Research Article

Tomas Hanak* and Jana Korytarova

Procurement management in construction: study of Czech municipalities

<https://doi.org/10.1515/eng-2019-0019>

Received Feb 08, 2019; accepted May 23, 2019

Abstract: Efficient spending of public money is a crucial requirement of public procurement. This requirement is even more important in the case of public works contracts since construction projects are usually very costly. Accordingly, public authorities should manage the procurement process in an efficient way. The aim of this paper is to analyse municipal procurement practices focusing on small-scale public contracts for construction works. The Czech Republic is the study area for this analysis. Data concerning procurement practices were collected through a questionnaire survey and on the basis of available internal municipal directives that govern the procurement process. The results show that a majority of municipalities use internal directives and specify financial categories for small-scale public contracts. It has also been found that the majority of municipalities contract external consulting companies for specific contracts or subsidised public contracts. Directives usually concern the issue of responsibility and the approval procedure related to the public contract. Based on the research findings, general recommendations for awarding public contracts have been formulated. These findings can potentially contribute to the dissemination of best practices among contracting authorities in the Czech Republic.

Keywords: public contracts for construction works, municipality, small-scale public contracts, internal directives

1 Introduction

Act No. 172/1991 Coll., on passage of certain assets from the property of the Czech Republic to the ownership of municipalities [1] transferred certain essential assets to the municipalities which have since become administered

and owned. Municipal immovable assets comprise undeveloped plots of land, land with buildings owned by private individuals, and plots of land containing buildings forming one functional whole with the land. Specifically, this includes especially the following:

- plots of land;
- residential and non-residential premises;
- infrastructure assets;
- local and public roads (pursuant to Section 9 (1) of the Roads Act [2], “*motorways and class-I roads are owned by the State. Class-II and class-III roads are owned by the region in whose territory the roads are situated, while local roads are owned by the municipality in whose territory the roads are situated. Special-purpose roads are owned by legal entities or individuals. Motorways, roads and local roads are not considered to constitute part of a plot of land*”);
- public greenery and public spaces.

One of the important functions of municipalities in relation to the management of immovable assets consist in carrying out effective acquisition procedures, i.e. processes describing, documenting and managing the life cycle of construction projects (creation, operation and expiration of immovable assets). Authors of this paper have focused on one of the important activities within the investment stage of the life cycle of construction projects, i.e. the selection of a suitable contractor to carry out construction works / projects related to the aforementioned municipal assets. As in other countries, these activities are regulated by legislative rules. The main piece of legislation is Act No. 134/2016 Coll., on public procurement [3], which classifies public contracts by their subject-matter (supplies, services and construction works) and also by funding limits – there are so-called *above-the-threshold public contracts* (for construction works in current expected value exceeding CZK 149,224,000 excl. VAT), *below-the-threshold public contracts* and *small-scale public contracts* (construction works under the current expected value of CZK 6 million excl. VAT) (Government Regulation No. 172/2016 Coll. [4]). In the event the municipality “as the contracting authority” implements a small-scale public contract, it does not have to proceed in accordance with the rules laid down

*Corresponding Author: Tomas Hanak: Brno University of Technology Brno, Czech Republic; Email: hanak.t@fce.vutbr.cz

Jana Korytarova: Brno University of Technology Brno, Czech Republic

by the Public Procurement Act – it only needs to comply with the fundamental principles of the Act such as transparency, equal treatment, non-discrimination and proportionality [3].

The aim of this paper is to study the solutions to the lack of statutory regulation of small-scale municipal contracts, *i.e.* whether the contracting authorities issue their own internal guidelines and, if they do so, how they structure them. The paper is organised as follows: firstly, literature review is carried out, followed by a description of the materials and methods and, finally, the results and discussion.

2 Literature review

According to the Czech legislative [3], the contracting authority is not obliged to use the procurement procedure to award the small-scale public contracts. However, the general procedure of awarding a small-scale public contract usually contains simplified standard public procurement steps:

- the tender dossier (*i.e.* the specifications of the public contract) is published on the contracting authority's tender portal profile;
- contractors capable of delivering the subject of the public contract are invited to submit bids;
- a reasonable deadline for the submission of bids is specified (*i.e.* taking into accounts the complexity of the subject of performance and the difficulty of preparing the bid);
- the evaluation commission is appointed;
- envelopes containing bids are opened;
- evaluation whether the qualification criteria have been met is carried out;
- the bids are evaluated;
- the results of the tender procedure are published on the contracting authority's profile.

The procedure for awarding a small-scale public contract seems simple. However, it is necessary to understand that the contracting authority (the municipality) expends public money and efficiency of this process is thus under the public control. Most of the public money spent through procurement is spent by decentralised public agencies in which municipalities take a large share [5]. From an economic point of view, the 3E principles (Economy, Effectiveness, Efficiency) must be adhered to in order to ensure efficient use of limited public budgets. This principle must be observed in all cases where public money is allocated

to provide for public services [6]. The procedure for selecting a suitable contractor for construction works, taking into account the aforementioned principles, carries a certain risk of the contracting authority's failure to properly manage the process. Such failure could result in increased costs (penalties) or project delay. Small-scale public contracts usually concern less complex works, which means smaller contractors usually participate in the tender procedure [7]. Dunovic *et al.* (2013) [8] also include procurement and contractual activities among the internal risk sources of the construction project, which can cause problems just as other internal sources such as management, technical and human factors, naturally alongside external risk sources such as legal, political, economic, social and natural risks. In order to effectively manage risks in public procurement, a certain regulation on the municipal level seems appropriate. Well prepared bids, selection of the best suited contractor and the subsequent implementation of a small-scale public contract surely depends not only on a well-prepared tender dossier, but also on the ability to attract a sufficient number of potential contractors. According to the findings of Ochraňa & Stehlík (2015) [9], each additional bid decreases the final price by 2.19%, which brings cost savings to the contracting authority.

Smaller municipalities usually lack the funding to maintain specialised departments employing experts educated in construction, economics and law. This fact may lead to errors in the procurement procedure such as incorrect layout of the specification (tender dossier) or incompatibility of the specifications with the standards and other documents [10], or incorrect estimations as to the length of the works, which is often the case in renovation of old buildings [11]. The schedule of construction works together with a budget and quality control plan are part of the main construction management documentation for planning the construction stage [12]. Staffing constraints on the municipal level also complicate the selection of a suitable project variant, which should be based on a multi-criteria approach [13] or evaluation of bids according to life cycle costs as the best possible co-ordination of design, construction, maintenance and supporting services over the lifetime of the contract [14].

Authors of this paper believe that in order to ensure efficiency in the use of public money, the procedures should be clearly specified for municipalities even on the level of small-scale public contracts.

Table 1: Municipal categories based on population [15] (Czech Statistical Office, 2001)

Municipal size category	Population	Share of the total number of municipalities in the Czech Republic	Share of the total population of the Czech Republic
C1	0 – 999	80%	17.2%
C2	1,000 – 9,999	17.9%	28.6%
C3	> 10,000	2.1%	54.2%

Table 2: Common number of small-scale public contracts for construction works

Municipal size category	Number of municipalities	Contracts within CZK 0 – 50,000 limit		Contracts within CZK 50,001 – 500,000 limit		Contracts within CZK 500,001 – 6,000,000 limit	
		Mean	Median	Mean	Median	Mean	Median
C1	52	2.77	2.00	1.60	1.00	1.06	1.00
C2	40	11.8	4.50	6.25	2.50	4.68	2.00
C3	2	N/A					

3 Materials and Methods

In order to meet the research objectives, it was necessary to obtain two sets of data. Firstly, these were primary data describing the current situation in awarding small-scale public contracts in the Czech Republic. All municipalities in the districts of Brno-venkov, Břeclav, Hodonín, and Vyškov, i.e. 412 municipalities in total, were contacted via e-mail and invited to fill in an online questionnaire, being assured that the data obtained would be anonymised. The questionnaire contained 8 questions in total divided into two parts. The first part included a question to identify the municipality's name in order to classify it according to its population size; the second part included questions concerning public procurement of construction works (e.g. examples of typical contracts, use of external companies to administer public contracts, and the number of contracts in each funding limit categories) and the existence, or lack thereof, of a directive/instructions regulating this area. Primary data were processed and analysed using a table and graphic processing with the use of the chi-square test of independence.

In the second part, publicly available and retrievable (online) directives/instructions regulating the area of public procurement were collected. The target number was 30 directives/instructions in order to perform a detailed analysis of tried and proven municipal procedures in public procurement of construction works. The analysis focused especially on the requisites concerning classification of contracts into categories based on the funding limit of the expected contract value, issues concerning competence and

responsibility, qualification, evaluation criteria, and the use of auctions and exemptions.

Due to the need to classify municipalities according to their size, the following 3 categories based on the population were created. Municipal size categories are specified in Table 1.

4 Results and Discussion

4.1 Evaluation of questionnaires

A total of 412 municipalities were contacted as part of the questionnaire survey. A total of 94 completed questionnaires were submitted, corresponding to a return rate of 22.8%. The data show that a vast majority of the municipalities are aware of the need to regulate the awarding of small-scale public contracts by applying internal directives. The total of 84% of respondents indicated that their municipality had directives/instructions in place to regulate public procurement. In municipalities which lack such directives (16% of the total), this fact can be attributed to the fact that the number of contracts awarded per year usually does not exceed 10 contracts.

The next question in the questionnaire asked about the common annual number of construction works contracts according to the expected contract values (CZK 0 – 50,000; CZK 50,001 – 500,000; CZK 500,001 – 6,000,000). Table 2 shows means and medians (since only tentative values were asked for, the data were not subject to further statistical processing).

Table 3: Typical examples of small-scale public contracts according to financial categories.

Limit (in CZK)	Examples of the subject-matter of public contracts
0 – 50,000	Small sidewalk and road sections, small-scale repairs of buildings (e.g. plaster) and roads, painting, coating, small-scale landscaping
50,001 – 500,000	Roads, sewers, water pipes, bridges, streetlamps, playgrounds (medium scale), air conditioning
500,001 – 6,000,000	Schools, nursing homes, reconstructions or large-scale infrastructure development (roads, sewers, water pipes, streetlamps)

Table 2 indicates that the number of contracts grows with the size of a municipality, which applies both in mean and median comparison. Unfortunately, only two municipalities fall within the C3 category; due to the lack of sufficient data, the relevant values are not indicated in the table. It can be seen from Table 2, that the number of contracts with lower value is higher than the number of contracts with higher value regardless the size of the municipality. Given the fact, that the aggregate value of contracts with lower value is high, they deserve adequate attention. Typical examples of contracts in the breakdown according to the above-specified funding limits are provided in Table 3.

The penultimate question asked whether municipalities used external companies to administer public contracts, while the final question asked in which cases. The data indicate that 66% of municipalities use the services of external companies. The usual reasons include the fact that some contracts receive subsidies (fear of subsidy risk [16]) and some contracts' value is higher than expected; some municipalities use external companies for all kinds of public contracts which do not qualify as small-scale public contracts (*i.e.* public contracts subject to the Public Procurement Act rules). External companies are also used in situations where it is difficult to specify certain parameters of the contract that require high expertise (small municipalities usually lack experts for specialised activities).

Further statistical analysis was conducted to establish the dependence between the existence of an internal municipal directive and the possibility to use external companies for administration of public contracts. The categorical variables were evaluated using the chi-square test of independence at a 95% significance level. The input data are indicated in Table 4. The chi-square statistic corresponds to 0.4324 and the p-value is 0.5141 at 1 degree of freedom. As the p-value > $\alpha(0.05)$, there is not sufficient evidence to reject the zero hypothesis concerning the independence of the examined variables. Therefore, the existence of an internal directive (or lack thereof) has no statistically signif-

Table 4: Numbers concerning the existence of internal directives and the possibility to use external companies.

Municipality	Employs external company	Does not employ external company
Internal directives exist	51 (64.6%)	28 (35.4%)
Internal directives do not exist	11 (73.3%)	4 (26.7%)

Table 5: Characteristics of the data sample

Size category	Number of municipalities	Directives for small-scale contracts only	Directives for all public contracts
C1	9	9	0
C2	9	9	0
C3	12	4	8

icant effect on the use of external companies for administration of public contracts.

4.2 Analysis of internal directives governing public procurement

A total of 30 internal directives governing municipal public procurement were collected (one municipality was a district of a statutory city). As concerns their size classification, 9 municipalities were smaller than 1,000; in categories C2 and C3, there are 9 and 12 municipalities, respectively (see Table 5).

The table clearly shows that all C1 and C2 municipalities only have directives for small-scale public contracts. In the C3 category, most municipalities have direc-

Figure 1: Funding limits in small-scale public contracts.

tives for all types of public contracts, *i.e.* also for above-the-threshold and below-the-threshold public contracts (specifically, this includes all municipalities with population above 20,000 people). However, the rules for below-the-threshold and above-the-threshold public contracts is not specified in much detail by these directives, since they are subject to the rules laid down by the Public Procurement Act. The analysis thus only concerns small-scale public contracts.

It was found that small-scale public contracts were usually classified into three categories according to funding limits. In extraordinary cases there were only 2 categories (municipality no. 23, see Figure 1), or 4 to 5 categories (municipalities nos. 17, 18, 21 and 26). That is why categories FC4 and FC5 are also provided in Figure 1. At the same time, further subcategories could be identified. Interestingly, the amount of funding limits determining the categories differed among the municipalities. These categories were subject to different rules concerning *e.g.* the approval of the contract or selection of the contractor. In some municipalities, the first category was limited by a relatively low value of the expected contract values (*e.g.* amounts such as CZK 5,000; CZK 20,000 or CZK 50,000), while other municipalities set a relatively high value (CZK 500,000; CZK 1,000,000). Similar differences can also be identified among the limits in other categories of public contracts. To illustrate, one municipality specified limits of CZK 5,000 and CZK 100,000 (dividing categories FC1 – FC2 and FC2 – FC3, respectively), while the values in another municipality were CZK 500,000 and CZK 3,000,000. It can be concluded that the differences in the funding limits used to categorise small-scale public contracts vary substantially.

In this regard, no significant connection can be identified between the funding limits and the size of municipalities. However, the chart shows that there is a certain tendency for large cities to set higher values than is the case in municipalities within the C1 and C2 categories. Figure 1 provides a convenient overview of the limits (100% on the Y axis is the upper limit of a small-scale public contract, *i.e.* CZK 6,000,000). The analysed directives are arranged from left to right in an ascending order according to the municipal size (*i.e.* the X axis shows the order of municipalities from the smallest to the largest in terms of population); for better orientation, vertical black lines separate the C1, C2 and C3 categories. FC_x then denotes the *x*th funding category within small-scale public contracts, where only FC1, FC2 and FC3 are commonly applied.

An important requisite of internal directives consists in a specification of persons responsible for managing public contracts. Municipalities usually leave the management of public procurement to the mayor or, in cities, the head of the responsible municipal authority's department in relation with the funding categories of public contracts. The selection of the contractor and its approval in the first FC is usually left to the mayor (of a village) or head of the responsible department (in a city). In these cases (*i.e.* contracts with a value not exceeding CZK 100,000 or 200,000), it is possible to proceed solely based on information about the market, local knowledge and experience and implement these contracts by means of a direct purchase. In the second FC, it is often necessary to conduct a market research consisting in issuing a call for bids to at least three potential contractors. In these cases, the mayor/head of department can no longer decide alone; instead, the decision is made by an appointed commission, usually consisting of a minimum of 3 members. The selection of a contractor in the case of contracts in the third FC is also usually conducted by a commission (consisting of 3 or 5 members), but it must be confirmed by a city council or a municipal assembly.

Directives rarely address the matter of qualifications. This can be attributed fact that qualifications are not necessary in very small scale contracts; however, in contracts worth millions of CZK, the use of qualification criteria should be considered in order to exclude unsuitable companies from participating. Directives used in large cities also contain provisions concerning the evaluation of public contracts. This includes *e.g.* specifying the minimum relative weight of the bid price as a criterion (*e.g.* 50%) or even a complete methodology for evaluating bids in terms of their economic advantageousness. Some directives explicitly mention life cycle costs, recommendations to seek a good price to quality ratio, specifications for fixed prices

Figure 2: Selected aspects of public procurement management.

and purely quality based tendering, or specification of the maximum permissible price. In such case, these quality criteria must be transparent and non-discriminatory, examples of assessing the correctness of the criteria can be found in decisions of the Office for the Protection of Competition [17].

In nine cases, the directives specifically mentioned the possibility of organising an electronic auction, which was considered an effective tool to achieve financial savings and increase transparency of the selection procedure [18, 19]. In several cases, directives also mentioned the requirement of security, indicating percentage values and exceptions to the application of the directives. A typical case where a municipality is not required to apply the directive are contracts under CZK 3,000, emergencies (crisis management, risk of delay, disasters), and purchases of books.

4.3 General recommendations for public procurement

Based on the findings presented in chapters 4.1 and 4.2, the following recommendations concerning public procurement of construction works can be formulated:

- Each municipality should adopt an internal directives governing public procurement, especially in relation to the procedure concerning small-scale public contracts which are not subject to statutory regulations.
- In large municipalities which more often award below-the-threshold and above-the-threshold public contracts, it is desirable for the directive to specify requisites concerning qualification requirements and evaluation criteria. This can help ensure unified approach to similar / identical contracts. It is also recommended to address the evaluation of contracts according to their economic advantageousness, especially in the context of building life cycle costs.
- In small-scale public contracts, it is necessary to internally specify individual financial categories corresponding to different procedural regimes in terms of contract administration, contractor selection and the approval procedure. The approval procedure may differ depending on the responsible person who is competent to give the approval (e.g. the mayor, municipal assembly, or city council). In this regard, the following choice of limits seems appropriate: CZK 0 – 50,000; CZK 50,001 – 500,000; and CZK 500,001 –

6,000,000. These limits are aligned to the fact that contracts with a value exceeding CZK 50,000 concluded between parties where one of the parties is an obliged person pursuant to the Free Access to Information Act must be published in the Contracts Register. In public contracts with a value exceeding CZK 500,000, the contracting authority is obliged to publish the entire concluded contract including all annexes on its profile.

- It is advisable to explicitly describe situations where the internal directives do not apply to a public contract in order to avoid disputes about whether or not the directive should have been applied. It is recommended to exempt only those cases where the application of the directive would be useless or undesirable (e.g. in cases such as book purchases or emergency response to an accident).
- Specific public contracts which cannot be adequately prepared by a municipality because the municipality lacks professionals with sufficient expertise (e.g. in relation to evaluation criteria or contractual terms) should be managed by specialised external companies.
- It is clear that public contracts co-funded from a subsidy programme must follow the rules laid down by the authority providing the subsidy.

Municipalities should also consider the use of electronic auctions, which is permitted for public contracts by law. However, the potential uses of auctions – especially in small municipalities – is very limited since the costs associated with organising such an auction could outweigh the benefits (i.e. the financial savings). Figure 2 shows selected basic aspects of public procurement management, including the influencing factors (whether the municipal budget covers the contract, whether the contract is of a special character, and whether the contract is subsidised).

5 Conclusion

This paper deals with the regulation of public procurement of construction works on the municipal level. The analysis of primary data obtained through a questionnaire survey and secondary data collected from the internal directives of municipalities enabled to conduct a study of the current situation in the Czech Republic. Practical experience shows that internal directives are especially necessary for small-scale public contracts and the data confirm that most municipalities are aware of this fact. Nevertheless, there are significant differences in the financial limits

in place for various categories of public contracts, which determine the procedure applied. For the interested practitioner, this paper brings general recommendations on specifying internal directives on the municipal level.

At the current stage, the research is unfortunately hampered by the lack of data representing municipalities identical both in terms of both primary and secondary data – in other words, the responding participants in the questionnaire survey differ from the municipalities analysed with regard to the collected internal directives. Further research will focus on supplementing the sample of secondary data (internal directives) in order to conduct a deeper analysis with a view to identifying other potential connections between the examined variables. Subsequent research will also focus on the category of cities (C3), which are a promising source of more detailed internal directives governing public procurement; however, cities are not well represented in the currently available sample.

Acknowledgement: This paper has been written with the support of the research grant “FAST-S-19-5954: Economic and Managerial Aspects of Construction Projects” and Project No. LO1408 “AdMaS UP – Advanced Materials, Structures and Technologies” supported by the Ministry of Education, Youth and Sports of the Czech Republic under the “National Sustainability Programme I”.

References

- [1] Act No. 172/1991 Coll., on passage of certain assets from the property of the Czech Republic to the ownership of municipalities.
- [2] Act No. 13/1997 Coll., on roads.
- [3] Act No. 134/2016 Coll., on public procurement.
- [4] Government Regulation No. 172/2016 Coll., on determination of thresholds and amounts for the purposes of the Public Procurement Act, Ministry of Regional Development of the Czech Republic, changes in the funding thresholds in public procurement, in the wording valid from 1 January 2018.
- [5] Lenderink, B., Halman, J. I. M., Voordijk, J. T., Public procurement of innovation in construction: A design science approach, Proceedings of the 2016 IEEE International Conference on Management of Innovation and Technology, Bangkok, Thailand, 2016, 255-259.
- [6] Korytářová, J., Dufek, Z., Hromádka, V., Vítková, E., Zásada 3E při realizaci veřejných stavebních investic v právních předpisech a v praxi (Application of 3E Principles in Public Construction Investments in Law and Practice), Právo a bezpečnost, 2017, 1, 47-55
- [7] McArdle, G., Gunning, J. G., Enhancing value for money in public procurement of northern ireland construction projects, Proceedings of the Institution of Civil Engineers: Management, Procurement and Law, 2018, 171(5), 207-219

- [8] Dunovič I. B., Radujković M., Vukomanović M., Risk Register Development and Implementation for Construction Projects, *Gradjevinar*, 2013, 65(1), 23-35
- [9] Ochraňa, F., Stehlík, P., Předražování veřejných zakázek na stavební práce v České republice (Overpricing of Public Procurement for Construction Works in the Czech Republic), *Ekonomický Casopis*, 2015, 63(3), 227-238.
- [10] Juszczyk, M., Kozik, R., Leśniak, A., Plebankiewicz, E., Zima, K., Errors in the Preparation of Design Documentation in Public Procurement in Poland, *Procedia Engineering*, 2014, 85, 283-292
- [11] Radziszewska-Zielina, E., Szewczyk, B., Sroka, B., Śladowski, G., Mesároš, P., Kutut, V., Problems of assessing the duration and cost of restoration projects on the example of Poland, Slovakia and Lithuania, *Scientific Review Engineering and Environmental Sciences*, 2018, 27(1), 3-8
- [12] Mesáros, P., Spisakova, M., Mackova, D., Analysis of safety risks on the construction site, *IOP Conference Series: Earth and Environmental Science*, 2019, 222, 1-11
- [13] Szafranko, E., Decision Problems in Management of Construction Projects, *IOP Conference Series: Materials Science and Engineering*, 2017, 251(1), 1-8
- [14] Jacob, D., Kochendörfer, B., Von Drygalski, M., Hilbig, C., Ten years of PPP in Germany: Experiences and Perspectives, *Proceedings of Institution of Civil Engineers: Management, Procurement and Law*, 2014, 167(4), 180-188
- [15] Czech Statistical Office. Rozmístění a koncentrace obyvatelstva ČR – 2001 (Distribution and Concentration of the Population of the CZ - 2001). Available at: https://www.czso.cz/csu/czso/4120-03-casova_rada_1961_2001-3__velikostni_struktura_obci_
- [16] Hanak, T., Korytarova, J., Subsidy risk related to construction projects: Seeking causes, *Open Engineering*, 2018, 8(1), 484-489
- [17] Office for the Protection of Competition. Collection of Decisions. Available at: <https://www.uohs.cz/cs/verejne-zakazky/sbirky-rozhodnuti.html>
- [18] Sičáková-Beblová, E., Šatníková, S., Klátik, P., Elektronické aukcie vo verejnom obstarávaní: teória a prax na Slovensku (Electronic Auctions in Public Procurement: Theory and Practice in the Slovak Republic), *Transparency International Slovensko*, 2011, 68 p. Available at: http://www.transparency.sk/wp-content/uploads/2010/01/aukcie.vnutro.indd_.pdf
- [19] Hawkins, T.G., Randall, W.S., Coyne, A.V., Baitalmal, M.H., Sustainable Integrity: How Reverse Auctions Can Benefit Suppliers in Emerging Markets, *Supply Chain Management: An International Journal*, 2014, 19(2), 126-141