The NISPAcee Journal of Public Administration and Policy, Vol. XII, No. 1, Summer 2019

10.2478/nispa-2019-0002

Factors Determining the Efficiency of Slovak Public Procurement

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Abstract

Many studies analyse factors (such as corruption, competitiveness, transaction costs), which are influencing public procurement efficiency. The purpose of this paper is to find out, what the main factors are in Slovakia that are influencing public procurement efficiency, and based on our analysis, we will also estimate what is the impact of each factor on the efficiency of public procurement in Slovakia.

The research for this paper was executed in three stages. We began with a small number of face-to-face in-depth interviews with specialist procurement advisors to contracting authorities. In the second stage, we created draft questionnaires for contracting authorities and for suppliers, and once we tested questionnaires, it was sent to 13,571 suppliers and to 4,300 contracting authorities. In the last stage, we used various types of analyses to examine identified factors.

There is significant agreement between suppliers and contractors that the two main factors causing inefficiencies are excessive bureaucracy and corruption or other ethical shortcomings. It is shown that insufficient competition, and the excessive use of the lowest price criterion for selecting winning bids, add further inefficiencies. Savings are greatest when there are between 6 and 8 bidders. E-auctions generally produce larger savings than more traditional methods, but Slovak procurement procedures are costly, compared to most other EU states.

This paper contributes to the understanding of what are the core factors which may influence public procurement efficiency. It also provides valuable information

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for government officials on how to change public procurement rules in order to achieve higher efficiency.

Key Words:
Public Procurement, Efficiency, Slovakia.

1. Introduction

Public procurement is the process whereby public authorities – including all levels of government and public agencies – buy goods, services, and works, and it is a key activity in the economy (Kastanioti et al. 2012). In EU countries, on average, public-procurement spending is equivalent to about 15 % of GDP (Table 1). Therefore, significant improvements in its effectiveness can deliver important savings, or an increase in the quality and quantity of procurement. So, public procurement warrants sustained public and academic attention.

Table 1
The size of public procurement in selected EU countries (2015)

	Public procurement to GDP: %	Purchases over EU directives threshold: %
Cyprus	5.5 %	26.7 %
Ireland	7.2 %	24.2 %
Italy	10.4 %	19.0 %
Spain	10.4 %	12.3 %
France	14.5 %	16.0 %
Czech Republic	14.5 %	19.3 %
Slovakia	17.0 %	27.5 %
Finland	18.2 %	19.4 %
Netherlands	20.0 %	10.4 %

Source: European Commission, Public procurement indicators 2015.

Slovakia is perceived to have a relatively high level of corruption. Transparency International's Corruption Perception Index 2016 ranked it 22nd out of 28 EU member countries, and in many cases the media directly links public-procurement problems to corruption. However, we will show that other important factors also determine the efficiency of Slovakia's public procurement system.

The goal of this paper is to present the opinions of procurers and suppliers on what causes inefficiencies in public procurement and to examine their suggestions in depth.

2. Literature review

There is a vast literature on public procurement. Here we briefly review the literature on the topics this paper highlights.

Excessive bureaucracy and high transactions costs are a significant topic in the public procurement literature. The general theory of transaction costs originated with Coase (1937, 1960). Later major contributions were made by, amongst others, Williamson (1985), Demsetz (1968), and Barzel (1985). Transactions costs have a direct impact on a range of aspects of public procurement, including the decision whether or not to outsource the product and the final price of the contract (Williamson 1985; Brown and Potoski 2003). Pavel (2007) created a taxonomy of the main types of transaction costs connected with public procurement (Table 2).

Table 2
Transactions costs in public procurement

Time Dimension / Sector	Ex-ante	On-going	Ex-post
Public sector	Preparing tender documentation Administering tender preparation Fees to involved external experts Legal expertise costs	Administration of running tender	Re-start of cancelled procedure Costs connected with contract amendments Costs of cancellation or delay Costs connected to control/remedy procedures Legal costs
Private sector	Preparing bid Costs to fulfil qualification criteria Guarantees	Communication with tenderer	Costs connected with contract amendments Costs connected with delays and cancellation Legal costs

Source: derived from Pavel (2007, 2013).

The evaluation of factors determining the final level of transaction costs is dealt with by Barney and Hansen (1994), Dyer and Chu (2000), Tadelis (2012), Parker and Hartley (2002), Akerlof (1970), and Hill (1990), amongst others.

Many authors propose that carefully constructed framework contracts and centralised procurement are effective tools to reduce transaction costs (Karjalainen 2011; Kastanioti et al. 2012; Dimitri et al. 2006). Žilinčík (2015) adds the issue of whether there is an effective process for contract amendments. For the Czech and Slovak Republics transaction costs in public procurement have been studied by Strand et al. (2011), Pavel (2013), Švejda (2010), Sumpikova et al. (2016) and Nemec et al. (2016). Švejda estimated that in Slovak public procurement, transaction costs vary between 0.25 and 5.6 % of the contract value. Pavel (2013) estimated that for

the Czech Republic, median transactions costs per participant were 0.4 % of the contract's value. By factoring in the probability of success in bidding, he estimated that a firm that won a contract expended 4.6 % of the contract's value in transactions costs for the winning bid and other unsuccessful bids. Nemec (2018) argues that there is a lack of political will to implement any unpopular changes in Slovakia, and we have to motivate politicians to switch from politics to policy decision.

According to Plaček et al. (2017) the core factors determining the level of transaction costs in public procurement are the quality of the legislative and regulatory framework; the type and method of procurement; the expected volume; management's experience, especially on the procurer's side; post-award behaviour and the attitudes of participants. Nemec et al. (2016) highlighted the fact, that there is an excessive amount of cancelled tenders in Slovak and Czech public procurement, which is also increasing average transaction costs in public procurement.

Many authors argue that an electronic procurement system is the perfect tool to reduce transaction costs (Sambasivan et al. 2010; Suki and Ramayah 2010; Fernandes and Viera 2015; Prier and McCue 2007). Sičáková-Beblavá et al. (2011) argue that e-tendering decreases transaction costs, increases transparency and improves results.

The issue of **corruption and ethics** in public procurement is another common topic. Langr and Ochrana (2015) and Langr (2018) argue that corruption in public procurement in Central and Eastern Europe has a systematic character. Many authors distinguish between corruption and the passive waste of resources. Corruption involves the active diversion of public resources to those involved in it. Bandiera et al. (2008, 1278) define passive waste as something whose "presence does not benefit the public decision maker." In other words, with public procurement the public decision maker is not motivated to increase the efficiency of the process. If the final price of a public procurement is higher than the market price, and there is no "punishment", then there is neither a tangible benefit nor cost to the public decision maker. See also Pavel (2013) and Nemec et al. (2014). Plaček et al. (2018) focused on risk assessment of individual and systematic corruption at the municipal level in the Czech Republic and Bulgaria by using the Corruption Risk FMEA model, and the authors found significant differences in corruption risk, which were detrimental in Bulgaria.

Academic research has probably most frequently focussed on the issue of **competitiveness.** In a heavily cited study Gupta (2002) analysed 1,937 tenders for highway construction in Florida, for 1981–1986. He found that the lowest prices could be achieved with 6 to 8 bidders. Extra bidders had no impact on price. He discussed both competitive and collusive procurement markets and noted that the higher the number of bidders, the greater the protection against collusive cartels. On the efficiency impact of collusive cartels, see Rose-Ackerman (1999).

Brannman et al. (1987) analysed auctions for timber and oil exploration and confirmed the impact of competition on the final price. Kuhlman and Johnson (1983) analysed highway construction projects in the USA during 1975–1980, and also confirmed the positive impact of competition on price. They also found that if the estimated price was not published, that increased the chance of a higher final price. Similar results were obtained by Gilley and Karels (1981), Elberfeld and Wolfstetter (1999), Szymanski (1996) and Millet et al. (2004).

Iimi (2006) analysed data from 26 developing countries from the period 1999–2005. He confirmed that competition by suppliers decreased the final price when there were up to eight bids. But beyond eight bidders the effect disappeared.

Gineitiene and Šerpytis (2011) analysed Latvian procurement of standardised goods but were more positive about the impact of competition on the final price. For some commodities they found that an extra bidder can decrease the price by more than 10 %.

Ilke et al. (2012) analysed Turkish procurement, 2004–2006, with data from 90,089 tenders. Their results suggested that on average every extra bidder reduces the final price by 3.9 %. The larger the expected financial volume of a tender, the great the number of bidders. However, the average number of bidders was only 3.09. If foreign companies bid, this increased the effect of competition.

For the Czech Republic, Soudek and Skuhrovec (2013) analysed electricity and gas supplies, where market price comparisons are simple, as both commodities are homogeneous. Interestingly they found that the expected price in tender documentation is normally over-estimated. Whether this reflects a desire to show savings in the final deal, or whether it just reflects caution, is unclear. Their core conclusion is that the key factor determining price was the selection method. On average open tenders delivered a 7 % price decrease compared to other methods. For electric power every extra bidder led to a final price reduction of 1 %. However, the impact for gas was insignificant. E-auctions decreased the price by an extra 6 %. The average number of bidders was four for electricity and 3.3 for gas.

Pavel (2010) analysed procurement for Czech road and railway infrastructure. He concluded that on average an extra bidder led to a price fall of 3.27 %. But the low numbers of bidders precluded estimating at what number this effect might cease. Importantly, the use of restricted tendering increased the price by 11.56 %.

For Slovakia, Šípoš and Klátik (2013) analysed all levels of procurement in 2012, focusing on the impact of competitiveness, e-auctions, and the method of tendering. The findings support those of previous studies: the price decreases, at a decreasing rate, as the number of bids rises, up to a maximum of five. On average e-auctions decrease the price by 5 %, and the use of open tenders also helps to lower the final price. Similar results were confirmed by Grega and Nemec (2015a, 2015b),

and the authors emphasise the fact that public procurement in Slovakia has the lowest competitiveness rate among all EU countries.

Sičáková-Beblavá et al. (2013) analysed 725 procurement actions in 32 Slovak organisations during 2008–2010. They confirm the positive effects of e-auctions and of competition. The first extra offer decreases the price by 4 %, and each additional extra offer by 84 % of the previous price change. They did not find a specific number of bidders beyond which the price ceased to fall.

Finally, some studies have examined how contracting and outsourcing impact on competition. Most of them confirm that final prices decreased as the number of bids grew and if open tenders were used. For Slovakia this was especially marked in the study by Mikušová-Meričková and Nemec (2013). However, studies of contracted waste management in the Czech Republic, by Soukopová and Malý (2012) and Soukopová et al. (2018), failed to find such a link. In fact, although in some sub-regions there was only one bidder, prices were not noticeably higher than in sub-regions with more bidders.

Afonso et al. (2006) conclude that a core problem is the use of a **lowest price selection criterion**, especially for services and works. This approach often leads to an unacceptably low quality of deliveries. For the Czech Republic this problem has been noted by Pavel (2013).

There are many ways of controlling the results from public procurement. Chamberland (2005), Triantafillou (2007) and Raymond (2008) propose that final price benchmarking should be regularly used. Many studies have analysed procurement data to demonstrate achieved savings, but commonly they ignore the quality of deliveries. It is not enough just to check a transaction for probity. It is also necessary to check the quality of deliveries: that is, to exercise performance control over the procurement process.

Two Slovak studies that applied this approach covered products where the quality of deliveries was generally uniform. Vlach et al. (2004) produced a benchmarking study of goods purchased by Slovak hospitals. The results were damning. Price differences of more than 100 % were observed, with laundry services and meat purchases providing the worst examples. Hospitals paid higher prices for drugs and medical equipment than did walk-in customers in pharmacies. Sulovcová (2015) produced a straightforward benchmarking study of Slovak universities' purchases of printer toners. Most bought them at above standard market prices.

3. Methodology

The research for this paper was executed in three stages. We began in 2014 and 2015 with a small number of face-to-face in-depth interviews with specialist procurement advisors to contracting authorities. We reasoned that they would be able to

provide comprehensive, detailed, and nuanced views on the likely relative importance of factors affecting the efficiency of Slovak public procurement.

In the second stage, and in the light of their experience, our experience, and the literature on procurement, we developed two somewhat different draft questionnaires for contracting authorities and for suppliers. The purpose was to discover what they felt were the core problems with the Slovak public-procurement system.

We used the *Slovak Public Procurement Journal* to source the addresses of the 4,300 procurement contracting authorities. We obtained 13,571 suppliers' addresses from data available on the emarket (www.eks.sk).

The questionnaire was administered in two phases. In the test phase we continued to send questionnaires until we had received 40 responses from contracting authorities and 80 responses from suppliers. Based on responses and feedback, we revised the questionnaire and then sent out the main mailing in the summer of 2017.

The final response rate was not high but was sufficient to be a representative sample. We received 211 answers from contracting authorities: a 4.91 % response rate, and 626 answers from suppliers: a 4.79 % response rate.

The third stage of the research focused on the main factors identified: excessive bureaucracy and transaction costs; corruption and ethics; competitiveness; and inappropriate use of the lowest price selection criterion.

4. Core factors limiting Slovak public-procurement efficiency

The questionnaires asked respondents to choose up to 3 factors that they felt adversely affected the efficiency of public procurement. The contractors ranked factors as follows:

- Excessive bureaucracy (143 answers);
- Frequent legislative changes (118 answers);
- Corruption and non-ethical behaviour (118 answers);
- Limited competitiveness (33 answers);
- Passive waste due to the limited motivation of contracting officials (23 answers).

The opinions of suppliers were slightly different:

- Non-ethical behaviour of public procurement officials (372 answers);
- Excessive bureaucracy (369 answers);
- Corruption (306 answers);
- Low quality of control in the public sector (180 answers);
- Contracting authorities do not respect legislative and regulatory framework (173 answers);
- Limited competition (48 answers).

We combined the questionnaire answers with the information received from face-to-face interviews and with data obtained by a secondary analysis of the existing literature. Based on our synthesis of these inputs we propose a weighted list of factors limiting the efficiency of the Slovak public procurement system (Table 3).

Table 3
Core factors limiting Slovak public procurement efficiency

	Ranking by procurers	Ranking by suppliers	Own ranking, based on secondary analysis and interviews
Excessive bureaucracy (including high transaction costs)	+++	+++	+++
Corruption and ethics	+++	+++	+++
Frequent legislative changes	+++	+	++
Inappropriate use of lowest-price criterion	+	++	+++
Contracting authorities do not respect legislative and regulatory framework	N/A	++	++
Limited competitiveness	+	+	++
Low quality of control in the public sector	N/A	++	++

Source: authors' calculations. N/A not applicable, +++ means top factor.

In the following sections we set out primary and secondary data for the most important factors noted in Table 3.

5. Excessive bureaucracy and high transaction costs

The legislative changes are a real issue in the Slovak public procurement. The first issue is their frequency – the Slovak public procurement law was changed 35 times in the decade from 2006, including six changes in 2015 alone. Self-evidently, such changes impose extra difficulties and hence increased transactions costs on bidders and on contractors/procurers. Table 4, following Pavel (2013), shows the second legislation connected issue – the growth in the volume of legislation.

The growth in legislation cannot be fully explained by the need to cover novel issues, for example electronic commerce. Both Pavel (2013) and Nemec (2011) connect it to what they identify as a specific administrative-legislative regional characteristic: the habit of trying to resolve implementation problems, not only by improving processes, but also by enshrining the changes in ever more detailed and complex legislation. Moreover, as the enlarged law generates many concomitant regulatory

and internal administrative norms, this complicates procurement execution for both suppliers and contracting authorities.

Table 4
Quantitative analysis of Slovakia's public procurement law (PPL)

Law number	Validity date	Normalised pages main text	Normalised pages including annexes
263/1993 Coll.	1/1/1994	14	14
263/1999 Coll.	1/1/2000	48	58
523/2003 Coll.	1/1/2004	89	98
25/2006 Coll.	1/2/2006	208	229
343/2015 Coll.	3/12/2015	259	275

Source: authors' calculations. Normalised page = 1800 signs.

Both suppliers and contractors used their options to provide verbal comments on this issue.

> *The Slovak public procurement law is not for humans. It is complicated, extensive and difficult to understand. Some paragraphs lack explanations, links and implications. It requires too many administrative actions, paperwork and time.*
>
> Contracting official

> *There is no doubt that excessive bureaucracy is the explanation for the limited efficiency of procurement. One example – from 2017 the small-scale procurement limit is 15,000 EUR. However, the subordinated unit already requires us to fill in comprehensive documentation for all purchases above 1000 EUR.*
>
> Contracting official

> *The bureaucracy it is necessary to accept, in operating on the e-market, is unbelievable. I am not sure that it was proposed by a "normal human being". It must be designed by people who do not understand private business at all.*
>
> Supplier

Strand et al. (2011, 83) estimated the administrative costs of public procurement connected with participation in above-EU threshold[5] tenders, for 2008. Table

5 Every 2 years, the European Commission announces an EU procurement threshold. A procurement above the threshold must be published in Tender Electronic Daily, an EU procurement journal, and EU procurement directives must be followed. Current thresholds are available at https://ec.europa.eu.

5 shows the estimated number of days needed to complete all the administrative steps connected with this level of procurement, separately for contractors and suppliers in each of the 27 EU countries.

Table 5
Administrative person-day costs of EU procurement 2008

Country	Contractors	Country	Suppliers
Bulgaria	68	Malta	34
Cyprus	44	**Slovakia**	**30**
Greece	44	Cyprus	29
Italy	43	Bulgaria	25
Slovakia	**38**	Greece	25
Portugal	35	Italy	20
Romania	31	Austria	20
Latvia	27	Denmark	18
Lithuania	27	UK	17
Denmark	26	Sweden	17
UK	25	Germany	17
Spain	25	Portugal	16
Hungary	23	Estonia	16
Sweden	21	Romania	15
Netherlands	21	Hungary	15
Slovenia	20	Ireland	15
Austria	19	Czech Republic	15
Estonia	19	Latvia	14
Germany	18	Spain	14
Poland	18	Belgium	14
Finland	17	Lithuania	13
Ireland	16	Netherlands	13
Belgium	16	Slovenia	12
France	16	Poland	11
Czech Republic	15	Luxemburg	11
Malta	12	France	10
Luxemburg	11	Finland	10

Source: Strand et al. 2011.

The very high costs facing Slovakia are clearly not a regional phenomenon. Both the Czech Republic and Hungary face much lower costs.

A specific source of transaction costs is cancelled tenders (see Table 2). Table 6 shows the large scale of this problem in Slovakia.

Table 6
Number of cancelled tenders in Slovakia

	2015	**2014**	**2013**	**2012**	**2011**	**2010**
Total number of tenders	7613	5766	8896	7813	5254	5168
Cancelled total	1404	1079	687	939	805	790
Cancelled %	18.44	18.71	7.72	12.02	15.32	15.29
Goods	2015	2014	2013	2012	2011	2010
Total number of tenders	x	2305	4048	3532	2128	1488
Cancelled total	x	433	304	383	268	187
Cancelled %	x	18.79	7.51	10.84	12.59	12.57
Services	2015	2014	2013	2012	2011	2010
Total number of tenders	x	1550	2177	2287	1481	1743
Cancelled total	x	276	227	309	171	129
Cancelled %	x	17.81	10.43	13.51	11.55	7.40
Works	2015	2014	2013	2012	2011	2010
Total number of tenders	x	1911	2671	1994	1645	1937
Cancelled total	x	370	156	247	366	474
Cancelled %	x	19.36	5.84	12.39	22.25	24.47

Source: www.uvo.gov.sk, 2016.

Our questionnaire included a question, intended to be an indirect assessment of the impact of bureaucracy and transaction costs on the final procurement outcomes. 58 % of contracting officials and 59 % of suppliers believed that operating without the current public procurement law (PPL) would result in lower prices and higher-quality procurements.

Transaction costs of the Slovak e-market

In this paper we recognise savings achieved by the use of e-markets and eauctions. However, we should also speak about transaction costs connected with the use of these tools. Table 7 sets out the basic characteristics of the Slovak e-market.

Table 7
E-market in Slovakia as of 30 September 2017

Indicator	Value
Number of procurements started between 1 October 2014 and 1 October 2017	93,431
Number of procurements finished between 1 October 2014 and 1 October 2017	77,911
Cases with only one bidder	17,756
Average number of bids per procurement	3.54
Value of completed procurements	786,202,190€
Savings (absolute)	140,730,192€
Savings (%)	17.90

Source: authors' calculations based on e-market data.

The suppliers' relatively high transaction costs are caused by the excessive bureaucracy involved in participating. The basic requirements are:

1. Registration on the e-market (by post or by e-signature).
2. Registration on the list of economic subjects of the Office for Public Procurement.
3. Registration on the list of partners of the public sector of the Ministry of Justice (compulsory for all bidders in single tenders valued over 100,000 EUR, or a total value of 250,000 EUR for two or more tenders during a calendar year).

From our interview information, we estimated the time and complexity of requirements needed for all three registrations. The estimated cost for registering on the e-market is close to zero. The cost to register on the list of economic subjects is 87.90 EUR. At the moment, central state registers are not interconnected, and all necessary certificates, such as penalty registry and business registry certificates must be submitted in paper form. This part of the process requires 2–4 weeks. Registering as a partner of the public sector is expensive and costs a minimum of 500 EUR. This is a recent anticorruption measure, introduced to exclude firms with unknown owners from the procurement process. However, not every supplier needs to register.

The costs to participate for Slovak public contracting authorities are covered by the Ministry of the Interior. Table 8 uses official data to provide an overview of these transaction costs.

Table 8
Ministry of Interior costs to run the e-market, VAT not included (estimated from 1 October 2014 to 30 September 2017)

Item	Monthly fee	One-time fee	Total per 3 years
Lump sum to create the system	*N/A*	3,514,201€	3,514,201€
Fee to administer the system	166,501€	*N/A*	5,994,036€
Fixed fees paid for finished procurements (198€ per procurement)	74,344€	*N/A*	2,676,384€
Fixed fees paid for cancelled procurements (99€ per procurement)	6,287€	*N/A*	226,332€
Fees paid for size of finished procurements (0.55% from size)	23,514€	*N/A*	846,504€
Fees paid for savings in procurements (2% from savings)	15,337€	*N/A*	552,132€
Total (VAT not included)	**285,983€**	**3,514,201€**	**13,809,589€**
Average monthly costs (per first 3 years)	383,600€		
Average costs per tender	177.25€		
Average % costs tender value	1.76		

Source: authors' calculations, 2017.

Remark: The numbers in column one were calculated for the first three years when the e-market system was operated (from 1 October 2014 until 30 September 2017). Average costs per month to operate the e-market system will be higher in 2018, because the volume and number of tenders was much lower for the first few months, when the e-market system started (and total fees are calculated based on volume and also number of tenders). This is our estimate; based on data provided from the e-market system (the Slovak government never released the total costs for the e-market system).

6. Corruption and ethics

International organisations generally assess Slovakia as having a high level of corruption. For example, according to Eurobarometer (2014) 90% of Slovak citizens feel that corruption is widespread in the country. Many authors, including Orviska and Hudson (2003) and Hunady and Orviska (2015), argue that a key specific determinant is a high Slovak tolerance of corruption by the general public – people in Slovakia and also in other countries of the region are not just victims, but co-creators/accomplices of corruption (Miller et al. 1998).

Eurobarometer (2014) reported that 84 % of the 300 Slovak firms it polled suspected that public-procurement tender conditions were normally prepared for a specific preselected supplier. Amongst other problems, the firms also claimed that those caught engaging in corrupt behaviour were rarely punished, and the selection criteria in procurement were deliberately vague.

We also asked our respondents some optional questions about corruption in public procurement. The fact that 91 % of suppliers and 85 % of contracting officials filled in this part indicates the urgency of the topic. Their common view was that corruption in Slovak public procurement is high level and systemic:

> *The corruption is not generated at the level of contracting authorities, but between elected leaders/appointed top managers and "pre-determined" suppliers … those who just carry out the process on the operational level do not influence its "pre-determined" results.*
>
> Contracting official

Respondents' answers to the question "Is there corruption in Slovak public procurement?" were as follows:

- 322 (51 %) of suppliers responded "definitely yes" and 178 (28 %) responded "maybe yes". No respondents answered "definitely no";
- 122 (57 %) of contracting officials responded "definitely yes" or "maybe yes" and only two replied "definitely no".

Not only do both suppliers and contractors see corruption as a significant problem, they argue that it is either increasing or certainly not declining. They say it increases with the size of contracts, and the government is unwilling to prevent it. Neither is whistle-blowing effective. Indeed, almost all suppliers claimed that reporting corruption leads to firms being put on unofficial black lists and excluded from future successful participation in tenders. They emphasised that reported corruption is unpunished and whistle-blowers are unprotected. Protective laws are of little help.

Procurement officials who wish to tackle corruption have to face the fact that Slovak civil-service and public-service legislation is widely seen as unsatisfactory. Indeed, the EU declared that improvements in civil-service legislation and behaviour were a core conditionality to be addressed after Slovakia's 2004 entry. However, Meyer-Sahling (2009) characterised Slovak civil-service developments after 2004 as a "destructive reversal process". In 2017, under EU pressure, the Civil Service law was amended. This may have improved performance and protections in a service long seen as politicised, based on patronage, and lacking any strong ethical dimension (Stanova 2014).

7. Competitiveness

As noted above, competitiveness is expected to have an important impact on the efficiency of procurement. But Slovak performance in this area is very poor. Indeed Strand et al. (2011) claim that for 2006–2010 Slovakia was the least competitive of all members in above-the-EU-threshold procurement.

We assessed the competitiveness of "national" public procurement for 2009–2014. These are the below-the-EU-threshold cases, reported in the public-procurement journal. The results are worrying: for this period the average number of bids for supplies of goods was around two, for services about three, and for works around five. With so few bids the risk of collusion cartels is extremely high (Pavel 2013).

The impact of competitiveness on the final price

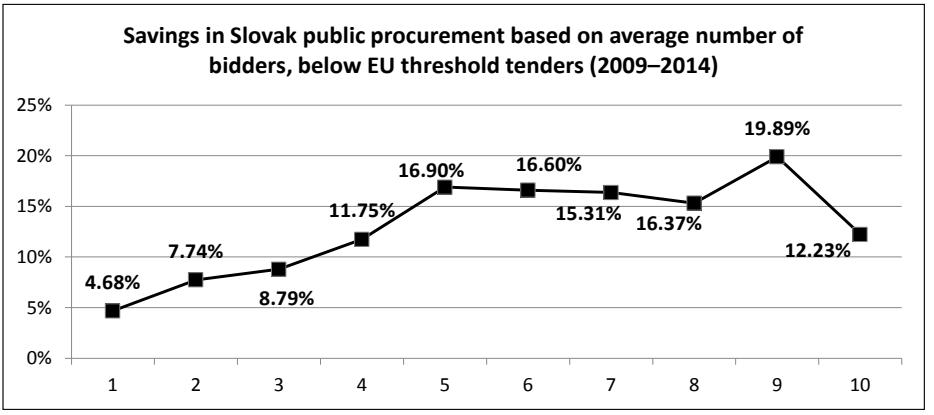
We calculated the impact of competition on price, by plotting the number of bids per procurement against the difference between the estimated and final price of the procurement. The data, covering 27,234 cases from the period 1 January 2009–12 August 2014, came from the server tender.sme.sk, administered by Transparency International Slovakia.

The procurements were divided into groups by the number of bids received for the procurement. For each group the absolute value of savings was calculated. So, the calculation is weighted to include the size of the contract. But to avoid large contracts over-dominating the result, we removed all contracts that were greater than 0.1 % of the total value of that group's contracts. The results are shown in Figure 1. Although the groups with large numbers of bidders have relatively few members, the overall result – that optimum savings occur in the groups with 6–9 bidders – is very similar to that in the existing literature, reviewed in section 1 above.

We also used a regression model to test for the determinants of savings for procurement above the EU threshold for 2009–2013. The data source was the European Commission, and it was published in Tenders Electronic Daily. We cleaned the data of all samples that seemed[6] incorrect, eliminating about a fifth of tenders, and processed them using EViews software. The dependent variable is the final price savings in a procurement: i.e. savings as a percentage of the estimated price. The independent variable, "number of bidders" was in the range 1–n, while the independent variables "EU financing", "Lowest price criterion" and "Subcontracting" took the values yes/no. The first two of these independent variables were significant at the 1 % level, and the third and fourth were significant at the 10 % level.

6 We had to eliminate data from many framework agreements, especially data from the procurer "Forests of the Slovak Republic, state enterprise". These framework agreements had, for example, 5 different parts, for each of which there was only one bidder. Procurers (especially Forests of the Slovak Republic) reported that such procurements had 5 bidders, ignoring the fact that there were 5 different procurements.

Figure 1
Slovak public procurement savings, by average number of bidders



Source: authors' calculations based on data from www.tender.sme.sk, 2014.

Table 9 shows the core results. The number of observations was 8,426, the adjusted coefficient of determination was 0.136. The latter is low, but high enough to consider the independent variable results.

Table 9
Results from OLS analysis – the impact of selected factors on the final price: above EU threshold tenders, 2009–2013

Factor	Impact on final price
Number of bidders	–2.63%
EU financing	1.54%
Lowest price criterion	–1.06%
Subcontracting	–1.05%

Source: authors' calculations

The fact that the use of the lowest price-selection criterion delivers greater savings is not a surprise, for most studies conclude that using the criterion leads to lower-quality products being delivered. We return to this below. On the other hand, the fact that procurement for EU-financed activities is less economical might seem a surprise, because EU funds are subject to relatively comprehensive control. The implication is that the controls are insufficiently effective.

Finally, we used data from the most recent period, 2014–2017, to see if it confirmed the above findings. Again, we used a GLM regression model, but this time our data was drawn from the Electronic contracting system, where bidders can enter more than one offer, as an e-auction is used in bidding. We divided procurements

by type into goods, services and works. The results in Table 10 show large increases in the adjusted coefficient of determination and confirm that more bidders lead to lower public-procurement final prices. The savings from an extra offer, for goods, and for services, is positive, but low.

Table 10
GLM regression model – data from Electronic marketplace (2014–2017)

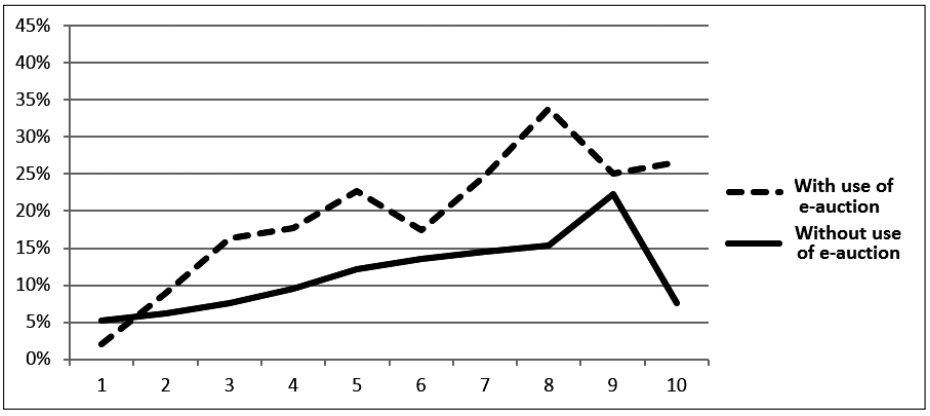
	Overall savings (expected vs. final price) by adding one bidder/offer		
	Goods	**Services**	**Works**
Number of bidders	2.98 %	3.27 %	2.54 %
Number of offers	0.1 %	0.06 %	N/A[7]
Additional data			
Sample size	3518	6288	190
Competitiveness rate	3.09	2.77	4.50
Adjusted pseudo R^2	0.44	0.40	0.35

Source: authors, based on data from Electronic Marketplace 2017.

The impact of e-auctions on the final price

From the data used in Figure 1 above, we also calculated the results of procurements with and without the use of e-auctions. The results are shown in Figure 2. If there are two or more bidders, on average eauctions lead to greater savings. But if there is only one bidder, on average e-auctions produce overpricing.

Figure 2
Savings size by number of bidders, with and without the use of an eauction



7 This value was not statistically significant, therefore we use N/A.

Source: authors, based on data from www.tender.sme.sk, 2014.

8. Lowest-price selection criterion

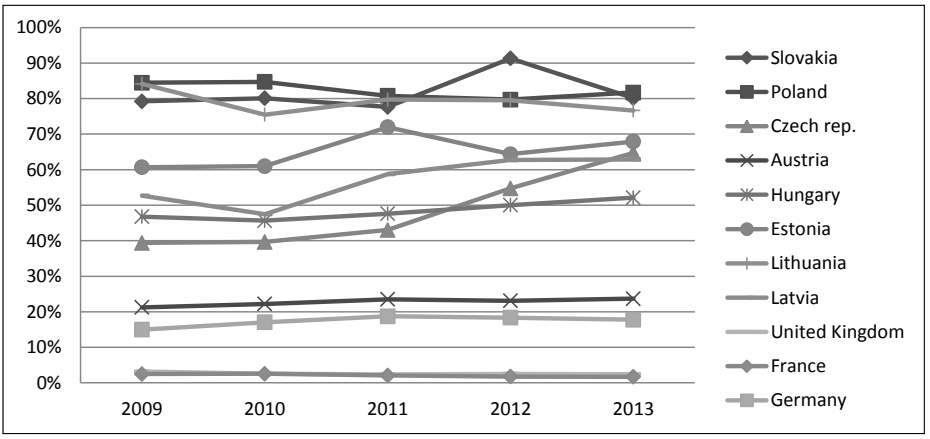
Until 2015 the Slovak public procurement law (PPL) defined only two possible selection criteria – the most economically advantageous bid (MEAT) and the lowest price. The current law 343/2015 added life-cycle costs (LCC) as a third possible criterion. As our data predate this third criterion, we use only MEAT and the lowest-price criteria.

Figures 3 and 4 show the proportion of public procurement of services and works decided on the lowest-price criterion, for selected countries. Clearly this criterion is used much more commonly in Central and Eastern Europe than in the other four European countries. As most goods are well standardised, they can be bought with minimum risk using the lowest-price criterion. But purchasing services and works in this way is a risky strategy, because quality is likely to vary with price.

Why does this happen? In our experience, it happens for three main reasons. First, procurement officials are reluctant to bear the risk connected with the use of more complicated selection criteria. Second, officials want to avoid the extra work involved in applying more complicated decision criteria. This is an example of passive waste. Third, officials have only limited access to information on how to appropriately apply the MEAT criterion (Sumpikova et al. 2015).

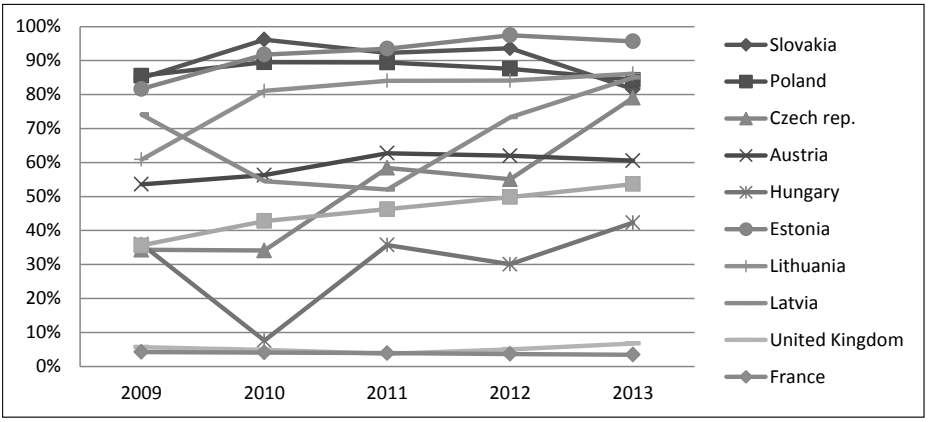
Figure 3

Proportion of public procurement of services awarded using lowest price criterion



Source: authors, based on data from Tenders Electronic Daily 2014.

Figure 4
Proportion of public procurement of works awarded using lowest price criterion



Source: authors, based on data from Tenders Electronic Daily 2014.

The use of the lowest-price criterion in Slovak public procurement has one further dimension: e-auctions. E-auctions are common, and two observations from suppliers provide stark examples of some of the problems with the lowest-price criterion, and with e-auctions.

> *Our business is security services – many firms in this segment submit unrealistically low prices, and if they win the tender, they pay illegally low salaries, or apply for contract amendments.*
>
> Supplier 1

We would add that such low salaries would probably be paid to pensioners, or to non-Slovaks. The contract amendments will often have been secretly agreed before the bid is entered.

> *The e-market is also used for services like translations. We have participated in many auctions, where, at the final moment, an unrealistically low price was proposed. For such a price good-quality translation services cannot be delivered. We cannot compete in this environment.*
>
> Supplier 2

It is too early to assess the impact of the relatively new EU Directive 2014/24/EU, which focuses on the MEAT decision criterion, on the development of the Slovak procurement market.

Conclusions

The goal of this paper was to determine the main factors causing inefficiencies in the Slovak public-procurement system, and where possible to supply some quantitative or qualitative assessments of their importance.

The questionnaire survey of the contracting authorities and suppliers, interviews with experts, and secondary data indicated four key factors.

First, excessive bureaucracy in public procurement, including the impact of frequent legislative changes, generates excessive transaction costs. Slovak procurement legislation was revised 35 times in the decade after 2006. For as early as 2008, Strand et al. (2011) had calculated that amongst EU members, for procurements above the EU threshold, Slovak procurement administrative costs per tender were the fifth highest for contractors, and costs per bid were the second highest for suppliers. Our survey showed that in 2017, 68 % of contractors and 59 % of suppliers identified excessive bureaucracy as one of the top three efficiency problems with the Slovak procurement system. 56 % of contractors also blamed frequent changes in legislation.

Second, corruption and other ethical shortcomings raise procurement costs and may damage the quality supplied. Our 2017 survey results show that 56 % of contractors blamed corruption and non-ethical behaviour for inefficiencies. In addition, 49 % of suppliers blamed corruption and 59 % blamed non-ethical behaviour.

Third, limited competitiveness, in the form of too few bidders, means possible savings are missed. 16 % of contractors, and 8 % of suppliers identified competition as a major efficiency problem.

Finally, excessive use of the lowest-price selection criterion for services and works can adversely affect quality and lead to non-transparent procurer-supplier relations. 29 % of suppliers picked out poor quality control as a top-three problem.

Removing these roadblocks to an efficient and effective public procurement system would be a complex, long-term project. Amongst other things it would involve fundamental alterations to a large set of hard-to-change institutional factors, beginning with the widespread toleration of corruption. Therefore, we leave detailed policy recommendations as a task for future study.

Acknowledgements

The preparation of this paper was supported by the Slovak Grant Agency APVV, project APVV-17-0360 (Multidimenzionálna analýza signifikantných determinantov efektívnosti verejného obstarávania s dôrazom na aplikáciu Health Technology Assessment v procese prípravy obstarávania). The authors would like to thank Alice Leonard for helpful comments on the paper.

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