An Analysis of the Forest Service Timber Sale Auctions: Pacific Northwest Region, 2001-2015

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US Forest Service Timber Sale Auctions

Timber represents one of the most important outputs from **National Forests** managed by US Forest Service and mandated under several legislative Acts.

Major issue is whether timber from National Forests is allocated efficiently, considering that some of the sales are designated as small business **set-asides** and sold to small (logger and mill) firms.

For a standard set aside sale, eligible timber firms must meet two criteria:

> They must have **no more than 500 employees**, and
>
> They must **manufacture the timber themselves or resell it to another small firm**, with the exception of a specified fraction of timber for which no restrictions apply.

The Pacific Northwest Region, Region 6 of the US Forest Service, consists of **16 National Forests**, all within the States of Oregon (11) and Washington (5).

In the period of 2001-2015, **60.7%** of the total timber volume harvested in the FS Pacific Northwest Region was sold through open bid, **19.0%** through sealed bid, and **20.3%** through IRTC auctions (source Timber Data Company).

Modeling Sealed and Open Bid Auctions

We adopt the **theoretical model** developed by Athey, et al. 2013, Athey, et al. 2011, and Guerre, et al. 2000 to frame our empirical analysis.

In an **open auction**, the price rises from the reserve price until all but one bidder drops out (bidder **collusion** is of concern due to “face to face” bidding and response).

In a **sealed bid auction**, bidders independently submit bids, the highest bid wins. Sealed bid auctions can be **less efficient** than open auctions (where the bidder with the highest true valuation wins).

In open auctions, all bidders have a dominant strategy of bidding up to **their true valuations**.

In sealed bid auctions, larger firms have incentives to **shade** their bids more than smaller firms

Preliminary Analysis and Results

Our **preliminary analysis** involves estimating determinants of the winning bids in sealed bid, open bid, and IRTC sale auctions (using panel data methods with fixed forest, species, and temporal effects).

Sealed Bid Auctions: Our results indicate that the reserve price, number of bidders, large firms entering have a positive and significant effect on the winning bids; the contract length and contract costs have a negative and significant effect; other effects (average lumber prices, total volume harvested, total haul miles, logging costs, small business set-aside sales, salvage sales) are not significant.

Open Bid Auctions: Our results indicate that the reserve price, average lumber prices, number of bidders, total volume harvested, housing starts have a positive and significant effect on the winning bids; the contract length, total haul miles, small business set-aside sales have a negative and significant effect; the logging costs, large firms entering, contract costs, salvage sales are not significant.

IRTC Sale Auctions: Our results indicate that the reserve price, large firms entering, scale sales have a positive and significant effect on the winning bids; the logging costs have a negative and significant effect; other effects are not significant.

Final Analysis and Estimation Methods

Our final analysis involves estimating an **econometric model of entry and bidding behavior of large and small (heterogeneous) firms** in US Forest Service timber sale auctions in the Pacific Northwest Region, and using the model to simulate the revenue, efficiency, and welfare effects.

Final analysis provides detailed information on **importance of endogenous participation (number of bidders) and bidders heterogeneity in different formats of auctions**.

We expect to find that with **endogenous participation**, sealed bidding will favor smaller (weaker) bidders and differences across auction formats will be even more apparent.

Views expressed in this presentation are of the author and not of the US Department of Agriculture

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