	-0.0189	-0.1091	0.0812	1.0000

Source: authors' calculation

We confronted the same lack of statistical confirmation when we conducted a regression analysis on the total PP duration employed as a dependent variable, and capacity indicators, such as: the number of employees in LGU, the number of employees working directly on process of PP, the number of organizational limit within LGUs, acting as independent variables. (Figure 5). The only variables that did show some statistical significance were the number of employees and the number of organizational units within a LGU. However, even

<sup>4</sup> The variables employed are as follows: preparation time in communal infrastructure (Prepmun), city/municipality (CM), number of employees in LGU (EmpLGU), number of employees working on PP activities (EMPPP) and total pp duration (Days)

these variables can offer no explanatory power for variations of the dependent variable in this sample (calculated adjusted  $R^2$  coefficients) were very low.<sup>5</sup>

**Figure 5** Multiple regression with PP duration as independent variable

Source	SS	df	MS	Number of obs	=	51
Model	2716.39729	4	679.099322	F(4, 46)	=	1.77
Residual	17672.5831	46	384.186589	Prob > F	=	0.1516
				R-squared	=	0.1332
				Adj R-squared	=	0.0579
Total	20388.9804	50	407.779608	Root MSE	=	19.601

Days	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Prepmun	-.2193655	.1678326	-1.31	0.198	-.5571949 .118464
EmpLGU	.2104299	.102838	2.05	0.046	.0034276 .4174321
UnitLGU	-5.960628	2.444723	-2.44	0.019	-10.8816 -1.039656
EMPPP	.9992815	.6286278	1.59	0.119	-.2660807 2.264644
_cons	60.90456	7.83227	7.78	0.000	45.13902 76.6701

Source: authors' calculation

Similar result were calculated in a different model using relative time for PP preparation as a dependent variable. One example of unsuccessful multiple regression is shown on Figure 5.

## 5. Findings and discussion

Since the aim of local government, unlike business organizations, is not to create profit but to provide services to its citizens, efficiency of LGUs is not easy to define or measure. While effectiveness could be observed through the success in achieving expected goals, efficiency can be seen savings of many kinds. However, being unable to observe and compare financial figures, we reverted to process time; the rationale being that procurement, as any other tasks used up fractions of time of a rather fixed pool of available LGU resources.

The common perception in Croatia is that our LGUs are too small and too fragmented, i.e. that they do not have sufficient size to employ efficient administrative capacity. Public procurement is known to be sensitive and time consuming process so one would expect that LGUs with greater administrative capacity would be more efficient in running it. However, although the importance and difficulties of PP preparation activities were emphasized by many respondents, according to answers collected in the sample, there were no significant variations in the total PPP time among different types of PP activities. Furthermore, we were unable to statistically explain the impact of longer preparation times on total PPP duration or on lowering the duration of extended tender time. Likewise, our calculations offered feeble confirmation that capacity levels (compared though numbers of employees) had any impact on PPP duration. Apparently, the influence of legal provision on PP process time has such a strong impact that none of the independent variables, predictable by theory, were able to demonstrate a statistically significant influence on total process time, or on process time structure.

Considering that respondents were reluctant in offering financial data on their PP transactions, it is possible that a deeper level of elaboration of transaction object's characteristics (maybe by comparing homogeneous object of procurements), could generate a regression model with more explanatory power. In the extension of this research we would

<sup>5</sup> We assume that regulation, being crafted primarily in order to control opportunistic behavior of civil servants, that is prevent political fraud that some suggest iv very much present in PP in Croatia (Podumnjak & David-Barrett, 2015)

like to compare technical features (utilities) of specific objects against bided price (price-quality ratios) and then eventually try relate technical complexity/functional differences to specified process execution variables such as time needed or personnel engaged. Another important issue is that we did not gather data concerning iteration, number of bidders (here reported to be 3 on average; exactly in conformance with legal provisions), specific contractual hazards, etc. Unfortunately, by examining answers provided by LGUs, and not being able to compare prices, we could not examine the effect of procurement procedures on bidders' behaviour, which remains a task for the next research cycle. Finally, in continuing this research, a new round of questionnaires will have to be passed, since over the past year major changes have been enacted in the Public Procurement Law, relaxing some of the requirements important for shaping process execution. It is also advisable to wait a year or two before the next questionnaire round, as the full effect of regulation changes is yet to be observed.

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