

The Economics of Public Procurement

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Driven by demand for further control over public spending and more efficient acquisition processes, procurement has become a key public function. Significant technological changes, international trade and global competition have forced governments and public institutions to extend policy interests beyond cost minimization, and to pursue new challenges including innovation, competition, transparency and reforms. Further, policy makers have become aware of the role of public procurement for many other socio-economic purposes. Crossing both economics and business, public procurement has raised the interest of practitioners directly involved in the management of purchases and with academic researchers to answer key questions, explore new issues, and to discuss an extensive range of topics.

This volume, which reflects this vast increase in economists' interest for procurement, collects the revised versions of some of the papers (all unpublished) presented at the Second International Procurement Conference held in the Villa Mondragone of the University of Rome Tor Vergata, Frascati (Rome), organized by the Department of Economia e Istituzioni of the University in collaboration with the Public Procurement Center at Florida Atlantic University.

The volume is organized in five sections: «Managing Risk in Procurement», «Efficiency in Procurement», «Contracting in Procurement», «Transparency in Procurement» and «Procurement Design». In what follows we give the reader a brief overview of the papers' content.

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While great emphasis in procurement is given to competition during tenders, it should not be forgotten that competition, compared to alternative mechanisms of allocation that soften it, modifies strategic behavior by bidders in directions that are not always favorable to the procurer.

This is evident in the case in which contractors face the risk to go bankrupt before the completion of the work and do not face unlimited liability thanks to the right to file for bankruptcy. The option to do so makes the bidding more aggressive (or the incentive to provide low quality if there is private information on it by the bidder) as it reduces the losses if firm's costs are high. It is also a very relevant concern, as Engel and Wambach show, for those firms (typically small ones) that have larger cost of preparing the bid and are then pushed to implement more risky (aggressive) strategies in terms of price. We suspect that the possibility, allowed in some countries like the US but not in Europe, to provide small firms with a bonus or prize during the tender not only fosters more competition but also — by reducing the cost of bidding conditional on winning the contract — diminishes the probability of default.

The issue of bankruptcy is not a rarity in procurement: more than 80,000 contractors went bankrupt in the U.S. in the period between 1990 and 1997, leaving unfinished business with liabilities exceeding US \$ 21 billion.

Engel and Wambach in this volume show that means to weaken competition (multi-sourcing, rationing, lotteries, and others) might lead to better results by reducing default probabilities than the standard competitive auctions that are becoming popular worldwide and have recently been allowed even in an open format with the new Directive in the European Union. Insofar as these same alternative methods reduce the winners' curse present in some of these same competitive formats, some of them show the very desirable property of reducing risk while reducing outlays, a feature that should concern vastly procurers worldwide. For example, Engel and Wambach argue that in some setting the reverse auction in open format, recently introduced in the EU, might have less desirable properties than the traditional sealed bid tender as it might lead to higher risk of default.

However alternative methods to reduce the moral hazard in the tender due to limited liability are not always easy to implement. For example, multi-sourcing, as Engel and Wambach underline, may not fully be feasible if there are capacity constraints or if there are switching costs from one firm to the other for the procurement agency.

Other methods have definitely undesirable properties. Albano, Bianchi and Spagnolo in this volume concentrate on a popular type, «Bid Average Methods». These are formulas to evaluate price offers that generally are meant to reduce the weight given to low (and therefore economically convenient) prices on the ground that they might turn out to increase the risk of completing the contract by the resulting winner. By focusing on some specific examples utilized worldwide, they show that firms respond to such rules in ways that are many times unfavourable for the procurer.

Albano, Bianchi and Spagnolo seem to have a point when they argue that «it appears contradictory to use a competitive awarding procedure that hinges on price, coupled with an awarding rule that is meant to limit price competition». They suggest alternative methods (like beauty contests and negotiations) to soften competition if this is truly a concern (as Engel and Wambach show that it might be the case). They also suggest alternative instruments to deal with the risk of bad contractual performance that do not require giving up standard competitive auctions: surety bonds, in particular, that have yet to find a role in the European Union.

When focusing on Bid Average Methods, they prove that some of them: either 1) provide an incentive for firms to find a «focal point», possibly collusive, or 2) make coordination among bidders more feasible and even easier to implement or finally 3) make the outcome for the procurer extremely uncertain and prone to inefficiencies.

But the issue of collusion in tenders and more generally of efficiency in procurement is obviously not limited to average-bid methods; once issues of risk are taken care of, obviously the goal of the procurer is to make sure that best money for value is obtained. Some features of competition, like the industrial structure in the relevant market, cannot be influenced by the procurer in the short-run and must be considered as given; others might. In particular,

auction design can go a long way in affecting the bid that each given firm will want or will be able to post in the tender. Both papers by Lunander and Nilsson and by Lundberg are concerned with the issue of tender format and competition. They do so taking advantage of experimental design, the first, and a large amount of tender data, the other.

Lunander and Nilsson tackle the optimal design of tenders for goods that exhibit synergies and economies of scale in production. This is an issue that is proving to be always more and more relevant as the institutional set-up of procurement agencies is increasingly moving — also due to the development of ICT and web-based purchasing portals — toward centralization, which increases both the size of tenders and the tendering of similar objects. A type of tender increasingly used by procurers is the combinatorial one, that allows not only to make offers on single lots, but also offers on one lot conditional on the award of other lots. This provides firms with the added possibility of taking advantage with certainty of cost synergies and reflecting these in the tender bids. Little is known about the collusive impact of such combinatorial tenders. In particular, do bidders have more difficulties to collude under a combinatorial auction than under standard simultaneous sealed bid auctions? This is the question that Lunander and Nilsson try answering to. Their results, while in need of being strengthened by further types of experimental designs, show encouraging responses as to the features of combinatorial design. Indeed, bidders seem to be less able or inclined to reach collusive agreements in such settings, either because they represent a new way to exploit cost synergies instead of an illegal cartel or because designing a collusive strategy in a combinatorial bid might be too complicated. Furthermore the experiment confirms as expected the efficiency advantages for a procurer of a combinatorial tender when in the presence of economies of scale.

Lundberg's paper is also interested with the impact on auction results of different formats. She takes into consideration single-unit and simultaneous (non combinatorial) sealed bid auctions of interior cleaning services in Sweden. Her unique dataset reminds us first of all of the urgent need for further expansion of data availability to the scientific community so as to improve our understanding

of procurement outcomes (an issue which many procurement agencies do not seem to view favourably). It is also of particular interest since in the period considered (1991-1999) many Swedish contracting authorities would not communicate ex-ante whether the award would be based only on price or on price and qualitative criteria. This system, now not allowed anymore by the European Union rules, introduces large doses of discretion in the hands of the procurer and can lead to inefficiencies of various type particularly if one takes into account that this market is (ex-post) dominated by large firms or in-house production units that won 75% of all contracts. Municipality characteristics by governing party and density are shown, together with the variable unemployment, to affect the value of the winning bid.

While one sometimes tends to forget, efficient procurement is not limited to the type of auction format. It also concerns contractual aspects like sub-contracting or more «primitive» choices as to whether in the first place negotiate directly or use an auction. Von Grawer-May and Wambach in this book tackle the issue of sub-contracting, a pervasive phenomenon in procurement valued in 2001 at 635 billion in the EU. They do so mostly taking the perspective of the firm that, participating to a tender, has to decide how, when and for how much to sub-contract. The authors finally conclude with some policy-advice for public procurers (that may decide to have a say in the tender notice on how sub-contracting is implemented by potential winners), taking the correct strategic stance of first understanding how bidders react to various types of sub-contracting schemes and then providing advice for policy-makers. As for the timing, firms may decide to sub-contract before (conditional on winning) or after submitting the offer to the procurement agency. Later sub-contracting leads to lower prices in the procurement main auction as sub-contractors are more aggressive in competing for a contract when they know the contractor has won the tender. Also, technical specifications are better known and offers can be made more precisely. However, sub-contracting earlier (before the tender) gives the firm precise knowledge of the sub-contractor's costs. How this trade-off is solved, the authors argue, depends on the technological efficiency of the firm compared to its auction rivals. Strategic

behaviour of sub-contractors should also be kept in mind when deciding when to sub-contract. Sometimes it can be shown that the best auction format is a two-step procedure where the firm short-lists a few potential candidates and after winning the contract implements an auction only among short-listed subcontractors. Firms can use different strategies to make bidders even more aggressive in the first selection stage, possibly by rewarding them in the second and final selection stage after the contract has been won. In such a setting, Authorities have to keep in mind that by requiring ex-ante that firms have already signed sub-contracts this might make firms bid less aggressively during the contract-award phase at the expense of efficient procurement.

Guccio, Pignataro and Rizzo are concerned with the greater appeal that competitive procedures might have with respect to negotiations in a critical sector like the health one. For one, the use of sealed bids makes it difficult to establish any relationship between the purchaser and the seller in a sector that requires certainty about the quality of the product and reputation concerns should be given great weight. Second, the particular characteristics of the goods purchased and their high-tech nature might make negotiations more effective than auctions in obtaining low prices. The empirical analysis on Italian health purchases however shows that auctions perform better than negotiations in almost all product categories. Authors attribute this to the competition effect. In the purchases of technical equipment for health where the goods characteristics are more complex, however, a negotiation seems to bring better economic results.

The issue of negotiation vs. competitive auction cannot be left exclusively within the realm of efficiency considerations. It must also take into consideration issues of transparency and ethically-compatible behaviour, especially in the public sector where the money that is spent does not belong to the spender but is entrusted to her by the taxpayer. Ethical considerations would seem to push for formal rules that limit the discretion of the contracting authority and reduce therefore the space for direct negotiation, a typical instrument used in the case of private firms' purchasing. However, formal procedures have a drawback in that, as discussed above, they seem to fail to fully capture the possible complexities of providing the re-

quired goods and services or infrastructure, both at the tendering stage and in the contractual phase. Formal procedures also are generally less capable of fully internalizing the value of acquired reputation among bidding firms. So the question becomes: Is there a way to reconcile a guarantee of transparency in procurement with the equally important issue of building a virtuous reputation-based system? Picci in this volume answers affirmatively to this question. He posits that Internet-based reputation systems like eBay are transferable to the public sector acquisition process, even for public works.

Internet is a powerful tool to spread traditional «word of mouth» to unprecedented levels. On eBay, for example, people are wary of conducting business with agents who performed badly in the past. Picci imagines a publicly accessible database where information on a public projects is continuously updated over the life of the project. The availability of an information system of this type would allow the computation of a vast array of useful indexes and measures helpful in addressing the weak governance of public works that plagues so many countries. This accessibility would give rise to so-called «voice-activities» of the relevant stake-holders, including consumers-taxpayers, that would be able to rank various administrations and push them to perform better in terms of the quality of the contract execution. Picci is aware that such voice-activities might be controlled by constituencies that have a non-benevolent goal in mind and suggests alternative ways on how to deal with those problems.

Coppier and Piga reinforce Picci's argument by showing that traditional measures of transparency are little capable of eradicating corruption. They show an only apparently puzzling figure arising from the data: there where transparency is high the country is more corrupt, according to institutional measures of corruption. Coppier and Piga show, with the help of a theoretical model, that this result may be the outcome of a benevolent planner that tries to reduce corruption via transparent policies. Such an effort might be nevertheless frustrated by the fact that making procurement transparent is a costly enterprise. The authors conclude that more structural measures must be devised to eradicate corruption in public

procurement, possibly following the lines of what suggested above by Picci.

But the dimensions of optimal procurement are vast and diverse, as the papers by D'Amato and Doni show. D'Amato tackles the issue of how much cooperation across regulators and procurement agencies is necessary in a setting where environmental concerns are relevant in the decision-making process and there are informational asymmetries in favour of the regulated firm. When the environmental agency does not cooperate with the procurement agency this results in a downward distortion in environmental quality. Doni instead shows that the issue of what information to release regarding the quality evaluation of a given offer, and to whom this information is released, can vastly condition the welfare of the procurer and of society, albeit not always in the same way. The issue is particularly relevant, the author argues, as the new EU Directive specifically provides opportunities to award a contract first by evaluating quality and then by accepting an economic offer. Under specific circumstances Doni shows that a policy of private revelation to each single firm of the procurer's evaluation leads to better outcomes for society than secrecy or public revelation. The latter however might maximize the procurer's utility.