

# Emergency Procurement: The Role of Big Open Data

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## I. Introduction

The 2020 Global Pandemic has been a watershed moment for the world economy on a scale unseen since the 2008 Global Financial Crisis. The COVID-19 crisis has demanded rapid government responses around the world, from the re-erection of travel and internal mobility restrictions to the massive and sudden acquisitions of medical supplies such as personal protective equipment and ventilators. These developments have had an impact on public procurement systems, not the least on data and analytical frameworks, putting existing mechanisms to the test, and shining a light on areas of opportunity for reform.

Many countries have already made strides towards incorporating transparency requirements into their procurement legislation along the lines of the approach found in traditional public procurement models, such as the UNCITRAL Model Law on Public Procurement (2011) and the systems of the EU and the Government Procurement Agreement (GPA) of the WTO. As elaborated in chapters two and three, these instruments and many of the national laws that implement them, require disclosure to the public or (often the case with information on selection and evaluation) just to participating suppliers, of certain very specific pieces of information, proactively, in some cases, or on request, in others. In some countries these procurement-specific obligations are also supplemented by general rights of access-to-information that allow both suppliers and others – including citizens in general – to access governmental information, including information relating to public procurement as, for example, under the Freedom of Information Act 2000 in the United Kingdom (see chapter 20).

However, openness has, in recent years, taken on a new meaning, more focused on online data availability, format, and reliability for information made available in a pro-active manner, rather than on specific disclosure or access-to-information rights and institutions facilitating freedom of information requests. Some countries have already moved significantly down the road towards an open contracting, or transparency by default, model: for example, this is the case with Ukraine, and of the countries studied for this book, the UK Government has recently proposed this approach in its December 2020 Green Paper, as explained in chapter 15. The novel technology-oriented understanding of transparency brought about by the open data movement and era of Big Data seeks to increase the capacity of governments, bidding firms, and citizens to monitor the procurement process by reducing information asymmetries and enabling both vertical and horizontal accountability. The overarching goal is reducing the costs of accessing and processing information, as well as increasing the quality of publicly available

data. Naturally, these capacities and features are crucial for effective and rapid COVID-19 responses.

Rather than having large teams of analysts pouring through archives to gather and summarize data from contracts and invoices, today interested parties can potentially access this information in seconds through dashboards or readily available datasets. New computational tools have increased the capacities of all stakeholders, including policymakers, members of civil society and researchers, to make complex queries on large datasets in a manner that was not possible just a few years ago.

However, currently, the actual quality and availability of data on public procurement often remains underwhelming. On the one hand, creating high-quality datasets presents several challenges. These come from the technical problems associated with gathering all the relevant data – often reported unsystematically – as well as the complexity of the legal reporting requirements and their differences across countries and over time. On the other hand, even when these data quality conditions are met, they must be complemented by intelligence systems and trained users. It is essential for making sense of large-scale datasets to develop robust and interpretable indicators and communicate them to users in a user-friendly manner such as dashboards or regular reports. Crucially, though, even the best analytics system fails to improve procurement outcomes in the absence of sophisticated users who can draw analytical insights and act on them (Fazekas et al, 2019).

Importantly, the COVID-19 crisis has exacerbated some pre-existing weaknesses and disrupted the reliability of current measures of efficiency and integrity in public procurement. Given the pressure on government buyers seeking to satisfy demands for emergency medical equipment and supplies, two challenges have emerged which we emphasize in this chapter. First, the crisis has put tremendous pressure on procurement institutions and their corresponding data systems, bringing to light weaknesses and showing how detrimental data shortcomings really are for effective policy responses. Second, the crisis has created opportunities for reforming data systems for the better or the worse. As is illustrated below, some governments have opted for drastically increasing transparency and data availability to better steer procurement systems and increase accountability, while others have taken the opportunity to restrict or delay data publication in the interest of speedy purchases and lowering the administrative burden for public administrations (Cepeda Cuadrado, 2020).<sup>1</sup>

To explore these challenges in a structured way, this chapter seeks to answer the following questions. How can data be leveraged to improve procurement outcomes in emergency situations? What do we need to do now to get our data systems ready for the next crisis?

The chapter is organized as follows. In the following section we define the term Big Data and identify the characteristics that distinguish it from traditional sources. We outline the features of high-quality datasets and their importance for transparency. In section III, we consider the challenges that the COVID-19 pandemic has posed for the public acquisition of emergency

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<sup>1</sup> Some governments, as is the case in Hungary, have also capitalized on the pandemic in an effort to curtail general access to information and to benefit well-connected suppliers with favorable contracts on emergency medical equipment (see: <https://www.transparency.org/en/blog/hungarys-rule-of-law-backsliding-continues-amidst-the-covid-19-crisis>).

goods, as well as for wider monitoring efforts to assess the integrity of such transactions. In section IV, we argue that the crisis has highlighted important shortcomings in procurement data reporting such as the lack of sufficiently detailed information on suppliers, products, demand, and subsequent utilization. In the final section, we trace a path forward in which the promises of Big Data are fulfilled, reflecting on the lessons learnt from this crisis and proposals to face subsequent ones on a stronger footing. These proposals include improving reporting practices, as well as data literacy among policymakers and stakeholders.

## II. Transparency, Big Data, and Public Procurement Outcomes

Transparency serves as the broad umbrella term under which much of the subsequent arguments surrounding data, outcomes and COVID-19 are spelled out. Government transparency in this broad sense encompasses any public information made available for actors outside or within government irrespective of the way in which it is made available (upon request, automatically, etc.) (Bauhr et al, 2020). Crucially, the subsequent discussion of open and Big Data predominantly focuses on de facto transparency rather than transparency as prescribed by laws and regulations. Hence, this discussion builds on and goes beyond most other chapters in this book taking a largely legal perspective.

Given the scale and complexity of government procurement systems, the term *Big Data* has occupied a central location in our understanding of transparency in public procurement, even though it only occupies a limited section of what transparency entails in this domain<sup>2</sup>. Big Data has several definitions; however, in this chapter we focus on the characteristics that distinguish it from traditional data sources. In contrast to data collected from traditional sources,<sup>3</sup> Big Data has a higher frequency of availability, often in real time. Similarly, the coverage and detail of Big Data is larger, encompassing several additional layers about observed cases. Not only does Big Data enjoy higher levels of granularity in comparison to traditional sources, but it can also be made more widely available to the public.

Its many advantages notwithstanding, Big Data approaches face several challenges that are not present when working with traditional sources. Importantly, the information used to build Big Data-sets is often generated for purposes that are different than the analytic aims of those who compile it. For example, social media posts are generated by users with the purpose of communicating a wide range of ideas to peers and the public. However, said posts can be recollected by parties interested in developing insights about user behavior and preferences. Thus, the analyst must not only collect the target number of posts from the internet, but also extract relevant information (e.g. text from HTML code) and structure it in a format that can be easily analyzed. Similarly, whereas questions in surveys are designed to extract information relevant to researchers and analysts, information scraped from online government publication

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<sup>2</sup> The term transparency has a wide variety of connotations, each emphasizing distinct overarching goals and corresponding to the perspectives of different scientific disciplines take (see e.g. Ball (2009)).; and the discussion of transparency in Chapter 2. .

<sup>3</sup> By traditional sources we refer to data that has been created *ex profeso* for analysis. This encompasses a wide range of data sources such as surveys, aggregate statistics, indicators, and structured interviews.

portals or data repositories is collected with a multitude of purposes in mind and thus must be cleaned, processed, and filtered for analytical uses (Fazekas, 2019).

Given the need to clean and collect data, there is a high technical entry-barrier for users who wish to analyse public procurement information scraped from the internet. The analysis of Big Data-sets demands a different set of tools and methods with which policymakers and researchers must first familiarize themselves.<sup>4</sup> Furthermore, interpreting the analytical results from these methods is often far from straightforward given data uncertainty, errors, complexity, and the diversity of markets that public procurement incorporates.

Public procurement has long been a data-rich area of public spending due to its reliance on public tendering and the demand and obligations relating to transparency that are designed to provide scrutiny of public procurement decisions by suppliers, monitoring authorities and citizens, whether for the purposes of legal compliance – as discussed in chapter two – or for other reasons. The turning point in Big Data and public procurement has been the transition from individual records on transactions to structured datasets. This was enabled by the proliferation of electronic and online procurement tools and reporting platforms such as the Tenders Electronic Daily (TED) site in the EU or national e-procurement system such as Portugal's BASE.<sup>5</sup> These electronic procurement platforms reduce the cost of monitoring and lower information asymmetries between well-connected insiders (bidders and procuring entities alike) and outsiders in the procurement process (suppliers who are potential market entrants, civil society, journalists, and others). In addition to this cost reduction, the granularity and streamlining of data is also increased considerably. Interested parties can access not only data on the attributes of contracts and bids, but also gain a deeper insight into network effects by exploiting relational data (Fazekas & Wachs, 2020). Similarly, they can access near real-time updates on the dynamics of the procurement market fostering rapid responses.

Although procurement data is widely available, it is not always reported systematically and completely. Systematizing the collection and publication of procurement data can reveal missing or unclear data points (e.g. reporting the names rather than the tax codes of bidders/winners). However, high-quality and integrated data systems are both complex and costly. They demand a) reliable data management structures and IT expertise to maintain, and b) cross-departmental collaboration to ensure the adequacy of their content (Fazekas & Saussier, 2018).

Crucially, the availability of machine-readable data on public procurement transactions – even if it is of the highest quality and scope – does not directly translate into results without the relevant actors being capable of making use of them (Bauhr et al., 2020; Fazekas & Blum, 2021). The emphasis here is on relevant actors who have an interest in using the data and capacity to make sense of it as well as sufficient power to make a difference. This argument is empirically tested

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<sup>4</sup> Often, analysing Big Data demands employing sophisticated machine-learning algorithms (e.g., Random Forests and Support Vector Machines). Though there are overlaps between these tools and more conventional statistical approaches (e.g., logistic regressions are often used in both cases), there is a difference in focus. Whereas in conventional statistical analyses the goal is typically to calculate the impact of a variable or the difference between groups within a pre-determined confidence level; machine learning approaches use the predictive capability of the data fed to a wide array of algorithms as a standard of validity.

<sup>5</sup> This is a result of the reporting requirements set by Portugal's Code on Public Procurement (decree 111-B / 2017).

by Bauhr *et. al.* (2020) who – based on a regression analysis of 3.5 million public procurement contracts across Europe (2006-2015) – find that providing bidding information such as submission deadlines to insiders of the procurement process (suppliers) is crucial for controlling corruption risks in public procurement. Moreover, these actors with an interest in procurement and decision-making powers also needed to have adequate understanding of public procurement regulations and market dynamics as well as be sufficiently trained for drawing insights from data analysis.

Data quality, data use, and behavioural changes resulting from data-driven insights should not be viewed in isolation. Data producers and monitoring bodies are among the principal actors potentially benefitting from better data on public procurement transactions. However, often the value of data is under-estimated, with this being considered merely as a question of compliance with legal requirements – which, as we have set out above, are currently often quite piecemeal and limited – rather than an asset for driving policy change and market efficiency. By realising the power of Big Data analytics in public procurement, the impetus for wider scope and greater quality data can grow, eventually creating a virtuous circle with better data feeding into greater data use which in turn supports even better data.

The challenges of data availability, quality and use notwithstanding, there have been many such developments in collecting analysing and using Big Data in public procurement. One example is the DIGIWHIST project (DIGIWHIST, 2020), which collects micro-level (at the contract level) public procurement data in Europe and offers an open, structured, and standardized platform to make it accessible to the public. Furthermore, DIGIWHIST generated robust indicators from procurement Big Data, making it easier for non-technical audiences to benefit from the project's findings. Regular users range from journalists and civil society through academia to governments and development banks. Nevertheless, much work remains to be done both in increasing the quality of data reported by European governments, as well as in the creation of reliable indicators to ensure that better data leads to a subsequent demand for better results.

The desirability of transparency for fighting corruption, improving government accountability, enhancing value-for-money, and supporting administrative efficiency have all received lots of policy and advocacy interest. However, a better understanding of the impact various types of transparency interventions have on increasing integrity, value-for-money and administrative efficiency remains of crucial importance (Fazekas & Blum, 2021).

Increasing the availability of public procurement data at a low-cost decreases transaction costs to all key players of public procurement. For bidders, easily and cheaply obtaining bidding and market information is paramount. For buyers, quickly and cheaply identifying suitable suppliers and understanding supply markets carries the benefit of improving purchasing and tapping into adequate supply markets. More and better accessible data has been shown to increase the quality and quantity of bidders, thus improving value-for-money (Blum *et al.*, 2021; Coviello & Mariniello, 2014; Lewis-Faupel *et al.*, 2016, de Michele & Pierri, 2020). The effect of information on administrative efficiency is somewhat less clear-cut; nevertheless, the evidence suggests that better and more readily accessible public procurement data can help buyers more quickly and cheaply vet bidders, considerably cutting down on the time needed for bid evaluation (Blum *et al.*, 2021). However, transparency requirements, if they are not properly

implemented in transactional e-procurement systems, can impose additional administrative burden on procurement officials too.

### III. The COVID-19 Challenge and Changes to Transparency Regimes

The COVID-19 crisis has presented multiple challenges to public procurement data systems all at once while also leading to drastically different policy responses. Generally, governments had to rely more on timely and accurate data to make rapid decisions while many of them increased transparency to improve accountability and efficiency of markets for critical products, while others decreased transparency in the name of flexibility and speed (Open Contracting Partnership, 2020). As experienced in past crises, public health emergencies and the need for rapid government response increase integrity risks, the current pandemic is no exception (Schultz & Soreide, 2008; OECD, 2020a).

The rapidly evolving and unusual market pressures on governments weakened their usually strong market power in supply markets. Especially during the early stages of the crisis, there was a shift in bargaining power away from procuring entities to suppliers of emergency goods which suddenly saw a large surge of demand for their products.<sup>6</sup> As explained in chapter two, in order to maximize value-for-money, guarantee integrity and realise other procurement objectives, the public sector model involves open market competition to select the best suppliers while meticulously evaluating their prior experience and suitability. However, if major procurement decisions must be made overnight, there is no time for lengthy open tendering procedures nor for detailed background checks and verifications.

These unusual conditions, in turn, increased the need for speedy and accurate data to assess unusual offers from companies have no prior history of supplying medical and emergency goods in order to screen fraudsters and low-quality providers. Readily available Big Data on market entrants in any award procedure could drastically cut down on time needed for checking potential suppliers and verifying their track record, even under emergency procurement pressures. However, for this to really make a difference data must be readily available, high-quality and of sufficient scope and detail. In this context, ready availability means that data could be retrieved for analytical purposes rapidly, within a couple of hours or a couple of days at most. High-quality procurement data implies that it is correct and accurate in representing actual tendering and contracting decisions while lacking any notable omission or missing information that would bias the analysis. Sufficient scope means that the data covers the bulk of relevant procurement markets and hence the relevant suppliers and their track record. Finally, sufficient detail means that the relevant bits of information for understanding medical markets are available, such as unit prices and technical details on product quality and quantity.

With extreme pressures on healthcare systems, stakeholders became much less concerned with transparency and procedural rules and more concerned with seeing results and quickly. In the scramble to acquire personal protective equipment, ventilators, and other critical supplies, states resorted in a significant way to exceptional award procedures involving limited transparency as

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<sup>6</sup> For example, some suppliers demanded advanced payments from procuring entities during the first stages of the crisis, which in certain cases was not even enough to secure the goods (OECD, 2020).

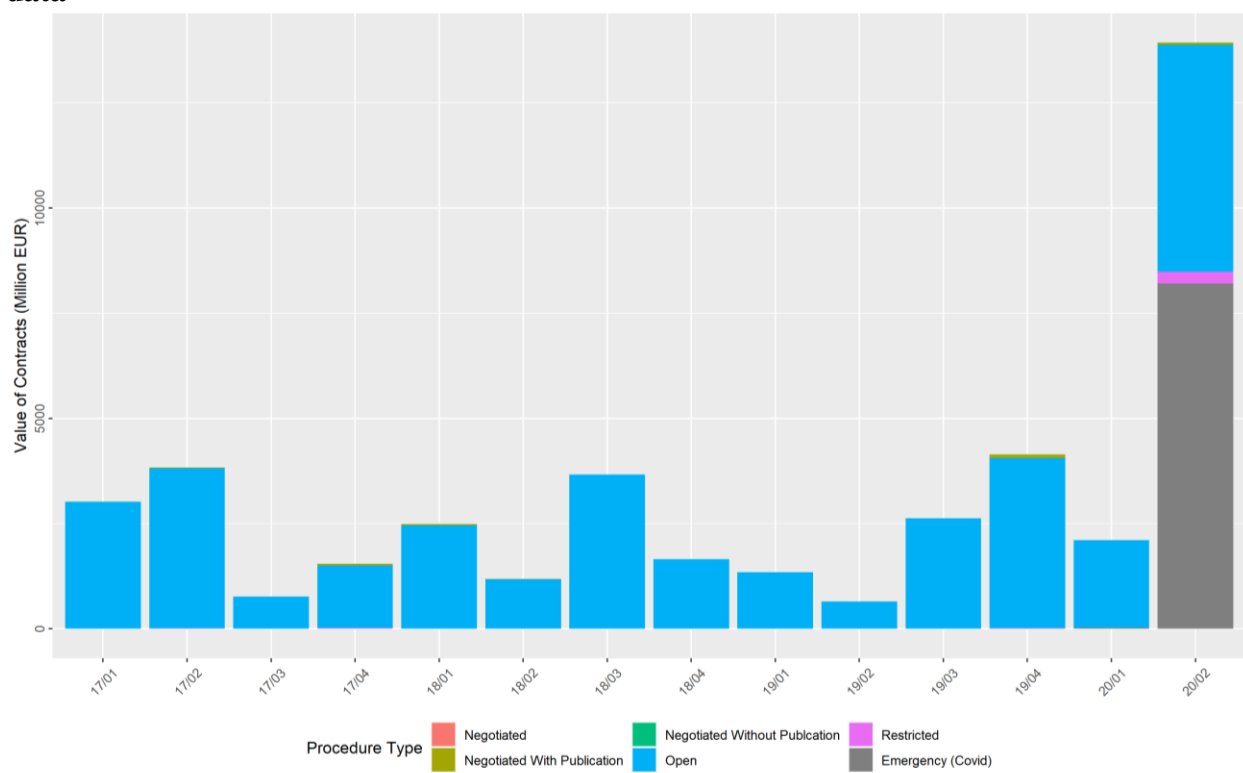
illustrated in the country study chapters in this book. Even limited transparency requirements for those procedures, in particular *ex-ante* reporting requirements, often appeared as a burdensome barrier to rapid and flexible procurement decisions needed in unusual circumstances. For example, in China, (where much pandemic-related work has been done outside the public procurement system altogether, through a state-directed system for use of resources) pandemic-related procurement has been done mainly under a complete exemption from the Government Procurement Law for emergencies, under which control is limited to purely internal record-keeping and internal scrutiny, as discussed in chapter 21, where it is argued that problem with the legal framework in terms of requirements for ex ante publicity for urgent procurement would have made that framework difficult to apply but that this has also diminished other – desirable – elements of transparency relevant under that framework, including ex post information). Hence, unsurprisingly the urgency and novelty of the COVID-19 crisis resulted in a reduction in transparency in some countries.

The scale of decreases in de facto transparency is revealed by selected case studies from around the world as well as large-scale data analysis for the EU. Contract award data was published with substantial delays in places like Buenos Aires and justification for emergency procedures was not clearly spelled out in Georgia (Open Contracting Partnership, 2020). Looking at the substantial changes to transparency practices such as the use of procedure types which require the timely publication of call for tenders in the EU lends further support to our argument. Figure 1 shows the total value of awarded contracts related to medical and emergency products (e.g. medical breathing devices, protective gear, antiseptics etc.) in EU by quarter (2017-2020).<sup>7</sup> Prior to the second quarter of 2020, most contracts were awarded following an open procedure with the total value of medical procurements remaining relatively stable. However, at the onset of the COVID-19 crisis, the total value of contracts for emergency medical goods skyrocketed, with the bulk of them through COVID-related emergency procedure types which do not require the prior publication of a call for tenders in the Official Journal of the EU.

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<sup>7</sup> Contract-level data comes from the EU's Tenders Electronic Daily site (TED). The classification was done by selecting the following Common Procurement Vocabulary (CPV) codes: 45215142, 33631600, 33191000, 33192120, 33157000, 39330000, 35113400, 33157110, 33157400, 33694000, 33141420, 33195110, 33670000, 18143000, 18424300. These have been denoted as predominantly COVID-19-related here: <https://simap.ted.europa.eu/covid-related-tenders>

**Figure 1. COVID-related contracts by quarter and procedure types, 2017-2020, EU, TED data**



Source: *opentender.eu*

There is also reduced appetite and, importantly, practical capability, for public scrutiny and oversight in this context: for example, when large medical purchases are made in a matter of a few days; quite apart from the much more limited scrutiny that is inevitable when open tendering approaches are not applied, opportunities for external scrutiny are greatly reduced in such cases even below the level often applied to direct awards. This is the case with ex ante scrutiny, at least, in some of the countries discussed in this book. For example, in Nigeria, as discussed in chapter 22, the emergency procurement rules that apply under that system were invoked and gave exemption from the usual ex ante approvals from the Bureau of Public Procurement – albeit also requiring a significant transparency of information regime both before and after awards<sup>8</sup>; while in the Indian state of Tamil Nadu, some of the procurement laws were suspended, affecting, in particular, ex ante publication obligations, although ex post transparency less so.<sup>9</sup>

Disruptions to open competitive practices – temporary or otherwise – such as open tendering and transparent publication can have detrimental effects as they increase the risk of inter-bidder collusion and corruption. For example, in a study of public procurement in Italy, Coviello &

<sup>8</sup> See Chapter 22, section II.B.

<sup>9</sup> See Chapter 19, section III.B.



Mariniello (2014) found that increasing publication requirements leads to an increase in the average number of bidders per contract, thus reducing the risk of corruption and increasing the intensity of competition. Similarly, the link between improved competition and increases in value-for-money and product quality has been validated empirically both in the developed (Bauhr et al., 2020) and the developing worlds (Lewis-Faupel et al., 2014; Iimi, 2006).

Increased risks set off by the pandemic are evidenced by scandals involving politicians, purchasing officials and suppliers of medical supplies from around the world, some of which are referred to in the country-study chapters in this book, although for the most part *ex ante* audits and investigations on these matters have yet to be completed.<sup>10</sup> Furthermore, temporary relaxation of reporting standards can also result in the reversal of the modest increases in data quality and overall transparency in recent years. Unchecked, a protracted relaxation in reporting standards can set off a *vicious* cycle of less data, less transparency, and less accountability.

The dual demands, in the name of speed, for weaker procedural safeguards against corruption and collusion and lower transparency requirements in certain respects – such as *ex ante* approvals or through use of competitive procedures – have also given rise, on the other hand, to movements to *increase ex post* transparency of information in some countries. For example, as described in this book, this is the case in Brazil, Nigeria (as noted above), and South Africa<sup>11</sup>. In the last case, for example, full details of all Covid-19-related contracts must be published, rather than just the limited information required of contracts in general. Similarly, other countries such as Lithuania<sup>12</sup> and Paraguay<sup>13</sup> have also decided to increase transparency on COVID-related spending in order to improve public accountability and trust in the crisis response. Increased transparency and hence the opportunity for public scrutiny may serve as a suitable counterbalance to the weaker procedural rules of emergency procurement.

Furthermore, the need to improve data reporting and use also present an opportunity to advance the data infrastructure of public purchases as well as data requirements in the longer term. This is discussed, for example, in chapter 22 in relation to South Africa - where there are clear indications from Government that the heightened transparency of COVID-19 contracts may be applied more broadly in future – and in chapter 17 in relation to Brazil.<sup>14</sup> As chapter 15 explains, the UK Government has also proposed a “transparency by default” regime, as well as reforms on both *ex-ante* transparency, reporting requirements and competition in direct awards; as that chapter explains, while these are not all specifically linked to the pandemic but part of a wider reform programme, public concerns over pandemic-related procurement were an important backdrop to the proposals that may have had some influence. Another example is that of Greece, which not only experimented with new data collection and analysis techniques but also aimed to embed them on post-pandemic processes and investigations.<sup>15</sup> The Hellenic Competition Commission meticulously collected itemised product, price and quantity data for COVID-related

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<sup>10</sup> See, for example, the discussions in chapter 15, section xx on the UK; chapter 22, section II.D on Nigeria and section III.D on South Africa; chapter 17, section V on Brazil.

<sup>11</sup> See chapter 17, section VII; chapter 22, section III.F on South Africa.

<sup>12</sup> See <https://www.occrp.org/en/coronavirus/europes-covid-19-spending-spree-unmasked>

<sup>13</sup> See <https://www.rindiendocumentas.gov.py/>

<sup>14</sup> See chapter 17, section VII.

<sup>15</sup> See <https://www.epant.gr/en/enimerosi/press-releases/item/1083-press-release-the-interim-results-of-hcc-s-investigations-on-health-and-hospital-equipment-during-covid-19-pandemic.html>

purchases such as masks. However, because the Greek public procurement information system, like most others in Europe, is centred around contracts rather than items, it had to spend months fielding a large scale survey of suppliers as well as resorting to advanced text analytics to extract the relevant data. In such cases, increasing transparency standards can set off a *virtuous* cycle with better data management systems and actionable indicators providing easily communicable insights and highlighting the importance of investing in data.

Of course, when transparency is mandated, it is necessary also to ensure that the requirements are complied with, and in a timely manner, which has not always been the case: chapter 22 suggests there has been low compliance in Nigeria with requirements to publish information on COVID-19-related procurement, a study by Kiprono reported by Open Contracting demonstrated almost no transparency in Kenya despite requirements to publish tenders and contracts relating to the fund for addressing COVID-19<sup>16</sup> and, as discussed in chapter 15, the UK National Audit Office found a problem with late publication of required award notices.<sup>17</sup>

The various types of impact in the pandemic on different types of transparency provision are reviewed further in chapter 2 and in the reflections in chapter 24, where the authors argue that an overall assessment of the application of transparency in the pandemic, the pandemic's potential future impact on transparency, and lessons to be learned from the pandemic are not straightforward and require a careful and nuanced analysis. However, it is clear that in some countries, certainly, transparency has been insufficient and/or reduced, and that this has created risks for procurement both in the pandemic and for the future in certain cases.

#### IV. The Covid-19 Challenge and Weaknesses of Data Systems

The COVID-19 crisis has exposed several data challenges, most of which have long hampered the effective policy uses of public procurement data, but it has also brought up new, pressing problems. To date, few procurement data systems have the required quality and level of detail needed to make sense of the large volumes of information that they contain. Crucially, for procurement data to support purchasing decisions effectively, they must have reliable information on quantities, unit prices and the key qualities of products purchased. Unfortunately, most procurement data systems around the world operate on the level of contracts, which masks the *itemized* details of purchases. Such a lack of detail means that analysts are typically left with best-guessing market efficiency from proxies such as number of bidders or where bidders come from. These crucial data gaps also severely limit the capacity of non-governmental actors to use Big Data to hold governments accountable. Unsurprisingly, “there is little evidence that technology-based openness initiatives and tools have fulfilled their democratic promises” (Schnell, 2020: 2).

To enhance analytical value, not only must the level of detail and quality of datasets be improved upon but expanding the scope of what is reported to include all relevant purchases of a market is crucial. Micro-level public procurement data sets typically capture only a fraction of total

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<sup>16</sup> Open Contracting Partnership, Lessons from the COVID-19 pandemic: Findings and recommendations for better emergency procurement from 12 countries (2020), p.8; T. Kiprono, “Resilience of Procurement Systems – Kenya”, <https://drive.google.com/file/d/1SR8uP4-ZYyH10gNUC5NteeIA1OYwEAKh/view>.

<sup>17</sup> See Chapter 15, section xx.

spending in developed as well as developing countries<sup>18</sup> (even if it is imprecisely measured from budget data equating it with procurable spending) (Bosio et al., 2020). For example, TED data capturing high value contracts in the EU typically accounts for less than half of total spending (OECD, 2011).

However, even if public procurement data reporting improves on the standards mentioned above – sufficient scope, high quality, all the needed detail, and easily accessible – this data remains largely isolated from the upstream supply markets and downstream user needs. In any reporting system, the names and registry IDs of the suppliers, bidders and contracting entities as well as the price and quantity of the items purchased are essential for analytics (Mendes & Fazekas, 2017). Crucially, the use of registry IDs enable linking to external datasets such as company ownership data or budgetary spending. However, even when these basic data points are reported, there are several key aspects that are left uncaptured. Procurement prices by themselves tell only an incomplete story in the absence of background data on supply markets such as production costs, the range of producers, transportation costs, or production bottlenecks. This is of even greater importance in the context of a crisis such as the COVID-19 pandemic. In normal times, we can assume that production costs move slowly so variation in procurement prices reflect the efficiency of the procurement process. However, this assumption does not hold in times of crisis when production costs and global market prices move rapidly and often erratically.

Similarly, the quantity of items purchased cannot, on its own, provide information about the efficiency of a given purchase, more so in a crisis setting. Past trends are not enough to gauge the optimal quantity of items purchased, regardless of price. Once again, during normal times, government demand for certain items may evolve slowly and predictably; however, this assumption does not hold during times of upheaval. In the absence of data on the demand size of a purchase (e.g. existing stocks and utilization trends), quantities become meaningless as there is no benchmark against which to compare them. Reporting existing inventories and supply-flows of emergency goods – or any other type of goods for that matter – within healthcare systems allows interested parties to hold procuring entities and suppliers more accountable even during hard times. Furthermore, improving demand-side reporting practices can allow procuring entities to increase the efficiency of their purchases and provide would-be suppliers with better information on untapped or under tapped markets. Another crucial issue is supplier history data. Suppliers that have no experience with producing emergency goods may be awarded emergency contracts to combat the pandemic.

Awards to suppliers with no prior experience in the medical supplies sector can occur even in relatively robust procurement systems in the context of an emergency such as the 2020 pandemic. In the case of Georgia, around half of the total value of emergency contracts during the summer of 2020 was awarded to companies that had no prior experience in public procurement<sup>19</sup> (Baratashvili, 2020). During normal times, the entry of new suppliers is desirable, especially in the context of supply shortages. However, over-reliance on newly established providers or those with little experience in the market during times of crisis can increase integrity

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<sup>18</sup> This is troubling considering that public procurement represents nearly 30% of total government spending in OECD countries (OECD, 2016) and even higher levels in developing economies (Bosio et al., 2020).

<sup>19</sup> Nevertheless, most of these suppliers (93%) were registered at least six months prior with the rest having been registered between March 22<sup>nd</sup> and May 1<sup>st</sup>, 2020.

risks, especially when contracts are directly awarded and reporting standards are loosened. This poses even higher risks in procurement markets with less competition overall, as is the case in Georgia (Baratashvili, 2020). Including supplier history into data reporting frameworks can further government accountability and support efficient procurement decisions, even in cases where procurement data reporting is already relatively robust.

Failure to address these issues could prove detrimental to existing systems as a protracted reduction in reporting standards could spark a downward spiral in the absence of public pressure for transparency. Without high-quality datasets, all interested parties in the procurement process would have their monitoring and (self-)evaluation capabilities diminished. Furthermore, in the absence of such data, insiders in the process (suppliers and procuring entities) would have fewer tools to keep each other in check, thus preventing that market mechanisms indeed lead to efficient public purchasing. The importance of robust transparency and accountability frameworks, both from the public and insiders in the bidding process, increases during times of crisis such as the one brought on by the global pandemic as the market power of key suppliers rises sharply. Publishing complete information about emergency contracts, even *ex post*, is a step forward.

## V. Lessons

We argue that the main obstacle towards realizing the full potential of Big Data in public procurement is the inadequacy of currently available datasets for analytic purposes. Though there is growing optimism about the promises of the procurement data revolution, crises such as the 2020 global pandemic exposed the inadequacy of existing data frameworks. Two shortcomings stand out. The first is the lack of detail and overall quality of most procurement data systems. The second is that procurement process data on its own tells little about the effectiveness and efficiency of emergency purchases in isolation from supply markets and healthcare utilization data.

Public scrutiny turned far more results-oriented during the early stages of the COVID-19 crisis, that is focused on getting the right supplies to hospitals on time, thus adding to existing challenges. Diminished concern over transparency, integrity, and cost-effectiveness in the acquisition of emergency goods is a critical issue given that the degree to which citizens tolerate corruption and inefficiency has a significant impact on the government's capacity – and willingness – to curb corruption in public procurement (Persson et al., 2012). The ability of civil society, members of the business community as well as other stakeholders to organize themselves to safeguard their interests and to maintain a level playing field fundamentally affects the levels of cronyism, corruption, and price-gouging in public procurement (Mungiu-Pippidi, 2015). Similarly, governments that do not uphold strict data reporting standards throughout the crisis and even post-pandemic miss out on valuable insights that could improve procurement efficiency.

During normal times, general market conditions are stable on both the demand and supply sides. This allows for the relatively easy assessment of the quality of public purchasing decisions. However, during times of crisis, supplementary information is necessary to make similarly

meaningful assessments. Data on starting stocks of purchased items (such as masks) and the rates of use are indispensable to assess the quality of procurement decisions. Depending on the actual usage of critical supplies such as personal protective equipment, the very same procurement decision can be efficient or wasteful in terms of acquiring too much or too little. Even simple price charts beg the question of whether overpricing was justified by the urgency of healthcare demand or the uptick in factory prices. In sum, without contextual supply chain and healthcare data, analysing public procurement outcomes such as prices and quantities purchased cannot provide sufficiently robust insights about the quality of a procurement decisions during times of emergency. Building sectoral integrated data systems is thus crucial for meaningful analysis in times of crisis as without them crisis governance is blinded by rapid price and demand fluctuations of essential products.

In addition to improving the scope and quality of reporting, we need more advanced indicators and analytic methods in order to make sense of the large amounts of data available. The emergence of a wide array of actionable indicators that rely on Big Data to award objective proxies of value-for-money, efficiency and integrity in public procurement is promising but should be taken further (Trapnell, 2015).

Strengthening procurement data frameworks comes hand in hand with an overall change in data culture. Stakeholders – in the broadest sense of the term – must adapt their technical skills and expectations to accommodate for this new and evolving landscape. Data-overload and misinterpretation of results are of significant concern. The transition from a data-poor environment to a world of Big Data can be daunting. The lack of expertise in managing and analysing such high-frequency and detailed datasets can lead to misinterpretation and unrealistic expectations regarding the role of large swaths of procurement data in efficient decision-making. It is thus paramount to combine data improvement efforts with a general shift towards improved data literacy by training public officials and monitors in the methods needed to analyse and assess the quality of the windfall of information made possible by the era of Big Data. The COVID-19 crisis underlines the need to move forward in this direction by demonstrating that current data reporting frameworks, though a step in the right direction, remain vulnerable.

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