

AN EVALUATION OF DECENTRALIZATION IMPACT

on transparency and efficiency of public expenditures



KYIV

2018

**[AN EVALUATION OF DECENTRALIZATION IMPACT ON TRANSPARENCY AND EFFICIENCY
OF PUBLIC EXPENDITURES]**

Artur Kovalchuk

Oleksa Stepaniuk

Nataliia Shapoval

Pavlo Iavorskyi

CONTENT

| | |
|-------------------------------------------------------------------------------------------|----|
| CONTENT | 1 |
| ACKNOWLEDGMENTS | 2 |
| EXECUTIVE SUMMARY | 3 |
| DEFINITIONS AND ABBREVIATIONS | 5 |
| INSTITUTIONAL CONTEXT AND MOTIVATION | 6 |
| DECENTRALIZATION IN UKRAINE | 6 |
| PUBLIC E-PROCUREMENT SYSTEM PROZORRO | 6 |
| RESEARCH QUESTIONS | 9 |
| RESEARCH STRATEGY | 10 |
| TRANSPARENCY AND EFFICIENCY INDICATORS | 10 |
| SAMPLE | 13 |
| ADMINISTRATIVE UNITS | 13 |
| PRICES PER UNIT | 15 |
| RESULTS | 16 |
| QUANTITY AND VALUES OF FINISHED TENDERS | 16 |
| PROCUREMENT STRUCTURE | 16 |
| TRANSPARENCY AND EFFICIENCY INDICATORS | 17 |
| TENDERS OUTSIDE OF PROZORRO | 17 |
| AVOIDING A HIGHER AND EURO THRESHOLDS | 18 |
| PROCUREMENT PROCEDURES | 18 |
| UNANSWERED QUESTIONS | 19 |
| COMPETITION LEVEL | 19 |
| DISQUALIFICATION | 20 |
| SUCCESS RATES | 20 |
| ABNORMAL SAVING RATE | 21 |
| CONTRACT TERMINATION | 21 |
| ADDITIONAL AGREEMENTS | 22 |
| SHARE OF LARGEST SUPPLIER | 23 |
| SPECIFIC GOODS PRICE EFFICIENCY | 24 |
| FOOD | 24 |
| FUEL | 26 |
| ROAD REPAIRING | 27 |
| CONCLUSIONS | 28 |
| APPENDICES | 30 |
| APPENDIX A. LIST OF AMALGAMATED HROMADAS AND RAIONS INCLUDED IN THE SAMPLE (IN UKRAINIAN) | 30 |
| APPENDIX B. KEYWORDS FOR IDENTIFYING LEGAL ENTITIES AND HOMOGENOUS GOODS (IN UKRAINIAN) | 31 |
| APPENDIX C. STATISTICAL MEASURES. | 33 |
| APPENDIX D. INDICATORS OF PROCUREMENT TRANSPARENCY AND EFFICIENCY | 34 |
| APPENDIX E. STRUCTURE OF PROCUREMENT BY ADMINISTRATIVE UNITS | 37 |
| APPENDIX F. PRICE EFFICIENCY OF SPECIFIC GOODS | 38 |

ACKNOWLEDGMENTS

This report was prepared by a team of Kyiv School of Economics, consisting of Artur Kovalchuk, Oleksa Stepaniuk, Nataliia Shapoval and Pavlo Iavorskyi. The work was performed in the framework of the Swedish-Ukrainian Project “Support to Decentralization in Ukraine” which is implemented in Ukraine by the Swedish Association of Local Authorities and Regions (SALAR) through SKL International AB guided by Jasmina Djikic. Academic supervision was provided by Tymofiy Mylovanov, PhD, KSE Honorary President.

This report is prepared within the framework of the Swedish-Ukrainian Project “Support to Decentralisation in Ukraine”, enabled by the financial support from Sweden.

Views, conclusions or recommendations belong to the authors and compilers of this publication and do not necessarily reflect the official position of the Government of Sweden. The responsibility over the content lies solely with authors and compilers of this publication.

This information is free for copying, reproduction and dissemination within Ukraine through any means if this is free of charge for end user, and on condition that such copying, reproduction and dissemination contains indication of the author and copyright owner.

EXECUTIVE SUMMARY

Historically, Ukraine inherited the Soviet Union's territorial, administrative and political systems. Although, since 1991 Ukraine has made a long way from the soviet period; till 2014, the Ukrainian administrative structure mostly resembled the Soviet Union model. However, in April 2014 the Ukrainian government launched a systemic decentralization reform – a delegation of significant part of resources and responsibilities from oblast and raion-level executive branch of the government to the local self-government. This is done through creation of *amalgamated hromadas*, the merge of several settlements with a single administrative centre.

Contemporaneously, the reform of public procurement has been implemented. According to the Law on Public Procurement of Ukraine, since August 2016, the majority of public procurements must be announced and executed through the ProZorro, the public procurement web portal. The new system brought more transparency and efficiency into the public procurement. On the other hand, the electronic procurement system does not completely cover the procurement cycle. Actually, it covers only tendering process while planning and agreement execution are mostly beyond the system.

The reforms mentioned could potentially significantly affect the procurement activity conducted by local contracting authorities. The aim of this paper is to compare efficiency of public funds usage by amalgamated hromadas (AH), raion state administrations (RSA) and unamalgamated hromadas (UH) - cities and villages that are not a part of amalgamated hromadas.

To evaluate efficiency and transparency of AH procurements, we constructed a system of eleven indicators: Avoiding ProZorro rate, Avoiding higher and euro thresholds rates, Usage of competitive procedures, Unanswered questions rate, Level of competition, Disqualification rate, Success rates, Abnormal saving rate, Contract termination rate, Fixing the price with additional agreements rate, Share of largest supplier. We also compared price efficiency across three groups. The sample included AH of Dnipropetrovska and Khmelnytska oblast created in 2015/2016 as well as all RSA and UH of these two regions.

The analysis showed the similarity between AH and RSA in terms of number of procurements, success and disqualification rates as well as competition level and share of terminated contracts. However, AH are more likely than RSA to choose direct selection of a supplier than a competitive procedure in cases, when it is allowed by the Procurement Law. Such behaviour can be caused by the lack of professionalism (or even corruption), desire to select a local trustworthy company or just because it is easier and faster to conduct uncompetitive below threshold procedure.

On the other hand, AH are less inclined (in comparison to RSA) to avoid the ProZorro system (by using procurements below UAH 50 K) and to sign additional agreements that increase the price. Such behavior is potentially punishable by the law. It can be suggested that procurement officers of AH only recently started to work with tenders above HT and are therefore more conscious of possible negative consequences of such actions.

Unamalgamated hromadas procure list of goods and services similar to AH, however they conduct a much smaller number of procurements with smaller total value. As a result, in most cases the procurement patterns of AH are more similar to RSA than to UH. For instance, on average 28% of AH procurement contracts value is assigned to one supplier. This indicator is the same for RSA, while for UH it is equal to 48%.

In order to compare the price efficiency of AH to RSA and UH, an analysis focuses on homogenous goods that could be easily compared. Such products must constitute a significant share of public spendings and have quite a big number of tenders to enable reasonable comparison. Particularly, the list of goods includes Food (Potato, Butter, Eggs), Fuel (A-95, A-92, Diesel) and Road repairing. According to the analysis, amalgamated hromadas' price efficiency is not worse than in other administrative units' groups. The price gaps between groups that used to exist are decreasing over time. Also, the more competitive is the market, the lower is the differences of price per unit.

Our findings show that all administrative units included in the study (amalgamated and unamalgamated hromadas, as well as raion administrations), struggle with common issues:

- lack of professional capacity;
- lack of incentives at the personal level (usually, conducting procurement is the additional non-paid task) frequently resulted in conducting simpler and faster (but not always better) procedures;
- the size of their procurements frequently is not sufficient for attracting large companies to their tenders;
- difficulties in guaranteeing the best combination of price and quality through an electronic auction.

These problems can be addressed by investing in the professional development of the procurement officers and by further reforming public procurement system. Among the current reform initiatives the most helpful for local public procurements will be the development of the e-catalogue (faster and more convenient way to conduct a transparent below HT procurement) and framework agreements (an option to “outsource” the most common above HT procurements, for instance, natural gas and petroleum, to professional procurement agency). Also noteworthy is the

initiative to further develop the institute of the authorized person. The idea is that one professional procurer can be more efficient than a tender committee consisting of non-professionals.

There is a need to study further and document the process of AH taking over the responsibilities and resources of raion administrations through the lens of public procurement. In one year it would be possible to track better the evolution of public procurement practices of hromadas established in 2015/2016 and compare them with the new ones established in 2017.

DEFINITIONS AND ABBREVIATIONS

ADMINISTRATIVE UNIT – a local council or state administration. There are several types of administrative units included in the study: Raion state administration/Raion council, Amalgamated hromada, Municipal/Village/Rural settlement councils (unamalgamated hromada).

AMALGAMATED HROMADA – the consolidated community of several settlements (usually villages or small cities) with a single administrative centre.

CONTRACTING AUTHORITIES – public authorities, local self-government bodies and social insurance and welfare units established under the law, as well as legal entities (enterprises, institutions, organizations) and their associations that satisfy the needs of the State or a local community.

EURO THRESHOLD – the value of tender that requires applying the strictest competitive auction procedure. The euro threshold corresponds to thresholds used in the EU public procurement legislation and is different for goods & services and construction works.

HIGHER THRESHOLD – the value of tender that requires applying of a competitive auction procedure. The higher threshold is different for goods & services and construction works.

LEGAL ENTITY (ENTITY) – a legal entity subordinate to the administrative unit.

LOWER THRESHOLD – the lowest value of procurement at which contracting authorities have to use an electronic procurement system. According to the Ukrainian legislation, the lower threshold is equal to UAH 50,000.

PROCUREMENT PROCEDURE – a procedure used for selecting a supplier for a public procurement contract. Law of Ukraine ‘On Public Procurement’ distinguishes competitive and non-competitive procurement procedures.

PUBLIC PROCUREMENT - the contracting authority’s activity of purchasing the goods and services which it needs to carry out its functions.

TENDER – procurement with the use of one of three competitive procedures: below higher threshold competitive procurement, open tender, open tender with publication in English. All three are established by the Law of Ukraine “On Public Procurement”

UNAMALGAMATED HROMADA – villages, rural-type settlements and cities that have not been amalgamated.

ABBREVIATIONS

AH – an Amalgamated Hromada.

AMCU – Anti-Monopoly Committee of Ukraine.

CA – a Contracting Authority.

CAH – a Council of the Amalgamated Hromada.

HT – a Higher Threshold.

JSRLE – the Joint State Register of Legal Entities, Individuals-Entrepreneurs and Non-Governmental Organizations.

LT – a Lower Threshold.

RSA – a Raion State Administration and Raion Council.

UH – an Unamalgamated Hromada.

INSTITUTIONAL CONTEXT AND MOTIVATION

The study is structured as follows: this Chapter provides an institutional background of decentralization and public procurement reforms in Ukraine as well as formulates goals of the study. The second Chapter explains the methodology of analysis. The third Chapter describes results of analysis related to key research question and, finally, the last Chapter summarizes main findings.

DECENTRALIZATION IN UKRAINE

Historically, Ukraine inherited the Soviet Union's territorial, administrative and political systems. Although, since 1991 Ukraine has made a long way from soviet period; till 2014 the Ukrainian administrative structure mostly resembled the Soviet Union model. The government was structured into three levels: national, oblast (region) and raion/city. Mostly decisions on distribution of resources were made at national level and executed through the system of oblast and raion state administrations while powers of the local self-government were limited and, to some extent, nominal.

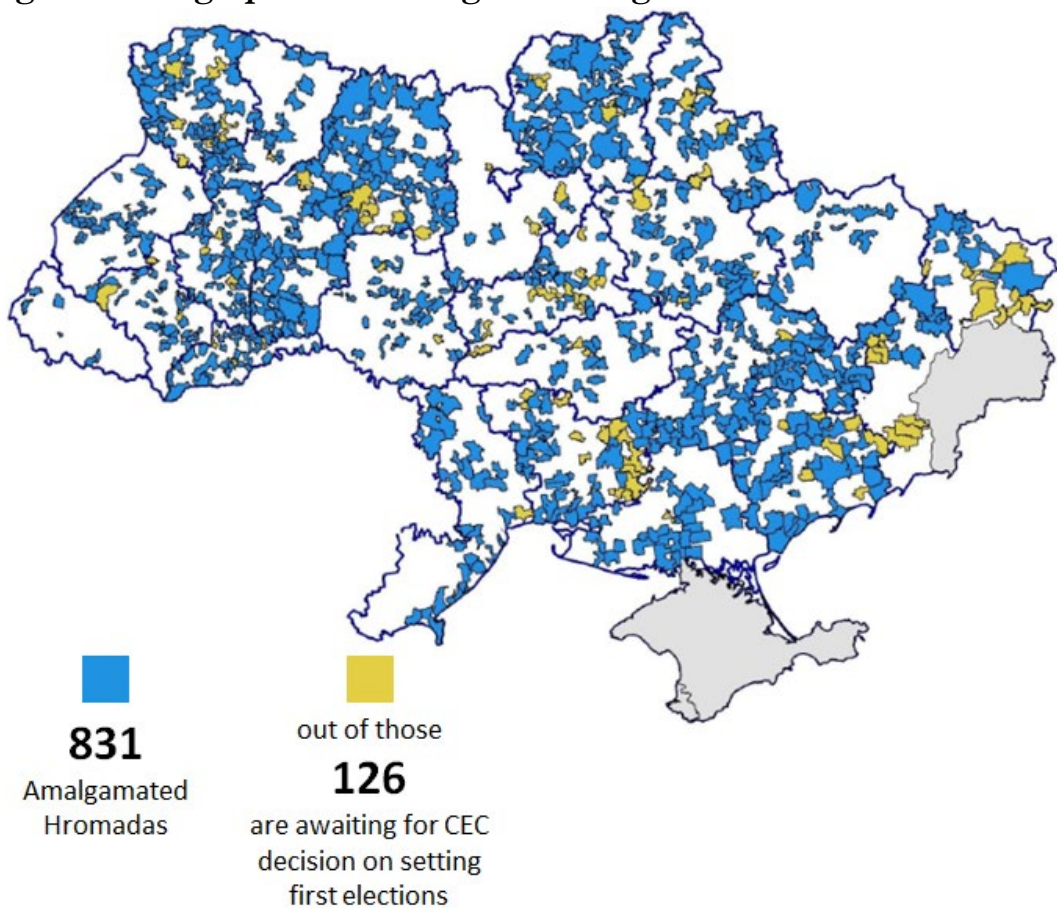
Such a structure stifles local economic development. Citizens did not have influence in public affairs at local level. Ineffective local governments were unable to successfully provide basic services, such as pre-school education, healthcare, utilities and transport infrastructure.

However, in April 2014 the Ukrainian government launched a systemic decentralization reform – a delegation of significant part of resources and responsibilities from oblast and raion-level executive branch of the government to the local self-government. The key issue of the reform is creation of the strong basic level of local self-government in line with European Charter of Local Self-Government. This is done through creation of *amalgamated hromadas (AH)*, the merge of several settlements with a single administrative centre. According to the type of an administrative centre (town, urban-type settlement or village), AH could be classified as urban, settlement and rural hromadas.

AH is governed by a *council of the amalgamated hromada (CAH)*, a representative body of a local self-government. It is elected by residents of territorial communities and has responsibility to independently resolve local issues, develop and approve AH budgets. Particularly, the Government redistributed tax revenues and expanded the system of state subsidies (medical and educational subvention, subvention on development of amalgamated hromadas etc.) that could be used according to AH decisions.

In 2015, 159 AH were established. As of September 2018, 831 AH consolidate 3,796 hromadas with 7 million residents (decentralization.gov.ua). However, only 665 AH have conducted their first elections to the CAH and were included in the 2018 State Budget¹. Figure 1 illustrates the distribution of AH across Ukraine in September 2018.

Figure 1. Geographical Coverage of Amalgamated Hromadas.



Source: Decentralization.gov.ua

¹ see Attachment 6 “Interbudget transfers” of the 2018 State Budget: <http://zakon5.rada.gov.ua/laws/show/2246-19>

PUBLIC E-PROCUREMENT SYSTEM PROZORRO

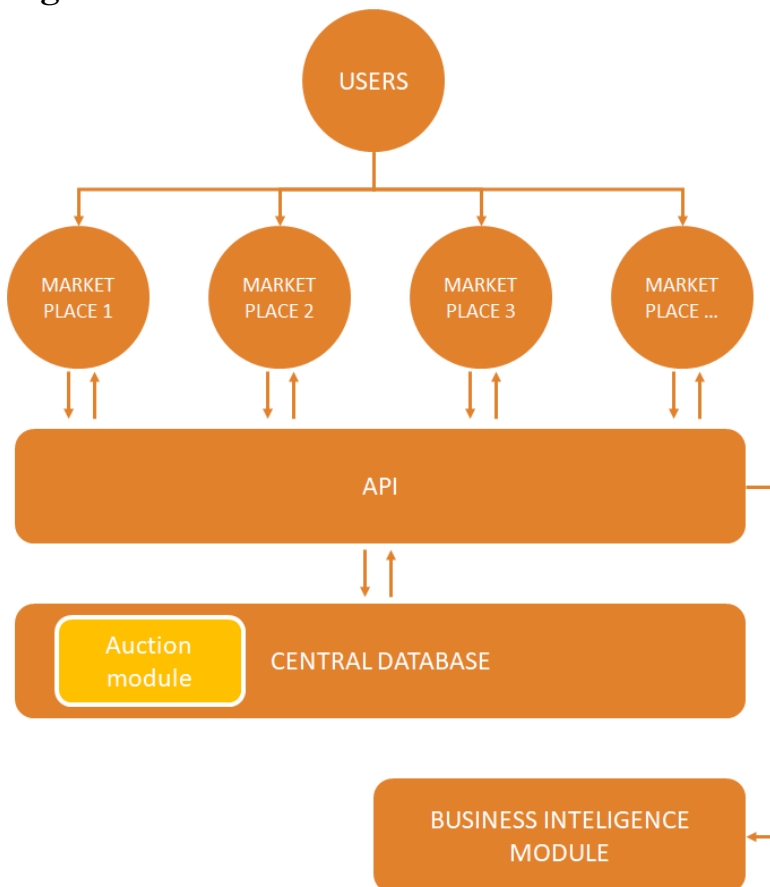
Contemporaneously, the reform of public procurement has been implemented. According to the Law on Public Procurement of Ukraine, since August 2016 public procurement² must be announced and executed through ProZorro³, the public procurement web portal administered by the state enterprise ProZorro (former “Zovnishtorgvydav”). The e-procurement system consists of the central database, the auction module and commercial marketplaces.

In order to participate in public tenders, bidders can choose one of 22 commercial marketplaces (7 companies that provided initial investment for the project became the first marketplaces). Commercial marketplaces are web resources managed by private companies that provide access to the electronic procurement system. Contracting authorities do not pay for using services of the marketplaces, while bidders pay USD 0.7-67 depending on the procurement value to participate in a tender. About 76% of this fee (as of 2017) is retained by a marketplace, and the rest goes to the public company that administers the ProZorro system.

A multiplatform approach, or the integration of several commercial marketplaces into the electronic procurement system, is aimed to establish a competitive market amongst the marketplaces, thus facilitating a persistent contest for quality improvement. These marketplaces can provide different supporting services, however, they all provide the same access to the central database. The central database contains all information on past and active public procurements and supports functioning of an auction module, a special program for conducting electronic auctions.

The verification of documents is performed after the auction⁴ and only for the winning bidder. This decreases the risk of corruption through not allowing bidders to participate in the auction by claiming that the submitted documents are inadequate.

Figure 2. ProZorro Architecture.



Source: “Co-creation of ProZorro” report of Kyiv School of Economics on the behalf of Transparency International.

Generally, introduction of ProZorro system intensifies a competition in public procurement and leads to more efficient usage of public funds through better pricing and quality. For instance, in the period from December 2016 to September 2017 more than 500 thousand of ‘below the higher threshold’ procedures with total reserve value of USD 2.5 billion were registered in the system. For each of these procedures there is publicly available information on the good procured, supplier and contract value.

Finally, more efficient and competitive procurement mechanism resulted in additional savings of public funds. In 2016, the share of contracting authorities that signed all contracts with one (single) winner fell by 28% from 11% to 5% of all

² Contracting authorities must use ProZorro system if a procurement expected value exceeds UAH 50,000.

³ ProZorro. <https://ProZorro.gov.ua/>

⁴ The ProZorro auction consists of four rounds. During the preliminary round all bidders submit their initial bids together with qualification documents. After the end of application period, the e-system automatically sets the date and time of the auction. At every stage of the auction the bidder participating in the auction can reduce the initial bid. The bidder with the lowest price at the end of the last round wins the auction. The auction is performed online with all the price proposals disclosed in real time.

contracting authorities⁵. Moreover, the average value of concluded agreement decreased by 70% from USD 55,000 to USD 16,000.

On the other hand, the electronic procurement system does not completely cover the procurement cycle. Actually it covers only tendering process while planning and agreement execution are mostly out of the system (plans are published online). Moreover, an existing legislation provides opportunities to manipulate tendering process by switching between different procedures. Within the ProZorro system there are 6 main procurement procedures that can be used by procuring entities depending on the volume and specifications of their needs. The main legislative background of all the procedures is comprised from the Law of Ukraine “On Public Procurement” and Regulation of SE “Zovnishtorhvydav Ukraine” dated 13.04.2016 No. 35.

Selection of procedures is on a *Threshold principle*. There are three thresholds (Figure 3):

- **Lower Threshold (LT).** Contracting authorities are not obliged to report procurements in the electronic system if the total value of procurement is lower than UAH 50,000.
- **Higher Threshold (HT).** Contracting authorities are not obliged to use open competitive procedures if the total value of tender is lower than a defined level. This level is equal to UAH 200,000 for goods and services and UAH 1.5 million for construction.
- **Euro Threshold (ET).** The value of tender that requires applying the strictest competitive auction procedure. The euro threshold corresponds to thresholds used in the EU public procurement legislation and is different for goods and services and construction works.

Currently, the system includes four types of competitive procedures and two types of uncompetitive procurement procedures. The contracting authority (CA) can be interested in using less complicated competitive procedure or using uncompetitive procedure to minimize its administrative costs and time required for procurement. In some cases, such decision can also be motivated by a desire to choose the “right” supplier, i.e. corruption.

Competitive procedures. All competitive procedures (Table 1) include online announcement of the procurement and an online auction. They differ in terms of obligations, moment when the supplier’s application documents are checked (before or after the auction) and number of applications necessary for the successful finalization of a procurement. Table 1 describes three main competitive procedures. The fourth type of competitive procedure is used exclusively for the defense procurements. Therefore, CA included in this study are not allowed to use it.

Table 1. Types of competitive procedures.

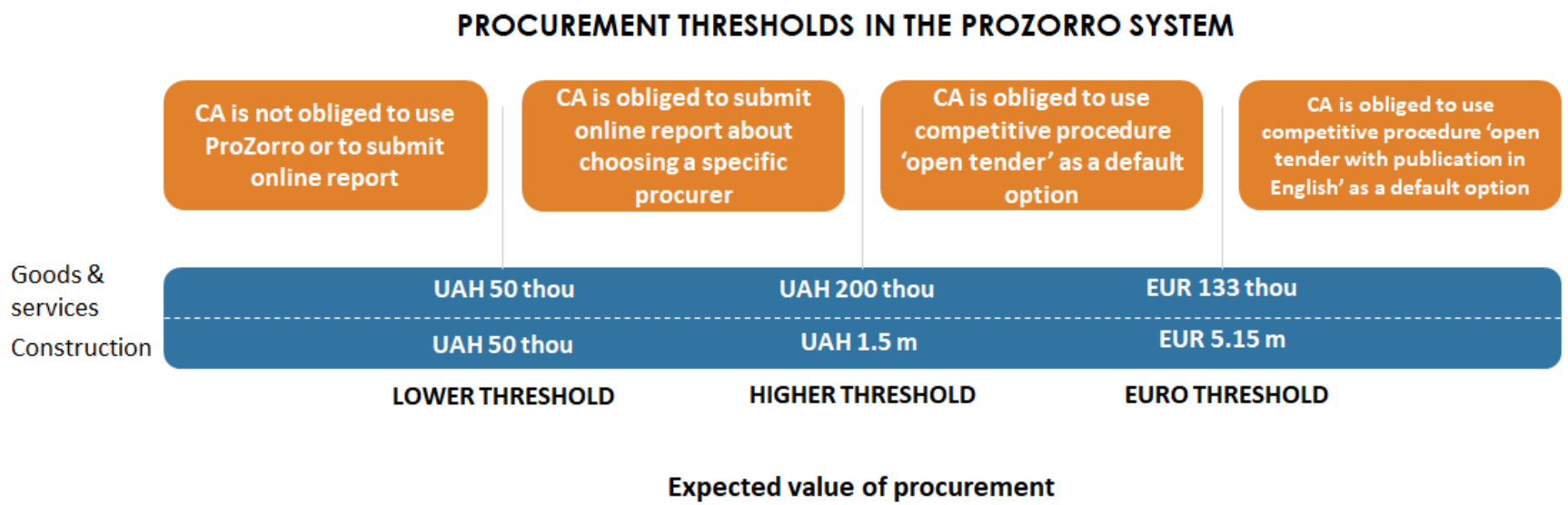
| Name | Obligations | Qualification | Number of suppliers |
|------------------------------------------------|-------------------------------------------------------------------|--------------------|-------------------------------------|
| Below threshold competitive procedure | Voluntary for procurements below the higher threshold | Post-qualification | One supplier is enough |
| Open tender | Obligatory for procurements above higher but below euro threshold | Post-qualification | At least two suppliers are required |
| Open tender with publication in English | Obligatory for procurements above euro threshold | Pre-qualification | At least two suppliers are required |

Source: Law of Ukraine “On Public Procurement”, Order SE “Zovnishtorhvydav Ukraine” No.35 dated 13.04.2016

Figure 3 depicts three procurement thresholds established by the Law “On Public Procurement”. The correspondence of the expected value of procurement and the threshold value determines the procurement procedure to be used by the CA

⁵ “Impact of ProZorro, March 2017”. Centre of Excellence in Procurement. <http://cep.kse.org.ua/article/impact-of-ProZorro.pdf>

Figure 3. Procurement Thresholds Used in Ukrainian Public Procurement System.



Source: Law of Ukraine “On Public Procurement”, Order SE “Zovnishtorhvydav Ukraine” No.35 dated 13.04.2016

Uncompetitive procedure has 2 types. *Report of concluded agreement* is applied if the value of procurement is above LT, but below HT. In this case, CA has a right to directly select a supplier. However, CA is obliged to submit a report into online system with the details of procurement and a copy of the signed contract. If the value of procurement is below LT, CA is not obliged to submit any information into the ProZorro system, but can do so voluntarily.

Negotiation procedure. If the value of procurement is above HT, CA can still directly select the supplier in the exceptional cases. The Law of Ukraine “On Public Procurement” specifies seven reasons that justify the usage of the negotiation procedure. Two most frequent reasons are two failed attempts to conduct a competitive procedure and an urgent need (e.g., in the case of natural disaster) that requires quick procurement.

Introduction of the electronic procurement system significantly increased the transparency of public procurements, increased the level of competition and decreased entrance barriers for private companies, especially for SMEs. Also, it attracted the unprecedented level of public attention and support. However, the electronic system by itself cannot cure all the problems of public procurement sphere. Stages of planning and, especially, fulfilling the contracts remain mostly outside of the e-system. As a result, further development of the system is impossible without improving the professional level of small and medium CAs. Local procurers generally have a good knowledge of the Procurement Law, but often lack the skills necessary for attracting and working with suppliers as well as efficiently using online auctions.

RESEARCH QUESTIONS

The impact on the procurement efficiency could be different for AH due to synergy effect of procurement and decentralization reforms. The combination of two reforms could lead to more efficient procurements due to openness of electronic procurement system and strong incentives to efficiently allocate own resources by local authorities. The evaluation of such an effect is a core question of this study. Therefore, the aim of this paper is to compare efficiency of public funds usage by amalgamated hromadas (AH), raion state administrations (RSA) and unamalgamated hromadas (UH) - cities and villages that are not a part of amalgamated hromadas.

The key research question is *What is the difference in procurement activity between amalgamated hromadas and "traditional" administrative units in terms of efficiency, transparency and prices?*

RESEARCH STRATEGY

This chapter explains a general approach used to answer key questions of the study: describe specific issues of sample definition and quantitative indicators construction.

TRANSPARENCY AND EFFICIENCY INDICATORS

Typically, procurement process is divided into three stages:

Pre-tender stage includes estimation of the need in goods and services, determining technical characteristics of the procurement object, preparing the tender documentation as well as selecting procurement procedure that will be used. This stage can include personal invitation to suppliers to participate in the procurement and meetings with suppliers to discuss the technical characteristics of the procurement object. If a contracting authority uses competitive procedure, pre-tender stage ends with the publication of the online procurement announcement.

Tender stage, in the case of competitive procurement, starts with the procurement announcement and ends with signing the contract. Correspondingly, it includes answering the questions of potential suppliers, qualification of suppliers (checking documents that were submitted by the supplier), preparing and signing the contract. In case, when one of the participants submits complaint to the Anti-Monopoly Committee of Ukraine (AMCU), it also includes participating in the meetings of the AMCU Permanent administrative board for reviewing complaints about violations of legislation in the field of public procurement.

Post-tender stage includes everything that happens from signing the contract till the end (or termination) of the procurement contract. This stage includes delivery of goods and provision of services. As a result, it can be considered the most important part of the procurement process.

To measure efficiency and transparency of AH procurement, we constructed a system of eleven indicators (Table 3) that evaluate each stage of the procurement process.

Table 3. Transparency and efficiency indicators used in the report.

| Pre-tender stage | Tender stage | Post-tender stage |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Avoiding ProZorro • Avoiding higher and euro thresholds • Use of competitive procedures | <ul style="list-style-type: none"> • Unanswered questions • Level of competition • Disqualification rate • Success rates • Abnormal saving rate | <ul style="list-style-type: none"> • Contract termination • Fixing the price with additional agreements • Share of largest supplier |

- **Avoiding ProZorro.** If the value of procurement is below LT contracting authority (CA) has a right to directly select a supplier and is not obliged to report it via the ProZorro system. Such a situation is completely legal. However, if the majority of CA procurements are outside the ProZorro system, it could indicate avoidance of transparent procedures. Such behavior can be the result of the lack of professionalism (e.g., in the case of small CA, the employee responsible for procurement can have no or rudimentary computer skills), desire to avoid administrative costs of reporting or to hide procurement details. We calculated *the share of procurements conducted outside of ProZorro and compared it between AH, RSA and UH.*
- **Avoiding higher and euro thresholds.** If the value of procurement is above HT, CA is obliged to use competitive procedure and if the value of procurement is above the euro threshold (ET), CA is obliged to use the strictest and most time-consuming competitive procedure. CA may wish to avoid the competitive procedure by announcing smaller procurements. Such behavior is illegal and punishable by a fine. Without the close examination of the procurement documents it is impossible to judge, whether CA was trying to avoid a threshold or there was a genuine need in smaller procurement. However, we can identify suspicious cases. For the purpose of this study, we identified *a procurement as suspicious, if its expected value was at most 5% below the HT or the ET.*
- **Usage of competitive procedures.** If the value of procurement is below the HT, CA can voluntarily choose to use the competitive procedure or the direct selection of supplier. On the one hand, the direct selection of supplier is a much faster and flexible mode of procurement than the competitive procedure. On the other hand, competitive procedure fosters competition between suppliers and, on average, provides better price per unit than the direct selection. To check at what extent CA are inclined to use competitive procedure for procurements below the HT we calculated *the share of competitive procedures in the below HT procurements for each administrative unit.*

- **Unanswered questions.** The mechanism of asking questions is an instrument of communication between CA and potential suppliers. In the case of competitive procurements below the HT, CA can ignore the questions submitted by the suppliers online regarding the particular procurement. Though such practice isn't prohibited by the Law, it is harmful for the specific procurement (suppliers do not receive all the necessary information) and harmful for the future procurements (ignored suppliers may choose to avoid future procurements). The indicator is constructed as a *number of procurements with unanswered questions in a case of "below HT" tenders*.
- **Level of competition.** According to the ProZorro data, higher number of auction participants, on average, results in better price per unit. To check the ability of administrative units to attract suppliers to participate in the auctions we determined *the average competition for each of the three key markets for AH, RSA and UH: construction works, fuel and food products*.
- **Disqualifications.** To participate in the competitive procedure each supplier has to submit a package of qualification documents. These documents prove supplier eligibility and ability to perform the contract. In case of competitive below threshold procedure and open tender, documents are checked after the auction and only the documents of the supplier with the lowest bid are checked. In the case of open tender with publication in English, documents of each supplier that applied to participate are checked before the auction and only eligible companies are allowed to participate. The high disqualification share can be the consequence of ill prepared tender documentation with unclear eligibility criteria or it can be the consequence of inexperience of suppliers. It also can be a sign of corruption, when tender committee is trying to find any reason to disqualify 'unwanted' suppliers. We calculated *the average share of disqualified suppliers per tender*.
- **Success rates.** There are three possible terminal states of the competitive procurement: successful procurement, unsuccessful or cancelled procurement. To successfully finish competitive procurement, contracting authority has to determine technical description of good and its expected value based on the available budget and market analysis. It also has to prepare and publish tender documentation and answer questions of potential suppliers. Finally, after the auction, contracting authority has to evaluate documents of the auction winner and sign a contract. Failure in each of these steps will lead to unsuccessful or cancelled procurement. We calculate *the average share of successful tenders in total number of announced tenders*.
- **Abnormal saving rate.** Nominal saving rate is calculated in the ProZorro system as a percentage decrease in the value of procurement as a result of the auction. Generally, high saving rate is regarded as a positive indicator, however, too high rate is suspicious. It can be a sign of inadequate expected value (mistake on the behalf of CA) or abnormally low price (suspicious behavior on the behalf of a supplier). To determine, how important is the problem of abnormal savings for the administrative units included in the study, we calculate *the share of tenders with abnormal savings in total value of finished tenders*. For the purpose of this study, we consider saving rate abnormal if it is greater or equal to 30%.
- **Contract termination.** Frequent contract termination is a sign of significant problems in the procurement function of the CA. We calculate *the share of terminated contracts in total volume of signed contracts*.
- **Fixing the price with additional agreements.** Ukrainian Law "On Public Procurement" gives the right to amend the price per unit indicated in the procurement contract up to 10% per one additional agreement if there were significant changes in the market price. Such provision is a protection against the necessity to constantly conduct new procurements of the highly volatile goods, for instance fuel. On the other hand, the right to amend the price can be and is often misused. We can compare *how often CA is signing additional agreements to amend the price in comparison to its peers*.
- **Share of largest supplier.** One of the main results of the new e-procurement system introduced in 2016 was greater diversification of procurement contracts among suppliers. For instance, in 2015 1,451 CA (11% of all CAs) had all procurement contracts signed with a single supplier. In 2016, after the introduction of the ProZorro system, their number decreased to 111 CAs. Generally, it is considered to be a good practice, when a CA is not overly dependent on one supplier. To compare administrative units in this regard, we calculated *the share of the largest supplier in the total value of signed procurement contracts*.

Prices. Given the requirements established in the procurement announcement, the price of goods procured could be the key indicator that summarizes information on all procurement stages. The better is the procurement process, the lower is the price received (other things equal).

In order to compare the price efficiency of AH, an analysis focuses on homogenous goods that could be easily compared. The main selection criteria are the importance of goods in public spending and sufficiency of sample size. In other words, such products must constitute a significant share of public spending and have quite a big number of tenders to enable reasonable comparison. Particularly, the list of goods includes:

- Food (Potato, Butter, Eggs)
- Fuel (A-95, A-92, Diesel)
- Road repairing

SAMPLE

ADMINISTRATIVE UNITS

We specified a set of administrative units to answer research questions. At the regional level, Dnipropetrovska and Khmelnytska oblasts were selected. Dnipropetrovska oblast is a leader in hromada amalgamation with 60 AH⁶ covering 53.4% of oblast area. Khmelnytska oblast is one of the most progressive regions in the scope of decentralization reform (5th place). Currently, there are 41 AH⁷ that cover 53.5% of oblast area (22 out of them were established in 2015). These two regions could be considered as representative for the Eastern and Western Ukraine and are big enough to provide data for statistical analysis.

The period of interest is restricted to 2017 as long as majority of AH were established in 2015-2016 and up to 2017 these communities became completely functional. On the other hand, 2017 is the only full year of mandatory electronic procurement (Table 2 shows the regional distribution of AH established in 2015 and 2016).

Therefore, final sample includes public procurement of the following administrative units in 2017:

- Amalgamated hromadas (AH);
- Unamalgamated hromadas (UH): villages, rural-type settlements and small cities that have not been amalgamated into AH.
- Raion state administrations (RSA).

Table 2. Distribution of AH established in 2015 and 2016 by regions.

| Oblast name | Number of AH established in 2015 | Number of AH established in 2016 | Total number of AH established in 2015 and 2016 |
|-------------------------------|----------------------------------|----------------------------------|-------------------------------------------------|
| Vinnytska oblast | 2 | 19 | 21 |
| Volynska oblast | 5 | 10 | 15 |
| Dnipropetrovska oblast | 15 | 19 | 34 |
| Donetska oblast | 3 | 3 | 6 |
| Zhytomyrska oblast | 9 | 23 | 32 |
| Zakarpatska oblast | 2 | 1 | 3 |
| Zaporizka oblast | 6 | 10 | 16 |
| Ivano-Frankivska oblast | 3 | 8 | 11 |
| Kyivska oblast | 1 | 1 | 2 |
| Kirovohradska oblast | 2 | 3 | 5 |
| Luhanska oblast | 2 | 1 | 3 |
| Lvivska oblast | 15 | 7 | 22 |
| Mykolaiivska oblast | 1 | 18 | 19 |
| Odeska oblast | 8 | 3 | 11 |
| Poltavska oblast | 12 | 6 | 18 |
| Rivnenska oblast | 5 | 13 | 18 |
| Sumska oblast | 1 | 13 | 14 |
| Ternopilska oblast | 26 | 10 | 36 |
| Kharkivska oblast | 0 | 4 | 4 |
| Khersonska oblast | 1 | 11 | 12 |
| Khmelnytska oblast | 22 | 4 | 26 |
| Cherkaska oblast | 3 | 3 | 6 |
| Chernivetska oblast | 10 | 6 | 16 |
| Chernihivska oblast | 5 | 11 | 16 |

Source: Decentralization website

For the analysis we selected all legal entities identified as related to one of the administrative units in the sample. For instance, we identified three separate legal entities related to the amalgamated hromada of Dunaevtsi (Khmelnytska oblast): city council, financial department and the department of education, youth and sports. Almost all AH and UH in the sample have a separate legal entity - an executive committee of the council.

⁶ including AH established in 2017

⁷ including AH established in 2017

In order to identify all legal entities required for the analysis, the following procedure was applied:

Stage 1. Get information from the Joint State Register of Legal Entities, Individuals-Entrepreneurs and Non-Governmental Organizations (JSRLE) on all active legal entities registered in Khmelnytska and Dnipropetrovska oblasts.

Stage 2. Exclude large oblast-level cities (Dnipro, Kryvyi Rih, Starokostiantyniv etc.). Such cities concentrate significant share of financial flows and definitely could be considered as outliers.

Stage 3. Restrict sample according to keyword list. The list includes names of administrative departments in the council system (Appendix B, Table B1).

Stage 4. Finally, remaining entities are manually related to specific AH, UH and RSA.

Stage 5. Screen procurement database to identify currently closed entities that conducted procurement in 2017.

Table 2 illustrates the sample constructed on JSRLE data. In total, we selected 1,124 legal entities in Dnipropetrovska and Khmelnytska oblasts. Out of this amount, 150 entities (13%) are related to 60 AH and 362 entities (32%) are related to 42 RSA while the rest are entities of UH.

Further comparison of JSRLE with ProZorro shows that data on some administrative units is not available in the electronic procurement system. Particularly, 56% of UH are not present in ProZorro. Such a situation could be partially explained by low value of procurement in these settlements. In other words, amounts of all tenders were lower than the threshold of UAH 50,000.

Table 3. Number of legal entities in the sample

| | Municipalities | RSA | Villages and rural settlements | Total |
|-------------------------------|----------------|------------|--------------------------------|--------------|
| Dnipropetrovska oblast | 11 | 162 | 336 | 509 |
| <i>including</i> | | | | |
| AH | 5 | - | 87 | 92 |
| RSA | - | 162 | - | 162 |
| UH | 6 | - | 249 | 255 |
| Khmelnytska oblast | 21 | 200 | 394 | 615 |
| <i>including</i> | | | | |
| AH | 11 | - | 47 | 58 |
| RSA | - | 200 | - | 200 |
| UH | 10 | - | 347 | 357 |
| Total | 32 | 362 | 730 | 1,124 |

Source: Own calculations based on the Joint State Register of Legal Entities

Box 1. AH and RSA missing in the sample

The share of absent RSA and AH is neglectable and each case has a logical explanation:

- **Malomykhailivka amalgamated hromada, Dnipropetrovska oblast.** Established in December 2016. It consolidates two councils (4 villages) with total population of 4,400 people. There are two identified legal entities related to the AH: Malomykhailivka village council and the executive committee of the village council. As of May 2018, the village council has never used the ProZorro system. The executive committee, on the other hand, announced its first tender through ProZorro system in January 2018. Since then, the committee announced 10 more tenders and already signed 10 contracts with suppliers. It remains unknown why AH did not use ProZorro system in 2017 despite it being obligatory. The reason can be related to the fact that AH was established only in December 2016, probably it did not become fully operational till late 2017, also it could have inherited contracts from two councils that joined AH.
- **Letychiv RSA, Khmelnytska oblast.** There are 57 rural settlements in the raion area, however, all of them are administratively amalgamated into two hromadas: Letychiv AH (45 villages) and Medzhybizh AH (12 villages). There is one legal entity related to raion council and 9 entities related to the raion administration. But neither of them have conducted public procurements in 2017 and 2018. The reason can be related to the fact that all settlements in the area are amalgamated.

The number of administrative units used for calculating transparency and efficiency indicators differs from one indicator to another. For instance, when calculating the average success rate of above HT procurements, we included only administrative units with at least three procurements with value above HT. As a result, 37 out of 59 AH and none of UH were included. Table 4 provides criteria for selecting administrative units for each indicator. The selection of a specific criteria was motivated by the intention to have a sufficiently large and reliable sample. For indicators that provide strong conclusions we selected especially strict selection criteria. For instance, for the indicator “Use of competitive procedures” we selected only those administrative units that have at least 5 finished below HT procurements.

Table 4. Selection criteria for administrative units used for calculating indicators

| Indicator | Criteria | Number of: | | |
|---------------------------------------------|---------------------------------------------------------------------|----------------------------|-----|-----|
| | | AH | RSA | UH |
| Avoiding ProZorro | procurement plan is available in the system | 59 | 41 | 196 |
| Avoiding higher threshold | at least 1 finished below HT procurement | 57 | 41 | 253 |
| Avoiding euro threshold | at least 1 finished above HT procurement | 57 | 36 | 53 |
| Use of competitive procedures | at least 5 finished below HT procurements | 56 | 37 | 118 |
| Unanswered questions | at least 1 below HT competitive procurement | 15 | 37 | 40 |
| Level of competition | at least 3 finished competitive procurements of the target category | specific for each category | | |
| Disqualification rate | at least 3 finished competitive procurements of the target category | | | |
| Success rates. Below HT tenders | 3 or more finished competitive procurements | 5 | 34 | 10 |
| Success rates. Above HT tenders | 3 or more finished competitive procurements | 37 | 28 | 3 |
| Abnormal saving rate | at least 1 finished competitive procurement | 58 | 40 | 45 |
| Contract termination | at least 5 signed contracts | 58 | 39 | 119 |
| Fixing the price with additional agreements | at least 5 signed contracts | 58 | 39 | 119 |
| Share of largest supplier | at least 5 signed contracts | 58 | 39 | 119 |

PRICES PER UNIT

In order to extract procurements of the selected goods from the ProZorro database, we used keywords for searching in the field “Good’s description”. The list of keywords presented in Table B2 (Appendix B).

After the initial dataset was created, the price of each good was extracted from tender contracts. If the price could not be identified, procurement tender was excluded from the dataset. The distribution of tenders included into the final dataset is presented in the Table 4.

Table 4. Number of finished tenders of selected goods in the sample

| | Number of finished tenders | | | | | | | |
|-----|----------------------------|--------|--------|------|------|------|--------|--------------|
| | Total | Potato | Butter | Eggs | A-95 | A-92 | Diesel | Roads repair |
| AH | 282 | 21 | 57 | 29 | 24 | 68 | 62 | 21 |
| RSA | 389 | 71 | 66 | 79 | 36 | 78 | 49 | - |
| UH | 217 | 12 | 20 | 3 | 31 | 22 | 8 | 121 |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

RESULTS

This chapter presents a general findings of the analysis: details on sample construction, assessment of developed operational transparency and efficiency indicators. Moreover, the last subsection provides a price efficiency analysis of specific goods.

QUANTITY AND VALUES OF FINISHED TENDERS

The first step is to compare total number and value of conducted tenders. In 2017, sample legal entities announced 17,700 procurements (18,200 lots) and successfully finished 16,200 lots (89%). Table 4 summarizes the general statistics on the number and value of finished procurements.

Generally, procurement activity is highly heterogeneous across and among administrative unit groups. For example, Bohdanivka AH (Dnipropetrovska oblast) was highly active in 2017 and signed many contracts with the total value of UAH 126.6 million. Further, Zelenodolsk AH signed 1,083 contract. In the same time, Lykhivka AH finished only 4 procurements.

Despite a high variation in a number of signed contracts, an absolute majority of AH and RSA had more than 5 contracts – 98% and 95% respectively. This indicator is significantly lower for UH as only 59% of UH signed more than 4 contracts.

Comparison of the number of finished tenders shows that procurement behavior of AH is closer to RSA rather than to UH. Specifically, in 2017 on average, AH finished 139 tenders, RSA - 113 tenders, while UH – only 13.

The pattern is a bit different if we look at total and average values of finished tenders. On average, the total value of contracts signed by one AH in 2017 is almost twice the average RSA's total value. Similar tendency prevails if we compare values of an average contract.

Table 5. Quantity and values of finished procurements by administrative units, 2017.

| | Number of administrative units ⁸ | Mean | Standard deviation | Median | Min | Max |
|------------------------------------------|---------------------------------------------|---------|--------------------|---------|--------|---------|
| Number of finished procurements | | | | | | |
| AH | 59 | 139.4 | 179.2 | 78 | 4 | 1083 |
| RSA | 41 | 112.8 | 120.9 | 77 | 1 | 595 |
| UH | 254 | 13 | 27.3 | 4 | 1 | 309 |
| Total value of signed contracts | | | | | | |
| AH | 59 | 25.3 m | 22.3 m | 19,9 m | 2,8 m | 126,6 m |
| RSA | 41 | 15.0 m | 12.8 m | 11,6 m | 0.1 m | 54,4 m |
| UH | 254 | 2.0 m | 3.9 m | 0.6 m | 0.04 m | 28,6 m |
| Average value of signed contracts | | | | | | |
| AH | 59 | 338.1 K | 283.5 K | 296.0 K | 36.2 K | 1.8 m |
| RSA | 41 | 172.7 K | 111.6 K | 157.1 K | 27.1 K | 481.9 K |
| UH | 254 | 216.9 K | 486.0 K | 128.8 K | 13.4 K | 7.0 m |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

PROCUREMENT STRUCTURE

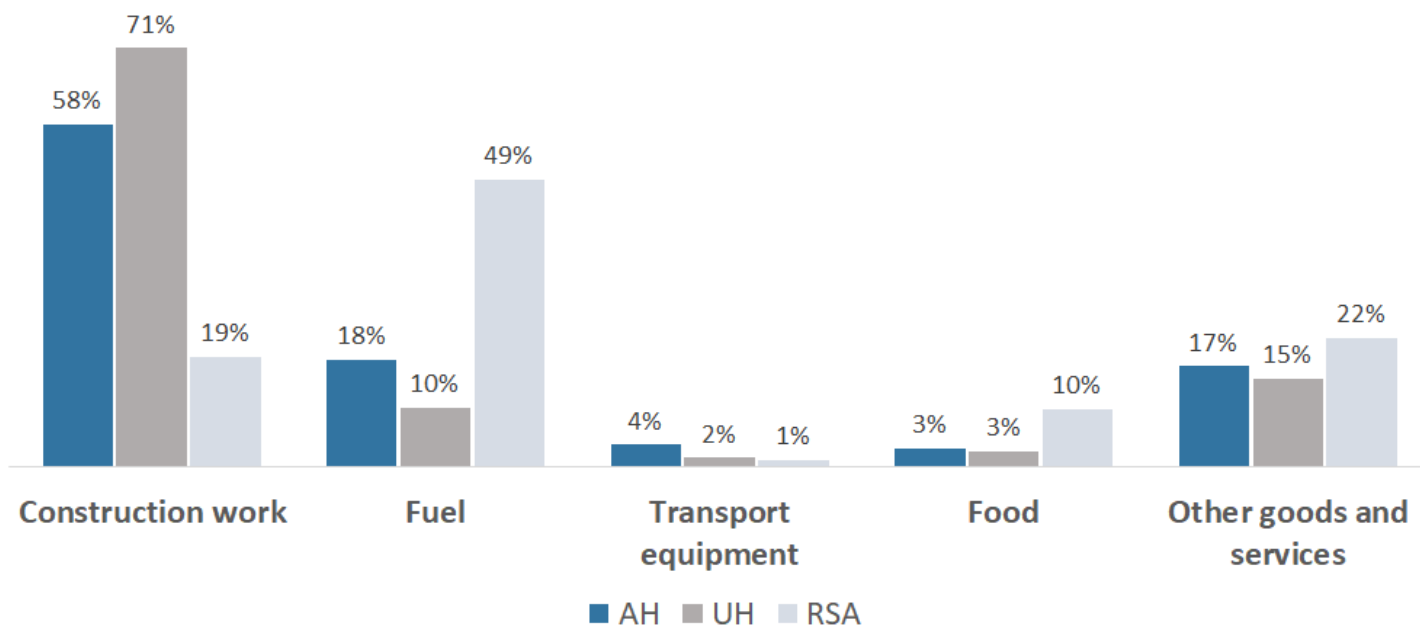
Although AH, RSA and UH procure almost an identical list of goods and services (Appendix E, Table E1), a structure of procurement varies across three groups (Figure 4).

First of all, *construction is the top one category in AH and UH procurement.* For instance, AH construction works constitutes 23% of procurements and 58% of total value (UH: 71% and 35%). The second important group in both cases is food and relative products: 18% and 13% for AH and UH, respectively.

In a case of RSA, procurement of fuel (petroleum, natural gas) and electricity constitute the highest value (49%) to local state administration procurement. Construction is on the second place in total value (19%). On the other hand, Food is the first category by the number of tenders.

⁸ 9 UH did not finish tenders in 2017 and were excluded from the table

Figure 4. Structure of Procurement by Administrative Units, % of Procurement Contract Value.



Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

TRANSPARENCY AND EFFICIENCY INDICATORS

As it was mentioned in the previous chapter, contracting authorities have some space to skip the ProZorro system as well as choose types of procurement procedures they are going to apply in the ProZorro.

First of all, they have to report procurement through the ProZorro, if its value exceeds a lower threshold (LT) of UAH 50,000. As a result, there is a possibility that procurements could be split in order to avoid a LT. Secondly, contracting authorities are obliged to use a competitive procedure if a tender value is above the higher threshold (HT). The HT is equal to UAH 200,000 for goods and services and UAH 1.5 million for construction. However, if a tender value is between LT and HT, contracting authorities have an option to choose between a competitive auction and a direct selection of suppliers⁹. Thirdly, if the value of procurement is above the euro threshold (ET) contracting authority (CA) is obliged to use the strictest and most time-consuming procedure - open tender with publication in English. Some CAs may wish to split their procurements to avoid the ET.

TENDERS OUTSIDE OF PROZORRO

If the value of tender is lower than LT, contracting authorities have a right to skip an electronic procurement and do not report contract in the system. However, they are still formally obliged to include all such procurements in an annual procurement plan which must be published online.

Even though the obligation to publish the procurement plan online is older than the ProZorro system¹⁰, some contracting authorities still do not provide procurement plans online or publish incomplete information. Nevertheless, we identified procurement plans of all AH and RSE as well as 75% of UH.

According to the collected data, on average AH are the least inclined to avoid the ProZorro system. The mean, median and the highest value share of procurements outside of ProZorro per AH is smaller than the corresponding indicators for RSA and UH (Table 6).

Table 6. Tenders conducted outside of ProZorro, % of the annual plan value.

| | Number of administrative units | Mean | Standard deviation | Median | Min | Max |
|-----|--------------------------------|------|--------------------|--------|-----|------|
| AH | 59 | 12.3 | 17.0 | 5.0 | 0.0 | 70.2 |
| RSA | 41 | 19.5 | 25.9 | 9.9 | 0.0 | 100 |
| UH | 196 | 36.9 | 43.1 | 10.4 | 0.0 | 100 |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: procurement plan of administrative unit is available in the ProZorro system

⁹ see Table 1 and Figure 3 for the correspondence of thresholds and procurement procedures options.

¹⁰ it was a part of the previous procurement law adopted in April 2014.

AVOIDING A HIGHER AND EURO THRESHOLDS

Contracting authority can split its procurement into several smaller procurements to avoid the HT and the necessity to conduct obligatory competitive procedure (open tender) or to avoid ET and the necessity to conduct the strictest competitive procedure (open tender with publication in English). Such behavior is illegal and punishable by the fine from UAH 12,000 to UAH 25,500.

It is impossible to make strong conclusions on intentions of public agents on the basis of the analysis of ProZorro data. However, a “red flag” approach can be applied. Therefore, the following general principle is constructed: *if a procurement’s expected value is lower than HT or ET by up to 5%, such a procurement could be considered a suspicious case¹¹.*

An analysis of ProZorro data shows that a large share of AH and RSA conducted at least one “suspicious” procurement (Table 7):

- 84% of AH (48 out of 57) and 73% of RSA conducted at least one below HT procurement with the signs of avoiding the open tender procedure;
- 11% of AH and 31% of RSA conducted at least one procurement with the signs of avoiding the open tender with publication in English procedure

Table 7. Suspicious procurements (with signs of avoiding thresholds) per administrative unit, % of total contract value

| | Number of administrative units | Number of AU with suspicious tenders | Mean | Standard deviation | Median | Min | Max |
|-------------------------------------------------------|--------------------------------|--------------------------------------|------|--------------------|--------|-----|-------|
| Share of below threshold contracts avoiding HT | | | | | | | |
| AH | 57 | 48 | 18.5 | 19.3 | 12.4 | 0.0 | 89.1 |
| RSA | 41 | 30 | 14.5 | 16.1 | 9.9 | 0.0 | 62.3 |
| UH | 253 | 62 | 7.6 | 19.1 | 0.0 | 0.0 | 100.0 |
| Share of above threshold contracts avoiding ET | | | | | | | |
| AH | 57 | 6 | 2.2 | 7.3 | 0.0 | 0.0 | 40.3 |
| RSA | 36 | 11 | 11.7 | 20.1 | 0.0 | 0.0 | 68.2 |
| UH | 53 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 1 finished below HT / 1 finished above HT procurement

Suspicious procurements constitute small share in terms of procurement number. However, they are among the largest, most expensive procurements. Thus, they are significant in terms of value (Table 8).

Table 8. Suspicious procurements (with signs of avoiding thresholds) per group

| | Share of suspicious below HT tenders in terms of: | | Share of suspicious above HT tenders in terms of: | |
|-----|----------------------------------------------------------|--------------------|----------------------------------------------------------|--------------------|
| | number of tenders | value of contracts | number of tenders | value of contracts |
| AH | 1.4% | 4.1% | 3.3% | 20.4% |
| RSA | 3.2% | 18.4% | 2.4% | 17.6% |
| UH | 0.0% | 0.0% | 3.1% | 10.4% |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 1 finished below HT / 1 finished above HT procurement

The much lower share of suspicious tenders of UH can be the result of a smaller volume of procurement (both in terms of total value and average size of contract) conducted by these administrative units. Therefore, for many UH there is no need to “split” procurements - all their procurements are genuinely below HT. As described in the Table 5, 50% of UH have average value of contract below UAH 129 K (lower than UAH 200 K higher threshold for goods and services) and median number of procurements is just four.

PROCUREMENT PROCEDURES

A competitive procedure as a default option is considered to be a good practice that allows to get the lowest price per unit and, to some extent, prevents corruption. Generally, the distribution of tenders in relation to HT varies across

¹¹ To determine "suspicious" procurements, we used the expected value of procurement - that is, the sum of the expected value of the lots that are included in the procurements. We used only those procurements that resulted in at least one contract.

administrative units (Table 9). Particularly, almost 75% of UH's tender value is below HT, while for AH and RSA such shares are 50% and 37% respectively.

Furthermore, an analysis shows that *AH and UH almost do not use competitive procedures for below HT procurements. 54 out of 56 AH conduct at least 90% of their “below HT” tenders through uncompetitive procedure.* Even more, the lowest value is 84%. The behavior of RSA is more positive: on average RSA conduct 39% of their “below HT” tenders through competitive procedure.

The tendency to rely on direct selection of supplier remains the same even if we exclude from the sample all procurements with value below UAH 50,000. According to the Procurement Law, contracting authorities are not obliged to even report such small procurements and it is reasonable to use direct selection of supplier for them.

Table 9. Uncompetitive procedure usage in “below HT” tenders.

| | Number of administrative units | Share of “below HT” tenders, % of total value | Mean | Standard deviation | Median | Min | Max |
|-----|--------------------------------|-----------------------------------------------|------|--------------------|--------|------|-----|
| AH | 56 | 50 | 99.1 | 2.8 | 100 | 83.8 | 100 |
| RSA | 37 | 37 | 61.3 | 32.3 | 63.6 | 3 | 100 |
| UH | 118 | 75 | 96.8 | 12.2 | 100 | 20.8 | 100 |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 5 finished below HT procurements

The popularity of uncompetitive offline procedure can be explained by the insufficient professional capacity of the local procurement officers: they can lack skills and knowledge required for preparing tender documentation and attracting suppliers to participate in the online auction (in most extreme cases they can have problems with using the computer). Also, the uncompetitive procedure is a possibility to select local and trustworthy supplier - for many procurers supporting a local economy and guaranteeing the quality of good/service is more important than the price. The third possible motivation is corruption, when procurer receives a reward from a company for selecting it as a supplier. Finally, it is simply much easier and faster to conduct uncompetitive below threshold procedure. Though, current reform initiatives (i.e., implementing e-catalogues) aimed at simplifying competitive below HT procedure will likely help to alleviate the problem.

UNANSWERED QUESTIONS

Having a productive dialogue with suppliers is of crucial importance for the success of the procurement. It helps to adjust the tender documentation so that it does not include discriminatory demands. It also motivates suppliers to participate in future procurements even if they did not win the auction. It is hard to give overall assessment of the dialogue, because some of its key elements, for example meetings with suppliers, are not indicated in the ProZorro database. However, we can still track instances when contracting authorities ignore questions of suppliers when conducting below HT procurements (the ProZorro system is built in such way that CA cannot ignore the questions of suppliers when conducting above HT procurements). Such practice is considered to be harmful for the long term relationships with contractors and for the contracting authority reputation.

Analysis shows that this practice is not dominant: relatively small proportion¹² of AH and UH that conducted competitive below HT procurements uses it:

- 4 out of 15 AH
- 18 out of 37 RSA
- 8 out of 40 UH

On the other hand, almost half of raions conducted at least one competitive below HT procurement while ignoring some the suppliers' questions. Still the *situation is not critical*, if we take into account that tenders with unanswered questions account for only a tiny part of below HT competitive procurements conducted by raions (4% in terms of expected value). For AH and UH this indicator is equal to 8% and 12%, respectively.

COMPETITION LEVEL

According to the ProZorro data, higher number of auction participants, on average, results in better price per unit. To check the ability of administrative units to attract suppliers to participate in the auctions we determined the average competition for each of the three key markets for AH, RSA and UH: construction works, fuel and food products.

The analysis shows that completion level is higher in the case of “above HT” tenders (Table D2, Appendix D). Particularly, an average number of participants for such tenders is 2.4-2.8. On the other hand, an average number of participants for “below HT” tenders is 1-1.9. *The key finding is no difference in completion across administrative units and products.*

¹² selection criteria: administrative unit has at least 1 below HT competitive procurement

DISQUALIFICATION

To participate in the competitive procedure each supplier has to submit a package of qualification documents. These documents prove supplier eligibility and ability to implement the contract. In case of competitive below threshold procedure and open tender, documents are checked after the auction and only the documents of the supplier with the lowest bid are checked. In the case of open tender with publication in English, documents of each supplier that applied to participate are checked before the auction and only eligible companies are allowed to participate.

The high disqualification rate can be a consequence of ill prepared tender documentation with unclear technical specification or it can be a consequence of inexperience of suppliers. It also can be a sign of corruption, when tender committee is trying to find any reason to disqualify ‘unwanted’ suppliers. We calculated the average share of disqualified suppliers per tender.

The analysis shows that disqualification is not a significant problem and, in fact, there are no significant differences across administrative units and products (Table D3 in the Appendix D).

SUCCESS RATES

As was described in the Research Strategy chapter, successfully finished procurement that used competitive procedure to select a supplier is one of the main indicators of well-functioning procurement function. To successfully finish competitive procurement, contracting authority has to determine technical description of good and its expected value based on their budget and market analysis. It also has to prepare and publish tender documentation and answer questions of potential suppliers. Finally, after the auction, contracting authority has to evaluate documents of the auction winner and sign a contract. Failure in each of these steps will lead to unsuccessful or cancelled procurement.

Competitive procurement is successful if it satisfies two conditions:

1. At least two companies applied to participate in the procurement auction (this condition applies to competitive procurements above higher threshold).
2. At least one company was not disqualified after the auction (in case of open tender with publication in English, at least two companies were not disqualified before the auction).

The contracting authority has also the right to cancel procurement. The cancellation of procurement can be a result of problems with funding but it can also be a result of problems in planning the demand for goods and services or it can be a sign of collusion between contracting authority and a company (some contracting authorities could cancel procurement if a “wrong” supplier wins the auction).

The success of each tender highly depends on its size. AH success rate is significantly higher in a case of “below HT” tenders (66%, see Figure 5). Success rate of “above HT” tenders is 54.2%. The pattern is similar in the case of raion state administrations: 64.6% vs 58.9%. Unfortunately, there are not enough data to make a conclusion about UH. The possible explanation of such a pattern is that below HT tenders have less strict requirements (e.g., tender can be successful if there is only one application).

On the other hand, success rates within procurement procedures across different groups are close. Although UH success rate is a bit higher, it is likely a consequence of the smaller number of competitive procedures conducted by these entities.

There is no significant difference across administrative unit groups in terms of procurement success rate.

Figure 5. Tender Success Statuses by Administrative Units Groups. Above HT Tenders.

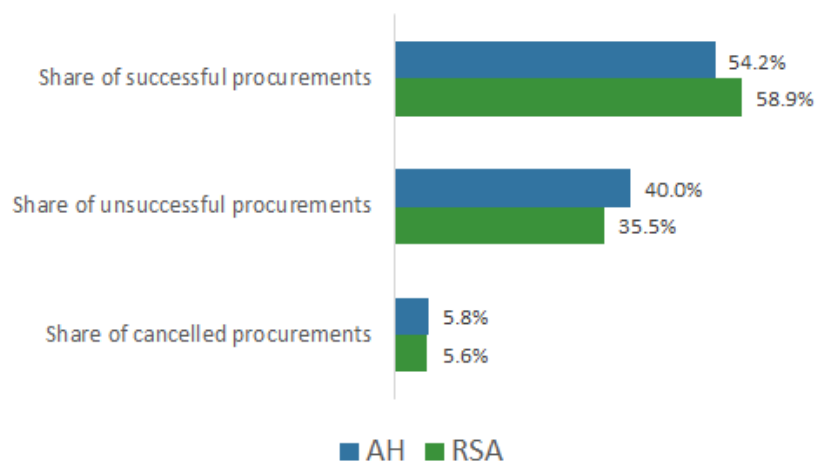
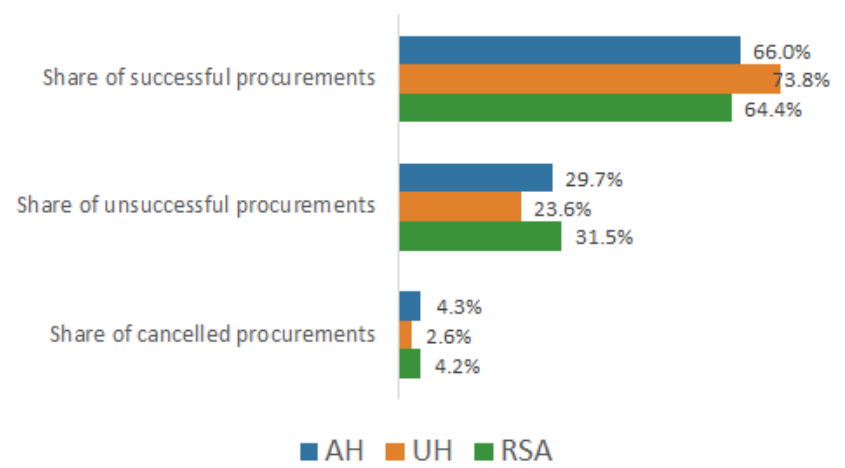


Figure 6. Tender Success Statuses by Administrative Units Groups. Below HT Tenders.



Source: Own calculations based on data from the ProZorro Professional Business Intelligence module
Selection criteria: administrative unit has at least 3 or more finished competitive procurements

ABNORMAL SAVING RATE

Nominal saving rate is calculated in the ProZorro system as a percentage decrease in the value of procurement as a result of the auction. Generally, high saving rate is regarded as a positive indicator, however, too high rate is suspicious. It can be a sign of inadequate expected value (mistake on the behalf of CA) or abnormally low price (suspicious behavior on the behalf of supplier). To determine how important is the problem of abnormal savings for the administrative units included in the study, we calculate the share of tenders with abnormal savings in total value of finished tenders. For the purpose of this study, we consider saving rate abnormal if it is greater or equal to 30%.

The analysis shows that *AH had a significantly lower share of tenders with abnormally high saving rate than RSA*. On average, 0.6% (in terms of value) of AH tenders are suspicious, for RSA this indicator equals 6.1% (Table 10). Partially it is a consequence of RSA having a higher share of below HT competitive procurements (that on average have higher saving rate) but also can be a sign of a better evaluation of tenders' expected values on behalf of AH. UH are between RSA and AH, however, the variation within group is very high.

Table 10. Share of competitive contracts with the saving rate above 30%, share of competitive contract value

| | Number of administrative units | # of AU with at least one suspicious tender | Mean | Standard deviation | Median | Min | Max |
|-----|--------------------------------|---------------------------------------------|------|--------------------|--------|-----|-------|
| AH | 58 | 48 | 0.6 | 1.8 | 0.0 | 0.0 | 11.0 |
| RSA | 40 | 12 | 6.1 | 9.3 | 3.0 | 0.0 | 40.0 |
| UH | 45 | 39 | 2.5 | 14.9 | 0.0 | 0.0 | 100.0 |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module
Selection criteria: administrative unit has at least 1 finished competitive procurement

CONTRACT TERMINATION

In the sample of administrative units with at least five signed contracts in 2017, *the share of terminated contracts (as a % of the total contract value) is approximately similar for AH and RSA*. On average, one AH has 5% of contract value terminated, while for raion this indicator equals 6% (see Table 11). Interestingly, even max values of two groups are similar: hromada Hrechani Pody has 31% of contracts value terminated, Shyrokiv's'kyy raion has 36% of contract value terminated. The share of terminated contracts is much smaller for UH (2% on average). This is most likely the consequence of the smaller number of contracts that are managed by these administrative units: on average UH signed 13 contracts in 2017, while AH and RSA have signed on average 139 and 112 contracts, respectively.

Table 11. Share of the terminated contracts per administrative unit, % of the contract value

| | Number of administrative units | Mean | Standard deviation | Median | Min | Max |
|-----|--------------------------------|------|--------------------|--------|-----|-----|
| AH | 58 | 5% | 7% | 2% | 0% | 31% |
| RSA | 39 | 6% | 10% | 2% | 0% | 36% |
| UH | 119 | 2% | 7% | 0% | 0% | 57% |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 5 signed contracts

ADDITIONAL AGREEMENTS

In the sample of administrative units with at least five signed contracts in 2017, share of contracts with amended price (as a % of total contract value) is very similar for AH and UH in terms of mean and median value per one administrative unit (see Table 12). Interestingly, ***RSA are strikingly different from other two groups - on average 20% of raions contract value are contracts with amended prices.*** This difference is the consequence of the different structure of goods and services procured by amalgamated and unamalgamated hromadas on the one hand and raions on the other. Specifically, 49% of raions procurements in terms of value is for fuel, share of fuel for other two groups is much smaller (see Figure 4). The fuel is the most volatile market in the public procurement sphere, on average every third contract is amended.

However, even if we exclude all fuel contracts from the sample, raions are still on average more inclined to amend the price of the contract. The average share of amended contracts for RSA without fuel contracts is 6% (2% for AH and 1% for UH). It can be suggested, that procurement officers responsible for AH procurements are more hesitant to sign the additional agreements than the RSA procurement officers, because they only recently started to work with project large enough to require price amendments and, as a result are more conscious of possible negative consequences of such actions.

Table 12. Share of contracts with amended price per administrative unit, % of the contract value

| | Number of administrative units | Mean | Standard deviation | Median | Min | Max |
|-----|--------------------------------|------|--------------------|--------|-----|-----|
| AH | 58 | 5% | 7% | 2% | 0% | 25% |
| RSA | 39 | 20% | 17% | 18% | 0% | 66% |
| UH | 119 | 2% | 7% | 0% | 0% | 42% |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 5 signed contracts

SHARE OF LARGEST SUPPLIER

One of the main results of the new e-procurement system introduced in 2016 was greater diversification of procurement contracts among suppliers. For instance, in 2015 1,451 CA (11% of all CAs) had all procurement contracts signed with a single supplier. In 2016, after the introduction of the ProZorro system, their number decreased to 111 CAs. Generally, it is considered to be a good practice, when a CA is not overly dependent on one supplier. To compare administrative units in this regard, we calculated the share of the largest supplier in the total value of signed procurement contracts.

In the sample of administrative units with at least five signed contracts in 2017, approximately 30% of contract value of average amalgamated hromada and raion belongs to contracts signed with one supplier. For UH this indicator is even higher (on average 48%) but as in the previous cases this could be the consequence of the smaller number of contracts signed by unamalgamated hromadas.

Taking into account the fact that until 2016/2017 majority of procurement officers that currently conduct procurements on the behalf of AH were employees of UH, the decrease of the share of largest supplier from 48% to 28% is definitely a positive consequence of greater number of contracts and greater share of competitive above HT procurements brought by the amalgamation. However, both AH and RSA can still benefit from the greater diversification of suppliers. This can be achieved by increasing the use of competitive procedures in below HT procurements.

Table 13. Share of the largest supplier, % of the contract value

| | Number of administrative units | Mean | Standard deviation | Median | Min | Max |
|-----|--------------------------------|-------|--------------------|--------|-------|--------|
| AH | 58 | 28.0% | 13.6% | 25.1% | 10.4% | 62.5% |
| RSA | 39 | 28.2% | 10.3% | 27.6% | 9.5% | 51.0% |
| UH | 119 | 48.1% | 20.0% | 44.1% | 15.6% | 100.0% |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 5 signed contracts

SPECIFIC GOODS PRICE EFFICIENCY

As it was previously stated, the price of the good summarizes the efficiency of the whole procurement process. There are many factors that affect the prices of goods in public procurements received by contracting authorities. Among them one can identify those that are especially important in the case of AH.

On the one hand, AH (a) “realized” that they spent their own money and thus, they have more incentives to save and (b) have more power to choose the directions of spending. On the other hand, there are some factors that have opposite effect: (a) because of low quantity demanded, the tenders announced are not interesting for large companies that could potentially provide lower price, and (b) the procurement officers could have insufficient capacity to negotiate lower price. Although, it is impossible to evaluate all these factors, we can assess their outcome – a contract price of good. Thus, the research question is whether AH were able to buy goods at a lower price than RSA and UH.

For the analysis we collected the data on all procurements conducted by subordinated entities through ProZorro system in 2017 (32,300 tenders). From these tenders we identified “typical” homogenous goods that can be compared between entities. Namely these goods could be splitted into three groups: Food (Potato, Butter, Eggs), Fuel (petrol A-95, petrol A-92, diesel), Road repairing. Finally, we removed observations with mistakes or missed information. The results of our analysis are presented in the Table 14.

Table 14. Prices of goods by administrative units in 2017¹³

| Good | # of tenders | Mean, UAH | Median, UAH | Standard Deviation | Is statistically different from UH? | Is statistically different from RSA? |
|-----------------------|--------------|-----------|-------------|--------------------|-------------------------------------|--------------------------------------|
| Food | | | | | | |
| Potato | 21 | 7.25 | 7.00 | 1.37 | No | Yes, higher by 10.9% |
| Butter | 57 | 102.91 | 100 | 22.22 | Yes, lower by 10.3% | No |
| Eggs | 29 | 2.08 | 2.3 | 0.46 | Not enough data on UH | No |
| Fuel | | | | | | |
| Petrol A-95 | 24 | 24.99 | 26 | 2.2 | Yes, higher by 4.6% | Yes, higher by 5.5% |
| Petrol A-92 | 68 | 23.30 | 23 | 1.7 | No | No |
| Diesel | 62 | 22.54 | 22 | 1.91 | No | No |
| Road repairing | | | | | | |
| | | | | | | - |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

The analysis shows that in general the AH price efficiency lies between UH and RSA.

FOOD

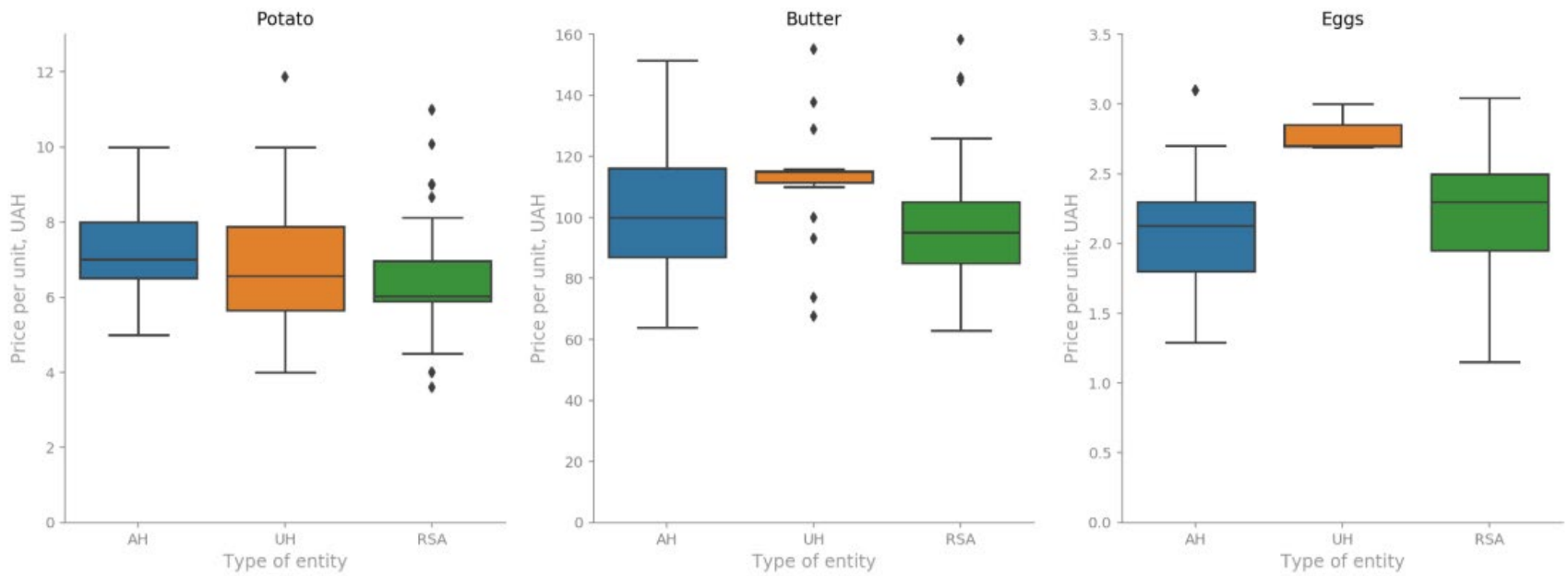
Food products constitutes a significant share of all procurement conducted through ProZorro in 2017. These goods usually are bought by or for schools, hospitals, etc.

In general, AH procurement behavior is closer to RSA. Particularly, the average quantity of butter bought by AH is 218 kg and 305 kg bought by RSA, while for UH this number is lower – 59 kg. According to ProZorro data, the larger quantity of potato usually is associated with lower price per unit, however, in the case of eggs there is a reverse relation: lower quantity is associated with the lower price. In contrast, there is no significant relation between quantity and price in procurements of butter. These relationships have some impact on price variation among administrative units.

According to the data available, in some cases AH food prices are statistically different from prices got by RSA and UH (Figure 6).

¹³ More detailed descriptive statistics presented in the Appendix F. Price efficiency of specific goods

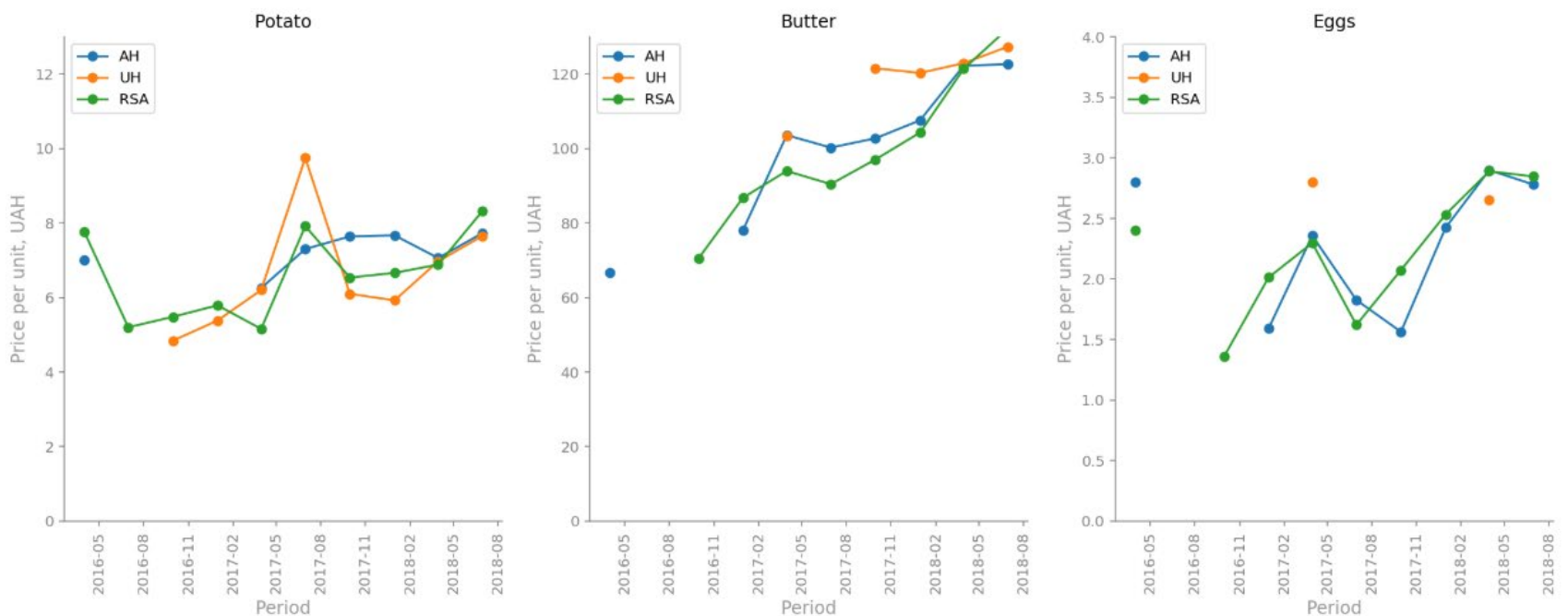
Figure 6. Distribution of Food Prices.



Source: Own calculations based on data from procurement contracts

On average, prices of potato contracted by AH is not statistically different from UH. However, they are more than 10% higher than those of RSA. In contrast, AH and RSA have similar prices of eggs and butter (as well as quantity procured). The price of latter was about 10% lower in comparison to UH.

Figure 7. Price Dynamic of Food Products.



Source: Own calculations based on data from procurement contracts

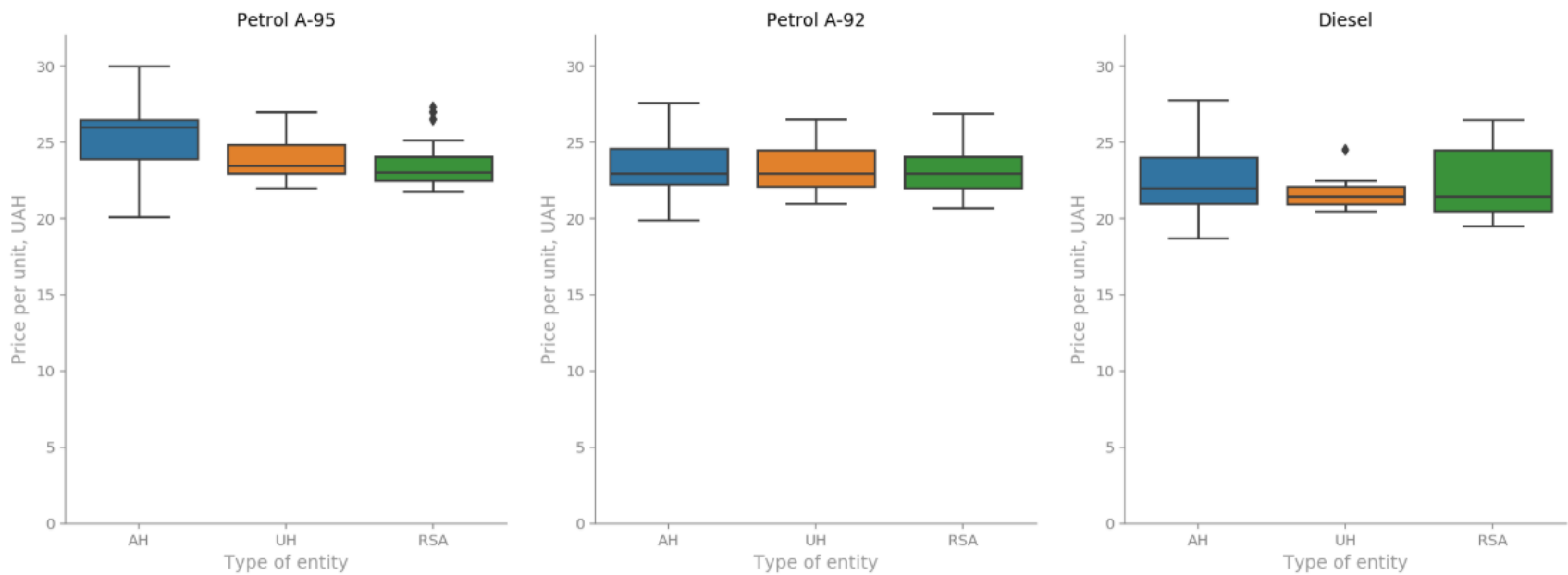
As it can be seen from the figures above, the average prices of food products tend to converge. The larger differences were observed for 2016-2017, while during the first half of 2018 the average prices are much closer to each other. This situation can be explained by the increased proficiency and/or increased access to procurement-related information that helps to better estimate reserve price.

To summarise, for food products from the analysis, amalgamated hromadas' average prices were lower or not different from unamalgamated ones', and slightly higher or not different from prices received by RSAs.

FUEL

Fuels are among the most frequently procured goods. For the aim of this study, three types of fuels were analyzed: diesel, petrol A-95 and petrol A-92 (latter one usually is cheaper). The distribution of these prices is presented in Figure 8.

Figure 8. Distribution of Fuel Prices.

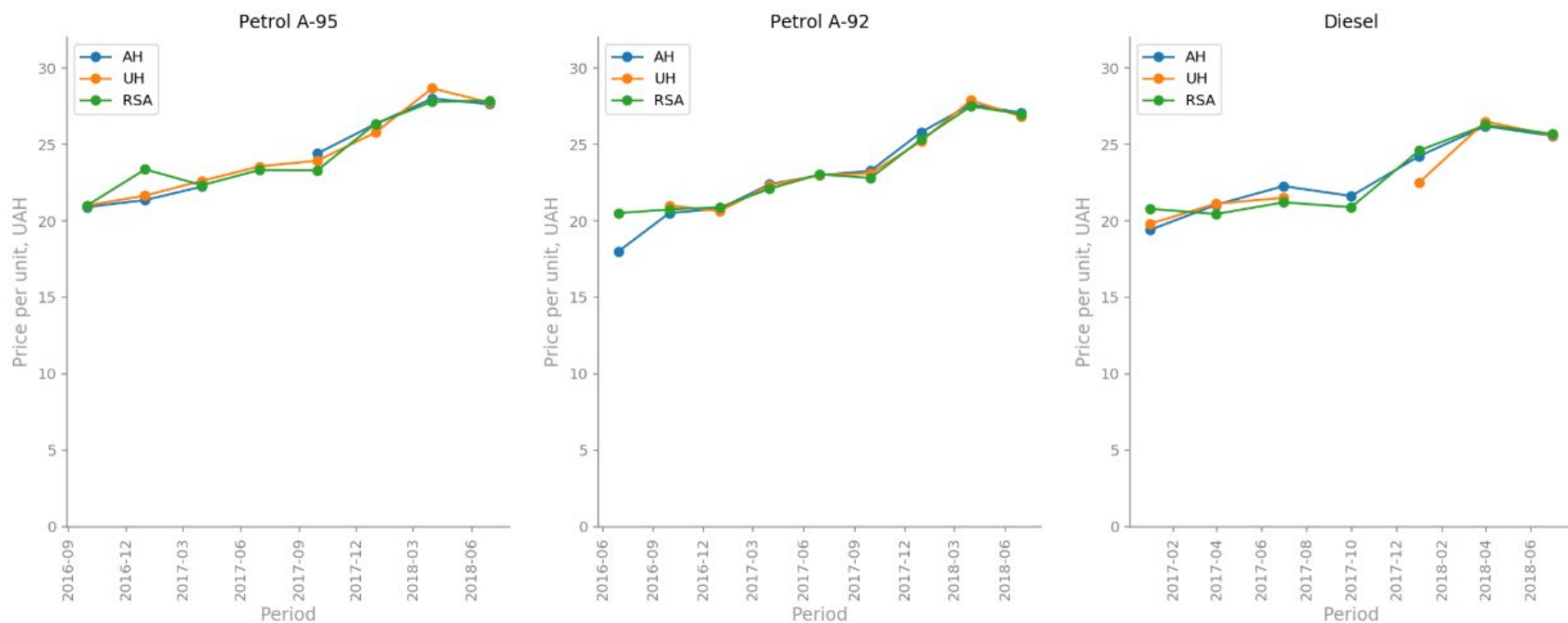


Source: Own calculations based on data from procurement contracts

Analysis shows that prices of Petrol A-92 and Diesel do not differ between the groups. Even though there is a minor difference (e.g., in case of diesel), such a difference isn't statistically significant.

The only difference is observed for prices of Petrol A-95. On average, AH prices are 4.6% higher than in case of UH and by 5.5% higher than prices contracted by RSA. This difference could be explained by the fact that AH usually buy this type of petrol in the end or beginning of year but not in the middle (see Figure 9). Even though there is reverse relationship between quantity and price per unit, it is not true in case of AH: On average, they buy 2.6 K liters per tender, while the average quantity procured by RSA and UH are 2.2 K and 1.0 K liters respectively.

Figure 9. Price Dynamic of Fuel Prices.



Source: Own calculations based on data from procurement contracts

Even though there are some differences in prices of Petrol A-95, in general, the price dynamic is very similar between all the entities.

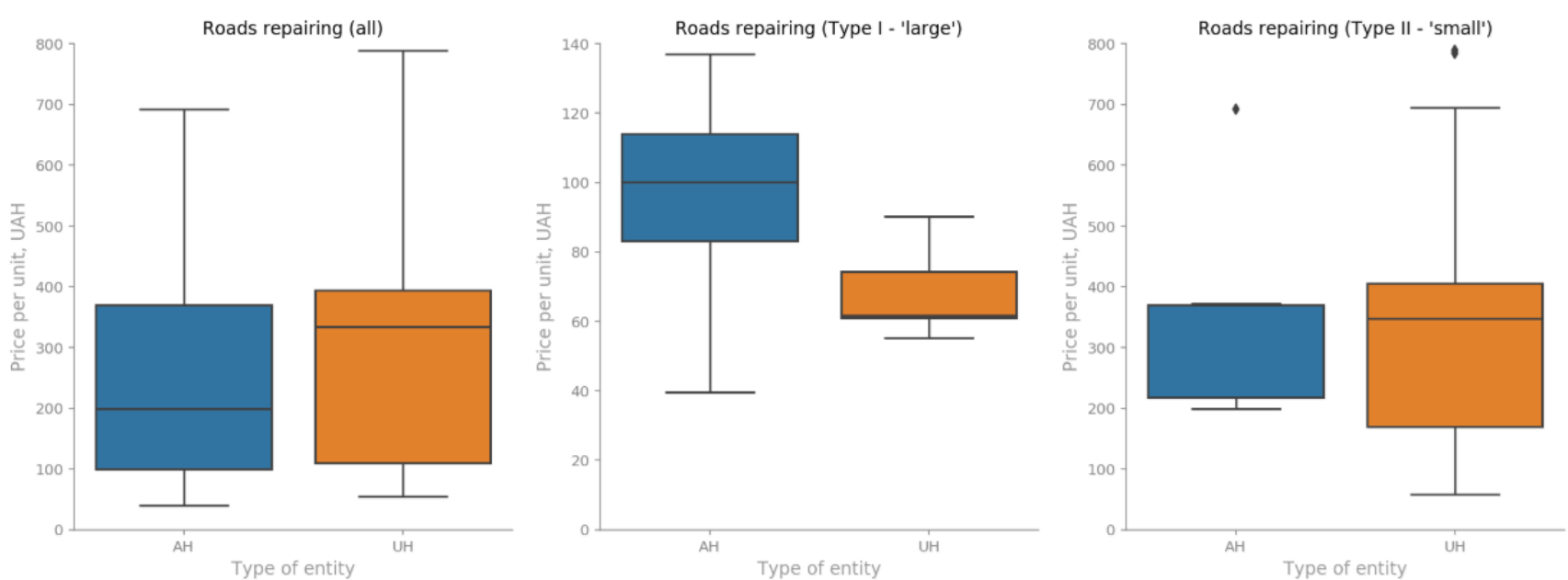
ROAD REPAIRING

Due the decentralization reform AH received more money and more power to allocate their resources. As a result, numbers and value of tenders related to road repairing increased significantly. In 2017, AH and UH conducted around 1,000 tenders on road repairing services. Mostly, these procurements were conducted without specified measurement units (in particular, squared meters) and were bought as 1 service or lot instead. Out of these procurements we choose those where prices per unit can be collected (that means that the units of measurement were precisely specified). Moreover, only ongoing repairing was analyzed (while the “capital repairing” were excluded due to impossibility to compare). It also worth to mention that RSA do not procure road repair. Thus, the results are presented for AH and UH only. Finally, we removed outliers with abnormally low or high prices (lower than UAH 60 and larger than UAH 800 per 1 square meter).

The results of the analysis are ambiguous. If the whole set of procurements is compared, AH were able to receive lower prices of road repairing per square meter (by 27%). But, as it can be seen from the Figure 10, this comparison is accompanied by large variation.

Because of potentially different types of repair and roads, the whole dataset was split into two types using K-means clustering technique¹⁴: Type I (with larger area covered by repairing) and Type II (with smaller area covered by repairing).

Figure 10. Distribution of Road Repairing Pricing.



Source: Own calculations based on data from procurement contracts

As it can be seen from the figure, the AH average price of repairing one square meter of the larger roads is higher than UH’s price (by about 43%). The situation is slightly different in case of smaller roads (Type II). In this case, the average prices are not statistically different and lie within range between UAH 325 and UAH 330, but the range of prices received by UH is much larger.

¹⁴ For more details, see: https://www.wikiwand.com/en/K-means_clustering

CONCLUSIONS

In this study we analysed the procurement efficiency of amalgamated hromadas (AH) established in 2015 and 2016 in Khmelnytska and Dnipropetrovska oblast in comparison to the procurements of raion councils and administrations (RSA) as well as unamalgamated hromadas (UH).

As a result of amalgamation, procurement officers of AH started to conduct more frequent and larger procurements. Consequently, the procedures which they use as well as volumes and success rates became similar to those of RSA. On the other hand, some of patterns of the procurement function of AH continue to be identical to the practices of UH.

Despite a high variation in a number of signed contracts, an absolute majority of AH and RSA had more than 5 procurement contracts (98% and 95%, respectively) conducted through ProZorro system. This indicator is significantly lower for UH, only 59% of UH signed more than 4 contracts. Comparison of the number of finished tenders shows that procurement behavior of AH is closer to RSA rather than to UH. Specifically, in 2017 on average, AH finished 139 tenders, RSA - 113 tenders, while UH – only 13.

Construction is the top one category in AH and UH procurement. For instance, AH construction works constitutes 23% of all procurements and 58% of total value (UH: 71% and 35%). The second important group in both cases is food and relative products: 18% and 13% for AH and UH, respectively. In a case of RSA, procurement of fuel (petroleum, natural gas) and electricity constitute the highest value (49%) of local state administration procurement.

According to the collected data, on average hromadas are the least inclined to avoid the ProZorro system. The AHs' mean share of procurements outside of ProZorro is smaller than the corresponding indicators for RSA and UH.

An analysis of ProZorro data shows that a significant share of administrative units conducted at least one procurement that has value close to procurement thresholds, and, as a result, could be classified as 'suspicious.' Around 84% of AH and 73% of RSA conducted procurements with symptoms of open tender avoidance. In a case of UH, the corresponding share equals 24%. For tenders with publications in English, 11% of AH and 31% of RSA conducted procurements with symptoms of open procedure avoidance.

AH and UH do not use competitive procedures if they can. An analysis shows that AH and UH almost do not use competitive procedures for below HT procurements. 54 out of 56 AH conduct at least 90% of their "below HT" tenders through uncompetitive procedure. The behavior of RSA is better: around 40% of their below HT procurements are conducted with competitive procedure.

AH and UH do not ignore companies' questions during below HT procurements. On the other hand, almost half of RSAs conducted competitive below HT procurement while ignoring some of the suppliers' questions. Still situation is not critical, if we take into account that below HT procurements with unanswered question account for only 4% of raions below HT competitive procurements (in terms of expected value).

There is no difference in completion across administrative units and products. Furthermore, the analysis shows that disqualification of the auction winner is not a significant or frequent issue. As a result, ***there is no significance difference in terms of procurement success rate.***

The analysis shows that ***AHs have significantly lower number of tenders with abnormally high saving rate in comparison to RSAs.*** Partially it is a consequence of RSA having a higher share of below HT competitive procurements (which on average have higher saving rate) but also can be a sign of a better evaluation of tender's expected value on behalf of AH.

The share of terminated contracts (as a % of the total contract value) is approximately similar for AH and RSA.

The average share of contracts with amended prices is much higher for RSA (20%) than for AH (5%) and UH (2%). This fact is mainly explained by the large share of fuel (the most volatile good in public procurement market) in the structure of goods procured by RSAs. However, even if we exclude fuel contracts, the RSA are still more likely to amend the prices than the AH (6% and 2%, respectively).

The decrease of the share of largest supplier from 48% (average for UH) to 28% (average for AH) is definitely a positive consequence of amalgamation (which brought greater number of contracts and greater share of competitive above HT procurements). However, both AH and RSA can still benefit from the greater diversification of suppliers. This can be achieved by increasing the use of competitive procedures in below HT procurements.

The price per unit is the key indicator that summarizes information on procurement efficiency. Although AHs' show varying price efficiency, their prices of procured goods, in general, ***are not worse than in other administrative units' groups.*** The more competitive is the market, the closer are prices (especially in the case of fuels). ***Even if some gaps were observed, these differences are decreasing over time.*** Better planning can help to receive lower prices (in particular, better estimation of needs and appropriate choosing of the period for procurement).

Our findings show that all administrative units included in the study (amalgamated and unamalgamated hromadas, as well as raion administrations), struggle with common issues:

- lack of professional capacity;
- lack of incentives at the personal level (usually, conducting procurement is the additional non-paid task) frequently resulted in conducting simpler and faster (but not always better) procedures;
- the size of their procurements frequently is not sufficient for attracting large companies to their tenders;
- difficulties in guaranteeing the best combination of price and quality through an electronic auction.

These problems can be addressed by investing in the professional development of the procurement officers and by further reforming the public procurement system. Among the current reform initiatives the most helpful for local public procurements will be the development of the e-catalogue (faster and more convenient way to conduct a transparent below-threshold procurement) and framework agreements (an option to “outsource” the most common above-threshold procurements, for instance, natural gas and petroleum, to professional procurement agency). Also noteworthy is the initiative to further develop the institute of the authorized person. The idea is that one professional procurer can be more efficient than a tender committee consisting of non-professionals.

There is a need to study further and document the process of AH taking over the responsibilities and resources of raion administrations through the lens of public procurement. In one year it would be possible to track better the evolution of public procurement practices of hromadas established in 2015/2016 and compare them with new hromadas established in 2017.

APPENDICES

APPENDIX A. LIST OF AMALGAMATED HROMADAS AND RAIONS INCLUDED IN THE SAMPLE (IN UKRAINIAN)

Table A1. List of amalgamated hromadas (AH).

| # | Oblast | Type | Administrative unit | # | Oblast | Type | Administrative unit |
|----|----------------|------|--------------------------------------|----|-------------|------|------------------------------------|
| 1 | dniproperovska | AH | 04501000000 ОТГ м. Апостолове | 1 | khmelnytska | AH | 22501000000 ОТГ с. Березлів |
| 2 | dniproperovska | AH | 04502000000 ОТГ с. Богданівка | 2 | khmelnytska | AH | 22502000000 ОТГ смт Війтівці |
| 3 | dniproperovska | AH | 04503000000 ОТГ с. Верби | 3 | khmelnytska | AH | 22503000000 ОТГ м. Волочиськ |
| 4 | dniproperovska | AH | 04504000000 ОТГ с-ще Святотасналівка | 4 | khmelnytska | AH | 22504000000 ОТГ с. Ганнопіль |
| 5 | dniproperovska | AH | 04505000000 ОТГ с. Вакулове | 5 | khmelnytska | AH | 22505000000 ОТГ с. Гвардійське |
| 6 | dniproperovska | AH | 04506000000 ОТГ м. Зеленодольськ | 6 | khmelnytska | AH | 22506000000 ОТГ с. Гуменці |
| 7 | dniproperovska | AH | 04507000000 ОТГ с. Грушівка | 7 | khmelnytska | AH | 22507000000 ОТГ м. Дунаївці |
| 8 | dniproperovska | AH | 04508000000 ОТГ с. Ляшківка | 8 | khmelnytska | AH | 22508000000 ОТГ смт Дунаївці |
| 9 | dniproperovska | AH | 04509000000 ОТГ с. Могилів | 9 | khmelnytska | AH | 22509000000 ОТГ с. Китайгород |
| 10 | dniproperovska | AH | 04510000000 ОТГ с. Нива Трудова | 10 | khmelnytska | AH | 22510000000 ОТГ с. Колибаївка |
| 11 | dniproperovska | AH | 04511000000 ОТГ с. Новоолександрівка | 11 | khmelnytska | AH | 22511000000 ОТГ смт Летичів |
| 12 | dniproperovska | AH | 04512000000 ОТГ смт Новопокровка | 12 | khmelnytska | AH | 22512000000 ОТГ с. Лісові Гринівці |
| 13 | dniproperovska | AH | 04513000000 ОТГ смт Солоне | 13 | khmelnytska | AH | 22513000000 ОТГ с. Маків |
| 14 | dniproperovska | AH | 04514000000 ОТГ с. Сурсько-Литовське | 14 | khmelnytska | AH | 22514000000 ОТГ смт Меджибіж |
| 15 | dniproperovska | AH | 04515000000 ОТГ смт Слобожанське | 15 | khmelnytska | AH | 22515000000 ОТГ смт Наркевичі |
| 16 | dniproperovska | AH | 04516000000 ОТГ с-ще Мирове | 16 | khmelnytska | AH | 22516000000 ОТГ смт Нова Ушиця |
| 17 | dniproperovska | AH | 04517000000 ОТГ смт Аули | 17 | khmelnytska | AH | 22517000000 ОТГ м. Полонне |
| 18 | dniproperovska | AH | 04518000000 ОТГ смт Божедарівка | 18 | khmelnytska | AH | 22518000000 ОТГ смт Понінка |
| 19 | dniproperovska | AH | 04519000000 ОТГ смт Васильківка | 19 | khmelnytska | AH | 22519000000 ОТГ с. Розсоша |
| 20 | dniproperovska | AH | 04520000000 ОТГ смт Вишневе | 20 | khmelnytska | AH | 22520000000 ОТГ смт Сатанів |
| 21 | dniproperovska | AH | 04521000000 ОТГ смт Кринички | 21 | khmelnytska | AH | 22521000000 ОТГ смт Стара Синява |
| 22 | dniproperovska | AH | 04522000000 ОТГ смт Лихівка | 22 | khmelnytska | AH | 22522000000 ОТГ смт Чорний Острів |
| 23 | dniproperovska | AH | 04523000000 ОТГ смт Покровське | 23 | khmelnytska | AH | 22523000000 ОТГ смт Чемерівці |
| 24 | dniproperovska | AH | 04524000000 ОТГ смт Роздори | 24 | khmelnytska | AH | 22524000000 ОТГ с. Гуків |
| 25 | dniproperovska | AH | 04525000000 ОТГ смт Софіївка | 25 | khmelnytska | AH | 22525000000 ОТГ с. Ленківці |
| 26 | dniproperovska | AH | 04526000000 ОТГ смт Томаківка | 26 | khmelnytska | AH | 22526000000 ОТГ с. Судаків |
| 27 | dniproperovska | AH | 04527000000 ОТГ смт Царичанка | | | | |
| 28 | dniproperovska | AH | 04528000000 ОТГ с. Варварівка | | | | |
| 29 | dniproperovska | AH | 04529000000 ОТГ с. Великомихайлівка | | | | |
| 30 | dniproperovska | AH | 04530000000 ОТГ с. Гречані Поди | | | | |
| 31 | dniproperovska | AH | 04531000000 ОТГ с. Маломихайлівка | | | | |
| 32 | dniproperovska | AH | 04532000000 ОТГ с. Новолатівка | | | | |
| 33 | dniproperovska | AH | 04533000000 ОТГ с. Новопавлівка | | | | |
| 34 | dniproperovska | AH | 04534000000 ОТГ с. Чкалове | | | | |

Legend:



 Administrative unit did not conduct public procurements through ProZorro system in 2017

Table A2. List of raions (RSA).

| # | Oblast | Type | Administrative unit |
|----|-----------------|------|-------------------------------------|
| 1 | dnipropetrovska | RSA | 04301200000 Апостолівський р-н |
| 2 | dnipropetrovska | RSA | 04302200000 Васильківський р-н |
| 3 | dnipropetrovska | RSA | 04303200000 Верхньодніпровський р-н |
| 4 | dnipropetrovska | RSA | 04304200000 Дніпровський р-н |
| 5 | dnipropetrovska | RSA | 04305200000 Криворізький р-н |
| 6 | dnipropetrovska | RSA | 04306200000 Криничанський р-н |
| 7 | dnipropetrovska | RSA | 04307200000 Магдалинівський р-н |
| 8 | dnipropetrovska | RSA | 04308200000 Межівський р-н |
| 9 | dnipropetrovska | RSA | 04309200000 Нікопольський р-н |
| 10 | dnipropetrovska | RSA | 04310200000 Новомосковський р-н |
| 11 | dnipropetrovska | RSA | 04311200000 Павлоградський р-н |
| 12 | dnipropetrovska | RSA | 04312200000 Петриківський р-н |
| 13 | dnipropetrovska | RSA | 04313200000 Петропавлівський р-н |
| 14 | dnipropetrovska | RSA | 04314200000 Покровський р-н |
| 15 | dnipropetrovska | RSA | 04315200000 П'ятихатський р-н |
| 16 | dnipropetrovska | RSA | 04316200000 Синельниківський р-н |
| 17 | dnipropetrovska | RSA | 04317200000 Солонянський р-н |
| 18 | dnipropetrovska | RSA | 04318200000 Софіївський р-н |
| 19 | dnipropetrovska | RSA | 04319200000 Томаківський р-н |
| 20 | dnipropetrovska | RSA | 04320200000 Царичанський р-н |
| 21 | dnipropetrovska | RSA | 04321200000 Широківський р-н |
| 22 | dnipropetrovska | RSA | 04322200000 Юр'ївський р-н |

| # | Oblast | Type | Administrative unit |
|----|-------------|------|---------------------------------------|
| 1 | khmelnytska | RSA | 22301200000 Білогірський р-н |
| 2 | khmelnytska | RSA | 22302200000 Віньковецький р-н |
| 3 | khmelnytska | RSA | 22303200000 Волочиський р-н |
| 4 | khmelnytska | RSA | 22304200000 Городоцький р-н |
| 5 | khmelnytska | RSA | 22305200000 Деражнянський р-н |
| 6 | khmelnytska | RSA | 22306200000 Дунаєвський р-н |
| 7 | khmelnytska | RSA | 22307200000 Ізяславський р-н |
| 8 | khmelnytska | RSA | 22308200000 Кам'янець-Подільський р-н |
| 9 | khmelnytska | RSA | 22309200000 Красилівський р-н |
| 10 | khmelnytska | RSA | 22310200000 Летичівський р-н |
| 11 | khmelnytska | RSA | 22311200000 Новоушицький р-н |
| 12 | khmelnytska | RSA | 22312200000 Полонський р-н |
| 13 | khmelnytska | RSA | 22313200000 Славутський р-н |
| 14 | khmelnytska | RSA | 22314200000 Старокостянтинівський р-н |
| 15 | khmelnytska | RSA | 22315200000 Старосинявський р-н |
| 16 | khmelnytska | RSA | 22316200000 Теофіпольський р-н |
| 17 | khmelnytska | RSA | 22317200000 Хмельницький р-н |
| 18 | khmelnytska | RSA | 22318200000 Чемеровецький р-н |
| 19 | khmelnytska | RSA | 22319200000 Шепетівський р-н |
| 20 | khmelnytska | RSA | 22320200000 Ярмолинський р-н |

Legend:

 Administrative unit did not conduct public procurements through ProZorro system in 2017

APPENDIX B. KEYWORDS FOR IDENTIFYING LEGAL ENTITIES AND HOMOGENOUS GOODS (IN UKRAINIAN)

Table B1. List of keyword for identification of legal entities.

| Key word level 1 | Key word level 2 |
|-----------------------------------------|----------------------------------|
| районна державна адміністрація | |
| районна рада | |
| сільська рада | |
| селищна рада | |
| міська рада | |
| відділ | міської ради |
| відділ | сільської ради |
| відділ | селищної ради |
| відділ | районної державної адміністрації |
| відділ | районної ради |
| виконавчий комітет виконавчого комітету | |
| виконком | |
| департамент | |
| управління | ради |
| управління | районної |
| сектор | |
| територ | громад |

Table B2. Keywords for extracting the data on homogeneous goods.

| GOOD | KEYWORDS | ADDITIONAL CONDITION |
|-----------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| potatoes | “картопля” | |
| butter | “масло” | <ul style="list-style-type: none"> ● CPV-code: 1553 ● Unit of measurement consists of: “кіл” or “кг” |
| eggs | “яйц” | <ul style="list-style-type: none"> ● Unit of measurement consists of: “шт” |
| petrol (a-95, a-92, diesel) | “бензин”, “диз” | <ul style="list-style-type: none"> ● CPV-code: 0913 |
| roads repairing | “ремонт”, “доріг”, “дорог” | <ul style="list-style-type: none"> ● Quantity of goods is not equal to 1; ● Unit of measurement doesn't consist of “шт” |

APPENDIX C. STATISTICAL MEASURES

MEAN. The statistical mean refers to average that is used to derive the central tendency of the data in question. It is determined by adding all the data points in a population and then dividing the total by the number of points. The resulting number is known as the mean or the average.

An arithmetic mean is calculated using the following equation:

$$A := \frac{1}{n} \sum_{i=1}^n a_i$$

VARIANCE. The statistical variance refers to a measure of how much a set of observations differ from each other. The technical definition is “The average of the squared differences from the mean,” but all it really does is to give you a very general idea of the spread of your data. A value of zero means that there is no variability; all the numbers in the data set are the same.

The variance of a set of n elements can be written as

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \mu)^2$$

STANDARD DEVIATION. The standard deviation is a measure that is used to quantify the amount of variation or dispersion of a set of data values. A low standard deviation indicates that the data points tend to be close to the mean (also called the expected value) of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values. The standard deviation is calculated as the square root of the variance.

APPENDIX D. INDICATORS OF PROCUREMENT TRANSPARENCY AND EFFICIENCY

Table D1. Success of competitive procedure usage in “below HL” tenders.

| | Number of administrative units | Mean | Standard deviation | Median | Min | Max |
|-------------------------------------------|--------------------------------|-------|--------------------|--------|-------|--------|
| "Above HT tenders" | | | | | | |
| <i>Number of successful procurements</i> | | | | | | |
| AH | 37 | 7.6 | 5.4 | 6.0 | 3.0 | 23.0 |
| RSA | 28 | 9.0 | 8.8 | 5.5 | 3.0 | 36.0 |
| <i>Share of successful procurements</i> | | | | | | |
| AH | 37 | 54.2% | 19.6% | 54.5% | 14.3% | 100.0% |
| RSA | 28 | 58.9% | 19.3% | 58.6% | 25.0% | 100.0% |
| <i>Share of unsuccessful procurements</i> | | | | | | |
| AH | 37 | 40.0% | 20.7% | 42.6% | 0.0% | 85.7% |
| RSA | 28 | 35.5% | 19.5% | 36.8% | 0.0% | 75.0% |
| <i>Share of cancelled procurements</i> | | | | | | |
| AH | 37 | 5.8% | 9.3% | 0.0% | 0.0% | 42.9% |
| RSA | 28 | 5.6% | 7.0% | 0.0% | 0.0% | 22.2% |
| "Below HT tenders" | | | | | | |
| <i>Number of successful procurements</i> | | | | | | |
| AH | 5 | 17.0 | 14.9 | 12.0 | 5.0 | 43.0 |
| RSA | 34 | 63.6 | 85.2 | 24.0 | 3.0 | 357.0 |
| UH | 10 | 13.3 | 20.2 | 7.0 | 3.0 | 70.0 |
| <i>Share of successful procurements</i> | | | | | | |
| AH | 5 | 66.0% | 12.7% | 67.2% | 45.5% | 77.8% |
| RSA | 34 | 64.4% | 16.0% | 66.3% | 36.0% | 100.0% |
| UH | 10 | 73.8% | 21.1% | 72.5% | 37.1% | 100.0% |
| <i>Share of unsuccessful procurements</i> | | | | | | |
| AH | 5 | 29.7% | 10.6% | 25.0% | 20.3% | 45.5% |
| RSA | 34 | 31.5% | 15.7% | 28.1% | 0.0% | 64.0% |
| UH | 10 | 23.6% | 19.6% | 24.3% | 0.0% | 57.1% |
| <i>Share of cancelled procurements</i> | | | | | | |
| AH | 5 | 4.3% | 6.0% | 0.0% | 0.0% | 12.5% |
| RSA | 34 | 4.2% | 5.1% | 2.4% | 0.0% | 20.0% |
| UH | 10 | 2.6% | 4.1% | 0.0% | 0.0% | 10.0% |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has 3 or more finished competitive procurements

Comments: There were only 3 UH in the sample with 3 or more “above HT” tenders.

Table D2. Competition level by good, tender size and administrative units.

| | Number of administrative units | Mean | Standard deviation | Median | Min | Max |
|---------------------|--------------------------------|------|--------------------|--------|-----|-----|
| Fuel | | | | | | |
| <i>Above HT</i> | | | | | | |
| AH | 12 | 2.5 | 0.6 | 2.3 | 2.0 | 3.7 |
| RSA | 16 | 2.8 | 0.7 | 2.6 | 2.0 | 4.3 |
| <i>Below HT</i> | | | | | | |
| RSA | 13 | 1.9 | 0.8 | 1.7 | 1.0 | 3.3 |
| UH | 2 | 1.0 | 0.1 | 1.0 | 1.0 | 1.1 |
| Food | | | | | | |
| <i>Above HT</i> | | | | | | |
| AH | 4 | 2.4 | 0.2 | 2.5 | 2.2 | 2.5 |
| RSA | 7 | 2.7 | 0.7 | 2.4 | 2.0 | 3.9 |
| <i>Below HT</i> | | | | | | |
| AH | 3 | 1.9 | 1.1 | 1.7 | 1.0 | 3.1 |
| RSA | 18 | 1.8 | 0.8 | 1.6 | 1.0 | 3.6 |
| UH | 3 | 1.1 | 0.1 | 1.2 | 1.0 | 1.2 |
| Construction | | | | | | |
| <i>Above HT</i> | | | | | | |
| AH | 9 | 2.8 | 0.8 | 2.7 | 2.0 | 4.2 |
| RSA | 2 | 2.6 | 0.9 | 2.6 | 2.0 | 3.2 |
| <i>Below HT</i> | | | | | | |
| RSA | 8 | 1.9 | 0.5 | 1.7 | 1.5 | 2.8 |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 3 finished competitive procurements of the target category

Table D3. Disqualification level by good, tender size and administrative units.

| | Number of administrative units | Mean | Standard deviation | Median | Min | Max |
|---------------------|--------------------------------|------|--------------------|--------|-----|-----|
| Fuel | | | | | | |
| <i>Above HT</i> | | | | | | |
| AH | 12 | 0.3 | 0.4 | 0.3 | 0.0 | 1.2 |
| RSA | 16 | 0.5 | 0.6 | 0.3 | 0.0 | 1.7 |
| <i>Below HT</i> | | | | | | |
| RSA | 13 | 0.1 | 0.1 | 0.0 | 0.0 | 0.4 |
| UH | 2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Food | | | | | | |
| <i>Above HT</i> | | | | | | |
| AH | 4 | 0.5 | 0.6 | 0.4 | 0.0 | 1.2 |
| RSA | 7 | 0.7 | 0.9 | 0.4 | 0.0 | 2.1 |
| <i>Below HT</i> | | | | | | |
| AH | 3 | 0.1 | 0.2 | 0.0 | 0.0 | 0.4 |
| RSA | 18 | 0.3 | 0.6 | 0.1 | 0.0 | 2.4 |
| UH | 3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Construction | | | | | | |
| <i>Above HT</i> | | | | | | |
| AH | 9 | 0.4 | 0.4 | 0.3 | 0.0 | 1.2 |
| RSA | 2 | 0.6 | 0.9 | 0.6 | 0.0 | 1.3 |
| <i>Below HT</i> | | | | | | |
| RSA | 8 | 0.4 | 0.1 | 0.4 | 0.3 | 0.6 |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

Selection criteria: administrative unit has at least 3 finished competitive procurements of the target category

APPENDIX E. STRUCTURE OF PROCUREMENT BY ADMINISTRATIVE UNITS

Table E1. Structure of Procurement by Administrative units (quantity and value of tenders).

| | AH | | | | RSA | | | | UH | | | |
|-------------------------------------------------------------------------------------------------------------|--------------|------------|------------------|-------------|--------------|----------|----------------|----------|--------------|----------|----------------|----------|
| | Number | % | Value | % | Number | % | Value | % | Number | % | Value | % |
| Construction | 1,883 | 23% | 859,654 | 58% | 319 | 7% | 113,877 | 19% | 1,150 | 35% | 361,913 | 71% |
| Food, beverages, tobacco and related products | 989 | 23% | 268,359 | 18% | 1,095 | 24% | 296,573 | 49% | 396 | 12% | 51,437 | 10% |
| Architectural, construction, engineering and inspection services | 758 | 23% | 55,864 | 4% | 130 | 3% | 6,871 | 1% | 294 | 9% | 7,937 | 2% |
| Office and computing machinery, equipment and supplies except furniture and software packages | 620 | 23% | 47,333 | 3% | 321 | 7% | 59,474 | 10% | 92 | 3% | 13,212 | 3% |
| Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products | 602 | 23% | 46,275 | 3% | 377 | 8% | 4,523 | 1% | 120 | 4% | 17,242 | 3% |
| Repair and maintenance services | 595 | 23% | 38,401 | 3% | 161 | 4% | 23,738 | 4% | 139 | 4% | 1,267 | 0% |
| Petroleum products, fuel, electricity and other sources of energy | 501 | 23% | 17,823 | 1% | 580 | 13% | 10029 | 2% | 289 | 9% | 3,748 | 1% |
| Construction structures and materials; auxiliary products to construction (except electric apparatus) | 436 | 23% | 16,523 | 1% | 285 | 6% | 966 | 0% | 128 | 4% | 4,841 | 1% |
| Sewage, refuse, cleaning and environmental services | 233 | 23% | 16,187 | 1% | 32 | 1% | 11,606 | 2% | 91 | 3% | 5,183 | 1% |
| Agricultural, farming, fishing, forestry and related products | 165 | 23% | 15,149 | 1% | 272 | 6% | 5,703 | 1% | 54 | 2% | 8,320 | 2% |
| Total | 8,203 | 23% | 1,483,984 | 100% | 4,589 | % | 609,258 | % | 3,298 | % | 511,121 | % |

Source: Own calculations based on data from the ProZorro Professional Business Intelligence module

APPENDIX F. PRICE EFFICIENCY OF SPECIFIC GOODS

Table F1. Distribution of prices by administrative units, UAH.

| | Number of contracts | Mean | Standard deviation | Min | 25% percentile | Median | 75% percentile | Max |
|---------------|---------------------|--------|--------------------|-------|----------------|--------|----------------|--------|
| Potato | | | | | | | | |
| AH | 21 | 7.25 | 1.37 | 5 | 6.5 | 7 | 8 | 10 |
| RSA | 71 | 6.54 | 1.7 | 3.6 | 5.88 | 6.04 | 6.96 | 13.2 |
| UH | 12 | 6.72 | 1.88 | 4 | 5.66 | 6.56 | 7.88 | 10 |
| Butter | | | | | | | | |
| AH | 57 | 102.91 | 22.22 | 64 | 86.87 | 100 | 116.28 | 151.52 |
| RSA | 66 | 97.83 | 17.3 | 63 | 85.13 | 95 | 105.05 | 158.33 |
| UH | 20 | 114.7 | 22.65 | 67.65 | 111.5 | 115 | 115.2 | 167.25 |
| Eggs | | | | | | | | |
| AH | 29 | 2.08 | 0.46 | 1.29 | 1.8 | 2.13 | 2.3 | 3.1 |
| RSA | 79 | 2.2 | 0.42 | 1.15 | 1.95 | 2.3 | 2.5 | 3.04 |
| UH | 3 | 2.8 | 0.18 | 2.69 | 2.7 | 2.7 | 2.85 | 3 |
| A-95 | | | | | | | | |
| AH | 24 | 24.99 | 2.2 | 20.11 | 23.91 | 26 | 26.46 | 30 |
| RSA | 36 | 23.69 | 1.64 | 21.78 | 22.5 | 23.06 | 24.05 | 27.3 |
| UH | 31 | 23.9 | 1.35 | 22 | 23 | 23.5 | 24.85 | 27 |
| A-92 | | | | | | | | |
| AH | 68 | 23.36 | 1.7 | 19.88 | 22.24 | 23 | 24.6 | 27.6 |
| RSA | 78 | 23.3 | 1.52 | 20.69 | 22 | 23 | 24.08 | 26.9 |
| UH | 22 | 23.38 | 1.54 | 20.99 | 22.13 | 23 | 24.5 | 26.53 |
| Diesel | | | | | | | | |
| AH | 62 | 22.54 | 1.91 | 18.71 | 21 | 22 | 24 | 27.8 |
| RSA | 49 | 22.24 | 2.1 | 19.5 | 20.5 | 21.49 | 24.5 | 26.49 |
| UH | 8 | 21.77 | 1.29 | 20.5 | 20.92 | 21.46 | 22.12 | 24.52 |

Source: Own calculations based on data from procurement contracts

