



## Support for Improvement in Governance and Management

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### Public Procurement

# Economic Issues in Public Procurement

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## Should an organisation use a centralised or decentralised procurement approach?

Effective procurement strategies, which control costs and streamline processes, are vital to all contracting authorities. Pursuing the best value-for-money in public procurement, while keeping the process management costs at bay, requires several crucial decisions including deciding on the 'optimal' mixture of centralised and decentralised procurement. A number of closely interlinked economic factors come in to play in this decision. The following points highlight where centralised procurement may be of benefit:

**Efficiency through cost control:** All contracting authorities need to control their spending. Centralisation may help to increase efficiency and reduce purchasing costs, mainly due to economies of scale, reducing work duplication, increased specialisation and better knowledge/resource sharing.

**Reducing local favouritism:** The need for relevant local information in setting quality standards and local delivery requirements may favour decentralised procurement but it may also give rise to local favouritism, especially towards local economic operators. Favouritism may also take place at central level. However, the higher visibility of centralised procurement makes 'tailored' procurement strategies more difficult to implement.

**Strategic procurement requirements:** Procurement is 'strategic' when it involves items/activities that have a considerable impact on business or national socio-economic policies. The higher the importance of those activities the more centralised decisions tend to be, since each purchasing decision is likely to exert a significant impact on the entire organisation. Governments usually consider the following areas as strategic activities: defence – due to its national importance and sensitivities, public health – because of the need to co-ordinate actions and enforce minimum quality standards, environment – because of the need to promote consistent, country wide policies and common standards.

**Networks and standards:** When purchasing decisions are decentralised, switching to potentially superior technologies may become difficult if not impossible. Key network industries are telecommunications, internet services, computer software and some aspect of modern banking such as ATM networks and e-markets. Goods or services are said to display network effects if their value to any user increases with the number of users already using them. When the number of users of a certain product with network effects is large enough, that product may de facto become a standard. A potentially serious problem may arise when another standard is available, but consumers including local purchasers, although inclined to consider the latter technologically superior to the former, are unwilling to switch because they are afraid that most of the other users will not follow.

**Emergencies:** There are several reasons for favouring a centralised rather than a decentralised approach to procurement in the case of genuine emergencies such as natural disasters: the need for co-ordinated interventions, reducing the risk of providing essential goods/services of different quality, reducing the risk of corruption when additional funds are handled.

**e-Procurement:** The term e-procurement (electronic procurement) is often associated with e-auctions, which occur as the final tendering phase of the procurement process. The coverage of e-procurement is in principle much wider, ranging from e-notices to e-catalogues and e-invoicing and e-payment systems.

Even if e-procurement is limited to an e-auction the cost of running and participating in the process is likely to be less than a paper-based procedure. Local purchasing units may be able to set up e-procurement systems relatively cheaply themselves and this may favour a decentralised approach. However there is no unique technological standard for running e-auctions or e-procurement systems. This means that the more independently local purchasing units behave, the more likely that technological choices will turn out to be not entirely compatible, thus raising firms' costs in becoming acquainted with different standards. A centralised procurement strategy imposing a single standard across an organisation reduces these costs and may encourage participation by SMEs.

## What is the best type of contract to use?

There are three broad categories of procurement contracts from an economic perspective: cost-reimbursement (or cost-plus), fixed-price, and incentive contracts. Each contract solution generates different behaviour on the economic operator's side in particular and may consequently have a different impact in terms of perceived or actual levels of quality and overall costs. Many procurement contracts are variants or a combination of these categories.

- **Cost-reimbursement (or cost plus) contracts:** The distinguishing feature of cost-reimbursement contracts is that the contracting authority agrees to reimburse all documented production costs related to the project and may also agreed to pay a fee for supervision. While fully ensuring against cost overruns, cost reimbursement contracts do not provide the economic operator with any incentive to deliver cost savings or other benefits.
- **Fixed-price contracts:** Under a fixed-price contract the economic operator is paid a fixed price for delivering to predetermined quality standards. The economic operator receives no additional payment for achieving higher quality standards. Penalties are typically included in the contract so as to protect the contracting authority from the risk of delivery of lower-quality standards than those laid down in the contract. A fixed price contract does not generally provide any cover for the economic operator against cost overruns but the economic operator enjoys the benefit of possible cost savings while fulfilling quality standards as agreed.
- **Incentive contracts:** Incentive contracts lie on the spectrum between cost reimbursement contracts and fixed-price contracts.

**Allocation of risk:** The different types of contract involve different allocation of risks between the parties. The appropriate allocation of risk in a contract between the contracting authority and the economic operator is a key practical issue and impacts on both cost and efficiency. This is best illustrated by way of an example:

### Heating of Schools

A municipality needs to ensure that its local schools are heated to at least 19 degrees centigrade during term time from 08.00 to 17.00. The school buildings require more heating in the winter months than the summer months. The cost of fuel varies depending upon international fuel markets. These variations and uncertainties result in risks to both parties; the contracting authorities and the economic operators.

**Cost reimbursement contract:** The municipality selects an economic operator to supply oil for heating according to the schools' needs. High-consumption patterns, and high costs, are observed from December to February, while demand drops in the summer months. The economic operator is paid according to the amount of fuel that is supplied and the contract includes a variation provision to reflect market prices for fuel.

In this case the economic operator is reimbursed for all documented costs necessary to achieve the agreed performance. The economic operator is paid for the heating oil that it supplies and so it is not concerned, for example, about broken glass in the windows or levels of insulation as neither of these factors would affect the payment it receives. In this case the risk is fully borne by the contracting authority, and the economic operator is unconcerned and unaffected by external events or issues, such as the quality and maintenance of the school buildings.

**Fixed price contract:** The municipality appoints an economic operator to provide energy services. The contract requires the economic operator to decide upon and take all necessary measures in order to keep the temperature inside school buildings at the agreed level of 19°C at the required times. The economic operator is paid an agreed, fixed fee for the entire service, which includes the cost of fuel, irrespective of how much fuel is actually used.

This arrangement shifts significant risks to the economic operator. The economic operator now has a strong interest in undertaking all possible actions to reduce the impact of cost-increase factors and particularly the unpredictable and volatile costs of fuel. It therefore makes sure that the glass in the windows is not broken and installs additional insulation to reduce heat loss. These predictable costs should help to reduce the unpredictable fuel costs. While paying a fixed price for the contract, the contracting authority also knows that the contractor will invest resources in building maintenance.

**Cost-reimbursement contracts** are a good idea where:

- it is a highly complex project;
- there are unforeseen contingencies, that is, events out of control of contracting parties that may lead to serious project disruptions;
- there is a need for contract flexibility;
- the relevance of quality dimensions are difficult to measure (e.g. proactiveness of a management consultant, user-friendliness of computer software).

**Fixed-price contracts** are a good idea where:

- the contracting authority wishes to buy goods/services satisfying only a minimum level of technical specifications;
- the economic operator has full control over most of the events affecting production costs;
- the economic operator's needs remain unchanged throughout the execution of the contract.

## How do you deal with heterogeneous tasks in the same contract?

In practice, particularly for more complex contract, elements of the two types of contracts outlined will be incorporated into a single contract. Incentive contracts show how these elements can be combined.

**Incentive contracts: cost and quality-incentive contracts:** Incentive contracts lie on the spectrum between cost-reimbursement and fixed-price contracts. The economic operator receives a two-part payment: a fixed component and a variable component, where the latter depends upon performance-enhancing targets. Cost-incentive contracts are mainly used in public works or in the procurement of high-tech products. Quality-incentive contracts are more commonly used for the procurement of off-the-shelf goods and services.

- **Cost-incentive contracts** generally include a target cost, a target profit, and a profit adjustment formula, which ensures that (i) actual cost or quality that meets the target will result in the target profit or fee; (ii) actual cost that exceeds the target will result in a downward adjustment of the target profit or fee; and (iii) actual cost or quality that is below the target will result in an upward adjustment of the target profit or fee.
- **Quality-incentive contracts** normally set a baseline quality level and an improvement schedule, specifying how much the contracting authority buyer is willing to pay for quality targets that are higher than the baseline level. Figure 1 below illustrates a simple quality incentive scheme with two quality levels higher than the minimum performance. In this case, an incentive contract normally specifies a base payment  $P$  for minimum performance  $q_{min}$ , typically a quality measure, and additional higher target levels  $q_1, \dots, q_n$  with corresponding bonuses  $B_1, \dots, B_n$ .

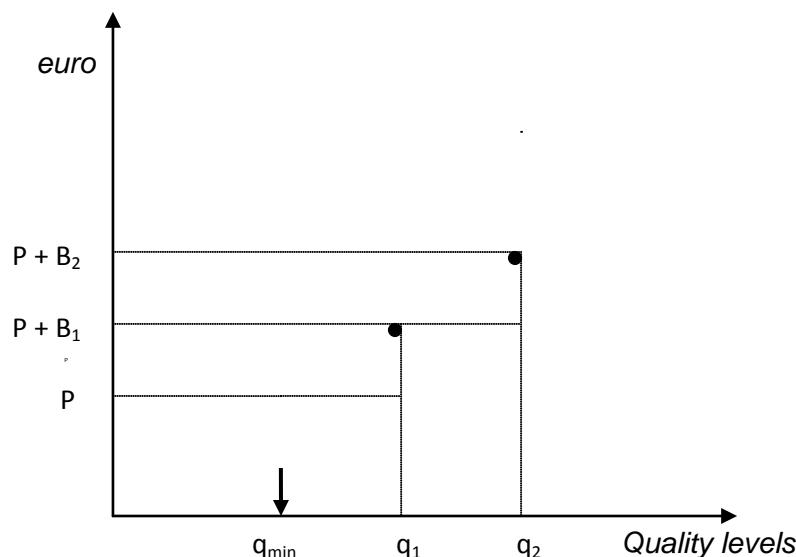


Figure 1: A quality incentive scheme

- There are two main categories of quality incentive schemes, depending on the extent to which contracting parties are able to define objective performance measures. These are (1) schemes involving verifiable quality dimensions which

can be checked by third parties including: time of delivery of a product or speed of problem resolution by a help desk service; and (2) schemes with non-verifiable quality dimensions which can be observed by both parties but cannot be verified by a third party including: a consultant's proactiveness, the degree of user friendliness of software or the kindness/courtesy of a help desk operator.

- There are internationally accepted statistical tools, such as the Customer Satisfaction Index, to measure a user's perception of quality dimensions for a product or service but these are subjective and non-verifiable by anyone other than the user rather than objective and thus independently verifiable.

## **Format for tendering: is it better to use a competition with sealed-bids or an electronic auction?**

**Contract costs:** The cost of a contract is made up of a number of elements. It is helpful for contracting authorities to understand how economic operators cost contracts, the impact of uncertainty on costs estimates and the mistakes that economic operators can make when estimating the cost of delivering a contract. Understanding these issues can help inform the decision on what is the best format for tendering a particular contract.

**Private and common cost dimensions:** When estimating the cost of performing a contract, each economic operator has to consider at least two different dimensions. (1) The private, firm specific, cost dimension concerns the economic operator's efficiency in performing each task specified in the contract. Efficiency results from the interaction between the experience of the economic operator's personnel in carrying out similar tasks and, more generally, the firm's managerial skills. (2) The common dimension relates to the economic operator's ability to correctly estimate the mix of the various tasks specified in the contract. This uncertainty is common to all economic operators.

Uncertainty about the common dimension can have a significant impact on tenders and contract delivery. Where, for example, an economic operator submits a bid on a basis of an overly optimistic estimate of the common component it may then suffer from the 'winner's curse'. This means that it may realise that the actual production costs are higher than the estimated costs and it may reduce the quality of delivery as a result. Uncertainty about the common component may also lead to concerns about potential running losses may result in over cautious bids and higher prices for the contracting authority.

Economic operators in a sealed bid situation will rely on considerably different knowledge bases and experience in preparing their bids. There is a danger that inexperienced bidders in this situation will under or over bid due to a number of factors including uncertainty as to the common component as outlined above.

## **Can e-auctions help reduce uncertainty and improve outcomes?**

E-auctions do not always resolve problems of under bidding or over bidding. However, costs information produced and available to economic operators during an e-auction process can help economic operators to adjust their estimates of the common component and so cost more accurately. In doing so, they may avoid becoming victims of underbidding by underestimating the full cost of delivery of the contract or of overbidding when relying only on their estimates of the common component.

**The down sides of e-auctions:** There are two primary sources of concern for a contracting authority when opting for an e-auction:

- Information circulation may increase the risk of collusion, especially in e-auctions for multiple contracts: economic operators can exploit the openness of the e-auction format to send signals to each other (through prices) in order to co-ordinate their bids. e-auctions may also enable members of a bidding ring to detect deviation from a collusive scheme and to punish deviating economic operators.
- The transparency and openness of an e-auction format may induce some economic operators to adopt bidding strategies in order either to conceal their information from rivals or to bluff.

### Should a contract be split into lots?

One of the main choices in public procurement is whether a requirement for works, goods or services should be acquired using one contract or a number of separate contracts or lots. The decision is not an easy one as savings derived from economies of scale may lead to a decision to use a single contract but the diversity resulting from multiple contracts can encourage competition and efficiency.

When deciding on the number and configuration of lots the contracting authority needs to know its market and consider a number of factors including:

- **Relevance of economies of scale:** for example, production costs may be lower if a number of lots are bundled and delivered by a single contractor. Bundling is to be preferred when strong synergies in production are expected (due, for example, to high fixed costs).
- **Number of potential participants and their degree of specialisation in production:** for example, if there are only a few economic operators capable of competing for several lots, competition among them can be increased by bundling the lots
- **After-market trade (subcontracting):** bundling may exclude smaller firms from bidding directly for the procurement contract but it does not necessarily prevent them from executing part of the contract. Bundling lots generally does not hurt from a savings perspective in the presence of efficient after-market trade (subcontracting) but where there is an inefficient after-market trade it can impact on savings.

**Division into lots and participation:** the size of each lot determines which potential economic operators can deliver the requirements and so participate in the process. In general a firm will participate in a procurement process if its expected profit from the tendering process is high enough relative to its bidding cost and the other options available to it. So how can a contracting authority best split a contract into lots in order to increase the expected profit of potentially new economic operators while at the same time retaining incentives for incumbent economic operators to participate?

The question is not an easy one since economic operators are heterogeneous, and therefore driven to participate by quite different incentives. However, economic operators can generally be distinguished by:

- their size (large or small); and
- whether or not they already have an established position in the market (incumbent or entrant).

**Size:** Small and medium-sized enterprises (SMEs) usually do not have sufficient capacity to execute a large contract on their own so by designing large lots, a contracting authority may exclude smaller firms from the competitive process. However, participation of SMEs is, in many cases, desirable; often highly specialised smaller firms are more efficient than large firms in executing at least certain parts of the project, they increase competition on the lots they bid on which lowers the expected cost and the existence of smaller economic operators may hamper collusive strategies among bigger players in the market. These arguments favour the division of the procurement contract into many small lots. On the other hand, the existence of complementarities between lots may induce economic operators to bid more aggressively for a bundle. This argument favours a bundled contract. The two opposite forces should be appropriately weighed case by case in order to reach the most appropriate contract **strategy**.

**Incumbent economic operators and new entrants:** If the group of potential economic operators that will compete comprises both well-established firms and new entrants, the tendering process should be designed so that new entrants perceive a reasonable chance of success. It may be that the contracting authority is uncertain whether new entrants will be more efficient than incumbents, and therefore designing the competitive process in order to ensure equal entry does not necessarily sound attractive in terms of expected purchasing cost. However, if experience plays any role in correctly executing the procurement contract, then learning-by-doing might put new smaller economic operators in a position to be more competitive in the future. Consequently, splitting the contract into several lots may achieve two goals at the same time: fostering current participation and increasing competition in the future. Contracting authorities must ensure that decisions on division into lots and also on bundling do not favour national suppliers, are non-discriminatory, and ensure equal treatment of all participants in the tendering process.

- Collusion: Awards of lots provides a method for 'splitting' the lots between potential competitors and it therefore makes it easy for bidders to achieve and sustain implicit or explicit collusive agreements so as to share the supply at inflated prices.

**Division into lots and collusion:** Broadly speaking, collusive agreements among economic operators aim to soften price competition. There are several collusive strategies for achieving such an outcome. When procurement contracts are split into several lots, colluding economic operators attempt to decide in advance which firm is going to bid on which lot as well as the financial offers to be submitted. Intuitively, each cartel member has to get a contract at a price that is high enough to deter it from cheating, that is, from winning all of the contracts by undercutting its fellow conspirators.

Successful collusive co-operation between economic operators requires three main ingredients:

- agreement on prices/quantities;
- effective monitoring of rivals' actions;
- enforcement, that is, the ability to punish deviant behaviour.

Enforcement is a crucial dimension. Conspiring economic operators have to find it more profitable to adhere to the collusive strategy rather than cheating on the other conspiring economic operators in order to get a bigger share of the pie. Adherence to a collusive strategy can be maintained only if cheating triggers retaliation in future market interactions. Thus collusion requires repeated interactions over time.



The effect of division into lots on the risk of collusion among economic operators is affected by a number of factors. Here are some pointers:

- **Number of participants:** Generally the larger the number of participants the lower the risk of collusion as the difficulties on agreeing within a cartel how lots are “won” increases with the number of participants. Contracting authorities concerned about collusion therefore need to pick the optimum number of lots to ensure as many participants as possible.
- **Symmetry:** Symmetric economic operators (i.e. of similar capacity/dimension/market shares) find it easier to split symmetric lots of a similar economic value. In contrast, they find it more difficult to split asymmetric lots. In general, each conspirator’s bargaining power within the cartel is proportional to its relative position in the relevant market. Therefore, to prevent collusion, the contracting authority should split the contract in such a way as to create some asymmetries between economic operators and between lots.
- **Number of lots:** Where there are more lots than participants, then collusive allocation of lots generally becomes more difficult for a cartel (although principles of rotation or multi-procurement collusion may be agreed within a cartel where procurements are repeated). In a more predictable market a contracting authority may try and split a contract into more lots than the number of expected tenderers.
- **Nature of tendering format – simultaneous or sequential format in award of multiple lots?:** Once contracting authorities have decided on the most appropriate division into lots, one additional issue is to be addressed: should the lots be awarded simultaneously or sequentially?

There are two ways in which a sequential format may facilitate collusion between economic operators compared to a simultaneous one. The first, intuitive collusive drawback is linked to the ability of cartel members to identify defections from the collusive agreement and to react quickly, within the same sequential award. The second way that a sequential format facilitates collusion is linked to the possible asymmetry within a cartel of colluding economic operators. The viability of cartels is often limited by the presence of ‘mavericks’, i.e. firms that are difficult to discipline as they have more to gain from undercutting a cartel (or less to gain from being part of it). If economic operators are asymmetric, a sequential competitive tendering can facilitate collusion by allowing the cartel to soften the maverick’s aggressiveness by allocating to that economic operator the last lot in a sequential tender. This action minimises the maverick’s incentive to defect and strengthens the viability of the cartel.

### Further reading:

[SIGMA Public Procurement Training Manual](#)