

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Journal of Environmental Economics and Management

journal homepage: www.elsevier.com/locate/jeem

Buybacks with costly participation



Jorge Holzer^{a,*}, Geret DePiper^b, Douglas Lipton^c

^a Department of Agricultural and Resource Economics, University of Maryland, 2200 Symons Hall, College Park, MD 20742 USA

^b NOAA Fisheries, Northeast Fisheries Science Center, 166 Water Street, MB 19, Woods Hole, MA 02543, USA

^c NOAA Fisheries, 1315 East West Highway, Silver Spring, MD 20910, USA

ARTICLE INFO

Article history:

Received in revised form

21 June 2016

Available online 4 May 2017

JEL:

D40

D44

D45

Q22

Keywords:

Auction

Buyback

Fishery

Lottery

Participation

ABSTRACT

Posted price offers and first price auctions, along with the multi-unit discriminatory auction extension, are two widely used mechanisms for allocating conservation contracts. The choice between the two typically hinges on the trade-off between the posted price's simplicity and the potential revenue gains of the auction. In this paper we introduce a novel mechanism that attempts to bridge the gap between the performance of posted price offers and auctions. A two-price and lottery schedule combines the simplicity of the former with some of the flexibility of the latter. Using a model that incorporates agents' cognitive and information costs of bidding, we analyze how the ranking of allocative efficiency and cost-effectiveness between the mechanisms varies as the wedge of participation costs increases. When the number of bidders is endogenously determined by participation costs, bid shading associated with a lack of competition in the auction compromises its cost-effectiveness vis-à-vis the posted price and the lottery schedule. We use data from three recent buybacks for fishing licenses conducted in Maryland to calibrate our model and identify conditions under which the two-price schedule outperforms the other mechanisms.

© 2017 Elsevier Inc. All rights reserved.

Introduction

Market based policy instruments continue to see increased interest and utilization in environmental and conservation applications (Pattanayak et al., 2010; Woodward, 2010). Challenges remain in bridging the theoretical performance of these created markets with performance in practical settings (Hahn and Stavins, 1992; Newell and Stavins, 2003; Jack et al., 2008). The performance of different auction mechanisms, in particular, have been the subject of much research. Two mechanisms commonly used in a wide variety of conservation markets are posted price offers and first price auctions, along with the multi-unit pay as bid extension. These markets appear in a number of different contexts including the sale of mineral resource extraction rights (e.g. Hendricks and Porter, 1988; Rothkopf et al., 1990; Porter, 1995; Cramton, 2007; Li and Zhang, 2010; Matoso and Rezende, 2014), water use rights (Simon, 1998; Cummings et al., 2004), renewable resource harvesting such as timber (e.g. Paarsch, 1997; Haile, 2001; Li and Zhang, 2010) and fish (e.g. Schelle and Muse, 1984; Curtis and Squires, 2007), contracts for adoption of conservation-related land use practices (e.g. Cason and Gangadharan, 2004; Latacz-Lohmann and Schilizzi, 2005; Horowitz et al., 2009; Jack, 2013) and endangered species habitat protections (e.g. Langpap, 2004). Alternative designs such as uniform-price and Vickrey auctions are less frequent, as they are vulnerable to collusion,

* Corresponding author.

E-mail addresses: jholzer@umd.edu (J. Holzer), geret.depiper@noaa.gov (G. DePiper), douglas.lipton@noaa.gov (D. Lipton).

bidder fear of auctioneer cheating, and bidder resistance to truth-revealing strategies (see Rothkopf et al., 1990 and Klemperer, 2002).

The persistent use of posted price offers is puzzling at a time when auctions have become enormously popular in other sectors of the economy. If discriminatory pricing generates higher expected revenues for the seller of user rights (or, conversely, allows the acquisition of harvesters rights at minimum cost), why would anyone name a single price? The auctions literature is replete with potential pitfalls in auction design and implementation that may explain the persistence of posted price offers, with a non-exhaustive list including collusion and other market manipulation, participation costs, the winner's curse, regret, moral hazard, adverse selection, equity, the impact of secondary markets, and optimal reserve price selection. Latacz-Lohmann and Schilizzi (2005) state "...an auction is a complex incentive mechanism, involving a higher risk of failure than a simple fixed-rate payment."

Several papers have investigated the impact that higher participation costs in single-object auctions relative to posted offers has on optimal mechanism selection (Wang, 1993; Hobbs, 1997; Wang et al., 2008; Wei and Lin, 2013). A lesson from this literature is that an increase in bidders' participation costs can reduce the seller's revenue under the auction. Costly information acquisition on the part of bidders is a specific subset of participation costs that has important ramifications for the theoretical efficiency of auction mechanisms (see for example Matthews, 1984; Larson and Sandholm, 2001; Bergemann and Välimäki, 2002; Jackson, 2003; Crémer et al., 2009). Additionally, deviations from the theoretical predictions of auction outcomes have been linked to bounded rationality and the cognitive costs of deriving an optimal bidding strategy in both the laboratory (Smith and Walker, 1993) and field (List and Lucking-Reiley, 2002). Transaction costs have consistently been identified as a critical issue in the success of conservation programs, with examples including the performance of water markets (e.g. Woodward et al., 2002), nonpoint pollution abatement programs (e.g. McCann and Easter, 1999) and fishery management (e.g. Abdullah et al., 1998). Recent examples have extended this general finding to include auctions for pollution abatement (Palm-Forster et al., 2016; Peterson et al., 2015) and fisheries buybacks (DePiper, 2015). By limiting competition in the market and inducing higher bid shading (Cao and Tian, 2010 and Carpenter et al., 2010), participation costs may undermine any revenue (cost) advantages of running an auction. Examples abound.¹

In these circumstances, a posted price offer is often seen as a "safe" alternative for allocating usage rights. However, underlying posted price offers is a great informational burden for the buyer. Naming the right price is critical to clearing the market and is no small feat. Offering too low a price means that the quantity of the good purchased will fall short of the buyer's goals. Conversely, offering too high a price induces a surplus supply of the good. A mechanism is then necessary to select "winners" from the pool of willing sellers. In both cases, pricing mistakes lead to fewer items being purchased than if the market clearing price was offered.

In sum, the choice between the two mechanisms hinges on the trade-off between the posted price's simplicity and the potential revenue gains of the auction. This trade-off can be cast in terms of whether the computational costs are more easily absorbed by the buyer, in which case the posted price becomes appealing, or by the seller, which suggests that the auction is the preferred mechanism. In this paper we investigate a unique design that attempts to bridge the gap between the performance of posted price offers and auctions in the presence of participation costs. In particular, we outline a two-price and lottery format that combines the simplicity of the posted price offer with some of the flexibility of an auction.

We examine allocative efficiency, price per item, and number of items acquired in a reverse auction when compared to the simpler posted price offer and two-price schedule by analyzing the simulated impact of a varying homogenous cost of participation. We adopt a non-prescriptive approach, in that we vary the participation cost differential between the auction, posted offer, and two-price and lottery scheme, and then analyze how the ranking of relative performance across the mechanisms varies. We show that the relative cost-effectiveness of the reverse auction may be fully eroded even at moderate levels of participation costs. In this circumstance, a buyer with the primary objective of maximizing the number of items acquired with a fixed budget (rather than allocative efficiency), is better off adopting the two-price and lottery schedule than either a reverse auction or a posted price offer. Conservation markets often target sellers facing non-zero cognitive or informational costs of participation, in an attempt to allocate access or achieve conservation goals. Understanding the impact of entry and bidding costs on design is critical to improving the performance of future programs. For our empirical analysis we use the experience of three buybacks for fishing licenses recently conducted in Maryland: a discriminatory auction, a fixed price offer, and a two-price offer combined with a lottery scheme. The two-price schedule was implemented after fisheries managers were disillusioned by what they perceived to be shortfalls in the performance of the auction and fixed price offers. The auction attracted little participation, which resulted in little competition and high

¹ Klemperer (2002) describes the 1991 U.K. sale of television franchises by a sealed-bid auction. Entry costs were high due to the requirement that participants submit very detailed region-specific programming plans prior to bidding. As a result, in the Midlands region the incumbent faced no competition and won with a bid of one-twentieth of a penny per head of population as compared to £9.36–£15.88 in the other regions. Bernal et al. (1999) describe the case of the allocation of the total allowable catch (TAC) in Chilean commercial fisheries. In Chile's individual transferable quota (ITQ) system, 100% of the TAC is auctioned in the first year of the program. To participate, bidders must present financial deposits as evidence of their *bona fide* commitment to bid in the public auction. To allow entry to the industry, 10% of the TAC is re-auctioned each year. Bernal et al. (1999) report bids below market value, due to lack of competition in the annual auction for the divested 10% of the black hake TAC. For details on Chile's transition to ITQs see Gómez-Lobo et al. (2011). Other international experiences auctioning off fishing quotas have had mixed results (Eero et al., 2002; Anferova et al., 2005; Eero et al., 2005). Various permit and vessel buyout programs using auctions, such as the New England Groundfish permit buyout of 2001 (Thunberg et al., 2007), and the Virginia Blue Crab Buyback Program of 2009 (DePiper et al., 2013), have been characterized by participation rates below 30% and bids well above market prices, and provide additional illustrations.

Download English Version:

<https://daneshyari.com/en/article/5100376>

Download Persian Version:

<https://daneshyari.com/article/5100376>

[Daneshyari.com](https://daneshyari.com)