

MONO VERSUS MULTIPLE CRITERIA EVALUATION OF BIDS IN PUBLIC PROCUREMENTS

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Abstract: Public procurements, contracting entities, and other subjects particular to the field of public procurements are often criticized. The media, subject matter experts and others have sufficient reasons for this criticism. The opinions on public contracts are not uniform. One of the important parts of this discussion is the criterion used to evaluate the bids. The Act on Public Contracts offers two basic evaluation criteria: the lowest tender price and the economic advantageousness of the tender. The aim of this paper is to state the pros and cons of each and to determine what criteria the contracting entities use. Equally, to identify what are the differences when using the criteria according to the subject-matter and according to contracting entity, specifically hospitals and districts of the Czech Republic.

Keywords: Public Procurements, Evaluation of Bids, Mono-criteria evaluation, Multiple-criteria Evaluation, Award Criteria, Price.

1 Introduction

The total value spent via public procurements based on the annual report by the Ministry of Regional Development fluctuates between thirteen and 16.4 percent of GDP in the Czech Republic in last six years. The value differs based on the source. The methodology to measure the total value of public procurement is not uniform. Regardless of the methodology and specific value, public procurement accounts for an important part of our national economy.

Public procurements are a frequent topic of criticism by the media, opposition politicians and others. The critics have many aspects upon which to focus. One central reason is the Act on Public Contracts (no. 137/2006 Coll.) and its' frequent amendments. Lately, the discussion on the choice of the basic evaluation criterion has increased.

2 Legal Regulation

The central legal regulation on public procurements in the Czech Republic is the Act Public Contracts. This Act incorporates the relevant legal regulations of the European Union (such as Directive 2005/75/EC of the European Parliament and of the Council, of 16 November 2005 amending Directive 2004/18/EC, on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts and Directive 2004/17/EC of the European Parliament and of the Council, of 31 March 2004, coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors).

The Act defines the evaluation criteria in general through two options for the basic evaluation criterion: economic advantageousness of the tender and the lowest tender price (§ 78). In the case of the competitive dialogue that is one type of the award procedure, the criterion economic advantageousness is used. In other types of the award procedure, the contracting entity selects the best evaluation criterion according to the tender specifics.

The economic operator is the tenderer with the lowest price in the case of the lowest tender price. In the case of the economic advantageousness of the tender, the contracting entity establishes partial evaluation criteria. The partial evaluation criteria are determined to express the relationship between the use value and the price. The set of evaluation criteria usually consists of criteria such as "tender price, quality, technical merit of the performance offered, aesthetical and functional characteristics, environmental characteristics, impact on the employment of people with disabilities, operational costs, cost-effectiveness, sales and after-sales service, technical assistance, delivery period or period of completion". (§ 78) The Act prohibits some partial evaluation criteria such as, the contractual terms and conditions or the terms of payment.

The contracting entity has to establish the basic evaluation criterion, respectively partial evaluation criteria, individually for each public contract. The decision as to the evaluation criteria depends on the contracting entity. Some contracting entities struggle with selecting the evaluation criteria (Ochrana, 2008). Using the incorrect criteria to evaluate bids leads to the choice of wrong operator. Subsequently, this leads to dissatisfaction, additional costs and terms extension. The worst case scenario of incorrect set of evaluation criteria is the violation of the law and it can be the subject of investigation by Office for the protection of competition. The evaluation criteria as well as all other parameters of public contract must comply with the principles of transparency, equal treatment, and non-discrimination (§ 6).

The Act on Financial Control (no. 320/2001 Coll.) adds the obligation to fulfill the principles of economy, efficiency and effectiveness labeled as 3E.

3 Comparison of Mono and Multiple Criteria Evaluation

Criteria are an important part of the process of decision-making. The criteria are the tools to measure how the alternatives fulfill the objectives (Keeney, a další, 2005). In general, criteria should be determined according to the objectives.

The professional community is not unanimous in the preferences of the basic evaluation criterion in public procurements. Both criteria have their advantages and disadvantages. The next paragraphs summarize the pros and cons of both basic evaluation criteria.

The multiple-criteria evaluation is common in real life decision-making. Even when buying yogurt, people use more than one criterion, such as flavor, price, size, brand, and some people may consider used ingredients or previous experience. Using multiple-criteria evaluation process leads usually to choice of a compromise alternative (Fiala, 2008). Finding an alternative that is the best according to all criteria is rare. Criteria usually work in opposite directions; better values according to one criterion are usually connected with those worse according to other criterion (e.g., price and time or price and quality).

As previous research demonstrates, tenderers do not trust and take less part in contracts evaluated with more criteria. The average number of bids in the case of the lowest tender price as the basic evaluation criterion is 2.75 and in the case of the economic advantageousness of the tender is 1,79 (Nikolovová, a další, 2012). According to public opinion, contracts with more criteria are pre-arranged. Receiving more bids is positive because with more bids the end price decreases. The truth of the negative relationship between number of bids and the price was proved with empirical research based on data from the Czech Republic (Pavel, 2010) and also from other countries (Carr, 2012).

Evaluation using one criterion is much easier than evaluating according multiple criteria. This does not mean that the whole process is easier. The difficulty is to determine other parameters of the item. The contracting entity has to set the desired parameters of quality into the subject-matter description, the technical specification, tender condition (Ochrana, 2008). In the yogurt example, the subject-matter description would consist of the desired flavor, size and ingredients. The tenderers would then compete only in price.

The selection of the basic evaluation criterion is the choice of parameters in which the tenderers compete (Hotra, 2008). The result of using the lowest tender price as the only evaluation criterion is lower end price. Tenderers offer only the lowest level of all parameters to reach the lowest price. Evaluating according to more criteria leads to higher end price. (Ryšavý, 2012)

In their effort to win the contract, tenderers sometimes offer such a low price that they cannot fulfill. The task of the evaluation committee is to request justification in the case of abnormally

low tender price. "If the tenderer has failed to justify in writing the abnormally low tender price within a fixed time limit, if it has failed to turn up to offer explanations or if the evaluation committee has found the justification thereof to be insufficient, the tender shall be rejected." (§ 77). The survey performed by OTIDEA in 2013 proves that contracting entities do not work with abnormally low tender price properly. Only 25 percent of respondents have not met with the situation when the winning bid had the abnormally low tender price. This signifies that 75 percent of respondents have met with abnormally low tender price and this bid won the contract. Some of the respondents have met with this situation repeatedly. (OTIDEA a.s., 2013)

Some experts on public procurements criticize using the criterion of the lowest tender price as they miss evaluating the quality. The Forum for Public Procurement with High Quality was established with the goal to increase the 3E principles of public procurements. It promotes principles such as the return to quality criteria and using abnormally low tender price. The Forum is a joint project of the Chamber of Public Contract Administrators and the Ministry of Industry and Trade of the Czech Republic.

The risk in using the criterion of the lowest tender price is in selecting the bid with inferior quality and a slightly better price. Tenderers are not motivated to offer quality.

The contracting entity has the opportunity to evaluate quality of the bids with quantitative and qualitative criteria. Qualitative criteria are not appealing to the tenderers. The higher importance (weight) the qualitative criteria have, the less bids are received. Nikolova et al have calculated the relationship between the importance of the qualitative criteria and number of bids – lowering the importance of qualitative criteria by 14 percent adds one extra bid (Nikolovová, et al, 2012).

The criterion of the lowest tender price is suitable for easily definable and standardized subject-matters such as, simple construction works or consumer goods. The utility of these subject-matters does not differ much on the market. If the purchased item is input or material it has probably well-defined parameters and the lowest price is suitable criterion (Pavel, 2008). Alternately, the lowest price is recommended to use to evaluate complex procurements where is hard to define the criteria such as consulting services (Hotra, 2008).

The economic advantageousness of the tender is convenient criterion where is a need to evaluate operating costs and in the cases when different parameters of the procurement significantly change the utility but not the price (Hotra, 2008).

Some risks are connected with each type of basic evaluation criteria. Evaluation according to the lowest price may lead to receiving less quality, to excluding some potential tenderers due to strict tender conditions and technical specification. The economic advantageousness of the tender discourages the tenderers to compete. With economic advantageousness of the tender comes the danger of violating the principle of transparency.

4. Research

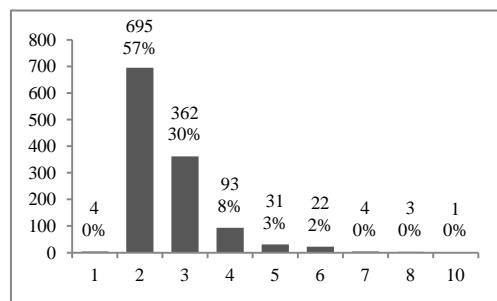
In our research, we have analyzed contract notices publicly available on Information System on Public Contract (www.isvzus.cz). A total of 8 395 forms of contract notices were announced in 2012. Some forms just corrected previous information. We have removed duplicate public contracts. The number of analyzed contracts was 6 085.

64 percent of analyzed public procurements evaluated the bids according to the lowest tender price. In 47 public procurements the contracting entity did not complete the basic evaluation criterion (0.7 % of contracts).

The rules on the presentation of the public procurement allow not publishing the partial evaluation criteria on the Information System on Public Contract. The partial evaluation criteria are then specified in detailed documentation available on request. In

1217 cases the contracting entity specified the partial evaluation criteria on the Information System on Public Contract.

Figure 1 Number of partial evaluation criteria



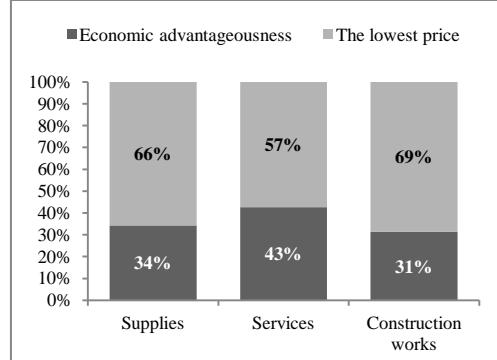
Source: Information System on Public Contract, own calculations

The number of procurements according to the partial evaluation criteria portrays the Figure 1. The highest number of criteria was ten. Only one contracting entity used ten partial evaluation criteria. The most common number of partial evaluation criteria used to evaluate bids is two. Two partial evaluation criteria were used in more than half of public procurements using the economic advantageousness of the tender. 99 percent of public procurements used two to six partial evaluation criteria. Using more than six criteria is rare.

In four cases, the contracting entity used only one partial criterion. It indicates improper completion of the form on the Information System on Public Contract.

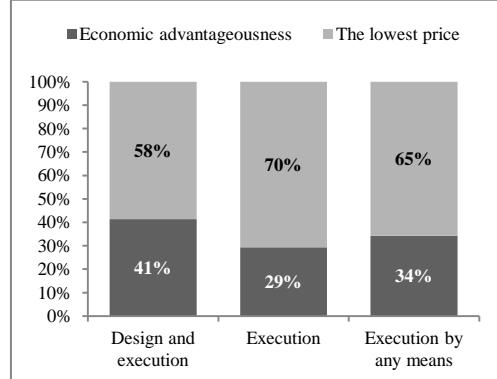
Recommendations on the use of the basic evaluation criterion advise to use them according to the specifics of the contract. The lowest tender price is suitable for some contracts while the economic advantageousness of the tender is suitable for others. The proportion of procurements with the lowest price on the total number of procurements according to the subject-matter displays Figure 2. The lowest price is used the most often to evaluate bids of construction works, least in services.

Figure 2 Basic evaluation criterion according to the subject-matter of procurement



Source: Information System on Public Contract, own calculations

Figure 3 Basic evaluation criterion according to the type of construction works



Source: Information System on Public Contract, own calculations

The subject-matter of construction works covers three different types of procurements: design and execution, execution and execution by any means, in accordance with the requirements specified by the contracting authority. According to theoretical assumptions, criteria used in these types should differ as the character of these types. Numbers of procurements evaluated according to the two basic evaluation criteria for the types of construction works are displayed on the Figure 3. Based on the Figure 3, we can see differences between the levels of using the price.

To find out if the differences in the proportion of procurements used to evaluate bids between the subject-matter are statistically significant, we used chi square test. We tested the hypothesis that the choice of the basic evaluation criterion is not dependent on the subject-matter of the contract. Alternatively the choice is dependent so the difference in the percentage of using price is significant.

The authors performed a standard chi-square test for association. The outcome from the Minitab 16 Statistical Software is Chi-Sq = 52,776; DF = 2; P-Value = 0,000 (Table 1). We can reject the null hypothesis. There is very strong evidence, that the basic evaluation criterion is not independent on the subject-matter of the contract.

Table 1 Results of Chi-Sq test on the association between subject-matter and basic criterion

	Economic advantageousness of the tender	The lowest tender price	Total
Supplies	864 901,34 1,547	1661 1623,66 0,859	2525
Services	715 598,27 22,774	961 1077,73 12,642	1676
Construction works	576 655,39 9,616	1260 1180,61 5,338	1836
Total	2155	3882	6037

Source: Information System on Public Contract, own calculations

The Table 2 displays results for chi-square test for association performed to find the association between the basic evaluation criterion and the type of construction work. The outcome is Chi-Sq = 13,457; DF = 2; P-Value = 0,001. The results are similar to the previous but a little less strong. Still the test offers strong evidence against the hypothesis about the same proportion of procurements with price among the types of construction works.

Table 2 Results of Chi-Sq test on the association between types of construction works and basic criterion

	Economic advantageousness of the tender	The lowest tender price	Total
Design and execution of construction works	91 69,20 6,868	129 150,80 3,152	220
Execution of construction works	395 422,75 1,821	949 921,25 0,836	1344
Execution of construction works by any means, in accordance with the requirements specified by the contracting authority	72 66,05 0,535	138 143,95 0,246	210
Total	558	1216	1774

Source: Information System on Public Contract, own calculations

Based on the recommendations, the basic evaluation criterion should differ in contracts by the same contracting entity if the purchase different items. We considered only contractors with more than five public procurements to examine if they tend to use the same criterion or not. We excluded public procurements when the contractor did not complete the type of criterion. The total number of contracting entities with more than five public procurements is 199. 77 percent of these contracting entities

used both types of basic evaluation criterion. 71 percent of contracting entities who used only one type of basic evaluation criterion used the lowest tender price.

The analysis of the number of procurements with each type of criteria according to subject-matter used by different types of contracting entities brings interesting results. Significant part of contractors with more than five procurements is hospitals. Hospitals used the lowest tender price in 76 percent of procurements.

The most common subject-matter purchased by hospitals was supplies, specifically in 83 percent of cases. In 73 percent of procurements with hospitals purchasing supplies were the bids evaluated according to the lowest tender price.

Table 3 Number of public procurements according to subject-matter and type of basic evaluation criterion

	Supplies	Services	Public works	Total
Economic advantageousness of tender	95	21	13	129
The lowest tender price	349	34	24	407
Total	444	55	37	536

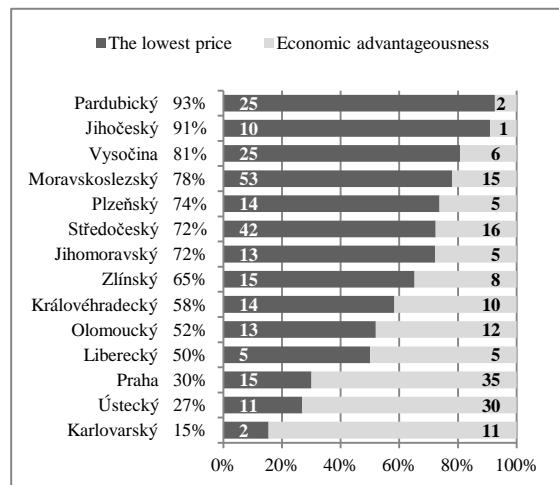
Source: Information System on Public Contract, own calculations

The items purchased by hospitals are devices such as blood separator, ultrasound device, incubator, material such as plasters, gauze, different kinds of implants and solutions. These items are purchased often, are well known by hospitals, it is not the first time they purchase them. These characteristics indicate using the lowest tender price. Hospitals followed the recommendations about using the lowest tender price.

The next analyzed type of contracting entity is districts. Czech Republic is divided into 14 districts. Situation with using the types of criteria among the districts is not as clear as with hospitals. The level in using the lowest tender price as the basic evaluation criterion differs among the districts. The Figure 5 shows the number of procurements evaluated according to the lowest tender price and number of procurements evaluated according to the economic advantageousness of the tender and proportion of procurements evaluated according to price on the total number of procurements by the districts.

The level of using the price as the basic evaluation criterion differs among the districts (see Figure 4).

Figure 4 Number of procurements evaluated by the two types of criteria by district



Source: Information System on Public Contract, own calculations

The minimum proportion of procurements evaluated according to price was 15 and it was used by Karlovarsky district. On the other side, the maximum proportion was 93 percent. The difference in using each type of evaluation criterion among the districts is significant. No conclusion can be made based on this

data. The purchases among the districts differ. The districts do not purchase the same items so they do not use the same criteria.

Jihočeský district purchased eleven times, eight of the ten was execution of construction work. In this case, using price to evaluate bids make perfect sense. Ústecký district purchased sixteen times services, four supplies and 21 executions of construction works. This explains the use of both types of criteria.

5. Conclusion

Both types of basic evaluation criterion have its advantages, and disadvantages as risks. The contracting entity has to weigh pros and cons of each other and also asses the subject-matter of procurement.

The performed analysis proves that contracting entities differentiate procurements and based on the specifics of the procurement select the basic evaluation criterion. This behavior is in compliance with the general recommendations.

In 36 percent of procurements the contracting entities used the economic advantageousness of the tender as the basic evaluation criterion. To select the best bid they performed multiple-criteria evaluation. Next analysis was focused on two groups of contracting entities with more than five procurements in 2012 – on hospitals and districts. Hospitals use the price evaluation criterion in most cases and the most common subject-matter is supplies. The authors believe that the reason for this choice is well known and repeating supply, and the contracting authority is able to thoroughly describe the tender subject. In the case of the districts this conclusion cannot be made as the subjects of the tenders differ.

Contacting entities use different criteria for different subject-matters of contract. This conclusion is positive. Some information indicates that contracting entities are forced to use only the lowest tender price (OTIDEA a.s., 2013). It was not proved based on analysis of procurements in total as by districts and hospitals.

Topics for next research are technical specifications, tender specifications and subject-matter description. The contracting entity has to set these parts of the procurement to define the desired quality. Well defined technical specifications, tender specifications and subject-matter descriptions are assumption to evaluate the bids according to price without problems.

Literature:

1. Carr, P. G.: *Investigation of Bid Price Competition Measured through Prebid Project Estimates, Actual Bid Prices, and Number of Bidders*. Journal of Construction Engineering and Management. 27. February 2012, Sv. 131, 11, stránky 1165–1172.
2. Fiala, P.: *Modely a metody rozhodování*. Praha : VŠE Oeconomia, 2008. ISBN 978-80-245-1345-4.
3. Hotra, S.: *Postupy při volbě základního hodnotícího kritéria v procesu zadávání veřejných zakázek s ohledem na složitost předmětu veřejné zakázky se zohledněním principů 3E (hospodárnost, efektivnost a účelnost)*. [Online] prosinec 2008. [Citace: 22. srpen 2012.] <http://www.portal-vz.cz/CMSPages/GetFile.aspx?guid=0807d018-1918-412e-9b98-3254ba13b869>.
4. Keeney, R. R. a Gregory, R. S.: *Selecting Attributes to Measure the Achievement of Objectives*. Operations Research. January-February, 2005, Sv. 53, 1.
5. Nikolovová, P. at al.: *Veřejné zakázky v ČR: Co říkají data o chování zadavatelů?* . Cerge EI. [Online] 6. October 2012. [Citace: 10. May 2013.] <http://idea.cerge-ei.cz/docu>.
6. Ochrana, F.: *Postupy pro výběr kritérií vhodných pro typické předměty s ohledem na možnosti definování měřitelných ukazatelů*. [Online] prosinec 2008. [Citace: 23. srpen 2012.] <http://www.portal-vz.cz/CMSPages/GetFile.aspx?guid=5238c7f9-2dbd-4b3f-874e-b9134f68a1a7>.
7. OTIDEA a.s. *Výsledky ankety mezi zadavateli veřejných zakázek státní správy a samosprávy*. [Online] 14. March 2013. [Citace: 6. May 2013.] <http://otidea.cz/wp-content/uploads/documents/V%C3%BDsledky%20ankety%20mezi%20zadavateli%20ve%20%C5%99ejn%C3%BDch%20zak%C3%A1zek%20st%20C3%A1tn%C3%AD%20spr%C3%A1vy%20a%20samospr%C3%A1vy.pdf>.
8. Pavel, J.: *Postupy při volbě základního hodnotícího kritéria v procesu zadávání veřejných zakázek s ohledem na složitost předmětu veřejné zakázky se zohledněním principů 3E (hospodárnost, efektivnost a účelnost)*. [Online] prosinec 2008. [Citace: 22. srpen 2012.] <http://www.portal-vz.cz/CMSPages/GetFile.aspx?guid=f476ecb6-a477-414e-b7a4-f455a50d4329>.
9. Pavel, J.: *Analýza vlivu mýty konkurence na cenu rozsáhlých staveb dopravní infrastruktury*. Politická ekonomie. 2010, Sv. 3.
10. Ryšavý, I.: *Dilema veřejných zakázek: Priorita ceny, či priorita kvality?* [Online] 6. December 2012. [Citace: 5. May 2013.] <http://moderniobec.ihned.cz/c1-58903300-dilema-verejnych-zakazek-priorita-ceny-ci-priorita-kvality>.

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