Sequential auction design and participant behavior
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Abstract (Summary)
This thesis studies the impact of sequential auction design on participant behavior from both a theoretical and an empirical viewpoint. In the first of the two analyses, three sequential auction designs are characterized and compared based on expected profitability to the participants. The optimal bid strategy is derived as well. One of the designs, the alternating design, is a new auction design and is a blend of the other two. It assumes that the ability to bid in or initiate an auction is given to each side of the market in an alternating fashion to simulate seasonal markets. The conditions for an equilibrium auction design are derived and characteristics of the equilibrium are outlined. The primary result is that the alternating auction is a viable compromise auction design when buyers and suppliers disagree on whether to hold a sequence of forward or reverse auctions. We also found the value of information on future private value for a strategic supplier in a two-period case of the alternating and reverse auction designs.

The empirical work studies the cause of low aggregation of timber supply in reverse auctions of an online timber exchange. Unlike previous research results regarding timber auctions, which focus on offline public auctions held by the U.S. Forest Service, we study online private auctions between logging companies and mills. A limited survey of the online auction data revealed that the auctions were successful less than 50% of the time. Regression analysis is used to determine which internal and external factors to the auction affect the aggregation of timber in an effort to determine the reason that so few auctions succeeded. The analysis revealed that the number of bidders, the description of the good and the volume demanded had a significant influence on the amount of timber supplied through the online auction exchange. A plausible explanation for the low aggregation is that the exchange was better suited to check the availability for custom cuts of timber and to transact standard timber.