

Cambridge University Press
978-0-521-87073-3 - Handbook of Procurement
Edited by Nicola Dimitri, Gustavo Piga and Giancarlo Spagnolo
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PART I

Preliminary issues

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1 Introduction

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1.1. Why a handbook on procurement?

Procurement represents a very large fraction of total economic activity. The value of public procurement transactions in EU countries is about 16 percent of their GDP, while in the United States it is around 20 percent.¹ In the private sector, the value of transactions is even larger and is steadily increasing, due to the current trend towards outsourcing all non-core business activities.

Efficient procurement is therefore a core necessity for firms' profitability and survival, and for the public sector's effectiveness in obtaining resources for social spending and/or lower taxes. Procurement design directly and substantially affects firms' and countries' performance in the short and in the long run: in the short run, most obviously by immediately determining the costs and quality of inputs in the private or public supply chains; in the long run, most importantly by determining suppliers' and more generally firms' incentives to invest in R&D and to innovate in general.

Procurement design and management is a complex issue though, as contractual problems directly interact with competitive screening and risk management problems. Moreover, procurement is most often a dynamic, repeated activity, with short-term objectives often conflicting with long-term ones. Strategic procurement decisions must be taken with a focus on the future dynamics of the demand–supply relationship. Neglecting the importance of repeated relationships with potential suppliers and the effects of procurement choices on an industry or a district dynamic could have very undesirable consequences for a large buyer, in terms of both price and quality. This dynamic distinguishing feature of procurement also greatly enlarges the role for reputational forces.

¹ See http://europa.eu.int/comm/internal_market/publicprocurement/index_en.htm.

Unfortunately, there is not a one-size-fits-all measure for effective procurement design: the variety and complexity of situations in which procurement decisions are made means that appropriate purchasing procedures must take into account many aspects, and be tailored to each single situation. Nevertheless, some key forces driving effective procurement design are common to most procurement decisions, and it is on these kinds of driving forces that this handbook is focusing, providing a toolkit for how to take them into account in different situations.

Strategic procurement decisions require rational and competent decision makers, especially when procuring innovative goods or services. The need for competence obviously relates to the specific ability to gauge market developments, but cannot leave aside more general skills that have to do with legal and, particularly, strategic issues.

It is with regard to this latter strategic need that this handbook hopes to bridge a gap between economists and procurers. Indeed we believe that, also thanks to many excellent existing books, legal professionalism in procurement has progressed faster than knowledge on the topics this handbook is concerned with. Strategic and efficiency issues, however, are no less urgent or important than legal consistency ones. If anything, they need to be studied also by legal experts of procurement to enable them to structure contracts appropriately and suggest modifications to laws that sometimes prevent full implementation of sensible procurement strategies.

Therefore, the main goal of the volume is twofold. It wishes to inform professionals involved in practical activity of the more robust indications coming from advanced economic research in the field, to help them solve the main problems arising in practical procurement design. At the same time, the book will also inform researchers of the most important problems that arise in procurement practice, in so doing providing important inspiration for new fertile research efforts in the field. This is why particular emphasis has been given to examples and case studies, through which the specifics of different procurement situations will be illustrated and discussed.

1.2. Terminology and definitions

Procurement is characterized by lack of uniform terminology; different terms, in different countries or contexts, are used to describe identical or

very similar situations, and these differences can sometimes generate confusion and misunderstandings.

Differences are particularly noticeable in the terminology of competitive bidding procedures. A main source of difference is given by the community of reference. For example, while economists normally refer to both sealed-bid and dynamic competitive bidding procedures as auctions, procurers by auctions typically intend dynamic, descending-in-price competitions, while sealed bidding is often referred to as sealed-bid tendering. The language used in legislation can also be different: for instance, the 2004 EU Directive on public procurement refers only to ‘electronic auctions’ and never mentions sealed bids or sealed bidding, which is instead used by the US Federal Acquisition Regulations.

Given such diversity of terminology, we found it compelling to attempt to harmonize language through chapters. The choice we made turned out to be a compromise among the terminologies used by most of the potential readers of the volume, so that all of them could feel sufficiently familiar with the language adopted. With very minor exceptions, throughout the book the terms *procurer* and *buyer* will be used interchangeably, as will the terms *bidders* and *suppliers* (sometimes *sellers*). By *contractor* we shall mean a supplier who has been awarded a supply contract. Moreover, we shall often use the term *competitive tendering* as a general expression for competitive bidding procedures, to mean what economists refer to as *auctions*. More specifically, we shall adopt the term *sealed bid tendering* (procedure) or simply sealed bidding for what economists refer to as *sealed bid auctions*, and use the term *dynamic (descending-reverse) auctions* or simply *auctions* for what economists name *open-dynamic auctions*. Finally, the term *tender* will be used to mean a *price/technical offer*. The glossary provides more detailed support and we encourage the reader to spend some time to glance through it.

1.3. Book structure and content

This book is organized in six parts, each of them covering a major theme of interest for effective procurement practice. After the preliminary section setting the stage, the following ones will discuss some general strategic principles in procurement, the design of competitive tendering

procedures, criteria to attract and select participants, methods to prevent collusion and corruption, and procurement and innovation in a dynamic perspective.

1.3.1. Part I Preliminary issues

This part introduces the reader to the main themes concerning procurement, motivating the volume and its structure.

Chapter 2 contains a discussion on the *variety of practices in public procurement*. It concentrates on evidence gathered from a survey conducted by Consip, mostly from European but also from some non-European countries. The authors point out that a large degree of heterogeneity emerges across countries in the procedures that are followed by public purchasers. This finding is crucial in that it gives the reader possible methods to approach the chapters of the book. The reader will find it interesting to compare the indications emerging from the survey with the practical conclusions proposed in this volume, on themes such as the choice of competitive tendering formats, scoring rules, etc.

1.3.2. Part II General strategic principles

This part contains three chapters, each of them dealing with a general aspect of procurement design.

The first important decision to make in designing the procurement system of a complex organization concerns its *degree of centralization*. The point falls within the general theme of delegation, a topic widely investigated, though not very extensively in procurement. In Chapter 3 the authors argue that evidence from practice is very heterogeneous showing a wide array of patterns of procurement design. While, in recent years, the public sector has exhibited a tendency towards more centralized systems, the private sector has showed much more variety, with a considerable presence of mixed models where elements of decentralization and centralization co-exist. The main effort of the chapter is devoted to identifying the most important reasons supporting centralized and delegated procurement.

After the overall design and the extent of delegation in a purchasing system are defined, the buyer has to tackle another crucial aspect, that is, the

structure of supply contracts. These must be tailored to achieve the desired quality at the lowest possible price compatible with suppliers' cost. Chapter 4 discusses the main categories of contracts that could be adopted in procurement. The authors observe that a major element of distinction among them is whether standards of quality are contractible, namely well specifiable in the formal agreement. The point is very important because when the procurer cannot introduce clauses in the contract that unambiguously describe the desired quality standards, then the procurer is bound to rely on non-contractible incentives.

Another fundamental dimension of procurement that buyers should carefully choose in order to deliver value for money is the *awarding procedure*. Chapter 5 deals with the issue by comparing advantages and disadvantages of competitive tendering procure with respect to negotiations. In a competitive tendering procurement compete for a contract by submitting offers to the procurer, who chooses the most economically advantageous tender. In a negotiation procedure the buyer interacts individually with one, or more, selected suppliers to obtain the best contract conditions. Competitive tendering procedures are typically more impersonal, accountable, and transparent than negotiations, though they normally prevent communication between buyers and sellers which could improve price and quality. Negotiations can instead allow the procurer to exchange information with potential suppliers and utilize their expertise when designing the project. The authors discuss the implications of these features for procurement design.

1.3.3. Part III Competitive tendering strategies

Having opted for a competitive tendering awarding procedure, the buyer faces two major decisions: she first has to select which competitive bidding format to adopt and then the number of contracts lots. This section is dedicated to these two very important aspects of procurement design.

Competitive tendering procedures fall within two main categories: sealed-bid tendering and dynamic reverse auctions.² In a sealed bid tendering

² For more on the main types of sealed-bid competitive tendering procedures see the glossary.

suppliers submit offers without observing the tenders made by the opponents, while in dynamic auctions prices are disclosed in the course of the competition so that suppliers have the opportunity to outbid their rivals before the auction ends. In procurement activity both formats are used, but on what elements can a buyer decide which one to opt for? Chapter 6 deals with this point, arguing that the choice should mostly depend on the nature of uncertainty for serving the contract. The authors notice that a possible problem with dynamic auctions is that they might last for too long and discuss how the auction length could be kept under control without the procedure losing effectiveness for the buyer.

Choosing how to split the supply is another major decision that buyers have to face. This determines the *number of supply contracts*, or lots, which bidders will compete for. Chapter 7 examines how the number and size of contracts to procure could emerge from the resolution of a trade-off. On the one hand, with few, large lots the buyer could better exploit the advantages of bidders' economies of scale and scope and would be likely to pay low prices for the awarded contracts. However, large lots could also preclude small business enterprises from submitting tenders, and have undesirable consequences for the buyer. A possible negative implication of this concerns the level of competition taking place in the competitive tendering as well as in the market where suppliers operate. The authors contend that if only few, large suppliers can participate in the tender, then it could be easier for them to collude. Moreover, reducing the number of competitors in a bidding competition could also have a negative impact on the outcome of future competitive tendering procedures and on the long-run sustainability of the level of competition in the suppliers' market.

When the buyer splits the supply into more than one lot, she has to determine which *multi-contract competitive tendering* format to opt for. The general choice between a multi-contract sealed bid format and a dynamic reversed auction is still based upon the general principles discussed in Chapter 6 for the single contract case. However, the presence of multiple lots introduces some new elements in procurement design; in particular, the format can vary depending upon whether lots exhibit so-called positive or negative complementarities. For a supplier, a set of contracts exhibit positive (negative) complementarities when the cost of serving all the contracts in the set is lower (higher) than the sum of the costs of each single contract. With either kind of complementarities allowing for package

bidding would enhance competition. Chapter 8 focuses only on sealed bid formats, leaving the treatment of multi-contract dynamic auctions to Chapter 9, and discusses competitive tendering designs to take into account both positive and negative complementarities.

Multi-contract dynamic auctions are studied in Chapter 9, where, in particular, the authors concentrate on the following three main formats: simultaneous descending auctions, simultaneous clock auctions, and the clock proxy auction. These innovative auction formats have been proposed in recent years to deal with auctions with many related items, where the most desirable allocation of items requires price discovery. The authors argue that selection among these three models should depend upon the nature of complementarities among contracts and the extent to which the supply can be split into multiple contracts. As the three models proposed are dynamic auctions, they are well suited to mitigate the problems of the so-called winner's curse, and could also help simplify the bidders' decision problem when the number of contracts is high.

1.3.4. Part IV Attracting and screening participants

A widely accepted view in procurement is that a key element of a successful competitive tendering for buyers is large and qualified suppliers' participation, a point which this section elaborates upon. This can be true in a variety of situations, some of the most important of which are discussed in the ensuing four chapters.

The advent of Information and Communication Technology (ICT) stimulated the development of so-called *e-procurement platforms* as electronic mediators enhancing transactions in two-sided markets. For instance, e-marketplaces in the public sector are e-platforms; they function as intermediaries between suppliers, exhibiting their catalogues, and public administrations, which can access the catalogues and order the products they need. In Chapter 10 the author argues that e-platforms are successful if they can find proper incentives to attract the two sides of the relevant market to enter as many transactions as possible. In particular the price charged by the platform to customers, at participation or usage level, is a major policy instrument to favour participation. In this context, prices should depart from costs to allow for cross-subsidies between the two sides of the market. The chapter deals also with non-price policy instruments.

Looking more closely now at the competitive tendering design, how could a buyer *foster the desired participation* by suppliers? Chapter 11 discusses some of the main elements inducing a desirable pool of participants to submit offers. The authors first consider which competitive tendering formats could be more favourable for the buyer, in particular to attract both large and small firms to participate. They argue this would occur when small firms believe they are not systematically outbid by stronger rivals. Besides the competitive tendering format, the authors discuss other important aspects of procurement design that can affect participation, such as the choice of the reserve price.

When bidders are asked to submit both an economic and a technical offer, buyers can take account of their own preferences by introducing a *scoring rule* assigning a score to the two components of the proposal, and awarding the contract to the supplier who obtains the highest overall score. This is calculated by giving weights to the technical as well as to the economic score. By varying the weights a procurer can fine-tune the right incentives for suppliers to satisfy his preferences. For example, if a procurer cares more about quality than price, then he could assign a higher weight to the technical part of the formula; by so doing he may attract suppliers providing higher quality standards. Based on the notion of ‘economic value of a point’, as the fundamental element for bidders to choose the composition of their offers, Chapter 12 suggests how a buyer could proceed to select the most appropriate scoring rule to meet her desiderata.

A main concern related to qualified participation is bidders’ effective ability to deliver the desired performance. Indeed, it is not infrequent for suppliers facing financial difficulties to participate in a competitive tendering, with the precise goal of winning the contract to try to survive in the market. Hence, a contract awarded at an *abnormally low price* is not necessarily good news for a buyer; indeed, the price may have been submitted by a risky bidder who will be unable to serve the contract appropriately, or to serve it at all. But how can buyers prevent this kind of risk? In Chapter 13 the authors discuss how limited liability can change suppliers’ attitude towards risk and influence the possibility of risky bids. They also suggest how procurement design could take into account the possibility of abnormally low tenders, and compare these measures with the relative advantages of third-party guaranteed financial instruments, such as letters of credit and surety bonds.