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ROUNDTABLE ON CONCESSIONS

(Background Note by the Secretariat)

-- Session I --

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ROUNDTABLE ON CONCESSIONS

Background Note

By the secretariat

1. Introduction

1. Over the past decades, governments have increasingly turned towards concessions as a way to raise funds and to improve services by applying private-sector expertise to investment, management and operation of infrastructure. Concessions have been extensively used in both developed and developing economies for infrastructure to provide socially significant services such as water, transport, telecommunications and electricity.

2. Citizen-consumers do not always perceive benefits from concessions. Particularly when the change is accompanied by reduced subsidy or correction of underinvestment, tariffs have sometimes increased after the introduction of a concession. Discontent with such tariff increases has been further fuelled when foreign multinationals are the concessionaire.

3. While concessions are not always capable of achieving stated government policy goals, increased focus on competitive conditions can improve the performance of the process. The purpose of this note is to discuss the main elements for the design of the concession allocation process and identify the competition problems that may arise during the term of a concession.[1] Improved focus on competition is one step towards better design.

4. The design and oversight of concession contracts is particularly complex. Reasons for this complexity include:

- Concession contracts necessarily do not cover all contingencies. They are "incomplete" in economics terms. Uncertainty about costs and revenues cannot be entirely resolved in advance. The uncertainty opens the contracts for renegotiation with its attendant negative consequences.

- Both concessionaires and governments can find it difficult to respect concession contracts over the term of the contract. Concessions typically involve large sunk investments that must be recovered over long periods, on the one hand, and governments are under pressure to maintain or improve services, on the other hand. Thus, there is a risk that governments behave opportunistically after concessionaires sink their costs and there is a risk that concessionaires behave opportunistically when governments have no immediate alternatives.

- Concession contracts often involve the creation of a privately operated monopoly which may, in itself, create competition problems. These may be reduced through a change in the structure of the concession or through ongoing price regulation. Introducing a regulatory structure before a concession auction can reduce uncertainty among bidders.

1. This note limits the focus to concessions for infrastructure and leaves aside the significant topic of concessions for the exploitation of natural resources.

- The success or failure of competitive auctions to award a concession to the most efficient operator can depend on subtle variations in design. Transactions costs—the lemons problem, in which buyers cannot assess the value of the object for sale so the market does not exist—impede selling on a concession to a more efficient operator after a faulty auction awards it to an inefficient operator.

5. The award of a concession should take place within a broader regulatory reform of a sector. Such a reform should include clarifying the service objectives and revenue sources, thereby uncovering cross subsidies that must be addressed in the concession design. Reform also often should included addressing how the sector will be governed during the long period after the concession has been awarded: where competition would be feasible and desirable, what sector-specific laws and regulatory institutions need to be established, and the application of competition law.

6. Competition authorities take an interest in concessions because, through advocacy, authorities may promote the use of a more competitive allocation process which in turn may increase economic efficiency, one of the standard objectives of competition authorities. Authorities may also be able to influence auction design in a way that reduces the possibility of collusion. Competition authorities may also promote better concession design which in turn might reduce subsequent harm to the competitive process such as through denial of access to essential facilities. Further, concessions are used where market entry is not free (otherwise numbers would not be limited). Hence, a market in which a concession is used has already passed through an important screen for attracting competition authorities' interest.

7. A number of key points emerge. These include:

- The design of a concession or concessions is constrained by the regulatory regime that will apply to the concession, the potential for renegotiation of the concession contract, and the feasible way of awarding the concession or concessions.

- The key objectives in auction design are attracting bidders, preventing collusion, and ensuring the integrity of the auction. Auction theory shows that attracting an additional bidder makes the auction more competitive. Theory also shows that an auction with N+1 bidders will always provide a higher price than any negotiation and any feasible auction with N bidders. In other words, if just one more bidder can be attracted to an auction than can be attracted to a negotiation for the same object, then the auction is more competitive. Therefore, auctions are in general preferred over negotiations and beauty contests.

- Designing a successful auction that identifies the most efficient operator is difficult and requires expertise. The examples of successes and failures of auctions can offer some warnings, but are not a substitute for analysis of the actual situation.

- Renegotiation, whether due to contact incompleteness[2] or opportunism, can eliminate the benefits of a competitive allocation mechanism; essentially, the winner of an auction will be the best negotiator not necessarily the best infrastructure operator. In particular, renegotiation means that agreements made by competitive award are superseded by the terms agreed in bilateral, non-public negotiations between concessionaire and government. Strenuous efforts should be made to restrict renegotiation to situations where renegotiation

2. Contracts are incomplete when they are complex or do not specify what happens under all contingencies. Of course, all contracts are to some degree incomplete; courts and other means of arbitration are meant to "fill-in the gaps."

is not opportunistic, that is, to situations where unexpected events, outside the control of the parties, have occurred.

- In sum, both an efficient allocation mechanism, such as a well-designed auction, and credible commitment to the resulting contract are necessary.

- Concessioning is not a substitute for regulation. Where a concessionaire will have substantial market power, then a regulatory structure is likely needed. In any case, competition law should apply to concessionaires as well as to any auction to award a concession.

8. This note begins with a review of the **key economics literature** and a **review of empirical experience** with concessions. The remainder covers the main steps in putting a concession into place:

- **Award of the concession**--the design of the mechanism by which the concession is awarded, with an emphasis on competitive award mechanisms.

- **Performance of the concession**—the problem of renegotiation and an overview of the standard competition issues that might arise in concessioned sectors.

- **Design of the concession**—the main contract elements that are constrained by the award and performance of the concession.

2. Concessions: What they are and what is the experience

2.1 The economics literature

9. Two classic economic theory papers on concessions (also called "franchises" in the literature) are by Harold Demsetz in 1968 and Oliver E. Williamson in 1976. Demsetz pointed out that when competition in a market is infeasible, such as for a natural monopoly, it may be feasible to have competition for the right to supply a market. (In the background is a desire to move away from the inefficiencies engendered by regulation by substituting competition.) It might be possible to organise such competition for the market if inputs to supply the market were available to bidders at competitively determined prices and if there were no collusion so that the outcome of the competition was indeed competitive. If there is a single product, uniform pricing, all bidders have access to the same technology and can produce efficiently, and the number of bidders is sufficiently high, then the bidders would compete away any excess profits and the winning bid will be the minimum price that allows the firm to break even, i.e., earn normal profits. This is a good outcome in the sense of choosing an efficient supplier who will supply at average cost. However, there may be substantial welfare losses by not pricing at marginal cost. If there is more than one product then there is no best way to choose the winning bid. And, as will be explored later in this note, the winner of the competition may try to cheat on the quality provided and attempt to renegotiate the contract.

10. Williamson's 1976 paper was a reaction to Demsetz. He explored further the idea that bidding for a concession or franchise could be a substitute for regulation.[3] He identified difficulties that were glossed

3. Williamson's seven factors that should be considered when deciding between franchising and regulation of a natural monopoly were: "(1) the costs of ascertaining and aggregating consumer preferences through direct solicitation; (2) the efficacy of scalar bidding; (3) the degree to which technology is well-developed; (4) demand uncertainty; (5) the degree to which incumbent suppliers acquire idiosyncratic skills; (6) the degree to which specialized, long-lived equipment is used; and (7) the susceptibility of the political process to opportunistic representations and the differential proclivity, among modes, to make them" [p. 75].

over by Demsetz, namely equipment durability and uncertainty, as the core issues for franchise bidding. Regarding incomplete long-term contracts (the type of greatest interest for concessions), Williamson made three main points. First, he felt that the initial award criterion would be artificial or obscure. Once there is more than one dimension to a bid, e.g., price and quality, or peak- off-peak prices and quality, the criterion by which a winner is chosen is arbitrary. Second, he felt that the steps needed to overcome contract execution problems—adjusting prices to reflect changing costs, specifying quality of service, stipulating monitoring and accounting procedures—converged franchise bidding toward regulation. Other contract execution concerns were that franchising agencies were unlikely to allow a winning bidder to fail. Quoting Eckstein, "publicly accountable decision makers 'acquire political and psychological stakes in their own decisions and develop a justificatory rather than a critical attitude towards them.'" (1956, p. 223) Third, for there to be meaningful competition when the contract is re-bid, the incumbent—the winner the first time—must not gain substantial advantages. But this may be unlikely in practice as his study of CATV showed. Williamson summarizes thus, "The upshot is that franchise bidding for incomplete long-term contracts is a much more dubious undertaking than Demsetz' discussion suggests."

11. Riordian and Sappington (1987) is of less direct interest to policy-makers as they abstract from the complications that Williamson pointed out to be empirically relevant. That is, they assume that consumer preferences are known, quality is not an issue, bidding is not repeated, government and concessionaire can costly commit to the contract, and there is no cost of writing complex contracts. That being said, they find that, under conditions of risk-neutral bidders with private information about production costs, the optimal franchise bidding scheme is for the government to offer a menu of contracts. Each contract defines maximum prices and net transfer payments (production subsidy less franchise fee) as functions of the firm's reported marginal product cost. The winner is the bidder who bids the highest ranked contract. The winner will have the lowest expected costs but prices will exceed marginal cost. Having more bidders increases the franchise fee and reduces the winner's profits.

12. The empirical tradition is somewhat longer. Edwin Chadwick, a reformer in early 19th century Britain, proposed franchising the funeral industry. In 1907 the following comment was made about contract incompleteness and renegotiation in concessions:

> "Regulation does not end with the formulation and adoption of a satisfactory contract, in itself a considerable task….It is a current fallacy and the common practice in American public life to assume that a constitution or a statute or a charter, once properly drawn up by intelligent citizens and adopted by an awakened public, is self-executing and that the duty of good citizens ends with the successful enactment of some such well matured plan. But repeated experience has demonstrated—what should have been always apparent—the absolute futility of such a course, and the disastrous consequences of reliance upon a written document for the purposes of living administration. As with a constitution, a statute, or a charter, so with a franchise. It has been found that such an agreement is not self-enforcing….[Moreover, the] administration may ignore or fail to enforce compliance with those essential parts of a contract entrusted to its executive authority; and legal proceedings…are frequency unavoidable long before the time of the franchise has expired." (Fisher, 1907, pp. 39-40 quoted in Williamson 1976 p. 91)

13. Governments introduce concessions to increase the efficiency of infrastructure by applying private sector expertise in investment, management and operation, as well as to raise cash. Concessions may change who—government, concessionaire, users—bears risk and uncertainty and may provide incentives for efficiency. But concessions are incomplete contracts (i.e., not all contingencies are provided for in the contract) and it is difficult for governments and private companies to commit to those contracts (renegotiation is relatively common). Concessions are a source of popular discontent in developing countries as citizen-consumers have felt abused by foreign multinationals. "The failure of users to benefit from a significant share of those efficiency gains [from private as compared with government enterprises]

has been, to a large extent, the source of their discontent with the infrastructure reform programs in developing countries [citations omitted]" [Guasch, p. 1]

2.2 What is a concession?

14. "A concession grants a private firm the right to operate a defined infrastructure service and to receive revenues deriving from it," in the words of one expert. It might be the right to operate a water system or a cable television system in a municipality, or to use a part of the electromagnetic spectrum. Concessions vary according to their risk allocations and incentives, investment and service responsibilities, and how tariffs are set. Usually, a concessionaire pays a fee to the concession-granting authority, and then incurs investment expenditures and collects payments directly from users over time. At the end of the concession period, there could be compensation for investments that have not been fully amortized. There could be provisions regarding early termination and non-compliance with the agreed terms.

15. Concessions differ from privatization in three main respects. First, the physical assets remain owned by the state, even though the use of the assets and the operation of the enterprise are transferred to the concessionaire. Second, concession contracts are of limited duration, typically 15-30 years. Third, the government typically retains closer oversight of concessions.

Box 1. Types of Concessions

Concessions can take a number of basic forms, but in practice form a continuum.
--Lease and-operate (or *affermage*), "under which the private contractor is responsible at its own risk for provision of the service, including operating and maintaining the infrastructure, typically against payment of a lease fee."
--concession *stricto sensu*, "the private contractor is also responsible for building and financing new investments. At the end of the concession term, the sector assets are returned to the state (or municipality).
The term BOT (build-operate-transfer) is often used to refer to greenfield concessions, and ROT is sometimes used to describe concessions in which investments entail primarily rehabilitation (hence the "R") rather than construction. BOO (build-own-operate) is a similar scheme, but does not involve transfer of the assets.
--Divestiture, "the transfer to the private sector of the ownership of existing assets and the responsibility for future expansion and upkeep."
Source: Pierre Guislain and Michel Kerf (1995), "Concessions—The Way to Privatize Infrastructure Sector Monopolies," Note no. 59, Public Policy for the Private Sector, World Bank

2.3 Why use concessions? What is the experience?

16. Concessions are often viewed as a substitute for privatization when it is not feasible for political or legal reasons. Concessions are generally followed by regulation but, under certain circumstances, substitute for regulation. There is empirical support for substantial efficiency gains from concessioning, but the experience has been marred by substantial renegotiation which can dissipate the gains. These issues are reviewed briefly below.

17. Arguments for concessioning over state provision are that (1) if awarded via a competitive process then the more efficient operator will be chosen, (2) the process facilitates regulatory oversight by revealing some potential providers' private information, (3) the regulation that becomes feasible because of the concessioning and auctioning process can increase cost efficiency over time. Regarding efficient choice of operator, it can be difficult to design an appropriate concession and a competitive process—the topic of a section of this note. Regarding information revelation, an auction provides companies an incentive to apply their experience gained elsewhere and in other activities, to determine what profits they could extract from an activity, and to bid accordingly. The bids reveal information about what the bidder thinks is feasible. Further, during the consultations as part of the process of designing the concession, information can be exchanged to help design the subsequent regulation. The third point refers to the difficulty of

imposing a hard budget and quality constraint on government or government-owned companies—which implies that efficiency is not promoted—in contrast with the efficiency-promoting application of, e.g., price-cap regulation, combined with the hard budget constraint of a privately owned company.

18. Arguments for continued state provision are that (1) concessions require complex design and monitoring systems, (2) it is difficult to enforce contracts and to limit contract renegotiation—a notion that includes both lower-than-contracted service quality and higher-than-contracted tariff increases— and (3) there are insufficient incentives to invest or perform maintenance near the end of the contract. Regarding the first point, a specific concern arises where there are significant externalities or universal service requirements, and these cannot be effectively monitored by a regulator. Then state control may be necessary because a concessionaire will have incentives not to provide costly but unmonitored services. The second and third points are addressed later in this note.

19. One formulation, by Shleifer (1998), for choosing between public and private provision is: Public provision is superior to private provision only when: (1) the opportunity for cost reduction stemming from decreasing quality—in a way that cannot be proven to an arbitrator—is high; (2) the probability of product or process innovation is limited; (3) gaining a reputation as an efficient service provider is unimportant; and (4) competition is weak and consumer choice is ineffective.

20. Concessions can also be substitutes for regulation. Demsetz and others had the idea that concessions could displace on-going, inefficiency-provoking, cumbersome rate-of-return regulation of natural monopolies with the market discipline of a competitive auction for a concession. Williamson's critiques and subsequent experience cast doubt on that idea, at least in many circumstances. However, some short-term concessions in use do have the flavour of Demsetz competition. (See e.g. the box on Norwegian regional air transport.) Nevertheless, much of the debate now focuses on state provision versus concession versus privatisation, with acknowledgement that on-going regulation may be needed.

21. Increased efficiency is a fundamental reason for concessioning. For example, in Latin America and the Caribbean, which have had twenty years experience with concessions, This experience has been studied.[4] There, efficiency gains of concessioned firms show significant *annual* gains, ranging from 1–9 percent.

22. Studies of the Latin American efficiency gains from concessions are summarised in Estache, Guasch, and Trujillo (2003). In electricity, the rate of productivity change is 1 per cent per annum across 39 firms in a dozen countries. For railways, average annual total factor productivity growth has been 5.3% (freight) and 9.8% (passengers) in Argentina. In Brazil, the average annual TFP growth has been 8.4% for the first two years of a concession in Brazil (the 8.4% rate contrasts with the 5.5% rate before the sectoral reform). For ports, between 1996-9 Mexican ports improved efficiency by 2.8 to 3.3% per year. For water, Argentina had TFP efficiency gains of 3.7% to 6.1% per year, depending on the province. Regrettably, there does not appear to be a broader study of post-concessioning efficiency gains. Against these efficiency gains must be set the one-time transactions costs. Transaction costs for concession-type projects—for development activity, negotiations, and the like—are estimated to range from 3 to 5 percent of total project value where concession arrangements are reasonably well understood, but exceed 10 percent of project cost where the concept is new. (Klein, So and Shin 1996)

23. The intent of the regulatory reforms and the concessions was to give concessionaires incentives to make these efficiency gains and then to require some of these gains to be shared with users in the form

4. While Latin America constitutes only a fraction of the experience with concessions, experience with concessions began early there and the region has been the subject of a unique, comprehensive study by an economist at the World Bank.

of lower tariffs. However, the "weak or absent correlation between these efficiency gains and lower tariffs and the perceived profitability of the private operators, often secured through the additional benefits captured through renegotiation, have been at the core of the increasing dissatisfaction among users." A late 2001 Latinobarometro survey found that 63% of people in 17 Latin American and Caribbean countries believed that the privatisation of state companies had not been beneficial. (Guasch, pp 11-12, citations omitted). And, on the other side, profitability was also not very high. One study of 34 concessions in nine Latin American countries found that concessionaires, on average, made losses. The authors warn that the figures may not be reliable due to possible errors of official revenue figures and possible biasing of intra-firm transactions. (Sirtaine, Pinglo, Guasch and Foster 2005)

24. Despite over three-quarters of concessions between the mid-1980s and 2000 in Latin America being awarded by competitive auctions, about 30% were renegotiated (with much higher incidences in some sectors) an average of just over two years after the concessions were awarded. On average, users lost and concessionaires gained in these renegotiations.

25. Moving beyond the Latin American data on concessions, a remarkably candid assessment of concessions in Thailand (Nikomborirak 2004) highlights other problematical aspects of poor design of concessions. First, designing a concession specifically to circumvent domestic law suggests an absence of broad, durable political support. Second, there appeared to be a lack of commitment to the concession contract by both concessionaire and government. According to the report, the concessionaire did not truthfully share profits per the agreement and the government sold a second telecommunications concession in violation of the contract with the first concessionaire. Third, a non-competitive allocation process yields a worse outcome than a competitive process: the negotiated telecommunications concession provides for a concession payment of 16% to 21% of line revenue whereas the contract that was the outcome of a bidding process provides for the payment of 43.1% to 44.5% of line revenue. Finally, there is a need for a predictable regulatory regime.

Box 2. Example of Concession of Zambian Railways

Zambian Railways is state-owned and has no rail-based competitors. A restructuring project began in 1992, followed in 1997 by a management contract with a foreign rail company. It was concessioned in 2004 to a consortium including Spoornet, the South African railway. At least one observer found the process to be a resounding success:

"Years of state mismanagement, neglect and regional conflict ran the railroad off its rods. From 1975–1998, freight traffic decreased from 6 million tonnes annually to a mere 1.4 million tonnes. At the end of that period, the railroad was losing $12 million a year and needed an estimated $45 million for rehabilitation…Since 1998, when the transition process began, freight traffic has increased by 64%. The ending of wars in neighbouring states also means that the railroad is poised to regain its coveted links with Angola and Namibia….[F]reight traffic on the line has increased by 500,000 tonnes this year [2003] to 2.3 million tonnes — and there's every indication that such growth will continue."

But in November 2005, the Parliament resolved unanimously that the agreement for the concession of the railway be revised. MPs complained about loopholes, ignoring maintenance obligations, slower service, unemployment of former employees of the railway, and more. One was quoted as saying, "It is vital that we re-negotiate this agreement by terminating it."

Sources: 10 October 2003, Issue 3, SADC Barometer, "Privatising Zambia's Railway." Published by the South African Institute of International Affairs; 24 November 2005 "Revision of Zambia Railways Concession" Times of Zambia (www.times.co.zm)

26. This introduction has served to highlight the main competition issues raised by concessions. The first set of issues centre on the allocation and agreement of a concession contract. These are discussed in

the next section on auctions, allocation by negotiations, and the problems of renegotiation. The second set of issues centre on competition during the term of the concession. These issues are not fundamentally different due to the presence of a concessionaire. They include exclusion of rivals by denying access to facilities and abusive pricing. They are discussed in section four.

3. Allocating concessions

3.1 Auctions

27. Auctions are used to choose who shall operate a concession because they can identify the most efficient operator. The idea is that the highest bidder will be the person/company who places the highest value on the concession, and that will, on average, be the person who can operate it most efficiently. (In this paragraph and many that follow, we abstract away from the complication that bidders might already own substitutes or complements.) But poor auction design can thwart this line of reasoning, and sometimes the auctioneer does not desire the most efficient operator. Also, where the objective is to provide the best mix of coverage or other aspects of "quality" and price, then it may be difficult to identify which bid was "highest." That is, the choice among a number of weighting systems to incorporate multiple dimensions—e.g., coverage, quality and price—is arbitrary where economic efficiency is the objective of the auction.

28. The extensive auction theory literature provides insights into auction design, but the focus has not been on features of the real world, e.g., collusion and bidding costs, that have important effects on the participation, competitiveness, and outcomes of auctions. For policymakers, auction theory provides two main lessons:

- The best kind of auction for selling an object or a concession depends on the specific circumstances. (Examples of circumstances that matter include bidders' risk aversion and whether the private information other bidders have about an object is relevant for how much a bidder values it—in the extreme, whether they would all value the object the same if they all had the same information. A key feature of auctions is asymmetric information—different bidders have different information and some may have better—more accurate—information than others.) This is described in more detail just below.

- Extrapolation from the better-analyzed single good auction case to the multiple goods auction is difficult and error-prone. (The 3-G mobile phone licenses in European countries were examples of multiple good auctions. Arguably, a series of auctions with the same participants has features of multiple goods auctions.)

29. In practice, the effects of collusion and entry—i.e., attracting more independent bidders—are more important for designing auctions than details of risk aversion, the relationship of one bidder's value of the contract to other bidders' values, and the asymmetry of bidders' information about the value of the contract. Collusion and entry are discussed below.

Box 3. Definitions: The Four Standard Types of Auctions

There are four standard types of auctions which are commonly used and well-studied:

1) **ascending-bid auction** (also called the open, oral or English auction) in which the price is raised until only one bidder is left, and that bidder wins at the final price
2) **descending-bid auction** in which the auctioneer begins with a very high price which is lowered until a bidder announces that he accepts the price, and that bidder wins at that price.
3) **first-price sealed-bid auction** in which each bidder submits a single bid, no bidder sees what the others bid, and the object is sold to the highest bidder at the price he has bid.
4) **second-price sealed bid auction** (also called a Vickery auction after its inventor) which works like the first-price sealed bid auction but the winner pays not what he bid but instead the amount of the second highest bid.

The value of winning the contract may depend only on the bidder's characteristics, like their own costs. This is called a **private value auction**.

Alternatively, the value of winning the contract may depend on factors affecting all bidders, such as consumers' willingness to pay and regulators' future behaviour. This is called a **common value auction**.

The four standard types have a surprising feature; they yield the same expected revenue under certain conditions. This is called the **revenue equivalence theorem**.[5]

30. The various types of auctions have advantages and disadvantages.

31. Collusion is easier in an open auction since bidders can immediately detect cheating on a cartel agreement and punish it. On the other hand, whether the auctions are open or sealed-bid, if the same bidders face each other often, then detection of cheating can be done when the bids are opened and punishment can be meted out with a delay at the next auction. Collusion of another kind, when auctioneers are corrupt and share sealed-bid information with other bidders, transforms the sealed-bid auction into an open auction as bidders can learn about others' bids and change their own.

32. Entry by weaker bidders is promoted by sealed-bid auctions as compared with an open auction. Described in greater detail below, the intuition is that weaker bidders will drop out of an open auction, therefore realise they may as well not enter at all, but that they have a chance of winning a sealed-bid auction, so enter.

33. Second-price sealed bid auctions have the advantage of duplicating the outcome of an ascending bid auction[6] but without the cost of assembling bidders. They have the advantage, as compared with a first-

5. Assume there is one unit of an indivisible good. Assume each of a given number of risk-neutral potential buyers of the object has a privately known signal that is drawn independently from a common, strictly increasing, atomless distribution. Then any auction mechanism in which (1) the good always goes to the buyer with the highest signal and (2) any bidder with the lowest feasible signal expects zero surplus, yields the same expected revenue. (Klemperer, p. 17, who also notes that this is not the most general statement of the theorem) In a private value model, a bidder's value depends only on his own signal. In a pure common-value model, the actual value is the same for everybody but bidders have different private information, i.e., different signals.

   Violating these conditions, e.g., risk-aversion on the part of bidders or information that is not independent, means that the different auctions no longer provide the same expected revenues.

6. The logic is as follows. An ascending bid auction ends when the bidder with the second-highest value drops out. He drops out when the bid is just higher than his valuation. So, the winner pays the second-highest valuation plus a little. If everyone bids their valuation in a second-price sealed bid auction, then the winner pays the second-highest valuation (by definition). But will a bidders bid his valuation? He will not

price sealed bid auction, of allowing a simpler calculation since the rational bid is the bidder's own value and does not require any estimate of the number of other bidders and their values. But second-price sealed bid auctions can also give rise to political difficulties. In particular, they make public how much money was left on the table (the difference between the highest and second-highest bid). The extreme outcome occurred during New Zealand's radio spectrum auction, where the first bid was NZ$100,000 and the second only NZ$6. (McMillan 1994). There was political fallout when taxpayers saw that the state got only NZ$6 when someone was willing to pay NZ$100,000. First-price sealed bid auctions and open auctions are better in this regard, since the first price wins in the a first-price sealed bid and the first price is unknown in the second case (the bidder who wins pays the amount of the standing highest bid when the second-highest bidder drops out of the bidding, so taxpayers do not see what they missed by not selling the license at the highest bidder's valuation).

34. An important question is, In awarding a concession, what should the auction be about? Should bidders bid tariffs or a concession fee? (The problem of multiple criteria is addressed later in the section on non-auction award procedures.) Demsetz promoted bidding on tariffs, but experience since then has shown that this is a poor choice. Tariffs are difficult for both government and concessionaire to commit to because they need to change in response to changes in the environment, and the negotiations with the regulator during this process eliminates the efficiency effect of competitive auction. Therefore, the usual practice is to award on the basis of concession fee, when an auction is used.

35. Both theory and practice show that auction design does matter. Some argue that it does not, claiming that the winner of the auction can sell to more efficient owners to eliminate any inefficiencies in the allocation from the auction. That argument is incorrect because, in the case of licenses or concessions, there are substantial transactions costs. The existence of these costs violates a key assumption of the Coase Theorem on which that argument rests.[7] *Inter alia,* since the value of the license or concession is not known to the buyers and sellers, some sales that increase efficiency will not take place and those which do take place will be delayed. Empirical evidence supports this theory: While there is demand for nationwide wireless telephone networks in the United States, the fragmented licenses that were initially sold were not quickly consolidated into national networks. (Milgrom, p. 20.) Further, today three of the four carriers who operated airmail routes in the United States in 1930 have hubs in cities they served then. (The fourth has gone bankrupt. See the box on U.S. airmail routes.) In Norway, the incumbent continues to win auctions for regional air services at the fourth set of contracts (See the box on Norwegian air services). So, getting it right the first time matters.

Box 4. Key Elements in Auction Design

"My own experience in auction consulting teaches that clever new designs are only very occasionally among the main keys to an auction's success. Much more often, the keys are to keep the costs of bidding low, encourage the right bidders to participate, ensure the integrity of the process, and take care that the winning bidder is someone who will pay or deliver as promised." *Milgrom 2004, p. xii.*

"What really matters in practical auction design is robustness against collusion and attractiveness of entry—just as in ordinary industrial markets." *Klemperer, p.131.*

bid more, of course. If he bids less, this lowers his likelihood of winning and does not lower the price he would pay if he won. If he loses to a bidder who bid less than his valuation, then he regrets his bid—if he had known, then he could have costlessly bid more, up to his valuation.

7. The Coase Theorem (1960) "asserts that an optimal allocation of resources can always be achieved through market forces, irrespective of the legal liability assignment, if information is perfect and transactions are costless." (Tirole 1989) However, other authors have the view that the initial assignment of property rights does indeed constrain the feasible allocations achievable by bargaining. (Varian 1987)

3.1.1 Preventing bidder collusion

36. The three direct strategies for preventing bidder collusion are aimed at interrupting signalling (to impede bidders reaching an understanding), helping cheaters on a cartel to avoid detection, and helping cheaters to defer the cartel's punishment. In addition, promoting entry—the subject of the next subsection—also discourages collusion both by increasing numbers and by obscuring identities—we all know the incumbents, but who might enter? Finally, collusion can be deterred by the credible threat of significant penalties. Sealed bid auctions are better than ascending bid auctions in this respect, since bidders cannot use their bids for signalling and cartelists cannot immediately detect a cheater and punish him.

37. The design of the auction affects signalling. Signalling allows bidders to identify what they wish to win, to threaten what they will do if thwarted, and thereby to reach an understanding of who will win what. Signalling can be done in a number of ways. For example, signalling can take place in the newspapers ("I'll be satisfied with just two of the 12 blocks of frequency on offer," "If the [five other bidders] behaved similarly it should be possible to get the frequencies on sensible terms," but "[I] would bid for a third frequency block if one of [my] rivals did"). (Klemperer, p. 136 citing Crossland 2000) In the instance from which the quotations were taken, six firms won two licenses each at low cost. Moving toward a sealed-bid auction, so the retaliation could not be taken immediately, may have reduced the effectiveness of this signal.

38. Signalling can also be done in various ways during the bidding. Signals can even be contained in the bids, e.g., using the last digits in a bid amount to identify a lot in which the bidder is particularly interested. This actually occurred in some of the telecommunications license auctions in the United States. This form of signalling can be prevented by prohibiting bids not in round numbers or by the auctioneer specifying the bid increment. Another form of signalling used in the FCC auctions was withdrawing a bid after it had been made. I.e., a company would enter a high bid, then withdraw its bid. Where two bidders are bidding against each other in several markets, they can use withdrawals to propose a split. Rule changes limited withdrawals to two rounds.

39. Collusion may be interfered with if bidders' identities are not revealed. If bidders know others' identities, then they can retaliate and cooperate across auctions. Further, bidders can intimidate others. One study found that small bidders avoided bidding against large bidders in the FCC's DEF auction in 1996-1977, and posited that they did this to avoid retaliation. If small bidders avoid large bidders, then it makes any collusion among large bidders easier to reach and more effective. (Cramton and Schwartz 2000)

40. Joint bidding arranged close to the auction date reduces competition without allowing potential entrants time to respond and compete against the cooperating bidders, thus has an economic effect like open collusion. This problem can be addressed by prohibiting joint bidding arrangements announced close to the auction date. (For those joint bidders who could not bid individually, joint bidding does not reduce competition. But it may be administratively difficult to quickly identify and separate these cases from anticompetitive joint bidders.)

41. Reserve prices can affect collusion. A high reserve price changes the calculation of a potential cartelist: With a low reserve price the choice is between colluding to end the bidding early at a low price and bidding longer and higher. With a high reserve price, the first alternative—collusion—is relatively less attractive because the lowest collusive price—the reserve price—is higher. In the extreme, if there are valid suspicions of collusion or not enough bidders show up, it may be reasonable to cancel an auction. Such a policy would need to be pre-announced to limit strategic conduct.

42. In addition to the direct methods for making collusion more difficult—interrupting signalling, prohibiting joint bidding arrangements near the auction date and increasing reserve prices—effective competition law may deter collusion. Indeed, it may be possible that larger penalties can be available in concessioning when there is a requirement that the bidder affirm to the government that he has not participated in any collusion in the bidding process. If the same firms may also bid in future procurement or other concessions tenders, the threat of debarment from future government contracts may be effective deterrence. (OECD 2005)

3.1.2 Promoting entry by bidders

43. More bidders is better. More precisely, in private-value auctions generally and in many common-value auctions, an ascending auction with no reserve price and N+1 symmetric bidders is more profitable than "any auction that can realistically be run" with N bidders. "So it is typically worthwhile for a seller to devote more resources to expanding the market than to collecting the information and performing the calculations required to figure out the best mechanism." (Klemperer p 27, citing result from Bulow and Klemperer 1996; see also the box on U.S. airmail below)

44. Promoting entry by bidders is aimed at encouraging weaker bidders—i.e., those less likely to win the auction—to participate actively. (Presumably those who feel they are likely to win do not need encouragement.) Sealed bid auctions are better than ascending auctions in this regard. The intuition goes as follows: Consider the ascending auction. Near the end of the bidding, only the strongest bidders will remain. The weaker bidders know this. If they are going to drop out of the bidding late, then they do better to not incur the bid preparation costs and not bid at all. By contrast, with a sealed-bid auction, weaker bidders may win at a price that the stronger bidder could have beaten, but did not because he traded-off the increased probability of losing against paying more. In a sealed-bid auction, the stronger bidder cannot change his bid once he sees the weaker bidders' bids, as he can do in an open auction. A second line of intuition is based on bidding strategies in a sealed bid auction being less straightforward than in an open auction, and the conjecture that in practice bidders are not likely to have a common view on the distribution of the true value of a contract. This results in a weaker player being more likely to win in a sealed bid auction. (Klemperer p. 133)

Box 5: Example of Entry in 3G Telecommunications Auctions

The Netherlands had five incumbent mobile-phone operators and sold five 3G licenses by ascending auction. Bidders were permitted to win at most one license each in order to promote competition in the 3G market. "Recognizing their weak positions, the strongest potential new entrants made deals with incumbents, and Netherlands competition policy was as dysfunctional as its auction design, allowing firms such as Deutsche Telekom, DoCoMo, and Hutchinson, who were all strong established players in other markets than the Netherlands, to partner with the local incumbents." In the end, only one potential entrant bid and it withdrew after receiving a threatening letter from an incumbent. The five incumbents won the five licenses, paying about €3 bn, far below the equivalent in the United Kingdom.
By contrast, Denmark's auction was considered to be a success. Denmark had four incumbent mobile-phone operators and sold four 3G licenses by auction. Having watched the earlier 3G auctions, the decision was made to use a sealed bid in order to attract weaker bidders, promote new entrants and scare incumbents into bidding high. The government kept secret the number of actual bidders, as well as all bids other than the fourth highest. All winners paid the fourth highest bid, worth about € 95 per capita. Among the winners was one new entrant. (Klemperer pp. 155-6, 163-4)

45. More generally, auctions with lower bid preparation costs will attract more bidders. This can be accomplished by standardizing auction procedures, including across time and jurisdictions. For some but not all aspects of auctions, this may involve a certain trade-off with designing auctions specific to their circumstances. This may also be accomplished by packaging auctions. The Tunisian Competition

Authority, for example, plays a role of reducing barriers and requirements so that they do not cause prices to rise or deter bidders. (See Sixth Global Forum on Competition, Tunisia DAF/COMP/GF/WD(2006)13.)

46. Also, bids can be encouraged by reducing the cost of providing the service, for example, by setting performance criteria that can be met by various means rather than specifying a particular technical solution. (See box 17 on Norwegian regional air services.).

47. It may be possible to "strengthen" weaker bidders. If the object is worth about the same to all bidders ("common value" in the literature), then a bidder with better information—such as the incumbent—can bid more aggressively than the others. The other bidders recognize that they will only win if they overestimate the value of the object by more than usual (the "winner's curse"), so they bid unusually cautiously. The result is that the incumbent wins more frequently and at a lower price. Providing better information to all bidders may reduce the informational asymmetry and improve the outcome of the auction. Other methods of encouraging entry that are supported by economic theory are set-asides—allowing only e.g., small enterprises to bid on certain licenses and of course restricting re-sale—and bidding credits—requiring e.g. small enterprises to actually pay only a specified fraction of their bids. (Klemperer pp. 234-239) An example of a set-aside, though perhaps aimed more at restricting market power later, is prohibiting incumbents from bidding.

Box 6. Example of Excluding Incumbents: Los Angeles versus Chicago

In the 1995 auction for mobile phone broadband licenses in the United States, licenses were for specified regions. The value of the licenses was probably about the same for all bidders. The licenses were sold by an ascending "English" auction. Fixed-line operators in the same region as the licenses were advantaged over others because they had a database of potential customers, a well-known brand name, and familiarity with doing business locally. Los Angeles has a higher household income, higher growth rate and a less dispersed population. In Los Angeles, the incumbent was allowed to bid and the auction yielded $26 per capita. In Chicago the incumbent was prohibited to bid and the auction yielded $31 per capita, even though the characteristics of the population would have led one to think that the LA license would be worth more than the Chicago license. (Klemperer 2004, p. 107)

3.1.3 Repeated auctions

48. Repeated auctions, such as when a concession has come to the end of its term and is re-auctioned, present special problems because of the incumbent's advantages over the other bidders. If each bidder thinks he values the concession about the same as the other bidders do, but that they each have different information about the true value of the concession, then they will all know that the incumbent has better information and will either not bid or will bid a low price. Requiring information to be provided by the incumbent to all bidders is unlikely to solve the information asymmetry problem, and in any case the incumbent may have reputational advantages that cause outside bidders to shy away from bidding aggressively.

49. There is an obvious trade-off between duration of concession contracts and the repetition of auctions.

50. Repeated auctions can be part of an ingenious design to shift uncertainty. That is, they can be a way for government to bear more uncertainty and thus receive higher concession fees, on average. A recent Dutch railway concession does this.

Box 7. Example of Designing around Uncertainty in the Dutch Betuweroute Concession

The Dutch state granted a short-term rather than a long-term concession for the Betuweroute in order to bear itself the current significant uncertainty about market developments. (The state bears the uncertainty in the sense that the price of the long-term concession which will be auctioned at the end of the short-term concession will reflect what actually happens in the short-term.)

In particular, the concession of the Betuweroute from the harbour of Rotterdam to the German border, which is designated for freight transport, will be granted for the period of 2007-2009/2010, to a consortium. During this period, the uncertainty about the volume of freight is expected to be reduced. Later, a longer concession will be allocated by competitive auction. The price the Dutch government will get for the concession will reflect the expectations held in 2009/2010 about future e.g., freight demand and maintenance costs, and these expectations will be more precise because of the experience of operating the concession during 2007 to 2009. Conceivably, though this is not mentioned in the Dutch discussion, the members of the consortium, since they will have information advantages gained by being incumbents, could be required to bid separately for the second concession.

Source: Submission by The Netherlands to the Sixth Global Forum on Competition 2006

51. Williamson (1976) argued that using recurrent short-term contracting allowed the expense of calculating contingencies to be avoided. Adaptations could be introduced at the contract renewals in response to what events had actually occurred. The Dutch Betuweroute concession seems to be an example of Williamson's theory put into practice.

3.1.4 Other auction issues

3.1.4.1 Auctions for multiple goods

52. The auction theory literature provides less guidance when there are auctions for multiple goods, or multiple auctions involving essentially the same players. While the practice is to extrapolate from the better-analyzed single good case to the multiple good case, that extrapolation is difficult and prone to error. Multi-unit auctions have been used to sell radio spectrum, electric power, Treasury bills and other objects. When the objects can be either substitutes or complements, auctions do not perform well. While for single-object auctions the objectives of higher revenue and allocation to the more efficient owner are aligned, for multi-unit auctions these objectives must be traded-off. The two examples below give a flavour of the considerations in multiple goods auctions.

Box 8. Description of the US Radio Spectrum Auctions

The design of the 1994 Federal Communications Commission auctions to sell spectrum licenses for PCS[8] has inspired a number of subsequent multi-unit auctions. This box describes the first of those auctions.

There was no off-the-shelf design for auctions of multiple objects with potentially highly interdependent values. (The value of one license depended on whether one already owned a substitute or a complementary license.) Among the difficulties was the fact that some potential bidders wanted nationwide licenses whereas others wanted regional licenses.

The basic design chosen was a simultaneous ascending auction. Ten licenses were offered in total, with the country being divided into several large regions. There was an auction for each license. At each round, each bidder would place bids. Bidders did not bid in every auction. At the end of each round, everybody could see each bid that had been made. Bidding increments were set by the FCC at each round. The idea was that bidders could put together their own optimal basket of licenses, taking into account the cost of the various licenses. Thus, at each round, each bidder could re-design its basket of licenses after surveying the current high bid for each license.

The rule for ending the auction, the closing rule, was that the bidding on all licenses ended when there was a round in which there were no bids on any license. The alternative rule that had been discussed was to close the bidding on each license when there had been a round in which there had been no bidding on that license. This alternative rule was not chosen because it meant that a bidder who thought he had won a particular license, but was outbid at the last moment, could not then bid for a substitute license if the bidder there had already closed. To keep the auction from going on for too long, there was a rule that serious bidders either had to have a high bid or place an acceptable new bid in each round. For the same reason, there was also a rule that bidders had to "be active" on a minimum percentage of the auctions for which they were eligible to bid. (Incumbent cellular licensees were barred from holding a PCS license in the same area.)

The auction closed after 47 rounds over 5 days. Fears that the process would be never-ending and too complex for the bidders proved to be unfounded.

Subsequent multi-unit licenses have been larger. From this small auction through March 1998, the FCC has held a total of 5,893 auctions. The rules have been changed as both bidders and the government have identified weaknesses. The FCC says, "Prior to [the 1993 law that gave the FCC authority to use competitive bidding], the Commission mainly relied upon comparative hearings and lotteries to select a single licensee from a pool of mutually exclusive applicants for a license. The Commission has found that spectrum auctions more effectively assign licenses than either comparative hearings or lotteries."

Sources: Milgrom 2004,Cramton and Schwartz 2000, and FCC website fcc.gov/auctions

8. PCS, Personal Communication Service, is the name for the 1900 MHz radio bank used for digital mobile phone services in Canada and the United States.

Box 9. Example of New Zealand Television Licenses

New Zealand sold licenses to deliver television broadcasts using simultaneous second-price sealed bid auctions. (Recall that in these auctions, the winner is the higher bidder but he pays the amount of the second-highest bid.) This kind of auction would work well only when the licenses are neither substitutes nor complements. But in the event, the licenses could be substitutes or complements, so bidders ran a risk of winning too few or too many licenses.[9] The actual outcome suggests that the auction was inefficient because the bids show little connection between the demands expressed by bidders, the number of licenses they won or the prices they paid. Also, bidders could not guess each other's values. For example, it appears that neither Sky—who bid much higher than the others—nor Totalisator—who bid NZ$401,000 for six licenses—made accurate guesses about their competitors' bidding strategies.

Table 1 Winning Bids on Nationwide UHF Lots: 8 MHz License Rights

Lot	Winning Bidder	High Bid (NZ$)	Second Bid (NZ$)
1	Sky Network TV	2,371,000	401,000
2	Sky Network TV	2,273,000	401,000
3	Sky Network TV	2,273,000	401,000
4	BCL	255,124	200,000
5	Sky Network TV	1,121,000	401,000
6	Totalisator Agency Board	401,000	100,000
7	United Christian Broadcast	685,200	401,000

Source: Hazlett (1998) cited in Milgrom, p. 12.

The auction could have been improved by having several rounds. The winner would be allowed the number of licenses desired (up to a limit set by antitrust concerns) at its winning bid, the second round would sell the right to choose next, and so on. Or the auction might have bids consisting of prices and quantities where the highest bidder got to fill its bid, then the second until all licenses were gone.

53. As this small sample has shown, auctions for multiple goods are difficult to design well. The tradeoffs are difficult to identify and much of the design work requires sophisticated modelling.

3.1.4.2 The problem of multiple criteria

54. Where there are multiple criteria, such as an objective to provide the best mix of coverage, quality and price, it may be difficult to identify which bid was "highest." There can be a pre-announced formula that inputs all the bid variables and comes out with a single number, but such formulae—and any scoring to convert quality variables into values—are bound to be arbitrary in an economic welfare sense. It may be better to apply a filter of basic requirements and identify the winner on the basis of the bid among those companies whose bids fulfil those requirements. (See the box on the Swedish Beauty Contest for an example of filtering followed by an auction.) On the other hand, there is an intuitive argument—not yet fully explored in economic theory—that where bidders have different characteristics then multidimensional "scoring" can both increase bidders' profits and the government's value. (Klemperer p. 247)

55. The need to take into account multiple criteria is often cited as a reason to use a non-auction allocation mechanism. Government might want, for example, a combination of coverage commitment,

9. This is not paradoxical. Assume three licenses are being sold and a bidder needs two of them to enter a market. If the bidder already has one licence, the remaining two are substitutes. If he does not yet have a license, two of them are complements.

price formula, and concession fee. But these multiple criteria must ultimately be translated into a single ranking, and then the highest ranking bidder wins the concession. In other words, there must be a formula which translated the different characteristics into a single ranking.

56. With complex concessions, it is reasonable for the concession designer to need to educate himself about the relevant characteristics, various technologies and tradeoffs. This can be accomplished during a public consultation period before any bidding takes place.

57. The issue is when that formula is arrived at. If it is arrived at before the bids are submitted, then one must ask why the formula cannot be publicly announced in advance and an auction be held on the basis of, say, the concession fee. Announcement in advance can also facilitate entry. A variation would be to publicly announce minima for the various dimensions and reject all bids not meeting those minima, then choose on the basis of concessions fees bid. Such an auction would seem to be as feasible as a beauty contest and would have the advantage of increased transparency to ensure that only relevant criteria go into the ranking.

58. If the formula is arrived at after the bids are submitted, it runs the risk of appearing to be arbitrary or to favour particular applicants, and of being prone to corruption.

59. Beyond the concern over corruption, the risk of collusion with the auctioneer would be lessened if the government advertised its objective requirements and the criteria by which bids or proposals would be evaluated since this should attract more bidders. But the risk of collusion by way of leaks from the evaluator would remain.

60. Even with the best of intentions, when comparisons among bids are very complex then the problem of dealing with multiple criteria may be unavoidable. And when bids are evaluated according to criteria that are either unclear or not pre-announced, even competitive auctions can take on some of the characteristics of negotiation.

3.1.4.3. Competition from incumbents

61. When companies are already present in a sector, there allocation of concessions can either strengthen or weaken competition. It may be advisable to disallow bidding from certain companies in order to promote competition from new entrants who enter via auctions or, alternatively, to prevent problems of discrimination by vertically integrated companies. These issues are discussed later under promoting entry by bidders and coverage of the competition law.

3.1.4.4 Collusion between the auctioneer and bidders

62. The common practice of public announcement of all bids received is aimed at uncovering collusion between auctioneer and bidders. This practice is intended to assure bidders that the auctioneer did not unfairly exclude their bid. Unfortunately, it also helps members of cartels to detect cheating.

Box 10. Example of Enhancing Transparency in Procurement in France

In discussion over revision of the French public procurement code (Code des Marchés Publics) an idea was put forward to increase the transparency of auctions. Rather than publicly announcing only the winning bid, all bids received for each public tender would be made public under this proposal. The idea was that stakeholders would be better able to monitor the process and ensure that it was fair. Most of the business community supported the idea, but the competition authority (Conseil de la Concurrence) had strong reservations. They argued that the transparency would discourage would-be cheaters on cartels from making competitive bids since they would be afraid of being found out and punished in a later tender. The competition authority further argued that, since the same firms bid time and time again in procurement auctions, having access to the losing bids as well would help the firms build up knowledge about how their competitors bid. The knowledge gained would facilitate tacit collusion.

Source: Jenny 2005

63. Unfortunately, the use of transparency in the bidding process to reveal unfairness and corruption conflicts with the aim of preventing collusion; transparency makes it easier for a bid-rigging conspiracy to detect and punish cheaters. Solutions are needed which advance both aims. For example, an inspector general or ombudsman could oversee the auctioneer and investigate complaints without necessarily revealing who bid what. Though how would concerns about capture or corruption at that level be satisfied? The optimal level of transparency would also depend on the relative effectiveness of deterrence through penalties for cartelisation and for corruption (more transparency would be in order if corruption is a larger problem than cartelization).

64. Further, the auctioneer should be sufficiently independent to operate in the public interest. *Inter alia*, its incentives should be aligned with that of the public purse, it should have sufficient independent knowledge, and it should have the necessary controls to maintain confidentiality of bids.

3.1.5 Conclusion on auctions

65. A few examples of actual auctions can give a flavour of how design can be improved.

- Switzerland auctioned off four 3-G mobile licenses in 2000. Weaker bidders dropped out, at least one because of the ascending-bidding rules. The government allowed last-minute joint bidding. In the last week before the auction, the number of bidders shrank from nine to four. The licenses were sold at their reserve price, one-thirtieth of the per capita revenues raised in the British and German auctions for similar licenses. [Klemperer 2004, p. 109] Setting a higher reserve price, forbidding last-minute joint bids, and perhaps switching to a sealed bid auction are likely to have improved outcomes for the treasury.

- Turkey auctioned off two telecom licenses sequentially, declaring the reserve price for the second licence would equal the selling price of the first license. One company bid far more than the first license was worth if it would face competition from a second licensee. No one bid for the second license. [Ibid, p. 110]

- The US auctioned off spectrum in 1996-7 using simultaneous ascending auctions for a large number of lots. Most bids were in round thousands of dollars. Two companies were competing heatedly for lot number 378. One company over-bid the other, with bids of $313,378 and $62,378, for lots where the second company had seemed to be the undisputed high bidder. The second company quit bidding for lot 378. [Ibid. p 105 citing Cramton and Schwartz 2002] The obvious inference to make is that one company was signalling that he

would punish the other in other auctions by bidding high prices if the second company would not drop out of the bidding for lot 378. Specifying sufficiently large bid increments can avoid this type of signalling.

66. Both experience and theory supports a few more rules of thumb to help authorities to anticipate and avoid some errors in how they design auctions.

Box 11. Rules of Thumb for Auctions

- Aim to interrupt signalling, help cheaters on a cartel to avoid detection, and help cheaters to defer the cartel's punishment. This can include using sealed bids, prohibiting bids not in round numbers, prohibiting joint bidding arrangements that are not announced sufficiently in advance of the auction date, and having a sufficiently high reserve price. Enforce the competition law effectively.
- Aim to increase participation. This can include wider advertisement of the auction, reducing the cost of bid preparation, and maybe reducing informational advantages of incumbents.
- Where the goods or concessions are complements or substitutes, design the auctions to takes these interactions into account. To take a simple example, simultaneous English auctions (where bidders can continuously assess their likelihood of winning the various goods and continuously adjust their bids) can do that, whereas separate sealed bid auctions do not. Once a seal bid is made, a bidder cannot revise it when it finds it has won or lost the auction for a complement or a substitute.
- Include in the design rules for reassessing the design if there are too few bidders. For example, if three licenses to offer mobile telephony services are offered and only three bidders show up, then the auction will yield much lower revenues than if four or more bidders show up. If the pre-announced rules state that the auction will be postponed until steps are taken to increase participation, then the auction should attract more interest and avoid disappointing outcomes.
- Where the bidders have the same expected value for the object, then if one bidder has a small advantage over the others such as valuing the object slightly more or having slightly better information then this can radically change the revenue that can be raised by the auction. Under these conditions, a sealed bid auction will raise more revenues than an open auction. [Klemperer, p. 12-13 or 236-7] This can be relevant, for example, when a concession is being re-auctioned and the incumbent has advantages over the other bidders, such as having made sunk investments or knowing more about the actual conditions of the concession.
- Auctions need to take account of the environment in which they are held. Experiences elsewhere are informative, but they are not a substitute for analysis and for simulations. The services of an experienced auction designer may substantially improve the likelihood of a successful outcome and would help avoid mistakes.

3.2 Other allocation mechanisms

67. Three allocation mechanisms that do not involve auctions are simultaneous negotiations, negotiation with a single provider, and beauty contests. These are addressed after a short discussion on multiple criteria.

3.2.1 Negotiations

68. In a **simultaneous negotiation** procedure, also called competitive negotiation, several potential bidders are contacted by the government and invited to enter negotiations. During the negotiations, they develop alternatives that would meet the concession requirements. Then the bidders submit their final offers on the basis of the solutions identified during the negotiations. After the government selects the winner, further negotiations finalise the contract terms. This mechanism is permitted in, for example, Romania. This approach might be considered appropriate when project design is complex so that the buyer can use the information exchanged during negotiation with the potential sellers to better design the desired

project. (Bajari et al 2004) *Inter alia* this approach allows various bidders' technical solutions to be incorporated into the final contract. On the other hand, it is not clear why learning about alternative technical solutions could not take place earlier and be reflected in the request for bids.

69. Where there are no agency concerns with respect to the auctioneer, simultaneous negotiation is analogous to an open, or English, auction. An open auction is particularly prone to collusion when there are few bidders and every bidder knows who else is bidding. Further, since competitive negotiation is not open to public scrutiny and involves discretion on the part of the government, it may be more prone to corruption.

Box 12. Example of Tendering Before Negotiating: French Water

There is evidence that preceding the negotiation stage with a public auction can improve outcomes. Open, publicly announced tenders for water concessions in France were relatively rare before 1993. Rather, the same concessionaire almost universally remained as manager of a local water company from one contract to another. In France, three large multinational companies, Vivendi Water, Suez-Ondéo and SAUR-Bouygues, have the largest market shares. They total about 90 %. Corruption scandals and unhappiness at the price of water led to the *loi Sapin* which, since 1993, has required an open tendering process for water management contracts before a second negotiation stage, and limited the length of contracts. A study of several hundred contract renegotiations found that the average length of contracts fell from 17 to 11 years, prices fell by 10%, despite the incumbent operator winning in 80-90% of cases.
Source: OECD Competition and Regulation in the Water Sector *DAFFE/COMP(2004)20 citations omitted and Saussier (2005)*

70. **Negotiating with only a single potential provider** at a time is worse than negotiating simultaneously with several providers. When the government must decide whether to accept the single negotiator's "best and final offer," the choice is not between this and the other negotiators' offers, as it is for competitive negotiation, but rather incurring the costs and delay of new negotiations with a new partner whose "best and final offer" is still unknown. The weaker bargaining position yields a worse outcome.

71. In comparison with negotiations, auctions do well. Auction theory shows that, under relatively innocuous assumptions, an auction with N+1 bidders will always provide a higher price than any negotiation with N bidders.[10] In other words, if just one more bidder can be attracted to an auction than can be attracted to a negotiation for the same object, then the auction is more competitive.[11]

72. In sum, negotiating simultaneously with several potential suppliers rather than using a competitive auction can strain anti-corruption and anti-discrimination systems. Auction theory shows that, under certain relatively innocuous conditions an auction raises more funds than simultaneous negotiations.

10. One assumption, that bidders are symmetric, is less innocuous. With asymmetric bidders, optimal negotiation can yield a higher expected revenue than an auction with an extra bidder. Bulow and Klemperer (1996) have shown that, under certain assumptions, an auction with N+1 bidders will provide a higher price than any negotiation with N bidders. They also show that if a seller could negotiate with N bidders while reserving the right to hold an ascending auction with an additional bidder and without a reserve price, then the seller would always do better to skip the negotiations and go directly to the auction. The conditions are: bidders are risk-neutral, their value functions are symmetric, and their signals are independent, bidders' lowest possible valuations exceed the seller's cost of supply, and bidders with higher signals have higher valuations.

11. One empirical study on refuse collection estimates that competitive auctions yield cost savings of 20% as compared with negotiation. (Dornberger, Meadowcroft and Thompson 1986, "Competitive Tendering and Efficiency: The Case of Refuse Collection." *Fiscal Studies* 7: 69–87, cited in Guasch)

However, where bid evaluation is complex, even auctions can take on some of the characteristics of competitive negotiation. See the Box on Oakland cable television franchising for an illustration.

Box 13. Example of Multiple Criteria and Renegotiation in Oakland Cable Television Franchising 1969

In June 1969 the City Council of the city of Oakland, California, adopted an ordinance setting out the main features for allocating a cable television franchise. City staff began discussions with prospective franchisees and community groups to gather information on costs, demand characteristics, and technical capabilities inter alia to define a standardized "basic service" so that bids would be comparable.
In April 1970, the five applicants were invited to bid. To summarize, the franchise winner should provide two systems, a basic system A with specified channels and a system B with unspecified special programming and unspecified other services. A subscriber would get access to system A by paying a connection fee and a monthly charge of amount "x." Franchise duration was 15 years. The annual franchise fee to be paid to the city was specified. The connection charges were specified. Minimum technical specifications were stipulated. Minimum service quality was described generally. Minimum coverage of the city and schedule was specified. (All areas of the city were to be served after three years.) Proposals to increase the rates to subscribers could be made annually, but the city ordinance did not specify any indexing or other criteria. The basic bid was an amount x that would be charged subscribers each month for the first outlet that would enable them to receive the basic system A.

Bids received were $1.70 from Focus Cable, $3.48 from Cablecom-General and $5.95 from TelePrompTer Corporation. Focus informed the city at the time of its bid that a partner vital to its qualification as a bidder had withdrawn. Focus had submitted the lowest bid, was the only local bidder, and represented an ethnic minority, so the City was reluctant to reject the bid. Two weeks later, TelePrompTer proposed to enter into a joint venture with Focus in which TelePrompTer would end up with 80% of the capital. The City awarded the franchise to Focus in November 1970. Focus asked for and was granted a rate of $4.45 per month for system B.
Focus then asked for the contract to be modified. After negotiation, the main changes were: lowering of technical capacity, increase of annual franchise fee, reduction of penalty for late construction by a factor of 20 or more, slower construction schedule, and a five-fold increase in monthly subscriber fee for additional connections.
In November 1974, 11 131 subscribers were connected. 10 361 had the extended service B and only 770 had the basic service A.

The Oakland experience leads to the following observations:
-- The lack of consumer appeal of basic service A meant that the focus on the monthly fee for basic service A in the award process "resulted in a strained and perhaps bogus competition."
-- The actual relationship between cost and price is not clear. First, the bids for service A raise the question of whether there was an economically meaningful competition. Second, the price of service B was negotiated and not determined by a competitive mechanism. Third, vertical integration (TelePrompTer supplied much of the equipment) and the city staff's lack of auditing capability obscure true cost levels.
-- An inference that Focus' initial bid was only meant to get its foot in the door is supported by the low initial bid, timing and nature of Focus' reorganisation, importance of its local bidder status, and its success in the contract renegotiation.
-- The City was not in fact in a position to take over if the franchisee withdrew. There was no inexpensive way to value the assets, nor a plan to prevent service interruptions.

Source: Williamson 1976

3.2.2 Beauty contests

73. Beauty contests, like their namesake, are rather difficult to define. In one definition, it is a "procedure where criteria of evaluation include technical expertise, financial viability, network coverage, roll-out speed, etc. Such processes are not transparent, and are often prone to intense lobbying and political intervention." (Jehiel and Moldovanu 2003). In another, it is a procedure in which "there are measurable indicators set out against which applicants can be judged" and the concession fee does not vary (it is often zero but it can be any value). Proponents of beauty contests argue that they allow a focus on critical

performance characteristics, such as coverage and speed of provision of that coverage, which encourages applicants to "excel" in those areas. Of course, commitments made in the beauty contest have the same difficulties of follow-up as commitment as those made in an auction.

Box 14. Example of Swedish Beauty Contest for UMTS Licenses

Sweden provides an example of a beauty contest for allocating UMTS licenses. The selection process had two steps. First, applicants were scrutinized on the basis of financial capability, technical capability, commercial feasibility and appropriate expertise and experience. Second, those who passed the first screen were judged on commitment concerning coverage and development rate.

The number of licenses was initially five, reduced to four. Two were reserved for new entrants and permitted them to also build GSM infrastructure.

Ten applications were received. Four applicants were screened out at the first stage. Among them was Telia, the largest and oldest of the established Swedish mobile operators, who was screened out because the selecting agency believed its proposal was technically infeasible.

One licensee—Orange—dropped out of the market in December 2002. At the end of 2003, the deadline for full coverage, coverage by the remaining three was in fact 67.5%, 74% and 66% respectively. (Bjuggren 2004, including cite to *Svenska Dagbladet* 28 March 2004) Clearly, renegotiation has been a problem, raising the question of the effectiveness of the screening and allocation process.

74. Proponents of beauty contests argue that charging a low or zero concession fee promotes lower priced services later. This argument confuses sunk costs with fixed costs and assumes there will be no price regulation later. Regarding sunk costs, once the concession fee has been paid, it does not affect the price of services. (The cost of capital may increase if paying the fee significantly increases the likelihood of bankruptcy, this can in turn affect prices.) Sunk costs do affect the decision to enter a market, but it would be a foolish company indeed to bid a concession fee that it expects will result in losses. Second, if there were a concern that prices would be too high later, then regulation—with details announced before the auction so bidders can take the future rules into consideration in formulating their bids—can be introduced or perhaps the number of licenses could be increased.

3.3 Commitment and renegotiation

75. Opportunistic renegotiation[12] eliminates the benefits of competitive auctions. If concessions are renegotiated soon after their award, then the initial auction becomes a bilateral negotiation between the auction winner and the government. The competitive benefits from the auction are lost. Governments often cannot reject renegotiation due to fear of political backlash and additional transactions costs of re-designing the concession, holding a new auction, and choosing a new concessionaire.

12. Renegotiation refers here to a significant change in the original contract and financial impact. I.e., stipulated tariff adjustments for inflation do not count, nor do stipulated periodic tariff reviews or other adjustments due to contingencies such as devaluation contained in the contract count as renegotiation.

Box 15: Example of a Renegotiation: Lima Airport

"In early 2001 Lima's airport was concessioned to a consortium, led by Frankfurt Airport operator, Bechtel, and a local partner, that submitted the highest bid. The criterion was the percentage of gross revenue that the operator would commit to turn over to the state. The winning bid offered the state 47 percent of gross revenue in addition to a commitment to invest more than US$1 billion and construct a second landing strip by the 11th year of the 30-year concession.

"Although that appears to be a very attractive bid from the government's perspective and as such was lauded, it also appears financially questionable. It means that from the residual 53 percent of gross revenue, the operator will be able to cover operating costs, amortize investments, and earn a fair rate of return on investments. Shortly after the award, the winning consortium began asking to renegotiate the contract. The operator has been delaying agreed upon investments, and the bickering from both sides has been a constant. The concession contract was renegotiated at the end of 2003, adjusting investment obligations and the percentage of the gross revenues to be given to the state each year."
Source: Guasch (2004), p. 47.

76. A study by Guasch (2004) of about 1,000 concession contracts awarded in Latin America and the Caribbean between the mid-1980s and 2000 provides the best empirical study of concession renegotiation. The results provide useful guidance about how to improve concession design to reduce the incidence of renegotiation. The contracts in the study include 17 countries and were fairly evenly distributed among four infrastructure sectors: telecommunications, energy, transport, and water and sanitation. The most important results are listed below.

- Renegotiation occurred in 30% of all concessions. Renegotiation occurred in 55% of transport concessions and 74% of water and sanitation concessions.

- The average time between award and renegotiation was 2.2 years for concessions that were supposed to run 15-30 years.

- Renegotiation was more common when the concession was awarded through competitive bidding (46%) than awarded noncompetitively (8%), excluding telecoms concessions.

- 61% of renegotiations were initiated by the concessionaire whereas 26% were initiated by the government. However, the type of regulatory regime has a significant effect on these proportions. Under price-caps, the concessionaire initiates renegotiation 83% of the time, whereas under rate-of-return, the concessionaire initiates 26% and the government 34% of the time. (Figures do not total to 100% since sometimes both initiated the renegotiation.)

- Renegotiation was more likely when the contract was awarded on the basis of lowest proposed tariff (60%) rather than highest transfer fee (11%).

- Renegotiation was more likely when the contract had investment requirements (70%) rather than performance indicators (18%).

- Renegotiation was more likely under price-cap regulation (42%) than under rate-of-return regulation (13%), and when a regulatory agency was not in place (61%) than when one was in place (17%).

- Renegotiation was more likely when the regulatory framework was in the contract (40%) than in a decree (28%) or a law (17%).

77. Guasch also performed a probit analysis[13] to estimate the effect of the various variables on the likelihood of renegotiation. That is, he looked at features like "the existence of regulatory body" and found that "the existence of regulatory body" had a large effect on whether contracts were renegotiated. He found that if there were a regulatory body then it greatly reduced the likelihood of renegotiation. He speculated that this was a proxy for better enforcement and that better enforcement would reduce claims for renegotiation. He found that the award criteria mattered; awarding tariffs on the basis of lowest tariff rather than highest fee significantly increased the likelihood of renegotiation. The type of regulation—price-cap versus rate-of-return—mattered a lot, with price-cap regulation leading to more renegotiation. The autonomy of a regulatory body was not robust to the specifications tested, i.e., these results should not be relied upon by policy makers. Investment obligations were seen as more likely to lead to renegotiation. Domestic concessionaires were seen as more likely to renegotiate. Macroeconomic shocks favoured renegotiation. Renegotiation was slightly more common after a change of government. Finally, an award process without competition, e.g., bilateral negotiation, led to fewer renegotiations. These findings are summarized in his table 6.15 reproduced below:

Table 6.15 Marginal Effects of Significant Variables on the Probability of Renegotiation

Significant variables affecting the probability of renegotiation	Marginal effect on probability of renegotiation
Existence of regulatory body	20–40 percent
Award criteria	20–30 percent
Type of regulation	20–30 percent
Autonomy of regulatory body	10–30 percent
Investment obligations	10–20 percent
Nationality of concessionaire	10–20 percent
Extent of competition in award process	10–20 percent
Macroeconomic shocks (devaluations)	10–15 percent
Electoral cycles	3–5 percent
Award process	10–20 percent

Source: Guasch (2004).

78. The main outcomes of the renegotiations were to "increase tariffs (62%), delays and decreases in investment obligations (69%), increases in the number of cost components with an automatic pass-through to tariffs (59 percent), and decreases in the annual fee paid by the operator to the government (31%). A small number of renegotiations, however, led to tariff decreases (19%), increases in the annual fee paid by the operator to the government (17%), and unfavourable changes for the operator of the asset base (22%)." (Guasch, p. 18)

13. The term "probit" means "probability unit." A probit analysis is used to analyze data where the dependent variable can have only two possible values. Here, either there was or there was not renegotiation. A probit analysis will discover which independent variables, e.g., the existence of a regulatory body, are most important in influencing the dependent variable, e.g., renegotiation. The traditional linear regression model explains the dependent variable y in terms of the independent variables x in this way, $y=\alpha + \beta x + \varepsilon$. But the probit model explains the probability distribution of the variable y in this way: prob(y=1)=f(x) where y can take the value 0 or 1. See Kennedy 2003.

79. Concessionaires' arguments for starting renegotiation were mainly that there was an imbalance in the financial equilibrium of the concession contract, i.e., they were not getting a fair rate of return on their investments. Governments' main arguments were "changes in government priorities in the sector, political concerns (often linked to the electoral cycle), dissatisfaction with the level and speed of sector development, and non-compliance by operator with agreed-upon terms." (Guasch p. 18)

80. Analysing these results can help to design future concessions that discourage renegotiation.

- The relatively low incidence of renegotiation in telecommunications and energy was attributed in part to these sectors being more competitive, thus providing the government with more alternative service providers and therefore reducing the bargaining power of the concessionaires. Low renegotiation in telecommunications was also attributed to more outright privatization rather than concessions.

- The relatively low incidence of renegotiation of non-competitively awarded concessions was attributed to the surplus having already been extracted in the initial negotiations.

- The effect of different regulatory regimes on renegotiation was attributed to their different risk characteristics. Under price-cap, the concessionaire bears more risk than under rate-of-return.[14] Also, the nature of the renegotiation was typically to change the treatment of cost components so that more were subject to automatic pass-through, thus reducing the concessionaire's risks.

- Using either a criterion that is likely to be modified soon, such as tariffs, or that is subject to manipulation and arbitrary decisions, such as technical proposals, to award a concession eliminates the effect of competitive auctioning. (The logic is as follows. The modification or arbitrariness means that promises made at the auction do not have to be kept in the future. Therefore, there is no cost to making promises which, if kept, would be costly. Hence, these promises cannot be used to identify the least cost provider. Hence, a competitive auction using these promises will not identify the least cost provider.)

81. Further lessons:

- If winners can default cheaply, they have effectively bid for an option to be a concessionaire. (After the winners had been declared in an Australian auction for satellite television licenses, two bidders defaulted on those bids they no longer wished to have. The government did not impose penalties for default. Example cited in Klemperer p. 110 reference deleted)

- If bankruptcy provides a way out of the commitment, then auctions favour bidders who are underfinanced over better-financed bidders who cannot default. Requiring bonds and penalizing defaults may help.

- Another source of pressure to renegotiate is the failure to deliver affordable services to the poor. If subsidies, cross-subsidies and user charges do not provide the necessary revenues to cover costs, then either the concessionaire cannot deliver what has been promised or cannot do so sustainably. Then government is pressured by consumers who insist on better service to

14. Under rate-of-return regulation, the concessionaire can pass through to consumers changes in costs, though often with a lag or smoothing. By contrast, under price-cap regulation, the concessionaire cannot in general adjust its prices to reflect cost changes.

renegotiate or to change concessionaire, or the concessionaire is pressured to renegotiate or terminate the contract.

- Where multiple criteria were used to choose the concessionaire, each criterion is open to renegotiation. Parties are likely to choose to renegotiate on the criterion where they are advantaged in the negotiation.

Box 16. Example of Renegotiation in U.S. Airmail Routes

A study of the allocation by competitive bidding of concessions to provide airmail services in the 1920s and 30s in the United States found that routes with more competition had lower prices, the bidding gave concessionaires incentives to expand demand for the service, but that incumbents gained advantages over other bidders even without franchise-specific investments.

Thirty-two routes were auctioned between 1925 and 1930. The Post Office specified a reserve price and quality standards and bidders bid the amount they would need to be compensated. Contracts were for four years. There was evidence of collusion in at least one auction and it was re-tendered. A series of rule changes, beginning in 1928, had the effect of not subjecting the winners in the initial auctions to further competition. Also, there was a practice of physically extending old routes rather than putting the extensions out to bid. Two routes were put out to bid after 1930. The contracts were awarded after the so-called "Spoils Conference" among the Postmaster General and the four major carriers. In reaction to the Spoils Conference, Congress began investigating the competitive bidding procedure. In February 1934, the new Postmaster General cancelled all route contracts. In May 1934, partly different routes were put out to bid with temporary, 3-month contracts. (The government forbade the participants in the Spoils Conference from participating in this second round of auctions. They therefore changed their names to some which are familiar today, and did participate.) These contracts were extended several times and the same contractors were in place in 1938 when the regulatory regime changed with the establishment of the Civil Aeronautics Board.

The study of these auctions found that more bidders participating in the auction lowered the price. By one measure, doubling the number of bidders lowered price by 30 percent.

The study also found that incumbents had advantages over entrants. In the second set of auctions, 11 routes had no incumbent and 21 had incumbents. In the 12 routes won by incumbents, they faced considerably less competition and the routes were considerably longer (perhaps reflecting that prior operating experience was more valuable on longer routes—in those days, navigation was visual and contractors had to establish their own emergency landing areas). Incumbents won at considerably higher prices. This plus other data suggests that incumbents had an advantage over entrants which was mainly that they could dissuade competitors from entering particular auctions.

As anecdotal support to the argument that subsequent trading will not overcome inefficient auction allocations, it is interesting to note that, "By the end of 1930 American Airlines had the southern transcontinental mail route with flights through Dallas, TWA had a mid-continent route with flights through St. Louis and United had a northern route with flights through Chicago. All three airlines have had hubs in those cities at the end of the 20th century." (Eastern was the fourth re-named member of the Spoils Conference.)
Source: Wolfram 2004

82. Renegotiation is not always opportunistic. The inherent incompleteness of concession contracts[15] means that sometimes renegotiation is necessary. For a concession contract to be credible, renegotiation should be according to clear, pre-established criteria agreed by all parties to the contract. "A renegotiation rule should expose what changed unexpectedly….The public policy criteria for testing whether revision is needed must be pre-established and clearly defined. And any change to the contract that is warranted should be limited to the issue at hand: the entire contract should not be renegotiated." (Crampes and Estache 1996)

83. Formal provision for renegotiation and bailout may encourage opportunistic renegotiation. Formal limitation on the use of renegotiation and bailout might help, but the credibility of these limitations relies on the credibility of the government. To the extent that international institutions or even governments of other countries are more credible, one strategy would be to use them to enforce renegotiation and bailout policies. Trade agreements between countries can address contract negotiation breakdowns involving foreign investors. Also, loans involving the World Bank or IMF may be backed by sovereign guarantees.

(Jamison et al 2005)

Box 17. Example of Entry and Renegotiation: Norwegian Regional Air Transport

This example involves concessions in a market with well-known technology, relatively low entry costs, and fairly straightforward technical and economic regulation. It involves a government administration with a reputation for honesty and competence. And yet, the concessions have not resulted in much entry or much cost savings, and there remain issues of how to improve the contract design with respect to renegotiation and duration.

Service on certain regional air routes are a public service in Norway. Originally provided by a monopoly licensee, Widerøe, a SAS-owned subsidiary, it has been auctioned since 1996. Bids are the required subsidy for each route. The service must comply with pre-announced standards on frequency, seating capacity, aircraft category and maximum fares. Regional airports require short take-off and landing aircraft. Widerøe, who also operated regional air services on a commercial basis, procured the required aircraft meeting the seat capacity requirements, which are no longer in production, on the basis of the monopoly license. It is the only Scandinavian company with a fleet of these aircraft.

Auctioning of the PSO for three-year periods was introduced to conform with EU regulations (Council Regulation (EEC) No 2408/92 Article 4, on access for Community Air Carriers to intra-Community air services). The auctions are simultaneous sealed-bid. I.e., a bid states the amount of subsidy required for each route the bidder wishes to serve. For each route, the winner is the lowest subsidy. In the first auction, held in 1996 for the period 1997-2000, Widerøe won all the concessions. The service standards were amended to encourage more competition. At Widerøe's request, three routes were removed from the PSO and Widerøe began to operate them commercially. (Widerøe 2000) In the second auction, Widerøe won most concessions, apart from some coastal routes won by Coast Air. In the third auction, Widerøe won nine of the 15 routes against six other bidders. In the fourth auction, Widerøe won 11 routes,

15. Concessions are incomplete contracts. For example, neither party knows, at the time of signing, precisely the cost of providing the promised service, the amount of the service that will be demanded at agreed tariffs, nor some of the other variables that affect the profitability of the contract. Further, it is costly to write all the contingencies into a contract. Third, it is costly to monitor and it may not be possible for an adjudicator such as a court to verify the actions and the contingencies contained in a contract. The result is that government and concessionaire may need to negotiate to take into account the contract's incompleteness.

Problems arise when the negotiations go far beyond the bounds of incorporating resolved uncertainty into the contract. Having made sunk investments (ranging from literally digging holes in the ground to preparing voter-consumers to expect the delivery of specific services), the negotiating strengths of the parties will have changed.

Coast Air won three and two others won one route each. The first auction significantly reduced the level of subsidies from the level under the single licensee system. The second auction substantially increased subsidies. The "headline" amounts of the subsidy over the contract periods were 1.0 bn NOK, 1.1 bn NOK, and 965 million NOK in the second, third, and fourth auctions respectively, but details—like the increase of 40 million NOK mentioned next and changing requirements on capacity—limit the comparability across auctions. In sum, auctioning has resulted in some entry and possibly lower subsidy.

The contract rules trade off risk-sharing and renegotiation. A carrier can cancel the contract with one year's notice. This shares risk between the concessionaire and the government, which reduces the overall cost of providing the air service. But it facilitates the following strategy: Bid low to win the contract. Gain experience in operating the route, so as to be better informed than rivals. Withdraw from the contract. Bid in the second auction against rivals with neither the specific operating experience nor the necessary aircraft, that is to say, bid high. Indeed, in July 2003 Widerøe announced a withdrawal from two routes. In the auction that followed, Widerøe won against two competitors. In the initial contract for 01.04.03 to 31.03.06, the subsidy for these two routes was 204 million NOK for the three years. In the replacement contract for the shorter period 07.07.04 to 31.03.07, the subsidy totals 246 million NOK.

Longer and staggered contracts may encourage entry. Three years may be too short for an entrant to recoup sunk costs. This problem is exacerbated by interim tenders for yet shorter terms that are held when a carrier cancels the contract. The Norwegian Competition Authority thinks that longer contracts may increase entry and thus increase competition, but notes that this would require a change in the relevant Council Regulation. The Authority also notes that staggering contracts may promote entry by easing the burden on small bidders to meet requirements to show a capacity to serve all routes on which they are bidding.

The auctions are simultaneous first-priced sealed bid. About half of the auctions are to serve city-pairs, many are city-triplets, and four auctions are larger sets—up to eight—of cities. Bids may be conditional, e.g., a bid could state a price for (1) Narvik-Bodø and a bid for (2) Narvik-Bodø if the bidder also won Røst-Bodø. The concessions seem to be designed to try to capture some of the value of serving related towns. One question is whether simultaneous open auctions would enable the auctioneer to capture more of the value of serving complementary routes, second, whether the additional organizational cost would outweigh any gains, and third, whether the switch from sealed to open bidding would discourage entry by weaker bidders or facilitate collusion. The net effect is unclear.

Sources:
OECD (2003), "Regulatory Reform in Norway: Marketisation of Government Services– State-Owned Enterprises"; various Invitations to Tender, Ministry of Transport and Communications (7 July 2005, 10 April 2002, 1 April 2000) and various press releases (Nr.: 135/05 date 02.11.05 "Regionale flyruter: Tildeling av einerett for drift av 16 ruteområde [Regional air routes: Award of sole right to operate on 16 route areas]" Nr.: 20/04 date 05.03.04 "Flyruter i Finnmark og Nord-Troms: Widerøe tildelt kontraktar," Nr. 96/99 Dato: 20.09.99 "Drift av regionale flyruter: Utvida og betre transporttilbod!", Nr.: 97/2002 date 28.08.02 "Ny tildeling av regionale flyruter: Eit godt tilbod for passasjerar og næringsliv i heile landet") on website odin.dep.no/sd; OECD 2004 *Non-Commercial Service Obligations and Liberalization* DAFFE/COMP(2004)19

84. The standard remedy to reduce opportunistic behaviour is to place it in a repeated context. The thinking goes that if a party recognises that it will be punished for opportunistic behaviour in the future, it will not engage in it today.[16] However, the evidence from the Latin American study shows that concessions

16. Following the logical argument forwards in time, opportunistic behaviour can be eliminated. The theory rests on there being no "final" concession or year (or on no given period being sufficiently likely to be the "final" one), on the opportunities for strategic behaviour occurring fairly soon after each other (or the interest rate by which future profits are discounted is fairly low), and the returns from persistent opportunistic behaviour being not too large relative to playing by the rules.

To provide a simple, imaginary example, assume that a widget company "W" often bids to be the operator of municipal widget concessions. Assume that the hundreds of municipalities share their experiences and that the concessions always last for, say, ten years. In 2005, "W" might consider opportunistically renegotiating its contract with municipality "M." But if "W" does that, then the other municipalities will

cannot always be put in a repeated context. When government is likely to change, e.g., by losing an election, then the government can behave opportunistically.[17]

85. Performance bonds and step-in rights can reduce incentives to renegotiate. **Performance bonds** (bank guarantees that indemnify the public party if the private operator fails to fulfil its obligations) are one way to prevent private partners from walking away from a contract, and they limit the bargaining options after the award. In a water concession in Latin America several partners in a consortium walked away from the concession when a dispute with the conceding authorities became unbearable. But key players stayed and tried to make the concession work, not least because of the risk that a large performance bond would be called. (Klein 1998b). The concession was abandoned in 1999. (Guasch p. 63) Nevertheless, Guasch recommends requiring a performance bond of not be less than (a) 2 percent of the total value of the contract and (b) 20 percent of the estimated annual revenue of the concession in its first year. (Guasch, p. 143)

86. **Step-in rights** allow government to take over the operation of a concession when the concessionaire is not performing according to specified standards. These provisions typically identify the breaches of contracts that justify direct intervention by the authorities; they require that the authorities give notice to the private operator; they provide for a cure period, during which the concessionaire is allowed to take remedial actions; and they specify the maximum duration of the authorities' intervention, as well as the type of measures they can adopt. If, at the end of the intervention, the concessionaire is not in a position to resume its activities, the contract can be terminated with cause by the public party. The Côte d'Ivoire–Burkina Faso rail concession has step-in right provisions. It states that if the concessionaire does not maintain adequate safety standards for the maintenance of rail infrastructure, the state holding companies, after having organized a hearing for the concessionaire, can force the concessionaire to adopt necessary measures. If such measures are not adopted, notice must be given to the concessionaire. Fifteen days later, if the concessionaire has remained inactive, the state holding companies can complete the necessary works with risks and expenses borne by the concessionaire.

87. A concession contract can include an **obligation to continue providing service** until a new concessionaire has been chosen**.** This helps governments overcome their reluctance to terminate a concessionaire due to concerns that basic services, such as water supply, may be interrupted. In Colombia this obligation is imposed by a general law governing concessions. (Klein 1998b)

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learn about it. They will suspect that "W" will try the same thing with them, so they will be inclined to disqualify "W" from future auctions. If a sufficiently large number of municipalities do so, then the loss to "W" from no longer having those concessions that it could be expected to have won is larger than any gains "W" makes from its renegotiation with "M."

However, if we now assume that there are few competitors to "W" then the argument above breaks down. If disqualifying "W" meant that only two serious competitors remained, the other municipalities might not disqualify "W." Then "W" will find it profitable to engage in opportunistic renegotiation as just one additional way to exercise its market power.

17. Concern about renegotiation has led to the development of the "least present value of revenues" criterion by Engel, Fischer, and Galetovic (2001). This criterion is renegotiation-proof. Under this regime, the government sets maximum tariffs and a discount rate (fixed or variable). Bidders bid the present value of total revenue to be received, and the lowest bidder wins. Any revenue reduction is automatically compensated by extending the length of the concession. Once the winning LPVR is received, the concession ends. This approach is better used where service quality does not affect the level of demand. The uncertain duration can raise the cost of capital. This model has not been widely adopted.

3.4 Conclusion on allocating concessions

88. To conclude, the allocation of a concession is vital; misallocation is costly and not correctable by selling on the concession. Competitive auctions can identify the most efficient operator. The idea is that the highest bidder will be the person/company who places the highest value on the concession, and that will, on average, be the person who can operate it most efficiently. But poor auction design can thwart this line of reasoning, and sometimes the auctioneer does not desire the most efficient operator. Also, where there are multiple criteria, it may be difficult to identify which bid was "highest." Auctions can be designed to discourage collusion and encourage more bidders, which are important issues in practice.

89. Alternatives to auctions include simultaneous negotiations, sequential negotiations and beauty contests. Auctions will provide a better outcome than simultaneous negotiations, according to economic theory. Negotiations and beauty contests raise issues of perceptions of corruption, arbitrary scoring, and favouritism. But complex contracts necessarily entail some negotiations.

90. Contract renegotiation—beyond that necessary to respond to contingencies in the contract—can eliminate the advantages of competitive auctions. Essentially, the outcome is a bilateral negotiation between the concessionaire and the government. More concessionaires, a contract where the government bears more risk, raising the cost of opening renegotiations and provision for step-in rights or obligation to continue service can discourage the practice, but renegotiation is common.

4. Addressing competition problems arising during the term of concessions

91. Concessionaires usually have significant market power. The coverage and enforcement of the competition law and other, perhaps sector-specific, laws determines the extent to which they may exercise such market power. In addition, the concession contract or the more general concession law may also have specific competition provisions.

4.1 Coverage by the competition law

92. Coverage by a competition law enforced by an independent competition authority helps government commit to not renegotiate certain aspects of the concession. For example, if the competition law has provisions regarding access to essential facilities, the concessionaire needs access to a facility qualifying as "essential," and an independent competition authority actively enforces the competition law, then this helps to commit the government not to extract profits by mandating high access fees and provides a mechanism for relief if it nevertheless does so. Similarly, if the concession contract does not mention the access fees that a concessionaire may charge, an actively enforced competition law may place a cap on access fees. For example, an electricity generating concessionaire might be "held up" by high electricity transmission fees. The abuse of dominance provision in the competition law might limit the hold up.

93. But rather than rely on *ex post* law enforcement alone, it may be better also to reduce the incentives or ability of the concessionaire to engage in anticompetitive behaviour.

94. One important set of circumstances are when the same company operates both an "essential facility" and competes against rivals who need access to that essential facility. For example, a company may both operate a port and use that port, along with its rivals, to compete in the shipping market. Such a firm has the ability and usually has an incentive to discriminate against its un-integrated rivals in a way that reduces consumer welfare and damages competition. In these circumstances, the OECD Recommendation of the Council concerning Structural Separation in Regulated Industries (2001) recommends that its Member countries "should carefully balance the benefits and costs of structural measures against the benefits and costs of behavioural measures." The Recommendation goes on to say that, "This balancing should occur especially in the context of privatisation, liberalisation or regulatory

reform." Applied in the case of concessions, this would mean considering, during the design of the concession, the costs and benefits of prohibiting a concessionaire for a non-competitive activity from engaging in a complementary competitive activity.

95. Another important set of circumstances are when the same company already owns or operates a substitute for the concession, and controlling both would allow it to engage in anticompetitive behaviour. Concessionaires may be able to cumulate concessions in a way to create market power. For example, if there are only a few ports along the same coastline, winning several operating concessions—or even just those for two adjacent ports—could enable a company to raise price or lower output or quality. This reduced competition can be countered by considering, during the design phase, the costs and benefits of prohibiting a concessionaire from holding competing concessions. Against the lost benefits from competition may be weighed economies of scale or scope, to the extent they can be predicted. (The need to design concessions and auctions to allow the exploitation of complementarities was discussed above.)

Box 18. Example of a Competition Authority Screening Bidders, and Application to Telecommunications: Mexico

In Mexico, the concessioning authority is empowered to allocate concessions and oversee their operation. The competition authority (CFC) has powers to issue opinions on the competition aspects of concessions and even auctions. However, such opinions are non-biding.

Further, the regulatory schemes established for the telecommunications sector and for rail transportation contemplate the need for a favourable opinion from the CFC on prospective concession holders, previous to the award of concessions or to authorize the transmission of concession-related rights. In assessing prospective auction participants, the CFC considers the implications of supply conditions and the participants' market power.

In 2001, an affiliate of Telmex asked permission to offer long distance cellular service. The CFC, noting its previous determination that Telmex held a dominant position in the market for long distance services, concluded that permitting the affiliate to expand into that market could only worsen the situation. In the end, the telecoms regulator, COFETEL, decided to recommend approval of the application, but imposed conditions.

Sources: Submission by Mexico to Sixth Global Forum on Competition 2006 and OECD 2004

96. One issue that can arise is the interaction of the competition law with laws more specific to concessions or with the concession contract. For example, care must be taken to ensure that there is no inadvertent weakening of competition law coverage. From an economic point of view, the allocation of a legal monopoly, such as a concession, by the government does not imply that anticompetitive conduct is less harmful. Indeed, legal entry barriers mean that such conduct can be more effective. The 2005 OECD Guiding Principles for Regulatory Quality and Performance says, in particular, "Eliminate sectoral gaps in coverage of competition law, unless evidence suggests that compelling public interests cannot be served in better ways. Competition law enforcement and sector regulation to promote competition and trade liberalisation should be co-ordinated to ensure consistency." This issue was raised in the Zambian port concession, mentioned below. There, the concessionaire claimed exemption from the competition law on the basis that section 3(f) of the Competition and Fair Trading Act exempts all matters to which the government is a party from the application of the law, and that the government was party to the concession agreement. A Supreme Court ruling appeared to imply that the competition law is applicable to the concessionaire. (Sources: Fifth Global Forum on Competition, Zambia DAF/COMP/GF/WD(2005)21 and An Ex-Parte Application for the Grant of Leave to Apply for an Order of Mandamus Directed to the Zambia Privatisation Agency and the Zambia Competition Commission and the Minister of Finance available at http://www.zamlii.ac.zm.)

Box 19: Example of Merger of Concessionaires: Port Terminals in Argentina

In 1994, auctions for long-term concessions (18-25 years) were held for the six terminals at one of the ports of Buenos Aires, Puerto Nuevo. The government imposed conditions on the auctions to create a market structure that could sustain competition: bidders were allowed to bid for more than one terminal, but they had to express a preference and could be awarded only one. But this condition was not complied with. A bidder who bid highest for terminal 2 and second highest for terminal 1 appealed the award of terminal 1 to a rival bidder. To avoid delay as the case wended its way through the court system, the government agreed to allow the bidders to merge and then jointly awarded terminals 1 and 2.
In 2001 the Argentine Antitrust Commission approved the acquisition of terminal 4 by Maersk Sea Land, one of the world's largest shipping companies. The Antitrust Commission found that Maersk would not be able to foreclose the market because terminal 4 had only a small share (8 percent) of the total capacity in Puerto Nuevo and there was a substitute port.

Source: Trujillo, Lourdes and Tomás Serebrisky (2003), "Market Power Ports: A Case Study of Postprivatization Mergers," Note no. 260 Public Policy for the Private Sector, World Bank, March.

97. Competition law enforcement plays an important role to ensure that the legal monopoly (or, in some cases, oligopoly) conferred by a concession does indeed fulfil its intended role of increasing efficiency for the benefit, at least in part, of users.

4.2 Regulation

98. Concessionaires are often subject to price regulation as a means to curb exploitation of significant market power. Exceptions to this general rule—concessioning unregulated monopolies—occur when raising revenue or protecting national champions takes precedence over economic efficiency or consumer welfare, or when regulation is not feasible. Concessionaires may also be subject to access regulation, i.e., to providing access to essential facilities to unintegrated rivals at regulated terms. The regulatory may also include a detailed description of any public service obligations such as the service to be provided, the obligation to supply, equal treatment of users, continuity of service, and so on.

99. Sector-specific laws and the institutions that enforce them can play an important positive or negative role. Regulators can be a faster, less expensive way to resolve access disputes and set tariffs than under the competition law. But of course they need to have positive attributes including professional capabilities, adequate resources, transparency of decision-making, have an appeals process, and independence from those they are regulating. (See the 2005 OECD Guiding Principles for Regulatory Quality and Performance.) For example, if a regulator also has commercial interests—as when one company is a regulator of a sector in which it is commercially active—its decisions will not reflect broader public policy interests.

100. Two types of regulation that are commonly applied are rate-of-return regulation and price-cap regulation. In the first type, the regulator assigns a value to certain assets necessary to perform the regulated services, sets a rate-of-return on those assets—often the market-determined rate-of-return on assets with similar risk characteristics—and sets prices that will allow sufficient revenue to cover both return on capital as well as costs that the regulator allows the concessionaire to pass through. In the second type, price-cap regulation, the regulator sets maximum prices on the services, often with automatic adjustments to account for changes in costs outside the control of the concessionaire and to account for expected feasible improvements in efficiency within the control of the concessionaire, and a pre-set review date. (Variations include setting a maximum price for a basket of services while possibly requiring certain relationship among individual prices, e.g., that the retail price for a service be at least a specified amount more expensive than wholesale access to facilities to provide the same service.) Rate of return regulation is

seen as less risky, for the concessionaire, than price-cap regulation since, under the former type of regulation, the regulator should adjust prices to reflect cost changes and it does not under the latter type.[18]

101. Access regulation can be necessary when the concessionaire is permitted to also supply a vertically related market. In particular, the concessionaire may try to evade regulation of the natural monopoly by discriminating in favour of its own vertically integrated business, capturing unregulated profits in the vertically related market. Prohibiting vertical integration might be a solution, but at a potential cost of economies of scope. Further, the most efficient bidder may be a long established operator in the vertically related market—a mine with respect to a railway or a shipper with respect to a port, for example— who has particular insight into potential improvements in quality and efficiency, and excluding such a bidder would reduce overall efficiency. Further, where there are successive monopolists, such as a port and the sole railway to that port, it may be more efficient to put the two activities into the same concession. This raises barriers to entry, since now an entrant would need to enter both levels simultaneously, but this may have no practical impact—if entry were likely there would be no need for concessioning—and the vertical integration should reduce hold-up and inefficiencies from uncoordinated investments, schedules, and the like.

Box 20. Example of Abuse of Dominance in Access: Mpulungu Harbour

A 25-year concession to operate Mpulungu Harbour and Port in Zambia was granted by the Zambian cabinet in 1997. The concession agreement provides for review every 5 years, but anti-competitive conduct was not a ground under which it may be terminated.

In addition to being the port operator, the concessionaire is also the largest of seven shipping companies that use the port. Based on tonnage, its share is about 50% of the total. There are no feasible transport alternatives.

The Concession Agreement provides that the concessionaire has complete pricing freedom, but must provide access on the same terms as it does provides access to itself. While in principle the port is regulated by a ministry, the Supreme Court found that, "There has been no coherent exercise of supervisory power" by the ministry.

Investigations carried out by the Zambia Competition Commission revealed that the concessionaire was abusing his position as Port Operator by engaging in various conduct that harmed its rivals in the shipping market. The concessionaire was found to be unfairly allocating shipping space on the vessels using the port, unfairly dictating the type of cargo to be loaded—which has the effect of eliminating competition in lucrative markets for products in high demand—reserving port storage for his exclusive use, and engaging in other conduct. Also, two weeks after taking over the Port, the concessionaire increased tariffs by 46% without consultations and without notice.

The ZCC pursued voluntary compliance with the competition law.
Source: Fifth Global Forum on Competition, Zambia DAF/COMP/GF/WD(2005)21

18. But the two main types of regulation may not be as different as they appear at first glance. A well-known observation is that the expected return on capital under the two regimes should differ by a risk premium. The return on capital under price-cap regulation is influenced by two mechanisms. First, investments under price-cap regulation need to earn at least a market rate to attract future investment. Second, governments face political questions when regulated firms earn much more than a market rate. These two influences mean that the return on capital under a price-cap regulation approaches that under a rate-of-return regime, plus a risk premium. As more cost elements are moved into a cost-pass through category under a price-cap regime, it approaches a rate-of-return regime. Similarly, as the review periods under a price-cap regime become shorter, it approaches a rate-of-return regime.

5. Design of concessions

102. The design of a concession is constrained by the elements that have been discussed in connection with the award of the concession and the competition problems that can arise during the concession. This section will highlight some of the features that can be identified in advance and in general.

103. However, no checklist can be complete. A difficulty of concessioning is that each situation is different. The idiosyncratic physical, historical or political constraints must be taken into account. Vast underinvestment may mean continued substantial subsidies if tariffs are not to rise too rapidly for users' budgetary comfort and it can mean an embarrassingly low "headline" concession fee. Political commitment to preserve jobs can mean that the concession must include provisions to that effect even if it makes the award process inefficient. A second political difficulty can be pressure to design a concession to get a large concession fee, sometimes by unwarranted exclusivity or duration, or by an overly-generous regulatory regime. With these caveats in mind, the following points should be considered in the design of a concession.

- **Number.** Where competition is feasible, as in some telecommunications markets, in general more concessions will promote competition. True, more concessions will mean lower "headline" concession fees, and it can be difficult to explain that a lower fee today but lower tariffs tomorrow benefits consumer-taxpayers. If the number of likely bidders seems unusually low, then a re-examination of the auction rules and the concession design may be in order; efficient potential operators may be discouraged by poor design.

- **Exclusivity**. There are trade-offs involved in granting a unique concessionaire protection from entry by competitors. Non-exclusivity can allow competitive pressure from entrants, especially if the market were incorrectly labelled a natural monopoly or ceases to be one due to technological change. But exclusivity can be necessary if e.g., public service obligations are paid by cross-subsidy rather than from other sources. Exclusivity can also decrease the riskiness of a concession, with a follow-on effect on renegotiation and cost of capital.

- **Duration.** There is a trade-off when determining the duration of a concession. Long concessions create appropriate incentives for the concessionaire to make long-term investments including to invest in maintenance near the beginning of the concession. Short concessions exacerbate the problem of insufficient incentives to make investments near the end of a concession, as well as the problem of incumbents gaining advantages over other bidders in successive concessions. However, short concession allow for more frequent competitive tendering, which can facilitate entry and ensure that any benefits of increased competition are reflected more promptly. Short concessions also allow for uncertainty to be borne by the government rather than the concessionaires, which in general reduces the subsidies or increases the fees gained.

- **Horizontal scope.** Where a concession may have various breadths—one license or several to provide the same service, one port or several along the same coastline—and they are substitutes, then it would promote competition in the market to have different concessionaires in charge of substitute facilities. And having different concessionaires would promote competition for the markets if it reduced the cost of bidding. This may need to be traded off against economies of scale or scope, however. Where a concession could be broken in to parts that may be complements, such as telecommunications licences in over adjacent regions, then consideration should be given to whether fiat—the government defining the scope of the concessions—or market—auctions that allow bidders to price the complements—is likely to yield the more efficient outcome.

- **Vertical scope.** If competition up- or downstream is feasible, economies of scope are small, and effective access regulation is difficult, it may be more efficient to prohibit the concessionaire to also operate in the vertically related market. But this must be weighed against the effect this has on bidders for the concession, since the most efficient bidder may well be a company that has long operated in a vertically related market and has particular insight into potential improvements in quality and efficiency.

- Further, where there are **economies of scope** between activities where competition is not feasible, e.g., a port and the sole railway to that port, it may be more efficient to put the two activities into the same concession. This should reduce hold-up and inefficiencies from uncoordinated investments, schedules, and the like.

- **Competition Law.** The competition law should apply to the concession award process and to the concessionaire, as it does throughout an economy.

- **Regulatory structure**. An appropriate regulatory structure and agency should be in place in advance of the concession award in order to reduce uncertainty faced by potential concessionaires. Elements that can affect profitability such as universal service requirements, restrictions on increases in user tariffs, special "social" tariffs need to be specified, or the objective formula for their calculation, should be specified in advance so that potential concessionaires can calculate any bid or negotiation strategy. The agency should have sufficient autonomy and implementation capacity to ensure high-quality enforcement and to deter political opportunism. In addition, the tradeoffs between price-cap and rate-of-return regulation, including their different allocation of risk, should be considered.

- **Allocation mechanism.** The concession design must also take into account the allocation mechanism. For example, if an auction is to be used to award the concession, then all the dimensions over which competition will not take place must be specified or otherwise prepared for, in order to reduce the scope for renegotiation. If an auction is not to be used, then the pre-design stage is even more important to avoid the appearance of favouritism or corruption in the choice of concessionaire. If the exclusion of a potential bidder is permissible, weigh carefully the consequences of such exclusion, bearing in mind the effect on subsequent market power and on the competitiveness of the auction—both directly and on the decision of weaker bidders whether to bid.

- **Disputes**[19]. Contracts should avoid ambiguity as much as possible. They should define the treatment of assets, evaluation of investments, outcome indicators, procedures and guidelines to adjust and review tariffs. They should include criteria and penalties for early termination, procedures for resolution of conflicts, and well-defined triggers for renegotiation. Consider imposing a significant fee for any renegotiation request, reimbursed if the renegotiation is decided in the operator's favour. Renegotiation should be as transparent as possible, perhaps using external, professional panels to assist regulators and governments in their analysis and decision-making, and with a timely, full public explanation of adjustments.

- Proper **regulatory accounting** of all assets and liabilities should be in place in order to reduce ambiguity about the regulatory treatment and allocation of cost, investments, asset base, revenues, transactions with related parties, management fees, and operational and financial variables.

19. Much of the material in this and the following bullet points is from Guasch, pp. 19-21.

- **Changes**. Bidders should be held to their submitted bids. The first tariffs review should be held only after a significant period, like five years, unless contract contingencies are triggered. Concession contracts should provide for significant compensation, including penalties, to concessionaires if government unilaterally changes the contract.

6. Conclusions

104. Competition authorities have important roles to play at a number of stages in concessioning.

- First, concessions are often awarded in the context of a broader regulatory reform of a sector. Such a reform often includes clarifying the service objectives and revenue sources, thereby uncovering cross subsidies that must be addressed in the concession design. Reform also often includes addressing how the sector will be governed during the long period after the concession has been awarded: where competition would be feasible and desirable, what sector-specific laws and regulatory institutions need to be established, and the application of competition law. Competition authorities can advocate for pro-efficiency and pro-competition regulatory reform at this stage.

- Second, competition authorities can advocate for more competitive design of the concession contract. They can identify provisions to encourage weaker bidders or discourage renegotiation, for example.

- Third, they can advocate for better design of the allocation mechanism. If concessions are allocated by auction, they can identify provisions to encourage more bidders and to discourage collusion. If not allocated by auction, they can promote a mechanism that would tend toward identifying the more efficient applicant.

- Fourth and fifth, during the auction and afterwards, during the term of the concession, they have a role to play as competition law enforcers to deter or prosecute collusion during auctions and to ensure that concessionaires do not abuse their dominance. During the allocation process, they should have a role to exclude from bidding those companies who would gain significant market power if they were awarded the concession.

105. Competitive auctions are more likely to yield the most efficient provider and raise the most funds, all other things equal, under many conditions. But poor design undermines their effectiveness, and renegotiation eliminates their advantages.

106. Renegotiation may have its origins in the incompleteness of concession contracts or in opportunism. Concession contracts are necessarily incomplete because uncertainty about costs and revenues over decades cannot be entirely resolved in advance. Concessions present commitment problems since large sunk investments must be recovered over long periods, on the one hand, and governments are under pressure to maintain or improve services, on the other hand. However, renegotiation, whether due to contract incompleteness or opportunism, can eliminate the benefits of competitive bidding for concessions; essentially, with renegotiation, the winner of an auction will be the best negotiator, not the best infrastructure operator. In sum, both an efficient allocation mechanism—such as a well-designed auction—and institutional arrangements to ensure credible commitment to the resulting contract are necessary.

107. The competition issues that may arise during the term of a concession are not fundamentally different due to the presence of a concessionaire rather than an asset owner. They may include exclusion of rivals by denying access to facilities and abusive pricing. Effective enforcement of the competition law promotes concessions that fulfil their objectives both as regards efficiency and the tariffs users must pay.

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