Sequential information disclosure in auctions ☆

Dirk Bergemann [a,*], Achim Wambach [b]

[a] *Department of Economics, Yale University, New Haven, CT 06520, USA*
[b] *Department of Economics, University of Cologne, Cologne, Germany*

Abstract

We propose a sequential auction mechanism for a single object in which the seller jointly determines the allocation and the disclosure policy. A sequential disclosure rule is shown to implement an ascending price auction in which each losing bidder learns his true valuation, but the winning bidder's information is truncated from below. As the auction ends, the winning bidder only has limited information, namely that his valuation is sufficiently high to win the auction. The sequential mechanism implements the allocation of the handicap auction of Eső and Szentes (2007) but strengthens the participation constraints of the bidders from interim to posterior constraints. Due to the limited disclosure of information, the participation constraints (and incentive constraints) of all the bidders are satisfied with respect to all information revealed by the mechanism. In the special case in which the bidders have no private information initially, the seller can extract the entire surplus.
© 2014 Elsevier Inc. All rights reserved.

* Corresponding author.
E-mail addresses: dirk.bergemann@yale.edu (D. Bergemann), wambach@wiso.uni-koeln.de (A. Wambach).

1. Introduction

1.1. Motivation

We propose a sequential auction mechanism for a single object and a finite number of bidders with independent private values. Importantly, the design of the mechanism encompasses the *joint* determination of the allocation of the object *and* the disclosure of the private information.

The present analysis is motivated by the observation that in many instances the seller of an object has considerable control over the information that the buyers have when bidding for the object under consideration. In fact, in some auctions, the seller intentionally limits the amount of information regarding the object sold to such an extent that they are commonly referred to as "blind auctions", see for example Kenney and Klein (1983) and Blumenthal (1988) for the licensing of motion pictures and Kavajecz and Keim (2005) for trading of large asset portfolios.

Interestingly, the relevant information is frequently disclosed sequentially *and* systematically linked to the bidding mechanism. In an auction practice referred to as indicative bidding, the seller (or an agent of the seller) initially invites "indicative" bids on the basis of a prospectus with a limited description of the asset and subsequently grants access to additional and more precise information only on the basis of sufficiently strong interest as expressed in the early rounds of bidding, see Ye (2007) or Boone and Goeree (2009). Similarly, in procurement auctions, in the "request for quote" process the buyer initially provides limited information about the project to the potential suppliers, which hand in a quote. On the basis of this first stage of the process, selected suppliers are invited who obtain further, more detailed information. In this procedure the improved specification of the project goes in parallel with negotiations of prices and conditions. The number of potential suppliers is reduced over time, until the winner is determined. Thus, in this sequential procedure suppliers learn more about the specification (and therefore about their costs) and only those able to compete further remain in the bidding process, see Beil and Wein (2003).

Here, we shall investigate the nature of a sequential mechanism in which the seller can jointly determine the allocation and the disclosure rule. Importantly, we shall explicitly allow for sequential disclosure rules, i.e. disclosure rules which depend on the current (and past) bids, and hence in a direct mechanism on the current (and past) disclosed information. The sequential mechanism that we consider implements the allocation of the handicap auction of Eső and Szentes (2007). Beyond the implementation, the proposed mechanism strengthens the participations constraints of the bidders from *interim* to *posterior* constraints. The sequential disclosure rule has the feature that each losing bidder learns his true valuation, but the winning bidder's information is truncated from below. As the auction ends, the winning bidder only has limited information, namely that his valuation is sufficiently high to win the auction. Due to the limited disclosure of information, the participation constraints (and the incentive constraints) of all the bidders are satisfied with respect to all information revealed by the mechanism, hence posterior constraints in the sense of Green and Laffont (1987).

The interaction between the bidding and the disclosure process can be described within an ascending auction format, say in the form of the Japanese button auction, in which the asking price is raised continuously over time, see Cassady (1967). At each point in time and associated current price, each bidder has to make a decision as to whether he is staying in the auction or exiting the auction, i.e. whether he continues to press the button or whether he releases the button. Suppose for the moment, that initially each bidder would only know the common prior