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Landowners' conservation motives and the size of information rents in environmental bidding systems

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ABSTRACT

We examine landowners' conservation motives, conservation costs and information rents in environmental bidding systems designed for forestry with the help of Faustmann and Hartman models and data from Finnish conservation program. We show that the Faustmann landowners receive information rents, on average 55% of the rental payments. For the Hartman landowners the high conservation costs of old stands result in low information rents; they are only 13% of the rental payments. This estimate omits amenity benefits the landowners derive from their forests; accounting for these benefits would increase information rents dramatically. Despite the high information rents, landowners' conservation motives decrease the rental payment required for participation in the conservation program. Hence, landowners' conservation motives give governments a great opportunity to allocate conservation contracts in a more cost effective way, thereby extracting larger benefits for scarce conservation funds.

Introduction

The problem of commons is pervasive in lands-use related industries such as agriculture and forestry. While the provision of environmental public goods is typically suboptimal, the negative

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externalities are excessive causing damage. For instance, forest management alters forest landscapes and species habitats, threatening many forest-dwelling species worldwide. Especially in agriculture but also in forestry, intensive management (such as fertilization, ditching and clear-cutting) causes nutrient runoff to waterways. Public policies encouraging sustained management and conservation on private lands have relied primarily on command and control instruments and uniform payments (Connor et al., 2008). These policies, however, more often than not entail misplaced incentives and high compliance costs.

Recent work on the payments for ecosystem services and voluntary inventive mechanisms, such as conservation contracting by various types of auctions, has challenged traditional environmental policies in agriculture and forestry. Competitive bidding is society's way of creating a market-mimicking solution to the management of environmental amenities and negative externalities. It creates competition between landowners wishing to participate in the conservation program; it leads to partial revelation of conservation costs, thereby helping to allocate the conservation contracts in a more cost-efficient manner than command and control instruments.

It has been demonstrated that under certain conditions, competitive bidding systems can lead to considerable costs savings relative to uniform payments (Latacz-Lohman and van der Hamsvoort, 1997). These "certain conditions" are, however, an important caveat for these promising but mostly theory – or simulation – driven results. The problem of asymmetric information is always present in the competitive bidding for environmental goods. Landowners know their conservation costs but the environmental authorities do not. Thus, despite competition among themselves, the landowners have an incentive to require payments in excess of their conservation costs. When submitting their bids, landowners face a trade-off between the probability of being accepted to the program and the size of their bid. Submitting a higher bid makes the landowner better off, ceteris paribus, but also increases the risk of being left out of the program, which prevents bids from rising excessively high. The wedge between the actual conservation costs and the bid is called the information rent; it is a return to the landowner in excess of the conservation costs arising from asymmetric information.

The performance of competitive bidding systems depends crucially on how high information rents are in practice. Given that the number of actual conservation contract systems based on competitive bidding is still quite limited, real data available for empirical examination is scarce. Moreover, estimating the size of information rents is a difficult problem by definition, because of unobservable conservation costs. Most studies use simulations or laboratory experiments that may not capture landowners' strategic behavior due to their hypothetical nature. A few of these studies assess the size of information rents (Latacz-Lohman and van der Hamsvoort, 1997; Kirwan et al., 2005; Schilizzi and Latacz-Lohmann, 2007; Vukina et al., 2008; Reeson et al., 2011; Iftekhar et al., 2012).[1] Out of these studies, only Kirwan et al. (2005) and Vukina et al. (2008) employ empirical bid data based on actual bidding behavior. Kirwan et al. (2005) examined information rents in the conservation reserve program (CRP), and found that information rents have increased over time constituting now 10–40% of the programs' rental payments. This result is consistent with Schilizzi and Latacz-Lohmann (2007), who stress that the landowners learn to make higher bids when bidding becomes frequent. In a more recent study, Vukina et al. (2008) examine CRP auctions in which environmental scores and bids are jointly used to determine the winners and conclude that CRP auctions are pretty competitive.

This paper contributes to the sparse literature on information rents by examining a real competitive bidding system designed for biodiversity conservation in forestry. We examine the role of conservation motives for rental payments and the size of information rents when landowners' heterogeneity is taken into account. Previous studies have focused either on cost differences among landowners (Iftekhar et al., 2012) or on differing preferences for forest amenity values among landowners (Vukina et al., 2008). Our analysis combines them both into a coherent analysis and allows for their interplay in bidding process. We use the actual data from the Finnish pilot program called trading in natural values

[1] There exists an extensive body of theoretical literature concerning the efficiency of voluntary agreements in nature conservation (Stranlund, 1995; Segerson and Miceli, 1998; Wu and Babcock, 1999; Smith and Shogren, 2002; Langpap and Wu, 2004; Espinola-Arredondo, 2008). For readers interested in auctioning contracts for conservation we would like to recommend a review study by Rousseau and Moons (2008). Ferraro (2008) describes basic features of contracting in the context of payments for environmental services.