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Measuring Performance of Public Procurement In Croatia

Output 1

Report on the analysis of the effectiveness of the public procurement system in Croatia

December 2021

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The general objective of the Project is to support the Croatian authorities to improve their administrative capacities to design and implement public projects and policies, through a strengthened public procurement system. The project outcome is to increase the capacity of Ministry of Economy and Sustainable Development (MoESD) to apply methodology for future public procurement performance monitoring to inform decision and policy making. This report corresponds to Output 1 "*Report on the analysis of the effectiveness of the public procurement system in Croatia and proposed actionable recommendations on strengthening the public procurement system*".

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List of Abbreviations

BPIs	Best Practice Indicators
CEPOR	SMEs and Entrepreneurship Policy Center
CPBs	Central Procurement Bodies
CPV	Common Procurement Vocabulary
EU	European Union
HRK	Croatian Kuna
MEAT	Most Economically Advantageous Tender
PECOS	Scottish Government's eProcurement software
PP	Public Procurement
PP Act	Public Procurement Act, OG 120/2016
PPoT	Procurement People of Tomorrow
SME	Small and Medium Enterprises
USKOK	Office for Suppression of Corruption and Organized Crime
WB	World Bank

Executive Summary

Introduction

1. The goal of this report to show how data analytics can support procurement policy and strategy to maximize the effectiveness of the public procurement system in Croatia. Public procurement represents a substantial part of the Croatian economy. The total value of contracts and framework agreements published in 2019 was more than HRK 43 billion excluding VAT, or more than 13% of Croatian GDP. As an EU member state, Croatia's public procurement system is fully aligned with the EU acquis Communautaire. The Public Procurement Act (the PP Act) ZJN 2016 (NN 120/2016) provides the legal basis for public procurement in Croatia. The Directorate for Trade and Public Procurement Policy (the Procurement Policy Directorate), part of the Ministry of Economy and Sustainable Development, is responsible for key aspects of the operation of the public procurement system, including coordination and oversight working with the range of other public authorities involved.

2. The Procurement Policy Directorate has commissioned this review at a point where it has a significant interest in using public procurement data more effectively to monitor progress and drive improvement across the public procurement system. A specification is in development for a new eProcurement system, which will aim to reduce the administrative workload of public procurement staff to ensure there is capacity to meet future demands. This new system also provides an opportunity to ensure that the public procurement system is appropriately linked to other data, including payments made under contracts, and that the correct data is being collected to inform meaningful analysis of public procurement system performance. This report was commissioned as one of the main outputs from a project funded by the European Union via the Structural Reform Programme and implemented by the World Bank in cooperation with the European Commission's Directorate General for Reform Support (DG REFORM).

Methodology and Evidence

3. The evidence which underpins this report comes from:

- public procurement data covering the period 2015 to May 2021, available in electronic format;
- feedback gathered from focus groups involving public procurement professionals and others;
- results of a survey on quality of goods, works and services delivered by firms; and
- data collected on cost and schedule overruns for a sample of contracts.

4. The analysis in this report covers 10 agreed indicators shown in Table 1 below. For each indicator, there is a conclusion regarding the evidence on that indicator. The 10 indicators are grouped into 5 dimensions, representing the key areas of interest for the main stakeholders in public procurement. Each of these dimensions is of equal overall importance in ensuring effective service delivery, although different stakeholders will attach different importance to them according to their interests (for example oversight agencies like audit offices will favor transparency and compliance, end-users will value quality, taxpayers will demand cost-efficiency, and private companies will seek fairness). Collectively, the indicators provide a

comprehensive means of assessing the effectiveness of different aspects of public procurement and identifying priorities for improvement.

Table 1: Agreed indicators of the effectiveness of the public procurement system

Dimension	Indicator
Cost-efficiency	1. Bidding process open to competition 2. Number of bids received for individual bidding processes 3. Quantity of bidding processes to buy the same or similar item 4. Incidence and size of cost overruns
Timely delivery	5. Time to complete different types of bidding processes 6. Bidding processes successfully awarded as opposed to failed or cancelled 7. Incidence and size of schedule overruns
Transparency	8. Publication of invitation for bids, contract awards and contract implementation information
Quality	9. Quality of goods, works and services received
Fairness	10. Fair and equal treatment of bidders

5. The report recommends priorities for further investigation and policy development based on the analysis against each of these indicators, and what capacity and governance arrangements are appropriate to support the overall approach to data-driven improvement. The report also considers other key issues which have arisen from the evidence and are relevant to the EU Procurement Strategy:

- Training
- Centralized Procurement and
- Digital Transformation.

Key Findings

6. The public procurement system in Croatia has been through a period of rapid change over recent years and there is clear evidence of significant improvements over recent years. This provides a strong foundation for further development to secure better value for money and better outcomes for Croatia as a whole. A data-driven approach has a lot of potential to add value to the work the Procurement Policy Directorate is leading to build on the achievements of previous Procurement reform activities, in particular to support opportunities for SMEs; advance environmental, social and innovative procurement practices; increase transparency in the procurement system; and deliver greater process efficiency and savings.

7. As the analysis in this report shows, the eProcurement system captures a rich dataset. There is still further work to do on the digital transformation, on both data quality and the scope of data collected centrally. On data quality, in addition to ensuring system users are well-trained there would be significant benefit in continuing to systems more robust in preventing blanks or inappropriate options in key data fields. Expanding centrally-collected data to cover contract management and completion, reasons for cost overruns, contract variations, unit costs and bills of quantity would all provide benefits in transparency, assessment of procurement performance and support for the integrity of the system. The existing data, however, provide a sufficient picture of public procurement in Croatia to justify a data driven-approach and a good basis for further development of both the scope and the quality of the data. The key requirement is to ensure that the Procurement Policy Directorate has the necessary staff to carry out the work required by a data-driven approach. This will require a team of data analysts working alongside procurement practitioners with significant experience in Croatia who can help interpret the results of the analysis.

8. A key issue initially is to identify which aspects of procurement data need to be the focus of analysis in order to maximize the benefit. Looking at the public procurement market and the overall procurement cycle, points which emerge strongly for further data analysis and exploration include low levels of competition for many categories of goods, services and works; and relatively low levels of SME participation in public procurement overall. Expansion would require changes to legislation as well as additional resource. Variations between contracting authorities on administration of public procurement, for instance on decision and processing times, suggest that overall improvements in efficiency and effectiveness may be possible.

9. There should also be exploration of the opportunity to increase efficiency and reduce costs by expanding the scope of central or collaborative purchasing. One way to achieve this would be to provide additional resource to the State Office for Centralized Public Procurement to carry out central purchasing on behalf of a wider range of contracting authorities or entities. There may also be potential to expand the range of goods and services covered in centralized or collaborative procurement.

10. The use of MEAT evaluation is now clearly established in public procurement law and practice in Croatia making the use of quality criteria mandatory in most evaluations. Collecting data on the weighting given to price in evaluations would allow some simple monitoring of the approach taken. The next step is to maximize the use of environmental, social and/or innovative approaches to public procurement to secure wider national outcomes. Investing time now in understanding how far these approaches are understood and being used in practice will allow the Procurement Policy Directorate to make any necessary changes to guidance and training over the coming years.

11. The training program for procurement practitioners is well-established in Croatia with a curriculum which requires at least 30 per cent of the course content to be based on practical examples and case studies. Before the Covid pandemic, the training was delivered face-to-face in a range of locations throughout the country. Practitioners who took part in the focus groups as part of this review were keen to see an even greater focus on examples and case studies in training and to retain an element of flexible, online delivery, building on the experience of adapting the training during the pandemic. A review of overall training content and quality and the options for flexible delivery would help ensure that the training continues to deliver maximum benefit in future years. In addition, some thought needs to be given to the level of

understanding of non-procurement staff who are involved in specification of technical requirements, evaluation committees and contract management. Focus group feedback suggests that some basic training for these staff would improve the overall efficiency and effectiveness of procurement work in contracting authorities.

12. The requirements of the PP Act for publication of data by contracting authorities already provide for a significant level of transparency, but there is scope for improvement by making it easier to access that information. Central collection and publication of more data, as highlighted above, would be one obvious step. More generally, international best practice on open government involves working with civil society commentators to identify what information is wanted and how it can be made easy to access and interpret. This would be a sensible step in Croatia to continue to increase transparency and enhance public confidence in the procurement system.

13. Finally, tackling corruption in public procurement is a priority for all jurisdictions. There has been international interest in 'red-flag' systems which identify potentially suspicious patterns in the public procurement data. There is information in this report (see Annex D in particular) on the sorts of indicators that can be helpful for a red-flag system, but there are also some considerations of cost and practicality in implementing a workable system. Any proposal to develop a system in Croatia would need to be led by an authority with appropriate investigation powers and would require a full business case. If such a system were to be developed, the Procurement Policy Directorate should cooperate in the development to ensure that procurement processes are properly reflected in the specification.

14. The Report makes 12 high-level recommendations, listed below, under the headings: Transparency and Integrity; Data-driven approach to improvement and governance; Training; Digital Transformation; and Centralized Procurement. The rationale for each recommendation is set out in detail in the body of the report, and the recommendations themselves are summarized for convenience below.

Recommendations

Transparency and Integrity
1. The Procurement Policy Directorate should **gather views from civil society commentators** on the transparency of the public procurement system, looking both at the information available and how easy it is to find and to interpret; and considering options for improvement based on the feedback received.

2. If the State Audit Office, USKOK or another authority with appropriate investigation powers is interested in establishing a red-flag system, they should review recent evidence from audit, whistleblowing, external commentators and any other sources on the perceived scale and nature of any corrupt or fraudulent behaviors in the public procurement system in Croatia, and **consider whether there is a case for introducing a red-flag system**. A red-flag system which identifies potentially suspicious patterns in the procurement data and might indicate collusion or tender-rigging can be powerful provided that:

   - all the data are needed in order to make the system work are already collected or can be collected to a sufficient quality standard;
   - legal issues around investigation and potential appeals against sanctions are addressed; and
   - the potential benefits of a red-flag system, including its potential deterrent effect, outweigh the development and ongoing operating costs.

   Subject to having sufficient technical expertise and resolving any data protection issues, it may be possible over a longer time to develop a red-flag system further by matching public procurement data against other data sources to identify a wider range of potentially suspicious patterns. The Procurement Policy Directorate should cooperate with consideration of a business case for a red-flag system and provide procurement expertise to inform the design and development if required, but the operation of any red-flag system and the investigation of the cases flagged should be carried out by a separate team who are seen as neutral and independent of other parts of the procurement system.

Data-driven approach to improvement and governance

3. The Procurement Policy Directorate should **recruit additional staff to plan for and carry out regular review of procurement data and other evidence about the functioning of the public procurement system**. Implementing the recommendations on data-driven improvement in this report will require a dedicated team of between 8 and 12 individuals with strong data analysis skills, working alongside colleagues with significant expertise in public procurement. If it suits the structure of the Procurement Policy Directorate, there could be advantages in forming these staff into a single team as a Procurement Improvement Unit.

4. In the **short term,** the designated staff should carry out the following early work to establish a baseline position:

   - 2021 position analysis of public procurement categories in Croatia for total value of spending and overall complexity and risk, to assess their position using the *Kraljic Matrix*[1] or an equivalent tool;
   - develop options for addressing barriers to participation in public procurement, particularly barriers experienced by SMEs, drawing on the results of the Enterprise Survey work currently being carried out by the World Bank and any further work needed in Croatia to establish SMEs' experiences of public procurement;
   - review a sample of documentation from procurement processes, choosing a wide spread of goods, services and works and types of public entity conducting the procurement, to assess how effectively environmental, social and/or innovative procurement approaches have been adopted; and based on this evidence consider whether any further coaching, guidance or training on these priorities is needed.

5. In the **medium-term**, the designated staff should carry out a program of analysis looking at aspects of the public procurement market and the procurement cycle, using the data-driven approach described above involving: data analysis, exploration, options, implementation, repeat. The procurement data dashboard developed by the World Bank team should provide a useful initial tool for the analysis, which should as a minimum aim to cover the following points over a three-year period:

   - Assess the levels of competition in the public procurement market for each procurement category by looking at trends in the number of bids in each procurement process, the market share for each supplier and unit costs (where these are available – see below) and supplier diversification, then use the Kraljic analysis or an equivalent tool to identify appropriate actions for procurement categories where the level of competition is a concern.
   - Track SME participation in public procurement through the data, including analysis of SME participation as subcontractors where possible, in order to understand the impact of any measures introduced to increase SME access to public procurement markets.
   - Explore variations in performance between contracting authorities on:
     - timeliness and accuracy of publication of procurement plans;
     - proportion of failed or cancelled procurement processes;
     - decision time;
     - time and cost overruns on the contract; and
     - timeliness of payments to contractors.

     As there can be many reasons for variations in all of these aspects, the aim of the exploration should be to identify those buyers whose performance in any one aspect is significantly above or below the average and then to discuss with the procurement practitioners what is helping them perform very effectively or what is causing delays or

[1] For an explanation of and references for the Kraljic matrix see section 3, paragraphs 124 to 127.

difficulties. This information can then be used to inform further development of policy, guidance and training.

- Carry out further annual reviews of documentation for a sample of public procurement processes to establish how effectively environmental, social and/or innovative procurement approaches are being used in Croatia.
- Carry out regular sampling of public procurement data to assess data quality and consider what system, guidance and/or training changes may be needed to address any recurring data quality issues which are identified.

6. In the **long term** (beyond 3 years) the Procurement Policy Directorate should:
   - ask the designated staff to propose their own program of regular data monitoring to replace the medium-term program above, based on what has been identified over the initial three years and the policy priorities at that time;
   - consider establishing a regular survey of supplier views on barriers to participation in public procurement, including a focus on SME views – to be run every 2-3 years;
   - put in place arrangements for the long-term monitoring of environmental, social and innovative procurement approaches; and
   - review an updated Kraljic or equivalent analysis to ensure that it reflects the latest position, to inform decisions about priority areas for action to improve the functioning of the public procurement market.

7. The analysis and policy options produced by the designated staff should be provided to the Procurement Policy Directorate and used to **agree and implement actions for improvement**. In some other countries, it has been helpful to establish a Steering Committee of senior leaders from state bodies involved in the public procurement system to assist the lead procurement authority in this task. The Procurement Policy Directorate should consider whether such an approach would help them drive improvements in the public procurement system.

Training

8. The Procurement Policy Directorate should recommend to the National School of Public Administration the development of basic training for non-specialist staff in contracting authorities who will be involved in developing technical specifications, on evaluation committees and/or management of contracts. Non-specialist staff need to understand the general principles of specification of requirements, evaluation of bids and the management of contracts if they are to work effectively with procurement practitioners to secure good outcomes. The training for non-specialists needs to be short and focused, and as flexible as possible so that staff can access it quickly when required, so an online solution may be a good option. Practical examples and case studies should be a major aspect of the training for non-specialist staff.

9. The Procurement Policy Directorate should carry out a **review of the effectiveness of the current training for procurement practitioners**, focusing on ensuring that all current training providers are working to a high standard and are choosing effective exercises, case studies and practical examples for the mandatory minimum of 30% of the curriculum required by Annex 1 of the 'Rules on education in the field of public procurement'.

10. The Procurement Policy Directorate should also consider promoting a continued approach to **flexible delivery of training**, including online training, once the Covid-19 pandemic restrictions are lifted.

Digital Transformation

11. In developing its new eProcurement system, the Procurement Policy Directorate should **continue to work towards an integrated system supporting every aspect of the procurement cycle from procurement plans through to contract supervision and completion**. Additional data that should be collected centrally as a priority to support overall monitoring and improvement of the performance of the public procurement system includes: unit costs and quantities for all contracts; linking all payments made under contracts to the eProcurement record; contract management data including all contract variations and reasons for these; and capturing information about evaluation criteria used.

Centralized Procurement

12. The State Office for Central Public Procurement should look at options to **continue to reduce costs and increase overall efficiency by expanding the current approach to centralized procurement,** including considering changes to legislation if these are necessary. There are two broad options: making contracts for goods and services currently procured by the State Office for Centralized Public Procurement available to a wider range of state-funded buyers, and/or expanding the range of goods and services for which central contracts are put in place. Central procurement for additional categories of goods or services could either be brought within the scope of the State Office for Centralized Public Procurement or put in place through collaborative arrangements between groups of public entities in geographical or sectoral groupings. Additional staff would be required to carry out new work so the scope to make additional savings would need to be considered in the business case for any changes.

1 Introduction

Scope of the Review

15. The Directorate for Trade and Public Procurement Policy (the Procurement Policy Directorate), part of the Ministry of Economy and Sustainable Development, has commissioned this review at a point where it has a significant interest in using public procurement data more effectively to monitor progress and drive improvement across the public procurement system. A specification is in development for a new eProcurement system, which will aim to reduce the administrative workload of public procurement staff to ensure there is capacity to meet future demands. This new system also provides an opportunity to ensure that the public procurement system is appropriately linked to other data, including payments made under contracts, and that the correct data is being collected to inform meaningful analysis of public procurement system performance.

16. The procurement data analysis in this report is based on all data published at https://eojn.nn.hr related to published contracts and framework agreements put in place between 2014 and 2020. The data therefore covers a period before and after the PP Act came into effect.

17. The agreed indicators which have been covered in the analysis are:

1. Cost Efficiency
    - Bidding process open to competition
    - Number of bids received for individual bidding processes
    - Quantity of bidding processes to buy the same or similar item
    - Incidence and size of cost overruns
2. Timely Delivery
    - Time to complete different types of bidding processes
    - Bidding processes successfully awarded as opposed to failed or cancelled:
    - Incidence and size of schedule overruns
3. Transparency, Quality and Fairness
    - Publication of invitation for bids, contract awards and contract implementation information
    - Quality of goods, works and services received
    - Fair and equal treatment of bidders

18. The agreed approach to the review was to investigate most of these indicators using data from the eProcurement system, but initial investigation uncovered limitations in the data

and required additional data collection to be undertaken through a survey of quality of goods, works and services delivered and also sample data on cost and schedule overruns. In addition, there were focus group discussions involving procurement practitioners. This chapter provides analysis and policy commentary on the indicators and other key strategic issues which emerge from the data.

19. It is important to recognize the implications of the scope of this review. Data analysis is a powerful tool to identify areas for improvement, and the interactive Tableau dashboard developed and provided alongside this report demonstrates how data visualization and tools to allow exploration of data can help leaders and practitioners to gain insight into performance of the public procurement system, or performance of their organization within the overall system. The approach is limited by the data available, and this report includes recommendations on data which should be collected in future as part of the overall digital transformation of public procurement. Even with an expanded dataset, however, the data-driven approach identifies issues but in many cases the underlying causes will not be clear, and further exploration of behaviors, market conditions, contracting authority processes or other factors will be required.

20. The focus group discussions carried out as part of this review have provided a useful insight from practitioners into overall system operation, but were not a forum for detailed exploration of specific points arising from the data. In reviews with different remits carried out in other countries, data analysis activity has been undertaken alongside detailed discussions with practitioners and officials in key authorities to ensure the review team have a deeper understanding of the public procurement system. That local knowledge and insight alongside the data analysis is required to enable development of specific options for changes in policy and practice to drive improvement.

Overview of Croatian Public Procurement

21. Public procurement represents a substantial part of the Croatian economy. The total value of contracts and framework agreements published in 2019 was more than HRK 43 billion excluding VAT, or more than 13% of Croatian GDP. Over the period from 2015 to May 2021, as shown in Figure 1, 39.3% of total public procurement volume (aggregate value) was for works, 36.4% was for goods and the remaining 24.3% for services – but the relative volumes of the different types of procurement have changed significantly over this period. This can be seen in Figure 2, which also shows the overall growth in recent years, with particularly strong increases in goods and works procurement since 2017.

Figure 1: Procurement type

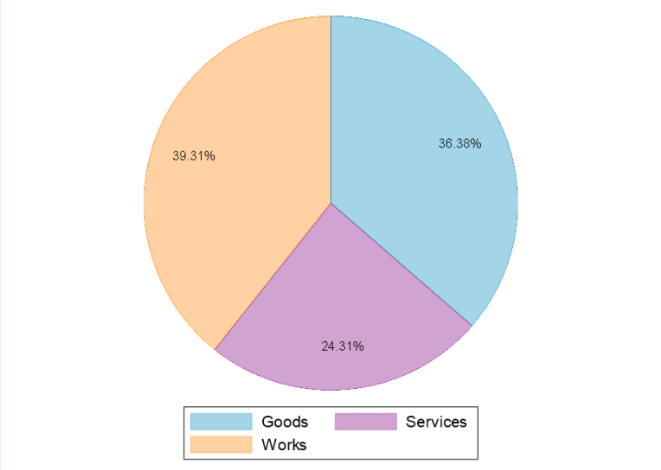
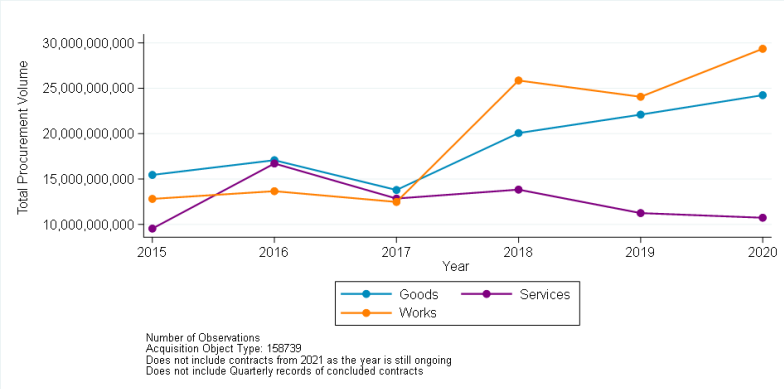
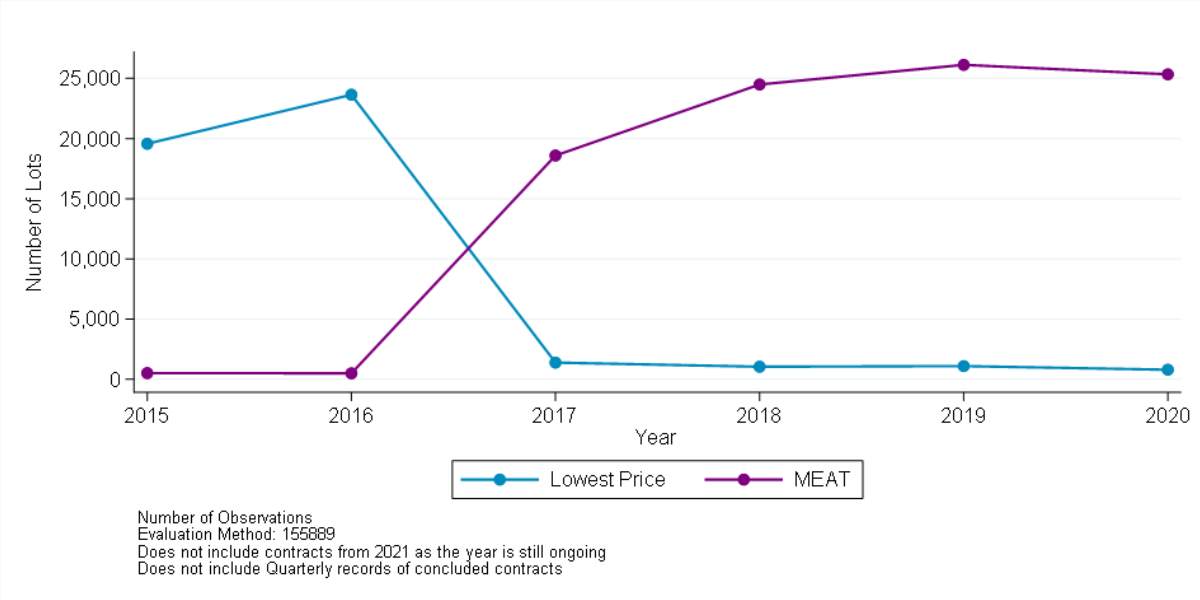


Figure 2: Procurement Volume by Year



22. The Procurement Policy Directorate has overseen very substantial reforms of public procurement in Croatia in recent years. Public procurement is now regulated by the Public Procurement Act (the PP Act), ZJN 2016 (NN 120/2016), which was adopted in December 2016 and came into effect on 1 January 2017. Public procurement data analyzed in this report demonstrates some of the impact of the PP Act, with the clearest example being the switch from lowest price to Most Economically Advantageous Tender (MEAT) evaluation criteria required under the legislation (see Figure 3 below). The PP Act is fully aligned with the EU acquis communautaire including Directive 2014/24/EU on public procurement, Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors. Directive 2014/23/EU on the award of concession contracts is covered separately by the Concessions Act, for which responsibility lies with the Ministry of Finance.

Figure 3: Number of Lots by Evaluation Method by year



23. The Procurement Policy Directorate has responsibility for key aspects of the operation of the public procurement system, including: the training and certification program for public procurement practitioners; the public procurement portal; opinions and instructions to guide public sector entities undertaking procurement; and legal assistance on the application of the PP Act and associated regulations. It is also the body in charge of coordination and oversight: working with other state bodies to try to ensure a uniform interpretation and application of the public procurement regulations; analyzing data on public procurement; publishing statistical reports; and taking improvement action to develop the whole public procurement system.

24. Other state bodies with roles in the governance and operation of the public procurement system include the State Office for Centralized Public Procurement, the State Office for Supervision of Public Procurement, other parts of the Ministry of Economy and Sustainable Development, the Ministry of Finance, the State Audit Office, the Office for Suppression of Corruption and Organized Crime (USKOK), bodies involved in the administration of ESIF funds and ARPA, the dedicated ESIF audit authority.

25. There have been some difficulties in accurately identifying total public procurement funded by the EU in Croatia. There is a field in the public procurement data supplied, but the balance between EU-funded and non-EU-funded procurement looks unrealistic and may be driven by some data quality issues. Based on the data supplied, Figure 4 below shows that the average contract size for EU funded procurement is higher than the average contract size for non-EU funded procurement.

26. The top ten procurement categories accounted for 37.6 percent of all procurement volume conducted in Croatia over the period 2015 to May 2021 (see Figure 5). The categories with the highest total volume of procurement are Construction and Surface Works and, Pharmaceutical products with totals of 19 billion and 18 billion Kuna respectively, followed by Construction work for pipelines, communication and power lines with 14 billion Kuna and Road transport services with 6.8 billion (see Figure 6).

Figure 4: Average Contract Size by Funding Source

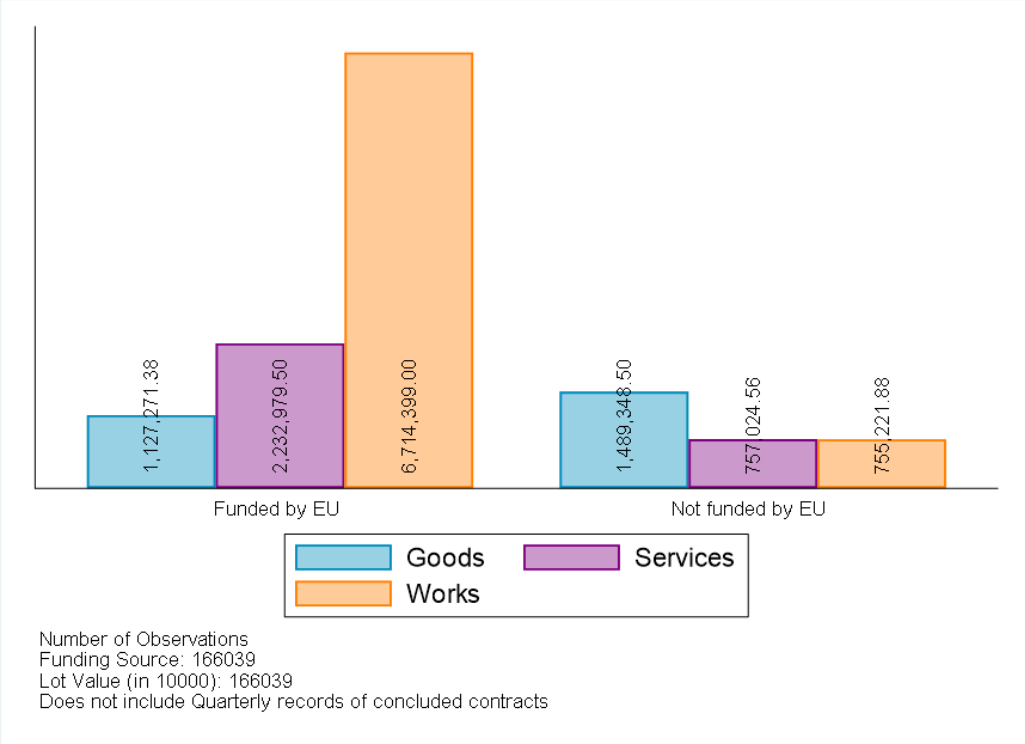


Figure 5: Total volume of procurement for top 10 products vs the rest

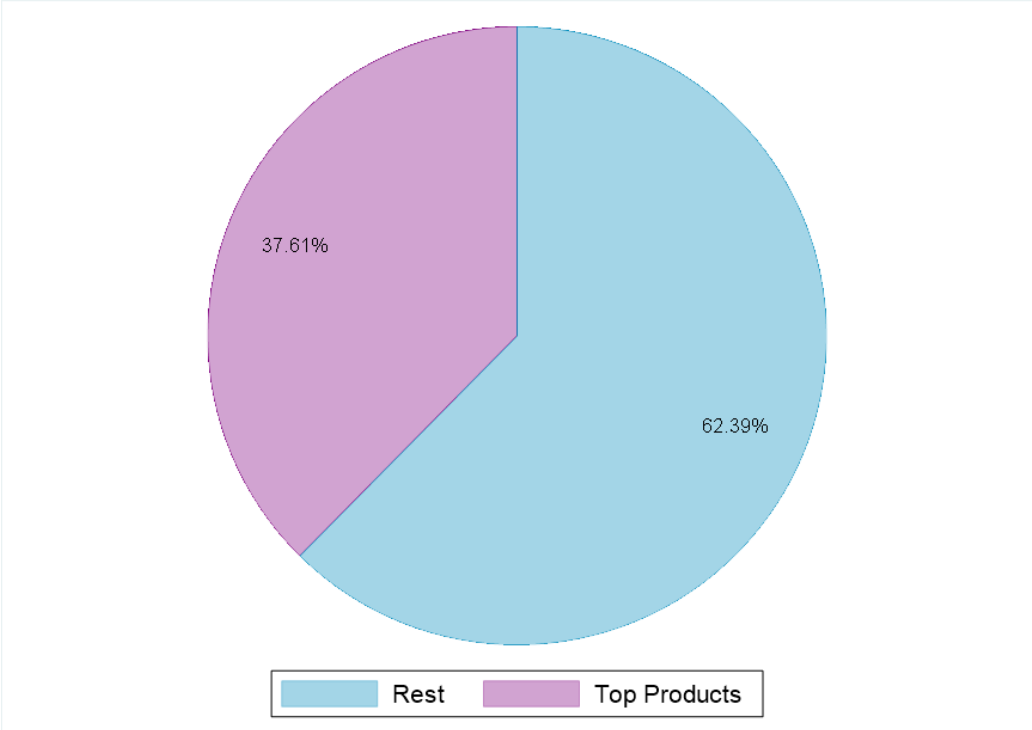
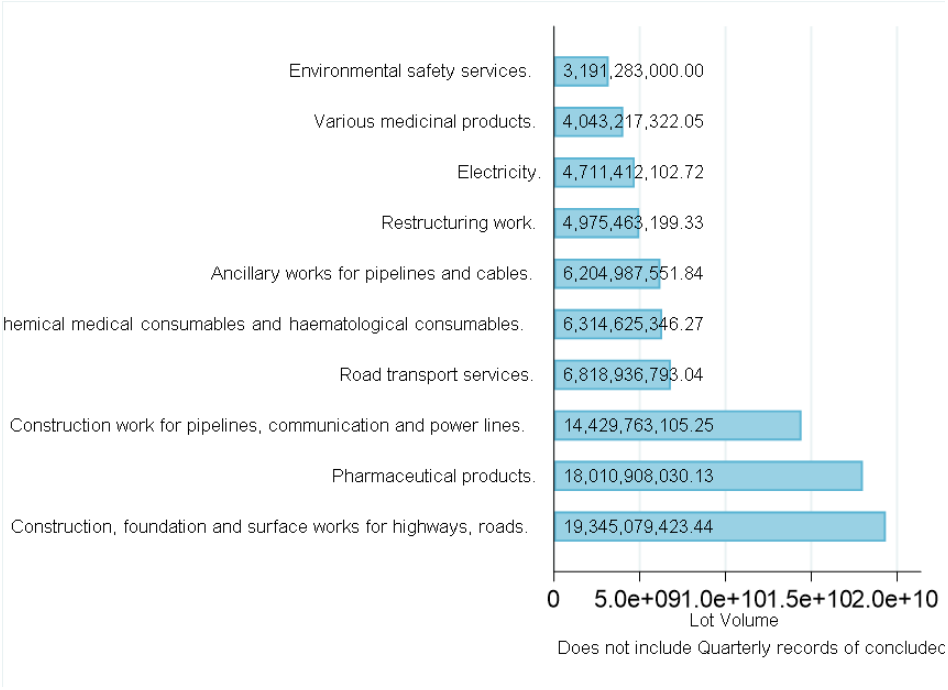


Figure 6: Top Categories by Procurement Volume in Kuna



27. The top 10 contracting authorities and entities in Croatia between them account for more than 38.6% of the total volume of public procurement over the period from 2015 to May 2021 (see Figure 7). All of the top ten contracting authorities are located in Zagreb. Overall there are 2517 contracting authorities and entities in the data analyzed, so there is a large number of bodies carrying out a much smaller value of procurement. Grad Zagreb has the highest volume of procurement among all procuring entities in Croatia with 32 billion Kuna procurement volume between 2015 to 2021 followed by Hrvatske Ceste D.O.O. Zagreb with 18 billion Kuna procurement volume (see Figure 8).

Figure 7: Top Contracting Authorities/Entities vs Rest

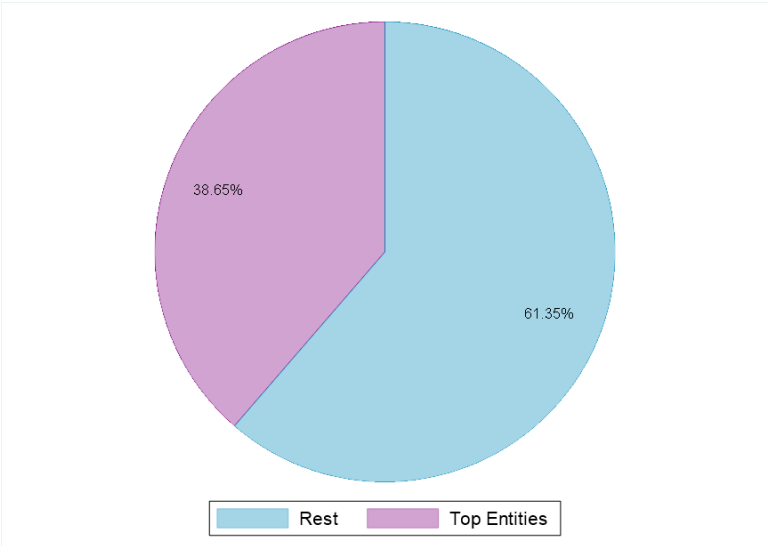
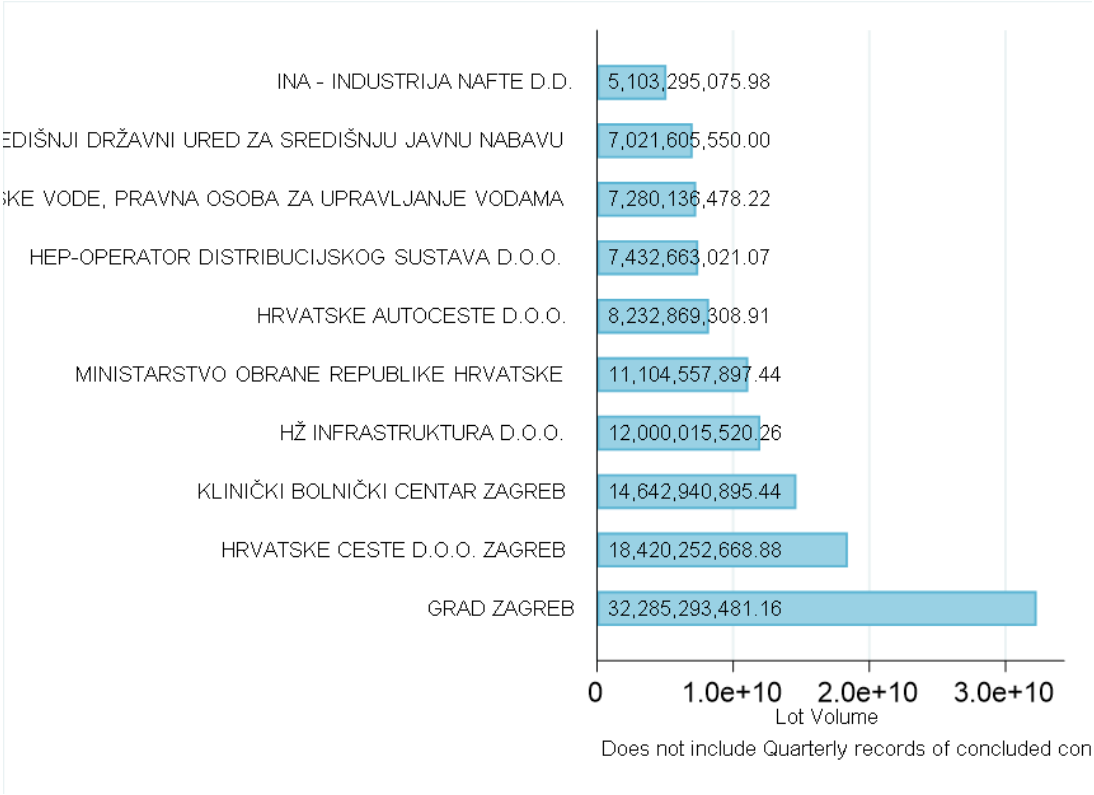


Figure 8: Top 10 Contracting Authorities/Entities by volume



28. The top 10 suppliers in the Croatian public procurement market supplied 27.6 percent of the total value of procurement between 2015 and May 2021 – showing a significant dependence on a relatively small number of suppliers (see Figure 9). In total, there are around 14000 firms supplying goods and services through public procurement in Croatia. Figure 10 shows the total value of contracts awarded over the period to each of the top 10 suppliers. Eight of the top ten suppliers are medical and energy firms, with the other two being the Croatian postal service and the shipping firm Jadrolinija. This pattern of concentration in a small number of key suppliers is important when looking at levels of competition generally later in this report.

Figure 9: Top 10 Suppliers vs Rest

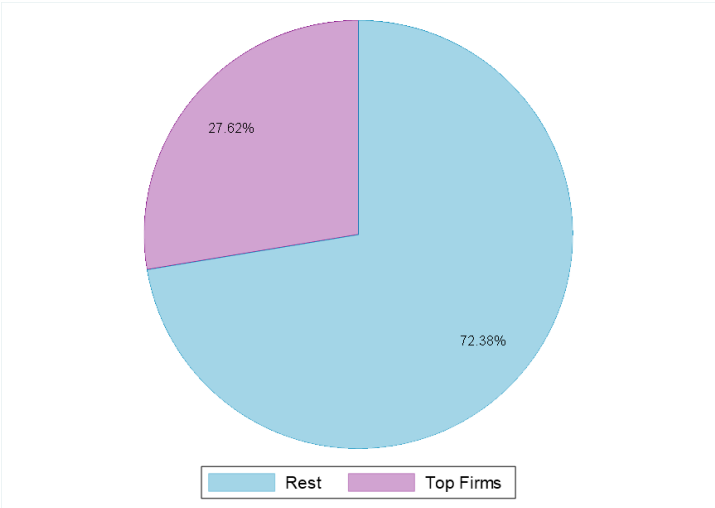
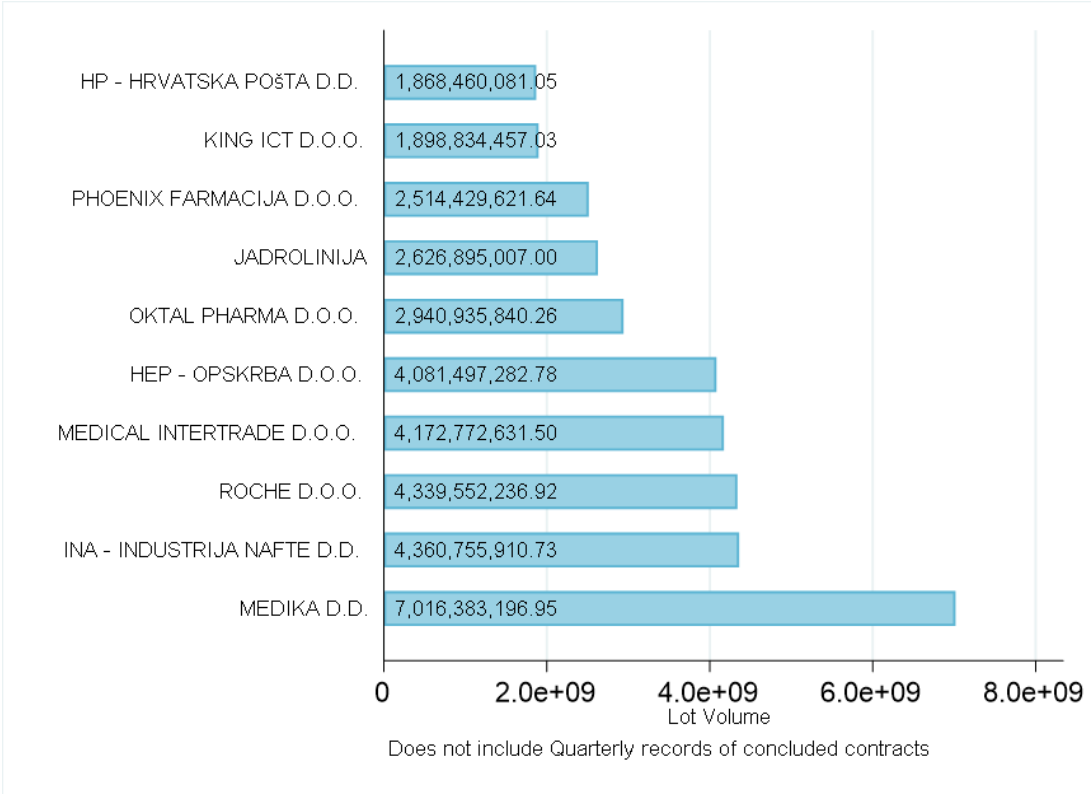


Figure 10: Top 10 Suppliers by Total Value of Awarded Contracts



29. Another interesting feature of the Croatian public procurement market is that some of the major suppliers are wholly or partly state-owned entities which are themselves buyers in the public procurement market. Initial analysis has identified a range of firms that are both suppliers and buyers in the public procurement market by matching supplier and contracting entity names, but that may not be a fully robust approach. It may be helpful for a team with local knowledge to analyze the impact of state-owned entities on the public procurement market in more depth. Figure 11 below shows that the total value of contracts awarded to entities that are both buyers and suppliers was around HRK 17.7 Billion over the period 2015 to May 2021, which is a little under 8 per cent of the total value of contracts awarded over the period. Figure 12 shows the top 5 entities that were both buyers and suppliers in the public procurement market with the total value of contracts awarded to each.

Figure 11: Total value of contracts awarded to entities that are both buyers and suppliers vs the rest

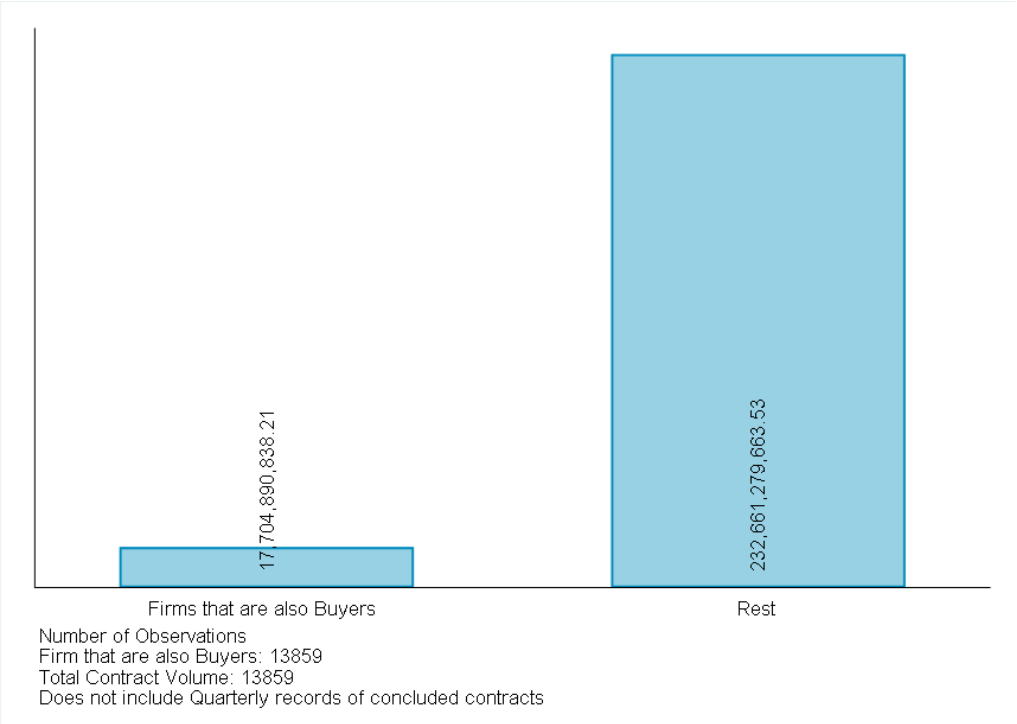
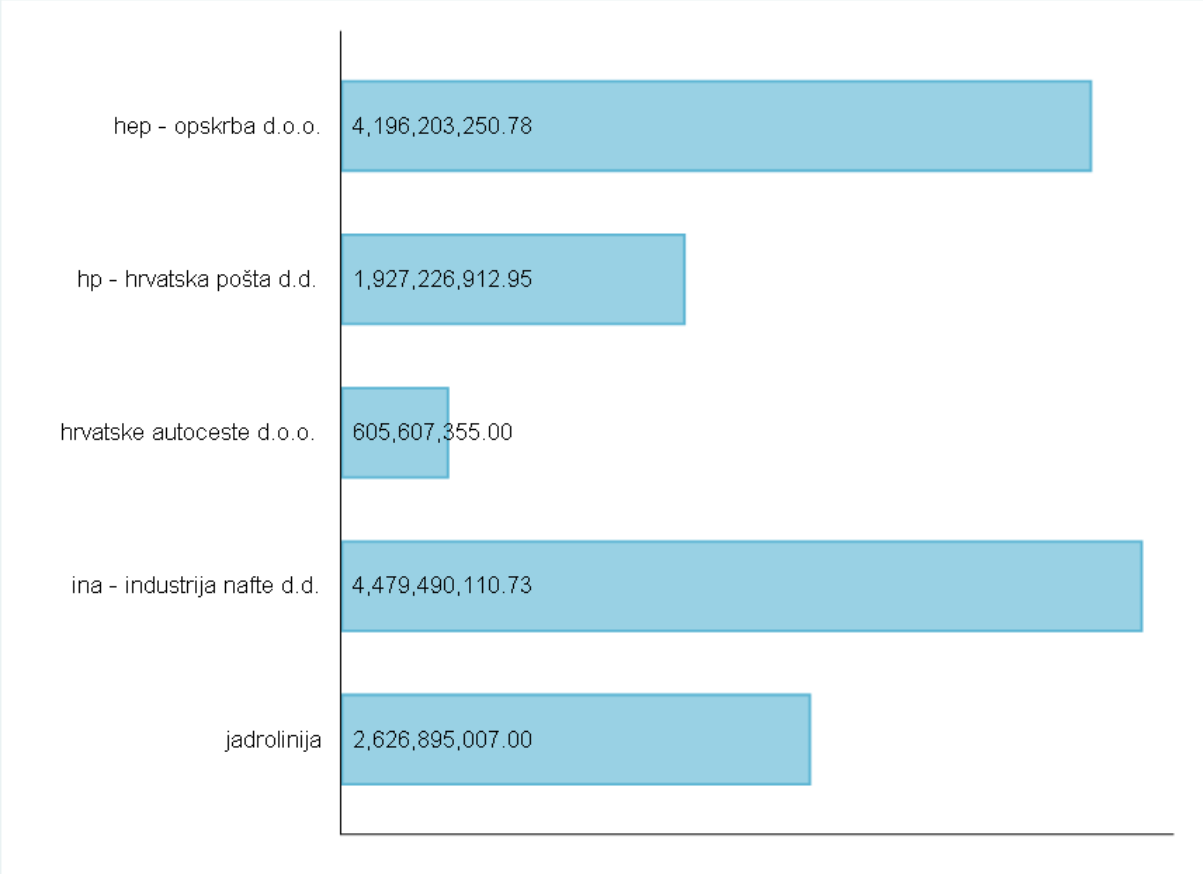
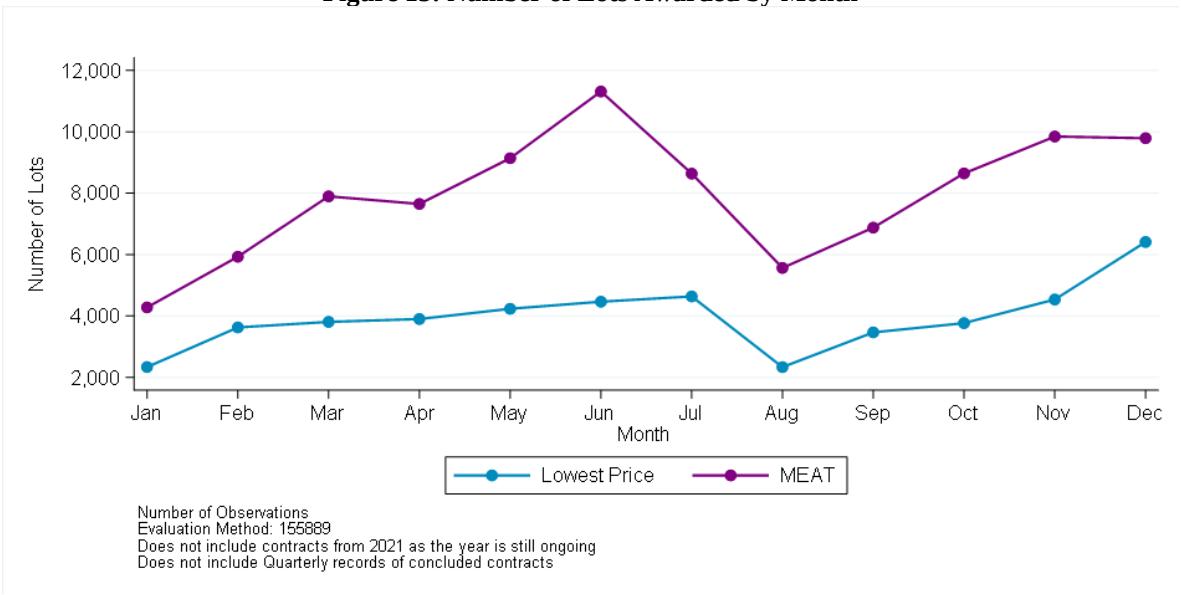


Figure 12: Total value of contracts awarded to top 5 entities that are also buyers 2015 to May 2021



30. There is significant seasonality in Croatian public procurement activity with peaks in the numbers of contracts awarded in June and December, as shown in Figure 13. Seasonal variation in public procurement activity is a common feature of procurement systems around the world. The overall pattern will be driven by a variety of factors including the timing of the fiscal year and public holiday periods, and these are usually government-wide issues.

Figure 13: Number of Lots Awarded by Month



2.1 Indicators relating to Cost Efficiency

2.1.1 Indicator: Bidding process open to competition

31. For this analysis, procurement processes in Croatia were categorized as:

- Open Participation – processes on which any firm can bid;
- Restricted Participation – processes where there is a pre-qualification stage for firms that wish to bid; and
- Closed Participation – processes that involve direct contracting.

32. Table 2 below shows the full categorization of procurement processes.

Table 2: Procurement Processes and Categorization

S.No.	Process Name	Category
1	Open Procedure	Open
2	Contracting Procedure Based on Framework Agreements	Open
3	Dynamic Procurement System	Open
4	Quarterly Records of Contracts	Open
5	Restricted Procedure	Restricted
6	Competitive Dialogue	Restricted
7	Negotiated Procedures	Restricted
8	Closed Procedure	Closed
9	Services Listed in Annex II B	Closed
10	Simple Procurement Procedure	Closed
11	Exempted Procurement	Closed

33. Public procurement in Croatia is demonstrably open. Figure 14 shows that only 0.5% of procurement processes between 2015 and May 2021 followed a closed procedure, and Figure 15 shows that the open procedure was used for the vast majority of public procurement over the period. Other approaches may be used for procurement procedures which are below the thresholds set in article 12 of the PP Act, but providing greater flexibility on lower value procurements is a common feature of public procurement systems.

Figure 14: Total Volume of Procurement by Category of Process

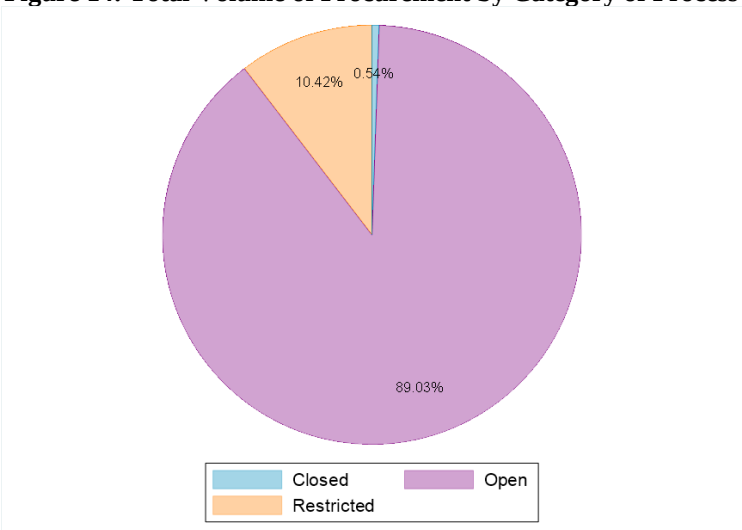
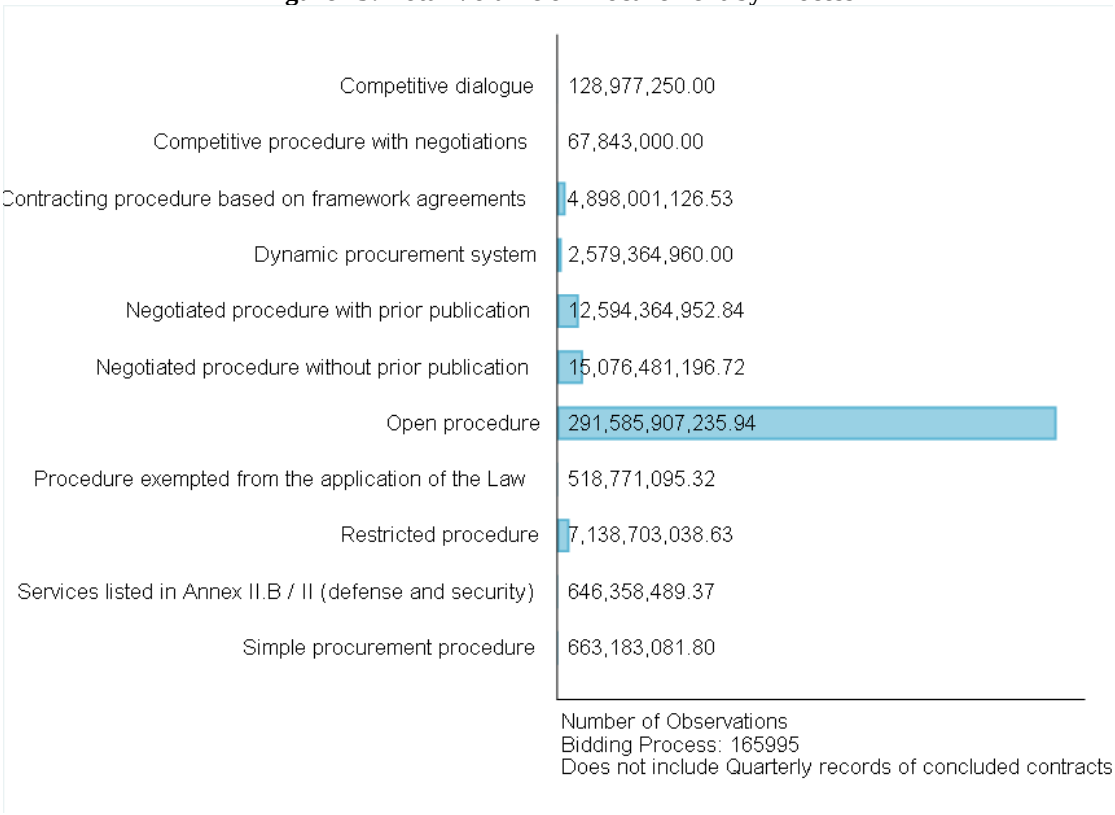


Figure 15: Total Volume of Procurement by Process



34. The number of processes following restricted and closed procedures was fairly steady over the period 2015 to 2020 (see Figure 16). As would be expected, the restricted, negotiated, and competitive dialogue procedures are used predominantly for larger and more complex procurement processes (see Figure 17).

Figure 16: Number of Procedures by Category of Process and Year

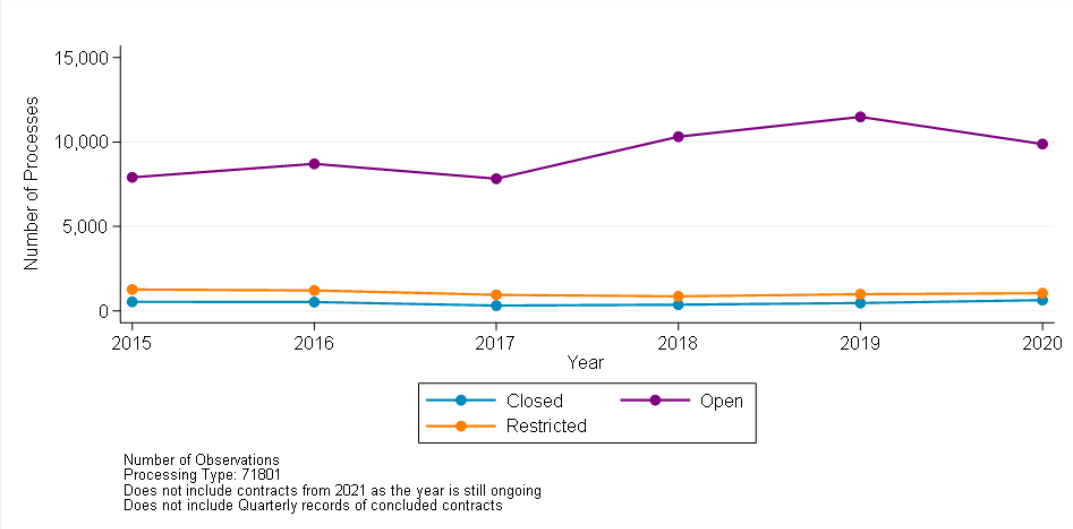
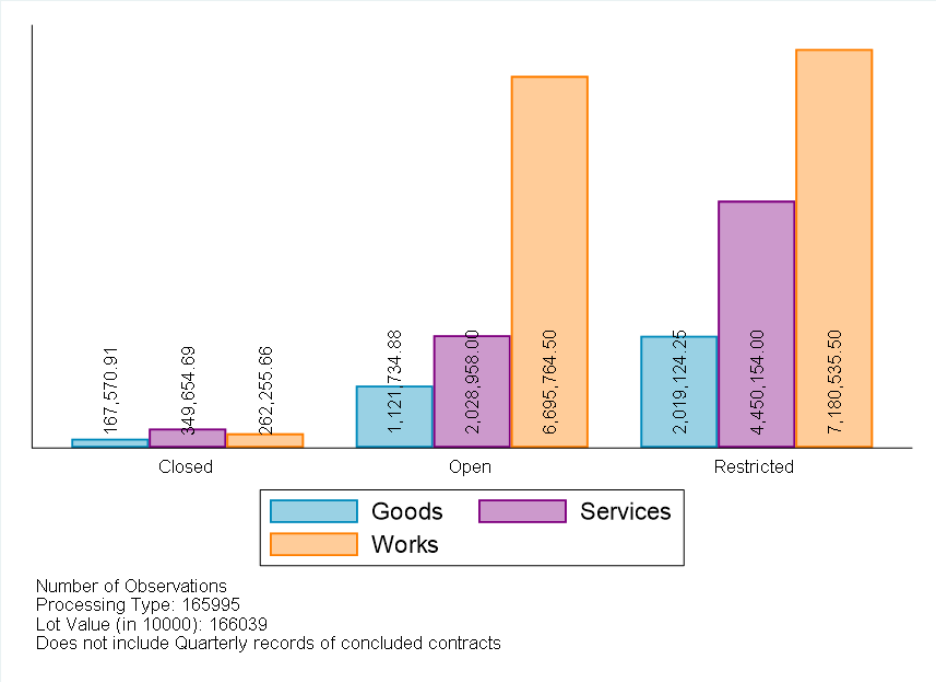


Figure 17: Median Contract Size by Category of Process



35. **Conclusion for this indicator**: Public procurement in Croatia is demonstrably open; there is no evidence to suggest that improvement is needed in ensuring bidding processes are open to competition at this stage.

2.1.2 Indicator: Number of bids received for individual bidding processes

36. The analysis of public procurement data in this report highlights a low level of competition for many public contracts. As this is a very significant point, the analysis has looked at levels of competition overall and also two important aspects: the participation of SMEs in public procurement; and the overall approach to procurement planning, as a way of keeping suppliers informed of future opportunities.

Overall participation

37. The average number of bidders across all procurement processes in the data is low, with a median[2] of only 2 bidders from 2018 onwards, although as would be expected there are significant variations between categories of procurement and some variations also between buyers. Figure 18 shows variations from year to year but no clear trend to suggest an increasing level of competition across the period. Figure 19 shows the median number of participants by procurement procedure, which highlights larger numbers of participants for competitive dialogue and negotiated procedure with prior publication, but as discussed above these account for only a small share of overall public procurement.

[2] Median number of participants per year is calculated as a continuous variable with the average number of participants per procurement type.

38. Figure 20 shows that on average there are significantly more bids for EU-funded procurement processes than non-EU-funded processes. This may be at least partly due to the larger average value of EU-funded public procurement processes in Croatia (see Figure 4 above) but it would be worthwhile to look further into this issue in case there are any other factors involved which could help to increase competition for non-EU Funded procurement procedures.

Figure 18: Median Number of Participants by Year

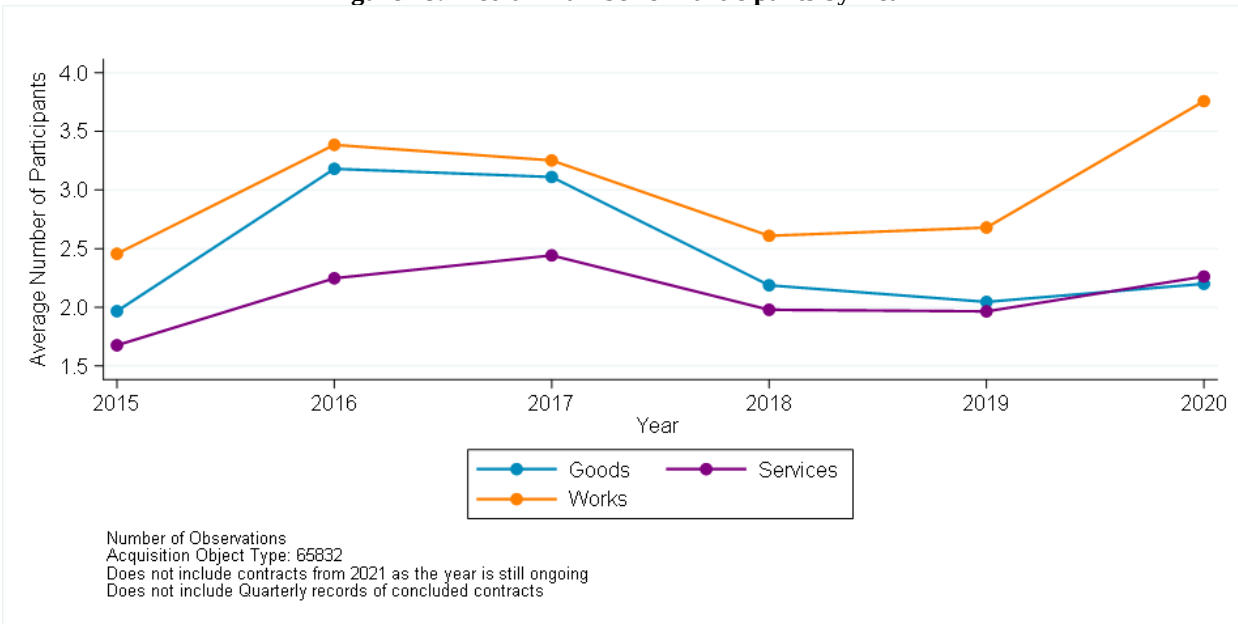


Figure 19: Median Number of Participants by Process

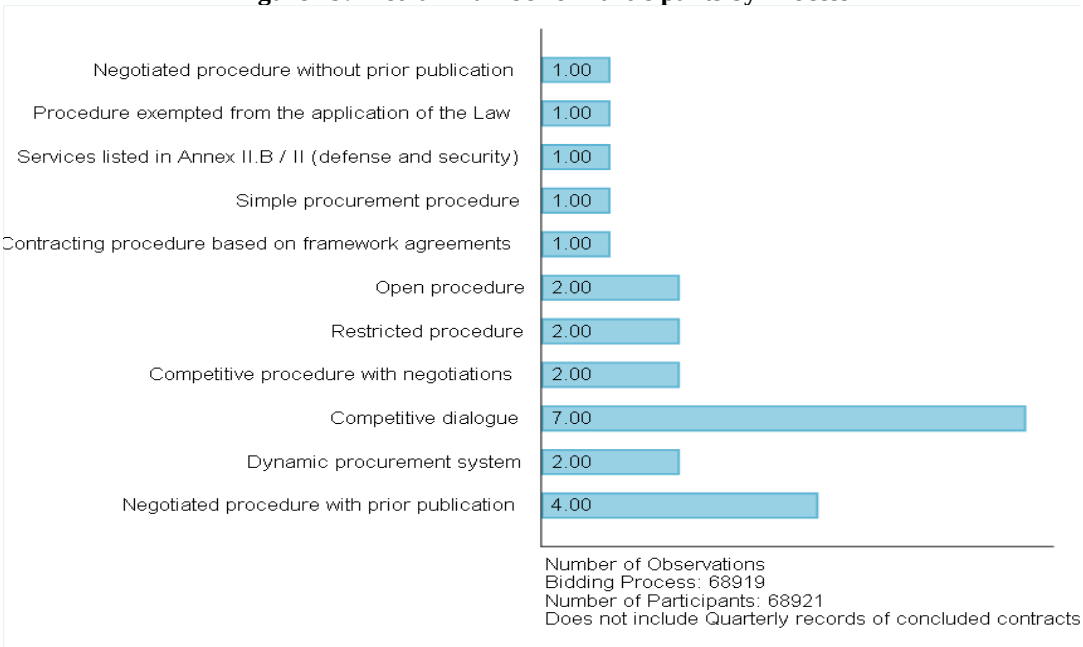
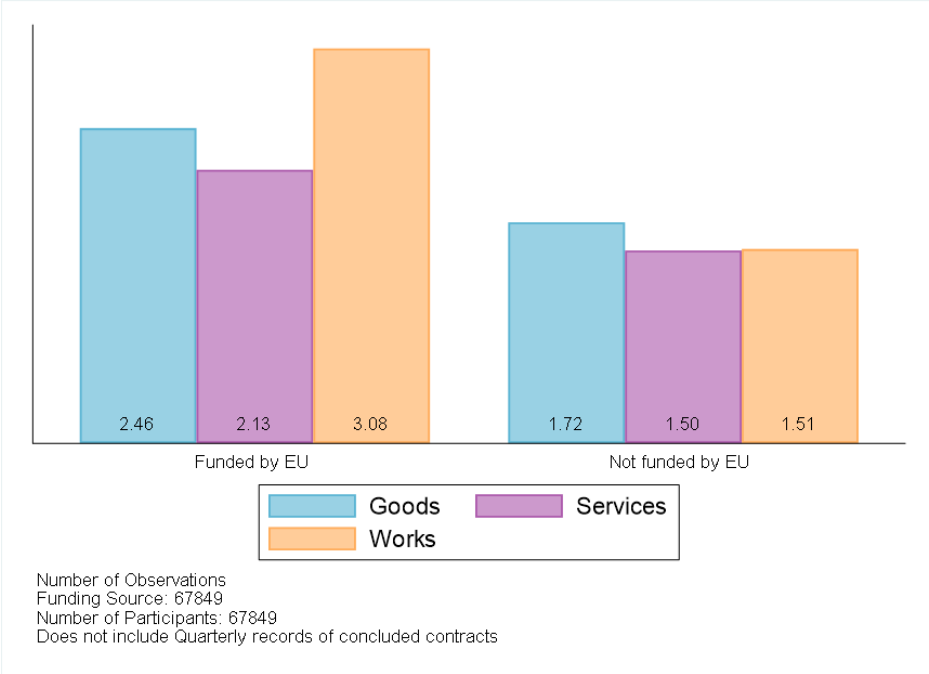


Figure 20: Number of Participants by Funding Source



39. Most focus group participants agreed that tender participation rates remain fairly low in Croatia. However, not all participants agreed that this was necessarily negative but stated that it needed to be looked at on a case-by-case basis. In some cases, several bids may be received but the names behind these bids are always the same so any apparent competition is fictitious. In some industries competition is limited due to the nature of the industry (ferry services were highlighted as one example).

40. Focus group participants said that reasons for the low participation rate are numerous. Recent economic challenges have led to a consolidation of the construction sector in the country, leading to fewer market players. Capacity to execute many different contracts at the same time is also limited for many market players, so they may choose to forgo certain tender opportunities if they judge that they do not have the capacity to respond at that time. One participant pointed out that firms may also be reluctant to re-submit bids after several unsuccessful attempts in the past. This may occur as some firms repeatedly submit bids that are inadequate and do not meet the minimum criteria to be considered. Another potential consideration was that businesses may be reluctant to participate in public procurement as they do not know how soon they will be able to work on the contract implementation. Unlike in the private sector, the highly codified process in public procurement is time consuming and unless emergency procurement rules are applied can take considerable time. Some companies may prefer to focus on the private sector to avoid these planning difficulties.

41. The data demonstrate the point made by focus group participants about looking at competition on a case-by-case basis. There are several CPV divisions with relatively high total public spending (in excess of HRK 1 billion over the period) where the average number of bidders over the period is below 3. Three bidders in a procurement process is widely used as a benchmark to indicate a reasonable minimum level of competition. Of these high value and low competition

CPV divisions, some include a range of very specialist goods, services and works where the number of suppliers is likely always to be limited.

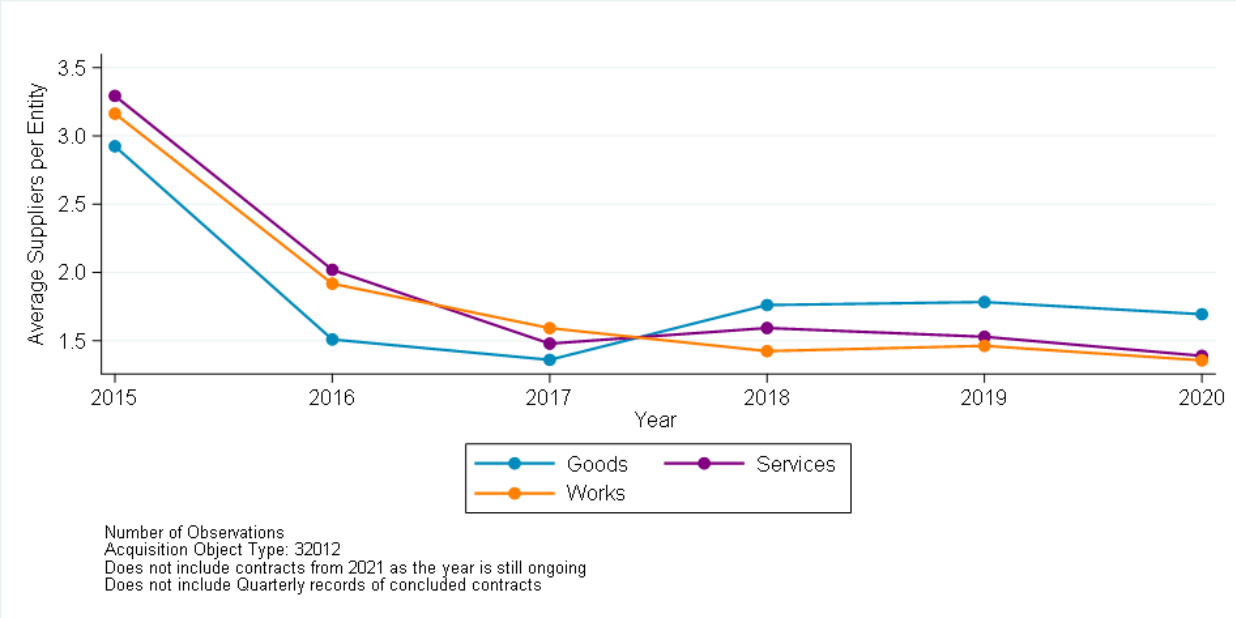
42. The biggest suppliers by total value appear to be in the pharmaceutical, energy and oil sectors, which are dominated by a small number of large suppliers in many European countries. Like construction, these are strategically important markets which need special attention to ensure that there is sufficient competition to ensure good value and continued supply, particularly in crisis situations like the Covid pandemic or natural disasters.

43. The point made by focus group participants about consolidation in the construction sector is also important. Experience in other countries suggests that overall capacity constraints can be a problem in the construction sector beyond even the limited number of market players. When governments wish to increase infrastructure investment, for instance, construction firms need reasonable notice and sufficient confidence in the pipeline of future opportunities to give them the confidence to scale up their workforce. If these steps are not taken, there may be very low competition for the proposed works.

44. There are some CPV categories where there is significant variation in the level of competition between procurement processes run by different contracting authorities or contracting entities. There may be many reasons for this, and it is possible that in some cases there are variations in approach that are leading to higher levels of participation. It would be an area worth exploring to understand what the main reasons are for the variations.

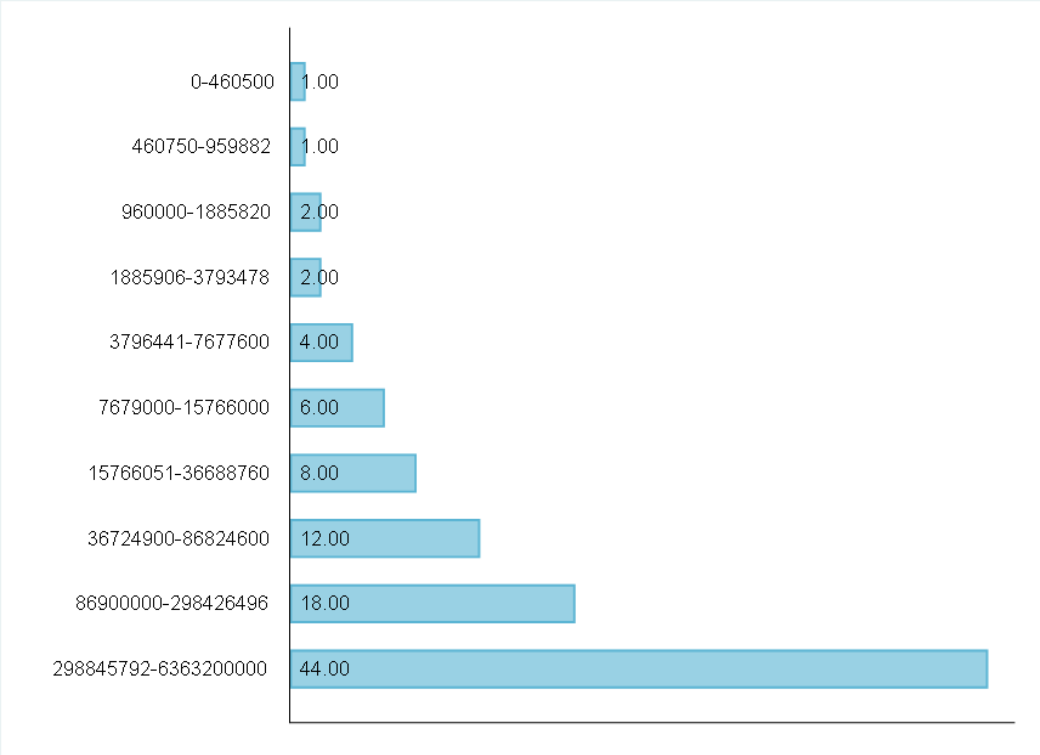
45. In addition to the analysis of the number of participants in individual procurement procedures, the data analysis has looked at the overall number of suppliers winning contracts over the period. The median number of suppliers who were awarded contracts for each CPV category for each contracting authority/entity fell significantly between 2015 and 2017 and remained low up to 2020 (see Figure 21).

Figure 21: Median Number of Suppliers per Product per Contracting Authority/Entity by Year



46. As would be expected, the median number of suppliers who were awarded contracts over the period is higher for contracting authorities and entities with a higher total volume of procurement (see Figure 22).

Figure 22: Median Suppliers per Contracting Authority/Entity by Annual Procurement Volume

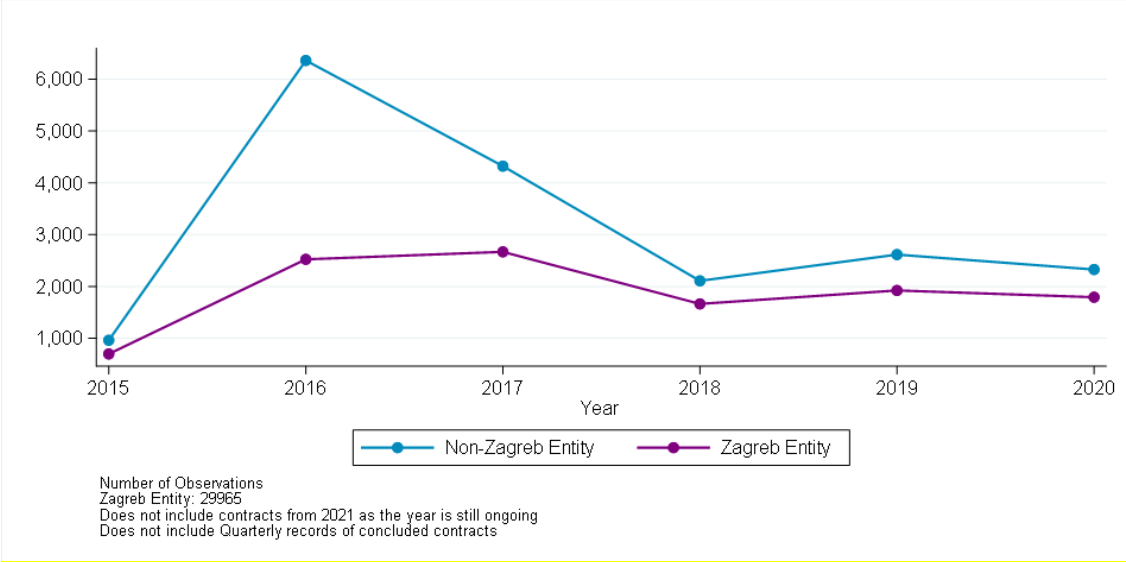


SME participation

47. It is important to look not only at the overall level of participation in public procurement but particularly at the participation of SMEs. The EU Procurement Strategy sets out the aim to 'increase the SME share of public procurement in line with their overall weight in the economy'. The Strategy was published in 2017 and at that time it reported that SMEs were winning 45 per cent of the aggregate contract value above EU thresholds across the EU.

48. According to the public procurement data, the number of lots that were awarded to SME firms decreased from a peak in 2016 to a lower level from 2018 onwards (see Figure 23). However, investigation of the data shows that a higher proportion of the data in 2016 and 2017 has missing supplier names, and all of the procurement processes with blank supplier names show that the supplier was an SME. It seems likely that the apparent pattern of a higher proportion of SME suppliers in 2016 and 2017 is mainly caused by this data quality issue. Interestingly, the data quality problems were more significant amongst contracting authorities outside Zagreb.

Figure 23: Number of Lots with SME Suppliers by Zagreb/Non-Zagreb Contracting Authority by Year



49. Overall, SMEs were the main contractor for only around 13 per cent of total public procurement by value in Croatia between 2015 to 2020. According to a report published in 2018 by CEPOR[3], SMEs made up around 99.7% of the Croatian economy in each of the years 2013 to 2017 – although many of those SMEs will be engaged in business that will not be relevant to public procurement. There will be further SME involvement as subcontractors, which could be analyzed as part of any follow up work, but overall it seems highly unlikely that this will take the total value of SME involvement in public procurement to the 2017 EU average of 45 per cent of aggregate contract value.

50. Looking at SME suppliers who won contracts over the 2015 to 2021 period, the 'winning rate' for SMEs – successful bids as a proportion of all bids submitted over the period - was similar to that for other suppliers (see Figure 24). Although, as might be expected, the median size of contracts awarded to SMEs overall was lower than that for other suppliers, the median size of service contracts awarded to SMEs was higher than the median contract size for other suppliers (2.6 million Kuna compared to 2.1 million Kuna – see Figure 26). It will be important to understand what can be learned from the SMEs that are currently successful in Croatian public procurement to help wider SME participation.

51. Figure 25 shows the proportion of SME suppliers in three different market types, based on analysis of the number of suppliers receiving contracts in each county for each CPV category over the 2015 to May 2021 period:

- Monopolistic – where there is just one supplier;
- Oligopolistic – where there are between 2 and 5 suppliers; and
- Not Concentrated – where there are more than 5 suppliers.

52. 14.5% of monopoly suppliers are SMEs, but only 9% of suppliers in oligopolistic markets are SMEs. In the markets that are not concentrated, around 16% of suppliers are SMEs. It would

[3] Mirela Alpeza, Mirna Oberman and Maja Has, *Small and Medium Enterprises Report Croatia – 2018*

be worthwhile to explore whether they are experiencing particular difficulties in competing with larger firms with more resources in markets for particular CPV categories.

Figure 24: Winning Rate by SME Status

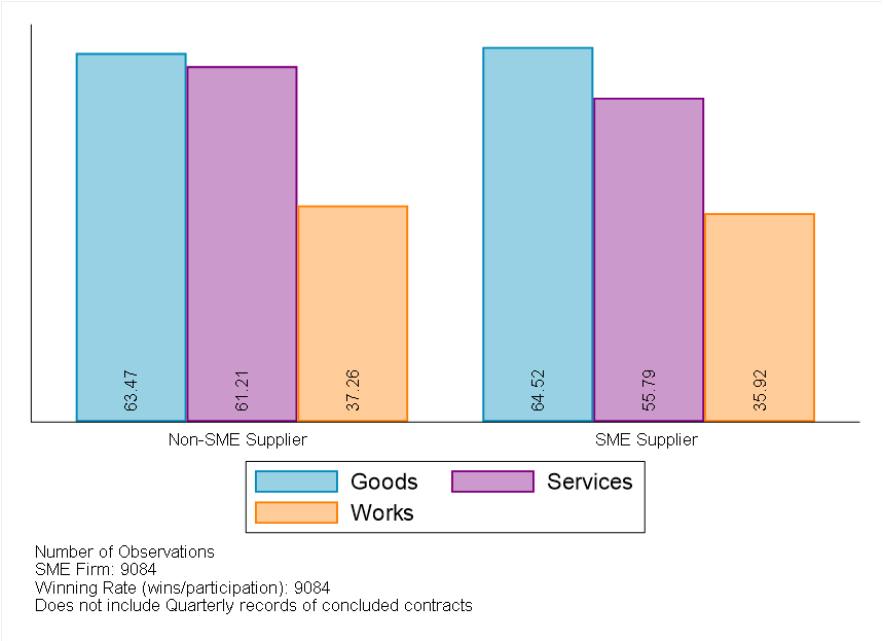


Figure 25: SME firms by Market Type

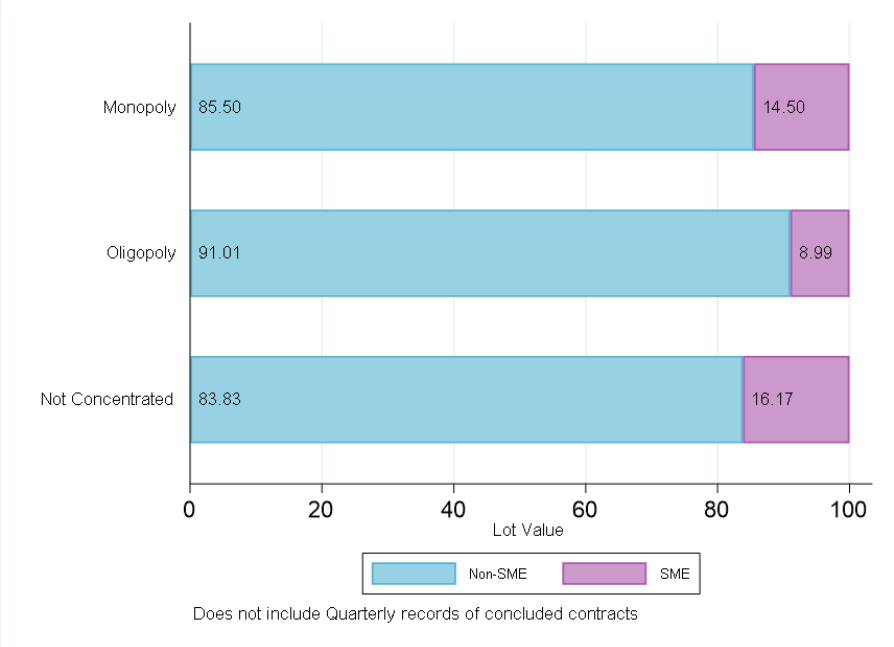


Figure 26: Median Contract Size by SME status

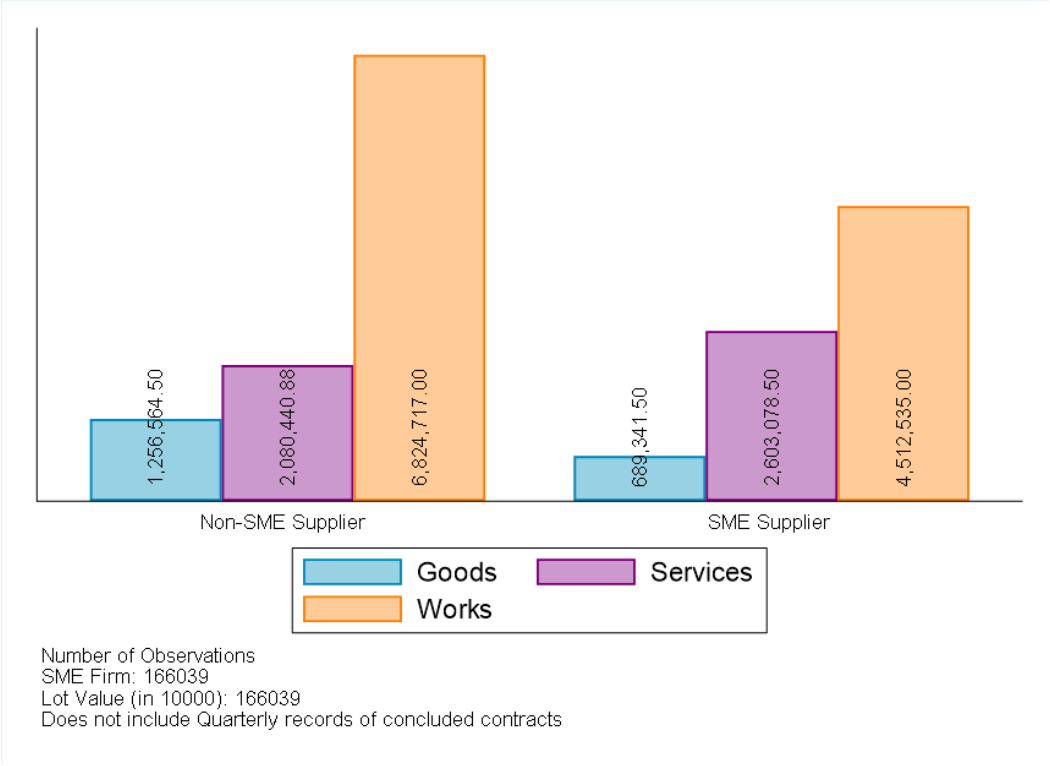
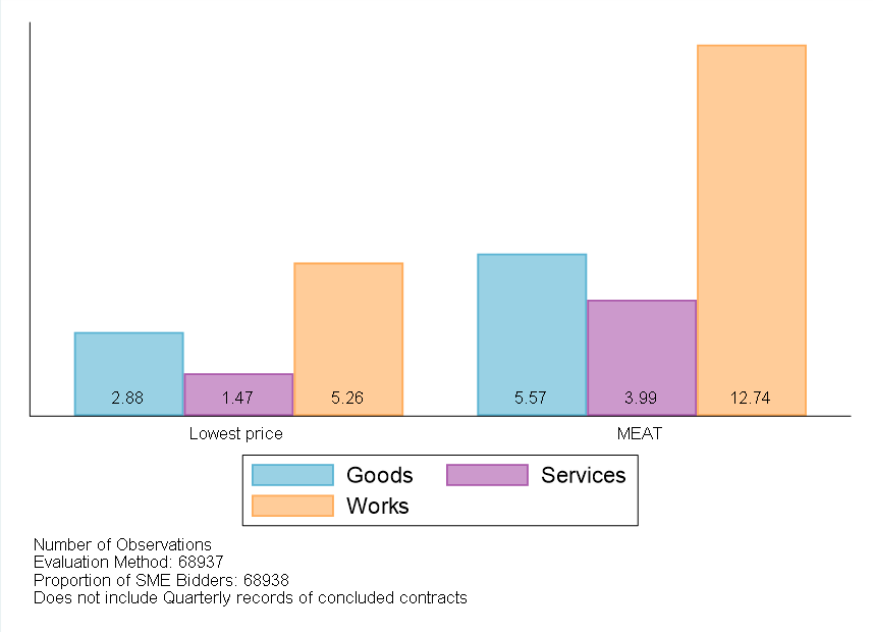


Figure 27: Proportion of SME Bidders per Process by Evaluation Method



53. Analysis of the factors which are drivers of SMEs winning contracts (see paragraphs 187 to 190 and Table 9 in Annex A) indicates that SMEs are slightly more likely to win a contract through open procurement. This may be due to the nature of contracts for which restricted procurement procedures are used, or it may be that the pre-qualification criteria used for restricted procurement procedures disadvantage SMEs. There was a comment from participants in the focus groups that factors such as lack of adequate credit scores for mandatory guarantee requirements could be a barrier for SMEs in public procurement. and there was some discussion of training needs and system improvements which might help SMEs compete effectively for public contracts.

54. In focus group discussion of how to respond to low SME participation, one practitioner suggested that training for SMEs would not be sufficient to address the issues. They suggested that the entire system would need to be changed: everything from sending tenders to evaluating tenders and eventual contract implementation. This participant suggested that the eProcurement portal would need to be overhauled to simplify the submission, as for some economic operators this has been too complicated. It was noted, however, that relying on IT solutions alone is likely not the whole solution either. One participant noted that they introduced an application for simple procedures, allowing tenderers to submit their tenders online. Despite this new technology, the number of submitted tenders did not increase subsequently, which the practitioner found surprising.

55. To understand properly what is needed to encourage SME participation in public procurement will require a more in-depth analysis that is out of scope for this review: survey or focus group work with SMEs themselves to understand what encourages them to bid or discourages them from bidding for public procurement, and systematic review of failed SME bids to identify any recurring issues of understanding of the process or setting of requirements which are acting as barriers to SME participation. Enterprise Survey work currently being carried out by the World Bank in Croatia will gather feedback from firms which currently participate in public procurement and from firms who do not, and this may provide a good starting point to look at barriers to participation. This could be supplemented by further work with Croatian SMEs in particular if necessary. Factors which have come up as barriers to SME participation in other countries include poor awareness of opportunities, lack of understanding of the process, lack of standardized procurement procedures, delays in receiving payments and perceptions that the system is not truly fair and open. The optimal policy response will depend on what SMEs themselves and procurement practitioners identify as current barriers to SME participation.

Procurement planning

56. Mandatory publication of procurement plans in Croatia is a significant feature of the public procurement system. It was required under the Public Procurement Act 2011 and remains a requirement under the PP Act 2016. Experience in other countries suggests that publication of plans can help significantly in securing effective competition as well as ensuring the transparency of public procurement.

57. Although procurement planning is well-established in Croatia, focus group participants mentioned delays in procedures, particularly for EU-funded projects, which can undermine effective planning and execution. This is borne out by analysis of the procurement data (see Figure 40). Pricing analysis was seen as a particular challenge for EU-funded projects which may contribute to delays (see also the discussion at paragraph 80).

58. More generally, coordination of procurement activity is always a challenge for public procurement practitioners, and this was highlighted by the focus group participants in Croatia also. It is important that procurement practitioners are able to communicate effectively with their colleagues within the organization. To make planning effective, there may need to be more work done to help senior managers understand the importance of procurement plans and to ensure effective collaboration with procurement practitioners to make these as accurate as possible.

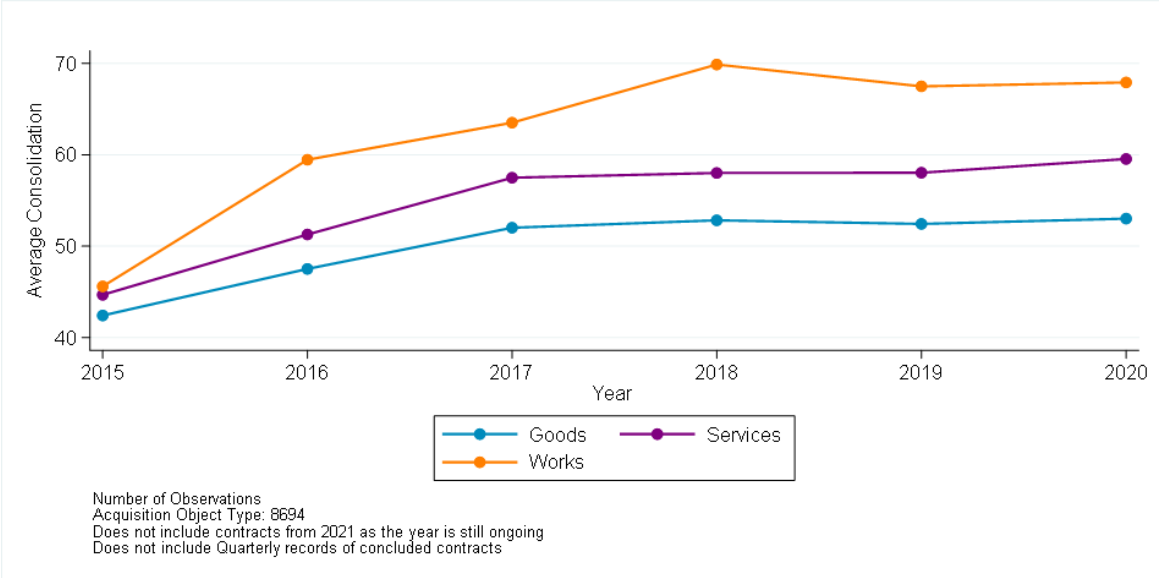
59. Although the procurement planning arrangements have been in place for some time, it the comments from focus group participants suggest that there may be scope for some improvement. A review of their effectiveness of the current procurement planning arrangements at some time during the next 3 years may be helpful in securing maximum benefit from procurement planning, including ensuring that potential suppliers are aware of upcoming opportunities for public contracts.

60. **Conclusion for this indicator**: the evidence suggests that levels of competition in Croatian public procurement are low. This may have implications for both overall value for money and security of supply. The policy response requires investigation of underlying causes and the operation of Croatian markets which cannot be determined by the data alone. The proposed approach to tackle this and decide on precise actions is discussed in section 3 on data-driven governance and improvement.

2.1.3 Indicator: Quantity of bidding processes to buy the same or a similar item

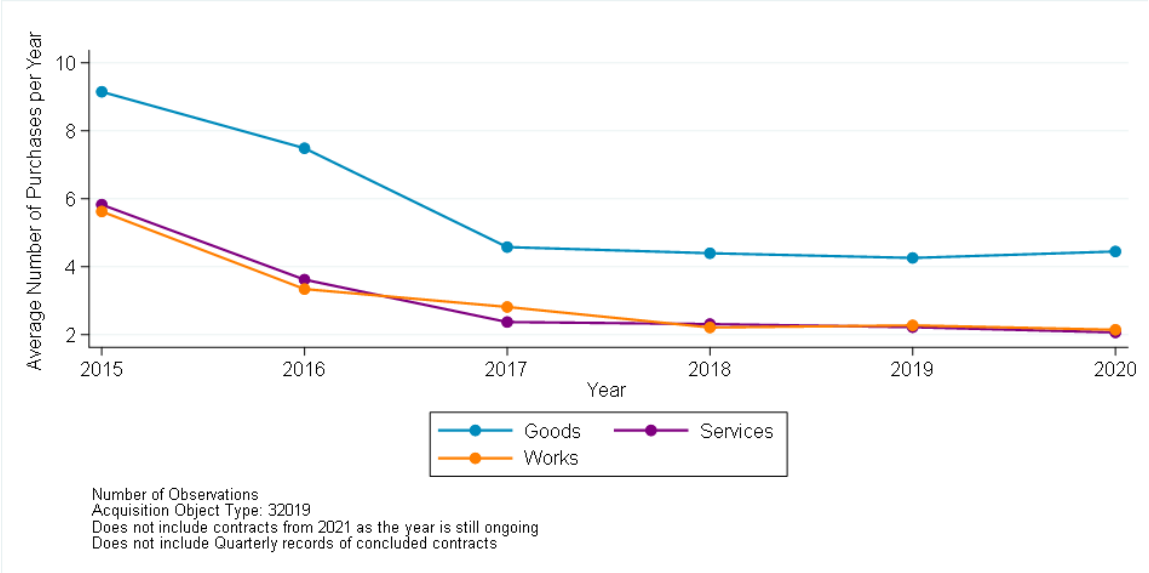
61. The analysis in this report considers as a measure of consolidation for each contracting authority and entity the highest value single lot awarded for particular category in each month as a percentage of the total value of lots awarded for that month. There is a demonstrable increase in procurement consolidation on this measure over the years 2015 to 2017, as shown in Figure 28, and that appeared to continue to 2018 for works procurement before falling slightly. Overall, consolidation levels appear broadly steady through 2019 and 2020.

Figure 28: Consolidation by Procurement Type



62. An alternative way of looking at consolidation is how many purchases a contracting authority or entity undertakes for each CPV category in a year. Figure 29 below shows that the median number of such possible 'repeat' purchases in a year fell significantly between 2015 and 2017, and has remained at the lower level up to 2020.

Figure 29: Median number of purchases per product-entity-year by year



63. The top 20 contracting authorities and entities have a median of more than 70 repeat purchases for the same CPV category code in a year. Klinicki Bolnicki Centar Rijeka has the highest number of 'repeat' purchases at 344 purchases per CPV category per year followed by Klinicki Bolnicki Centar Zagreb with 342 'repeat' purchases (see Figure 30).

64. Looking instead at the CPV categories that have the highest level of 'repeat' purchases by a contracting authority or entity in a year, 14 of the 20 CPV categories are for medical equipment and pharmaceuticals (see Figure 31). Various medicinal products have the highest median repetition of purchases per product code at 319 purchases per procuring entity per year. It seems likely that the repetition of purchases for products may be driven by the diversity of specific products under the product code.

Figure 30: Median Number of Purchases per CPV Category per Year by Top Contracting Authorities/Entities

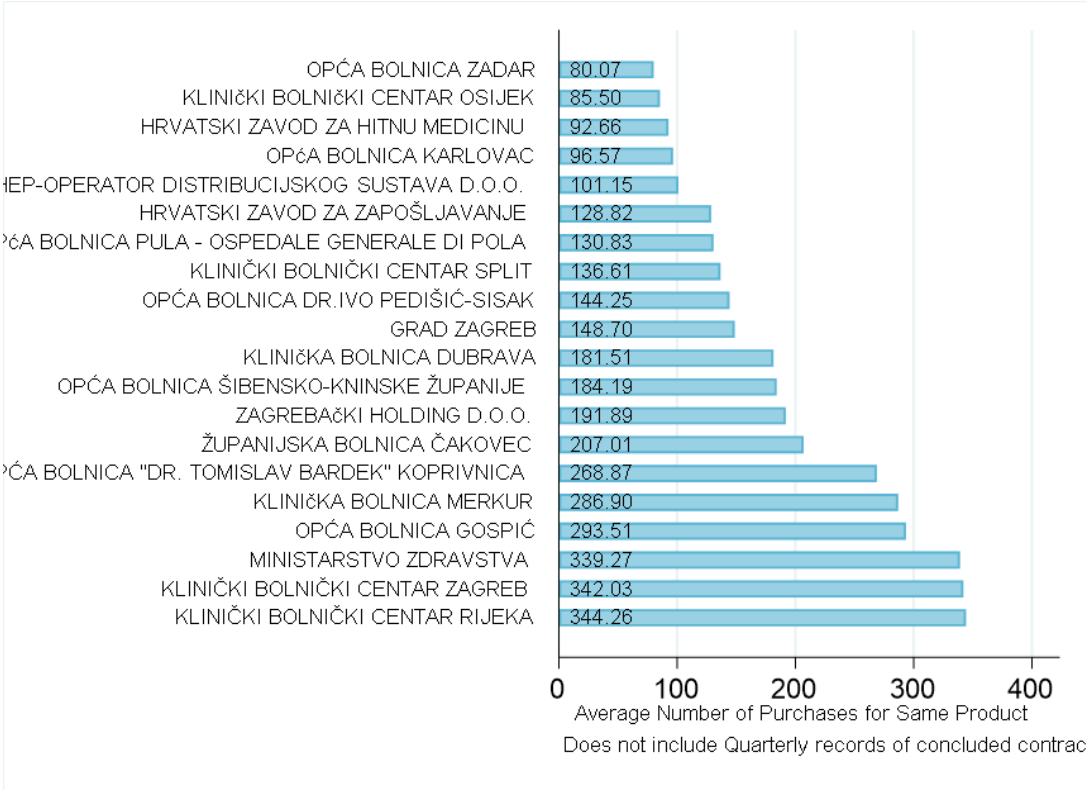
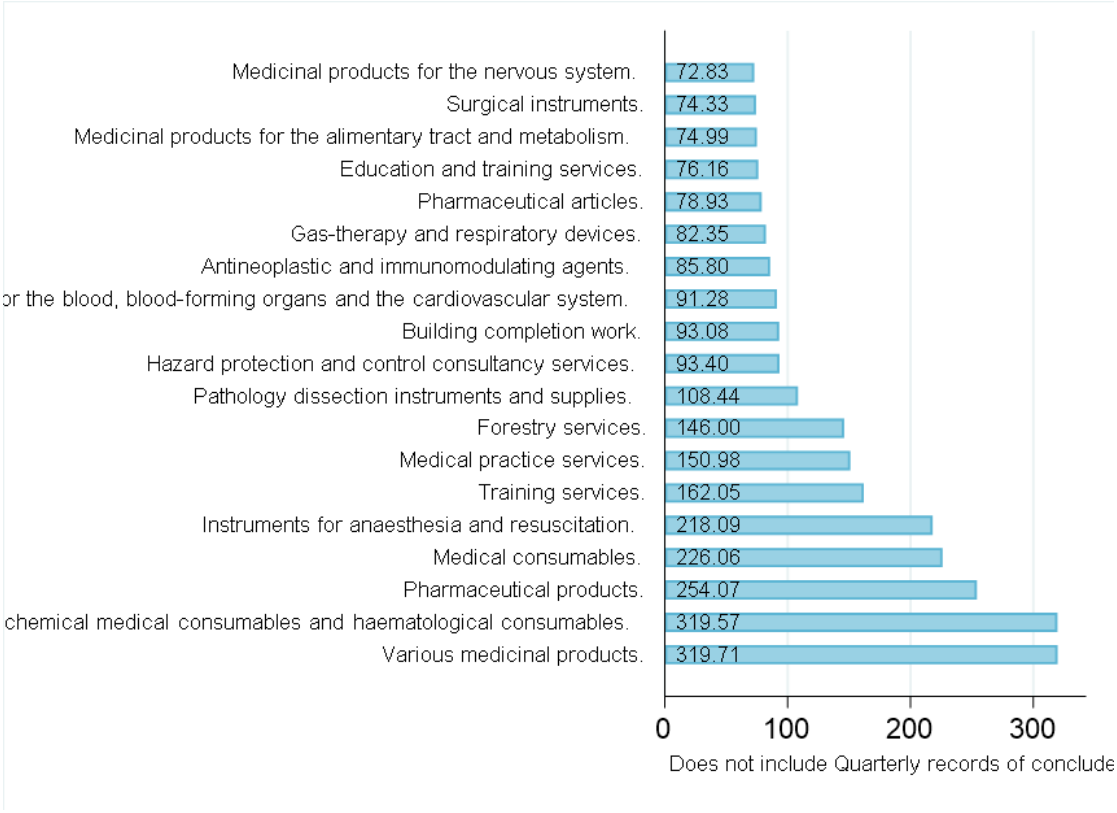


Figure 31: CPV Categories with most 'repeat' purchases by contracting authorities/entities in a year



65. These measures of consolidation are interesting for overall assessment of the scope for improvement but there are not directly comparable international data that would enable assessment of how Croatia is performing relative to other countries. The limitations of CPV categories have to be recognized, and in this case contracting authorities and entities may well be making purchases of goods, services and works which have the same category but which are still distinct and could not appropriately be consolidated. It is also not easy to identify where different, related lots may have been advertised and awarded through a single procurement process. The latter is particularly important to consider in looking at the potential impact on SMEs of increasing consolidation, as breaking down procurement processes into smaller lots where this is possible is often seen as a way of making public procurement accessible to SMEs.

66. It does not appear from the regression analysis at paragraphs 97 to 97 and Table 7 that the consolidation of demand is a significant driver of competition, but there may be scope for efficiencies in the administrative overhead of running procurement processes. In addressing consolidation, consideration needs to be given to security of supply and the risks and benefits of potentially working with a smaller number of suppliers compared to the potential benefits of reduced costs. As with other aspects, data on consolidation needs to be considered by procurement professionals with experience of the Croatian public procurement market.

67. Consolidation of procurement by individual contracting authorities and entities also needs to be considered alongside opportunities for consolidation through centralized or collaborative procurement across contracting authorities and entities, which is discussed in section 6 below.

68. **Conclusion for this indicator:** the evidence available is not sufficient to judge whether action is required to increase consolidation in general. Further investigation of opportunities to increase consolidation should be informed by considerations of security of supply and of market access, particularly for SMEs, as well as by a drive to reduce the administrative overheads of public procurement. The overall approach proposed is described in section 3 on data-driven governance and improvement.

2.1.4 Indicator: Incidence and size of cost overruns

69. Data on cost and schedule overruns was not available from the eProcurement system but was collected from a random sample of contracts in 60 procuring entities out of which responses for only 326 contracts were received. Since participation in the survey was not mandatory and there were some data availability issues, these sample data are liable to selection bias and should not be interpreted as representative of the overall trends in Croatia. There were also data quality issues which required heavy data cleaning and processing which again argues for caution in interpretation of the results.

70. Cost overruns across this sample of contracts fell significantly between 2017 and 2019, from 23 per cent to under 2 per cent (see Figure 32). This would be encouraging if it reflected a wider pattern across public contracts. The relatively low cost overrun of on average 1.82 per cent for works contracts (see Figure 33) in the sample is particularly striking, as experience in other countries suggests that these can be particularly difficult to manage effectively. However, as mentioned above, it is not possible to draw firm conclusions based on this limited and potentially biased sample.

Figure 32: Cost overrun for sample contracts by year

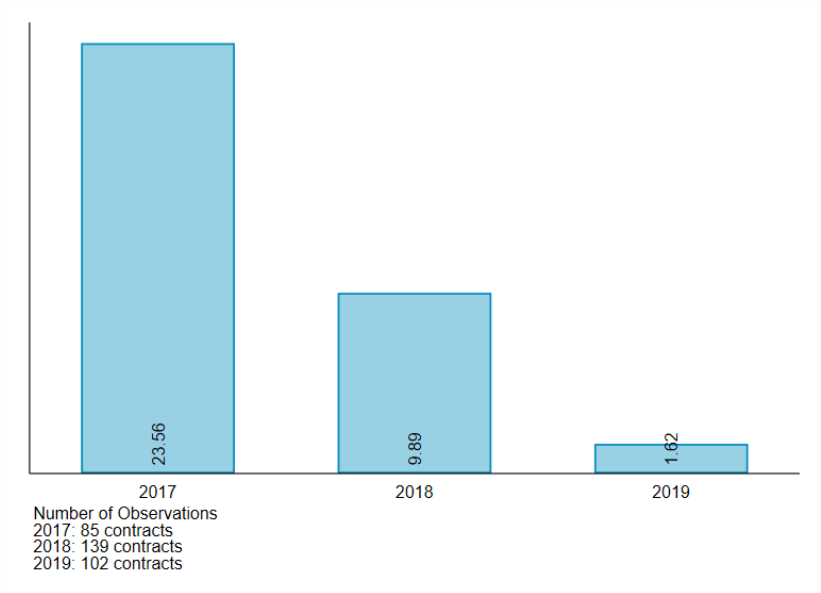
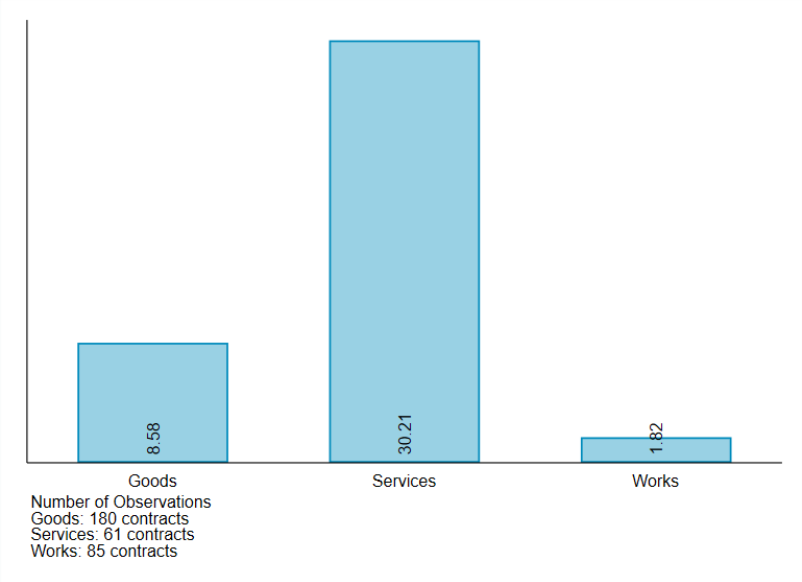


Figure 33: Cost Overrun for sample contracts by Procurement Type



71. Focus group participants reported that most contract implementation and supervision is carried out by technical staff and not the procurement experts. However, for smaller procedures and/or specific requests procurement staff are still involved, primarily with regard to complaints from economic operators or when contracts need to be re-negotiated.

72. Several participants also addressed the topic of contract termination. While some mentioned they had to go through early contract termination procedures they all stated that this was the least desired outcome as it led to further delays and was oftentimes painful because most companies that are unable to fulfil their contractual obligations do so involuntarily. However, except for force majeure events the contractual obligations still remain valid and if these cannot be satisfied the only alternative may be the termination. In any case participants stressed the importance of trying to find workable solutions with the economic operators and evaluating all options before moving towards a contract termination.

73. **Conclusion for this indicator:** the data currently available do not provide sufficient evidence to know whether there is a significant problem with cost overruns in Croatia, nor to do a robust international comparison. Collecting data on spending against each contract should be a priority for further system development, and this is covered in recommendation 11 in section 5 on digital transformation.

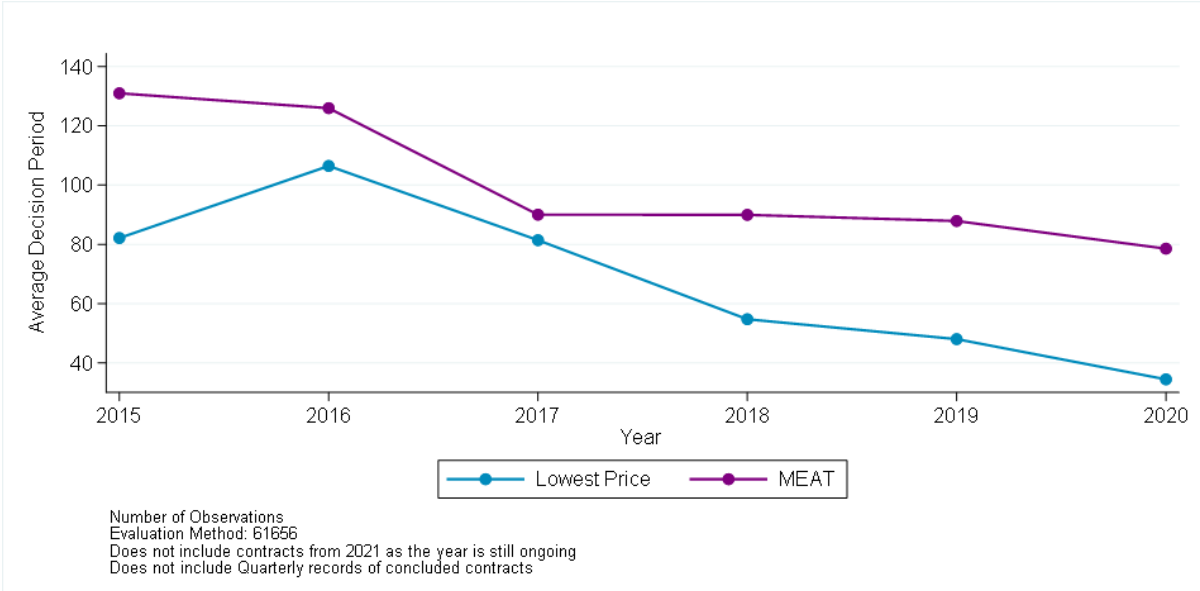
2.2 Indicators relating to Timely Delivery

2.2.1 Indicator: Time to complete different types of bidding processes

74. The decision period in a procurement process is calculated as the period between tender opening date and contract signing date, i.e. the time taken for a contracting authority or entity to evaluate the bids submitted in the procurement process and notify a successful supplier. The total processing period in a procurement process is calculated as the period between process initiation and contract signing date, i.e. the total time for a contracting authority or entity to complete the full procurement process and notify a successful supplier.

75. Overall, both decision periods and processing periods have become shorter since 2015, as shown in Figure 34 and Figure 35, and they follow very similar trajectories suggesting that the decision period is the main driver of the overall time taken for public procurement. Although decision periods using MEAT evaluation are longer than those for lowest price evaluation, the average decision period in 2020 using MEAT evaluation was slightly shorter than the average decision period in 2015 using lowest price, suggesting that this evaluation methodology is now well-established since the change brought in by the PP Act. There is a seasonal pattern to decision periods, with significantly longer decision periods for procurement procedures initiated in November and December (see Figure 36) – presumably due to the impact of holidays.

Figure 34: Median Decision Period[4] by Evaluation Method and Year



[4] Median decision period is calculated using a continuous variable with the average decision period per procurement type

Figure 35: Median[5] Processing Period by Evaluation Method and Year

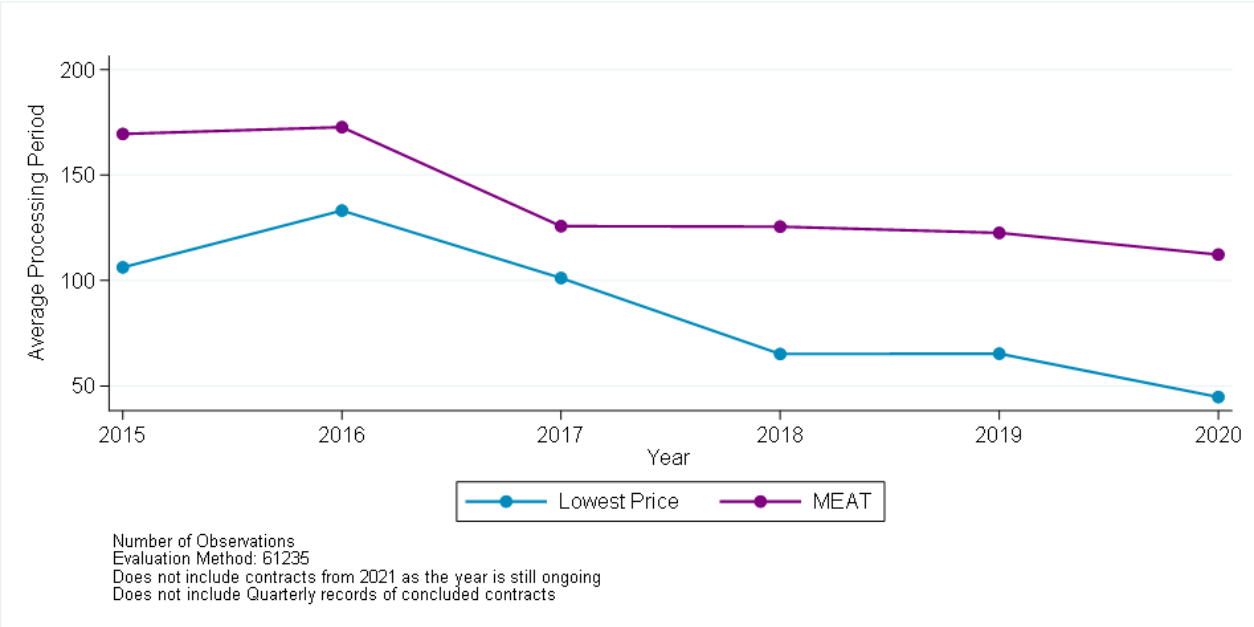
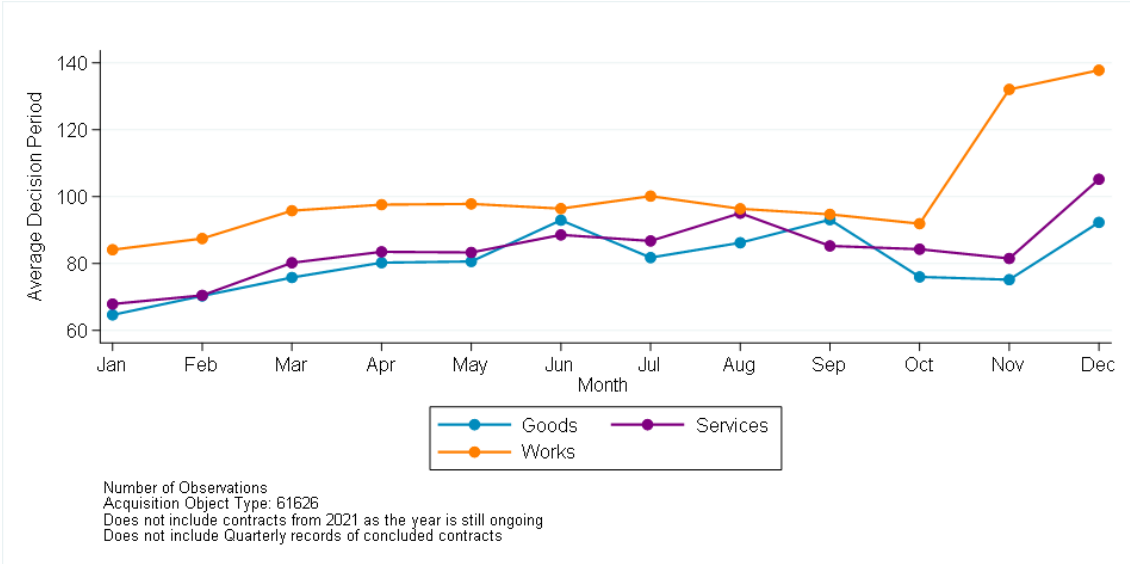


Figure 36: Median Decision Period by Month



[5] Median processing period is calculated using a continuous variable with the average processing period per procurement type

76. The decision period has been calculated for each procurement as the time between receipt of bids and award of the contract. As would be expected, there are very substantial variations between decision periods for different procurement procedures, with competitive dialogue procedures taking the longest time and contracting under an existing framework agreement the shortest time (see Figure 37). Total processing periods, that is the total time from the start of the procurement process to the award of the contract, are substantially longer than decision periods for the procedures involving negotiation or competitive dialogue, as can be seen from Figure 38. Note that contracting under framework agreements, purchases through dynamic procurement systems and negotiated procedures without prior publication are omitted from Figure 38 due to missing data on the start date of the procedure.

Figure 37: Median Decision Period by Procurement Procedure

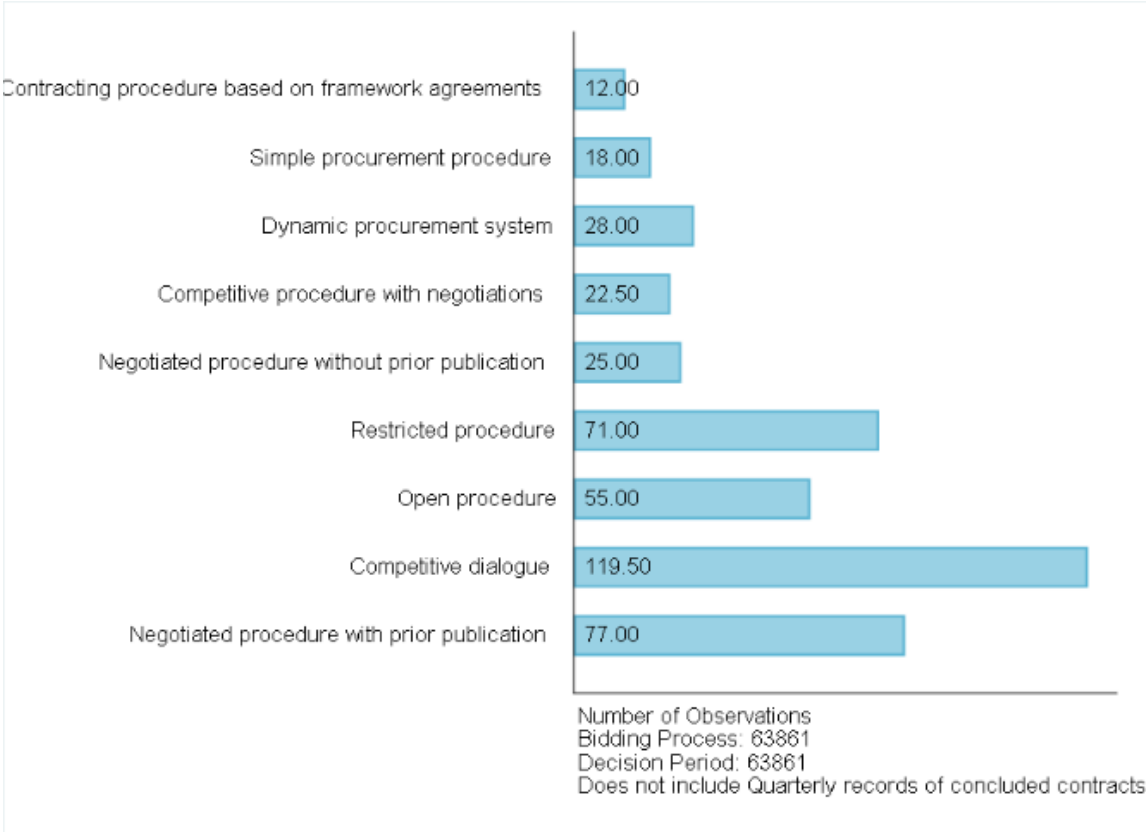
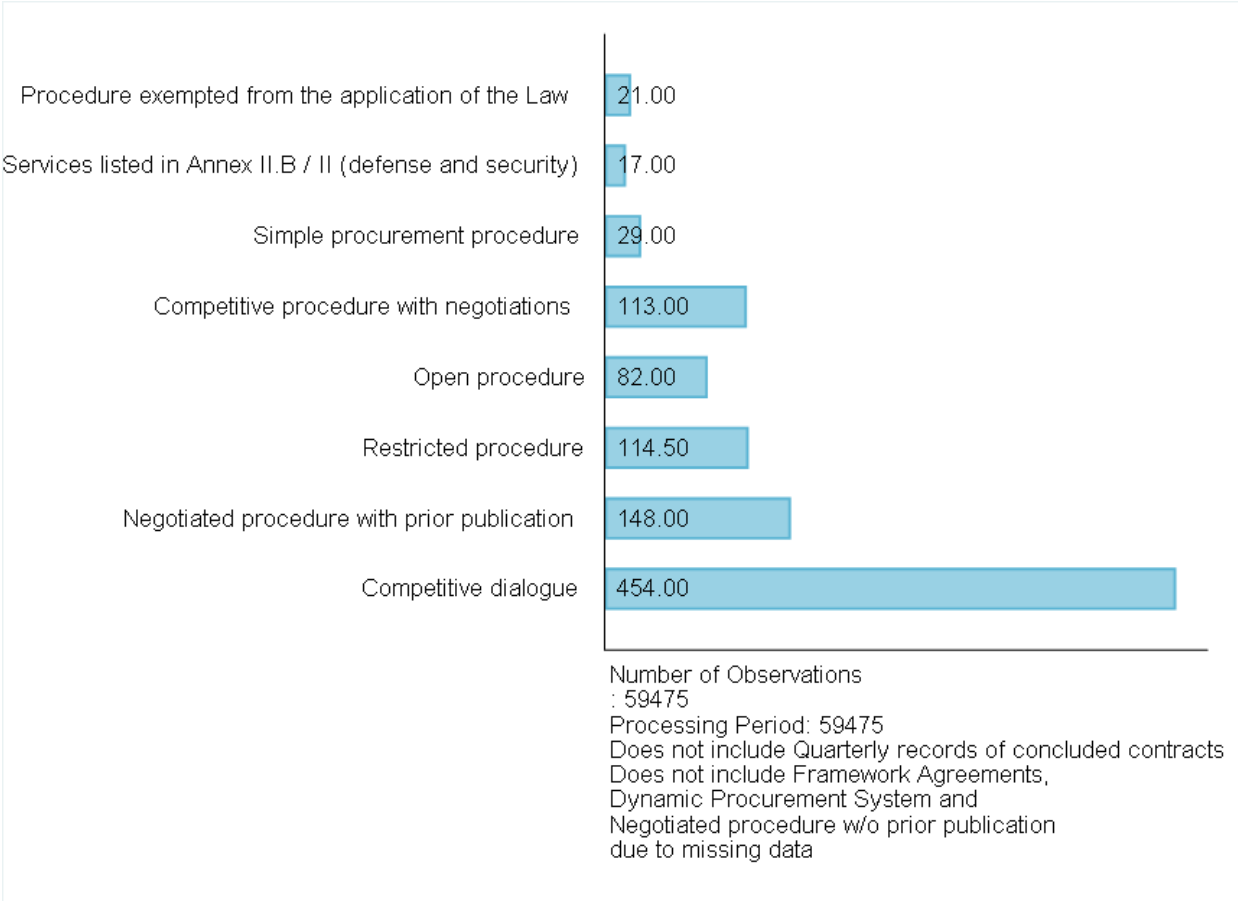
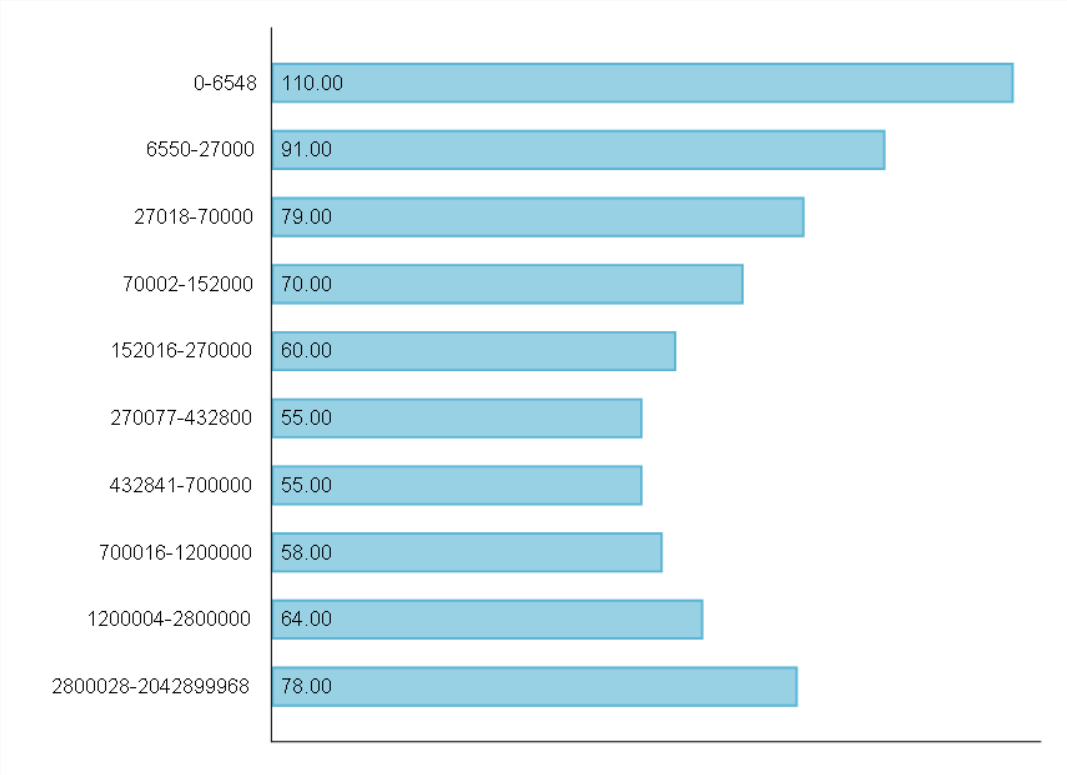


Figure 38: Median Processing Period by Procurement Procedure



77. More surprisingly, small value contracts as well as large value contracts have longer average decision periods, and the longest decision period is 110 days for the smallest lots with a median size of less than 6548 Kuna. There are also very substantial variations between buyers in their execution of the procurement process. As an example, the decision periods for 1918 purchases of disposable, non-chemical medical consumables and hematological consumables during 2019 using the open procurement procedure appear to vary between 17 and 359 days, with a median of 86 days. Both the variations in decision periods between contracting authorities and the reasons for the notably long decision periods for smaller value contracts would be worth further exploration with contracting authorities.

Figure 39: Median Decision Period by Contract Value



78. Focus group participants identified a variety of factors that influence the efficiency and motivation of procurement staff in Croatia including funding, sufficient staffing, and availability of training and IT tools. Many focus group participants pointed out the extensive time constraints that they faced. This was especially acute with regard to professional training and learning, where many stated that they had no time for training due to their workloads. The high workload was attributed to a variety of factors, including the seasonality of workloads in some sectors, for instance where a lot of new tenders are published in spring for works to be conducted during the summer and this leads to chokepoints for procurement teams. Some sectors experience long delays in their procurement due to complexity or the nature of the industry, which leads to an accumulation of many open procedures at the same time.

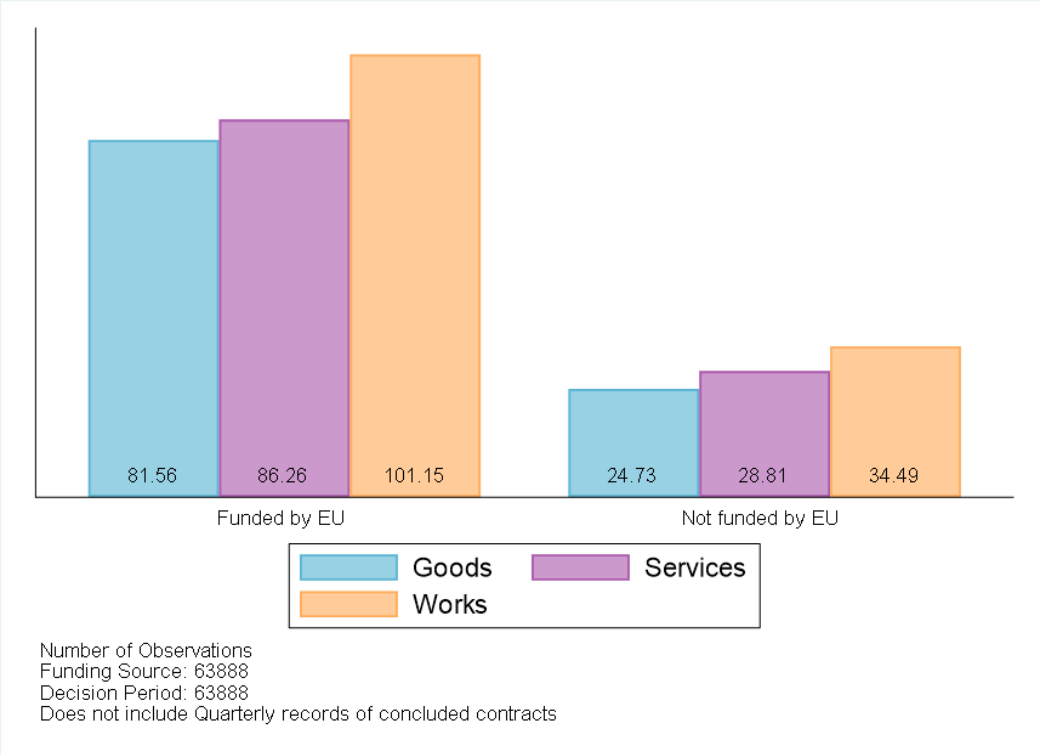
79. Another factor that leads to time constraints is the high turnover rate of staff, leading to a significant overhead of work in training new recruits. Many focus group participants stated high turnover rates as a major cause of concern, citing that especially younger employees find more appealing and interesting positions both abroad and in other functions and choose to move. This affects professionalism and increases the need for training of new staff. One participant stated that they had enough knowledge but the introduction of new requirements and guidelines almost annually required further training of staff and undermined staff capacity. While many participants stated that they felt appreciated by their superiors and work colleagues, a few also said that the importance of the procurement function was not sufficiently recognized.

80. When discussing concrete procurement procedures several participants named long durations as a major factor that made their life difficult as it artificially extended the procedures and created more bottlenecks. Several focus group participants regarded the deadlines set for different types of procurement procedures as too long to work efficiently. Some focus group

participants also named pricing analysis as a problem, especially with regard to EU-funded projects that often took several years to get approved. By the time the tenders were approved and ready for publication, market prices already experienced an increase, leading to budget shortfalls that triggered further delays.

81. The data analysis demonstrates the point raised by procurement practitioners in that decision periods for EU-funded procurement processes are substantially longer than for non-EU-funded processes (see Figure 40). The median decision period for EU-funded processes is almost double that for non-EU-funded processes for goods and works and more than double in the case of services. If there are any steps which can be taken to streamline the procurement process for EU-funded projects, this could be a significant efficiency gain for public procurement teams and may help ensure these contracts remain attractive to suppliers in the longer term, but minimum time periods are set by the European public procurement directives so cannot be changed by Croatia unilaterally.

Figure 40: Median Decision Period by Funding Source



82. Establishing the technical specifications for a tender requires a lot of coordination inside an organization with colleagues from other departments and several participants felt that coordination and communication needed to be improved to help reduce the time to prepared tender documents. One participant stated that plans are not adopted on time something that cannot be influenced by the procurement unit but hinges on the financial/accounting unit. Also, technical teams expect tenders to be published at sometimes unrealistic timeframes. However, as these timeframes are set out by the procurement act and the legal body underlying it, there is little that can be done at the execution level to change this. Several focus group participants stressed key to solving this is building and strengthening synergies between different departments and

institutions, since procurement is a highly collaborative process within an organization that can only be well executed if this collaboration is efficient and roles and functions are clearly assigned.

83. The variations between decision periods for procurement procedures all being carried out within the same legal framework are striking. Before any change to deadlines or procedures is considered, there needs to be more interrogation of the data and discussion with procurement practitioners about what is driving the particularly fast or slow decisions on procurement processes and what changes would help both reduce the average decision time and also reduce the variability between buyers. To have the greatest impact, these explorations should start by looking at categories of goods and services with both a high number of procurement processes annually and a high total expenditure. Exploration of the reasons why there are such long decision periods for smaller value contracts would also be worthwhile.

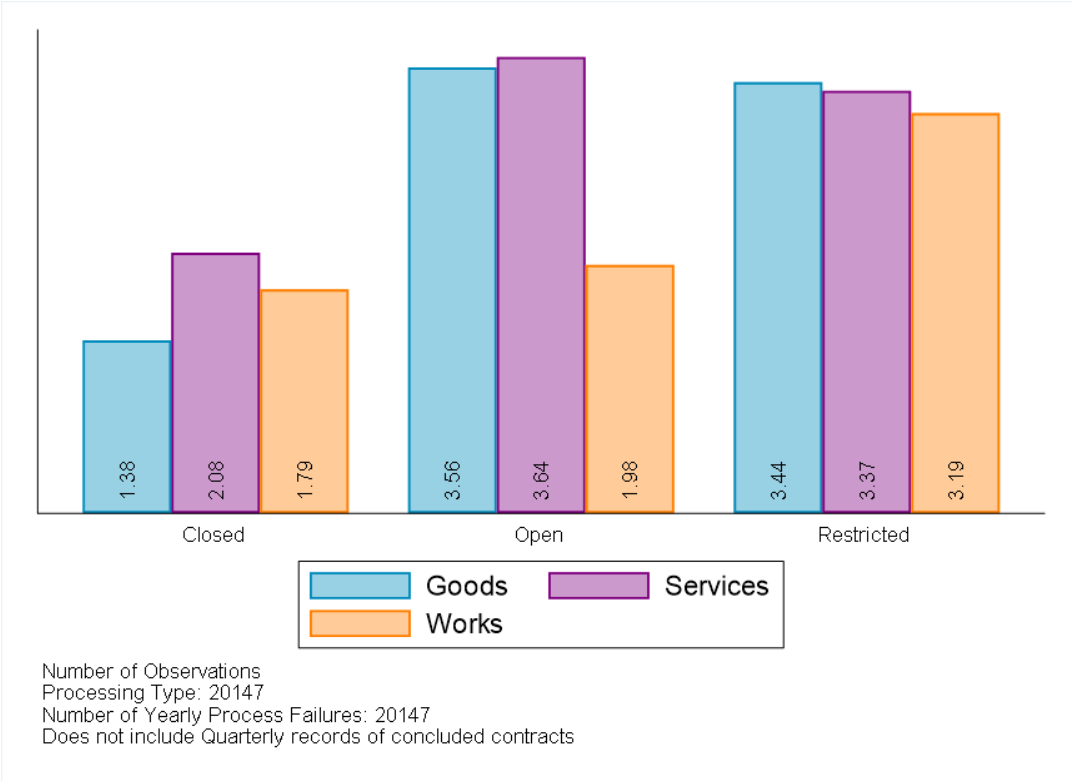
84. **Conclusion for this indicator:** the evidence suggests that average decision times for public procurement in Croatia have been decreasing, which is positive, but the variation in decision times between contracting authorities/entities for similar categories of goods and services suggests that there may be room for further improvement. It is not possible to determine the underlying causes of the variations in decision times by looking at the data alone. An approach to further investigation of this and other points is covered in section 3 on data-driven governance and improvement.

2.2.2 Indicator: Bidding processes successfully awarded as opposed to failed or cancelled:

85. The median number of failures[6] in procurement processes per year for different categories of procurement procedure is shown in Figure 41. Any procurement processes which fail are not an effective use of the time of procurement practitioners, but it is inevitable that there will be some processes which do not result in a contract award for a variety of reasons. The overall level of failures and cancellations does not look so high as to be a major concern, although it may be helpful to look at numbers of failures and cancellations compared to the overall number of contracts let by each contracting authority/entity and, as with the variations in the decision period, explore any variations variation in the proportion of failures across different categories of goods and services. As with other aspects, there would need to be more in-depth exploration with the procurement practitioners themselves to identify the reasons for any variations between buyers. There may be interventions through training or revised guidance that would help to reduce the levels of failure or cancellation in future.

[6] Median number of failures is calculated using a continuous variable with the average number of failures per procurement type

Figure 41: Annual Failures per Contracting Authority/Entity by Category of Procedure



86. **Conclusion for this indicator:** the evidence does not suggest that failures or cancellations are a major or increasing problem, but they should continue to be monitored as part of an overall approach to data-driven governance and improvement, as discussed in section 3.

2.2.3 Indicator: Incidence and size of schedule overruns

87. Data on schedule overruns was collected through a separate exercise from a random sample of contracts across all contracting authorities and entities in Croatia. Returns were received from 41 contracting authorities and entities covering 229 contracts with a revised contract date or final date of delivery. Schedule overrun was calculated as the difference between the revised contract date or the final date of delivery and the original contract end date (365 days from contract signing date).

88. Schedule overruns across this sample of contracts fell between 2017 and 2019 (see Figure 42). The same considerations of data quality and small sample size apply here as to consideration of cost overruns, so while the reduction is potentially encouraging if it were replicated across public contracts, it would not be sensible to reach any firm conclusions on the basis of the sample data. Figure 43 shows a breakdown of the schedule overruns in the sample by goods, services and works. Services contracts show by far the longest overrun. It is possible that there are some contract extensions included in these data as well as overruns.

Figure 42: Schedule overrun for sample contracts by year

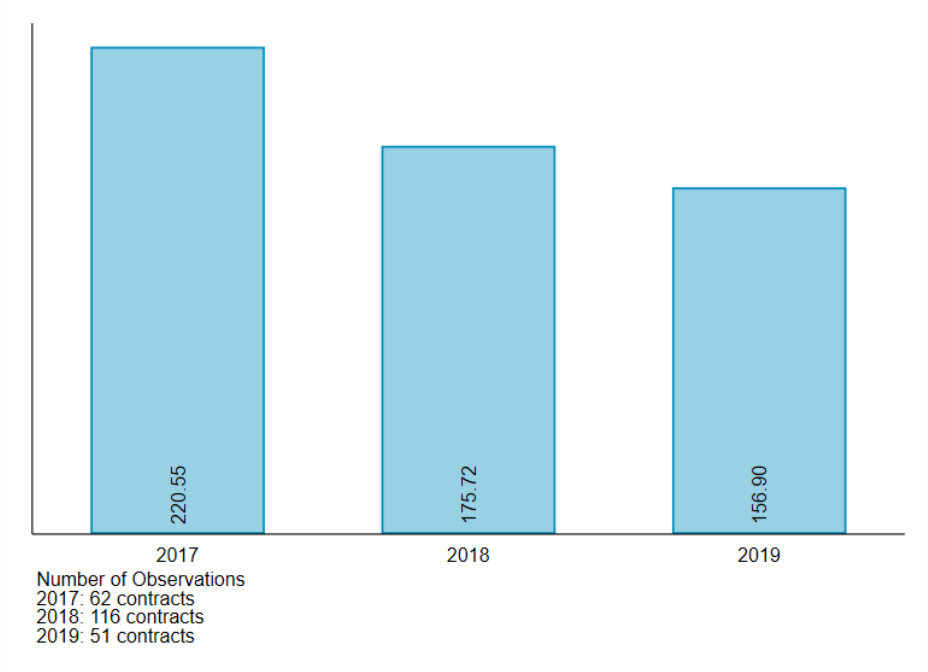
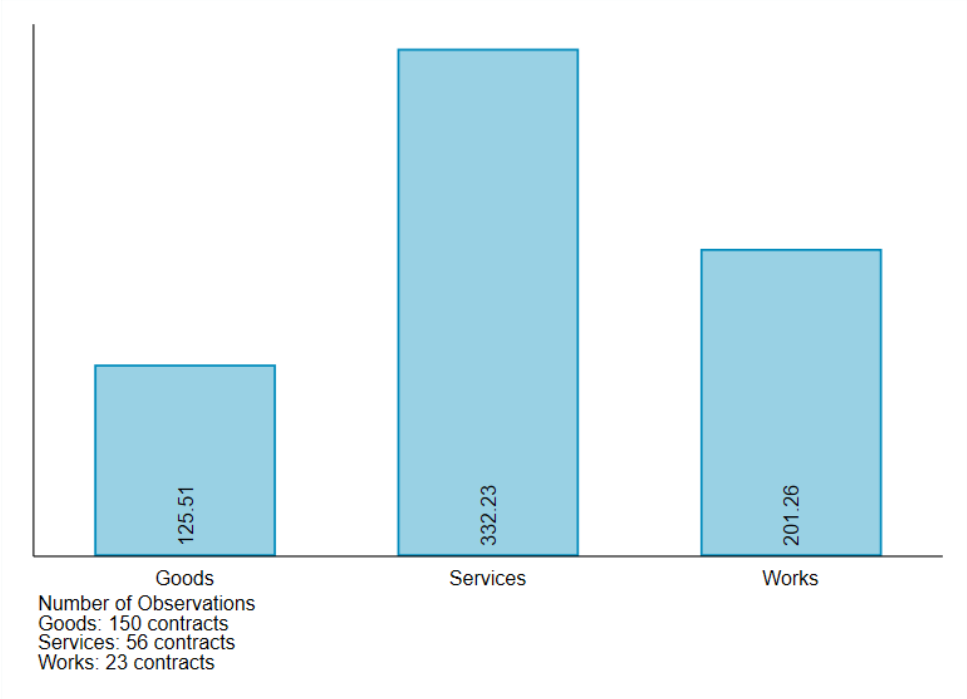


Figure 43: Schedule overrun for sample contracts by Procurement Type



89. In addition, an online survey tool was used to gather the experience of procurement officers on contract implementation. A full description of the survey approach and the questionnaire used is given in section B.4 of Annex B. Figure 44 and Figure 45 summarize the responses on timeliness of contract completion. Around a third of respondents (137 out of 408, or 33.5%) stated that more than 10% of contracts administered by their organization were delivered late. Just over half of respondents (209 out of 400, or 52.3%) stated that fewer than 10% of contracts administered by their organization were delivered early.

Figure 44: Percentage of Contracts delivered later than expected according to survey responses

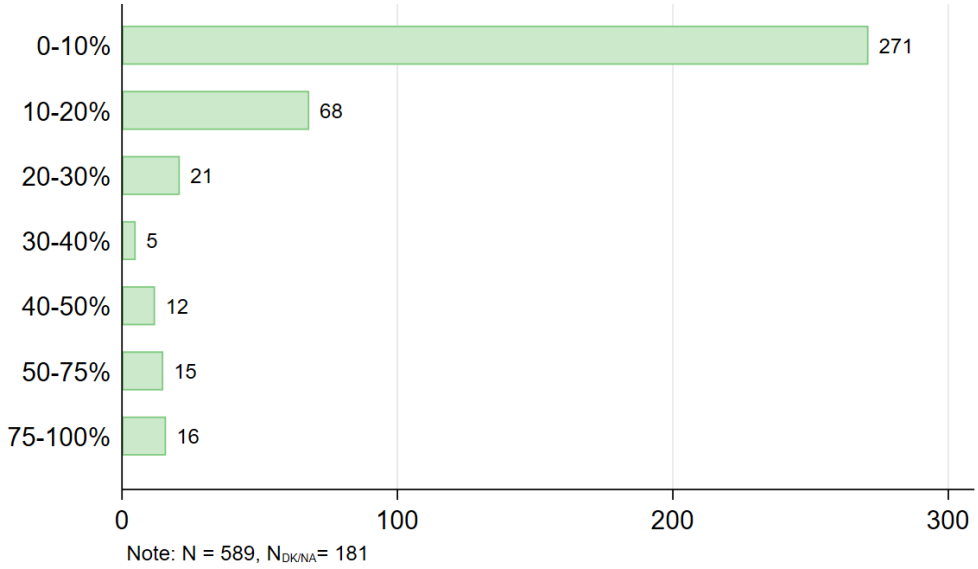
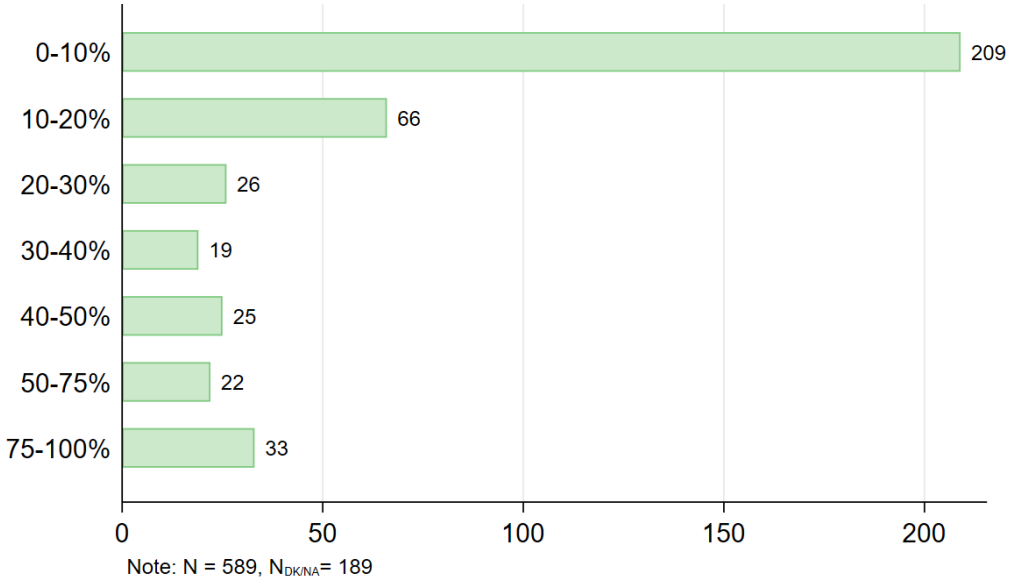


Figure 45: Percentage of contracts delivered earlier than expected according to survey responses



90. As reported in section 2.1.4 on cost overruns, focus group participants reported that most contract implementation and supervision is carried out by technical staff and not the procurement experts.

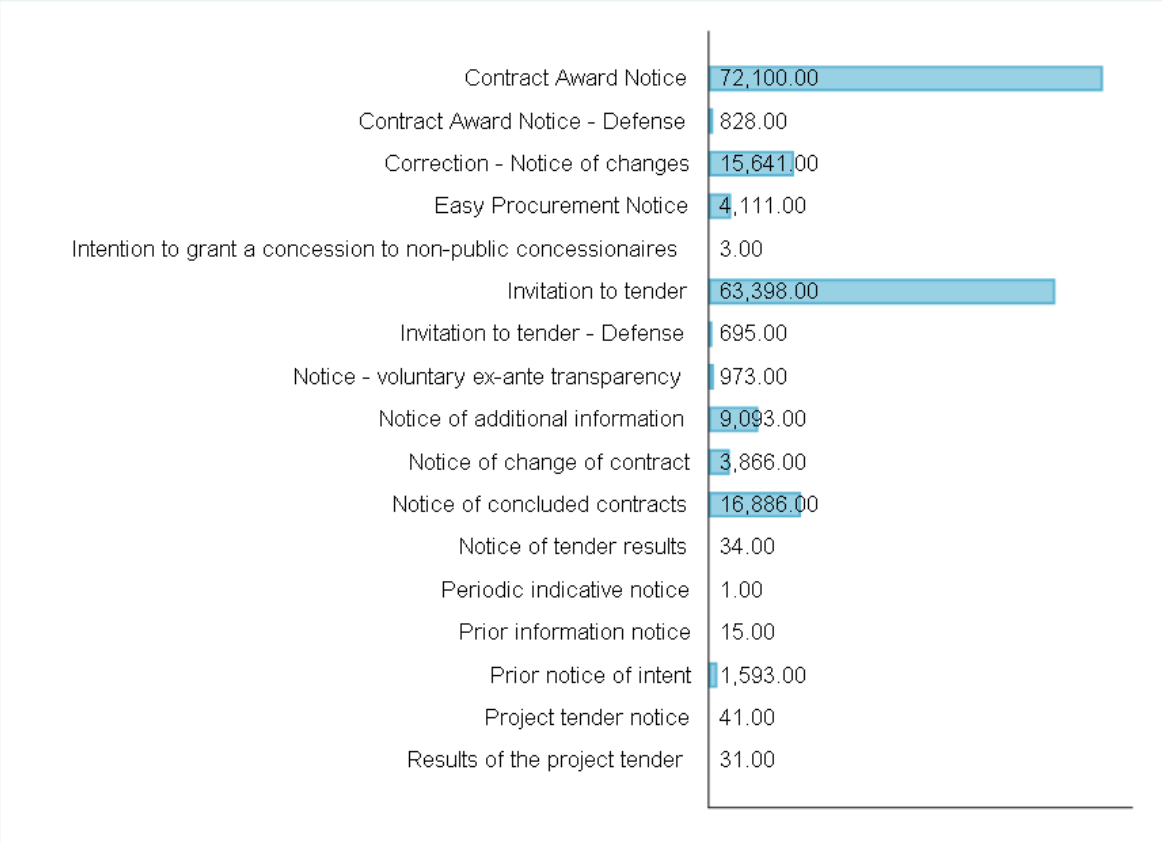
91. **Conclusion for this indicator:** the data available do not provide sufficient evidence to know whether there is currently a significant problem with schedule overruns in Croatia, nor to do a robust international comparison. Collecting data on delivery or conclusion dates for each contract should be a priority for further system development, as part of monitoring for overall contract implementation and management as covered in recommendation 11 in section 5 on digital transformation.

2.3 Indicators relating to Transparency, Quality and Fairness

2.3.1 Indicator: Publication of invitation for bids, contract awards and contract implementation information

92. The Procurement Policy Directorate and other state bodies have clearly recognized the importance of transparency as a key driver of integrity and public confidence in the public procurement system. The requirement to publish invitations to bid through the eProcurement system is the foundation of open and transparent procurement. A full breakdown of the data showing documents published on the eProcurement portal is shown in Figure 46 below.

Figure 46: Documents published on the eProcurement Portal



93. Article 28 of the PP Act requires contracting authorities/entities to maintain and publish a register of public procurement contracts. While the 2011 Public Procurement Act set out the information which must be contained in that register, which included information on subcontractors, the date of conclusion of the contract, the total amount paid to the supplier under the contract and the reason for total payment being higher than the original contract value where this occurred, Article 28 of the PP Act gives responsibility for setting the requirements for contract registers to the Procurement Policy Directorate.

94. Contract implementation information is important for transparency of the public procurement the system and also important for assessing system performance and informing further improvement work. Both transparency and procurement system improvement would be improved by collecting and publishing such information centrally. As a minimum it would make

sense to collect all the information required under Article 28 of the PP Act through the eProcurement system in future. A more ambitious approach would be to link all payment data relating to contracts to the procurement data and to capture all contract variations through the eProcurement system also.

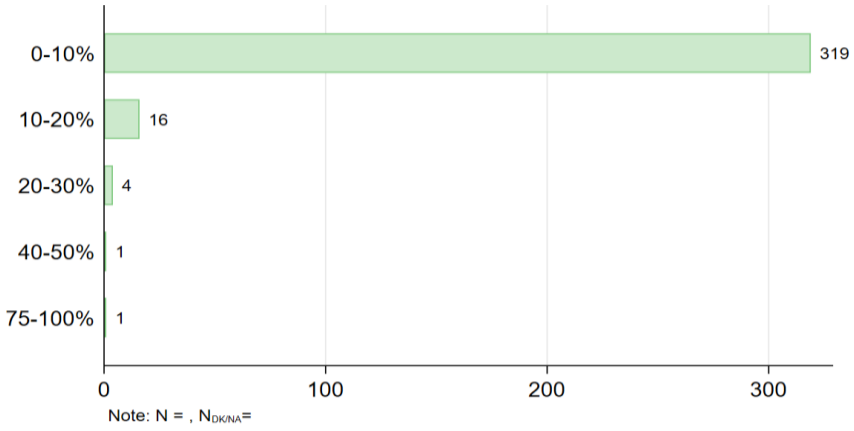
95. **Conclusion for this indicator:** the evidence suggests that the PP Act in Croatia already requires a good level of transparency in publication of bids, contract awards and contract implementation information, but this could be improved by gathering all of the information required under Article 28 of the PP Act centrally through the eProcurement system and by building on this to link all payment data relating to contracts to the procurement data and capturing data on all contract variations. This is covered in section 5 on Digital Transformation and in recommendation 11.

2.3.2 Indicator: Quality of goods, works and services received

96. The eProcurement system does not include any data on the quality of goods, works and services received. To supplement the public procurement data analysis, a survey was carried out to gather data from procurement practitioners on contract award and implementation practices and overall quality of goods, services and works received. A full description of the survey approach and the questionnaire used is given in Section B.4 of Annex B.

97. When asked about the proportion of contracts that where none of the bidders met the evaluation criteria, 319 respondents stated that this applied to fewer than 10% of procurement processes, while only 22 respondents stated that the bidders did not meet the criteria for more than 10% of procurement processes (see Figure 47).

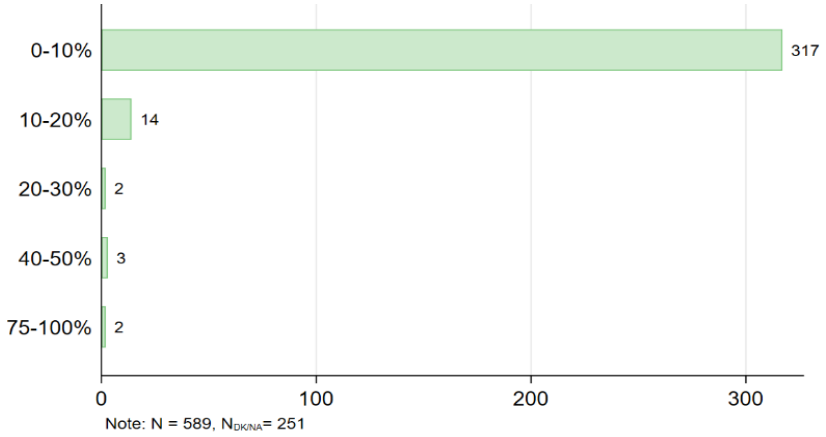
Figure 47: Percentage of Tenders where none of bidders met the criteria according to survey responses



98. In spite of the overall data analysis at section 2.1.2 showing low levels of competition for many procurement processes, 317 survey respondents stated that fewer than 10% of processes run by the contracting authority or entity had a low or inadequate number of bidders, compared to 21 who stated that more than 10% of processes had a low or inadequate number of bidders (see Figure 48). This discrepancy between the perceptions of procurement officers and the results of the data analysis is interesting. It may be that experience of working in Croatian public procurement has led to procurement officers having low expectations of the number of bidders,

or there may be other factors at work. Improvement work focused on increasing competition will need to take account of the experience of procurement officers as well as the data analysis.

Figure 48: Percentage of tenders where there was a low or inadequate number of bidders according to survey responses



99. When asked about the percentage of contracts awarded to suppliers with a previous record of poor quality, only 18 respondents out of 283 stated that more than 10% of the contracts in their organization were awarded to suppliers with a previous record of poor quality. Those 18 respondents were asked the follow up question: 'How often did your organization award a contract to a supplier with a previous record of delivering poor quality for the following reasons?', with the reasons listed as:

- winning supplier had the lowest price;
- none of the other suppliers met the evaluation criteria;
- no other firms bid; and
- the winning supplier had a good relationship with the contracting authority/entity.

100. The responses to each part of this follow up question are summarized in Figure 49, Figure 50, Figure 51 and Figure 52 below. Results based on such a small number of responses need to be approached with caution, but even a small proportion of contracts being awarded to suppliers with previous track records of quality issues due to a focus on price, a lack of other valid bids or no other bids being received at all is a matter of concern. Although an even smaller number of respondents suggest that a supplier with a previous track record of quality issues would be awarded a contract because of a good relationship with the contracting authority or entity, but that would be an even bigger concern. These results underline the need to start central collection of data on contract management and delivery and to monitor any patterns of contracts awarded to suppliers who have not satisfactorily addressed quality issues from previous contracts.

Figure 49: Reasons for awarding a contract to a supplier with a previous track record of low quality: winning supplier had lowest price

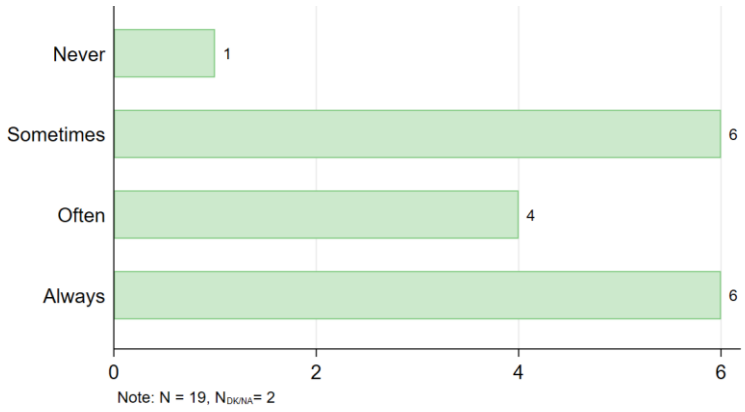


Figure 50: Reasons for awarding a contract to a supplier with a previous track record of low quality: none of the other bidders met the criteria

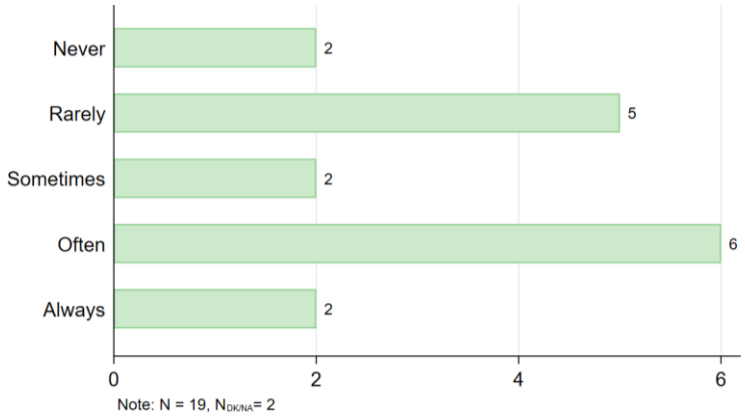


Figure 51: Reasons for awarding a contract to a supplier with a previous track record of low quality: no other firms bid on the tender

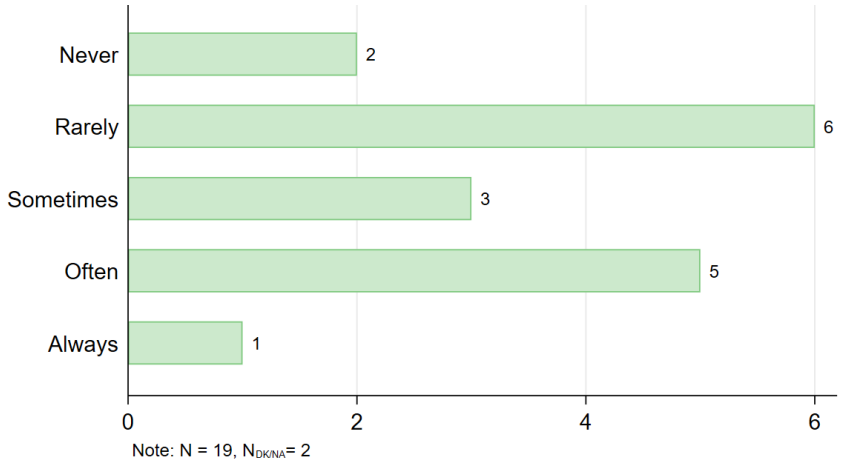
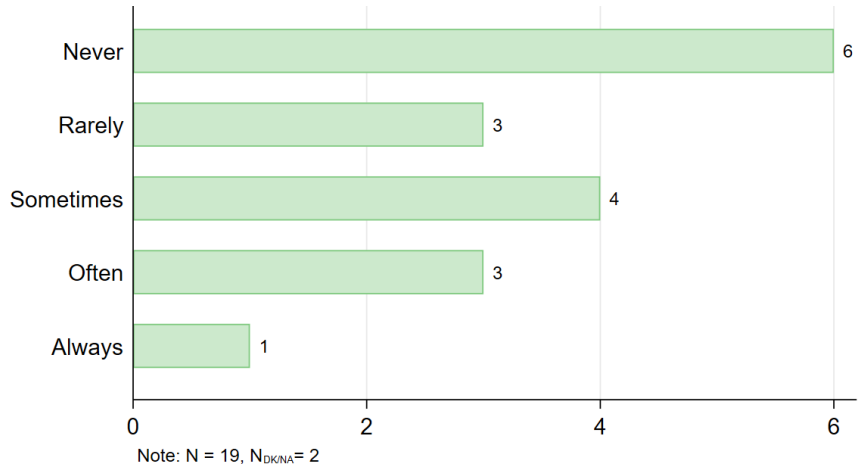


Figure 52: Reasons for awarding a contract to a supplier with a previous track record of low quality: firm had a good relationship with the contracting authority



101. Turning to quality issues on a given contract rather than previous track record of quality, most respondents (400 out of 486) reported that the quality standards on 75% or more of contracts met the expectations of the contracting authority or entity (see Figure 53). An even higher proportion of respondents (412 out of 486) reported that the supplier was reliable in the delivery of 75% or more of the contracts (see Figure 54). The significant minority of respondents who stated that fewer than 75% of contracts met quality expectations or had a reliable supplier need further investigation. The survey went on to ask more questions about procurement officer experiences of the types of problems experienced on contracts.

Figure 53: Percentage of contracts where quality met the expectations of the organization according to survey responses

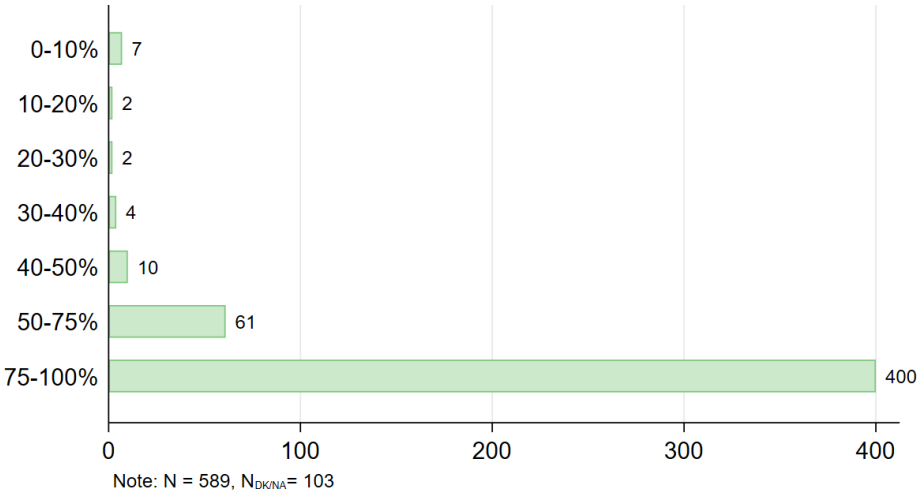
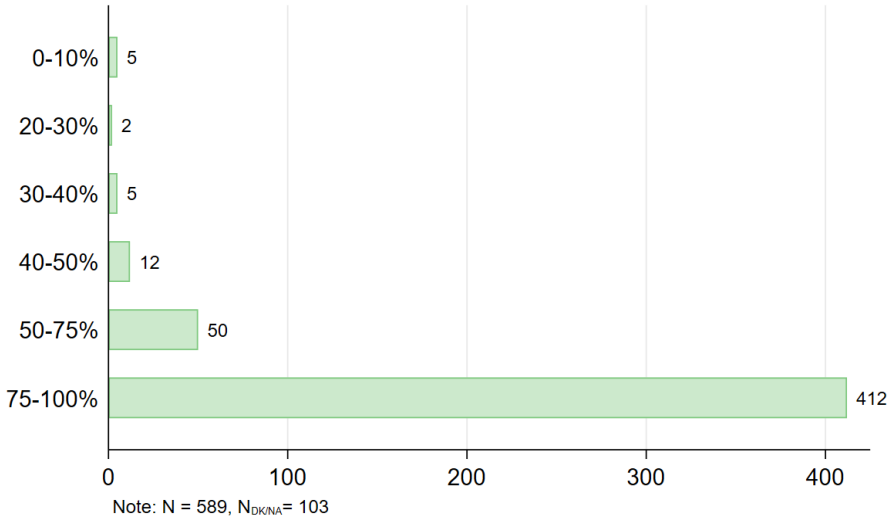


Figure 54: Percentage of contracts where the supplier was reliable in the performance of the contract according to survey responses



102. Figure 55 shows a summary of responses from procurement officers about contracts which faced significant challenges, with 112 out of 365 respondents – almost one third – stating that more than 10% of contracts faced significant challenges. Figure 56 shows a summary of responses about contracts where suppliers had a lack of manpower or financial resources for delivery of the contract, with 59 out of 324 respondents stating that this applied to more than 10% of contracts. Figure 57 shows responses on contracts with disruptions in the supply chain, with 81 out of 342 respondents – almost one quarter – stating that these applied to more than 10% of contracts.

Figure 55: Percentage of contracts with significant challenges according to survey responses

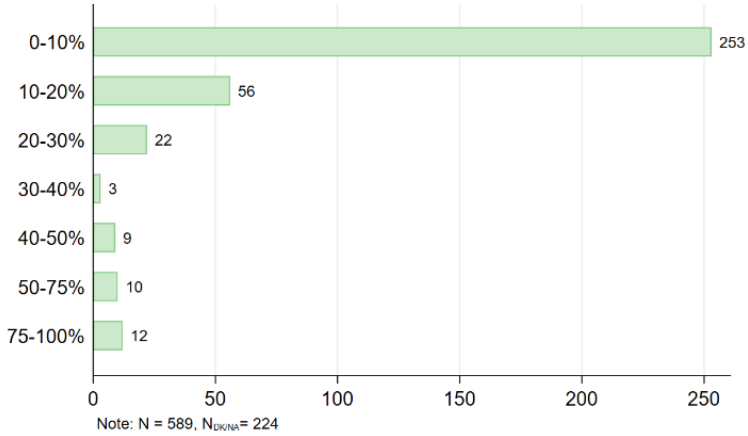


Figure 56: Percentage of contracts with lack of manpower or financial resources according to survey responses

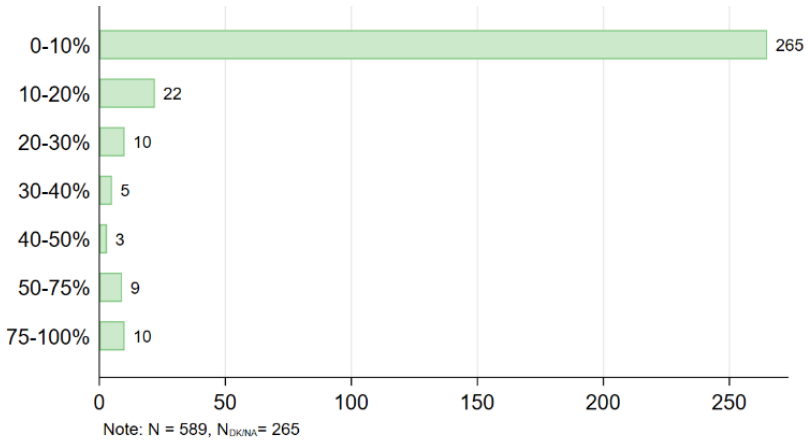
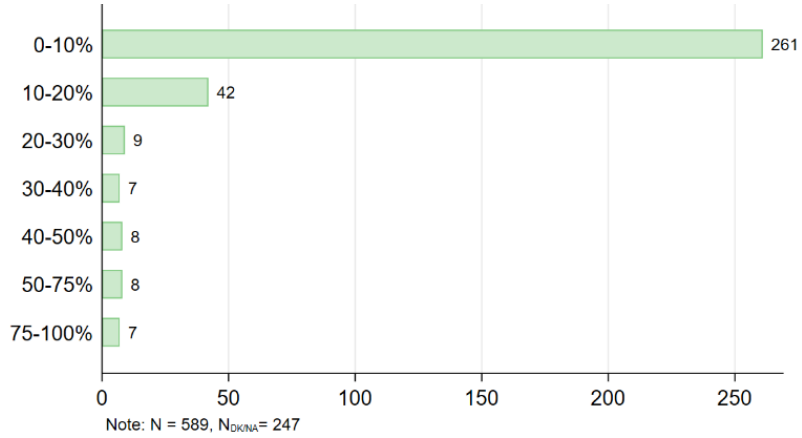


Figure 57: Percentage of contracts with disruptions in supply chain according to survey responses



103. When asked about the percentage of suppliers that were not able to deliver the product at all, more than 90% of respondents (296 out of 322) stated that no more than 10% of contracts administered by their organization had failed in delivery (see Figure 58). More than 85% of respondents (275 out of 321) stated that a lower than expected quantity of product had been delivered for no more than 10% of contracts administered by their organization (see Figure 59).

Figure 58: Percentage of contracts with failure in delivery according to survey responses

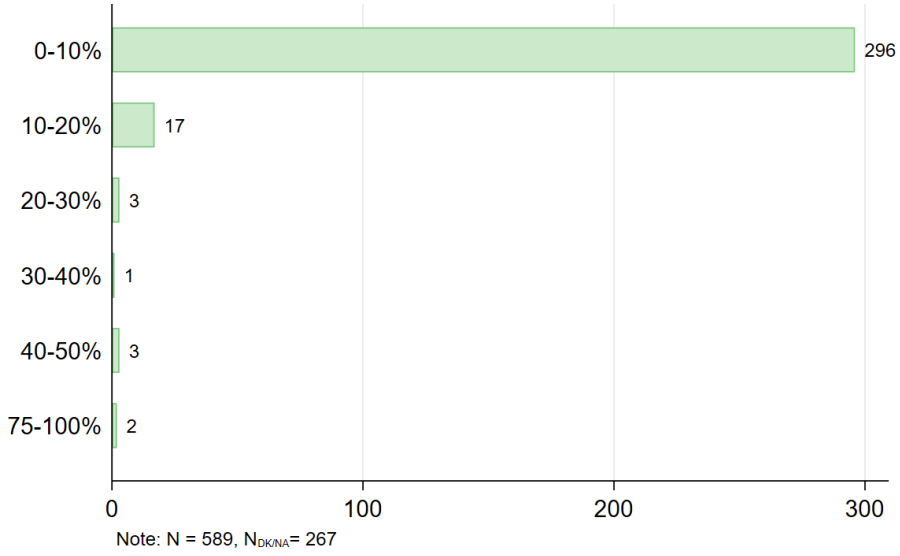
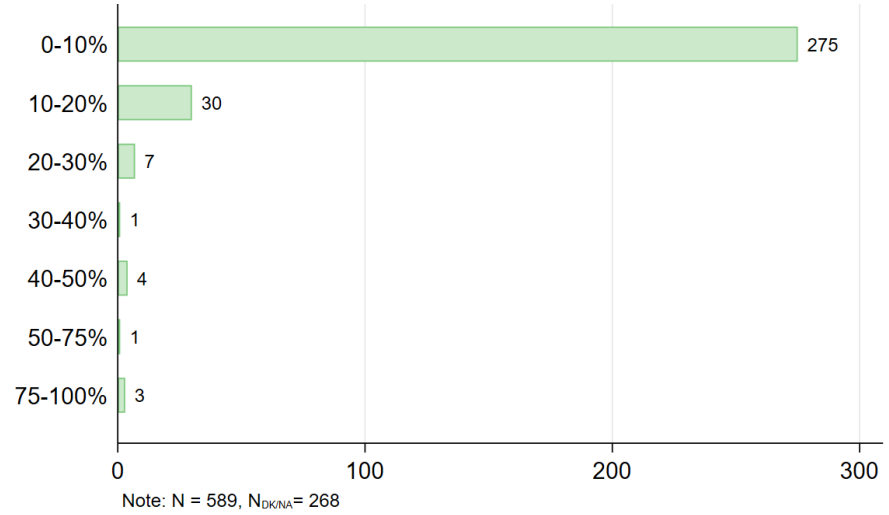


Figure 59: Percentage of contracts with quantity lower than expected according to survey responses



104. The survey also asked about penalties or payment constraints during contract implementation. 271 out of 285 respondents said that their organization had refused to pay an invoice because the products or services delivered were different from the specifications for no more than 10% of contracts (see Figure 60). 270 out of 286 respondents said that their organization had refused to pay an invoice from a supplier due to the poor quality of the delivered products or services for no more than 10% of contracts (see Figure 61). 265 out of 271 respondents said that their organization applied penalties due to the low quality of the delivered products or services delivered for now more than 10% of contracts.

Figure 60: Percentage of contracts where the organization refused to pay an invoice because the products delivered were different from the specifications according to survey responses

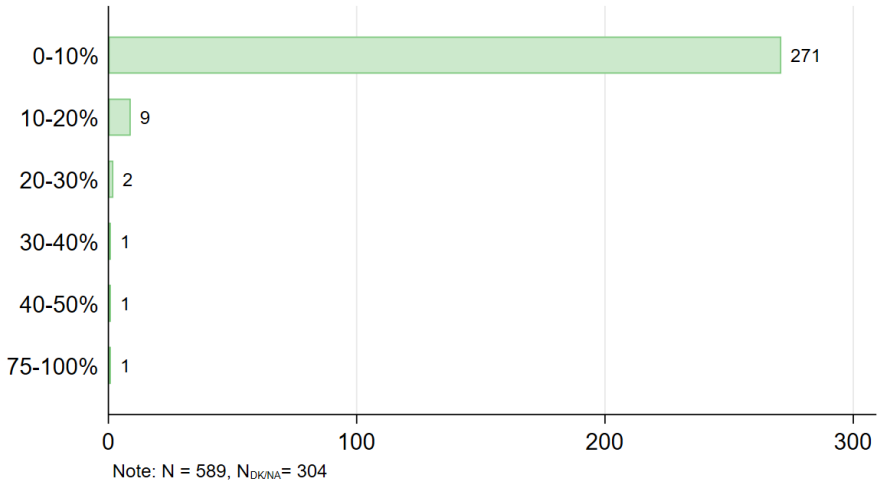


Figure 61: Percentage of contracts where the organization refused to pay an invoice due to poor quality of delivered product according to survey responses

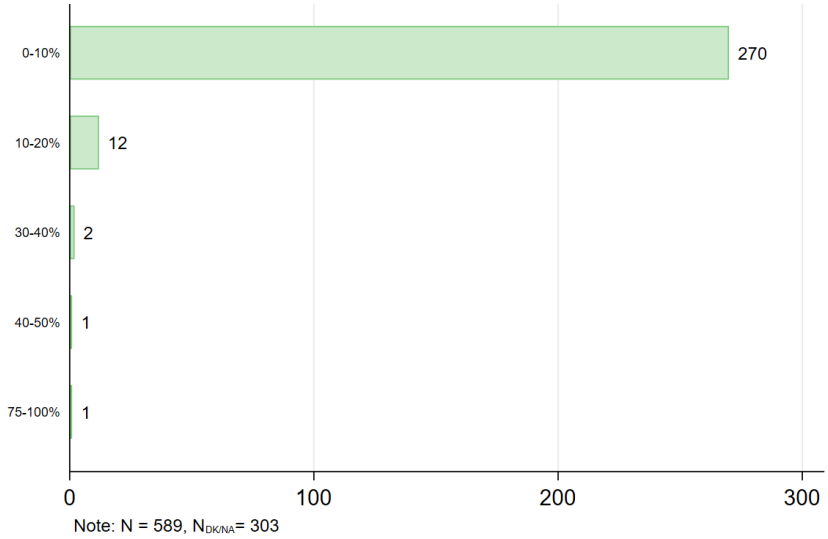
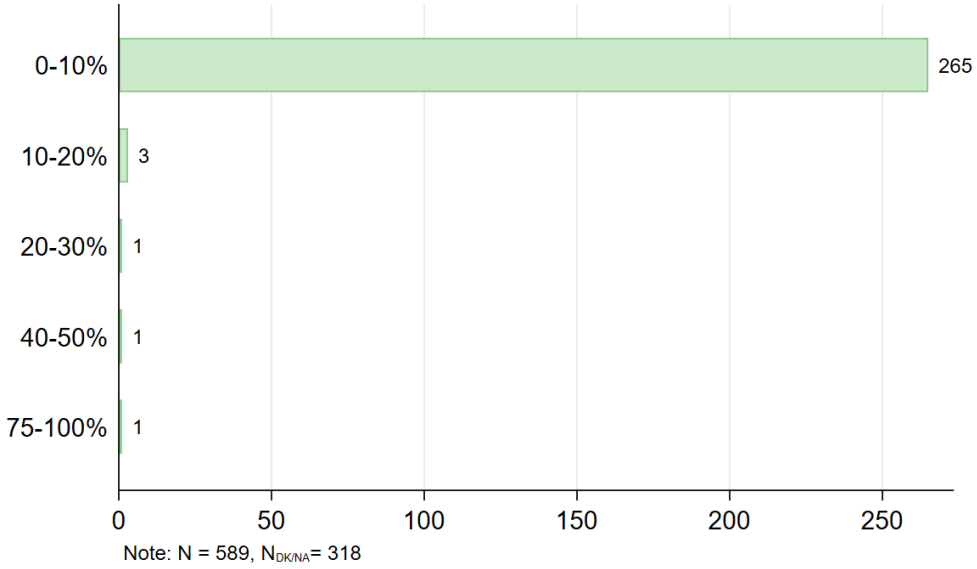
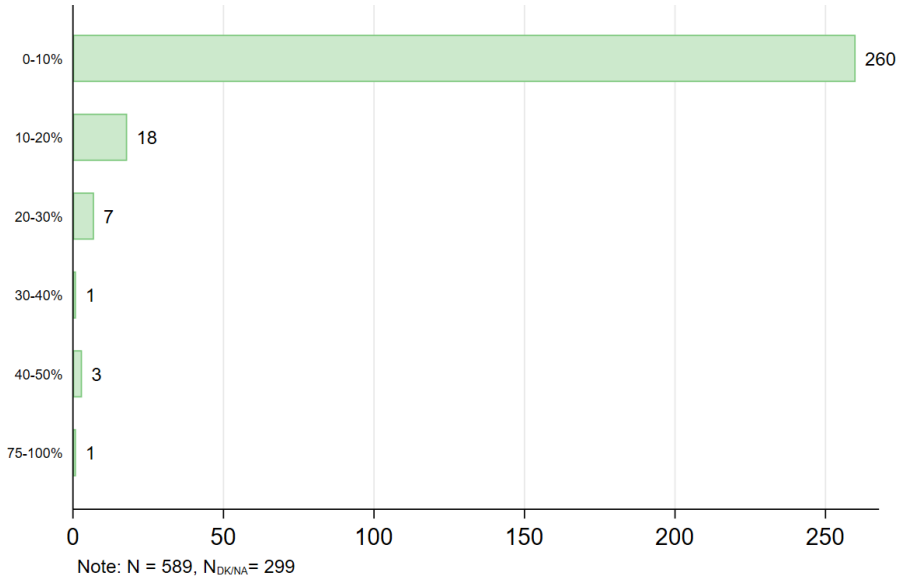


Figure 62: Percentage of contracts where a penalty was applied due to low quality of product delivered



105. Turning to issues within the contracting authority or entity itself, 260 out of 290 respondents stated that no more than 10% of contracts were delayed due to budget unavailability in their organization (see Figure 63).

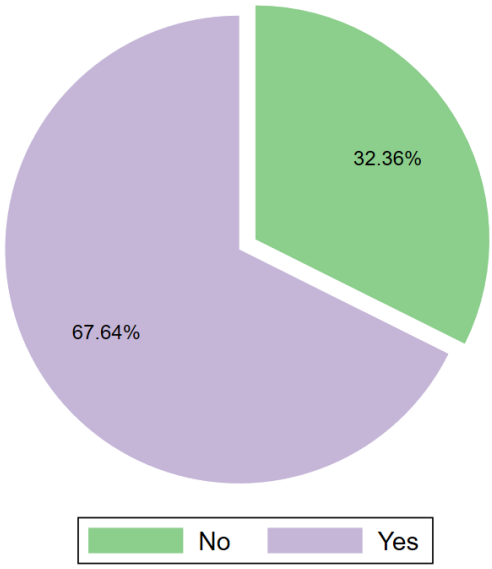
Figure 63: Percentage of contracts where delivery was delayed due to budget unavailability according to survey responses



106. Looking at contract implementation and management, approximately 68% of respondents said that they were personally involved in implementation of contracts while 32% said they were not (see Figure 64). About 59% respondents said that their organization would have an

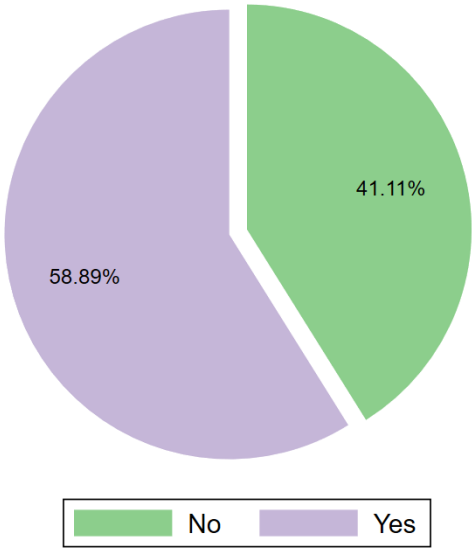
implementation plan designed and agreed upon at the start of a works or services contract, while 41% said this would not happen (see Figure 65).

Figure 64: Survey respondent engaged in supervising contract implementation



Note: N = 343

Figure 65: Implementation plan designed and agreed at start of a works or services contract according to survey results



Note: N = 343

107. Respondents who said their organization would have an implementation plan designed and agreed at the start of a works or services contract were asked about how they track if suppliers are able to meet the implementation plan. Responses are summarized in Figure 66. The majority of respondents indicated that contract implementation is routinely tracked in some way. Only 11

out of 202 respondents said that contract implementation is not tracked and no specific action taken to ensure that contracts are implemented as planned.

108. Overall 108 respondents out of 150 said that no more than 10% of works and services contracts deviated significantly from the agreed plan upon at the start of the contract (see Figure 67).

Figure 66: How contract implementation is tracked according to survey responses

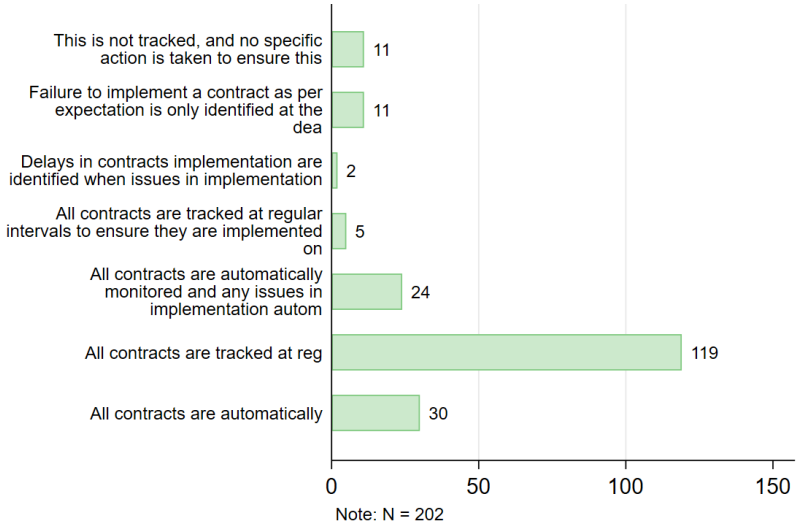
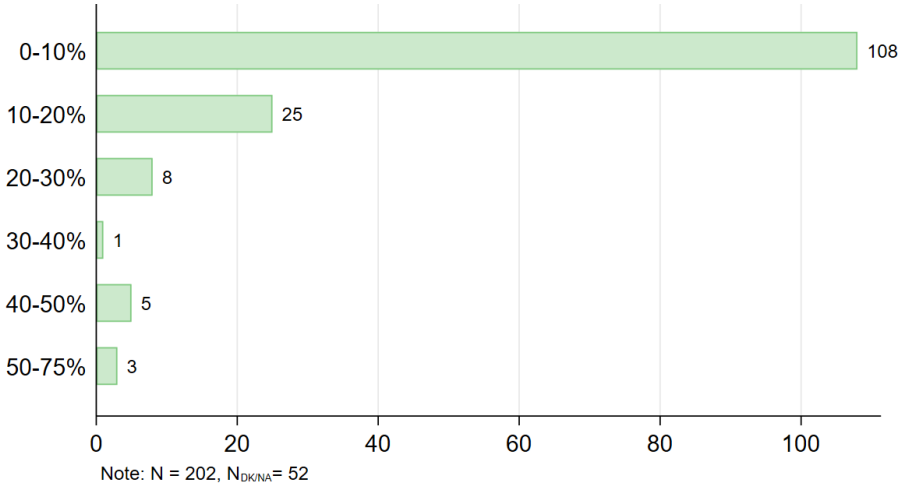


Figure 67: Proportion of contracts with significant deviation from implementation plan according to survey responses



109. Feedback from focus group discussions indicated that most contract implementation and supervision is not carried out by procurement practitioners, except where there are difficulties, including complaints from economic operators or where contracts need to be re-negotiated. Contract termination, as a last resort, was highlighted as particularly difficult and unwelcome and as would be expected, procurement practitioners make every effort to find workable alternatives.

110. **Conclusion for this indicator:** the evidence on this point is limited by the constraints of a sample survey but raises some potential issues of concern. Gathering more central information on contract implementation through the eProcurement system, as described in section 2.3.1 above, would assist with monitoring of quality. In particular, it would be helpful to include reasons for early termination of contracts in information gathered on contract variations. This could, however, have reputational implications for suppliers who would therefore expect to have an opportunity to challenge any subjective assessment and may be reluctant for such assessments to be published.

2.3.3 Indicator: Fair and equal treatment of bidders

111. There is a well-established complaint process for public procurement in Croatia which allows bidders to raise concerns about fair and equal treatment. The State Commission for Supervision of Public Procurement reviews and decides on complaints, and publishes information on the outcomes of cases. Table 3 and Figure 68 below show a summary of the outcomes in each of the years 2014 to 2019, and Figure 69 shows a summary of all the decisions over that period. While overall numbers of cases have remained relatively steady, with a dip in 2017 which perhaps is associated with both buyers and suppliers adjusting to the new procurement law, there have been slightly higher proportions of cases in 2018 and 2019 where the State Commission has overturned the selection decision or cancelled part of the procurement documentation. This demonstrates the independence and integrity of the State Commission in carrying out its role and so is in many ways positive. An increase in decisions overturned would not be unusual in the short term following the introduction of major system reforms.

Table 3: Complaint decisions by year

Decision	2014	2015	2016	2017	2018	2019	Total
The Selection Decision is annulled	289	319	317	327	384	370	2006
The appeal is rejected	304	285	290	226	317	322	1744
The appeal is dismissed	426	300	289	176	171	253	1615
Part of the Documentation is cancelled/annulled	101	65	70	106	160	138	640
Suspension of Proceedings	125	96	88	45	61	57	472
The Decision on Annulment is Annulled	45	39	50	41	34	40	249
The part of the Selection Decision is annulled	15	18	17	21	34	18	123
Negotiation Procedure Cancelled/Annulled	2	3	1	1	1	1	9
Other	8	12	13	2	8	10	53
Total	1307	1125	1122	943	1162	1199	6858

Figure 68: Complaint decisions by year

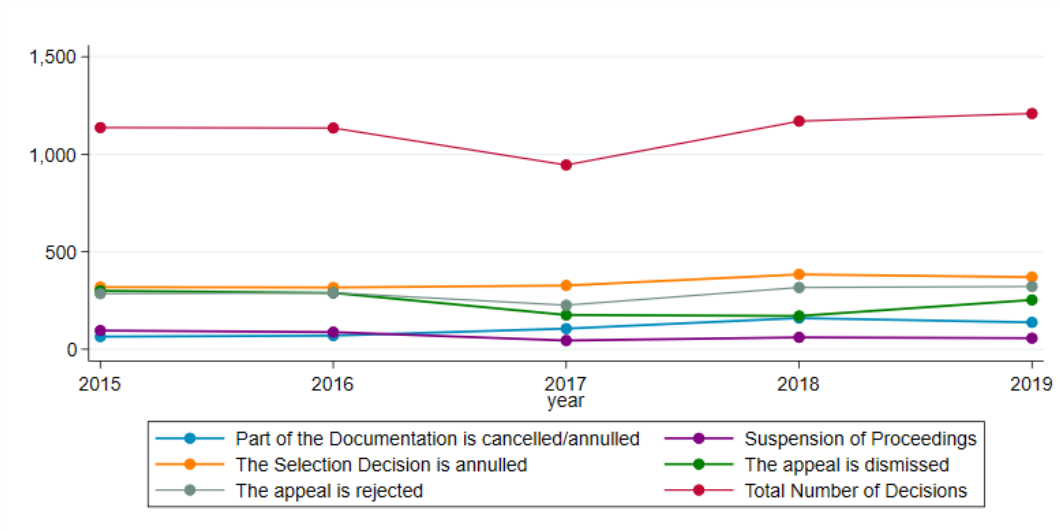
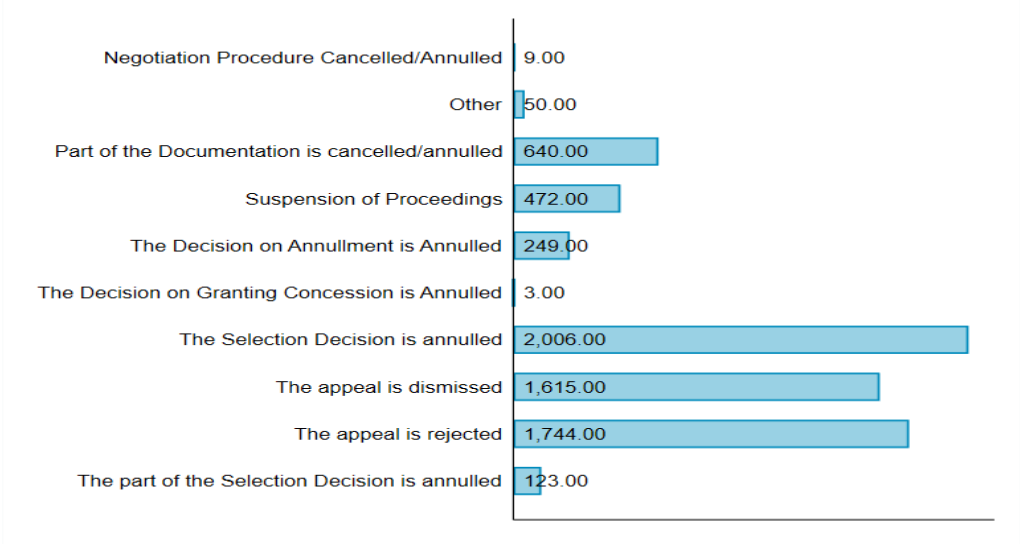


Figure 69: Summary of decisions on complaints 2014 to 2019



112. If the State Commission is able to provide feedback to the Procurement Policy Directorate on any recurring issues which it identifies in cases where its decision is in favor of the complainant, this will be valuable evidence to consider on where further improvements are needed in public procurement practice. The Procurement Policy Directorate can reflect these in guidance and in the commissioning of further training as appropriate.

113. In addition to the handling of complaints by the State Commission for Supervision of Public Procurement, the work of the Office for the Suppression of Corruption and Organized Crime (USKOK), is essential to ensuring the integrity of the public procurement system. The information provided by USKOK sets out very clearly the major risks of corruption and conflicts of interest and measures that can be taken to mitigate those risks. This information is not only available to public officials but also published on the website, which demonstrates a level of transparency not seen in some other jurisdictions.

114. Focus group discussion demonstrated that this is still a sensitive topic. Procurement practitioners who took part reported that they had not encountered collusion or favoritism in their own experience but could not rule out the possibility that it was happening in other areas. There was an example from one participant of being asked to adjust product specifications for an economic operator, with the accompanying legal and ethical dilemmas. Participants said that while procurement specialists could monitor prices and red-flag behavior amongst economic operators, it was difficult to know whether price-fixing had taken place. Collusion is likely to be a problem only in certain markets, and where it is happening the impact would not only be on public procurement. The risk of collusion can be bound up with issues of lack of capacity in markets such as construction discussed in the section on Competition above (see paragraph 43). Some focus group participants disagreed with any suggestion of collusion between bidders, saying that they had observed very heated competition between bidders, even to the point where the behavior of bidders could be regarded as absurd.

115. Published information will be more effective if it is available in a form where it is readily understood, particularly by key commentators including journalists, academics and non-governmental organizations. As part of its continued drive to increase transparency, it would make sense for the Procurement Policy Directorate to carry out discussions with external commentators from civil society as well as procurement practitioners and leaders of public organizations to explore how far current measures are seen as being effective, what evidence exists of the scale of any current problems and what options there are to increase the overall transparency and integrity of the system. There would be an option to go even further, and to establish arrangements for regular engagement with civil society: for instance, the state procurement body in Chile, Chilecompra, has a Civil Society Council[7] established by law to ensure a permanent citizen participation in the public procurement system. Its members are representatives of non-profit civil organizations. While this is an example from a non-EU country, the approach taken is consistent with the overall expectations of transparency in public procurement in EU member states.

116. In addition to continuing to increase transparency, taking further steps to ensure the integrity of the public procurement system is understood to be a priority for the Croatian Government. One option would be the introduction of a red flag system. Michael Kramer, a specialist consultant in anti-corruption and fraud, recently produced a short overview report for World Bank work in Romania on this subject which is attached at Annex D. This provides an indication of the types of flags which could be introduced and highlights that the fundamental requirement of a red flag system is access to the relevant data. An additional point is, of course, ensuring that the data is of sufficiently good quality.

117. The Kramer report highlights a number of examples of systems that have been developed in a range of countries. The example of the BRIAS system in South Korea highlights both the importance of careful consideration of the categories of data used and the potential for introduction of such a system to drive changes in behavior by raising awareness and the fear of being caught. It is worth noting, however, that the UK Competition and Markets Authority Tool, which is reported as having widely distributed and being reviewed by 29 National Competition Agencies, was withdrawn from use in January 2020[8]. This was a tool developed and used while

[7] https://www.chilecompra.cl/consejo-de-la-sociedad-civil-de-chilecompra/
[8] https://www.gov.uk/government/publications/screening-for-cartels-tool-for-procurers

the UK was an EU member state so the experience may be relevant to Croatia. The reasons for the withdrawal are not currently clear, but this could be explored in any follow up work on the development of a red-flag system. Many examples in the report involve analysis using a range of public procurement and payment data only, but there is reference to a system currently in use in Brazil which involves cross-checking procurement data with other government databases. Experience of equivalent systems in other government contexts, for instance the Connect system used by HM Revenue and Customs in the UK (again, developed and implemented while the UK was an EU member state) to identify potential tax irregularities[9], suggests that a sophisticated IT system for the analysis could significantly speed up the identification of potential irregularities, but commissioning such a system would require a substantial investment and a project team with a mix of data analysis and public procurement expertise in place for a significant time.

118. Whether based on procurement data alone or involving a more sophisticated matching with other databases, a well-designed red-flag system would streamline the process of identifying potential irregularities and highlight cases that might otherwise be missed, but would need to be set up with cooperation between the public authorities responsible for the public procurement system, and any development could not be led by the Public Procurement Directorate as it does not have the powers required for the investigation of cases. The bulk of the operating costs would still be taken up in the investigation of potential irregularities, and there needs to be a well-developed system for decisions and penalties with an appropriate appeal mechanism. The team operating any red-flag system and carrying out investigations must be seen to be independent of others involved in the operation of the procurement system and perceived as unbiased. These points need to be thought through at the design stage also. Further detailed assessment of the feasibility and scope of a potential red-flag system for Croatia could be addressed in any follow-up work.

119. **Conclusion for this indicator:** the procurement data and other evidence available in this review are not sufficient to establish whether there is a significant problem with the overall fairness, regularity and propriety of the public procurement system. Continuing to work towards greater transparency through publication of more data and making the data more easily accessible is important as greater scrutiny should maintain and potentially increase the fairness of the public procurement system over time. It is possible to go further and look at using automation, such as 'red flags' within the eProcurement system to inform investigation of potential irregularities but this needs further investigation as evidence from other countries suggests that implementation of such a system can be expensive and is not straightforward. A lead authority with relevant audit and investigation powers would also need to be identified as the development and operation of any red-flag system would not fall within the scope of the Procurement Policy Directorate.

120. **Recommendation 1:** The Procurement Policy Directorate should gather views from civil society commentators on the transparency of the public procurement system, looking both at the information available and how easy it is to find and to interpret; and considering options for improvement based on the feedback received.

121. **Recommendation 2:** If the State Audit Office, USKOK or another authority with appropriate investigation powers is interested in establishing a red-flag system that would include public procurement in Croatia, they should review recent evidence from audit, whistleblowing, external commentators and any other sources on the perceived scale and nature of any corrupt or

[9] https://www.taxation.co.uk/articles/hmrc-s-connect-computer-and-investigations

fraudulent behaviors in the public procurement system in Croatia, and consider whether there is a case for introducing a red-flag system. A red-flag system which identifies potentially suspicious patterns in the procurement data and might indicate collusion or tender-rigging can be powerful provided that:

- all the data are needed in order to make the system work are already collected or can be collected to a sufficient quality standard;
- legal issues around investigation and potential appeals against sanctions are addressed; and
- the potential benefits of a red-flag system, including its potential deterrent effect, outweigh the development and ongoing operating costs.

Subject to having sufficient technical expertise and resolving any data protection issues, it may be possible over a longer time to develop a red-flag system further by matching public procurement data against other data sources to identify a wider range of potentially suspicious patterns. The Procurement Policy Directorate should cooperate with consideration of a business case for a red-flag system and provide procurement expertise to inform the design and development if required, but the operation of any red-flag system and the investigation of the cases flagged should be carried out by a separate team who are seen as neutral and independent of other parts of the procurement system.

3 Overall approach to data-driven improvement and governance

122. The overall analysis suggests that the public procurement cycle in Croatia is functioning reasonably effectively, but there is scope for improvement. Relatively low competition in many categories is a significant concern, as is low participation by SMEs in public procurement and the variations in process between public entities undertaking procurement suggest that there is scope to continue to drive improvement in the efficient and effective operation of the system. Continuing to improve the overall completeness and quality of data on the public procurement system is essential to ensure that future analysis is accurate.

Strategic analysis using the Kraljic Matrix

123. The analysis around competition and participation by SMEs are areas where it is particularly important that procurement practitioners work closely with data analysts to bring the insights from the data and experience of working with suppliers across a variety of markets together.

124. The Procurement Policy Directorate will be familiar with the approach proposed by Peter Kraljic in the Harvard Business Review in 1983 and since developed further in the procurement literature. Figure 70 below shows a version of the summary matrix from *Procurement positioning supplier relationships: Utilising the Kraljic Matrix to identify potential supply risk*, and also *Applying the Kraljic Matrix*, both published by the Chartered Institute of Procurement and Supply (CIPS) in 2020. Refreshing any analysis already done using Kraljic or an equivalent methodology to develop appropriate approaches to increase competition and manage supply risk is an important area for early action.

125. The CIPS paper on *Applying the Kraljic Matrix* recommends the following steps:

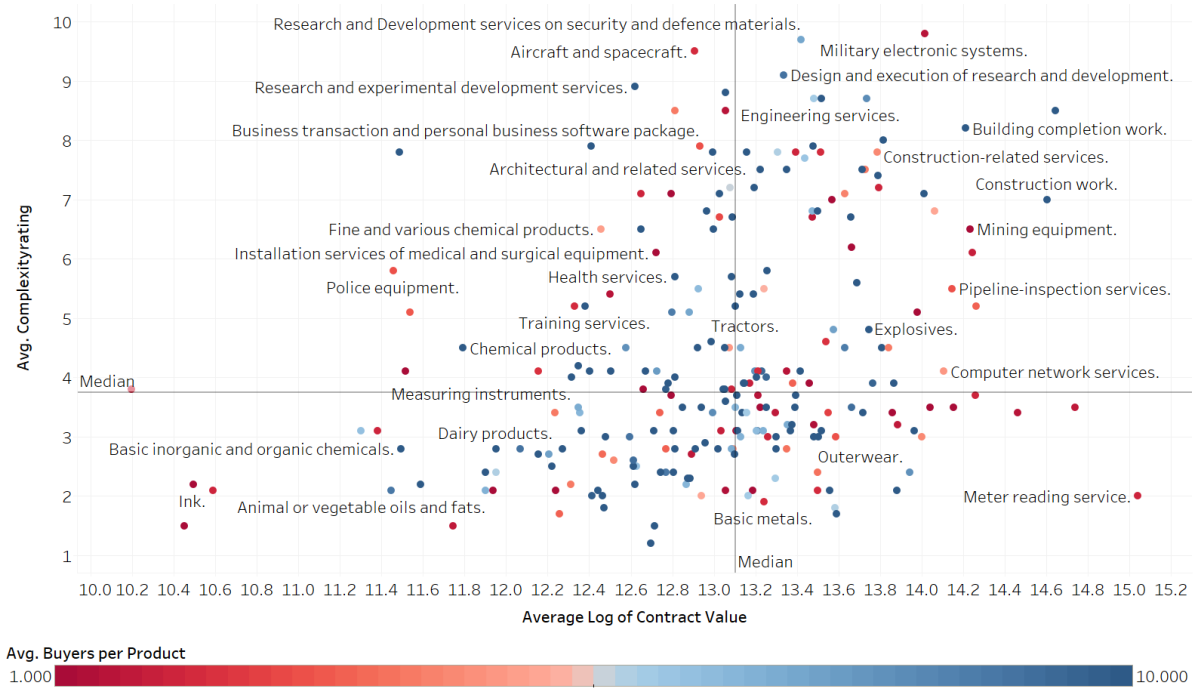
- make a list of all purchases in descending value order;
- evaluate the risk and market complexity of each purchase;
- position each item on the matrix as appropriate;
- regularly make decisions on whether or not to move a particular item to a different quadrant in the matrix.

126. Initial attention should focus on goods, services and works with high total spending across contracting authorities and low competition – and especially any category where procurement processes routinely have fewer than 3 bids, which is often used as a benchmark for a minimum level of competition.

127. As an illustration of what a Krajlic analysis for Croatia might show, the matrix in Figure 71 uses an assessment of complexity levels by CPV division carried out in Romania and applies this to the total value of purchases in the Croatian public procurement data. Note that **the axes on this version are reversed**, with complexity as a measure of risk appearing on the y-axis and cost on a logarithmic scale appearing on the x-axis. It gives an indication of the overall approach that could be used in addressing issues of competition, value and security of supply, but this can only be illustrative, as a full assessment of the complexity or level of risk needs to be informed by an in-depth understanding of the Croatian public procurement market and strategic priorities.

Figure 70: Kraljic Matrix

Figure 71: An Illustrative Example of the Kraljic Matric at the CPV Group Level

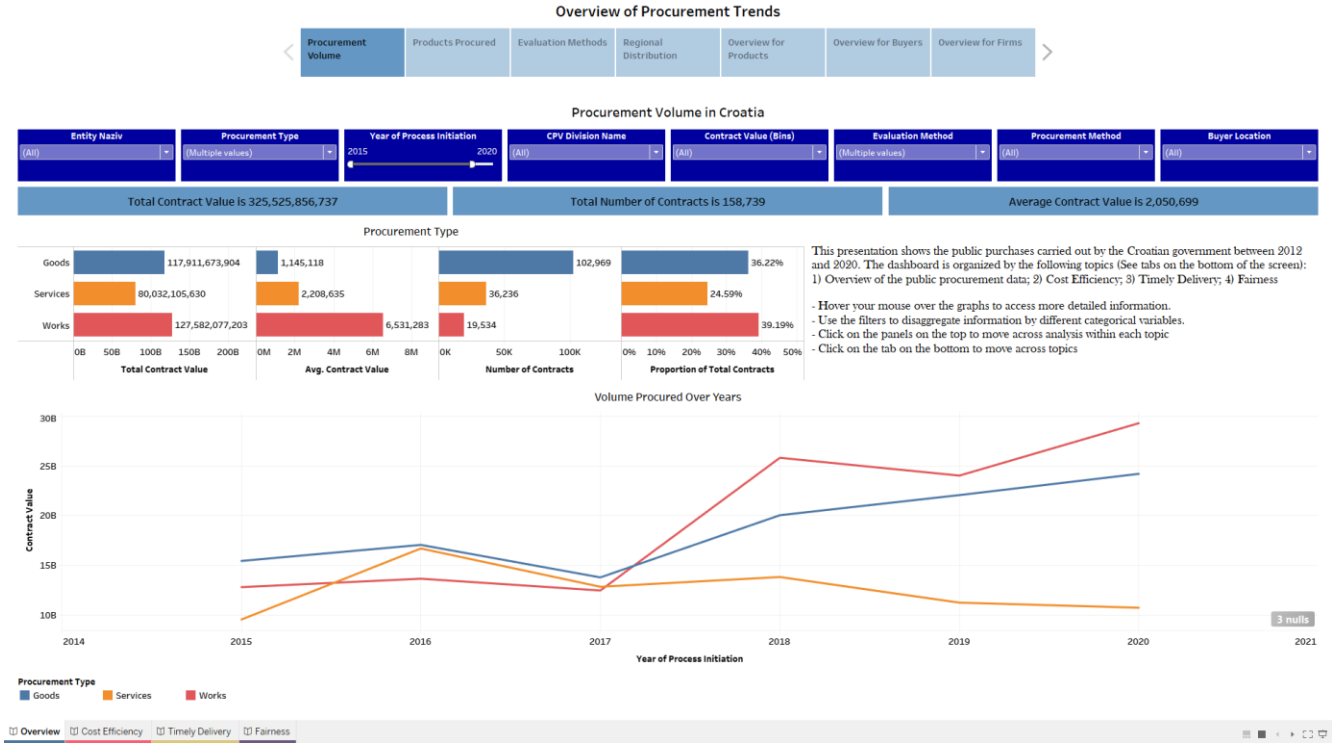


Note 1: The Complexity Rating used in this chart was taken from previous analysis in Romania. For an accurate picture of complexity in Croatia, the complexity rating should be constructed for products purchased in Croatia separately

Digging deeper into the data using the Tableau Dashboard

128. This report is complemented by a dynamic dashboard using Tableau that produces visualizations of the data extracted from the eProcurement system and allows users to dig into the data in more depth.

Figure 72: Screenshot of Tableau Dashboard



129. The Tableau dashboard follows a similar pattern of analysis to the report, with added flexibility for users to explore the data. The structure and content of the dashboard is shown in Table 4 below. This will allow the user to explore products, buyers or suppliers across a range of indicators at a level of detail that is not possible in the report.

Table 4: Overview of the Tableau Dashboard

Topic/Dimension	Indicators covered in the Topic/Dimension
Overview	1. Procurement Volume 2. Matrix of Products Procured 3. Evaluation Methods 4. Regional Distribution 5. List of Products with Total Contract Value, Average Contract Value, Number of Contracts and Proportion of Total Volume

Topic/Dimension	Indicators covered in the Topic/Dimension
	6. List of Buyers with Total Contract Value, Average Contract Value, Number of Contracts and Proportion of Total Volume 7. List of Suppliers with Total Contract Value, Average Contract Value, Number of Contracts and Proportion of Total Volume
Cost Efficiency	1. Procurement Methods 2. Number of Participants 3. Market Concentration 4. Consolidation 5. Repeat Purchases 6. List of Products with Average Buyers per Product, Average Market Concentration and Average Repeat Purchases 7. List of Buyers with Average Market Concentration and Average Repeat Purchases
Timely Delivery	1. Bid Submission Period 2. Decision Period 3. Total Processing Period 4. Process Failures 5. List of Products with Average Bid Submission Period, Average Decision Period, Average Processing Period, Number of Processes 6. List of Buyers with Average Bid Submission Period, Average Decision Period, Average Processing Period, Number of Processes
Fairness	1. Suppliers per Product-Buyer 2. Single Suppliers 3. SME Firms 4. New Firms 5. Non-Local Firms 6. Zagreb Based Firms 7. List of Products with Number of Processes, Average Proportion of SME Bidders, Average Winning Rate of SME Suppliers, Average Proportion of New Bidders, Average Winning Rate of New Supplier, Average Proportion of Non-Local Bidders, Average Winning Rate of Non-Local Supplier, Average Proportion of Zagreb

Topic/Dimension	Indicators covered in the Topic/Dimension
	Based Bidders, Average Winning Rate of Zagreb Supplier 8. List of Products with Number of Processes, Average Proportion of SME Bidders, Average Winning Rate of SME Suppliers, Average Proportion of New Bidders, Average Winning Rate of New Supplier, Average Proportion of Non-Local Bidders, Average Winning Rate of Non-Local Supplier, Average Proportion of Zagreb Based Bidders, Average Winning Rate of Zagreb Supplier

130. As highlighted several times in this report, exploration of the data will identify points of concern or interest but there is a further step required to ensure that underlying causes for patterns in the data are fully understood before changes to policy or practice can be developed, agreed and implemented. The Tableau Dashboard is provided as a starting point. The sequence for data-driven improvement should therefore be: (a) data analysis, (b) exploration of points of interest or concern with procurement practitioners to understand underlying causes, (c) development of policy or practice changes where these are required, (d) agreement and implementation of changes and then (e) ongoing analysis to understand the impact of the changes. This cycle can be repeated as required where monitoring suggests that there are remaining problems even after changes have been made. In short, the data-driven approach involves: data analysis, exploration, options, implementation, repeat.

131. There are some areas which are important to the overall functioning of the public procurement system and on which there is currently no systematic and comprehensive data. Contract management, unit prices and quantities are key elements where data is currently not collected through the eProcurement system. A list of data to consider adding to the future eProcurement system is given in section 5 on Digital Transformation below.

132. It will also be important to consider the approach to procurement as a strategic function. The mandatory use of MEAT evaluation in the Croatian public procurement system is a significant step in strategic public procurement, provided that it is well used. Under the rules for MEAT, contracting authorities/entities can assign no more than 90 per cent of the overall weighting to price in most circumstances. The Most Economically Advantageous Tender Practical Examples Manual published in 2017 sets out key principles and case studies which should provide a good grounding in this approach for procurement practitioners in Croatia. The curriculum for training in public procurement includes sustainable and green public procurement, although how far it introduces social or other public benefits will depend on the approach taken and examples chosen in delivering the curriculum. It is not possible to assess the impact of the switch to MEAT evaluation of tenders from the public procurement data itself. Capturing the weighting allocated to price in the evaluation of tenders in the eProcurement system would be one simple monitoring step which may give some insight into how contracting authorities and entities are using MEAT evaluation, but it is important to look more deeply.

133. A very important aspect to assess is how effectively procurement practitioners are building in environmental, social and/or innovative procurement approaches to secure the best strategic outcomes from public procurement. This requires a qualitative exploration as it cannot be identified from the numerical data. If this exploration were to find that a significant number of opportunities are being missed, this would point to a need for further guidance or training,

perhaps including a wider range of practical examples. A follow up exploration should be carried out later to assess whether progress is being made and ideally repeated annually over the following three-year period. In the longer-term, the Procurement Policy Directorate may want to build methodology for tracking environmental, social and innovative procurement online. There has been a suggestion that this may involve an approach based on artificial intelligence and machine learning. This is not straightforward but would be of interest to other EU countries and more widely around the world, so it may be possible to collaborate with others on the long-term approach.

134. **Recommendation 3**: The Procurement Policy Directorate should recruit additional staff to plan for and carry out regular review of procurement data and other evidence about the functioning of the public procurement system. Implementing the recommendations on data-driven improvement in this report will require a dedicated team of between 8 and 12 individuals with strong data analysis skills, working alongside colleagues with significant expertise in public procurement. If it suits the structure of the Procurement Policy Directorate, there could be advantages in forming these staff into a single team as a Procurement Improvement Unit.

135. **Recommendation 4:** In the short term, the designated staff should carry out the following early work to establish a baseline position:

- 2021 position analysis of public procurement categories in Croatia for total value of spending and overall complexity and risk, to assess their position using the Kraljic Matrix or an equivalent tool;
- develop options for addressing barriers to participation in public procurement, particularly barriers experienced by SMEs, drawing on the results of the Enterprise Survey work currently being carried out by the World Bank and any further work needed in Croatia to establish SMEs' experiences of public procurement;
- review a sample of documentation from procurement processes, choosing a wide spread of goods, services and works and types of public entity conducting the procurement, to assess how effectively environmental, social and/or innovative procurement approaches have been adopted; and based on this evidence consider whether any further coaching, guidance or training on these priorities is needed.

136. **Recommendation 5:** In the medium-term, the designated staff should carry out a program of analysis looking at aspects of the public procurement market and the procurement cycle, using the data-driven approach described above involving: data analysis, exploration, options, implementation, repeat. The procurement data dashboard developed by the World Bank team should provide a useful initial tool for the analysis, which should as a minimum aim to cover the following points over a three-year period:

- Assess the levels of competition in the public procurement market for each procurement category by looking at trends in the number of bids in each procurement process, the market share for each supplier and unit costs (where these are available – see below) and supplier diversification, then use the Kraljic analysis to identify appropriate actions for procurement categories where the level of competition is a concern.
- Track SME participation in public procurement through the data, including analysis of SME participation as subcontractors where possible, in order to understand the

impact of any measures introduced to increase SME access to public procurement markets.

- Explore variations in performance between contracting authorities on:
  - timeliness and accuracy of publication of procurement plans;
  - proportion of failed or cancelled procurement processes;
  - decision time;
  - time and cost overruns on the contract; and
  - timeliness of payments to contractors.
- Carry out further annual reviews of documentation for a sample of public procurement processes to establish how effectively environmental, social and/or innovative procurement approaches are being used in Croatia.
- Carry out regular sampling of public procurement data to assess data quality and consider what system, guidance and/or training changes may be needed to address any recurring data quality issues which are identified.

137. **Recommendation 6:** In the long term (beyond 3 years) the Procurement Policy Directorate should:

- ask the designated staff to propose their own program of regular data monitoring to replace the medium-term program above, based on what has been identified over the initial three years and the policy priorities at that time;
- consider establishing a regular sury of supplier views on barriers to participation in public procurement, including a focus on SME views – to be run every 2-3 years;
- put in place arrangements for the long-term monitoring of environmental, social and innovative procurement approaches; and
- review an updated Kraljic or equivalent analysis to ensure that it reflects the latest position, to inform decisions about priority areas for action to improve the functioning of the public procurement market.

Strategic direction and governance

138. The Procurement Policy Directorate's coordination role across the range of authorities responsible for aspects of the public procurement system is complex, particularly in relation to securing agreement on strategic priorities and ensuring that improvement work is carried out effectively. The commissioning of this project demonstrates that the Procurement Policy Directorate remains committed to using procurement data to identify areas for improvement and to make this central to its overall strategic approach. A data-driven approach to improvement reflects international good practice, but it needs to be resourced properly to be effective. As this report shows, analysis of procurement data can help identify areas for potential improvement that range from system-wide issues to procurement practice in individual public entities. Most often, data analysis will identify areas for further investigation. To get a complete picture of what is happening there needs to be discussion with procurement leaders and/or practitioners, so as well as skilled data analysts it is important to have procurement professionals in the team to follow up

on the data analysis and explore working practices and the operation of the public procurement market. The output required is not only the analysis but policy options to address any issues identified. The Procurement Policy Directorate must ensure that it has designated sufficient analytical and professional procurement staff to be able to carry out its work program to review the effectiveness of the public procurement system. If there are gaps in capacity, filling these should be a high priority for any further system development. There would be a further option to create a separate unit, possibly along the lines of the Scottish Procurement Information Hub described in Annex C.

139. The designated staff reviewing the effectiveness of the public procurement system will report analysis and policy options to senior decision-takers in Procurement Policy Directorate, who will then ensure coordinated implementation with other state bodies involved in the procurement system. Other countries have found it helpful to establish a board or committee to work with the central procurement authority to drive coordinated amongst all the state bodies and contracting authorities responsible for the operation of the public procurement system. Examples are included at Annex C.

140. Although the remits and membership of these committees and boards vary, they all involve a range of senior figures from key state bodies involved in the public procurement system, typically including senior representatives of large contracting authorities. Committees or boards along these lines allow for planning priorities to be established and shared across the range of different authorities involved in aspects of the public procurement system. Creating a board or committee along these lines in Croatia could support the Procurement Policy Directorate in its leadership and coordination role across the public procurement system and should regularly see analysis and discuss the policy options which are presented for improvement.

141. If established, any committee should meet regularly, at least once per quarter. Using the data-driven governance approach, the key workplan for the committee would be to review the latest analysis of public procurement data and any other evidence on the performance of the public procurement system, to agree coordinated actions as required to implement improvements and to agree actions necessary to remove blockages to progress.

142. **Recommendation 7:** The analysis and policy options produced by the designated staff should be provided to the Procurement Policy Directorate and used to agree and implement actions for improvement. In some other countries, it has been helpful to establish a Steering Committee of senior leaders from state bodies involved in the public procurement system to assist the lead procurement authority in this task. The Procurement Policy Directorate should consider whether such an approach would help them drive improvements in the public procurement system.

4 Training

143. There is a comprehensive ordinance in place in Croatia which sets out the rules for training in public procurement, including the required curriculum which is to be covered in 50 training hours. A requirement of the curriculum is that a minimum of 30 per cent of the teaching covers exercises, examples and case studies. The one example of an exam paper shared with the review team (November 2018) focuses mainly on knowledge of legislation and rules but also some important ethical issues. The pass mark for the public procurement certificate examination is 70 per cent, so a high standard of knowledge is expected. A minimum of 32 hours of continuing professional development is a requirement for renewal of certificates in subsequent years. In addition, Croatia has been involved in the development of ProcurCompEU[10], the European competency framework for public procurement professionals, which provides a strong basis for maintaining and enhancing the capability of procurement practitioners in Croatia in future.

144. The responsibility for overseeing the system of training and authorizing the providers lies with the Procurement Policy Directorate. The system is based on face-to-face training provided locally in a wide range of locations around Croatia. Data on the outcomes of courses for students between 2008 and 2021 is summarized in Table 5. The training data from these programs suggests that the average examination score for procurement officers after completing the training program peaked at 91.6% in 2011 and fell to 60 percent in 2019. Training has continued through the Covid pandemic but exam results have continued to fall further in 2020 and the first part of 2021. The proportion of students that passed the exam has been falling since 2014.

Table 5: Training results by year

Year of Training	Number of Students	Passing Rate	Average Grade	Average Grade (nonzero)
2008	66	100%	89.5	89.5
2009	1,544	99%	90.6	91.0
2010	610	100%	91.2	91.2
2011	287	100%	91.6	91.6
2012	745	99%	87.9	87.9
2013	634	100%	88.7	88.8
2014	715	95%	83.8	86.0
2015	1,021	82%	77.7	82.5
2016	675	82%	76.9	82.6
2017	820	73%	72.8	81.2
2018	1,554	63%	63.5	79.7
2019	1,265	60%	60.5	81.5
2020	717	54%	54.3	81.4
2021	175	47%	44.8	83.9

[10] https://ec.europa.eu/info/policies/public-procurement/support-tools-public-buyers/professionalisation-public-buyers/procurcompeu-european-competency-framework-public-procurement-professionals_en

145. The falls in the average examination score and proportion of students passing the examination is mostly driven by the number of students receiving scoring zero in the examination. The final column in Table 5 shows the average examination score excluding all the candidates who scored zero, and this is much more stable over the years. It seems likely that many if not all of the students who are shown has having zero scores did not sit the examination. The training is not restricted to public procurement practitioners, so there may well be students who undertake it in order to increase their understanding of public procurement and then do not sit the examination.

146. The data on the results of courses run by training providers over the period 2017 to 2019, that is recent, face-to-face training pre-pandemic, show significant variation in the pass rates between training providers for those students who sat the exam. There appear to be some issues with the data quality, so the results should be treated with caution. If students who did not sit the exam are included, the pass rates are lower and there is still significant variation. The figures suggest that some examination of the quality standards of the different training providers may be appropriate.

147. Most focus group participants were positive about the training they had received, but there was a significant appetite for more practical examples. The curriculum for public procurement training already mandates a minimum of 30 per cent of time to be spent on exercises, practical examples and case studies, which is positive, but some examination of the quality and range of case studies and examples at this stage may lead to options for further improvement of training. Funding of training was seen as a barrier for participants from some organizations.

148. The shift to online training due to the Covid-19 pandemic was seen as positive by some participants, who particularly appreciated the flexibility and the saving of time. A shift towards more flexible delivery of procurement training, even once the pandemic restrictions are lifted, may be valued by procurement staff and should be considered. The opportunity to undertake training without needing to travel to attend in person, and potentially also to undertake the training online at times that fit around work and family commitments, may help with recruitment and retention of procurement staff. There are international examples (see Annex C) of building online systems for ongoing training needs assessment and flexible access to training.

149. Public procurement practitioners taking part in the focus groups reported some difficulties in working with non-procurement staff in contracting authorities who are involved in technical specification of requirements and in evaluation committees. If these non-procurement staff do not have some understanding of the principles of public procurement, they may have unrealistic expectations and fail to work effectively as part of the procurement process. This will undermine the quality of the procurement process and may take up time from procurement practitioners to resolve any issues. Focus group feedback also indicates that procurement practitioners are often not involved in contract management, which is largely carried out by non-specialist staff. All of this feedback suggests that some basic training for non-specialist staff could lead to improved outcomes and more effective use of procurement practitioners' time. The core public procurement training course is open to all staff but does provide more detail than may be necessary for staff who will not be procurement practitioners. More basic training on the approach to public procurement is already available for non-procurement staff involved in EU-funded processes, which may provide a basis from which training for non-procurement staff could be developed for other public procurement processes.

150. Participants in the focus groups also suggested that turnover rates amongst public procurement practitioners were relatively high, and that there is a case for both increased pay and introduction of non-monetary incentives to assist with retention. Almost any group of public

officials can argue for additional pay, and a business case for a pay increase or other financial incentives to increase retention would need to be based on a thorough examination of the rates of staff turnover and the costs of any proposed incentives. Non-monetary incentives are an important aspect of staff retention and usually rely on good leadership of teams to ensure a motivating and supportive working environment, a focus on the development of individual members of staff through both training and stretching assignments and the opportunity for staff to engage in improvements to working practices. Leadership training for senior procurement managers may be a priority if staff surveys or other sources of feedback suggest that current levels of motivation are not high.

151. **Recommendation 8:** The Procurement Policy Directorate should recommend to [the National School of Public Administration the development of basic training for non-specialist staff in contracting authorities who will be involved in developing technical specifications, on evaluation committees and/or management of contracts. Non-specialist staff need to understand the general principles of specification of requirements, evaluation of bids and the management of contracts if they are to work effectively with procurement practitioners to secure good outcomes. The training for non-specialists needs to be short and focused, and as flexible as possible so that staff can access it quickly when required, so an online solution may be a good option. Practical examples and case studies should be a major aspect of the training for non-specialist staff.

152. **Recommendation 9:** The Procurement Policy Directorate should carry out a review of the effectiveness of the current training for procurement practitioners, focusing on ensuring that all current training providers are working to a high standard and are choosing effective exercises, case studies and practical examples for the mandatory minimum of 30% of the curriculum required by Annex 1 of the 'Rules on education in the field of public procurement'.

153. **Recommendation 10**: The Procurement Policy Directorate should also consider promoting a continued approach to flexible delivery of training, including online training, once the Covid-19 pandemic restrictions are lifted.

5 Digital Transformation

154. There is a comprehensive and well-managed eProcurement system in place in Croatia, which can be developed further to provide a full end-to-end digital tool. If a red-flag system is to be introduced, it will need to draw heavily on the eProcurement data and ensuring that all of the data required for that system is in place and of a sufficiently high quality would be a high priority for further system development, but much of the data of interest for a red-flag system would in any case be useful for wider monitoring and improvement of the public procurement system.

155. Unit cost and bill of quantities data is very important to give a good understanding of system performance and levels of savings. It could potentially be published and therefore provide an additional element of transparency. Another area worth considering for expansion of the system is the information which contracting authorities and entities are required to publish under Article 28 of the PP Act, where this is not already collected through the eProcurement system. Going beyond collecting existing data centrally to link all payment data on contracts to the procurement data would be a significant step forward and capture any contract variations through the eProcurement system would be even more helpful and should be the ambition in the medium- to long-term, if it cannot be implemented immediately. If all of this information were held in a central system, it would allow analysis of contract management to inform procurement system improvements. Central publication of the information would increase transparency by making it easier for external commentators to find and to interrogate all of the published data.

156. One other potential addition to the system identified above would be to capture information that will help understand how procurement is being used as a strategic tool in government. The addition of a field to the eProcurement system to capture the overall weighting given to price in the MEAT evaluation would give a very basic insight into how contracting authorities and entities are approaching the procurement process. It would be possible to go further and to capture all of the evaluation criteria and their associated weights to support analysis of how environmental, social and/or innovative approaches are being used in public procurement. There may be options over time to assess this using artificial intelligence and/or machine learning approaches, but that is not a straightforward option. Given the interest in strategic procurement across the EU, it may be possible for Croatia to develop an approach to analyzing the use of environmental, social and/or innovative approaches in partnership with other EU member states.

157. Overall, the areas that we see as priorities for further digital transformation of public procurement in Croatia are the following:

- **central collection of contract management and all payment data**: a comprehensive and integrated contract management system, including linking payment data to contracts in the eProcurement system, which would make it for the Public Procurement Directorate and contracting authorities themselves to analyze timeliness, cost and at least some elements of quality of delivery of all contracts;
- **unit prices and quantities**: if there were gathered systematically from bids and completed contracts through the eProcurement system, the data could be analyzed to estimate savings and identify any anomalies;
- **evaluation criteria used and the weights associated with these**: at a minimum, it would be helpful to gather the weight given to price in the MEAT evaluation, to allow basic monitoring of how far quality criteria are being used in the evaluation approach,

but capturing all evaluation criteria would make it easier to assess how environmental, social and innovative procurement approaches are being used;

- **identification of procurement officers in charge of procurement processes**: assigning a unique Officer ID to each procurement officer on the eProcurement system would allow their procurement activities to be tracked through the system – and this could be extended to all members of evaluation committees.

158. Feedback from procurement practitioners in focus groups was mixed. Some participants highlighted the high quality of the eProcurement tools overall, even when compared to more developed EU member countries, while others, perhaps inevitably, highlighted areas where there is scope for improvement, including in e-auction systems, ease of registration on the eProcurement portal and ensuring that published data on contract completion could be read by the accounting office. If ideas for improvements are not currently being captured centrally for consideration in future system upgrades then this would be a sensible step to take.

159. **Recommendation 11:** In developing its new eProcurement system, the Procurement Policy Directorate should continue to work towards an integrated system supporting every aspect of the procurement cycle from procurement plans through to contract supervision and completion. Additional data that should be collected centrally as a priority to support overall monitoring and improvement of the performance of the public procurement system includes: unit costs and quantities for all contracts; linking all payments made under contracts to the eProcurement record; contract management data including all contract variations and reasons for these; and capturing information about evaluation criteria used.

6 Centralized Procurement

160. The EU Procurement Strategy highlights the important role that can be played by central purchasing bodies (CPBs).

> *The large procurement volumes of CPBs could be used to leverage strategic procurement, e.g. by setting procurement targets. Their role in the standardisation of public procurement processes and market insight also represents a key element for the professionalisation of public administrations and it enables SME-friendly procedures. The aggregation of knowledge and expertise creates spill-over effects, as CPBs often provide support and consulting services for other contracting authorities*[11].

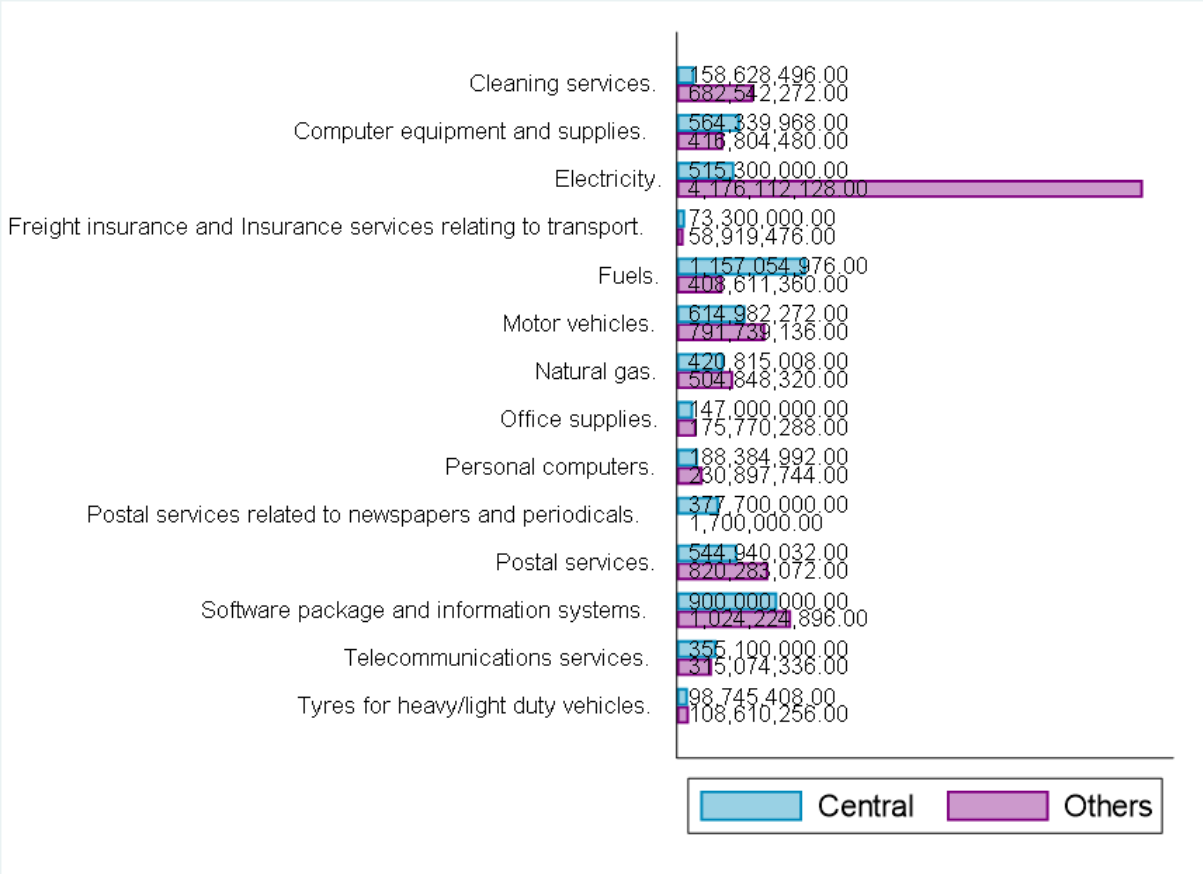
161. Croatia already has the State Office for Central Public Procurement (the Central Procurement Office), which is the central purchasing body for a number of government agencies including ministries for 20 categories of goods and services[12]. The Central Procurement Office currently has 31 regular clients including ministries, and in addition is now the central purchasing

[11] *Communication from the Commission to the Institutions: Making Public Procurement work in and for Europe* COM (2017) 572

[12] Decision on procurement categories (Official Gazette, No. 64/16)

body for 600 smaller state-owned entities such as universities, for which it puts in place framework agreements for 7 categories of goods and services, plus all courts and state attorney offices. The SOCPP conducts public procurement for all courts and state attorney offices throughout the country, which adds about 80 more clients Figure 73 shows the total value of purchases from late 2014 to May 2021 of the categories of goods and services which are currently purchased by the Central Procurement Office compared to the total value of purchases by other buyers – excluding purchases under framework agreements.

Figure 73: Total value in Kuna of goods and services procured by the Central Procurement Office compared to other buyers, 2015 to May 2021



162. The centralized purchasing arrangements have been in place and developed further over a number of years, so now is an appropriate time to review how to continue to build on the value they have delivered and further increase total savings of public expenditure on the goods and services, expenditure on the administration of public procurement and the overall quality of the goods and services acquired through central purchasing arrangements. There are two main ways in which the scope of centralized purchasing could be expanded in Croatia:

- other publicly-funded entities could be required to use or given the option to access central contracts, particularly for categories such as electricity, motor vehicles and postal services where there is currently substantial expenditure by other buyers; and/or
- a wider range of goods and services could be subject to central purchasing arrangements.

163. For either of these options, the central contracts could be put in place and administered by the Central Procurement Office or be collaborative contracts with another body in the lead. Expanding the remit of the Central Procurement Office would require a change in the legislation and additional staff to carry out the extra work, so would need to be considered based on a business case comparing the costs to the projected savings. A collaborative approach led by an existing contracting authority can be very effective if a range of publicly-funded bodies in a particular geographical area or a particular sector have shared needs and established relationships which can be exploited to put in place joint contracts without having to expand the remit of the Central Procurement Office.

164. Analysis of the public procurement market in Croatia using the Kraljic Matrix is discussed in section 3 above (see paragraphs 124 to 127), and the output of such an analysis would provide a good basis for decisions on expanding centralized purchasing arrangements to additional categories of goods and services.

165. One area where centralized procurement can bring significant benefits is in medical goods and services. Some of these are highly specialized so would require a team with professional knowledge of the requirements of public health entities, but as spending on hospitals and medical services is such a large component of overall public expenditure in most countries, the benefits of centralized procurement can be substantial.

166. Evaluating the potential benefits of centralized or collaborative procurement requires a good understanding of local markets so the options discussed above based on international experience need to be scrutinized fully before any decisions are taken. There may be better options for expanding centralized or collaborative procurement based on a full review of the Croatian public procurement markets.

167. **Recommendation 12:** The State Office for Central Public Procurement should look at options to continue to reduce costs and increase overall efficiency by expanding the current approach to centralized procurement, including considering changes to legislation if these are necessary. There are two broad options: making contracts for goods and services currently procured by the State Office for Centralized Public Procurement available to a wider range of state-funded buyers, and/or expanding the range of goods and services for which central contracts are put in place. Central procurement for additional categories of goods or services could either be brought within the scope of the State Office for Centralized Public Procurement or put in place through collaborative arrangements between groups of public entities in geographical or sectoral groupings. Additional staff would be required to carry out new work so the scope to make additional savings would need to be considered in the business case for any changes.

Annex A Regression Analysis

A.1 Introduction to regression analysis

Regression analysis is a statistical technique used to determine whether there exists a relationship between a dependent variable and one or more explanatory variables. The regression equation is of the form:

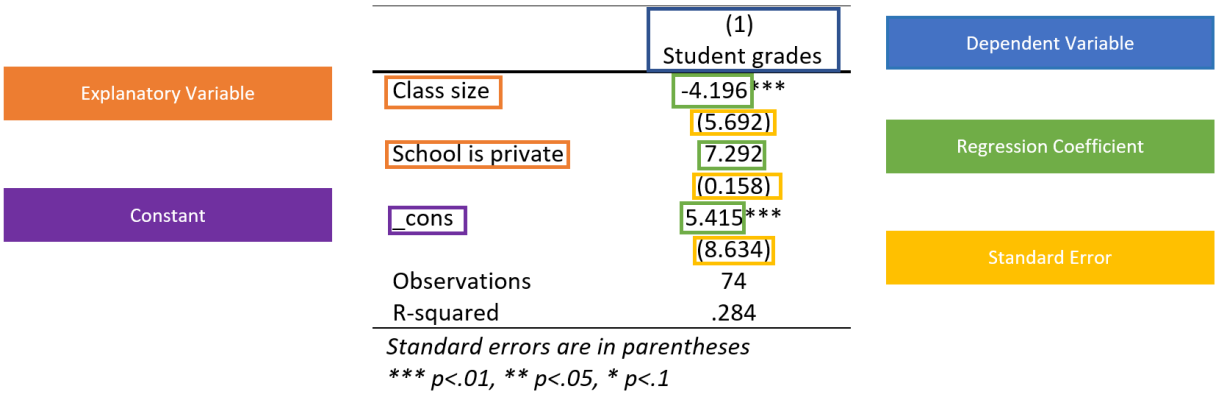
$Y = b_1X_1 + b_2X_2 + ... + \varepsilon$ where Y is the dependent variable, X's are explanatory variables and b's regression coefficients.

In the context of this FA study, procurement outcomes and procurement characteristics are dependent variables and explanatory variables respectively. Hence, we are trying to establish whether there is any relationship between procurement characteristics and procurement outcomes.

Regression results summarizes the nature of relationship in case it exists. Some of the statistics produced from regression include F-statistic, R-squared, regression coefficients, p-values etc. The sign and magnitude of regression coefficients are critical in understanding the relationship. Positive value indicates an increase in the value of explanatory variable results to an increase in dependent variable. In contrast, negative value implies an increase in the value of explanatory variable leads to a decrease in dependent variable. The magnitude of regression coefficients gives information on how large or small the change of dependent variable is whenever there is a unit increase in the explanatory variable. For instance, if a variable X has a regression coefficient of -2 implies that if variable X increases by 1, the value of explanatory variable will decrease by 2.

The goal of regression analysis is to know whether explanatory variables do have a genuine effect on dependent variable, or the effect is due to random chance. In other words, establishing whether there exists **a statistically significant relationship**. This is achieved by determining whether the regression coefficients of independent variables are really different from 0 and if they are, whether it can be considered not to be out of random chance. The null hypothesis states that each explanatory variable has absolutely no effect on the dependent variable i.e. has a coefficient of 0

Example



In the example above, the regression analysis explores the relationship between student grades (dependent variable) and class size and school type (in this case whether its private) explanatory variables. Each explanatory variable has two values – regression coefficient and standard errors.

Standard errors are in brackets whereas regression coefficients aren't. The asterisks indicate whether the explanatory variables are statistically significant or not with the number of asterisks giving information on whether the p-value is less than 0.01, 0.05 and 0.1. The R-squared is a statistical measure that represents the proportion of the variance of the dependent variable that is explained by the explanatory variables in a regression model.

Class size has a coefficient of -4.196. The negative sign implies a negative relationship with a unit increase in class size resulting to a 4.196 decrease in student's grade. School is private has a coefficient of 7.292 which implies a student from private school is probably to have a grade that is 7.292 higher than a student from a public school. The three asterisks in the regression coefficient of class size can be interpreted as being statistically significant at a p-value of 0.01. On the other hand, school is private can be understood to have no statistical significance since it has no asterisk.

A.2 Key indicators used in analysis

Process Characteristics

- *Estimated Value of the Process:* The estimated value of the tender package at the time of tender advertisement.
- *Open Processing:* A binary variable tagging whether the process was conducted through open participation methods (==1) or through closed or restricted participation methods (==0).
- *Number of Lots:* A discrete variable with the number of lots per tender package that were advertised.
- *MEAT Evaluation:* A binary variable tagging whether the process was conducted through Most Economically Advantageous Tender evaluation method (==1) or through Lowest Price evaluation (==1).
- *Great Value Procurement:* A binary variable tagging whether the process was categorized as 'Great Value Procurement' (==1) or 'Small Value Procurement', 'Exemption Procurement' or 'Trivial Procurement' (==0).
- *Goods Procurement:* A binary variable tagging whether the Procurement Type for the procurement was categorized as 'Goods' (==1) or 'Works' or Services (==0).
- *Number of Participants:* A discrete variable with the number of firms participating the bidding process.
- *Fourth Annual Quarter:* A binary variable tagging whether the procurement was conducted in the last fourth quarter of the year between October to December (==0) or in the rest of the annual quarters between January to September (==0)

Entity Characteristics

- *Market Concentration:* A continuous variable with the share of contracts for a product procured by an entity that was won by a firm over the total procurement for that product by that entity.

- Consolidation: A continuous variable with the share of the maximum value of procurement for a product by an entity in a month over the total procurement for that product by that entity in that month.
- Yearly Procurement Volume: A continuous variable with the total volume of procurement conducted by an entity in a year.
- New Product Procured by Entity: A binary variable tagging whether the product procured by the entity in the procurement process is a new product or not.
- Zagreb Entity: A binary variable tagging whether the procuring entity is based or located in Zagreb (==1) or outside of Zagreb (==0).

Bidder Characteristics

- *SME firm:* A continuous variable calculating the proportion of small, medium size bidders over the total number of bidders in the procurement process.
- *Non-Local Bidder:* A continuous variable calculating the proportion of non-local bidders i.e. firms not based in the location of where the procuring entity is based, over the total number of bidders in the procurement process.
- *Zagreb Firms:* A continuous variable with the proportion of bidders that are based in Zagreb over total number of bidders.
- *New Bidder:* A continuous variable with the proportion of new entrants bidding on the procurement package over total number of bidders.
- *Firm Specialization:* A continuous variable with the median rate of product specialization of firms bidding on the procurement process.

A.3 Drivers of outcomes related to indicators

168. In this section the drivers of outcomes that are related to procuring entity behavior such as processing time or process failures are explored through regression analysis. There are many factors in a procurement process that may impact the number of participants in a tender. The factors that are explored in this analysis are categorized under process related characteristics, entity related characteristics and firm related characteristics. This section will explore the drivers of outcomes related to Timely Delivery, Cost Efficiency and Fair and Equal Treatment of Bidders through the following;

- ***Decision period*** i.e. the number of days between tender opening date and contract signing date, and
- ***Competition*** i.e. the number of participants in each process,
- ***Non-local winners*** i.e. whether the firm winning the contract was not based in the location of the procuring entity procuring the product,
- ***SME winners*** i.e. whether the firm winning the contract was a small or medium size supplier,
- ***Zagreb winners*** i.e. whether the firm winning the contract was based in Zagreb or not, and
- ***New winners*** i.e. whether the firm winning the contract had never won a contract with that entity before.

169. These outcomes look at the main characteristics of efficiency, timeliness, and fairness in procurement processes in Croatia and the factors that may drive procuring entity office and firm behavior. The purpose of exploring the drivers of these outcomes is to understand what procedural or buyer characteristics may impact the efficiency of the procurement process.

170. The regression model used for the exploration is as follows:

$$Outcomes_t = \beta_0 + \beta_1 Z_{it} + Product.Fixed.Effects + County.Fixed.Effects + Year.Fixed.Effects + \mu_{it}$$

171. Where, Z is a vector of all process and entity related characteristics that were explored in the regression. The list of characteristics explored are listed in each Regression Table. The regression tables describe the results from the regression analysis conducted as per the model above by looking at two models, one with fixed effects and one without. This way we can understand whether the results are robust and consistent through the simple OLS model and the fixed effects model.

172. The regression coefficients are reported for two kinds of models:

a. A Simple OLS where only the expected change in the dependent variable from a change in the independent variable is calculated ***without*** controlling for the kind of product, the year of processing or the region where the procurement was conducted and,

b. An OLS with Fixed Effects where the expected change in the dependent variable from a change in the independent variable is calculated ***after*** controlling for the kind of product, the year of processing or the region where the procurement was conducted. The OLS with

Fixed Effects is a more rigorous type of regression analysis where the specific characteristics of types of products, regions and time are controlled for.

173. The coefficients from the regression analysis are listed in the last column of the table.

174. To find the complete description and list of all characteristics explored in this and subsequent regression analysis, please refer to section A.2 above. In case the reader is interested to get a brief introduction on what regression analysis is, please refer to section A.1.

A.3.1 Drivers of Outcomes related to Timely Delivery

Drivers of Decision Period

175. The median time taken between the tender opening date to the contract signing date is around 91 days for open participation methods which are the predominant method of procurement in Croatia. When looking at the Simple OLS Model with no fixed effects on products, year of initiation and county of buyer, we find that with an increase in the estimated value of the tender package the decision period also goes up by 3.6 days. This effect however does not stay robust when we add fixed effects on the product, year, and county of buyer. Use of open processing increases the decision period by 30.47 days in comparison to other processing methods under the Fixed Effects model. This could be due to added regulations or norms on evaluating bids under open processing that may impact decision time (Table 6: Drivers of Decision Period at a Process Level).

176. With an increase in the number of lots by one unit in a process, there is an increase in decision period by 0.245 days. With an increase in the number of participants the decision period increases by 1.718 days. Great Value procurement takes 22 days longer than the other types of procurement. Decision period also increases by 4.075 days with the procurement process conducted in the fourth quarter of the year in comparison to the previous annual quarters. This suggests that indeed the seasonality of procurement processes, with bunching towards the end of the year, leads to increases in the time it takes to process the bids during the evaluation stage (Table 6: Drivers of Decision Period at a Process Level

177. With an increase in market concentration i.e. the amount of procurement supplied by the top 5 firms for each product in a county, there is in fact a decrease in the time it takes during decision period by 0.747 days when looking at the Simple OLS model without county level fixed effects. This is likely due to lower amount of time it may take for buyers to evaluate bids from firms that have supplied or worked with the buyer in the past. With an increase in the number of repeat purchases by the procuring entity, we also find that that the decision period increases by 0.028 days. This small increase in decision period may be due to the higher number of processes conducted for buyers with repeat purchases. This is partially confirmed with our finding on consolidation which suggests that entities with a higher level of consolidation of procurement demand in a month tend to have a lower decision time. Interestingly, we also find that when a procuring entity procures a new product that they have not bought in the previous years, the decision time for those products is higher at 20 days in comparison to older products (Table 6: Drivers of Decision Period at a Process Level).

178. We also find that with an increase in the proportion of Zagreb based firms bidding in the procurement process, there is also an increase in the decision period by 0.32 days. An increase in the proportion of more specialized firms however lead to a lower decision period by 0.217 days. This suggests that not only does the number of submissions on a procurement process have an effect on decision period, but also the kind of firms that bid on these processes. When looking at the Simple OLS with no fixed effects on county of buyer, we find that procurement conducted by Zagreb based entities takes 27 days longer in comparison to non-Zagreb based entities (Table 6: Drivers of Decision Period at a Process Level).

Table 6: Drivers of Decision Period at a Process Level

Row No.		Effect on Decision Period	
		Simple OLS	With Fixed Effects
1	**Process Characteristics**		
2	Increase in Process Estimated Value	3.610***	1.400
3	Use of Open Processing	48.81***	30.47***
4	Increase in Number of Lots	0.121	0.245**
5	Use of MEAT Evaluation	-21.06***	5.493
6	Great Value Procurement	9.418***	22.04***
7	Goods Procurement	-10.24***	-1.721
8	Increase in Number of Participants	3.294***	1.718***
9	Procurement in Fourth Annual Quarter	8.411***	4.075*
10	**Entity Characteristics**		
11	Increase in Market Concentration	-0.747***	
12	Increase in Number of Annual Failures	0.225	0.202
13	Increase in Number of Yearly Repeat Purchases	-0.0185	0.0285**
14	Increase in Consolidation	-0.0569	-0.0912**
15	Increase in Yearly Procurement Volume	3.306***	-1.240
16	New Product Procured by Entity	23.11*	20.76*
17	Procurement by Zagreb Entity	27.46***	
18	**Firm Characteristics**		
19	SME Firm	0.00473	-0.0272
20	Non-Local Bidder	-0.0232	-0.0188
21	Zagreb Firm	0.287***	0.326***
22	New Bidder	0.181**	0.0960
23	Increase in Firm Specialization	-0.299***	-0.217***
24	Constant	-8.707	77.61
25	Year Fixed Effects	No	Yes
26	Product Fixed Effects	No	Yes
27	County Fixed Effects	No	Yes
28	Observations	21313	21257
29	* p<0.05	** p<0.01	*** p<0.001

Reading the Table (See Section A.1 for an Introduction to Regression Analysis):

Row 1 to 23: Regression Coefficient: This provides the expected change in the dependent variable (here: Decision Period) for a procurement process due to a shift in the independent variable like Process Estimated Value, Use of Open Processing, Number of Lots etc. The regression coefficients are reported for two kinds of models: a) A Simple OLS where only the expected change in the dependent variable from a change in the independent variable is calculated ***without*** controlling for the kind of product, the year of processing or the region where the procurement was conducted and b) An OLS with Fixed Effects where the expected change in the dependent variable from a change in the independent variable is calculated ***after*** controlling for the kind of product, the year of processing or the region where the procurement was conducted. The OLS with Fixed Effects is a more rigorous type of regression analysis where the specific characteristics of types of products, regions and time are controlled for.

Rows 25 to 27: "Yes" indicates whether year, product and county fixed effects are applied in the regression analysis. When this indicates yes, then the regression coefficients can be interpreted as the effected change in Decision Period from a change in the Process, Entity or Firm characteristics ***after*** controlling for the type of product, year or region where the process was conducted.

Row 28: Observations: The number of observations used for each model.

A.3.2 Drivers of Outcomes related to Cost-Efficiency

Drivers of Competition at Process Level

179. Competition in Croatia for procurement processes is fairly low at only 2-3 bidders per process, even though the use of open participation methods is predominant. With an increase in the estimated value of the procurement process, the number of participants in the process increase by 0.316 firms. So, larger value tender packages tend to attract more participants to the process. Interestingly, the use of open participation methods shows no effect on number of participants. The increase in the number of lots per process, expectedly, also increases the number of firms participating in the procurement process by 0.048 firms, while the use of different evaluation method does not have any impact on the competitiveness of the process (Table 7: Drivers of Competition at the Process Level).

180. With an increase in the rate of market concentration, we find that the number of participants in a tender decrease by a slight amount when looking at the Simple OLS model without any fixed effects at the county level. Interestingly, procuring entities with a higher annual procurement volume are also seen to have a lower number of participants by 0.23 firms. This is not entirely inconsistent with the trends we saw earlier where the procuring entities with the highest annual procurement volume seem to also have more than 70 percent of their main purchases supplied by a single supplier (Table 7: Drivers of Competition at the Process Level). Expectedly however, where there are more firms per product in a county, we find that the number of participants is higher, suggesting that the level of competition may be driven by market conditions more than procurement choices made by buyers (Table 7: Drivers of Competition at the Process Level).

181. When looking at the Simple OLS model with no county level fixed effects, we find that procuring entities based in Zagreb have lower number of participants in comparison to non-Zagreb based procuring entities, after controlling for other factors like annual procurement volume, procurement size, evaluation method etc. This may suggest that even though Zagreb remains the center of most procurement volume in the country, the competition on procurement processes may still not be better than in non-Zagreb based buyers after controlling for process related factors (Table 7: Drivers of Competition at the Process Level).

Table 7: Drivers of Competition at the Process Level

Row No.		Effect on Competition	
		Simple OLS	*With Fixed Effects*
1	**Process Characteristics**		
2	Increase in Process Estimated Value	0.337***	0.316***
3	Use of Open Processing	0.280***	-0.0363
4	Increase in Number of Lots	0.0390***	0.0480***
5	Use of MEAT Evaluation	-0.331***	0.180
6	Great Value Procurement	-0.253***	-0.0425
7	Goods Procurement	0.0310	0.0748
8	Procurement in Fourth Annual Quarter	0.175***	-0.0481
9	**Entity Characteristics**		
10	Increase in Market Concentration	-0.00116*	
11	Increase in Consolidation	-0.000167	0.000741
12	Increase in Yearly Procurement Volume	-0.181***	-0.233***
13	New Product Procured by Entity	0.330	0.427
14	Firms per Entity at Product Level	0.0271***	0.0288***
15	Procurement by Zagreb Entity	-0.133**	
16	Constant	0.287	-1.544
17	Year FE	No	Yes
18	Product FE	No	Yes
19	County FE	No	Yes
20	Observations	22901	21734
21	* p<0.05	** p<0.01	*** p<0.001

Reading the Table (See Section A.1 for an Introduction to Regression Analysis):

Row 1 to 16: Regression Coefficient: This provides the expected change in the dependent variable (here: Competition) for a procurement process due to a shift in the independent variable like Process Estimated Value, Use of Open Processing, Number of Lots etc. The regression coefficients are reported for two kinds of models: a) A Simple OLS where only the expected change in the dependent variable from a change in the independent variable is calculated ***without*** controlling for the kind of product, the year of processing or the region where the procurement was conducted and b) An OLS with Fixed Effects where the expected change in the dependent variable from a change in the independent variable is calculated ***after*** controlling for the kind of product, the year of processing or the region where the procurement was conducted. The OLS with Fixed Effects is a more rigorous type of regression analysis where the specific characteristics of types of products, regions and time are controlled for.

Rows 17 to 19: "Yes" indicates whether year, product and county fixed effects are applied in the regression analysis. When this indicates yes, then the regression coefficients can be interpreted as the effected change in Competition from a change in the Process, Entity or Firm characteristics ***after*** controlling for the type of product, year or region where the process was conducted.

Row 20: Observations: The number of observations used for each model.

A.3.3 Drivers of Outcomes related to Fair and Equal Treatment of Bidders

Drivers of Non-Local Winners at Contract Level

182. On average, 38 percent of all procurement volume in Croatia is won by firms that are not based in the same county as the procuring entity procuring the product. With an increase in the value of the lot, the likelihood of a non-local firm winning the contract goes down by 1 percent. The use of open participation methods, in fact, reduce the likelihood of a contract being won by a non-local firm by 4.419 percent. When looking at the Simple OLS model we find that with an increase in the number of lots, the likelihood of a non-local firm winning the contract decreases by 0.05 percent, however this effect is not statistically significant in the Fixed Effects model.

183. Notably, the use of most economically advantageous tender evaluation method (MEAT) increases the likelihood of a contract being won by non-local firms by 4.6 percent in comparison to lowest price evaluation. Procurement of Goods also have a higher likelihood of non-local firms winning the contract by 1.5 percent. Procurement processes with higher competition or number of bidders also have a higher likelihood of a non-local firm winning the contract by 1.26 percent. That being said, non-local firms are less likely to win a contract by 4.64 percent when the procurement is conducted in the fourth annual quarter of the year. This is interesting as a high volume of procurement for a procuring entity is conducted in the fourth quarter of the year between October to December.

184. Non-local firms are more likely to win a contract with procuring entities that have higher market concentration for the product by 0.22 percent when looking at the Simple OLS model without fixed effects at the county level. Interestingly, with an increase in the number of bidding firms for a product and a buyer, the likelihood of a non-local firm winning the contract also increases. With an increase in the total volume of procurement conducted by an entity in a year the likelihood of a non-local firm winning the contract increases by 1.72 percent suggesting that larger buyers are more likely to contract with firms that are not based in their county.

185. When looking at the Simple OLS model we find that the procurement conducted by procuring entities for products that have never been procured by that entity before have a lower likelihood of having a non-local winner by 4 percent. This effect is not statistically significant for the Fixed Effect model, suggesting that the effect may have been driven by the variations at the level of products, counties, or year of procurement initiation. Procuring entities with a higher number of repeat purchases for a product in a year also tend to have a lower likelihood of a non-local firm winning the contract by 0.04 percent.

186. When looking at the Simple OLS model without county level fixed effects, we find that the largest effect on the likelihood of non-local winners may be through the relationship with Zagreb based entities. Non-local firms are 30.54 percent less likely to win a contract if the procurement is conducted through procuring entities based in Zagreb.

Table 8: Drivers of Non-Local Winners at Process-Level

Row No.		Effect on Likelihood of Non-Local Winners	
		Simple OLS	With Fixed Effects
1	**Process Characteristics**		
2	Log of Lot Value	-2.022***	-0.993***
3	Use of Open Processing	4.656***	-4.419***
4	Increase in Number of Lots	-0.0300***	-0.000692
5	MEAT Evaluation	-17.75***	4.658***
6	Great Value Procurement	2.475***	-0.364
7	Goods Procurement	9.578***	5.106***
8	Increase in Number of Participants	1.452***	1.266***
9	Procurement in Fourth Annual Quarter	-3.018***	-4.639***
10	**Entity Characteristics**		
11	Increase in Market Concentration	0.228***	
12	Number of Purchases at Product-Entity-Year Level	-0.0267***	-0.0406***
13	Increase in Bidding Firms per Entity	0.0387***	0.337***
14	Increase in Yearly Procurement Volume	2.595***	1.721***
15	New Product Procured by Entity	-4.451***	-0.771
16	Procurement by Zagreb Entity	-30.54***	
17	Constant	46.03***	92.11***
18	Year FE	No	Yes
19	Product FE	No	Yes
20	County FE	No	Yes
21	Observations	146139	121454
22	* p<0.05	** p<0.01	*** p<0.001

Reading the Table (See Section A.1 for an Introduction to Regression Analysis):

Row 1 to 16: Regression Coefficient: This provides the expected change in the dependent variable (here: Non-Local Winners) for a procurement process due to a shift in the independent variable like Process Estimated Value, Use of Open Processing, Number of Lots etc. The regression coefficients are reported for two kinds of models: a) A Simple OLS where only the expected change in the dependent variable from a change in the independent variable is calculated ***without*** controlling for the kind of product, the year of processing or the region where the procurement was conducted and b) An OLS with Fixed Effects where the expected change in the dependent variable from a change in the independent variable is calculated ***after*** controlling for the kind of product, the year of processing or the region where the procurement was conducted. The OLS with Fixed Effects is a more rigorous type of regression analysis where the specific characteristics of types of products, regions and time are controlled for.

Rows 17 to 19: "Yes" indicates whether year, product and county fixed effects are applied in the regression analysis. When this indicates yes, then the regression coefficients can be interpreted as the effected change in Non-Local Winners from a change in the Process, Entity or Firm characteristics ***after*** controlling for the type of product, year or region where the process was conducted.

Row 20: Observations: The number of observations used for each model.

Drivers of SME Winners at Contract Level

187. On average only 13 percent of all procurement volume is conducted through SME firms. With an increase in the value of the lot, the likelihood of an SME firm winning the contract increases by 0.6 percent. This is interesting as one would expect that small firms may be more competitive in small value contracts. SME firms have a higher likelihood of winning a contract by 3.4 percent if open participation methods are used.

188. The use of 'Most Economically Advantageous Tender' evaluation method over lowest price evaluation has no statistically significant effect on the likelihood of an SME firm winning the contract. With an increase in the number of bidders however, we find that SME firms are more likely to win a contract suggesting that small firms may be encouraged through increasing competition and access to procurement processes. When looking at the effect of seasonality however, we find that interestingly the likelihood of an SME firm winning a contract is lower in the fourth annual quarter by 0.78 percent. This is important to note in light of the seasonality of Croatian public procurement.

189. With an increase in the market concentration in a county, we also found that there was a decrease in the likelihood of an SME firm winning a contract by 0.03 percent in the Simple OLS model. However, when there is an increase in the total number of bidding firms for a product and a buyer, the likelihood of an SME firm winning the contract increase by 0.3 percent further suggesting that more competitive markets with higher number of firms and higher access to procurement processes tend to produce better outcomes for SMEs.

190. When looking at the number of repeat purchases made for a product in a year by a procuring entity, we find that for buyers with a higher number of repeat purchases, the likelihood of an SME firm winning contract decreases by 0.04 percent. That being said, for procuring entities with a higher annual procurement volume, the likelihood of an SME firm winning the contract is higher by 1.72 percent. When looking at the Simple OLS model without fixed effects on county, we found that SME firms have a lower likelihood of winning a contract if the procurement is conducted in Zagreb by 1.6 percent. This could be an important factor for the success of small firms in Croatia. This is also important given that most of the procurement conducted in Croatia is concentrated in the City of Zagreb.

Table 9: Drivers of SME Winners at Process Level

Row No.		Effect of Likelihood of SME Winners	
		Simple OLS	With Fixed Effects
1	**Process Characteristics**		
2	Log of Lot Value	-0.355***	0.611***
3	Use of Open Processing	3.450***	3.144***
4	Increase in Number of Lots	-0.0477***	-0.0151***
5	MEAT Evaluation	2.146***	-0.573
6	Great Value Procurement	1.649***	0.478
7	Goods Procurement	-0.746**	-0.526
8	Increase in Number of Participants	3.127***	2.634***
9	Procurement in Fourth Annual Quarter	-0.149	-0.784***
10	**Entity Characteristics**		
11	Increase in Market Concentration	-0.0349***	
12	Number of Purchases at Product-Entity-Year Level	0.0215***	-0.00695***
13	Increase in Bidding Firms per Product-Entity	0.00109	0.313***
14	Increase in Yearly Procurement Volume	-1.418***	-2.295***
15	New Product Procured by Entity	2.367***	2.546***
16	Procurement by Zagreb Entity	-1.653***	
17	Constant	32.47***	-2.296
18	Year FE	No	Yes
19	Product FE	No	Yes
20	County FE	No	Yes
21	Observations	146139	121454
22	* p<0.05	** p<0.01	*** p<0.001

Reading the Table (See Section A.1 for an Introduction to Regression Analysis):

Row 1 to 16: Regression Coefficient: This provides the expected change in the dependent variable (here: SME Winners) for a procurement process due to a shift in the independent variable like Process Estimated Value, Use of Open Processing, Number of Lots etc. The regression coefficients are reported for two kinds of models: a) A Simple OLS where only the expected change in the dependent variable from a change in the independent variable is calculated ***without*** controlling for the kind of product, the year of processing or the region where the procurement was conducted and b) An OLS with Fixed Effects where the expected change in the dependent variable from a change in the independent variable is calculated ***after*** controlling for the kind of product, the year of processing or the region where the procurement was conducted. The OLS with Fixed Effects is a more rigorous type of regression analysis where the specific characteristics of types of products, regions and time are controlled for.

Rows 17 to 19: "Yes" indicates whether year, product and county fixed effects are applied in the regression analysis. When this indicates yes, then the regression coefficients can be interpreted as the effected change in SME Winners from a change in the Process, Entity or Firm characteristics ***after*** controlling for the type of product, year or region where the process was conducted.

Row 20: Observations: The number of observations used for each model.

Drivers of Zagreb Winners at Contract Level

191. On average 50 percent of all procurement volume conducted in Croatia is supplied through firms based in Zagreb. With an increase in the value of the lot, the likelihood of a firm based in Zagreb winning the contract decreases by 0.175 percent. The use of open processing methods seems to in fact reduce the likelihood of a Zagreb based firm winning the contract by 4.47 percent. The use of 'Most Economically Advantageous Tender' evaluation method also reduces the likelihood of a firm based in Zagreb to win a contract by 3.27 percent. So, it seems that while the change in the evaluation method has not affected the number of participants in a procurement process, it has had an effect on the kind of firms winning contracts over lowest price evaluation.

192. When looking at the kind of procurement conducted, we find that the likelihood of a firm based in Zagreb winning a contract increases in case of good procurement in comparison to services or works procurement by 5.34 percent. Great Value procurement have a lower likelihood of a Zagreb based firm winning the contract in comparison to exemption, trivial or small contracts by 1.25 percent. Zagreb based firms also have a higher likelihood of winning the contract for processes where there are more firms bidding on the contract by 1 percent. Zagreb based firms also have a lower likelihood of winning a contract in the fourth quarter by 3.18 percent suggesting that seasonality may have an effect on the kind of firms winning contracts.

193. With an increase in market concentration in the county, we find that the likelihood of a Zagreb based firm winning the contract also increases by 0.25 percent. Zagreb based firms also have a lower likelihood of winning a contract in with procuring entities that have a higher number of bidding firms for the product in total by 0.027 percent. However, firms based in Zagreb do well with procuring entities that have a higher volume of annual procurement. With an increase in the annual volume of procurement, the likelihood of a firm based in Zagreb winning the contract also increases by 1.56 percent. Interestingly, when a procuring entity procures a new product that has never been procured before, the likelihood of a firm based in Zagreb winning the contract decreases by 4.05 percent. When looking at the Simple OLS model without county level fixed effects, we find that Zagreb based firms have a higher likelihood of winning a contract by 10 percent with procuring entities also based in Zagreb.

Table 10: Drivers of Zagreb Winners at Process Level

Row. No		Effect of Likelihood of Zagreb Winners	
		Simple OLS	With Fixed Effects
1	**Process Characteristics**		
2	Log of Lot Value	-1.919***	-0.175**
3	Use of Open Processing	1.363**	-4.475***
4	Increase in Number of Lots	-0.0345***	-0.0222***
5	MEAT Evaluation	-13.96***	3.271***
6	Great Value Procurement	4.419***	-1.255***
7	Goods Procurement	19.01***	5.343***
8	Increase in Number of Participants	1.013***	1.084***
9	Procurement in Fourth Annual Quarter	-1.309***	-3.189***
10	**Entity Characteristics**		
11	Increase in Market Concentration	0.254***	0.318***
12	Number of Purchases at Product-Entity-Year Level	0.0154***	0.00151
13	Increase in Bidding Firms per Entity	0.00377	-0.0279***
14	Increase in Yearly Procurement Volume	1.911***	1.561***
15	New Product Procured by Entity	-9.257***	-4.052***
16	Procurement by Zagreb Entity	10.13***	
17	Constant	34.64***	0.0838
18	Year FE	No	Yes
19	Product FE	No	Yes
20	County FE	No	Yes
21	Observations	146139	121454
22	* p<0.05	** p<0.01	*** p<0.001

Reading the Table (See Section A.1 for an Introduction to Regression Analysis):

Row 1 to 16: Regression Coefficient: This provides the expected change in the dependent variable (here: Zagreb Based Winners) for a procurement process due to a shift in the independent variable like Process Estimated Value, Use of Open Processing, Number of Lots etc. The regression coefficients are reported for two kinds of models: a) A Simple OLS where only the expected change in the dependent variable from a change in the independent variable is calculated ***without*** controlling for the kind of product, the year of processing or the region where the procurement was conducted and b) An OLS with Fixed Effects where the expected change in the dependent variable from a change in the independent variable is calculated ***after*** controlling for the kind of product, the year of processing or the region where the procurement was conducted. The OLS with Fixed Effects is a more rigorous type of regression analysis where the specific characteristics of types of products, regions and time are controlled for.

Rows 17 to 19: "Yes" indicates whether year, product and county fixed effects are applied in the regression analysis. When this indicates yes, then the regression coefficients can be interpreted as the effected change in Zagreb Based Winners from a change in the Process, Entity or Firm characteristics ***after*** controlling for the type of product, year or region where the process was conducted.

Row 20: Observations: The number of observations used for each model.

Drivers of New Winners at Contract Level

194. On average, almost 21 percent of all procurement volume was conducted in Croatia was supplied through firms that had never won a contract with the procuring entity before. With an increase in the value of the lot, the likelihood of a new firm winning the contract increases by 0.75 percent. The procurement method does not have any effect on the likelihood of a new firm winning the contract. The use of 'Most Economically Advantageous Tender' evaluation method hurts the likelihood of new firms winning a contract by 2.43 percent while the likelihood increases when the procurement is categorized as 'Great Value Procurement' by 0.973 percent in comparison to 'Small Value', 'Exemption' or 'Trivial' procurement.

195. Seasonality of procurement activities i.e. the bunching of procurement activities in one annual quarter over others may affect the likelihood of new firms winning a contract with a procuring entity. Specifically, new firms have a higher likelihood of winning a contract with a procuring entity when the procurement is conducted in the fourth annual quarter of the year i.e. between October to December. Competition i.e. an increase in the number of participants in a procurement process, increases the likelihood of a new firm winning the contract by 0.43 percent, while the procurement of Goods has a lower likelihood of a new winner by 4.44 percent in comparison to Services or Works.

196. When looking at the relationship of entity characteristics, we find that an increase in the total number of bidding firms for a product increases the likelihood of a new entrant by 0.09 percent. Interestingly, with an increase in the annual procurement volume for a procuring entity there is a decrease in the likelihood of a new entrant winning the contract by 1.17 percent. This may indicate that new firms may be more successful in smaller procuring entities. The largest likelihood for a new entrant winning the contract comes from the procurement of a new product by the procuring entity by 36 percent. New entrants are also less likely to win a contract when the procurement is conducted by a procuring entity based in Zagreb.

Table 11: Drivers of New Winners at Process Level

Row. No		Effect of Likelihood of New Winners	
		Simple OLS	With Fixed Effects
1	**Process Characteristics**		
2	Log of Lot Value	1.293***	0.751***
3	Use of Open Processing	-1.599***	0.176
4	Increase in Number of Lots	-0.00604***	-0.00624***
5	MEAT Evaluation	7.755***	-2.437***
6	Great Value Procurement	-1.326***	0.973***
7	Goods Procurement	-10.38***	-4.444***
8	Increase in Number of Participants	0.377***	0.430***
9	Procurement in Fourth Annual Quarter	1.094***	0.414*
10	**Entity Characteristics**		
11	Increase in Market Concentration	0.102***	0.108***
12	Number of Purchases at Product-Entity-Year Level	0.000710	0.000531
13	Increase in Bidding Firms per Entity	0.0101***	0.0951***
14	Increase in Yearly Procurement Volume	-1.231***	-1.177***
15	New Product Procured by Entity	39.09***	36.07***
16	Procurement by Zagreb Entity	-0.931***	
17	Constant	12.81***	-7.132*
18	Year FE	No	Yes
19	Product FE	No	Yes
20	County FE	No	Yes
21	Observations	146139	121454
22	* p<0.05	** p<0.01	*** p<0.001

Reading the Table (See Section A.1 for an Introduction to Regression Analysis):

Row 1 to 16: Regression Coefficient: This provides the expected change in the dependent variable (here: Zagreb Based Winners) for a procurement process due to a shift in the independent variable like Process Estimated Value, Use of Open Processing, Number of Lots etc. The regression coefficients are reported for two kinds of models: a) A Simple OLS where only the expected change in the dependent variable from a change in the independent variable is calculated ***without*** controlling for the kind of product, the year of processing or the region where the procurement was conducted and b) An OLS with Fixed Effects where the expected change in the dependent variable from a change in the independent variable is calculated ***after*** controlling for the kind of product, the year of processing or the region where the procurement was conducted. The OLS with Fixed Effects is a more rigorous type of regression analysis where the specific characteristics of types of products, regions and time are controlled for.

Rows 17 to 19: "Yes" indicates whether year, product and county fixed effects are applied in the regression analysis. When this indicates yes, then the regression coefficients can be interpreted as the effected change in Zagreb Based Winners from a change in the Process, Entity or Firm characteristics ***after*** controlling for the type of product, year or region where the process was conducted.

Row 20: Observations: The number of observations used for each model.

Annex B Data Sources and Methodology

B.1 Public procurement data from eProcurement system

198. Almost all the analysis conducted in this report has been done using the data extracted from the eProcurement System in Croatia. The eProcurement system in Croatia has a comprehensive database of all procurement processes conducted in Croatia from 2015 onwards. The data analyzed in this report contains procurement processes conducted from 2015 to May 2021. The data used for the report was organized in different datasets at different levels of observation (procurement process level, bid level, contract level, lot level etc) which was merged together to create a master dataset which was in the process-contract-lot level. For much of the analysis the master dataset was used, with some procurement process level indicators like number of bidders, maximum and minimum quoted prices etc extracted from the process level dataset. In total there are 51,036 procurement processes covered in this analysis, which includes 221k contracts at the lot level. Data was also collected for complaints and decisions on complaints registered on procurement processes in Croatia. To understand the trends related to training in Croatia, data on training participation, exam scores and pass rates for procurement officers was also collected and analyzed.

B.2 Data collection on contract implementation

199. The team conducted an online data entry exercise with procuring entity officers in Croatia to collect data on the delivery time and payment value of contracts conducted by procuring entity offices between 2017 to 2019. This exercise was conducted because data after contract signing was not available i.e. contract implementation and management data was not collected through the eProcurement system. The online data entry exercise was voluntary with all procuring entities in the public procurement data collected from the eProcurement system as a part of the exercise. Up to 60 contracts between 2017 to 2019 were randomly sampled for each procuring entity for the data entry. Among more than 707 procuring entities, only 80 procuring entities submitted completed data entry spreadsheets with at least one of the data fields having non-missing values. This low response rate could be due to the voluntary nature of the data entry exercise wherein officers could choose to participate in the exercise.

Most entries came from Zagreb based procuring entities, with 18 participating procuring entities and a total of 152 completed entries for contract implementation data. Krapin-Zagorje had 9 procuring entities participating in the exercise with 57 total entries from these buyers. The analysis of this data suffers from a few biases. First, buyers could self-select into the exercise, thus increasing the risk of a biased sample. Second, the number of total observations and the number of buyers participating in the exercise was low, thus the analysis may not be representative of the true trends in the population. That being said, the analysis from this exercise may provide a quick snapshot of some potential trends in the participating procuring entities. The insights from these trends may be informative for a more in-depth analysis of contract implementation in Croatia through a larger and more comprehensive data collection exercise.

Figure 74: Number of Participating Procuring Entities by County

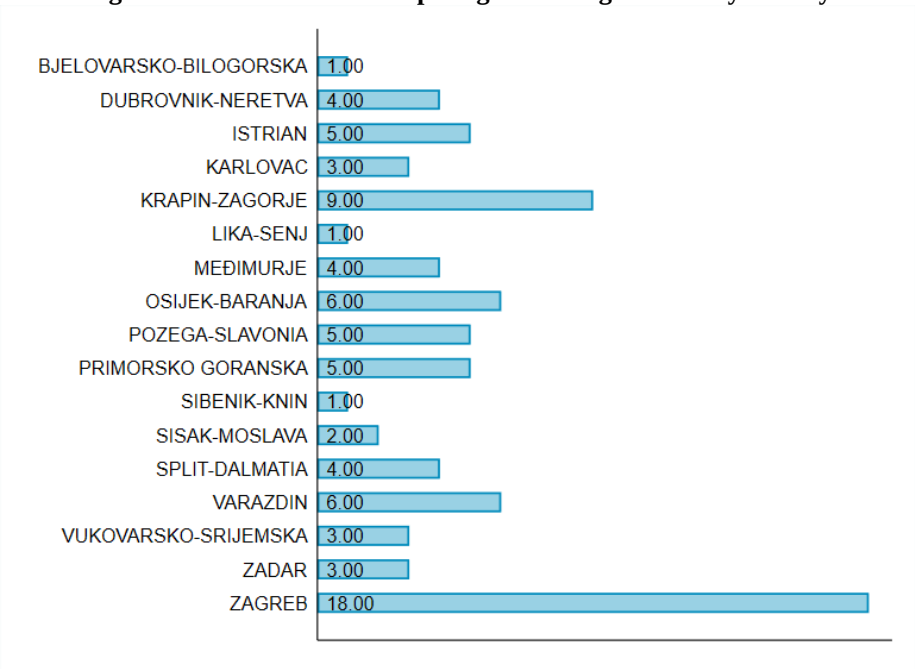
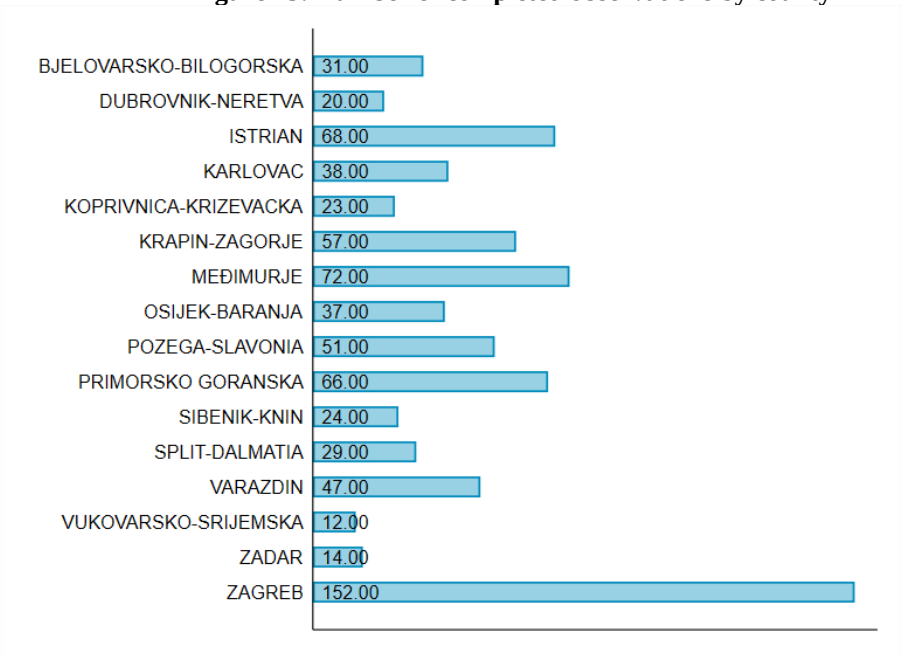


Figure 75: Number of completed observations by county



B.3 Focus group discussion with procurement officers

200. From the preliminary insights of the focus group discussion the team also conducted a series of focus group discussions with procuring entity officers. The purpose of conducting the focus group discussions were to a) understand the potential underlying context behind the

trends seen in the data and b) to cover concepts and dimensions that are hard to measure from data analysis. The discussion revolved around the following topics:

1. **Resource/Information constraints faced by procurement officers**
    a. Training/Information Constraints
    b. Physical/Resource Constraints
    c. Financial Constraints
    d. Human Resource Constraints
2. **Procurement planning, management of procuring entity office**
    a. Constraints in Discretion and Autonomy to conduct procurement activities
    b. Constraints in clarity of roles or responsibilities
    c. Constraints in planning and coordination
3. **Contract Supervision in organizations**
    a. Planning or Management Constraints
    b. Supplier/Subcontractor Quality and Delivery Constraints
    c. Constraints in Issuing Payments
    d. Constraints in Renegotiations and Contract Variations
4. **Competition in Public Procurement**
    a. Competitiveness of Small Firms
    b. Local Talent, new talent or skill
    c. Private contracts vs Government contracts
    d. Outreach from Buyers to Suppliers
5. **Corruption or Collusion in procurement**
    a. Incumbency
    b. Favoritism
    c. Collusion/Beneficial Ownership

201. The focus group discussions were recorded and the notes from the meeting included statements from these discussions keeping the anonymity of the officers participating in the exercise. The key insights from these focus group discussions are discussed in the relevant sections of the report, and a summary of the key points is shown in Table 12. The main insights revolve around Incentives, Resources, Competition, Training and Contract Supervision.

202. During a period of three weeks in April 2021 a total of eight focus group discussions were conducted virtually with senior procurement specialists from both public and private organizations across Croatia. The team ensured that both experts from the capital region as well as other parts of Croatia were represented. The discussion was led by a former procurement specialist and was held in Croatian with simultaneous translation over a period of 2-3 hours. On average 3-4 people participated in a discussion and the questions were standardized for every group. Nonetheless, participants were provided with ample

opportunities to give their views on topics of particular concern or interest. The discussions were greatly appreciated by procurement staff and most saw it as a learning opportunity to share experiences with other colleagues in the same field.

203. The following Matrix provides a summary overview of the discussion topics and findings. Findings are discussed in the body of the report along with analysis of the procurement data and the survey results.

Table 12 Key take-away points from the focus group discussions

Main Topic	Key Take-Away
Incentives	• Both, monetary and non-monetary important. Renumeration considered too low leading to high staff turnover rates.
Proc. Platform	• Procurement platform in Croatia generally well regarded. Adoption of new technologies crucial to keep up with other countries. • Small issues such as registration at the platform being difficult remain.
Time Constraints	• Mentioned on many occasions during the discussions due to understaffing, high turnover rates of staff, inadequate procurement planning and other unforeseen events causing delays in the execution of procurements
Training	• Trainings are highly appreciated by participants; they wish there was more time and funds available. There is a misconception among some superiors that spending money on trainings may be risky if the staff subsequently leaves the organization.
Firm Participation	• Firm participation is low in Croatia, and most participants agreed that this was unfortunate, but that procurement was not necessarily to blame for this but rather the private sector and limited competition. Facilitating access to bidding for SMEs was still viewed as important to increase firm participation.
Favoritism and Collusion	• Participants agreed that they had not witnessed cases of collusion among firms bidding and that competition even with few bidders was quite fierce. However, participants also acknowledged that better tools are needed to monitor the market and collaboration with anti-cartel authorities to detect price fixing etc.
Proc. Planning	• A major bottleneck identified was the collaboration with colleagues from other departments to work out the bidding documents. Better coordination and collaboration can help speed up procurement pr
Contract Supervision	• Contract supervision while primarily executed by non-procurement staff was still discussed in the focus groups. Participants agreed that it was important to find solutions with companies to keep delays to a minimum. A good monitoring system ensures that problems can be identified early on to help prevent worse outcomes later on in the contract lifetime.

B.4 Survey of procurement officers

204. The team conducted an online survey of procurement officers in Croatia on their perspective of quality of contract implementation. This online survey forms the basis of the analysis on quality of goods, services and works delivered in Croatia. The survey instrument is provided in section B.4.2 below. The survey was conducted in Croatian, with language options for English. There were 645 officers who responded to the survey. The survey analysis should be interpreted with the following sources of bias and limitations in mind. First, procurement officers could self-select into the survey and provide their responses based on their experience conducting procurement in their organization. Hence, the responses may not be representative of the overall perceptions of procurement officers and suppliers. Second, the survey measured perceptions as self-reported by participants. In an online setting, the self-reported answers may suffer from recall bias or even be affected by the mood or the setting in which the respondent answered the questions.

B.4.1 Characteristics of procuring entities who participated in the survey

205. Participants of the survey on quality of contract implementation were asked several questions about the type of organization they belonged to and the main government sectors or areas of work in their organization. Among the participants who clearly stated the type of organization, 143 were from regional or local authority organizations, 130 from public legal organizations, 58 from ministry or other state authorities. The participants of the survey came from many different sectors of work. The sectors with the highest representation in the survey are ‘Education’ and ‘Public service’ with 192 and 173 respondents respectively. There were 36 respondents from the healthcare sector, while there were 32 from the recreation, culture and religious sector and 26 from the social protection sector.

206. Given the diversity of organizations that the respondents come from, while the survey may not be representative of all sectors, procurement offices and types of organizations in Croatia, we can however still see some variety in types of respondents in this survey.

Figure 76: Type of Organization

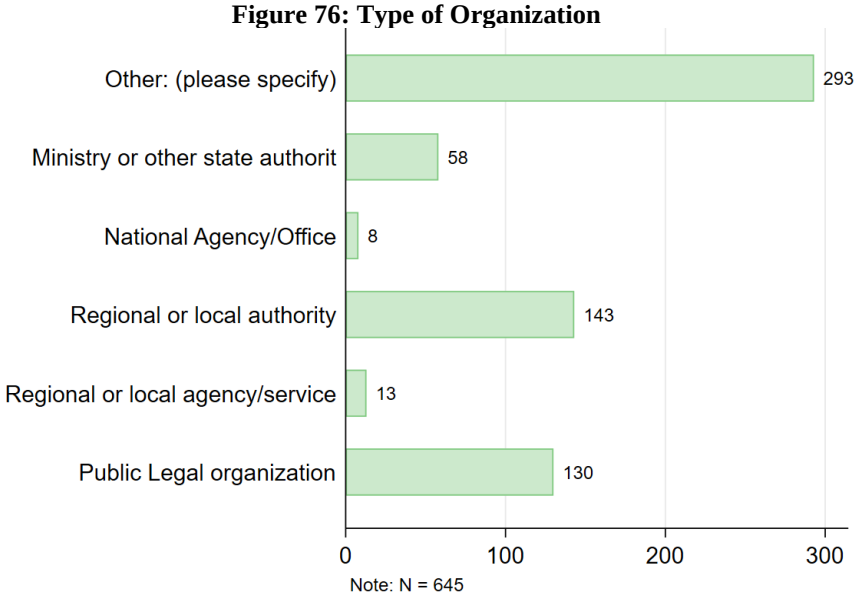
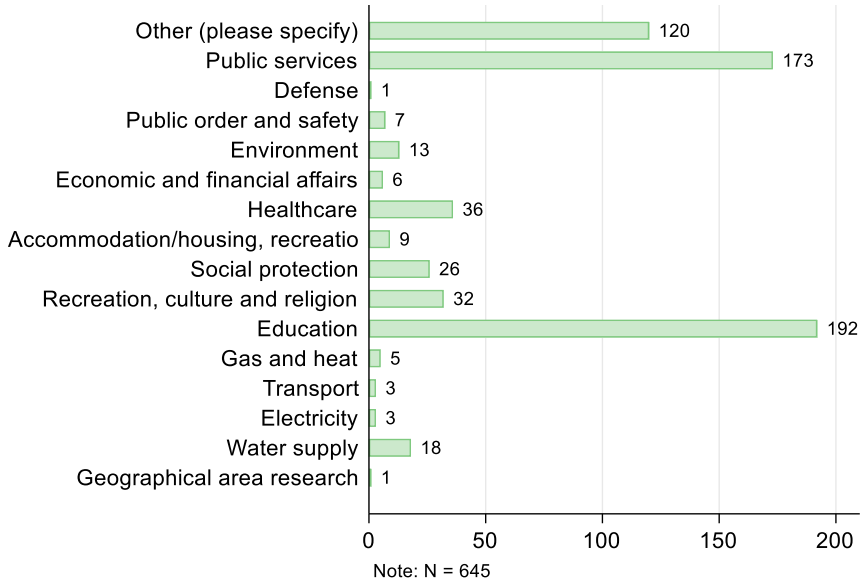


Figure 77: Main Government Sector/Area



207. The respondents for the survey on quality of contract implementation were also asked questions on their experience working on procurement. This was done to put the responses provided by the procurement officers in context to the level of experience of officers responding to the survey. Almost all respondents (92 percent) said that they had conducted procurement activities in their organization in the past. Only 7.82 percent of respondents stated that they had never conducted procurement activities. For this set of respondents, the survey was designed to close after the question. Only respondents who had experience conducting procurement activities were asked the rest of the questions in the survey.

208. Most of the respondents had 1-3 and 4-6 years of experience in conducting procurement activities (148 and 140 respectively). This means around 49 percent of all respondents in the study had around 1 to 6 years of experience working in procurement activities. In addition, 110 respondents have 10-12 years of experience respectively. This implies that the survey participants were experienced procurement officers with many years of experience conducting procurement activities. The procurement officers were also asked about what proportion of the procurement conducted in their organization was for Goods, Works, or Services. The average proportion of procurement in the organizations participating in the survey was 32 percent for Goods, 21 percent for Works and 20 percent for Services.

Figure 78: Conduct of Procurement Activities

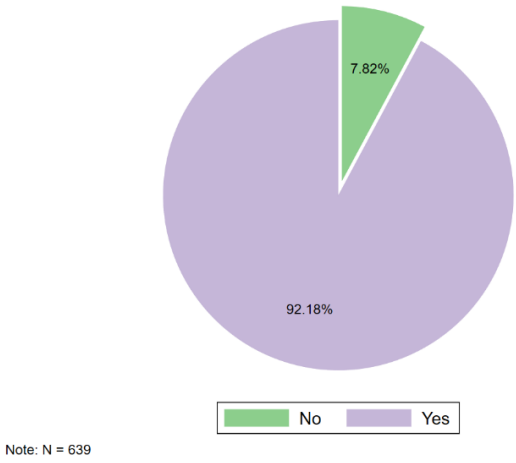


Figure 79: Years of Experience in Procurement Activities

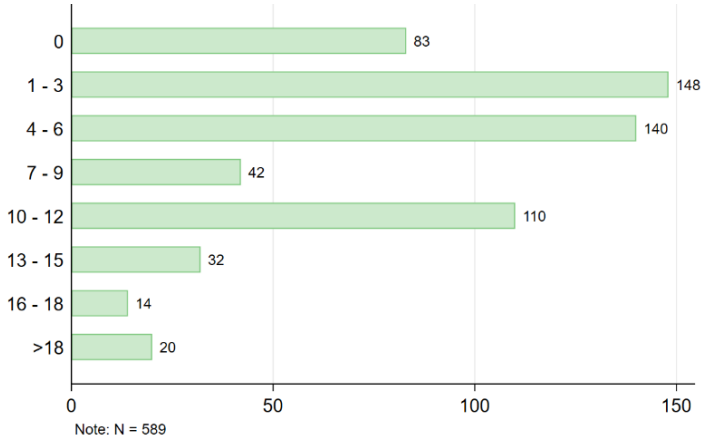
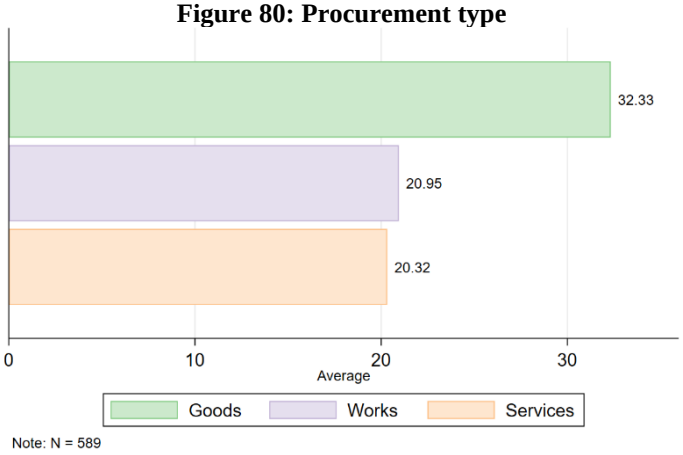


Figure 80: Procurement type



B.4.2 Survey Questionnaire

SURVEY ON PROCUREMENT PRACTICES OF CONTRACTING AUTHORITIES IN CROATIA

1	Please select the location of your organization	
2	Please select the name of your organization	
3	Organization Type	▪ Ministry or other state authority ▪ National Agency/Office ▪ Regional or local authority ▪ Regional or local agency/service ▪ Public Legal organization ▪ European institution/agency or international organization Other: (please specify)
4	Email ID	
5	Main Government Sector/Area	1. Public services 2. Defense 3. Public order and safety 4. Environment 5. Economic and financial affairs 6. Healthcare 7. Accommodation/housing, recreation, culture 8. Social protection 9. Recreation, culture and religion 10. Education 11. Gas and heat 12. Transport 13. Electricity 14. Water supply 15. Postal services 16. Exploitation of a geographical area 17. Other: (please specify)
6	Do you conduct procurement activities in your organization?	Yes/No

7	How many years of experience do you have in conducting procurement activities? Please enter 0 if you have less than 1 year of experience.	[Integer]
8	Please think of all the procurement processes conducted in your organization in the past two years. What approximate percentage of tenders has been advertised for a) Goods b) Works c) Services	[Enter Integer] a) _____ b) _____ c) _____

Competition and supplier quality

This section will go through questions related to the suppliers in the market that your organization has engaged with in the past. Please think of an answer that may apply to most of the tenders advertised in the organization in the past 2 years for products/services procured during 'normal' (non-Covid) times.

9.	For what approximate percentage of tenders has your institution been unable to award a contract because none of the bidders sufficiently met the evaluation criteria?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
10	For what approximate percentage of tenders has your institution been unable to award a contract because of low or inadequate number of bidders?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
11	In your experience, for what approximate percentage of tenders has your institution awarded a contract to a supplier with previous	a) 0-10% b) 10-20% c) 20-30% d) 30-40%

	record of delivering goods or services of poor quality?	e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
12	[If Question 10>=10%] In your experience, how often did your organization award a contract to a supplier with a previous record of delivering poor quality for the following reasons? a) The winning supplier had the lowest price among all other bidders b) None of the other bidders sufficiently met the evaluation criteria for the tender c) There were no other firms that bid on the tender d) The firm had a good relationship with the contracting authority	a) Always b) Most of the times c) Sometimes d) Rarely e) Never (-9) Don't Know, (-99) Not Applicable
13	Please specify any other reason for awarding a contract to a supplier with a poor track record. Skip if you have no other reason	[Text]
14	What challenges does your organization face while evaluating bids from firms participating in the advertised tenders?	[Text]
15	What measures can be taken to increase the number and quality of firms participating in tenders advertised by your organization?	[Text]

Quality of contract implementation

This section will go through questions related to the quality of the products/services that are delivered by suppliers to your organization through procurement processes. Please think of an answer that may apply to most of the contracts managed in the organization in the past 2 years for products/services procured during 'normal' (non-Covid) times.

16	For what approximate percentage of contracts did the quality of the products/services delivered typically meet all the expectations of the organization and the terms of the contract.	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75%

		g) 75-100% (-9) Don't Know, (-99) Not Applicable
17	For what approximate percentage of contracts were you confident that the supplier was dependable and reliable in the performance of its contractual obligations?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
18	For what approximate percentage of contracts did the supplier suffer from significant challenges or difficulties in meeting the contractual obligations?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
19	For what approximate percentage of contracts did the supplier suffer from a lack of manpower or financial resources to deliver the product/service as per contractual obligations?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
20	For what approximate percentage of contracts did the supplier suffer from disruptions in the supply chain leading to challenges in getting necessary provisions for the implementation of the contract?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable

21	According to you, what are the main reasons for low quality of products or services delivered by economic operators?	
22	What measures can be taken to improve the quality of products or services delivered by economic operators?	

Timeliness of delivery

This section will go through questions related to the time taken during contract implementation by the supplier to deliver the product or service. Please think of an answer that may apply to most of the contracts managed in the organization in the past 2 years for products/services procured during 'normal' (non-Covid) times.

23	For what approximate percentage of contracts were the products/services delivered later than the expected date of delivery?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
24	For what approximate percentage of contracts were the products/services delivered earlier than the expected date of delivery?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
25	For what approximate percentage of contracts were the suppliers unable to deliver the products?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know,

		(-99) Not Applicable
26	For what approximate percentage of contracts was the quantity delivered lower than the quantity stipulated in the order?	h) 0-10% i) 10-20% j) 20-30% k) 30-40% l) 40-50% m) 50-75% n) 75-100% (-9) Don't Know, (-99) Not Applicable
27	According to you, what are the main reasons for late delivery of products or services by economic operators?	
28	What measures can be taken to ensure timely delivery of products or services by economic operators?	

Payments

This section will go through questions related to the payments and penalties during contract implementation. Please think of an answer that may apply to most of the contracts managed in the organization in the past 2 years for products/services procured during 'normal' (non-Covid) times.

29	For what approximate proportion of contracts was the delivery or completion delayed because of budget unavailability in your organization?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
30	For what approximate proportion of contracts has your institution refused to pay an invoice to a supplier because of poor quality of goods, works or services delivered?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100%

		(-9) Don’t Know, (-99) Not Applicable
31	For what approximate proportion of contracts did your organization refuse to pay an invoice from a supplier because the products/services delivered were different from the specifications in the contract?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don’t Know, (-99) Not Applicable
32	For what approximate proportion of contracts has your institution applied penalties in an invoice submitted because of late delivery?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don’t Know, (-99) Not Applicable
33	For what approximate proportion of contracts has your institution applied penalties in an invoice submitted because of low quality of product/service delivered?	h) 0-10% i) 10-20% j) 20-30% k) 30-40% l) 40-50% m) 50-75% n) 75-100% (-9) Don’t Know, (-99) Not Applicable
34	If your institution had to modify a contract during execution, how long does it take to approve a contract amendment? Please provide an answer in calendar days	[Integer]
35	According to you, what are the main challenges that your organization faces when issuing payments to economic operators?	
36	What measures can be taken to make the process of issuing payments to economic operators easier?	

Supervision of contracts

This section will go through questions related to how contracts are tracked and supervised in your organization. Please think of an answer that may apply to most of the contracts managed in the organization in the past 2 years for products/services procured during 'normal' (non-Covid) times.

[If Question 8 has Works or Services as >20]		
37	Are you engaged in supervising the implementation of contracts related to works or services in your organization?	Yes/No
38	For works or services projects is there is an implementation plan that is designed and agreed upon at the start of the contract?	Yes/No
[If Question 8 has Works or Services as >20] AND Question 38 == Yes		
39	How do you track if suppliers are able to meet the implementation plan as decided and agreed upon at the start of the contract?	a) This is not tracked, and no specific action is taken to ensure this b) Failure to implement a contract as per expectation is only identified at the deadline c) Delays in contracts implementation are identified when issues in implementation are communicated to the project team d) All contracts are tracked at regular intervals to ensure they are implemented on time e) All contracts are automatically monitored and any issues in implementation automatically flagged (-9) Don't Know, (-99) Not Applicable

40	For what approximate proportion of works or services projects in your organization does the final implementation deviate significantly from the plan agreed upon at the start of the contract in terms of quality or time?	a) 0-10% b) 10-20% c) 20-30% d) 30-40% e) 40-50% f) 50-75% g) 75-100% (-9) Don't Know, (-99) Not Applicable
41	What are the main challenges you face when supervising the implementation of contracts?	
42	What measures can be taken to improve the process of tracking and supervising contracts in your organization?	
43	What other challenges do you face when performing any of your duties as a procurement officer in your organization?	
44	What other measures can be taken to improve the procurement process in your organization?	

Annex C Some International Examples

Strategic analysis and governance structures

209. The **Scottish Procurement Information Hub**[13], developed while Scotland was part of an EU member state, has a team supporting a sophisticated spend analysis tool which is available to procurement professionals in contracting authorities as well as to the Scottish Government. Amongst other things, it enables analysis of: overall spending on goods and services from suppliers; who the key suppliers are; suppliers used in common and therefore opportunities for collaboration.

210. Currently more than 122 organizations, including the Scottish Government, local authorities, the National Health Service Scotland, universities, colleges and other public bodies, provide their accounts payable date on an annual basis and are also expected to provide annual uploads of data required for Best Practice Indicators (BPIs) including savings, qualified procurement staff, and total expenditure with contracted suppliers. The Procurement Hub also provides a contract register and the functionality to analyse PECOS (the Scottish Government's eProcurement software) line item detail on a quarterly basis. It has functionality that enables buyers to monitor performance in areas such as contract and eCommerce usage. The web-based analytical tool which provides access to the hub data is operated by a third-party supplier under contract, and the Hub is run by a team of analytical and procurement staff.

211. Examples of Boards or Committees overseeing system improvement:

- the Procurement Reform Board in the Republic of Ireland[14],which oversees the implementation of the Irish procurement reform strategy and brings together representatives of the major contracting departments and government agencies under the leadership of their Procurement Director (Paul Quinn);
- the Public Procurement Group in Scotland[15], which is the successor to the Ministerially-led Procurement Reform Board;
- governmental procurement committees in Australia with broadly comparable remits:

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[13] Some additional information about the Scottish Procurement Information Hub is available at https://www.gov.scot/policies/public-sector-procurement/support-for-public-sector/ and https://www.publiccontractsscotland.gov.uk/news/news_article.aspx?ID=1162. For more detail about the operation of the Hub, the World Bank can facilitate contact with the relevant team in Scotland.

[14] https://ogp.gov.ie/about-us-3/procurement-reform-board/. Note that although the Board is described as an interim structure pending the establishment of the Office of Government Procurement, it is still in place and OGP has recently advertised for new members https://ogp.gov.ie/interim-procurement-reform-board-vacancy-2021/ .

[15] https://www.gov.scot/publications/public-procurement-governance/

- Queensland has a Government Procurement Committee[16] and Industry Advisory Group along the lines of the Scottish model;
- Victoria has the Victorian Government Purchasing Board[17]
- South Australia has the State Procurement Board[18].

Flexible delivery of training

World Bank

For providing affordable and quality learning opportunities for procurement practitioners, as well as students who want to pursue a career in public procurement, World Bank, together with the Charter for Public Procurement Studies (CPPS), has launched this learning and knowledge portal iNET. This is further reflection of World Bank's own commitment to enhanced use of country systems and e-Procurement.

Through this procurement learning portal, the sponsors intend to offer many learning courses and networking opportunities for procurement professionals around the world. The Certificate Program in Public Procurement (CPPP) is the first in the series of learning programs, offered free online.

Procurement iNET, short for Information, Networking, Education and Transaction, aspires to become the digital space for public procurement professionals from around the world. It will keep them informed about the latest practices, policies and more. Public procurement professionals may need to research and source specific information. They will have access to an observatory. To keep them informed of the latest happenings, a periodical eZine will be circulated to all registered members. Videos from experts will be made available to become aware and knowledgeable. Procurement iNET will also allow the professionals to network with each other. They could identify people similar to them and reach out via the platform to connect, interact and learn & share with those whom they identify with. What's more, all this within the platform, without sharing private information or credentials.

https://www.procurementinet.org/about-procurement-inet/

Procurement People of Tomorrow (PPoT) is a Scotland-wide partnership involving both the public and the private sector that supports recruitment and development of the next generation of procurement and commercial professionals. The initiative was developed when Scotland, as a constituent country within the UK, was part of an EU member state. The four Centres of Expertise – Scottish Government for the central government sector, Scotland Excel for the

[16] https://www.forgov.qld.gov.au/procurement-governance-framework
[17] https://www.buyingfor.vic.gov.au/victorian-government-purchasing-board-vgpb
[18] https://spb.sa.gov.au/content/procurement-governance

local government and voluntary sectors, NHS National Services Scotland for the health sector and Advanced Procurement for Universities and Colleges – have worked in partnership with the University of Strathclyde and the University of the West of Scotland, amongst others, to create the Procurement Development Framework online tool for career development and training. The tool has the Scottish Procurement Competency Framework at its core and allows users to:

- self-assess their skills;
- identify relevant training and development needs; and
- plan their career and personal development.

The tool contains embedded job roles and reporting functions which support sectoral learning and development priorities. Scottish Government led further work to develop an app version of the tool, initially through a summer internship to bring fresh skills and expertise in 2017 and completed using contractors including local SMEs in 2018. The content of the app was tested with procurement professionals across the public sector and members of the Procurement People of Tomorrow (PPoT) working group. The app also has an administrative portal, allowing reporting on competency strengths and weaknesses and job roles to inform organizational and sectoral learning and development plans.

For more information see https://www.gov.scot/publications/procurement-people-of-tomorrow-programme/

Centralized Procurement Body roles and remits

Austria: The **Bundesbeschaffung GmbH (BBG)** is the central purchasing body for the Federal Government of Austria. BBG was established in 2001 by the Federal Procurement Agency Law with a main task to provide central procurement services to federal ministries, in particular to negotiate and conclude framework agreements and make them available to the federal state as well as to other public entities. In addition, its main tasks include bundling requirements to obtain better prices and terms from suppliers and standardizing public purchasing to reduce processing costs and legal risks. The categories carried out by BBG: IT & telecommunications, energy, mobility, services, facility management, office supplies and furnishing, food, chemistry, lab and pharmaceuticals, machinery and workshop equipment, office equipment, paper, cars, textiles, transport, books, newspapers, e-media, security services, facility management, cleaning. In addition to its standard role of a CPB,

The Austrian BBG operates as a coordination centre for the promotion of public procurement of innovation in Austria. Austria developed an action plan on Public Procurement Promoting Innovation and adopted it back in 2012. A PPPI Service Center was established within BBG was established in 2013. PPPI Service Center or (national competence centre for innovation procurement) is financed by the Austrian Ministry of Digital and Economic Affairs (BMDW) and by the Austrian Ministry for Transport, Innovation and Technology (BMVIT), and acts as the single point of contact for pre-commercial procurement and innovation procurement issues in Austria. In a cooperation with the Federal Administrative Academy, it provides training, disseminates information, organizes regular seminars aimed at

raising awareness among decision makers and procurement practitioners about the benefits of innovative and sustainable procurement.

BBG also cooperates with the Vienna University of Economics and Business (WU) for the Public Procurement Excellence - Programme for Public Buyers of CPBs. The program is funded by the European Commission and aims to support public procurement practitioners in performing their roles and achieving the objectives of public procurement at newly or to be established Central Procurement Bodies.

www.bbg.gv.at

United States of America: The Office of Federal Procurement Policy in the Office of Management and Budget established a government-wide approach to acquiring common goods and services, based on the **category management** principles.

Based on fiscal year 2015 data from the Federal Procurement Data System, agencies spent over $270 billion—over half of all federal contract spending—on common requirements like information technology (IT) hardware, office supplies, and other basic needs. The analysis led to the definition of 10 core categories for which the principles of category management are applied: information technology, transportation and logistics services, travel and lodging, facilities and construction, security and protection, office management, professional services, medical, human capital, industrial products and services.

https://www.federalregister.gov/documents/2016/10/07/2016-24054/category-management

https://www.whitehouse.gov/omb/management/office-federal-procurement-policy/#_Office_of_Federal

Annex D Red Flag Indicators: Digital Fraud Detection in Procurement Systems

The International Experience

CONTENTS

1. Introduction to red flag indicators – what they are and their benefits

Red Flag Indicators (hereinafter "indicators") are algorithms to detect indicators of fraud, waste, abuse, errors and irregularities in electronic procurement data. Many of the algorithms are based on proven forensic accounting tests that have been used for decades; others were developed more recently as the result of lessons learned in procurement fraud audits and investigations.

The algorithms are particularly effective when installed in eProcurement, Enterprise Resource Management (ERP) or Integrated Financial Management Information Systems (IFMIS), such as SAP, Oracle and FreeBalance. This is because many such systems offer easy, real-time access to the masses of well-organized data that they collect and store, without the burden of manually collecting and converting paper records to electronic files.

The indicators can be run on a continuous monitoring basis, with ex-ante real time alerts of potential fraud, or on an ex-post basis. The indicators also can be run against databases of historic procurement data to identify red flags of previous fraudulent practices, such as on-going cartel activity.

The indicators installed in procurement systems can be an important component of an overall eGovernment program because most serious fraud and corruption occurs in procurement transactions, resulting in very significant losses. According to the OECD, US $9.5 trillion is spent on procurement globally every year, equal to 12-20% of the average governments' GDP. The OECD cites estimates that corruption drains 20-30% of this amount, or more than US $2 trillion, annually.[19]

Standard eProcurement systems, even without the installation of the indicators, represent a major advance in the efficiency and integrity of procurement procedures, streamlining the process, reducing its cost and eliminating many opportunities for human interference and mischief. A 2016 article in The Economist reported that:

> *"… For more than a decade, [the Copenhagen Consensus] has assessed the global costs and benefits of different development schemes … The winner, yielding a fantastic $663 in benefits for every dollar spent, is digital procurement. … One study suggests that eProcurement cuts the price of contracts by about 12%. Because switching to online bids is fairly cheap, the assumed returns are huge."*[20]

The indicators can further enhance the benefits of eProcurement by among other things:

- Blocking non-compliant or improper procurement transactions, such as bids from companies on ineligible lists or bids received after the bid deadline;

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[19] https://www.oecd.org/gov/public-procurement/Methodology-Assessment-Procurement-System-Revised-Draft-July-2016.pdf; https://www.oecd.org/cleangovbiz/49693613.pdf

[20] The Economist, Developing Bangladesh, How to Spend It, An Ambitious Attempt to Work Out the Best Use Scarce Resources," May 7, 2016; https://www.economist.com/finance-and-economics/2016/05/05/how-to-spend-it

- Providing instant alerts of possible fraud, prioritized by importance and level of risk, *before bids are evaluated, contracts are awarded or payments disbursed*, for the first time effectively making a fraud detection system a fraud prevention mechanism*;*
- Instantly reviewing 100% of all transactions, rather than limited audit samples as used in standard audits;
- Reviewing transactions in a thorough and more effective manner than human auditors can;
- Permitting detailed, real time remote monitoring by oversight agencies, which is not currently feasible in paper procurement transactions; and
- Creating detailed audit trails and digital evidence for auditors and investigators.

In addition to procurement professionals, the Indicators can be used by:

- Auditors conducting procurement compliance audits or forensic audits of suspected wrongdoing;
- Investigators conducting procurement fraud investigations. The Indicators are particularly useful to evaluate the validity of whistleblower reports of misconduct and to focus a subsequent investigation;
- Competition Agency personnel responsible for the detection and prevention of cartel activity and bid rigging violations;
- Development agency personnel involved in the oversight of procurement procedures by borrowers. These officials can receive real time reports of possible misconduct at the same time and in the same details as those received by local procurement officials;
- NGOs involved in the review of "Open Contracting Data" for indicators of fraud, waste or abuse.

On-site or on-line training and instructional materials on how to interpret the reports and follow up on the reports should be provided.

2. How do red flag indicators work?

As noted above, the indicators are computer algorithms that identify red flags of possible fraud, waste, abuse and inefficiencies in tenders and purchasing transactions. The red flags are then matched to their potential related schemes and scored to measure the level of risk. Red flags are not conclusive evidence of fraud but are pointers or symptoms of possible misconduct.

For example, in tenders the indicators may identify bids submitted by different companies that are an exact percentage apart, indicating collusion, or identify bids from debarred bidders. In purchasing transactions, the indicators may identify invoices that do not match the values on the related purchase order, or which greatly exceed the average amount of prior invoices. Much more sophisticated tests can be run, of course, including algorithms that are "learned" by Artificial Intelligence and Machine Learning systems from the analysis of the procurement data and previous tests. (For examples of red flags and the related schemes that can be detected

see Appendix A, below). The indicators can be tailored to the available data and the particular risks encountered in different procurement environments.

The initial tests run on the procurement data can be followed by on-line background checks of the firms and individuals identified in the data analytics. These checks, which can be automated as part of the indicators system or conducted separately by accessing relevant online databases, often have proven to be equally effective to identify potential fraud. They include:

- Confirmation of the existence, legitimacy and ownership of a bidder through review of business and tax registrations;
- Information from business reporting services (to compare to the information contained in bids);
- Reverse address and high risk address checks, to identify bidders located at non-business addresses; and
- Politically Exposed Persons (PEP) and corporate debarment lists reviews.

Further follow up steps can be included in on-line or standard handbooks that can accompany the programs. An example of follow up steps that can be run by investigators can be found at https://guide.iacrc.org; https://guide.iacrc.org/proof-of-common-schemes.

3. Types of reports generated by red flag indicators

The indicators can produce useful reports in the following categories, ranging from simple statistical reports to alerts of potentially fraudulent transactions:

- Significant procurement statistics. For example, the number of contracts awarded to certain contractors by certain approving officials, or the average cost of certain procurements, followed by "outliers" significantly outside those parameters.
- Economy and efficiency indicators. For example, the verification of the selection of the best product for the best price or the failures to do so, as well as the failure to collect available discounts and rebates from vendors, etc.
- Compliance reports. For example, contracts in violation of procurement rules, such as the acceptance of bids from debarred companies or sole source contracts above the sole source limit.
- "SPQQD" reports. SPQQD refers to "Selection, Price, Quantity, Quality and Delivery" Indicators that can point to fraud, waste or abuse. An obvious (but common) example is the frequent, improper selection of a vendor that charges higher prices and delivers substandard product, which points to a kickback scheme.
- Fraud, waste and abuse reports. These include reports of the possible schemes listed above and in Appendices A and B.

When run proactively, the reports can appear as instant "pop up alerts" on an eProcurement portal or as automatically generated emails directed to designated procurement or audit personnel. The reports can contain recommended quick follow up steps to help determine whether fraud, waste or abuse is in fact present and can provide administrative reporting requirements.

4. Types of schemes that can be detected or prevented by governance filters

Among the more common and costly procurement fraud and corruption schemes that can be detected or prevented by the indicators are:

a) Collusive bidding by contractors: this refers to secret agreements by bidders or suppliers to divide work and artificially inflate prices, often with the complicity of government officials.

b) Bid rigging: Improper manipulation of the bidding or vendor selection process to favor certain suppliers and exclude others.

c) "Shell company" vendors: vendors secretly owned by procurement or purchasing agency officials. These "companies" often operate as brokers that add no value to the transactions and receive a disproportionate amount of orders and provide substandard product at high prices.

d) Phantom vendors: "ghost" suppliers, set up by purchasing agency insiders that submit fictitious invoices that are paid as part of schemes to embezzle funds.

e) Purchases for personal use, resale or diversion: a very common abuse that can be quite costly if not adequately monitored and controlled.

f) False, inflated and duplicate payments: another quite common schemes that can expand and be quite costly if not controlled. Such invoices can be submitted and paid in error or deliberately with an intent to defraud.

As noted above, the indicators identify potential schemes by highlighting significant red flags of their presence. For example, the primary red flags of Collusive Bidding, Bid Rigging and Phantom Vendors include:

a) Collusive Bidding:

- Different bids from the same IP address
- Bidders with same contact information
- Unusual bid patterns, e.g., bids an exact % apart
- Sequential bid securities
- Same bidders rebid in same order

b) Bid Rigging:

- Procurement official's contact information is same as bidder's contact information
- Shorter notice to submit bids than rules require
- Sole source awards greater than sole source limits
- Multiple purchases just below procurement threshold
- Award to only one evaluated bidder
- Award to other than the low bidder

c) Phantom Vendors (Ghost Suppliers):

- Vendor not listed in corporate registries, directories or on the internet
- Vendor located at non-business address
- Paid vendor not on Approved Vendor List
- HR employee record matches vendor record

- "Fuzzy match" vendors with different bank accounts
- High number or percentage of sequential invoice numbers
- Broken sequence invoice numbers

The presence of a significant number of these red flags would be a strong indication that a scheme is present. More detailed analysis of the data and other follow up steps can then be taken to confirm or exclude the presence of the scheme. More complete lists of the red flags for all six of the schemes listed above are set out in Appendix A, along with the data required to detect them. Other common procurement schemes and inefficiencies that can be addressed by indicators are listed in Appendix B.

5. Scoring of corruption risks

The risk score refers to the risk to the procuring entity and can be calculated by that entity. Scores can be assigned to each indicator or pattern of indicators according to their likelihood of occurrence and the perceived risk level. The likelihood of occurrence primarily depends on the number and nature of the red flags: several red flags are, of course, usually more significant than a single indicator, and some red flags, such as a bidder being listed on an excluded party list, or bids from supposedly different companies submitted from the same computer, are more significant than others.

The perceived risk level refers to the operational, reputational and financial damage that a scheme might cause if it is in fact present: a possible collusive bidding case in a $100 million procurement would present a higher risk level than false invoices for office supplies. The likelihood of occurrence depends primarily on the number and strength of the red flags detected.

The scoring system might be devised by a committee of procurement, audit and operational personnel based on their prior experience and knowledge of the entity's operations and markets. Its primary purpose is to allow the entity to prioritize its responses to the issues raised by the fraud filters, which might otherwise overburden the response team.

6. Measures to limit "false positives"

Dealing with "false positives" – red flags of potential irregularities or fraud that have an innocent explanation – is one of the primary difficulties in implementing any effective digital fraud detection programs. False positives are particularly disruptive if the fraud detection algorithms are too general or are not tailored to the risk environment being examined.

False positives can be reduced by the following measures:

- Identify unambiguous indicators, such as different bids from bidders on a debarred list;
- Identify and prioritize other strong indicator, such as bids from different bidders that are an exact percent apart and sequential bid securities;

- Identify repeat transactions, such as a high number of split purchases by the same procurement official from the same supplier; and
- Identify transactions with multiple indicators, such as a high number of red flags associated with a single purchase.

Another important factor in reducing false positives is to link the indicators to reports of potential fraud, such as whistleblower complaints. The indicators can be used to help verify or rebut a complaint.

7. What are the requirements for successful implementation of the indicators in eProcurement systems ?

The most important factor in installing the indicators in eProcurement systems is access to the data required to run the algorithms. As mentioned before, although most of this data is readily available in any procurement environment, it still must be collected and stored in a manner accessible to the Governance Filters.

Early planning for the integration of the indicators is, therefore, quite important, as the planning stage will include the decision as to what data the eProcurement system will collect and store, which in turn will decide what indicators can be run. Existing eProcurement systems that did not incorporate this planning can be modified to acquire the necessary data and install the indicators, but at considerable additional cost and difficulty.

For example, in Indonesia (see page 9, below) planning for an eProcurement system was complete and implementation had begun before the procurement agency became aware of the benefits of the indicators. As a result, the system included only purchasing and receiving information, and not invoice and payment information. Invoice and payment information could have been included but was considered unnecessary. Since most indicators of fraud in purchasing systems rely on invoice and payment information, the utility of the indicators was severely constrained. Adding the missing data at the then current stage of development would have been disruptive and costly, so the developers decided to wait until an upgraded version was delivered to add the invoice and payment indicators.

Data outside the procurement system can be imported if other tests are desired, such as matching the contact information of purchasing employees to bidders or suppliers. Software engineers involved in the installation of the indicators in Indonesia reported that, assuming the relevant data is accessible, and that the eProcurement design allows access to it, the indicators could be installed without significant programming difficulties or additional expense.

8. Examples of red flag indicators in practice

According to a 2014 Transparency International Report, citing a 2013 Price Waterhouse Coopers (PwC) report, the many advantages of eProcurement systems, even without the indicators, have been "under-utilised."

At present it appears that most eProcurement systems are only partially implemented. A typical system, for example, may publish requests for bids on the internet but accept bids in pdf format. This, of course, greatly reduces the utility and benefits of the systems. Exceptions that have

been cited as "successful" and more complete eProcurement systems include those in South Korea, Albania, Georgia and Ukraine.

The introduction of Red Flag Indicators also has lagged, probably because of the slow implementation of full eProcurement systems that can utilize them, as well as unfamiliarity with fraud detection procedures among procurement personnel. The same 2013 PwC report found that "although the majority of EU countries have central and/or local databases for public procurement, only half of them query their data about unusual patterns, and only a few develop or use indicators that point to possible cases of corruption. Similarly, only three countries have eProcurement platforms that contain a module designed for the detection of corruption."[21] The PwC report did not identify the countries.

More current research has revealed the following countries where indicators have been applied.

a) Brazil

The Public Spending Observatory cross-checks procurement data with other government databases. Possible misconduct is identified by "orange" or "red" flags for follow up investigations. Among other Indicators, the system looks for:

- Conflicts of interest by procurement personnel
- Procurement abuses, such as contract splitting to avoid competitive bidding
- Unusual bid patterns
- Bidders with the same address
- Rotation of winning bidders
- Contract amendments within one month of contract award

https://www.oecd.org/governance/procurement/toolbox/search/public-spending-observatory-brazil.pdf

Brazil also has adopted open data policies to help attack corruption. http://webfoundation.org/docs/2017/04/2017_OpenDataBrazil_EN-2.pdf

b) United Kingdom

The UK Competition and Markets Authority developed a tool for use by public sector organizations to detect potential anti-competitive behavior. The system's indicators include, among others:

- Tenders with a single bidder or low number of bidder
- Price discrepancies: winning price is an outlier, similar bid prices, apparently arbitrary cost calculations
- "Low endeavor" bids, e.g., bids by the same author
- Most interestingly, the ability to identify similar text and word count in different bids. Such similarities in bids is the number one red flag of collusive bidding.

[21] https://www.transparency.org/files/content/corruptionqas/The_role_of_technology_in_reducing_corruption_in_public_procurement_2014.pdf; https://ec.europa.eu/anti-fraud/sites/antifraud/files/docs/body/identifying_reducing_corruption_in_public_procurement_en.pdf.

The tool has been distributed to almost 90 organizations in the UK and is being reviewed by 29 National Competition Agencies.

https://www.slideshare.net/OECD-DAF/cartel-screening-in-the-digital-era-uk-competition-markets-authority-january-2018-oecd-workshop

https://www.gov.uk/government/publications/screening-for-cartels-tool-for-procurers

c) European Union

DIGIWHIST - the Digital Whistleblower - offers products devoted to Fiscal Transparency, Risk Assessment, and Assessing the Impact of Good Governance Policies; https://digiwhist.eu. The products include:

- EuroPAM, The European Public Accountability Mechanism, a data collection effort to enhance transparency of public administration and the accountability of public officials; http://europam.eu
- Opentender, a platform that allows the user to search and analyze tender data from 33 jurisdictions; https://opentender.eu/start
- MET, Monitoring European Tenders, another tool to assess the risks in European tenders; https://monitoringeutenders.eu

The Government Transparency Institute provides big data analytics to auditors to identify and prevent fraud and corruption in public procurement; http://www.govtransparency.eu

d) South Korea

South Korea has instituted "BRIAS" – the "Bid Rigging Indicator Analysis System." According to a 2016 OECD report, BRIAS looks at bid prices (as a ratio compared to a reference price), the number of participants and the competition method, and applies a formula that generates a potential bid-rigging score. A significant score leads to the collection of more information from the procurement system, followed by a referral for investigation if deemed warranted.

The OECD report found that the results "have been limited: only three cases initially identified by BRIAS have led to findings of guilt." This is attributed to competition from more traditional whistleblower reporting system, but it may also be the result of the relatively limited categories of data – price, number of participants and competition method – the system initially collects. In contrast, a list of numerous data points recommended for collection for specific schemes is contained in Appendix A.

Interestingly, the OECD report noted that "during the period of [BRIAS] operation, voluntary reporting by cartel participants has increased significantly, and some of this increase is

attributed to the raised awareness and fear of being caught generated by the implementation of the BRIAS system."[22]

e) Indonesia

The Red Flag Indicators program in Indonesia referred to in the previous section was developed by the Indonesian National Procurement Agency (LKPP), financed by the US Millennium Challenge Corporation (MCC) and implemented with the assistance of PwC and international and local IT firms.

In addition to the eProcurement system discussed above, the program involved the planned installation of the indicators in the government's database of historic procurement information. The indicators to be installed include the following, with more planned to be introduced later:

1. Recommended contract award to other than the low bidder
2. The low bidder withdraws, followed by award to the second low bidder
3. Bids from different bidders:
    a. have the same business address, telephone number or email address
    b. are from the same IP address
    c. are submitted with ---- seconds/minutes (adjustable) of each other
    d. are identical (including line item bids)
    e. are an exact % apart (including line item bids)
4. 6-9-17 bid pattern (second low bid 6% higher than low bid, third low bid 9% higher, fourth low bid 17% higher)
5. Total or line item bid prices equals cost estimates (or within --- percentage (adjustable)
6. High prices bids: bids --- percentage (adjustable) above cost estimate
7. Less than 30% of companies that bought bid packages submit bids

The following collusion red flags were discovered in Indonesian procurements during the development of the project:

1. Rotation of winning bidders in large infrastructure tenders
2. Different bidders submit "ping ponged" bids for identical different lots or in similar tenders, e.g.,

[22] https://www.oecd.org/governance/procurement/toolbox/search/korea-bid-rigging-indicator-analysis-system-brias.pdf

BIDDERS	LOT A Bid (Specs same as Lot B)	LOT B Bid (Specs same as Lot A)
Company One	$100	$300
Company Two	$300	$100

3. Different bidders submitting bids from the same IP address
4. The same Bid Evaluation Committee members select the same companies a disproportionate percentage of times
5. Other collusive bidding Indicators listed in Appendix A also were discovered in Indonesian contracts in previous investigations.

f) Switzerland

The Swiss Competition Commission (COMCO) has conducted significant research on the digital detection of collusive bidding and bid rigging. Although not directly linked to eProcurement, such research has identified useful indicators that can be included in eProcurement systems and run on a proactive, real time basis .[23]

For example, COMCO identified the following recurring patterns in its cartel investigations:

1. The range of bids (from highest to lowest) was lower in tenders in which collusion was found, i.e., the highest and lowest bids tended to occur within a 10% window. In similar tenders in which collusion was not found the typical range of bids was in a 20% window;
2. There was a wider gap between the lowest and second lowest bids (e.g. 3.5 % difference) than between the higher bids (e.g. about a 1% difference). This was attributed to the desire to ensure that the designated "low" bidder would have a sufficiently lower price than the next lowest bidder to survive a higher technical score by the next lowest bidder. (The close distribution of bids by the losing bidders also was different than the patterns detected in non-collusive bids in other cases.)
3. The cases revealed a pattern of the rotation of winning bidders and among the same group of repeat bidders.

[23] For more information see, http://www.oecd.org/competition/workshop-on-cartel-screening-in-the-digital-era.htm

The Swiss findings are discussed in more detail at https://www.slideshare.net/OECD-DAF/cartel-screening-in-the-digital-era-swiss-competition-commission-january-2018-oecd-workshop;

https://www.oecd.org/competition/workshop-on-cartel-screening-in-the-digital-era.htm

Other red flags that have been proven to be effective in detecting cartel activity in prior cases are set out in Appendix A, Collusive Bidding, below.

APPENDIX A

Some of the most common and costly schemes and their red flags that can be detected or prevented by Red Flag Indicators:

- Collusive bidding
- Bid Rigging
- Shell Company Vendors
- Phantom Vendors
- Purchases for Personal Use
- False, Inflated and Duplicate Invoices

The sample indicators in the sections below are prioritized and color coded as follows:

RED: Real-time BLOCKS or ALERTS of significant Indicators , e.g., warning of a

bid submitted by a debarred company or different bids from the same IP

address

BROWN: Pre-programmed REPORTS for other common procurement fraud

schemes, waste or abuse

Both the "primary data sources" and "other potential data sources" listed for each scheme below should be readily available from any eProcurement system. The primary data requirements refer to the information needed to identify the most significant indicators. Other potential data sources refer to the information needed to identify useful but less critical indicators.

COLLUSIVE BIDDING: Secret agreements by bidders or suppliers to divide work and artificially inflate prices, often with the complicity of government officials.

Sample red flags include:

- Different bids from the same IP address
- Bidders with same contact information
- Unusual bid patterns, e.g., bids an exact % apart
- Sequential bid securities

- Same bidder's rebid in same order in later rounds
- High price bids; e.g. bids that exceed the confidential owner's estimate by > 30%
- Pattern of rotation of winning bidders
- Same bidders always bid, win and lose
- Losing bidders become subcontractors
- Unusual bid patterns, e.g., "6-9-17 bid pattern"
- Bids not in conformity with prior legitimate bid patterns
- Distant bidders are cheaper than local bidders
- Losing bidders can't be located in corporate registries, directories or on the internet

Data Requirements

Primary data sources

- Bidder's address, tele, fax, email, IP address
- Winning and losing bids
- Bid securities
- Owner's cost estimates

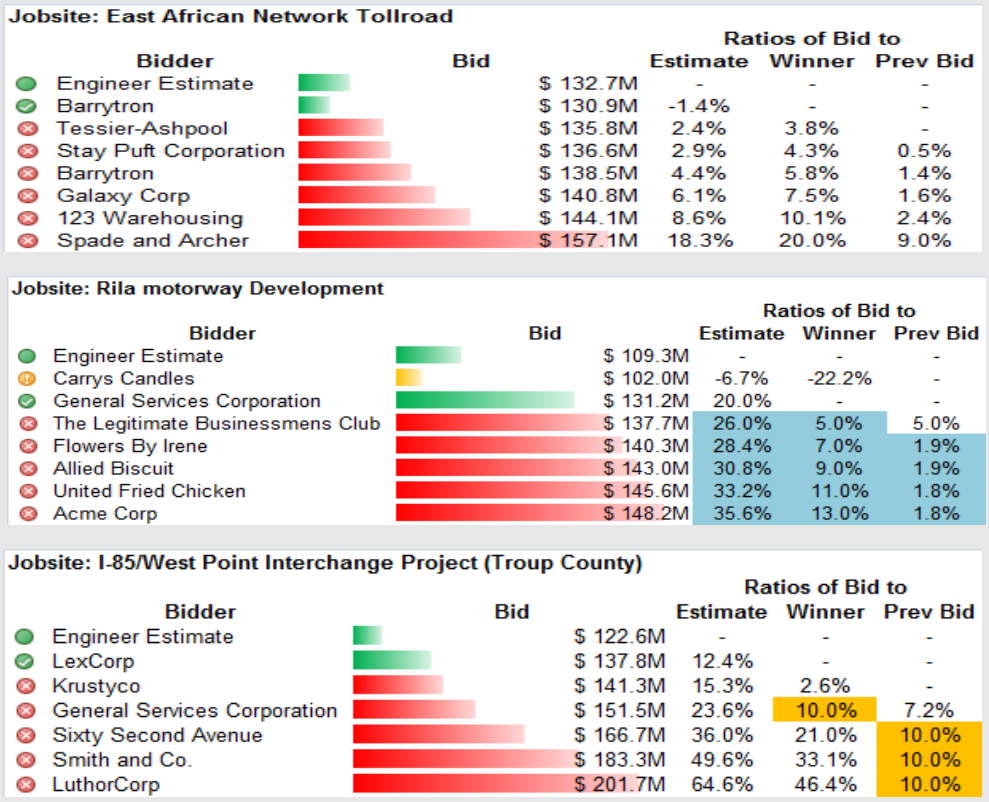
Other potential data sources:

- Line item prices
- Subcontracts
- Previous bids

The charts below illustrate bid patterns associated with legitimate bids and bids rigged as the result of collusion among bidders. The top chart shows an irregular but plausible distribution of bid prices from seven bidders. The bottom two charts show bids exact percentage apart, an indicator of collusion.

Sample Graphic Reports of Collusive Bidding Indicators

Blue and orange highlighted bids indicate potential collusion



Jobsite: East African Network Tollroad

Bidder	Bid	Ratios of Bid to Estimate	Ratios of Bid to Winner	Ratios of Bid to Prev Bid
Engineer Estimate	$ 132.7M	-	-	-
Barrytron	$ 130.9M	-1.4%	-	-
Tessier-Ashpool	$ 135.8M	2.4%	3.8%	-
Stay Puft Corporation	$ 136.6M	2.9%	4.3%	0.5%
Barrytron	$ 138.5M	4.4%	5.8%	1.4%
Galaxy Corp	$ 140.8M	6.1%	7.5%	1.6%
123 Warehousing	$ 144.1M	8.6%	10.1%	2.4%
Spade and Archer	$ 157.1M	18.3%	20.0%	9.0%

Jobsite: Rila motorway Development

Bidder	Bid	Ratios of Bid to Estimate	Ratios of Bid to Winner	Ratios of Bid to Prev Bid
Engineer Estimate	$ 109.3M	-	-	-
Carrys Candles	$ 102.0M	-6.7%	-22.2%	-
General Services Corporation	$ 131.2M	20.0%	-	-
The Legitimate Businessmens Club	$ 137.7M	26.0%	5.0%	5.0%
Flowers By Irene	$ 140.3M	28.4%	7.0%	1.9%
Allied Biscuit	$ 143.0M	30.8%	9.0%	1.9%
United Fried Chicken	$ 145.6M	33.2%	11.0%	1.8%
Acme Corp	$ 148.2M	35.6%	13.0%	1.8%

Jobsite: I-85/West Point Interchange Project (Troup County)

Bidder	Bid	Ratios of Bid to Estimate	Ratios of Bid to Winner	Ratios of Bid to Prev Bid
Engineer Estimate	$ 122.6M	-	-	-
LexCorp	$ 137.8M	12.4%	-	-
Krustyco	$ 141.3M	15.3%	2.6%	-
General Services Corporation	$ 151.5M	23.6%	10.0%	7.2%
Sixty Second Avenue	$ 166.7M	36.0%	21.0%	10.0%
Smith and Co.	$ 183.3M	49.6%	33.1%	10.0%
LuthorCorp	$ 201.7M	64.6%	46.4%	10.0%

BID RIGGING: Improper manipulation of the bidding or vendor selection process to favor certain suppliers to the exclusion of others.

Sample red flags include:

- Procurement official's contact information is same as bidder's contact informatoin
- Shorter notice to submit bids than rules require
- Sole source awards greater than sole source limits
- Split purchases
- Multiple purchases just below procurement threshold
- Award to only one evaluated bidder
- Award to other than the low bidder
- Unusually high line item bid, followed by change order increasing quantities
- Unusually low line item bid, followed by change order removing or reducing line item

- Winning bid price the same as cost estimate

Data Requirements

Primary data sources:

- Bid evaluation Committee members and bidder contact info
- Winning and losing bids
- Bid notice and due date
- Debarment list
- Procurement thresholds

Other potential data sources:

- Line item bid prices
- Contract date and price
- Change orders and amounts
- Procurement plan info
- Previous similar tender results

SHELL COMPANY VENDOR: Vendors secretly owned by procurement or purchasing agency officials.

Sample red flags include:

- Vendor located at a non-business address or not listed on the internet
- HR/vendor matches (cell phone numbers, etc.)
- Vendor not on Approved Vendor List
- Sole source purchases above competitive threshold
- Multiple purchases just below competitive threshold
- Split purchases
- Segregation of duties violations (same person orders, approves and receives purchases)
- SPQQD factors present
- Vendor provides variety of disparate goods or services in contrast to existing vendor norms (per vendor codes and product codes)
- Prompt payment in contrast to the existing payment norm

Data Requirements

Primary data sources:

- Vendor master file
- HR master file
- PO, receiving, invoice, payment information
- Procurement thresholds
- Segregation of Duty requirements

Other potential data sources:

- Benchmark prices
- Vendor and product code lists
- Payment date

PHANTOM VENDOR: "Ghost" suppliers, set up by insiders, that submit fictitious invoices as part of a scheme to embezzle funds.

Sample red flags include:

- Vendor not listed in corporate registries, directories or on the internet
- Vendor located at non-business address
- Paid vendor not on Approved Vendor List
- HR employee record/Vendor record match
- "Fuzzy match" vendors with different bank accounts
- High number or percentage of sequential invoice numbers
- Broken sequence invoice numbers
- Purchases just below competitive thresholds
- Split purchases
- Benford's Law violations[24]
- Small initial purchase
- Vendor provides hard to verify goods, works or services (per product code)

Data Requirements

Primary data sources:

- Approved and paid vendor lists
- HR and vendor master files
- PO, invoice, receiving, payment info

Other potential data sources:

- Procurement thresholds
- Benford's Law distributions
- Vendor and product code lists

[24] Benford's Law states that in naturally occurring number sets, the number 1 will occur as the first digit about 30.4% of the time, the number 2 about 17% of the time with the other digits descending in regular order until the number 9 that appears as the first digit about 4% of the time. Prices in invoices, quantities in reports, etc. that do not follow this pattern can indicate fabricated numbers and fraud. See https://en.wikipedia.org/wiki/Benford%27s_law

PURCHASES FOR PERSONAL USE, RESALE OR DIVERSION: A very common abuse that can be quite costly if not adequately monitored and controlled.

Sample red flags include:

- Purchase of inappropriate personal "consumer items" per product code
- Purchased items not in inventory
- Different "ship to" address
- Split purchases
- High number of purchases of certain items susceptible to personal use (laptops, tires, gas, etc.)
- Returns without credits
- Multiple purchases just below thresholds
- Small initial purchase
- Incomplete information on PO or invoice
- Purchased items, volumes differ from procurement plan
- Employee has outside business (used to resell or divert products)

Data Requirements

Primary data sources:

- Vendor product codes
- Purchased item product codes
- PO, invoice and receiving records info
- Procurement thresholds

Other potential sources:

- Returns and credits
- Inventory records
- Procurement plan info

FALSE, INFLATED AND DUPLICATE INVOICES: Whether done intentionally or inadvertently this is a common problem that can be quite costly if not controlled.

Sample red flags include:

False invoices:

- Invoice information does not match PO, receiving or payment information
- Sequential invoice numbers
- Broken sequence invoice numbers

- Outliers in price, quantity
- Benford's Law violations
- Missing information on invoice

Inflated invoices:

- Invoice price, quantities greater than the PO price, etc.
- Total payments greater than total invoice amounts

Duplicate invoices:

- Invoices with same number, dates, quantities, item description or amounts

DATA REQUIREMENTS

Primary data sources:

- PO, invoice, receiving and payment information including:
  - Dates
  - Invoice numbers
  - Item number, descriptions
  - Product codes
  - Price and quantities
  - Receiving info
  - Payment amount

Other data sources:

- Benford's Law distributions

APPENDIX B

Some of the additional fraud, waste and abuse schemes and inefficiencies that Red Flag Indicators can detect or prevent include:

- Failure to collect entitled rebates and discounts
- Failure to comply with procurement regulations and best practices
- Change order abuse
- Co-mingled contracts
- Duplicate payments
- Exclusion of qualified bidders
- Failure to meet contract specifications
- False or inflated invoices
- Front loading of contract expenses
- Improper sole source awards
- Leaking of bid data
- Manipulation of bids
- Overpayments
- Rigged specifications
- Split purchases
- Unbalanced bidding
- Unnecessary and excessive purchasing
- Product substitution