Written Exam for the M.Sc. in Economics summer 2014

Auctions

Re-examination

August 18, 2014

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

This exam question consists of 5 pages in total including this page.

This exam contains 4 exercises. For each of the exercises, the indicative weighting of the exercise in the grading of the exam is listed in parenthesis.

Exercise 1: True or false statements (20%)

State whether each of the following 3 statements are true or false and give a short explanation.

Question 1a: Statement: A lottery is an example of a standard auction

Question 1b: Statement: You should expect more last-minute bidding (sniping) in an eBay auction for antiques than for computers

Question 1c: Suppose 3 objects are being sold in a uniform price auction with 10 bidders.

Statement: Each bidder will submit a demand curve below his true demand curve for all 3 objects.

Exercise 2: Blueland (30%)

The small country Blueland has recently discovered a large presence of valuable minerals in its subsoil. The government is now interested in auctioning off the right to mine for minerals to 1 of 10 interested mining companies. In order to determine the amount of minerals that are in the underground, the minister for raw materials has suggested that one mining company, Berlin Mining, should carry out some excavations and publish an excavation report that estimates the amount and type of minerals in the subsoil.

Question 2a: Comment on which auction formats would be most suitable with this approach

After a mining company complained over the approach, the government has chosen another approach. The government has decided to engage an independent consulting company to produce a thorough excavation report for the government. The government is now contemplating whether it should publish the results of the excavation report.

Question 2b: Discuss whether the government should publish the excavation report.

It turns out that there are 5 fields with equal expected presence of valuable minerals. The fields will be sold through 5 sequential first-price sealed-bid auctions. However, some economists in the Ministry of Raw Materials are concerned that the sequential first-price auctions will not allocate the rights efficiently and 5 sequential second-price sealed-bid auctions would be a better option.

Question 2c: Discuss their concerns

Exercise 3: Multiple object auctions (15%)

In a multiple object auction, a seller has put 8 objects for sale. Four bidders with limited demand of 5 have participated in the auction and submitted the following bids:

	Bidder 1	**Bidder 2**	**Bidder 3**	**Bidder 4**
Bid 1	85	86	87	95
Bid 2	82	35	54	55
Bid 3	76	29	37	31
Bid 4	20	29	35	30
Bid 5	19	2	6	13
Bid 6	0	0	0	0
Bid 7	0	0	0	0
Bid 8	0	0	0	0

Question 3a: Determine the winners and calculate their prices in a uniform price auction

Question 3b: Determine the winners and calculate their prices in a Vickrey auction

Exercise 4: An auction for a house (35%)

A retired couple wishes to travel around the world, and in order to finance their trip they want to sell their large house by a lake outside Copenhagen. There are three bidders with private values independently and identically distributed according to a uniform distribution on [0,8], where 8 can be interpreted as 8,000,000 DKK. The realtor from the real estate company proposes to sell the house in a second-price sealed-bid auction.

Question 4a: Show that it is a weakly dominant strategy for each bidder to bid his valuation, i.e. show mathematically that $\beta^{II}(x_i) = x_i$

The old couple is worried the house might not bring in enough money through the proposed second-price auction. In fact, they feel it is a weird way of determining the price and quite a gamble. Consequently, the realtor proposes to change the auction format and sell the house in a first-price sealed-bid auction.

Question 4b: Show that the symmetric equilibrium is $\beta^{I}(x_i) = \frac{2}{3}x_i$

Question 4c: Show that the expected payment of a bidder is $m^{I}(x_i) = \frac{1}{96} * x_i^3$

Question 4d: Show that the expected ex-ante payment of a bidder is $E[m^{I}(x_i)] = \frac{4}{3}$

Question 4e: What is the expected revenue of the auction?