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Working Paper

Procurement of Goods and Services - Scope and Government

SFB/TR 15 Discussion Paper, No. 93

Provided in Cooperation with:
Free University of Berlin, Humboldt University of Berlin, University of Bonn, University of Mannheim, University of Munich, Collaborative Research Center Transregio 15: Governance and the Efficiency of Economic Systems

Suggested Citation: Wolfstetter, Elmar G. (2005) : Procurement of Goods and Services - Scope and Government, SFB/TR 15 Discussion Paper, No. 93, Sonderforschungsbereich/Transregio 15 - Governance and the Efficiency of Economic Systems (GESY), München, https://doi.org/10.5282/ubm/epub.13458

This Version is available at:
https://hdl.handle.net/10419/93854

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GOVERNANCE AND THE EFFICIENCY OF ECONOMIC SYSTEMS
GESY

Discussion Paper No. 93

Procurement of Goods and Services – Scope and Government

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December 2005

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Financial support from the Deutsche Forschungsgemeinschaft through SFB/TR 15 is gratefully acknowledged.

Procurement of Goods and Services

Scope and Government

Elmar Wolfstetter*
December 2005

1 Introduction

In modern economies firms are part of an extensive network of division of labor embedded in markets. Rather than producing everything "in house," the modern firm buys most inputs from the best available source outside. Similarly, firms' outputs are continuously specialized and redefined to make them fit into the larger scheme of division of labor.

Outsourcing permits firms to concentrate on their core competency and to minimize the scope of their own production activity. It reduces cost, leads to a faster dissemination of innovation, and allows firms to trim their size to keep it manageable. Moreover, it helps owners to keep the rent seeking demands of its employees at bay.

By contrast, the socialist firm tended to produce everything internally. It tended to be too large to be properly manageable, it did not use the best available inputs, and it adopted new technologies and product design slowly and reluctantly. Thus it failed to take advantage of the benefits of widespread division of labor and competition.

Of course, outsourcing flourishes only in a framework of functioning and open markets, the free flow of goods between nations, a functioning legal system with reliable contract enforcement and antitrust laws. And it requires a well governed internal organization that has identified its competency and is skilled in modern procurement techniques.

However, apart from realizing the benefits of outsourcing, one must also be aware of its limits. A viable firm is able to maintain a competitive edge that allows it to earn market rent. That rent can only be preserved if the firm has identified its core

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I would like to thank Giancarlo Casartelli for sharing his experience and insight into modern procurement with me. Research support by the *Deutsche Forschungsgemeinschaft* (DFG), SFB Transregio 15, "Governance and the Efficiency of Economic Systems," is gratefully acknowledged.

competency and keeps all those activities "in house" that define its identity. If outsourcing is allowed to enter into that core domain, the firm is at risk of being replaced by competitors and thus may destroy the very foundation of its success. Therefore it is important to see both the benefits of outsourcing and its limits.

In the present paper I briefly review the main forms of procurement and explain which form should be used in which context. Specifically, I discuss some of the difficulties that are pertinent when complex goods or services are to be procured and stress the importance of rewarding suppliers who provide good quality. In addition I discuss issues of integrity of the procurement process and sketch ways and means to fight dishonest behavior.

The paper is composed as follows: Section 2 introduces the main selection methods and types of contracts and explains why in procurement "no one size fits all." Section 3 addresses the integrity of the procurement process and discusses the issues of collusion and corruption. The paper concludes in section 4 with a sketch of some unresolved issues.

2 Procurement How?

Depending on the nature of the good or service one chooses among the following basic forms of procurement:

1. shopping,
2. direct contracting,
3. procurement auction.

Shopping refers to comparing price quotations from several suppliers to assure competitive prices. It is appropriate for procuring readily available "off-the-shelve" goods or simple services of small value.

Direct contracting refers to "single-source" contracting without competition. It is appropriate if the good or service is proprietary and available only from one source.

Procurement auction is a formalized competitive selection procedure, often called "reverse auction" (reverse because it concerns buying rather than selling).

This procurement method is our exclusive concern here.

2.1 Preparation of the Auction

As a general rule, an auction must be well prepared and all relevant documents must be carefully specified, widely advertised, and accessible to all potential bidders, early before the auction is scheduled to take place.

The documents should include the technical specification of the good or service to be procured, a cost estimate, possibly the maximum permitted bid, and a copy of the contract to be awarded to the winner of the auction.

If bids include complex technical specifications one may first invite expressions of interest and then select a short list of the highest qualified, interested bidders who are then (exclusively) invited to bid.

To assure sincere bidding one may require that bids are valid for a specified time and back this up with a "bid security" that shall not be repaid if a bidder withdraws his bid.

Briefly summarized, the preparation of the procurement auction involves the following key steps:

1. statement of the Terms of Reference (TOR) (technical specification, cost estimate, contract, and auction method),
2. advertising and soliciting expressions of interest (making all bidding documents accessible),
3. selection of a short list of the highest qualified (or of qualified), interested bidders,
4. invitation to bid to be sent to short listed bidders, together with the final TOR, the contract to be awarded to the winner, and a statement of the selection rule and the deadline for bidding.

2.2 Selection Method

There are four broad selection methods (I follow the terminology of the World Bank's Procurement Guidelines[1]):

1. least-cost selection (LCS),
2. quality-based selection (QBS),

[1] The World Bank and the Asian Development Bank have two useful sets of procurement guidelines which are available for download. These may serve as benchmark for use in private and public procurement. One of these guidelines is geared to the procurement of goods and services; the other to the procurement of professional consultants such as engineers who are hired to prepare a feasibility study or prepare the design of a hydroelectric power plant. See The World Bank (2004; 2005) and Asian Development Bank (2002).

3. quality- and cost-based selection (QCBS),
4. other.

LCS is a straightforward auction in which only the price matters and the lowest bidder is selected as winner. This method is used if the good or service can be completely specified and the job can be done by several equally qualified suppliers.

QBS is an auction in which only quality matters and the supplier who promises to deliver the best quality is selected as winner, regardless of price. This method is used if suppliers have different skills and quality has an important downstream effect (as in the drafting of a feasibility study or a construction plan for a hydroelectric power plant).

In turn, QCBS is used when the procurer believes that quality and price can be traded-off in a particular manner provided a minimum quality score is reached. The procurer employs a "scoring auction"; there, quality and price are independently evaluated and scored; then, the two scores are aggregated using a fixed rate of substitution (scoring rule); finally, the supplier with the highest total score is selected as winner.

Other selection methods are: the "selection under a fixed budget" (FBS), the "selection based on the supplier's qualifications," and the "single-source selection." These are all variations of pure quality competition.

2.3 Two-Envelopes Bidding Procedure

When bids are complex proposals one generally uses a two-stage format, called the "two-envelopes" bidding procedure. There a bidder submits two sealed envelopes – one containing the technical proposal, the other containing the financial proposal. The financial proposal remains under seal with an auditor until the technical proposal is evaluated and quality scores have been assigned. Finally, the financial proposals are opened, aggregate scores are computed using a specified scoring rule, and the highest scoring bidder is awarded the contract.

Of course, the sealed financial proposals may be replaced by an open bidding process which starts after all technical proposals have been evaluated.

2.4 Auction Format

Concerning the financial proposal, one distinguishes between open- and sealed-bid auctions and various pricing rules. In a sealed-bid auction, bidders submit their financial proposals together with their technical proposals. In an open-bid auction,

bidders quote prices and then may undercut each other, until no more undercutting occurs and the contract is then awarded to the lowest bidder.

Alternatively, a "clock format" can be used. There, the auctioneer quotes a price and asks bidders whether they supply at that price or quit the auction. As long as two or more bidders supply at a given price, the auctioneer lowers the price, and this process continues until only one supplier remains who then wins the auction and is paid the price at which the "clock" stopped.[2]

2.5 Pricing Rule

The pricing rule is typically first-price, i.e., the winner of the auction is paid his bid. Another familiar pricing rule is the Vickrey- or second-price rule. There, the winner has to pay the second lowest bid. This pricing rule is effective in an open-bid auction, where the price clock stops at the price at which the second lowest bidder quits the auction. However, most procurement auctions are sealed-bid auctions and the Vickrey rule is rarely if ever used in sealed-bid auctions.[3]

2.6 Types of Contracts

The contract to be awarded to the winner of the auction is typically one of the following:

1. lump-sum contract,
2. unit-cost contract,
3. time-based contract,
4. retainer and/or contingency (success)-fee contract,
5. other.

Typically one would use a lump-sum contract. However, a unit-cost contract is adopted if at the time of bidding the scale of the procured good or service is uncertain or if multiple sourcing is a possibility. Similarly, a time-based contract is used if the scale or scope of the good or service is uncertain. The latter is particularly relevant for the procurement of complex consulting services.

Retainer and/or contingency-fee contracts are used when success is readily measurable, for example in the remuneration of investment banks for preparing a public stock offering or the privatization of a publicly owned firm.

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[2] Alternatively, the procurer can start with a low price and then gradually raise that price until the first supplier is ready to supply. This format may be called "Dutch reverse auction."

[3] This format is not popular because it is vulnerable to manipulations by the auctioneer who may invite a *shill bidder* to close the gap between the two lowest bids, and to collusion among bidders.

Other forms of contracts are "percentage contracts" (primarily used for architectural and legal services), and "indefinite delivery contracts" (primarily used for "on call" specialized services).

Of course, all contracts may later be renegotiated, for example in the event when the client changes plans or specifications and the contractor then calls for a "change order." Naturally, a supplier cannot be expected to deliver services beyond those to which he is bound by contract. Therefore, the contract should always include covenants that rule how various contingencies shall be handled and how and where disputes are settled.

3 Scoring Auctions

Ideally the TOR is detailed and the procurer is able to indicate in advance how he trades-off quality and price. In that case, the procurer can use a full fledged "scoring auction" that informs bidders exactly how they can trade-off quality and price without affecting their score.

3.1 Elements of Scoring Auctions

For simplicity suppose that technical proposals are fully characterized by a single quality parameter, q. In that case, bids are two-dimensional and fully characterized by quality and price (q,p).

The scoring auction consists of the procurer's value function, V, that maps quality into a monetary value, and the scoring rule, S, that maps bids (q,p) into a score, according to the formula

$$S(q,p) = \alpha V(q) - \beta p, \alpha,\beta \geq 0. \tag{1}$$

Accordingly, the marginal rate of substitution (MRS), i.e., the rate by which quality can be substituted by a price reduction is

$$\text{MRS} \quad \left.\frac{dp}{dq}\right|_{S \text{ const.}} \quad \frac{\alpha}{\beta} V\ (q). \tag{2}$$

In addition it includes a selection rule (the highest scoring bidder wins the auction) and a pricing rule (typically, the winner is paid the price he quotes).[4]

[4] Some variations of these rules are mentioned below.

QBS and CBS can be obtained from eq. (1) as a special case by setting $\alpha = 1, \beta = 0$, resp. $\alpha = 0, \beta = 1$. However, except in these special cases one would set $\alpha = \beta = 1$.

3.2 Properties of Scoring Auctions

The scoring auction has several nice properties. Let $C(q,t)$ denote the cost function of a potential supplier, defined on quality, q, and a productivity parameter, t. Then, one can easily see that each bidder will choose the cost minimizing quality, regardless of the value function V and regardless of the scoring rule S,

$$q(t) \quad \arg\max_{q}(p \quad C(q,t)). \tag{3}$$

In other words, the choice of quality depends only upon bidders' productivity parameter, t; therefore bidders' strategic choice problem reduces the choice of price p.

Employing a simple change of variables one can show that the two-dimensional bidding problem is actually equivalent to the standard one-dimensional auction in which bidders are viewed as buyers and the auctioneer is a seller. Essentially, this requires only a change of perspective by viewing the procurement auction as an auction in which the procurer "sells" and suppliers "buy" a contract, and bids are scores (see Che (1993)).[5]

The immediate implication is that all results of the standard private-value auction extend to the (properly interpreted) two-dimensional scoring auction. In particular, if productivity parameters are drawn from the same continuous probability distribution, the game has an unique, strictly monotonically increasing, pure strategy equilibrium; efficiency of procurement is assured; and the pricing rule does play a significant role since well-known revenue equivalence results apply.

Interestingly, these strong results are not restricted to the case of one-dimensional quality that has been assumed here. They apply even if quality has arbitrarily many dimensions, provided the scoring rule is quasi-linear in price and quality characteristics, as assumed for the case of one-dimensional quality in eq. (1).[6]

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[5] Define $b = S(q(t),p)$ as a bid and $x = V(q(t)) - C(q(t),t)$ as a bidders' "virtual" valuation and assume $\alpha = \beta = 1$. Then bidders can be viewed as being endowed with a private value x and bidders' strategy can be viewed as a function of their private value, $b(x)$. Consequently, the payoff of a bidder whose valuation is x but who bids as if his valuation were equal to y is $\pi = (p - C(q(t),t)\Pr\{b(x) > b(X_1)\}$, where X_1 denotes the largest of all rival bidders' virtual valuations. Evidently, it coincides with the payoff function of the standard first-price auction.

[6] This was shown recently by Asker and Cantillon (2004).

3.3 Problems of Implementation

The procurer is often unable to compute the function V that maps the quality of the technical proposal into a monetary value. This is particularly relevant if the procurer is a public firm or agency rather than an individual residual claimant.

If one looks at the scoring rules that are actually used in public agencies one can see that they deal with this issue by changing the scoring formula (1) in a way that avoids estimating the value of quality $V(q)$ These changes often make the scoring a problematic exercise.

3.4 Deficiencies of Frequently Applied Scoring Rules

As an example I now look in detail at scoring rules that are employed by several international agencies.[7] They have three main characteristics:

1. Technical proposals are scored relative to a "best practice" as a percentage point; thereby scores are given for different quality characteristics. For example, 50 or fewer scores are given for technical competency and 50 or fewer scores for the quality of the staff, etc. The sum of these scores is then called the "technical score," $\sigma(q) \in [0,100]$.

2. Financial proposals, i.e., the quote prices p are scored relative to the best (lowest) price:

(4) $$s(p) \quad \frac{p_{\min}}{p} 100 ,$$

   where $p_{\min} := \{p, ..., p_b\}$ denotes the smallest of all n price bids. The "price score" is thus also a percentage point, $s(p) \in [0,100]$.

3. Finally, the total score is computed by taking a convex linear combination of the technical and the financial score with relative weight γ (for example 80% quality and 20% price, $\gamma = 0.8$):

(5) $$\phi(q,p) = \gamma\sigma(q) + (1 - \gamma)s(p).$$

Evidently, these formulas differ considerably from the properly designed scoring rule (1) that should ideally be used.

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[7] These rules are employed by The World Bank, the Asian Development Bank, and other international agencies.

First, the technical score $\sigma(q)$ does not reflect the absolute economics value of the technical proposal for the procurer. Instead, it only reflects the relative quality rank.

Second, the financial score is also measured as a relative score, relative to the lowest price and thus does not reflect the cost of the proposed qualities.

This has several undesirable implications which are illustrated in two examples, summarized in Tables 1 and 2. Both examples assume that quality counts for 80% and price for 20%, i.e., $\gamma = 0.8$.

The first example (see Table 1) considers two sets of bids that differ exclusively in quality. Quality is perfectly ranked in the sense that relative scores and relative valuations are identical, i.e., $\sigma(q_1)/\sigma(q_2) = V(q_1)/V(q_2)$. In the first set of bids (columns 2–3), the value difference of technical proposals is relatively small and the less valuable project 2 is selected by both scoring rules, S and ϕ. However, as the values of quality V are proportionately increased (columns 4–5), say because projects have a greater downstream impact, the correct scoring rule $S(q,p)$ values quality more highly and now switches to select project 1, whereas the scoring rule $\phi(q,p)$ is completely unresponsive and sticks to project 2 which is no longer desirable.

Table 1: The Impact of Higher Relative Spread of Values V on the Selection Rule

	Proposal 1	Proposal 2	Proposal 1	Proposal 2
$V(q)$	25	20	100	80
p	30	18	30	18
$S(q,p) = V(q) - p$	–5	2	70	62
$\sigma(q)$	25	20	25	20
$s(p)$	60	100	60	100
$\phi = 0.8\ \sigma(q) + 0.2\ s(p)$	32	36	32	36

This indicates that *the often used rule ϕ is biased against quality and gives unduly high weight to price whenever the relative spread of valuations of technical proposals is large.*

This bias against quality is further aggravated by the particular way in which the financial score $s(p)$ is computed. This observation is illustrated in the second example which is summarized in Table 2.

There, two technical proposals are considered that exhibit a large difference in quality (proposal 1 is twice as valuable as proposal 2). There are two sets of bids (columns 2–3 and 4–5) that differ only in the prices quoted for the two proposals. In both sets of bids the *absolute* price difference is the same (and equal to 9); however the *relative*

price difference is significantly higher in the second set of bids (columns 4–5) than in the first (columns 2–3). As a result, the price score $s(p)$ gives more weight to price when the relative price difference is higher (going from columns 2–3 to 4–5). Subsequently the scoring rule $\phi(q,p)$ selects the wrong proposal only because it is relatively cheaper, although the absolute cost of foregone quality is unchanged.

This indicates that *the scoring rule for price, $s(p)$, that is part of ϕ, adds a further bias against quality when the relative bid spread is large.*

Table 2: The Impact of an Increased Relative Spread of Prices on the Selection Rule

	Proposal 1	Proposal 2	Proposal 1	Proposal 2
$V(p)$	100	50	100	50
P	90	81	10	1
$S(q,p) = V(q) - p$	10	–31	90	49
$\sigma(q)$	25	20	25	20
$s(p)$	90	100	10	100
$\phi = 0.8\ \sigma(q) + 0.2\ s(p)$	38	36	22	36

Why did the inventors of the scoring rule ϕ choose to rank price relative to the lowest price? This probably has to do with the fact that they could not use a proper technical score that measures the economic value of technical proposals and instead employed a relative and thus dimension-free quality score (relative to an ideal proposal that is given a maximum of 100 points). Consistency of measurement required that the dimension-free quality score be matched with a dimension-free price score. This was then achieved by scoring price relative to the lowest price $p_{\min}$ bid (which is given a maximum of 100 scores).[8] Logical consistency was thus achieved.

Although it is consistent, the scoring rule $\phi(q,p)$ is, however, not economically sound and its application may considerably distort the selection of suppliers. In particular, if there are large downstream effects, it may be better to switch simple QBS or LCS until one has designed improved QCBS selection rules that are economically meaningful and yet easy to administer.

4 Open- vs. Sealed-Bid Auction

Generally, auction theorists advise to use an open-bid format. However, most procurement auctions are sealed-bid auctions. Both formats have advantages and

[8] A more meaningful measure would be obtained by fixing a maximum permitted price $p_{\max}$ and applying the scoring rule $s(p) = (p_{\max} - p)/p$.

benefits. Therefore, before choosing a format one should review their pros and cons, taking into account the particular circumstances of the auction.

The main advantages of the open-bid format are the greater strategic simplicity and the fact that bidders can infer others' private signals when they quit the auction at a particular price, which is relevant if there is some common value component.[9]

Historically, the open-bid format was not popular in procurement because it required physical presence of bidders at the location of the auction. Of course, this is no longer a valid reason because it is now easy to run open-bid auctions online. However, open-bid auctions tend to be susceptible to collusion. Therefore, if one suspects that bidders may engage in collusions, one should stay away from the open-bid format.

If an open-bid auction is used, one should consider the "clock" format in which bidders can only chose between supplying the good or service at the quoted price or irreversibly quit the auction. This format precludes strategic jump bidding and collusive communication.

5 Procurement with Buyer Discretion

In contrast to a scoring auction, in a procurement auction with buyer discretion the procurer does not commit to select the winner by a fixed rule. Instead, he uses his discretion, evaluates technical and financial proposals and then picks the one bid that suits him best, and perhaps engages that supplier in extensive bargaining.

Evidently, this discretion makes it difficult to bid because essentially bidders must play a game with unknown selection rule. Therefore it should only be used if the procurer cannot decide how to rank bids before he actually sees them and if quality has important downstream effects.

In procurement, both the fully structured scoring auction and the unstructured auction with discretion are widely used. Scoring auctions figure prominently in WTO, The World Bank, the Asian Development Bank, and especially in EU procurement

[9] In their seminal paper Milgrom and Weber (1982) have shown that an open ascending-bid auction is more profitable for the auctioneer than both first- and second-price sealed-bid auctions, provided there is some common value component and private signals are "affiliated." This result is often quoted to justify the use of an open-bid auction. However, one should be aware that this result is based on the fairly strong stochastic order assumption of "affiliation."

directives,[10] whereas in private procurement the buyer typically does not commit to detailed rules and reserves the right to select the winner on any basis.[11]

6 Integrity of the Procurement Process

In a large scale firm or public organization the procurement is managed by an "agent" who is either an employee or an outside specialist. This may gives rise to a problem of corruption. Corruption means that the auctioneer twists the auction rules in favor of some bidder(s) in exchange for bribes.

Corruption is frequently observed in procurement. Recently, the Attorney General of New York, Eliot Spitzer, sued a leading insurance brokerage firm, alleging that it "steered unsuspecting clients to insurers with whom it had lucrative payoff agreements, and that the firm solicited rigged bids for insurance contracts." (The Economist (2004).)

Apparently, for years the accused insurance brokers received special payments from insurance companies that were above and beyond normal sales commissions. These payments—known as "contingent commissions"—were characterized as compensation for "market services" but were, in fact, rewards for the business that the insurance brokers steered and allocated to the insurance companies. In addition to steering business to its insurance company partners they, at times, solicited fake bids, which deceived its customers into thinking that true competition had taken place.

Major insurance companies in the U.S. were named in the complaint as participants in steering and bid rigging. The immediate victims of the illegal practices were the brokers' customers—mainly large corporations seeking property and casualty coverage, but also small and mid-sized businesses, municipal governments, school districts, and some individuals.

Other instances of corruption abound.[12] Therefore, a firm must always take precautions to limit the potential for corruption and detect and penalize corruption if

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[10] A detailed account and analysis of the EU and WTO procurement directives is in Trepte (2004, Ch. 6).

[11] For example, in the vast majority of "FreeMarket" internet procurement auctions the procurer is not committed to select the supplier by a fixed rule (see Jap (2002)). See also the survey of private sector procurement methods by Anderson and Frohlich (2001) and the analysis of private sector building contracts in Northern California by Bajari, McMillan, and Tadelis (2002).

[12] Recently, The World Bank estimated the volume of bribes exchanging hands for public sector procurement alone to roughly $200 billion per year; see Kaufmann (2005).

it occurs. Efforts to curb corruption have been increased in recent years,[13] due to new legislation that makes companies liable for the behavior of their branches and affiliates[14] and penalizes not only direct bribes but also bribes paid to third parties.[15] Another milestone is new legislation that prescribes the prosecution of companies involved in corrupt practices outside their home country.[16]

Typically, corruption occurs either through bid rigging, bid orchestration, or a distortion of quality ranking. Thereby the corrupt auctioneer has either a predetermined relationship with a favored bidder or he determines the most profitable illegal contact after bids have been submitted.[17]

6.1 Bid Rigging

Bid rigging occurs when the auctioneer allows a favored bidder to adjust his bid after receiving information about rival bids.

If the auctioneer has a predetermined relationship with a favored bidder, he allows that bidder to match the lowest bid of his competitors. This can mean one of two things:

1. If the preferred bidder happened to submit the lowest bid, the auctioneer allows him to raise his bid and still win the auction, thereby increasing his payoff.

2. If the preferred bidder had not submitted the lowest bid, the auctioneer gives him the option to lower his bid so as to win the auction anyway. Of course, the favored bidder exercises this option only if that lowest rival bid exceeds the favored bidder's cost.

In both cases, the resulting price is the lowest bid of the non-preferred bidders, and the preferred bidder wins whenever that price exceeds his cost.

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[13] Interesting surveys and case studies of antibribery initiatives of private companies in Asia are in Arvis and Berenbeim (2003) and Stapenhurst and Kpundeh (1999).

[14] Historically, only individuals could be prosecuted and sentenced for a crime. The possibility of making organizations – "legal persons" – criminally liable was pioneered in France in 1690, with the "Grande Ordonnance Criminelle". This principle was scrapped during the French Revolution, but it was rediscovered in the late 20th century in the United Kingdom and in the United States.

[15] An important example is the "Convention on Combating Bribery of Foreign Public Officials in International Business Transactions", adopted by the OECD and ratified by many non-OECD countries.

[16] The best example is the "U.S. Foreign Corrupt Practices Act" (FCPA).

[17] For a more elaborate survey of corruption in procurement see Lengwiler and Wolfstetter (2005b).

Evidently, the original bid of the preferred bidder is irrelevant, because it can be adjusted in either direction. Therefore, the auction with a preferred bidder is equivalent to a sequential auction in which the non-preferred bidders first submit their bids, and then the preferred bidder can respond and has the right to match the lowest rival bid. In other words, the preferred bidder is granted a "right of first refusal."

In the cases studied so far, the favored bidder is predetermined. However, it may be advantageous for the auctioneer to select a favored bidder only after he has observed the bids, for the following reasons:[18]

1. The auctioneer may infer the maximum gain from corruption from observed bids, and then select the most profitable bidder for corruption.

2. By approaching only one or a few bidders, the auctioneer minimizes the number of illegal contacts, and thus the risk of detection.

There are several remedies for these kinds of corruption. The most effective remedy is to run an open-bid auction in which the auctioneer cannot tamper with bids. However, an open-bid auction may be undesirable, for example due to fear of collusion. In that case, one should adopt electronic bidding using modern methods of encryption and time stamping.

6.2 Bid Orchestration

Even if bids cannot be tampered with after they have been submitted, corruption may still occur in the form of bid orchestration. There, the auctioneer serves as the "ring manager" of a collusive cartel among bidders who coordinates bids before they are submitted. A widely publicized example is the recent insurance broker scandal in the U.S. mentioned above.

6.3 Distortion of Quality Evaluation

Bid rigging and bid orchestration are the only forms of corruption if the selection method is LCS. If quality matters and either QBS or QBCS is used, corruption can also occur in the form of a biased evaluation of the technical proposal.

In complex procurements, the firm sets up an evaluation committee that evaluates technical proposals and awards quality scores.

[18] This case is analyzed in detail in Lengwiler and Wolfstetter (2005a).

In order to deal with this problem one should, first of all, make the technical proposal tamper proof so that proposals cannot be changed after the auctioneer has seen all proposals. This can be achieved by using modern encryption and time stamping tools, provided one makes sure that the decryption key is kept by an entrusted party and documents are decrypted only after the evaluation committee meets.

Another safeguard is to monitor the work of the evaluation committee and check for irregular voting patterns, such as decisive votes by an individual member or by using voting rules that precludes that one member can be decisive.[19] If an evaluation committee is frequently employed, one can also apply statistical methods to detect irregularities. Committee members who are under suspicion of corruption should be removed and prosecuted.

7 Conclusions

In the present paper I have briefly reviewed some basic issues of modern procurement. This account is far from comprehensive. Many important issues were only touched and others were completely left out.

For example, many procurements concern the purchase of many units of a good and these can in principle be supplied jointly by several suppliers. Also, suppliers may wish to subcontract and the procurer has to decide whether he should permit subcontracting.

Multi-unit procurement raises many difficult problems. For example, if one allows bidders to bid in the form of a supply function with the intention of filling orders by several suppliers, bidders are given more possibilities of strategic gaming, and they may be able to use this to strategically raise the price by engaging in "strategic supply reduction."[20] In the face of these possibilities, it becomes important to design auction forms that keep strategic supply reduction at bay.

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[19] Such a voting rule is proposed in Lengwiler and Wolfstetter (2005b).

[20] This corresponds to the problem of strategic "demand reduction" in standard auctions where the auctioneer is a seller and bidders are buyers (see Riedel and Wolfstetter (2005)).

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