
COMPETITION IN PUBLIC PROCUREMENT IN THE FIGHT AGAINST CORRUPTION: ANALYSIS OF AN EXAMPLE OF UKRAINE

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Abstract: *Corruption, as a social phenomenon, destroys the system of government, jeopardizes basic democratic values, delays economic development, and impedes the development of healthy competition in the economy. The increasing number of anti-corruption measures that have arisen around the world in the past few decades testify to the importance of this issue. The purpose of this paper is to investigate the anti-corruption measures that exist internationally in the field of public procurement. This paper will also research and analyze the innovations that have been adopted into Ukrainian legislation, and consider their impact on overcoming corruption in the public economy sector.*

The results of the study show that thanks to public procurement reforms, the introduction of e-procurement, transparency in the tender processes, and increased leverage on unfair bidders, there has been a tendency to make savings in public finances. At the same time, competition remains low due to imperfect legislation and low trust in the integrity of officials.

In the fight against corruption, the authors consider it necessary to increase competition in procurement by enhancing operational control of procedures, namely the development of a public procurement monitoring system.

The study presented reveals the widespread corruption schemes that have been devel-

oped in the system of public procurement in Ukraine, reveals the cause and effect of the inadequacy of the reforms carried out, and develops directions for further reforms of the system in order to overcome corruption in the public sector.

Keywords: *public procurement, corruption, tenders, sub-threshold procurement, public administration.*

JEL classification: *D73; H 57; H 50.*

1. Introduction

The share of public procurement in the GDP of every country is quite significant. According to the European Commission, the total volume of public procurement in the European Union is 14%, or approximately 2 trillion euros per year, which indicates the high economic importance of public procurement and its role as a powerful instrument for influencing market relations (European Commission 2020)

In such sectors as energy, transport, waste recycling, social protection, health, and educational services, public authorities are major buyers in the overall economic space of every country. The public sector can use procurement to stimulate jobs, growth, and investment, as well as to create an economy that is more innovative, resource- and energy-efficient, and socially inclusive. The high quality of public services depends on modern, well-managed, and efficient procurement (European Commission 2020). In every country, regardless of the level of economic development, public procurement should provide solutions to strategic and tactical challenges. The strategic policy is to support the national producer, public finance management, environmental protection, social policy, support for depressed regions, and others.

Public procurement is an important component of the anti-corruption system. Corruption destroys the democratic system of state governance, threatens law and order, endangers honesty and social justice, impedes economic development and competition in the economy, and threatens the destruction of the moral principles of society. Therefore, advanced European economies in the fight against corruption are developing multi-vector tools that include different standards, including those related to public procurement. The amount of literature that recognizes the importance of public procurement in the development of a country's economy is growing. Scientists consider corruption to be one of the main problems in public finance, and develop strategies to reduce the risk of its occurrence. This problem is particularly acute in developing countries. In the work of many scientists, the experience of European countries is studied and a strategy is developed taking into account national peculiarities.

The current stage of development of Ukraine's economy is characterized by processes of adaptation to the world economy, which is determined by the need to implement the provisions of international law at the national level. With the entry into force of the Law of Ukraine "On Public Procurement" of December 25, 2015, state procurements were reformed into "public procurement" (Verkhovna Rada of Ukraine 2015). In recent years,

significant organizational work has been carried out on the planning, development, and implementation of new technologies in public financial management. At each stage, analytical and methodological work was carried out by representatives of the Ministry of Finance of Ukraine, the State Treasury Service of Ukraine, the Department of Public Procurement Regulation of the Ministry of Economic Development, the Antimonopoly Committee of Ukraine, and the significant participation of international organizations. In their work, Ukrainian scholars widely study international experience of the public procurement system and the tools used in the fight against corruption as they constantly look for new mechanisms in accordance with the historical, economic, and social realities of Ukraine. But in the research of and search for new tools, scientists are limited to certain areas of the economy or explore certain methods (psychological, technical, repressive) that have a short-term effect. In our opinion, a comprehensive approach with the strengthening of the economic instruments of influence will reduce the corruption component, which at the same time will increase the efficiency of procurement. As public resources are limited, the efficiency of the procurement process is one of the components of all public procurement. An open, transparent, and non-discriminatory procurement regime is considered to be the best tool for approaching the optimal price–quality ratio, as it increases the level of competition among suppliers and reduces the risk of corruption.

In this article, the term “corruption” will involve the investigation of any method of manipulation in the conduct of public procurement procedures aimed at violating or avoiding the use of applicable legal acts. The article first examines research in the field of public procurement in Ukraine and the world, and analyzes Ukrainian legislative initiatives in the framework of integration processes. The second part of the article then deals with the methodology used for the study. In conclusion, the results of the study are summarized.

2. Literature review

Many scholars of economy, law, and sociology pay close attention to the study of corruption in public procurement. Scientists consider corruption in public procurement from a variety of aspects, investigating the issues of transparency, competition, detecting illegal schemes, and developing a strategy to combat the problem.

Locatellia et al. (2017) consider that despite the importance of the corruption component in the selection, planning, and implementation of government projects, this topic is poorly researched, especially with regard to large and unconventional procurement. The scientists investigate how corruption in government megaprojects affects cost, lead-time, and cost savings. The impact of the complexity of the public procurement object on the outcome of the auction and the level of corruption was investigated by Baldia et al. (2016). Grossi and Pianezzi (2018) examine the impact of society in the fight against corruption through the prism of the philosophical views of Rousseau, Popper, and Kant, and point to the need for democratic scrutiny and the building of social ethics for a common outcome.

Soreide (2002) bypassed economic instruments and instead paid close attention to the political aspect of combating corruption in public procurement.

In countries with a poorly developed economy, the issue of corruption during public procurement is quite acute. Researchers are trying to learn from the experience of other countries and incorporate it into their domestic economies, taking into account the political, economic, and social conditions. Watilshaka and Saidb (2015) focused their research on reducing corruption by reducing the involvement of intermediaries in bidding, and proved the effectiveness of e-procurement to promote transparency, accountability, and efficiency in procurement. Neupane et al. (2014) dedicated their research to the evaluation of the perception of potential e-procurement participants. The authors developed a theoretical model which reflects the impact of monopoly power, information asymmetry, trust, and transparency on the perception of e-procurement. Williams-Elegbe (2018) examined the causes of widespread corruption in developing countries and identified the causes of the failure of anti-corruption measures in Nepal. Sewpersadh and Mubangizi (2017) used experience of fighting corruption in Hong Kong to model anti-corruption measures for combating corruption in South Africa's public procurement system. Achua (2011) explored the reforms undertaken in the Nigerian public sector, and assessed and formulated a strategy to combat corruption in the country. Mugadza (2018) conducted an analysis of the fight against corruption in public procurement in Hong Kong, China, and South Africa, and identified four main directions for combating corruption: criminal, administrative, institutional, and civic activity. In his work, Mugadza examined two approaches to combating corruption – traditional and classic, characterized them by identifying their key features, and explored their strengths and weaknesses. Modisakeng et al. (2020) explored methods of effective supplier contract management from the perspective of local governments, and believe that the use of e-procurement will improve procurement efficiency. Issambayeva et al. (2019) also see great potential in the introduction of e-procurement as a way to increase competition and transparency, although Ukraine's experience shows that the introduction of an e-system is not a panacea for overcoming corruption. Hamzah et al. (2020) studied the mechanisms of reducing procurement prices by increasing competition among suppliers which will increase the efficiency of procurement, but do not consider it as a tool to reduce the corruption component in the economy of the state.

The global community, the EU in particular, has a well-developed public procurement system which many countries are guided by. Despite this, the EU budget loses a certain amount from corruption schemes in the field of public procurement every year. Hessami (2014) in his work used empirical data to explore the advanced economies of 29 countries, and looked at the link between political corruption and public spending structure. In his study, he argued that corruption in public procurement occurs not only in developing countries but in highly developed countries as well. Vukovic (2019) examined the relationship between corruption procurements and mayoral elections in the example of Croatian cities, and proved a hypothetical non-linear relationship between corruption and re-election. Ferwerda et al. (2017) devoted their work to identifying significant indi-

cators of corruption risks and identified indicators that could prevent corrupt practices in public procurement.

A transparent system of public procurement has also been introduced in recent years in the post-Soviet region, the main purpose of which is to ensure fair, competitive procurement. Detkova et al. (2018) analyzed the effects of corruption on the encouragement of customers to maintain fair competition among participants, and investigated weak competition in electronic trading. These problems are also relevant to Ukraine's public procurement system. Szucs (2017) analyzed the reform of public procurement policy in his work, and focused on alternative methods of public procurement during threshold purchases. He also analyzed reforms and examined the results of their influence on production in the country. Kováčiková (2019) examined the conflict of interest that arises during procurement and proposes a system of "red flags" that would indicate a conflict of interest that should help to overcome corruption, mass violations, and fraud during the procurement process. The development of a system of indicators for monitoring the procurement process in order to prevent violations is a current issue in Ukraine, and may be the source of a separate study in the future. Babica (2019) explored the shortcomings and prospects of innovation in public procurement and considers them as a tool to promote sustainable development in Latvia. Recent data suggests that the problem of systemic corruption in public procurement is common to all countries that moved to a market economy in the 1990s. Langr (2018) investigated methods of detecting falsifications in bidding. These studies, however, are aimed at identifying corruption components, and not at finding methods to prevent violations of the system.

In Ukraine, many scholars devoted their work to the study and analysis of public procurement. Research on this issue is mostly limited to studying the experience of other countries – for example, Ivanova and Sevostianova (2018) conducted a comparative description of the domestic electronic system with the European one. However, much of the research of recent years is descriptive and mostly limited to some comparisons, although further research is needed on this issue as the public procurement system in Ukraine is developing rapidly, and legislation in the technical part of tenders and monitoring is constantly improving. Altsyvanovych and Tsymbalenko (2018) studied the main approaches used to prevent corruption risks, namely psychological, technical, and repressive, and concluded with the need for an integrated approach to solving this issue, but in the process of their research overlooked the search for economic approach. Parasiy-Vergunenko (2017) proposed a methodology for analyzing public procurement which makes it possible to evaluate its effectiveness, whereby for each analytical stage a system of indicators and algorithms for their calculations were developed. Radionov (2011) investigated the problems of inefficient use of budget funds, and identified the causes and negative factors that lead to budget violations. Zdyrko and Ostapcuk (2020) considered issues of auditing the effectiveness of public procurement, and proposed the application of criteria of economy, productivity, and efficiency. However, despite the fact that there is a lot of research in the field of improving the efficiency of public procurement, researchers do not see them as tools in the fight against corruption.

The reform of the public procurement system in Ukraine began more than two years ago, and this provides a large area for research and analysis with the aim of finding new approaches to increase control over spending and budgetary savings.

The problems of corruption in the public procurement system arise in every country, therefore much attention is being paid to developing international instruments to overcome manipulation and increase transparency during procedures. Due to the spending of large amounts of public funds on public procurement in every country, and the significant negative effects of corruption schemes, international organizations pay great attention to the creation of preventive measures. Table 1 provides an overview of the EU Directives used to increase transparency and integrity in the public procurement system (*Harmonisation of public procurement system in Ukraine with EU standards: Compendium of EU public procurement directives* 2015).

Table 1. *EU Public Procurement Directives.*

Directives	Scope of application
2014/24/EU, February 26, 2014	Procurement in the public sector
2014/25/EU, February 26, 2014	Procurement in the field of housing and communal services
2014/23/EU, February 26, 2014	Conclusion of concession agreements
89/665/EEC, December 21, 1989	Regulates the use of appeals procedures for awarding contracts for the purchase of goods and work with public funds
92/13/EEC, February 12, 1992	Regulates the use of appeals procedures for awarding contracts for the purchase of goods and work with public funds by water, energy, transport and telecommunications organizations
2009/81/EU, July 13, 2009	Procurement in the defense sector
2014/55/EU, April 16, 2014	About electronic implementation in procurement

Source: compiled by the author on the basis of Harmonisation of public procurement system in Ukraine with EU standards: Compendium of EU public procurement directives (2015)

The submitted directives introduce an effective procurement process, the purpose of which is the rational use of budget funds. The directives introduced certain control measures aimed at increasing competition and reducing the risk of corruption and budget over-spending. A transparent procurement process is considered to be the main tool for the effective fight against corruption, and is being implemented by the Directives. First of all, this involves: the disclosure of public procurement rules; the timely disclosure of procurement plans; the publication of tender announcements; the disclosure of evaluation criteria; the publication of information on concluded contracts; the establishment of appropriate and timely dispute mechanisms; and the introduction of the practice of informing public officials of their involvement in the public procurement process.

Ukraine has assumed obligations under the Association Agreement, in particular Art. 148-156 on the implementation of a public procurement system in accordance with EU standards (Verkhovna Rada of Ukraine 2014). In recent years, Ukraine has been undergoing European integration processes in the management of the budget system. At the legislative level, the methods of public finance management are enshrined, which include the achievement of concrete results with their use and the efficiency of their usage at all stages of the budget process. Consistent adherence to commitments undertaken by Ukraine on the path to global integration demonstrates a clear position on strengthening control over the efficiency and use of budget funds. Budget accounting is the tool for achieving this goal in terms of financial information, and the introduction of new legislation on public procurement is the tool in terms of the effective use of budget funds. The scheme of integration processes is presented in Figure 1.

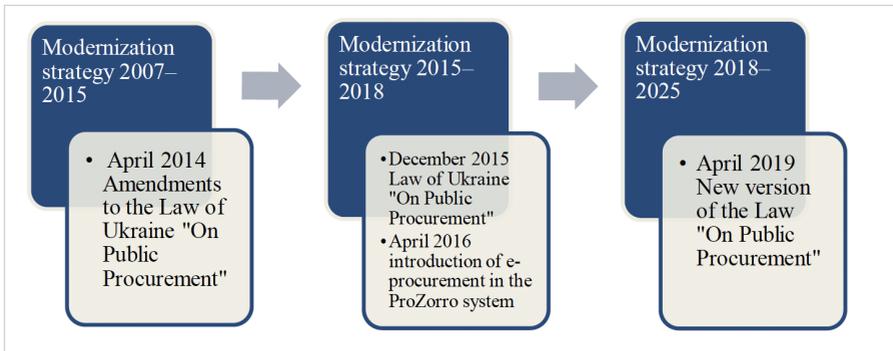


Figure 1. Scheme of integration processes in public procurement. Compiled by the authors

The reform in Ukraine began with the adoption of a strategy in 2007, which set the general direction of accounting reform in the public sector. The implementation of this project was intended for the period of 2007–2015, but for good reasons the implementation of the reform was postponed several times. At the end of 2015, a strategy was adopted to modernize accounting in the public sector for 2015–2018, thus confirming the inevitability of the reform. In connection with the reform of the budget system, considerable attention is paid to the management and use of public finances. This was achieved by creating a transparent regulatory framework for public procurement, an effective institutional infrastructure for public procurement, and the accountability and integrity of public authorities in the field of procurement.

Work on harmonizing public procurement procedures in Ukraine with EU standards began in 2013. In recent years, the Law on Public Procurement was amended in 2010 and, before it was replaced by a new version in 2014, has been constantly amended. A new, more progressive version of the Law of Ukraine “On Public Procurement” of April 10, 2014. № 1197-VII was adapted to EU rules in key areas. The changes were made in order to simplify the public procurement procedure, increase the level of transpar-

ency and openness, fight against corruption, and harmonize domestic legislation with EU standards. Work on improving procurement legislation has continued, in particular with the introduction of electronic bidding. The logical result of this process was the approval by the Verkhovna Rada of the new Law of Ukraine “On Public Procurement” on December 15, 2015, based on which there was a gradual transition to procurement from paper to an electronic system starting from April 1, 2016.

All reforms of the state procurement system took place in accordance with the approved Road-map, and today it is possible to evaluate definite results in the work of the new system of public procurements. For further research, it is necessary to study the European legislative content on the fight against corruption in the context of integration processes in Ukraine.

The main document in the international regulation of public procurement is the UNCITRAL Model Law, which is adopted as the basis for national legislation in many countries. The main objectives of creating a model law are to maximize the efficiency and effectiveness of procurement, expand and stimulate the participation in procurement of international suppliers and contractors, develop competition between suppliers and contractors, create a level playing field for all suppliers and contractors, promote the objectivity and fairness of the procurement process and public trust in it, and ensure the openness of procedures (UNCITRAL 2011).

The new Ukrainian legislation on public procurement is based on the main principles and approaches of the UNCITRAL Model Law, although it went beyond the accepted template primarily in the implementation of electronic procurement.

The most comprehensive anti-corruption convention is the United Nations Convention against Corruption, adopted by the United Nations General Assembly on October 31, 2003, which came into force on December 14, 2005. The articles of the Convention deal with issues of transparency in the public sector and establish a code of conduct for public officials. In order to ensure the transparency of procurement procedures and to ensure the public disclosure of information, the Convention articles require: the establishment of a proper procurement system, transparency in procurement, the application of objective criteria for decision-making, the introduction of an effective system of internal control, the integrity of public officials, and the proper preparation of documentation of a public nature (Verkhovna Rada of Ukraine 2006).

The United Nations Convention against Corruption was ratified by Ukraine on October 18, 2006, and came into force on January 1, 2010, since when it has become an integral part of national legislation and is considered superior to any provision of domestic law.

Another framework mechanism for regulating the public procurement system is the World Trade Organization (WTO) Agreement on Public Procurement, which is the legislative basis for international trade between governments. The agreement provides general rules for tender bidding and outlines responsibilities for each country. The purpose of such an agreement is to create non-discriminatory conditions for all market participants to ensure international competition in the public procurement system. The

implementation of this agreement by the participating countries should stimulate good governance and promote the rational use of budget funds.

Ukraine has been a member of the WTO since May 16, 2008, with an observer status, which has allowed it to increase the opportunities for international procurement and liberalize trade with the EU. Ukraine also joined the WTO agreement on government procurement in February 2016 (Verkhovna Rada of Ukraine 2016). Joining this agreement has opened the world public procurement market to Ukrainian companies, which is one of the most important areas of public procurement reform.

The leading body established in Europe to fight corruption is the Council of Europe, which has developed multi-functional instruments aimed at overcoming criminalization in the public sector, contributing to the increased liability of officials and aiming to minimize losses from corruption schemes.

The Council of Europe uses a comprehensive approach to combat corruption in three main areas: setting standards, monitoring compliance, and technical assistance in the implementation of projects and programs. The Council of Europe provides assistance in reforming the economic sphere to prevent corruption and money laundering to many countries, including Ukraine.

Most of the instruments created by the Council of Europe have a much larger scope than public procurement, but Resolution (97) 24, on twenty guiding principles of the fight against corruption, provides a number of measures aimed at preventing corruption in the public sector. These include: access to public information and the promotion of ethical conduct; ensuring transparency in public administration; the creation of rules which regulate the rights and duties of officials; the provision of audits of the activities of state administration bodies; ensuring the responsibility of officials for consequences arising from their participation in corruption schemes; and the provision of transparent public procurements that will foster fair competition (OECD 2017).

Another source of recommendations for anti-corruption measures is the World Bank, along with other international financial institutions. Ukraine must adhere to the general rules applicable to borrowing countries that use donor funding provided by international financial institutions. For borrowers, certain standards are set for reforming the public procurement sector, which should ensure transparency, increase competition and objectivity in the use of donor funds, and provide control over the use of such funds.

The main task of the World Bank's procurement sector is to provide support for reforms in order to improve the procurement system of borrowing countries by: creating an effective legislative framework; increasing accountability, objectivity, and transparency in the spending of budget funds; and protecting competition, efficiency, economy, and equality during bidding procedures.

The Organization for Economic Cooperation and Development (OECD) develops procurement evaluation tools and implements the principles of professional ethics in public procurement. The main tools for combating corruption during public procurements are presented in Table 2.

The Istanbul Action Plan to Combat Corruption, adopted in 2003, deals with Eastern European and Central Asian countries, including Ukraine. Ukraine takes into ac-

count the recommendations of the OECD report “Anti-corruption Reforms in Ukraine. Fourth round of monitoring of the implementation of the Istanbul Anti-Corruption Action Plan” (OECD 2017).

Ukraine is reforming its public procurement system through the introduction of new legislation and an electronic trading system. The new system was introduced almost two years ago, and there is a need for analysis to identify deficiencies and risks of corruption in the system of public procurement.

Taking into account the above, it can be said that Ukraine supports all global efforts to combat corruption during public procurement. Changes in Ukrainian public procurement legislation were also caused, in part, by political motives. After the signing of the Association Agreement with the EU, it was necessary to integrate the public procurement system in accordance with European rules and principles.

Table 2. *OECD Instrumentation on Combating Corruption in Public Procurement*

OECD tools	Date	Scope of application
Convention on the fight against bribery by foreign officials in international business operations	1999	Recommendations on the fight against corruption of officials during international business relations, methods of international influence in order to minimize corruption risks, proposed sanctions for dishonest officials.
General Principles on Professional Ethics in Public Procurement	2009	Ten principles are proposed based on fair, transparent, accountable public procurement, alongside the tools for implementing these principles.
Guidelines for combating government procurement violations	2009	Guidance materials to assist governments in creating conditions for obtaining an optimal price/quality ratio in the procurement process.
Professional ethics in public procurement: from A to Z	2007	Recommendations for assessing the risks arising during public bidding, the methodology for increasing transparency at each stage of the bidding, and the tools for increasing accountability and public control.
Bribery in public procurement: methods, subjects and actions in response	2007	Recommendations for the analysis of corruption risks in public procurement, mechanisms for identifying potential corrupt officials and corruption agreements, and methods for preventing corruption in public procurement

Source: compiled by the author based on: OECD Report, 2017

This is evidenced by the project “Harmonization of the Public Procurement System in Ukraine with EU Standards”, which was started in November 2013. The project aims to promote the development of a sound and consistent public finance management system through the establishment of a transparent regulatory framework, effective institutional infrastructure, and a system of responsible and honest state administration. In addition, it is necessary to take notice of additional measures provided by other international instruments and the practical experience and recommendations from the anti-corruption approaches of the leading states.

The implementation of these principles through the introduction of new legislation and the e-procurement system should have reduced the level of corruption in Ukraine but, according to research conducted in recent years by Transparency International Ukraine, the Corruption Perception Index in Ukraine (2019) remains rather low. The index is based on a series of independent surveys involving international financial and human rights experts, including Asian and African development banks, the World Bank, and the American organization Freedom House. The index is a rating from 0 (the maximum level of corruption) to 100 (no corruption). The results of this research in Ukraine are presented in Fig. 2.

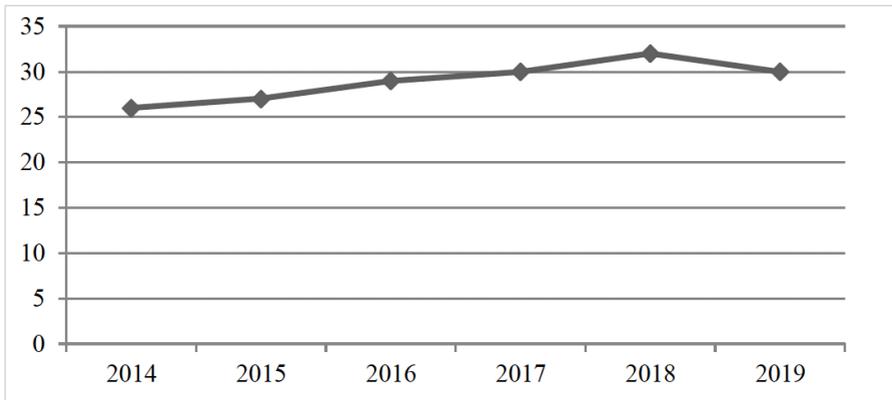


Figure 2. *Corruption Perception Index in Ukraine*

Source: compiled by the author on the basis of Transparency International Ukraine (2018)

As can be seen from the graph, Ukraine is experiencing, albeit very slow, a growth in the Corruption Perception Index (CPI). Along with other factors that help fight corruption – such as judicial reform or the introduction of electronic declarations for officials – a significant role is played by the introduction of new legislation in the field of public procurement and the introduction of the electronic procurement system.

In the worldwide rating for 2019, Ukraine did not significantly improve its position among neighboring countries, who ranked as follows: Poland – 58, Romania – 44, Hungary – 44, Belarus – 45, Moldova – 32, Slovakia – 50, and Russia – 28. Over the last year, Ukraine has reduced its position and regressed to the level of the year 2017.

Worldwide experience shows that for the stable development of a society it is necessary to reform the budget system in accordance with the strategic tasks of the socio-economic development of the country. Having chosen the path of European integration, Ukraine must adhere to the global standards of ensuring financial stability, social guarantees, and high economic activity. Therefore, the main task of fiscal policy is to modernize the budget sector of the economy, reform public expenditures, and increase the efficiency

and effectiveness of the use of budget funds. To fulfill these tasks, a public procurement reform was launched in Ukraine based on transparency, proper governance, and the prevention of misconduct; involving monitoring, accountability and control.

3. Methodology and empirical data

3.1. Analysis of the efficiency of the use of budget funds during electronic procurement

During the last decade in Ukraine, at the level of legislation governing public procurement, many reforms were undertaken to overcome the existing and potential risks of corruption. The previous system of public procurement, which ceased to function in August 2016, was considered to be corrupt. This system allowed for a conspiracy between the participants and customers, permitted the use of non-competitive procurement procedures, and lacked the possibility of conducting procurement through electronic bidding. The flaws of the old system had to be fixed due to the enactment of the Law of Ukraine “On Public Procurement,” which was supposed to greatly increase transparency and competition in the procurement process and which introduced mechanisms of influence on customers and participants behaving unfairly. The new law contains key provisions for the functioning of electronic public procurement, establishes general technical and security requirements for the electronic procurement system, provides the basis for an electronic authorized site, reduces the number of procurement procedures to three, and introduces the appeals office for procurement procedures.

The electronic system combines the main electronic portal with a network of private electronic platforms. The data obtained in the process of interaction with the system is publicly available, and is used for monitoring. The implemented reform in the field of public procurement has opened access to more participants, has become noticeable to the general public, and the openness of the system has raised the level of awareness of citizens regarding public procurement. As a result of these innovations, observers’ access to purchasing processes has been simplified and monitoring has become simpler and more convenient. The electronic system has simplified access to bidding for bidders and reduced administration costs, as well as speeding up the procurement process. In addition, Ukraine, as a member of the WTO Agreement on Government Procurement, has become more open to foreign participants and has itself gained access to global procurement processes. The main achievement of the introduction of the electronic procurement system is the saving of budget funds, which is constantly covered on the official website of ProZorro. The savings effect is calculated as the difference between the expected purchase price and the value of concluded contracts. The expected value of the offer is set by the customer at the time of publication of the contract, and represents the maximum amount of funds that can be spent by the customer under a particular contract. The procedure for determining the expected value is not established by law, and so is quite a subjective indicator. The actual value is set at the time of concluding the contract, and is the minimum price offer for a separate contract.

Calculation using this method does not reflect the efficiency of the use of budget funds in procurement by bidding and procurement by negotiation procedure – that is, without the use of open bidding due to the lack of an offer with the expected value. To add, according to statistical data from 2017–2019, such procedures account for almost half of all purchases, as can be seen in Table 3. Consequently, the total cost of threshold procurement and procurement conducted under the negotiation procedure amounts to half of the value of all purchases, with this trend continuing over the past years. Thus, calculation of the estimated budget savings in procurement proposed by ProZorro does not fully reflect the effectiveness of procurement.

Table 3. Procurement analysis

Procurement type	2017		2018		2019	
	UAH billion	%	UAH billion	%	UAH billion	%
Threshold procurements	171.101	35.6	188.643	28.7	167.61	21.0
Negotiation procedure	89.313	18.6	102.94	15.7	129.38	16.2
Open bidding	93.52	19.4	151.41	23.0	253.66	31.8
Open bidding with publication in English	110.519	23.0	194.71	29.6	230.54	28.9
Negotiation procedure for defense needs	16.43	3.4	20	3.0	16.37	2.1
Total	480.883	100	657.703	100	797.56	100

Source: compiled by the author based on: ProZorro Statistics

In order to determine the savings of public funds from the standpoint of legality, we propose the application of an operational approach, i.e. determining the savings of budget funds for each purchase. The effectiveness of each individual procurement is assessed by calculating the savings, which are determined as a percentage of the initial contract price.

The savings indicator (E) will be calculated as follows:

$$E = \frac{\Sigma beg - \Sigma end}{\Sigma beg} \times 100\% \quad (1), \text{ where}$$

Σbeg – expected cost,

Σend – the cost of the contract.

According to the calculation presented, an analysis of purchases among customers in Zhytomyr in 2019 was conducted. A total of 6242 purchases were investigated using the ProZorro analytical module. The results of the research were grouped by risk regarding the possibility of a corruption component (Table 4).

Table 4. Indicators of saving public funds for procurement in Zhytomyr in 2019

Savings indicator	Estimation of economy	Number of lots	% of the total number of lots	Total expected cost, thousand UAH	Total contract value, thousand UAH
E=0	There are no savings	729	12%	126792.4	126792.4
E<5	low savings	1656	26%	195911.3	187185.7
5% <E<12%	normal savings	3157	51%	513724.4	447387.0
13%<E<20%	high savings	484	8%	2269161.7	1767287.3
E>21%	speculative savings	216	3%	40365.1	28916.4
Total		6241	100%	3145954.9	2557568.8

Source: compiled by the author based on: ProZorro Statistics

According to the data presented in the table, the number of purchases with zero savings is 12%. This situation is observed in the application of negotiated procurement procedures, mainly for gas supply services, electricity supply, etc. In Ukraine, the problem of a forced monopoly exists due to the lack of competition in this market. The large percentage of low-cost purchases is due to the lack of a sufficient number of bidders. In this situation, a sufficient number of proposals for each purchase is not provided, and so the percentage reduction of the initial price is minimal. The percentage of purchases with high savings is 8% of the total, while the total cost of such purchases is the largest and exceeds all others at times. A more detailed analysis shows that the categories of “high savings” and “speculative savings” include capital construction and the overhaul of roads. Such procurements are traditionally of high value and have a high risk of corruption. The general research shows that in 2019 in Zhytomyr there was fairly low competition among participants.

3.2. Competition as a tool for ensuring the transparency of public procurement

One of the main tools for combating corruption during public procurement is the increase of competition and the introduction of the principle of non-discrimination of participants, as stipulated in Article 3 of the Law of Ukraine “On Public Procurement.” The implementation of this principle is carried out through the establishment of equal conditions for participation in these procedures for participants of all forms of ownership and organizational and legal forms of activity. In this case, customers are prohibited from resorting to actions that would discriminate against potential participants. In accordance with the Law of Ukraine “On Public Procurement,” the customer may establish one or several qualification criteria, including: the availability of equipment, material, and a technical basis; the availability of employees with relevant qualifications; and the documented completion of a similar contract. This rule is not always used as it is intended by the law. Customers take steps to reduce competition during the procurement

process by defining specific and overly detailed requirements for a procurement item in order to ensure that a particular participant wins, thus discriminating against the participation of other potential participants. There are cases where customers combine in one lot several types of products to be produced by different manufacturers. Because of this, producers cannot bid, and a certain intermediary firm wins. Also, to reduce competition, the delivery time specified in the contract is often too short for the manufacturer to produce and deliver the necessary quantity of product. Dishonest customers, during the disclosure of conditions, may also overstate the terms of payment for products, which reduces the number of participants willing to bid. Due to this, with today's constant inflationary processes in the economy, not all manufacturers can wait for an extended period of time to receive payment for products. As a result, the desired participant wins the tender, and after the signing of the agreement the delivery times and terms of payment for the products can be reviewed.

An analysis of the level of competition in public procurement is an important part of the research of the competitive environment, since a higher level of competition reduces corruption and creates favorable conditions for the most profitable deals, which leads to the increased efficiency of public procurements. Typically, the level of competition is calculated as the ratio of the number of participants to the number of procedures in public procurement. This technique is used when calculating the level of competition in the "ProZorro" system, and Parasiy-Vargunenko (2017) proposes to use the formula:

$$P = \frac{K}{N} \quad (2), \text{ where}$$

P – level of competition,
 K – number of participants,
 N – number of procedures.

Taking into account the negative factors, and despite the simplification of the procedure for public procurement, competition among participants remains low. The dynamics of competition in the public procurement market for the period of 2016–2019 are presented in Table 4. Since the launch of an electronic public procurement system in August 2016, there has been a steady rise in the number of participants and procedures. However, the level of competition over the period of 2016–2019 remains insignificant at a level of two participants per procedure, indicating a lack of competition, an overstated price, and a guarantee of procurement by agreement. To prevent such a situation in the market of public procurement, the Law of Ukraine "On Public Procurement" provides a procedure for appeal.

Table 5. Analysis of the level of competition

Indicator	September 2016	September 2017	September 2018	September 2019
Number of procedures, thousands	50.8	82.69	92.54	94.29
Number of participants, thousands	118.9	185.2	211.92	236.67
The level of competition	2.34	2.24	2.29	2.51

Source: compiled by the author on the basis of ProZorro Statistics

3.3. The implementation of the principle of non-discrimination of participants during public procurement

The use of the electronic system during procurement provides access to information for potential suppliers or participants dissatisfied with the procurement process, as well as for public observers. On one hand, this leads to increased competition, promotes the transparency of work done by the government organizations, facilitates public control, and increases the likelihood of exposure for conspiracies, fraud, and the inefficient spending of budget funds. On the other hand, dissatisfied participants have access to information on the tenders that have taken place, and may contest the decision on the winning bid by appealing to the Antimonopoly Committee of Ukraine regarding the violation of the principle of non-discrimination of participants.

The ACU Board must consider the complaint in due time and make a decision regarding the violation of the principle of non-discrimination, and may oblige the customer to amend the tender documentation for which the violation was discovered or cancel the purchase entirely. However, the appeal of participants to the Antimonopoly Committee of Ukraine on violations, alongside being a means of protecting the rights of participants in procurement, can also be a means of abuse by delaying the bidding process, since according to Art. 18 of the Law of Ukraine “On Public Procurement” the consideration of a complaint can take up to 15 working days. The result of the consideration of a complaint may be a confirmation or refusal of violation in the procurement procedure. The statistical data on complaints submitted to the Antimonopoly Committee are presented in Figure 3.

As can be seen from the data, there is a sharp rise in the number of appeals, especially in the last year. This is due to the simplification of the procurement procedure and the possibility to automatically submit a complaint to the electronic cabinet of the appeals body. On one hand, this greatly enhances the possibilities of preventing unfair competition or revealing a violation of the law, and ensures the implementation of the basic principle of non-discrimination of participants in public procurement. On the other hand, this allows dishonest parties to challenge procedures without valid reasons, since the filing of a complaint is allowed even without payment. In 2017 the number of such appeals increased by 47 percent compared with 2016 (Figure 3).

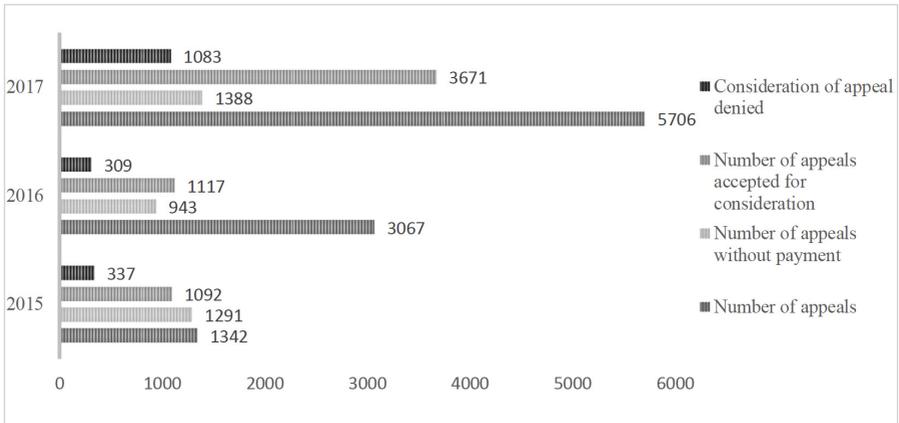


Figure 3. Dynamics of appeals to the Antimonopoly Committee of Ukraine

Source: compiled by the author on the basis of ProZorro Statistics, 2015–2017

In practice, there are cases where the procurement procedure was delayed through an automatic appeal by 120 days. In order to prevent such cases, amendments to the legislation should be introduced that would not allow the automatic suspension of the procurement procedure until the payment for the appeal is made. In addition, raising the fees for appeal procedures may reduce the number of unfounded appeals. Such an increase would be expedient and economically justified, as over the past seven years, despite the inflationary processes in the country's economy, changes in legislation, and rises in the minimum wage and the cost of living, the price for appeals has remained unchanged.

Despite the problems identified, as a result of an increase in the number of applications in 2017, the budget revenues doubled in comparison with 2016, amounting to 24.3 million UAH. With the raising of the fee for appeals, the budget revenue will increase and the number of submissions of groundless complaints will be reduced.

One of the most popular schemes to avoid open bidding is to break up one large purchase into several smaller ones. The new legislation on public procurement requires the mandatory conduct of electronic procurement if the amount of procurement exceeds the threshold of 200,000 UAH for goods and 1.5 million UAH for services. Purchases below this threshold can be entered into the system in the form of reports. To avoid public procurement procedures, customers divide one large procurement into several smaller ones and only file a report in the system upon the conclusion of a contract. This approach allows the customers to make purchases by negotiation, in violation of the principles of public procurement. According to statistics, the number of customers who used the electronic system for public procurement with the application of the provisions of the Law "On Public Procurement" in 2017 amounted to 14,620, and customers who conducted threshold purchases amounted to 25,610. At the same time, in 2017, 137,854 contracts were concluded in accordance with the rules of public procurement law, and 765,504

threshold contracts – 5.6 times more, a tendency that is repeatedly observed in the following years. The amount of threshold purchases in the total number of final agreements is also quite high, as shown in Table. 6.

Table 6. *The number of contracts concluded*

The procurement procedure type	2017 year		2018 year		2019 year	
	number of contracts	%	number of contracts	%	number of contracts	%
Threshold procurements	765,506	84.7	950,907	87.7	1,094,620	87.5
Negotiation procedure	51,340	5.7	48,866	4.5	58,746	4.7
Open bidding	76,801	8.6	78,322	7.3	89,896	7.3
Open bidding with publication in English	7,592	0.8	4789	0.4	5625	0.4
Negotiation procedure for defense needs	2,121	0.2	1359	0.1	2054	0.1
Total	903,360	100	1,084,243	100	1,250,941	100

Source: compiled by the author on the basis of ProZorro Statistics

Obviously, we must consider the preferential use of threshold procurement by customers for the purchasing of goods, work, and services. Such a situation is explained by the simplified procedure of threshold procurement, the smaller volume of necessary documentation, the possibility of avoiding competition, and ensuring the fulfillment of the contract by a particular participant. However, if we return to the procurement analysis of 2017 in Table. 3, then the total amount for threshold procurement was 110.519 billion UAH, and the total amount for contracts concluded in accordance with the rules of the law on public procurement was 370.364 billion UAH. It is clear that contracts with lesser value fall under the law, but it is inappropriate to break up contracts to avoid open bidding – a process used by unscrupulous customers.

To combat such a scheme, we consider it necessary to lower the threshold for public procurement, so that a greater number of purchases fall under the legislation. The problem in threshold procurement today is the lack of a legislative framework that would regulate this issue. Therefore, it is necessary to extend the Law on Public Procurement with the introduction of a simplified procedure for procurements with a lower threshold value.

A lack of regulation at the contract implementation phase is a major corruption risk, which is also observed in many other countries. This increases the risk of corruption in the field of public procurement since the contract price and volume often change after the contract is concluded, and contractors often fail to fulfill their contractual obligations. Due to collusion between the customer and the contractor, there are deviations from the contract agreements which lead to negative consequences. It is necessary to set up an effective system for monitoring contract implementation, and amendments to

the contract must comply with the law and provide a limit on the value of the contract. In practice, there is a tendency for the value of the contract, after the winning bid, to increase several times with the aid of additional agreements, while the legislation allows for fluctuations in price within 10%. In addition, the contractor often supplies a product of lower quality or differing specifications, or even replaces product entirely with lower quality analogues. Officials deliberately avoid proper control by collaborating with the contractor, which leads to an increase in prices due to changes to the contract. Regulation on the publication of reports on the performance of contracts exist to prevent such situations, but it is not explicitly stated in the Law "On Public Procurement," so some of customers avoid disclosing such information and ignore this requirement.

4. Results

The introduction of public procurement accountability through the electronic procurement system greatly contributed to the strengthening of the CPI in 2016. Due to the operation of the ProZorro and DoZorro systems, cases of procurement violations have become more apparent to business and the public than they were under the system of paper tenders.

The introduction of the automatic calculation of the savings percentage (1) for each purchase into the DoZorro system would allow users to quickly detect suspicious purchases with speculative savings in order to identify unscrupulous participants.

Active exposure of such tenders with the DoZorro system can significantly reduce corruption in procurement. As shown in Table 3, there is a steady increase in the number of auctions and public procurements, indicating the confidence of small and medium enterprises in the reform of public procurement and thus fulfilling the main objectives of the introduction of a new system of public procurement: transparency, competition, and ethical behavior. The increase in the number of participants in public procurements directly strengthens Ukraine's position in the determining of the CPI rating (Fig. 1), although very slowly as the level of competition among participants in recent years remains low.

The results of this study support the idea that corruption in public procurement is caused by low competition among participants in the system (Table 4). Therefore, the main way to overcome corruption risks during tenders is to increase the number of participants by implementing a number of measures at the state level that would strengthen the confidence of potential suppliers and reduce discrimination in the system. These measures include:

- the introduction of automatic monitoring for the detection of unscrupulous participants in the electronic public procurement system;
- a reduction in the marginal amount for subthreshold procurement to prevent the avoidance of competitive bidding;
- the introduction of a simplified procurement procedure for standard goods, works, and services (such as stationery or computer equipment) in order to attract more participants;

- the prevention of the automatic suspension of the procurement procedure until payment of the appeal in order to prevent fictitious complaints;
- an increase in the fee for appealing the purchase.

An important indicator that affects the level of corruption during public procurement is the efficiency of the use of public funds. Such an indicator should reflect the productivity, performance, and cost-effectiveness of budget spending. The absence of a clear, legally established principle and mechanism for the effective use of budget funds in Ukraine affects the identification of the corrupt actions of participants in the budget process. At present, it is impossible to determine the results of the use of budget funds at a legislative level, since the current system is not oriented based on their efficiency.

5. Conclusions

Public procurement is a powerful tool for influencing a country's economic market, which allows for the formation of a stable and efficient economic system. The reform of public procurement in Ukraine has allowed the public procurement system to be more open and simplified the access of participants to bidding, along with reducing the level of government spending on administration and accelerating the procurement process. Currently, a hybrid procurement system operates in Ukraine, in which state bodies are responsible for the integrity of the central database and business structures are responsible for providing trading platforms to customers and participants. This approach is rare and prevents corrupt practices within the system itself.

However, the introduction of an electronic bidding system has not been the only result of the reform. Public procurement has become more noticeable for small and medium-sized businesses, and openness has raised awareness among citizens. In addition, Ukraine, as a member of the WTO Agreement on Government Procurement, has become more open to foreign participants and itself has access to procurement abroad. The electronic system has lowered the cost of administering the procurement process and accelerated the procurement procedure.

Despite the transparency, constant public monitoring, and optimization of the process, corruption in public procurement in Ukraine remains present. It is necessary to develop a number of tools to overcome the risk of corruption in the system of public procurement, including: amending the legislation in order to increase the level of competition; reducing the number of unfounded appeals; and monitoring the implementation of contracts. It is necessary to develop and regulate, at the legislative level, a single system to analyze the indicators of the effectiveness of state funds.

Under the present system, the effect of budget savings is calculated as the difference between the expected purchase price and the actual cost of concluded contracts. Thus, the concept of "procurement savings" and the concept of "procurement effectiveness," which underlie the principles of public procurement anticipated by law, differ significantly in practice. The legislation does not clearly define what is understood by, and indeed what is the essence of, the principle of public procurement: "maximum economy and effectiveness." The expected cost of procurement is determined by the customer at

the time of the publication of the procurement notice, and is a rather subjective indicator because when the initial price of the contract is set the validity and real market value of the procurement are not taken into account. In addition, the full life-cycle of the product or service is not taken into account at all. The calculation of effectiveness should include the expiration date and the possibility of disposal after the expiration date. Taken into consideration, these indicators could be addressed, alongside a number of environmental and social issues. These provide prospects for future research.

The reform of public procurement gained considerable support among Ukrainians and from the international community, but faced considerable resistance and caused ardent debates. There are blind spots in the system which increase the risk of corruption, making it impossible to fully analyze and monitor public procurement.

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