A literature review of the use of auctions in the fishery sector

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Outline

- Introduction
- Auction theory
- Auctions used in fisheries
- Perspectives for future work

Introduction-Why auctions?

- Focus in fishing management has been on cost reduction. Now, it could be on earnings improvement, because of a possible limit of cost reduction.
- Auctions on fishing rights, secures an efficient fishing fleet and that the seller gets the ressource rent, for instance the government. So far allocation on fishing rights has been based on historic, and can be characterized as a kind of ”grand fathering”. In Denmark the current regulation runs until 2014, could auctions on fishing rights be it’s replacement?

Introduction-Hypotheses

1. The RET can't be applied in practice. In practice a revenue maximizing auctiondesign depends on the context.
2. Fish auctions gives higher prices for the fish to the fishermen, than long term contracts
3. Auctions on fishing rights gives the seller the entire ressource rent. And in the example of government-owned rights, it gives the society the resource rent and not the fishermen.
4. Auctioning fishing rights secure that those fishermen or fishing enterprices with the highest valution gets the rights.
5. Auctions on fishing rights provides a more efficient fishing fleet.

Introduction-Areas where auctions are used, and could be used

✓ Fish auctions, price setting fish, max. fishermens earnings, ex. Denmark
✓ Auction over fishing rights, allocation of TAC, max. sellers/government revenue, other fishery specific goals. A more market orientated fishing policy secures a more flexible and a efficient fleet.

- Seadays, kilowattdays, etc.

Auction theory

1. The four standard types of auctions: A) English, B) Dutch, C) 1. price sealed bid auction, D) 2. price sealed bid auction. (Phlips, 1988)

A. English: Auctioneer starts at a low price → competing buyers bid up the price break → auction ends when one buyer is back → final price is the remaining buyers last bid.

B. Dutch: Auctioneer starts at a high price → then lower the price until the first of competing buyers accept the auction bid

C. 1. price sealed bid auction: Potential place their bid in a closed envelope → Whoever has the highest bid wins and pays the price he has bid.

D. 2. price sealed bid auction: Potential place their bid in a closed envelope → Whoever has the highest bid wins and pays an amount equal to the second highest bid for the goods

Auction Theory-Two models and a hybrid

- Private value model: Every buyers valuation is private information of the buyer himself
- Common value model: The real value of the goods, are the same for all competing buyers, but buyers have different private information about what this value is. (Klemperer,1999)

- ”almost” common value model: Fish and fishing rights must be characterized as ”almost” common value goods → They are only ”almost”, because the true value can be marginally different from buyer to buyer (Klemperer, 1998) (Armstrong 2000)

Auction Theory-Revenue Equivalence Theorem (RET)

Assume each of n risk-neutral potential buyers has a privately known value independently drawn from a common distribution F(v) that is strictly increasing and atomless on . Suppose that no buyer wants more than k available identical indivisible objects. Then any auction mechanism in which (i) the objects always goes to the k buyers with the highest values, and (ii) any bidder with value expects zero surplus, yields the same expected revenue, and results in a buyer with value v making the same expected payment. (Klemperer 2004, 42)

In other words, the RET says no matter which of the four standard auction types are used, then it will produce the same output, given that the assumptions of the RET holds. The conclusion is the same in the "almost" common-value case.

- Assumptions:

a) A single seller with reservation value faces *n* potential buyers, where buyer *i* holds reservation value , *i* = 1,…..,*n.*
b) The reservation values of the parties are independent and identically distributed, drawn from the common distribution with , and strictly increasing and differentiable over the interval ,.
c) The agents are risk-neutral. (Riley et al 1981)

Auctions used in fisheries-Fish auctions

Armstrong (2000) relaxes some of the RET-assumptions:

- *Risk neutrality:* If risk-aversion among buyers, then the 1.price sealed bid auction gives the highest prices, because it takes advantage of the risk-averse buyers fear of losing the auction, opposite in the English auction where the buyers can observe each others bids (Riley 1989). However Armstrong (2000) claims that risk-averse buyers is not a problem, especially in the major fisheries, due to large catches and short time between the auctions. Therefore the RET seems to hold.
- *Independent private values:* Fish buyers seems to have common values rather than private values, because of two reasons. a) Processors who bid don't know what price they will get for the final processed fish. b) Traders do also buy the fish. According to Armstrong (2000) common value does not violate RET. *Affiliated values*: If one bidder believes that the value of the item(fish) for sale has certain value then the other bidders has a high degree pobability to believe the same. → English auction is preferable, gives information about the bidders to the bidders → weakens winners curse and leading to more aggressive bids → higher prices (Armstrong 2000)

Auctions used in fisheries-Fish auctions

- *Symmetry:* Asymmetry is defined as observable differences between bidders. Asymmetry is not an issue in fish auctions, why? Each item or species/quality of fish for sale are directed to specific costumers who are very much alike.Therefore no auction mechanism are preferred over another → RET still holds.
- *Conclusion:* The RET do not hold in all circumstances, therefore what really matters in good auction design are the conditions in which the auction takes place (Kaplan 2000). In other words, what really matters is economic theory about problems on entry, collusion and predatory behavior.
- *Netauctions:* Guillotrau et al (2004) → no arguments for achieving higher prices than in a normal auction, neither does empirical evidence exist.
- *Test of which mechanism gives the highest prices:* Perez Agundez et al (1999) wants to test whether there exist interactions between French auction market prices for hake. If interaction, then in the long, prices will move together. The investigation methods that they uses are co-integration and multivariate techniques (factorioal and cluster analysis). → the result is diverse dependend of the invetigation method.

Auctions used in fisheries-Fish auctions

Do fish auctions give higher prices than long term-contracts: According to Matthiasson et al (2000) then yes. Trondsen (2002) explains why. Contract-sale meets less demand. The product attributes in the catch that do not fit the purchaser specialization profile will, meet less demand. One could also explain this phenomenon with; risk averse buyers has less risk in auctions and thereby willing to pay more. In a contract the buyers risk, is to buy the fish at higher price than future market prices.

Auctions used in fisheries-auctions on fishing rights

Auctionmechanism offers two signifikant advantages:

- The process is efficient, it identifies the market demand and appropiate ”price” for quotas.
- The process identifies those potentiel users of the resource(fishing rights) with the highest valuation (Morgan 1995) → leads to a efficient fishing fleet.

An auction can lead to distributional changes, if capital-imperfections exist.→ Solution, set aside a proportion of the quotas only to the designated bidders. → Justification, if bidders willingness to pay does not reflect social value, for instance this could happen as an impact of the pioneering efforts of the existing fishermen (Morgan 1995)

The design of the auction depends on the context. So to maximize sellers revenue one has to look into issues such as collusion, entry and predatory behavior (Morgan 1995)

Auctions used in fisheries-auctions on fishing rights

Size of quotas, matching the fleet capacity: A rapid change in fleet capacity in response to changes in quotas is not practical. → Simultanious auction of quota units is preferred, in achieving a match between quota and fleet capacity. Such auctions with multiple rounds of sealed bids, allows bidders to use all information revealee during the auction process and then makes it more easy to construct unit aggregations to match capacity. This assumes that TAC for the fishery in question has first been divided into a number of quota units, which size reflects the incremental quota. → the size of the quota unit to be auctioned will therefore be specific to the fishery in question (Morgan 1995)

Reserve price: Increase revenue by shifting a part of risk to regulatory authority. It also stimulate bidding competition. → It reduce post-auction investment, since the owner only retains a part of the revenue generated by the quota. → Tradeoff between the policy objectives of maximizing revenue and providinjg incentives/disincentives for post-auction investment in the fishery (Morgan 1995).

Auctions used in fisheries-auctions on fishing rights

Motivation for market orientation: Value adding has two sources, a) Increasing the value of catch by improving market orientation in supply of quality and time b) reducing the cost of catch and production (Trondsen 2002)

Time limited individual quotas (ISQ) versus ITQ's: Exchange quotas will generate a price-actually ressource rent that fishers are willign to pay to the quota owners. Flaws of a free market auction over TAC could for instance be that social cost may be higher than what is political acceptable. ISQ may fit into fishers planning horizon, while uncertainties characterize fisheries. ISQ could also atttract some new entrants, requires less capital than ITQ → raises the auction revenue. Flaws of ISQ, the risk of "deep pockets" → less future competition. This bevavior is ceteris paribus higher in ITQ than ISQ. Another benefit of ISQ, is its skill to collect the resource rent. In ITQ the entire ressource rent is difficult to collect, because its difficult to secure future prognoses of quota value. ITQ and its secondary market do not give resouce rent to the society, but the fishermen (Trondsen 2002).

Perspective and conclusion

Perspective for future work:

- Comparing different ports/auction mechanisms and their pricesetting ability, using different techniques. Welfare impacts on higher prices to the fishermen → effect on consumer prices.
- How to design auctions allocation ITQ's/ISQ's and maximizing revenue and extract the ressource rent. Can auctions provide a more efficient fleet (DEA, SFA) and secure that those with highest valuation gets the quotas. How could this idea be promoted to the fishermen, perhaps through redistribution of the revenue to the fishermen or rural areas?
- In general, more empirical work is needed.

Conclusion:

- The RET can't be applied in practice.
- Fish auctions gives higher prices for the fish to the fishermen, than long term contracts
- Auctions on fishing rights gives, if the auction design is correct, the seller the ressource rent. Provides a more efficient fishing fleet. At least in theory.