

Auction Theory and its Applications (EC 543)

M.A. Optional Course

Number of Credits: 4

Mode of evaluation: There will be one mid semester examination and one end semester examination of equal weightage.

Overview

Some of the most exciting of the recent advances in microeconomic theory have been in the modelling of strategic behaviour under asymmetric information. One part of this broad research programme is the theory of bidding mechanisms or auctions.

Auction Theory is an incredibly active field with many applications. It is important for both theoretical and practical reasons. On the theoretical side, the study of auctions provides one way of approaching the question of price formation. The theoretical results in auction theory can explain the existence of certain trading institutions, and perhaps can even suggest improvements in the existing institutions. Lessons from auction theory have led to important insights in many areas within economics. On the practical side, it may be noted that auctions are of considerable empirical significance. A huge volume of economic transactions is conducted through auctions. Governments use auctions to sell treasury bills, foreign exchange, mineral rights including oil fields, and other assets such as firms to be privatised. Government contracts are typically awarded by procurement auctions, and firms buying inputs or subcontracting work often use procurement auctions. Other economic transactions, for example takeover battles, are auctions in effect if not in name. The theory of auctions is closer to applications than is most of frontier mathematical economics.

The purpose of this course is to introduce the modern game theoretic literature on auctions. A large part of the course will deal with theoretical models. However, we will also discuss a few real world applications of auction theory. Some basic knowledge of game theory and a willingness to deal with technical issues are the main prerequisites for this course.

Brief Course Outline

1. Introduction to basic auction forms, private and common values.
2. Private values auctions: the symmetric, independent, private value auction with risk neutrality, the revenue equivalence theorem
3. Extension of the basic model: risk averse bidders, budget constraints, asymmetries among bidders, revenue and efficiency comparison with asymmetry, resale and efficiency

4. The analysis of optimal auctions: mechanism design, the revelation principle, optimal mechanisms
5. Auctions with interdependent values: introduction, common value auctions, winner's curse, affiliation, revenue and efficiency comparisons across different auction forms.
6. Collusion in auctions: bidding rings and efficient collusion.
7. Multiple object auctions: introduction, analysis of discriminatory and uniform-price auctions, discussion of US treasury bills auctions.
8. Practical auction designs: The FCC spectrum auctions in USA, the European 3G auctions, lessons from such experiences.

Readings

A. Books

1. Vijay Krishna (2010) "Auction Theory" (2nd edition) Academic Press, New York, USA.
2. Paul Milgrom (2004) "Putting auction theory to work" Cambridge University Press, Cambridge, U.K.
3. Paul Klemperer (2000) ed. "The economic theory of auctions" vol. I and II, Edward Elgar, Cheltenham, U.K.

All journal articles will be referred to from time to time during the lectures.