

PERCEIVED ETHICAL RISKS IN PUBLIC PROCUREMENT IN HUNGARY (2009–2021)

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ABSTRACT

The conduct of participants in the public procurement market, their flexibility in terms of compliance with the rules and unlawful conduct cannot be studied only and exclusively within the framework of corruption research. This paper aims to present how market participants' perceptions of unethical conduct have changed over 13 years. Our findings demonstrate that the market of public procurements should not be held uniformly responsible for cases of corruption in spending public money. The paper summarises the results of five surveys carried out between 2009 and 2021. Participants of the public procurement market reported that misconduct was a major issue in public procurement in Hungary over the entire reference period. Grievances were the most pronounced on the part of tenderers. In the assessment of market participants, the regulation performs moderately in curbing practices restricting competition. At the same time, they rated their own and other participants' ethics medium at best in the whole reference period. Only contracting authorities reported some general improvement, in a single year (2021). There is a general market consensus that procurements of construction projects, services and high-value procurements are the most prone to corruption. In this respect, market participants perceived an improvement in 2021, at least in comparison to 2018. Respondents identified the highest risk of corruption in the planning, evaluation and performance stages. Based on our panel data regressions, the general level of ethics as perceived by market participants was stagnant, while corruption exposure followed an inverted U curve, peaking in 2018 and dropping between 2011 and 2009 levels in 2021. The reasons behind that slight improvement are clear. Digitalisation has made communication more traceable, and the controllability of the procedure has inspired optimism in market participants.

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In other words, transparency and accountability have a strong influence on the perceived level of ethics in public procurement.

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1 INTRODUCTION

More than 10% of Hungary's GDP is spent on the domestic public procurement market. We can only provide an estimated value of the market based on the available data. Relying on EU data from the Single Market Scoreboard (2022), higher value public procurements (i.e. above EU public procurement thresholds) between 2019 and 2022 amounted to 8-14% of the GDP, on top of procurements of a value above domestically applicable public procurement thresholds.² Considering EU tenders, the size of the Hungarian public procurement market is comparable to that of Lithuania, Greece, Romania, Croatia, France and Poland. However, it is expected that lower-value tenders will also be added in the future, providing a more accurate picture of market size. The Hungarian legislation is harmonised with EU Public Procurement Directives (2014/23/EU, 2014/24/EU, 2014/25/EU). Studies available in English on public procurement in Central Europe typically focus on the analysis of data concerning competition, efficiency, the role of SMEs and corruption (Bauhr et al., 2020; Džupka et al., 2020; Nemeč et al., 2021; Plaček et al., 2019; Plaček et al., 2020).

As in the entire region, only a few studies have been published in Hungary on the behaviour of participants of the public procurement market and their attitudes to unethical conduct (e.g. Tátrai, 2018). Individual opinions, while perceptions-based by nature, may provide important added value to targeted inquiries into the attitudes of market participants. This study is therefore not a piece of corruption research, but a detailed survey of specifics of the public procurement market, assessing respondents' views through various questions concerning corruption, unfair competition and forms of unethical conduct by contracting authorities and tenderers. The study is not politically motivated and relies exclusively on the perceptions of respondents in making connections between unethical practices and conditions of competition, efficiency and performance in the public procurement

² Although total market size is published every year in the annual report of the Public Procurement Authority, the disclosed data are highly discrepant from the Single Market Scoreboard and the applied methodology is unknown. Therefore, data from the latter will be considered.

market. We start from the assumption that the perceptions of market participants can only be analysed by long-term repeated data collection. The fact alone that a segment of the market is found unethical by a significant share of its participants does not mean that every participant is complicit. By analogy, seeing frequently imposed fines for cartels in a sector should not lead us to the conclusion that all participants engage in cartel practices. Our study does not investigate the institutional or individual factors behind misconduct, i.e. the root causes of unethical conduct, but rather the everyday impressions and first-hand experiences of those directly involved in them. Even in a study setup, respondents cannot be detached from what they hear and the general opinion they have formed about public procurement activities. The reputation of the profession is heavily dependent on how market participants judge their own activities. It is, therefore, important to ask public procurers directly. The questionnaire was designed for experts in the field, and familiarity with industry terminology was required to fill it. That also presupposes first-hand experience of the workings of public procurements. When analysing responses, we anticipated that perceived ethical risks would be affected by changes in the regulatory environment and the full digitalisation of the public procurement market, introduced on a compulsory basis in the EU in 2018. The resulting changes in market activity and the roles of participants were comparable in scale only to those faced by public procurers upon Hungary's accession to the European Union in 2004. Accordingly, the market was shocked by the redrawn public procurement landscape where previously widespread forms of unethical conduct were no longer possible. It would be a false analogy to extrapolate the assessment of market participants' conduct onto the functioning of the entire national economy and changes in the ethical concerns characterising it. The focus of this paper is restricted to the public procurement market to explore how market modernisation may improve participants' attitudes and assessment of the market. The paper starts with a brief literature review. It presents indicators of corruption used in public procurement procedures to illuminate how effective these are in determining the infiltration of corruption in a given market. The rest of the paper is composed of a methodology part, the presentation of the main survey results and a summary of our conclusions.

2 LITERATURE REVIEW

The literature on corruption is the primary resource for studying and measuring the behaviour and ethics of participants in the public procurement market. Relationships between market structure, market characteristics and misconduct were identified first by Rose-Ackerman (1975) as a pioneer in the field, which signifies that research in this area is relatively new. While the objectives of this study are

more complex, they require a review of the most important measurement methods of corruption. These methods have been developed for diverse purposes and have their own strengths and shortcomings that will be highlighted below.

The most frequently used indices include the Control of Corruption Index of the World Bank (WB CCI) and the Corruption Perceptions Index of Transparency International (TI CPI), available for all countries of the world. Discussing the underlying methodology of the WB CCI in their paper, Kaufmann et al. (2010) describe it as an indicator constructed of several hundred variables obtained from 31 different data sources, capturing the perceptions of survey respondents including non-governmental and governmental organizations, commercial business information providers, and public sector organizations worldwide. As the TI CPI is more widely used in public procurement procedures, as described later in detail, and tends to be more frequently cited in the reference literature for public procurement, our observations on corruption perceptions indices will be based on that indicator.

The TI CPI (2022) aggregates data from 13 sources capturing the perceptions of experts and businesspeople of corrupt practices in the public sector, including bribery and spending public funds for private purposes. The index has been reviewed by a number of researchers. Among them, Hessami (2014) found it to be a highly subjective indicator. Andersson (2017) also criticised the TI CPI for providing a single number for each country without regard to the specific circumstances in which corruption occurs. While it is a well-founded critique, indices by nature use simplification to facilitate the comparison of performance across countries or regions. That is why public procurement analyses refer more often to the position taken by countries in the ranking and how it changes year over year rather than to the development of their TI CPI scores. For the purpose of self-assessment, it is especially important for countries how they rank relative to other countries of the same continent. The market treats the nominal value of the index differently in this respect.

Aiming for an indicator which is more exact than the CPI, Transparency International has designed the Global Corruption Barometer (TI GCB, 2021), used only once to date in 2021 in a survey restricted to EU countries. Like other international organisations, TI carefully introduces and carries out test runs of newly developed indicators and dedicates significant resources to the required development, surveys and analyses. The survey was interview-based and interrogated citizens' views and experiences of corruption. In addition to their general perception of corruption, respondents were also asked a targeted question about government corruption. The survey included questions easily understandable by members of the general public on the close ties between business and politics, and the private and public sector.

Based on the results, 52% – quite high a share – of people in the EU doubt that government contracts are allocated in a competitive manner. These people think that the procurement of goods and services in their countries often gets decided using bribes or personal connections. Apparently, the survey questions were phrased in this way to avoid ambiguity and to make sure that they are clearly understood by the general public (TI GCB, 2021: 28). The survey concentrates on personal experience of corruption and does not concern its systemic nature or even the initiators of corruption. The gravity of the problem is illustrated well by fear of retaliation, which would be a concern for 45% of respondents if they reported wrongdoings. Whistleblower regulation and best practices are especially important in this respect since this figure implies that corruption is institutional. There have been other attempts at the quantification of corruption in recent years, however, these are less robust and easily verifiable methods. For example, according to the ‘Combating corruption in the European Union’ report of the European Parliament, the estimated total cost of corruption risk in the EU-27 between 2016 and 2021 was EUR 29.6 billion (EP, 2023:2). Based on OECD (2014), more than half of foreign bribery cases occurred to obtain a public procurement contract. Although the report is characterised by high latency and an intricate methodology, the data indicate that risks are indeed higher in the case of public funds. Based on this, it would not be a foregone conclusion that public procurement per se should prompt international organisations to develop more sensitive indicators designed exclusively for the public procurement market than those applied in warning systems for standard procurements.

A good example is the report prepared by the Commission of the European Anti-Fraud Office on the identification and reduction of corruption in public procurement in the EU (OLAF, 2013a). The report aims at developing a methodology to estimate the direct costs and other elements of corruption. The results emphasize the role of the media, whistleblowers and the power of the public. Another deliverable of this OLAF project was a study estimating the costs of corruption in public procurement for EU taxpayers based on a case study of 8 Member States (OLAF, 2013b). The costs of corruption were identified in the following five sectors in 2010, the year of publication of the study: road & rail construction, water & waste services, urban/utility construction, training, and research & development. The novelty of the study is its attempt at estimating the quantifiable consequences of corruption based on the methodology. While all estimates are imprecise, and the results of this study are also derived from diverse case studies, interviews and available data sources, the magnitude of the resulting figures is itself interesting – even though they would be hard to reproduce.

The presentation of the data by sector allows for a more concentrated analysis of the sectoral impact of corruption. For example, the perception indices described

above do not take sectoral differences into account while it is obviously important which sector the questionnaire and market participants' opinions refer to. Furthermore, as illegal revenues from corruption tend to be more frequent in higher-value projects, differentiation by the subject matter of procurement is also relevant. For instance, analysing the procurement of goods in construction or defence projects may be more informative for researchers than studying the perceptions of society in general.

In their study, Tátrai et al. (2023) observe, based on public procurement data in the official EU database Tenders Electronic Daily³, that EU-funded projects typically attract fewer bidders. In this respect, lack of competition and the reason, therefore, also invite specific analysis in the context of public procurement, although not necessarily by sector but by applying other bases of differentiation. If we assume that market participants intentionally shun these procedures, there must be an underlying reason – probably previous experience with the market. That is why continuous monitoring of the market is important.

The special report of the European Court of Auditors (2023) contains extensive criticism of official statistics on public procurement in the EU. It points out that highlighting specific indicators leaves actual issues uncovered and leads to generalisations. The report particularly stresses the importance of having specific indicators for EU-funded procurement procedures. In addition, it makes special mention of shortcomings in the identification of registered economic operators in cross-border awards, which they see as a key aspect in the fight against corruption. It also reflects a contradiction long been discussed in the literature, namely that the average number of days between the publication of the tender notice and the deadline for the receipt of tenders cannot be assessed in a uniform manner. According to the report, a too-short advertisement period can deter bidders from preparing adequate bids, while the buyer may informally notify the favoured bidder about the opportunity ahead of time. Alternatively, the advertisement period may become lengthy due to legal challenges, which may also signal corruption risks. This also suggests that a simple system of indicators may not be better than not having a system at all.

Numerous research papers and studies have been published with the objective of assessing or measuring corruption in public procurement using different methodologies. Gnoffo (2021) advocates the use of corruption indicators that integrate risk factors for the quantification of corruption. Gnoffo (2021) differentiates performance drivers, and structural (level of competition) and individualistic (level of award risks and evaluation bias) drivers of corruption in public procurement,

3 www.ted.europa.eu

which are defined by a different logic. The study of Dávid-Barrett and Fazekas (2020) provides a good example of the latter, exploring associations between public procurement contract awards and the political ties and owners of the winning bidder. Surveys typically focus on the issue and look for corrupt practices at the individual level rather than taking a broader approach to investigate systemic links.

While the perceptions indices mentioned above may effectively communicate social sentiment, they are not suitable for identifying the factors affecting the expectations and decisions of market participants. The same is true, of course, to the different methodologies proposed for the quantification of corruption. In the following sections, we present additional results obtained by corruption indicators that were expressly developed and used for public procurement procedures.

The *'Preventing Corruption in Public Procurement'* study of the OECD (2016) lists several technical issues among integrity-related risks, such as the choice of procurement procedure, requesting unnecessary samples during the procedure or duplicate invoicing of the same item. These could all be managed by simpler control or regulatory measures. The true novelty of the study is its endeavour to define the size of the market and to quantify the damage caused by corruption, in addition to assessing unethical decisions and acts in public procurement procedures.

In their public procurement study, Ferwerda et al. (2017) point out that only some of the most important indicators used as red flags significantly relate to corruption. They regard eight as especially effective, including, among others, large tenders, lack of transparency, collusion of bidders, shortened time span for the bidding process and complaints from non-winning bidders. IT-assisted automation and screening are possible in the case of many of these indicators. Tátrai and Németh (2018) arrive at a similar conclusion in their paper comparing six red flag tools that were developed and/or funded by international research projects or organisations. They establish that all of the tools are based on existing, analysable data, and only the World Bank, OECD and OLAF tools integrate additional interviews and human information sources, which, however, make the analysis and assessment of corrupt practices more complicated. Personal experience with the market and procedures unquestionably provides added value, but only at the cost of resource-intensive interviews and a necessary element of subjectivity in evaluation. It should be pointed out that none of the methods above are perfectly suited to the measurement of corruption at non-individual, i.e. institutional level.

3 METHODOLOGY

Under the ongoing research project of Corvinus University of Budapest, exploring the specificities of public procurement in Hungary, market participants have been surveyed since 2009 using a continuously increasing question bank. This paper focuses on the conduct and ethical standards of participants by analysing responses to relevant questions. In the last ten and a few years, publicity has increased, and public procurement databases have become accessible and available for research in Europe and Hungary alike. The mandatory introduction of electronic public procurement contributed to the sense of security of market participants. Consequently, forms of unethical conduct have changed, since the possibilities for misconduct are much more limited in the closed system of online procurement procedures than in the case of physical tender submission.

Formal issues are now less of a problem, as opposed to the challenges of ensuring competition and decreased confidence between contracting authorities and bidders. This changing environment invoked similarly changing responses and perceptions in relation to corruption and unethical conduct in market participants. This paper presents the results of repeated data collection on five separate occasions, each time using a questionnaire. The questionnaire was delivered to respondents through professional organisations. Due to its complexity and industry jargon, public procurement expertise was indispensable for filling it. The respective data collections took place in 2009, 2011, 2013, 2018 and 2021. *Table 1* shows the distribution of respondents by their role in public procurement, while *Table 3* displays the composition of the sample by experience in the market.

Table 1
Composition of the sample by respondents' role in public procurement

Role in public procurement	2009	2011	2013	2018	2021	Total (N)
Contracting authority, Classic	35%	35%	42%	44%	42%	203
Contracting authority, Utility	20%	11%	7%	8%	12%	60
Tenderer	33%	37%	32%	21%	21%	148
Legislator	0%	4%	2%	3%	3%	12
Consultant	7%	6%	13%	15%	15%	57
Total valid	94%	92%	96%	91%	92%	480
Total invalid	6%	8%	4%	9%	8%	35
Total (N)	104	106	104	100	101	515

Source: authors' figures

While the size of the sample remains largely the same each year, its composition by roles filled in public procurement differs. Apart from changes in the market, these variations in yearly averages may also be explained by the changing role of respondents. Small subgroups in the sample significantly decrease the reliability of statistics. Therefore, we have formed a consolidated category of classic contracting authorities and utilities as well as of consultants and legislators and excluded invalid responses (*Table 2*). There was no obstacle to such consolidation since the same procurement rules and activities are applicable to utilities and to so-called ‘classic contracting authorities who are subject to public procurement regulations because of the nature of their activities and exclusive rights, among others. The rationale for consolidating legislators and consultants is the holistic view of the market characterising these respondents who – unlike contracting authorities and tenderers – do not operate within a single, well-defined group.

Table 2
Composition of the sample by consolidated respondent roles

	2009	2011	2013	2018	2021
Tenderer	34.7%	39.8%	33.0%	23.1%	22.6%
Legislator/consultant	7.1%	10.2%	16.0%	19.8%	19.4%
Contracting authority	58.2%	50.0%	51.0%	57.1%	58.1%
Total (N)	98	98	100	91	93

Source: authors' figures

Table 3
Composition of the sample by respondents' experience in public procurement

How long have you been involved in public procurement?	2009	2011	2013	2018	2021	Total
Less than a year	5.77%	7.55%	9.62%	4.00%	3.96%	6.21%
1 to 5 years	35.58%	35.85%	38.46%	23.00%	20.79%	30.87%
More than 5 years	58.65%	56.60%	51.92%	73.00%	75.25%	62.91%
Total (N)	104	106	104	100	101	515

Source: authors' figures

In terms of respondents' experience in public procurement (*Table 3*), a low level of knowledge in the sample could be a source of distortions and an obstacle to gaining an accurate picture. As more than 50% of respondents reported more than five

years of experience in each year of data collection, it is reasonable to assume that the pool of survey participants had a good understanding of the public procurement market at the time of data collection.

A five-point Likert scale was used for most questions in the first questionnaires, which we did not change in later data collections for the sake of comparability. There is no consensus in the literature on whether five-point scales could actually be considered interval scales. Therefore, questions of a similar substance were also evaluated in aggregate, with the results compared both before and after aggregation. For this purpose, we divided the summed value of the variables by the number of the aggregated variables, obtaining results between 1 and 5 on an interval scale satisfying all requirements. The affected variables are marked by the phrase *aggregate*.

Differences between the groups were checked by two-sample unequal-variance T-tests by groups. The significance level was set to 5%.

4 RESULTS

The results of the survey are discussed below, paying particular attention to questions concerning the ethical conduct of participants. Market participants were asked about their view of the relationship between public procurement efficiency and reducing corruption. Respondents reported that corruption has been an acute problem in public procurement for years, and curbing it could be the solution to improving efficiency (*Table 4*). Taking the whole data collection period into account, we find that Tenderer's ratings were significantly higher than the ratings of the other two groups. The two-sample T-test showed no significant difference between those groups. A comparison of the data from each year shows that Tenderers felt corruption more severe than Contracting authorities in 2009 and in 2018, and then both other groups in 2013. By contrast, in 2021, the results were more coherent, with no significant differences between the groups.

Neither a whole sample comparison nor a group-level comparison of year-on-year averages provided significant differences. Based on the results, it can be established that corruption had been a major problem in market participants' perception, which did not improve throughout the reference period. Accordingly, fluctuations at the population level are attributable to the composition effect and are very small as compared to the standard deviation.

Table 4
How could the efficiency of public procurement be improved in Hungary by reducing corruption?

		2009	2011	2013	2018	2021	Overall
Tenderer	N	34	39	33	21	21	148
	Average	4.65	4.28	4.61	4.62	4.29	4.49
	Standard deviation	0.691	0.686	0.788	0.590	0.784	0.724
Legislator/consultant	N	7	10	16	18	18	69
	Average	4.29	4.30	3.63	4.33	4.17	4.12
	Standard deviation	0.951	0.823	1.025	0.970	0.857	0.948
Contracting authority	N	57	49	51	52	54	263
	Average	4.14	4.20	4.00	4.12	3.93	4.08
	Standard deviation	0.934	0.763	0.959	0.878	0.949	0.901
Total	N	98	98	100	91	93	480
	Average	4.33	4.24	4.14	4.27	4.05	4.21
	Standard deviation	0.883	0.733	0.975	0.857	0.901	0.876

Note: 1 – not the right solution, 5 – perfect solution

Source: authors' figures

The next survey question addressed the problem from a regulatory perspective (Table 5). It asked how effective the regulation is in eliminating unfair competition, including collusion, cartel arrangements and granting unfair competitive advantage to certain economic operators.

Overall, respondents rated the regulation only moderately effective in preventing unethical conduct. Taking the whole reference period, Tenderers rated the regulation significantly better than Legislators/consultants, even though Tenderers attributed the highest importance to curbing corruption, too.

Year by year, there were no significant differences between the groups. These findings are especially interesting in light of the study of Tátrai and Nyikos (2012), in which they asked Hungarian public procurement market participants about using public procurement as a means for achieving particular goals. In respondents' view, in many cases, the different goals 'undo each other', and at the end of the day, ensuring fair competition will be secondary to prioritizing certain groups of bidders or enforcing green and social aspects. As an indirect consequence, anti-corruption efforts also receive less attention. Our study, in turn, confirms that the fight against corruption and the measures required to improve efficiency in public procurement are closely correlated.

Comparing the averages of the respective years of data collection to the 2009 baseline we see lower values in each subsequent year. We have repeated the calculations also by group to exclude the composition effect. A comparison of the perceptions of each sample group in the respective years reveals that Contracting authorities and Tenderers rated all years worse than 2009 (there were no significant differences between values for the other four years). The ratings of the Legislator/consultant group were basically congruent with their responses, but in their case, the 2018 figure was not significantly different from either 2009 or the other three years. However, it must also be considered that abuses have become more sophisticated, limiting the possibilities of using the regulation as an anti-corruption tool.

Table 5
How efficient are public procurement regulations
in curbing unfair competition (excluding unsuitable bidders,
granting improper advantages to certain bidders, corruption)?

		2009	2011	2013	2018	2021	Overall
Tenderer	N	34	38	33	21	21	147
	Average	4.03	3.05	3.36	3.33	3.19	3.41
	Standard deviation	0.834	0.928	0.895	0.856	0.680	0.920
Legislator/consultant	N	7	10	16	18	18	69
	Average	3.43	2.60	3.06	3.22	2.89	3.03
	Standard deviation	0.976	0.699	0.998	0.808	0.676	0.840
Contracting authority	N	57	49	51	52	54	263
	Average	3.74	3.04	3.14	3.29	2.85	3.22
	Standard deviation	0.897	0.763	0.825	0.915	0.810	0.894
Total	N	98	97	100	91	93	479
	Average	3.82	3.00	3.20	3.29	2.94	3.25
	Standard deviation	0.889	0.829	0.876	0.873	0.763	0.901

Note: 1 – not at all; 5 – very efficient

Source: authors' figures

Answers to questions concerning the ethical standards of market participants reveal a curious picture. Respondents rated the conduct of both their own group and the other groups as moderately ethical at best (Table 6). Only a few significant differences are observable across the ratings. Among them, utilities were rated by Tenderers much worse in 2009 than by the entire group of contracting authorities they are included in. We can find the same difference in 2013, but this year, the assessment of classic contracting authorities also deteriorated.

The overall rating for all data collection years of Contracting authorities by Tenderers is significantly worse than vice versa. Interestingly, Contracting authorities' assessment of Tenderers is not significantly different from Tenderers' self-assessment.

The negative views of Tenderers convey an important message. Based on the data of the Single Market Scoreboard (2022), the rate of procurement procedures with only one bidder – or single bidding – is very high in Hungary. One of the reasons behind that unfortunate trend typical to Central-Eastern European countries (Tátrai et al., 2023) is market participants' lack of confidence and low opinion of the market, reflected in Tenderers' ratings of Contracting authorities in our study. That is also a warning since, in order to intensify competition and attract potential tenderers, it is crucial to reinforce tenderers' belief that they have a chance to win fairly in the public procurement market, as it was done in other European countries (Poland, Romania, Italy, Bulgaria).

Table 6
How ethical do you consider
the conduct of public procurement market participants?

Respondent	Rated group	2009	2011	2013	2018	2021	Overall
Tenderers	Classic contracting authorities	2.62	2.79	2.45	2.81	3.19	2.73
	Utilities	2.41	2.76	2.55	2.90	3.05	2.69
	Tenderers	2.53	2.71	2.70	2.57	2.95	2.68
Legislator/ consultant	Classic contracting authorities	3.14	3.10	2.56	3.11	3.28	3.03
	Utilities	3.14	3.30	2.81	3.44	3.50	3.26
	Tenderers	2.71	2.40	2.63	3.00	2.94	2.78
Contracting authority	Classic contracting authorities	2.93	3.08	3.08	3.04	3.57	3.14
	Utilities	3.05	3.10	3.02	3.19	3.57	3.19
	Tenderers	2.51	2.88	2.67	2.67	3.09	2.76
Total	Classic contracting authorities	2.84	2.97	2.79	3.00	3.43	3.00
	Utilities	2.84	2.99	2.83	3.18	3.44	3.05
	Tenderers	2.53	2.76	2.67	2.71	3.03	2.74

Note: 1 – unethical; 5 – fully ethical (averages)

Source: authors' figures

Examining the development of the general level of ethics between 2009 and 2021, it can be observed that the assessment of both classic contracting authorities and utilities is significantly better in 2021 than in any previous year, while the average for Tenderers in the same year is above 2009 and 2013 values.

To avoid the composition effect, the development of opinions was also reviewed by the group. In this case, there is no change perceived by Legislators/consultants, while Tenderers rated only classic contracting authorities higher than the other groups in 2021 but compared to 2013 exclusively. The group of Tenderers did not see any improvement in ethics in any other groups. This implies that the sole reason for the improvement seen in overall results is the more positive rating assigned by Contracting authorities. They considered that all groups performed better in 2021 than in all previous years. (The only exception was Tenderers, whose 2011 and 2021 ratings did not differ significantly.)

We also investigated which areas of the public procurement market participants deemed the most corrupt (*Table 7*). We inquired, in particular, into procurements by the different groups of Contracting authorities, low and high-value tenders, and different subject matters of procurement. The different areas received a uniform rating overall, with only two statistically significant differences found between the averages assigned by the groups formed based on their role in the market. Those differences include the significantly higher level of corruption perceived in 2011 by Tenderers (3.74) than by Contracting authorities (3.41) in procurements by utilities. A similar difference is present in 2013 in the case of Supplies, where the corresponding group averages were 4.00 and 3.57, respectively.

Table 7
Which areas of public procurement do you consider the most infiltrated by corruption in Hungary?

	2009	2011	2013	2018	2021	Total
Construction projects	4.11	4.26	4.24	4.37	4.03	4.20
High value procurements	4.10	4.24	4.17	4.41	3.89	4.16
Acquisition of services	3.62	3.84	3.82	3.86	3.59	3.75
Acquisition of supplies	3.43	3.65	3.68	3.76	3.33	3.57
Procurements by classic contracting authorities	3.49	3.61	3.63	3.77	3.32	3.56
Procurements by subsidised entities	3.37	3.40	3.54	3.74	3.53	3.51
Procurements by utilities	3.38	3.53	3.56	3.69	3.27	3.48
Low value procurements	2.86	3.15	3.37	3.44	2.97	3.16

Notes: 1 – not at all; 5 – thoroughly corrupt (average values)

Values on a background other than white are significantly different by row.

Source: authors' figures

Based on the results, market participants detected the lowest risk in procurements by subsidised entities, utilities and low-value procurements. Procurements of construction projects, services and high-value procurements are the most prone to corruption. High-value procurements are also identified as a high-risk area in the study of Ferwerda et al. (2017), stating that one of the most important indicators in corruption warning systems is project size in terms of monetary value. However, one has to be careful with an estimated value, considering that if the size of the public procurement framework contract is based on the framework contract amount and not on the value of actual contracts, the calculations may be misleading. We have derogated from standard public procurement terminology in our survey to avoid misunderstandings and to make sure that respondents actually have contracts of a high value in mind when answering the question.

Looking at changes over time, respondents reported an improvement in most of the areas in 2021, at least in comparison with 2018. There were two exceptions: (a) the figures were steady in the case of acquisitions of services over the whole period covered, and (b) procurements by subsidized entities, where respondents perceived a sharp decline in 2018 over 2009 and 2011, followed by a slight improvement, while these procurements were still considered one of the lowest-risk areas overall.

Table 8
Which parts or stages of public procurement procedures are at risk of corruption in your opinion, and to what extent?

	2009	2011	2013	2018	2021	Total
Planning	3.68	4.00	4.14	4.35	4.05	4.04
Tender submission	3.16	3.72	3.70	3.55	3.45	3.52
Evaluation	3.69	3.94	3.83	3.70	3.57	3.75
Contract award	2.81	3.18	2.97	2.93	2.74	2.93
Contract performance	3.50	3.68	3.59	3.89	3.60	3.65
Appeals	2.50	3.12	3.13	3.07	3.00	2.96

Notes: 1 – no risk; 5 – high risk (average values)

Values on a background other than white are significantly different by row.

Source: Authors' figures

Williams-Elegbe (2018), one of the most renowned researchers of corruption in public procurement, lays particular emphasis on screening collusion in the planning (technical and financial), evaluation and contract performance phase of procedures. Along the same lines, we have examined the entire procurement cycle,

broken down to the stages of planning, tender submission, evaluation, contract award and performance, as well as the closely linked appeals stage.

Table 8 shows the degree of corruption risk market participants attribute to each stage of the public procurement cycle. Overall, the planning stage is deemed to be the most exposed to corruption, but the risks are also rated high in the evaluation and contract performance stages. The perceived risk, by contrast, is below average in the contract award and appeals stages.

A statistically significant difference between the different groups' opinions is identified in a single case in 2018 in the assessment of risks in the contract award stage by Tenderers (3.24) and Contracting authorities (2.79). Aggregate results for the whole reference period indicate that both Legislators/consultants (3.59) and Contracting authorities (3.67) see a lower risk in the evaluation stage than Tenderers (3.96). A similar difference of opinions is observable regarding the contract award stage, where a rating of 2.81 by Contracting authorities and 2.87 by Legislators/consultants is opposed to an average value of 3.16 assigned by Tenderers.

An analysis of the time series of aggregate results reveals a significantly higher risk rating in the planning stage in 2013 and 2018 over 2009, and in the tender submission stage in 2011 through to 2018 compared with 2009. The degree of risk associated with the evaluation and contract award stages was lower in 2021 than in 2011, while it was larger in 2018 than in 2009 in the case of the contract performance stage. The perceived risk of corruption in the appeals stage increased sharply after 2009 and was significantly higher in the rest of the reference period.

We have also run panel data regressions to check the robustness of our results. In addition to the years of data collection, the interactions of each year and group of participants were featured as independent explanatory variables in the regressions. We used this method to control for variance in respondents' experience that could give rise to distortions in the overall picture due to the changing composition of the sample.

The interpretation of auxiliary dummy variables is as follows: the variables 2011, 2013, 2018 and 2021 have a value other than 0 when the data was collected in the corresponding year. This way, they capture general trends in the given year. When they are significant, it means that the value assigned to the variable concerned by all market participants in the year of the dummy variable differs from the 2009 baseline.

Interactions as auxiliary variables assume a value of 1 if the response is from the corresponding year and type of market participant. When these variables are significant the market participants concerned assigned a significantly different value to the explained variable in the year concerned than all other market participants. Whenever there is a significant variable, differences between the yearly

averages for the whole population may originate partly from the structural differences of the samples. As this effect is addressed by the dummy's coefficient in the panel data regression, if the other variables are still significant, the difference identified is not due to individual structural differences but is present even if we control for those structural differences.

Three aggregate values were analysed as dependent variables. The average values of the variable presented in *Table 6* correspond to the average level of ethics of market participants, while the average values of the variables in *Tables 7* and *8* approximate corruption risk by providing the average risk in the different areas and stages of procurement, respectively. Regression results are presented in *Table 9*.

Table 9
Results of panel data regressions explaining aggregate variables*

	Ethics Aggregate	Areas of corruption Aggregate	Corruption by stage Aggregate
Constant	2.733	2.858	2.833
2011	0.044	0.788	0.796
2013	-0.117	0.879	0.775
2018	0.291	1.026	0.802
2021	0.356	0.757	0.712
2009 Tenderer	-0.214	0.811	0.559
2011 Tenderer	-0.023	0.157	0.050
2013 Tenderer	-0.051	0.198	0.099
2018 Tenderer	-0.263	0.009	0.118
2021 Tenderer	-0.026	-0.115	-0.180
2009 Contracting authority	0.097	0.681	0.336
2011 Contracting authority	0.243	0.017	-0.075
2013 Contracting authority	0.305	-0.068	-0.125
2018 Contracting authority	-0.057	-0.004	-0.142
2021 Contracting authority	0.324	-0.159	-0.150
Adjusted R ²	8.80%	8.01%	7.92%

Notes: *Baseline: 2009 rating by respondents other than Tenderers and Contracting authorities. Values on a background other than white are not significant at the 5 percent level.

Source: Authors' figures

The results of the panel data regressions corroborate our previous findings. The general level of ethics among market participants stagnated over the reference period since the dummy variables for years were not significant. The improvement recorded at the last data collection was due to the positive perception of Contracting authorities in 2021, but no such significant improvement could be identified in other participants' responses.

The aggregate corruption variables show that both Contracting authorities and Tenderers had a more negative opinion than the rest of the respondents in 2009, which, however, did not continue in subsequent years. Finally, an inverted U-shaped curve can be plotted in which the average perceived risk of corruption rose until 2018 based on significant yearly constants, and then slightly decreased below the 2011 level by 2021.

5 SUMMARY

The objective of this study was to explore the views of market participants on unethical conduct detected in the public procurement market, having regard to their expertise in the field and adopting familiar public procurement terminology also used by these experts. Hessami (2014) established that corruption is not restricted to low-income countries, which is clearly confirmed by the outlined research, indicating how widespread the problem is. Spending public funds triggers interest and potential abuses. We have studied the full spectrum of unethical conduct from corruption to fraudulent practices, regardless of whether they are motivated by private interest or macro-level corruption. However, analyses based on individuals' perceptions have their limitations. Respondents and the methodology are changing, and therefore, inquiries into corruption going beyond opinions formed typically by external observers should be carried out with care.

As the public procurement market cannot operate in isolation from the Hungarian economy, collusion, cartel arrangements, and macro-level corruption practices do have an impact on public procurements, even if they cannot be traced formally in the public procurement activity itself, calls for tenders, evaluation or contract performance. Public procurement cannot be taken out of context in this paper either, but focusing specifically on ethical issues related to public procurement has a rationale since it helps define the grounds on which market participants rate each others' conduct as more ethical or less ethical.

The main takeaway from the OLAF (2013a) report is that research is more worthwhile in the industry rather than at the general level, and the scale of corruption should not be extrapolated to the entire market. It is difficult to commit abuses in a competitive market with multiple operators, even if institutional corruption is

rife. Another important factor discussed by Tátrai et al. (2023) is the decreasing intensity of competition. Loss of market confidence and participants exiting the procurement market is a clear sign in a similar market environment that stakeholders have lost trust in effective competition. Of course, big data analysis may provide valuable results, but in our case, it is more difficult to identify common practices in the background and actual violations. The report of the European Court of Auditors (2023) opens up new horizons that will likely play a more important role in future investigations into corruption, including more diversified indicators and methodologies.

The results of our analysis of public procurement in Hungary indicate that in the period between 2009 and 2021 reducing corruption was considered an important means of increasing public procurement efficiency by market participants. The opinions of the different groups of participants were basically steady over the years, except for Tenderers, who expressed significantly graver concerns than other market participants in three of the five data collection years. Responses are coherent in their rating of the efficiency of the legal regulations in eliminating factors of unfair competition, which was medium at best and has not improved since 2009.

The level of ethics of market participants was also assessed as medium or worse in the entire reference period. Taking the whole sample, there seems to be a slight general improvement in all groups in 2021, which, however, was only perceived by Contracting authorities. Tenderers reported a slight improvement only in the case of classic contracting authorities, while the Legislator/consultant group did not see any substantial change for the better.

Market participants' assessment of corruption exposure in different areas of public procurement was largely homogeneous. Construction works, high-value procurements and acquisition of services were regarded as the most risk-prone areas, while the lowest risk of corruption was identified in procurements by subsidised entities and utilities and in low-value procurements. Moreover, the perceived level of corruption was lower in 2021 than in 2018 in most areas covered. Acquisition of services was the only area where corruption risk was steady throughout the reference period, while in the case of procurements by subsidised entities we recorded a deterioration in 2018 over 2009 and 2011, followed by an improvement by 2021.

Analysing discrete stages of the public procurement cycle, the highest risks were detected in the planning, contract performance and evaluation stages of procedures. At the same time, the perceived corruption risk in the contract award and appeals stages was below the average. A time series analysis reveals no improvement in this respect. While the perceived risk in the evaluation and contract award stages decreased relative to 2011, it remained the same or even increased in the other stages.

The panel data regressions on the aggregate variables derived from our ethics and corruption variables show that the general level of ethics as perceived by market participants was constant in the 2009–2021 period, except for the perceived improvement recorded for Contracting authorities in 2021. The general perceived risk of corruption follows an inverted U curve, rising steadily until 2018 and then falling below the 2011 but above the 2009 level in 2021.

The suspected presence of corruption in the Hungarian public procurement market is a major problem according to all participants, but Tenderers have the strongest suspicions. That may partly be self-justification for unsuccessful tendering. At the same time, even market participants assessed their own level of ethics only medium. However, market participants should not engage in dubious practices even though other groups do so, which would itself contain unethical conduct as most abuses require the involvement of representatives from two different groups of market participants.

The more positive outlook after 2018 documented in our paper cannot be ascribed simply to the revision of the procurement legislation or to changes in market competition or participants' conduct. The 2018 introduction of electronic public procurement was the only relevant legislative change that rendered the exchange of documents and bids during the procedure or retrospective amendments impossible and facilitated access to documents and online communication. Providing a uniform means for keeping track of procedures has increased transparency, moreover, procurement review bodies now have direct access to the documentation. Accordingly, respondents detected a lower risk of corruption in the evaluation and contract award stages of procedures.

Years after its introduction, participants of the Hungarian public procurement market look back at the introduction of electronic procurements approvingly, which makes the case for implementing systems of the greatest possible transparency with searchable data and access to public procurement reports and market participants' activities within a closed system of verifiable data flows. The reasons behind the slight perceived improvement are clear. Digitalisation has made communication more traceable, and the controllability of the procedure has inspired optimism in market participants. In other words, transparency and accountability have indeed a strong influence on the perceived level of ethics in public procurement.

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