A BID PRICE EQUATION FOR TIMBER SALES ON THE OUACHITA AND OZARK NATIONAL FORESTS

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POSTER SUMMARY

Data from 150 timber sales on the Ouachita and Ozark National Forests in Arkansas and southeastern Oklahoma were used to develop an equation that relates bid prices to timber sale variables. Variables used to predict the natural logarithm of the real, winning total bid price are the natural logarithms of total sawtimber volume per sale, total pulpwood volume per sale, average sawtimber volume per acre, average sawtimber volume per tree, and the ratio of southern yellow pine #2 dimension lumber producer price index (PPI) to pine sawlog PPI. The sawtimber and pulpwood components of these sales were primarily shortleaf (*Pinus echinata* Mill.) pine with some loblolly pine (*P. taeda* L.) for sales occurring in the extreme southeastern portions of the Ouachita National Forest.

A timber cruise is typically conducted to determine sale volume on these sites. The intensity of the cruise is related to sale value, but typical large sales must have a sampling error of ± 10 percent. Sales are then advertised and awarded to the highest bidder. Records for 150 timber sales on the Ouachita National Forest from June 1992 to December 1998 were available for this study. Revenue for each timber sale was obtained by:

Revenue = ($CCFS/PPIS)CCFS + ($CCFR/PPIP)CCFR&T.

The PPI for pine sawlogs (PPIS) was used to deflate the nominal bid price for sawlogs ($CCFS). The roundwood bid price ($CCFR) was deflated by the PPI for pine pulpwood (PPIP). These quantities were multiplied by the hundred-cubic-foot amounts of sawlog (CCFS) and roundwood (including topwood, CCFR&T) to obtain sale revenue.

A number of researchers have used regression analysis to model timber sales in the South, beginning with Guttenburg (1956). Regression analysis yielded the following relationship between real total bid price and the independent variables:

$$\ln(Bid) = b0 + b1 \ln(TSV) + b2 \ln(TPV) + b3 \ln(SVPA) + b4 \ln(SVPT) + b5 \ln(PPIR)$$

where Bid is real winning bid price (thousands of 1996 dollars), TSV is total pine sawtimber volume (thousands of CCF's), TPV is total pine pulpwood volume (roundwood and topwood, CCF's), SVPA is average sawtimber volume (CCF) per acre, SVPT is average sawtimber volume (CCF) per tree, PPIR is producer price index for southern yellow pine #2 dimension lumber divided by sawlog PPI when sale occurred, ln x is the natural logarithm of x, and b0, b1, b2, b3, b4, b5 are estimated coefficients. The fit index for predicting Bid was 0.94 (proportion of total variation in Bid explained by the model). All parameter estimates were significant at the 0.05 level except that corresponding with TVP. However, it was retained because it has been found significant in other studies (Anderson 1976, Buongiorno and Young 1984, Carter and Newman 1998), and its importance was indicated by procurement foresters interviewed as part of the study.

LITERATURE CITED

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