Weighted South-Wide Average Pulpwood Prices

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ABSTRACT. Weighted average prices provide a more accurate representation of regional pulpwood price trends when production volumes vary widely by state. Unweighted South-wide average delivered prices for pulpwood, as reported by Timber Mart-South, *were compared to average annual prices weighted by each state's pulpwood production from 1977 to 1986. Weighted average prices for pine roundwood and pine chips were significantly higher than unweighted averages; for hardwood roundwood and hardwood chips, there was no significant difference between the weighted and unweighted average prices.*

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Timber Mart-South (TMS) is a forest products price reporting service covering 13 southern states.[2] Stumpage and delivered wood prices are reported quarterly (monthly prior to 1988) by state, zones within each state, and for the South as a whole. In addition, average annual prices for each state and the region are published in a yearbook (Norris 1987).

Data collection and reporting procedures used by TMS were recently described by Gunter and Cubbage (1987). As noted, average prices within specific zones of each state and statewide averages reported by TMS are weighted roughly according to the volumes produced within the respective areas. However, the South-wide prices are unweighted averages of all the states. Consequently, region-wide averages may not adequately reflect the variation in timber production by state. This study examines whether the unweighted South-wide average prices published by TMS for delivered pulpwood differ significantly from average annual prices weighted by each state's pulpwood production.

PROCEDURES

The 13 states included in the TMS survey are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. Annual delivered price data for each state and the region from 1977—the first year available for TMS prices—to 1986 were obtained from the TMS yearbook for four pulpwood categories: pine roundwood, pine chips, hardwood roundwood, and hardwood chips. Production data used to weight state prices in each category were gathered from USDA Forest Service Resource Bulletins that report pulpwood production by state on an annual basis (May 1988a, Widman 1988).

To obtain a South-wide weighted average price for a particular year and category, each state's production was divided by the South-wide total for that year. The resulting quotients were then multiplied by each state's price for the year and were summed to determine the weighted annual average price. The final price was rounded to the nearest 10 cents, following the procedure used by TMS for presenting the unweighted averages. Weighted average annual prices were calculated in this manner for the four pulpwood production categories examined.

RESULTS

Tables 1 through 4 compare the weighted and unweighted average delivered prices for each pulpwood category examined. Weighted average prices for pine roundwood and pine chips were significantly higher than the TMS unweighted averages (Tables 1 and 2); for hardwood roundwood and chips, there was no significant

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Year	Weighted average	Unweighted average	Difference
	..... $		
1977	32.70	32.20	+ 0.50
1978	34.60	34.00	+ 0.60
1979	37.70	36.70	+ 1.00
1980	41.20	40.20	+ 1.00
1981	42.80	40.70	+ 2.10
1982	45.60	42.90	+ 2.70
1983	48.50	45.70	+ 2.80
1984	51.90	48.50	+ 3.40
1985	50.10	47.40	+ 2.70
1986	42.70	41.60	+ 1.10
Mean	42.78[1]	40.99[1]	+ 1.79

[1] Means are significantly different at the 0.01 level, according to the t-test for paired observations.

Table 2. Comparison of weighted and unweighted average delivered prices of southern pine pulp chips (dollars per green clean ton, fob mill).

Year	Weighted average	Unweighted average	Difference
	..... ($)		
1977	13.80	13.80	0
1978	14.40	14.30	+ 0.10
1979	15.70	15.50	+ 0.20
1980	18.90	18.50	+ 0.40
1981	21.90	21.50	+ 0.40
1982	23.40	22.90	+ 0.50
1983	25.60	25.20	+ 0.40
1984	26.50	26.00	+ 0.50
1985	25.40	25.10	+ 0.30
1986	23.30	23.20	+ 0.10
Mean	20.89[1]	20.60[1]	+ 0.29

[1] Means are significantly different at the 0.01 level, according to the t-test for paired observations.

Table 3. Comparison of the weighted and unweighted average delivered prices of mixed hardwood roundwood (dollars per standard cord, fob yard, no freight).

Year	Weighted average	Unweighted average	Difference
	..... ($)		
1977	25.60	25.50	+ 0.10
1978	26.90	26.60	+ 0.30
1979	28.70	28.60	+ 0.10
1980	30.70	30.60	+ 0.10
1981	30.50	30.50	0
1982	31.70	31.70	0
1983	32.10	32.10	0
1984	32.80	32.70	+ 0.10
1985	32.50	32.50	0
1986	31.50	31.50	0
Mean	30.30	30.23	+ 0.07

Table 4. Comparison of weighted and unweighted average delivered prices of hardwood pulp chips (dollars per green clean ton, fob mill).

Year	Weighted average	Unweighted average	Difference
	..... ($)		
1977	11.30	11.60	− 0.30
1978	11.90	12.10	− 0.20
1979	12.80	12.70	+ 0.10
1980	14.70	14.40	+ 0.30
1981	15.70	15.30	+ 0.40
1982	16.30	16.20	+ 0.10
1983	17.50	17.30	+ 0.20
1984	18.00	17.90	+ 0.10
1985	18.00	18.00	0
1986	17.50	17.60	− 0.10
Mean	15.37	15.31	+ 0.06

(Tables 3 and 4).

For both pine roundwood and chips, there was a significant positive correlation between volume and price in most years. Consequently, the weighted averages were higher because the highest prices were in the states with the highest production; on the other hand, low prices in states with low pine production biased the unweighted average prices downward. For pine roundwood, the differences between the two averages were especially noticeable after 1980, when Kentucky was added to the TMS survey. The inclusion of Kentucky in 1981 at a price of $32.50 per cord reduced the unweighted average by 70 cents; however, when weighted by its production of 11.8 thousand cords, out of a total of 26.9 million, the weighted average was reduced by only 2 cents.

There was no significant correlation between volume and price for hardwood roundwood and hardwood chips. Hardwoods make up only about 30 percent of the total southwide pulpwood production, and production volumes vary less by state than with pine roundwood and chips.

As a further check on the performance of the weighting procedure, the calculated weighted average prices for pine roundwood and pine chips were compared to prices paid for pulpwood by Midsouth and Southeast pulpmills (Figures 1 and 2), as reported by the Southern and Southeastern Forest Experiment Stations (Davenport 1987, May 1988). Prices for approximately 50% to 75% of the South's pulpwood receipts are accounted for in these surveys. Theoretically, a Southwide average would fall between the two series, since the areas represented by the two surveys have about the same production volumes. Several of the TMS weighted prices fall in that range, and closely parallel the two price series overall. Some differences are to be expected, since the two Station surveys are not fully

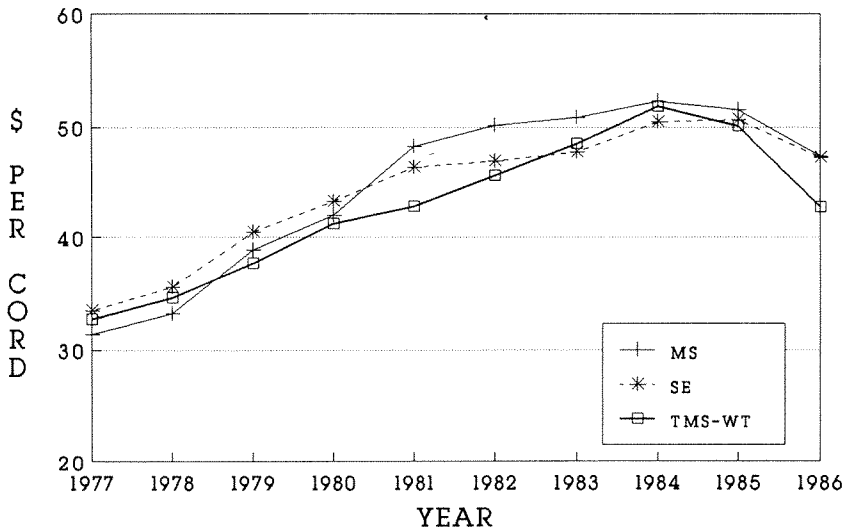

Figure 1. Comparison of TMS weighted (TMS-WT) average annual prices for pine roundwood with Midsouth (MS) and Southeast (SE) survey prices for softwood roundwood. All prices are f.o.b. yard.

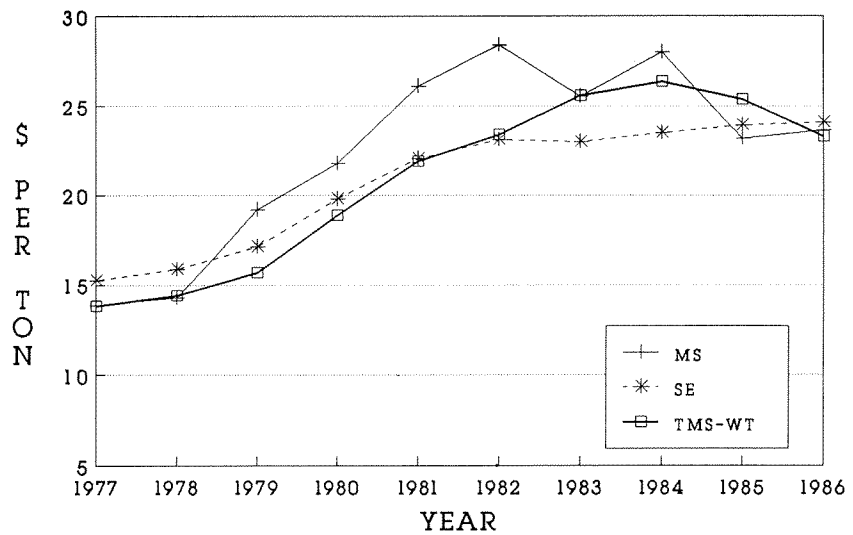

Figure 2. Comparison of TMS weighted (TMS-WT) average annual prices for pine chips with Midsouth (MS) and Southeast (SE) survey prices for softwood chips. TMS and MS prices are f.o.b. consuming mill, SE prices are an average of all pricing points.

weighted, and TMS includes Kentucky, which is not among the seven states in the Midsouth price series or one of the five states in the Southeastern series.

CONCLUSION

An earlier study determined that TMS does a credible job in providing reliable information concerning the ranges of timber prices within each state (Franklin and Hazel 1983). However, Southwide average prices are often used as inputs in various economic analyses and investment decisions. Weighted average prices provide a more accurate representation of Southwide pulpwood prices when production volumes vary widely by state.

Based on the results of this study, weighted averages should be used to represent Southwide annual delivered prices for pine roundwood and pine chips. Although there was no significant difference between weighted and unweighted prices for hardwood roundwood and chips, the demand for hardwood pulpwood has been rising in recent years. As production rises accordingly, there will be greater variation in production by state. Prudent procedure would be to calculate weighted average annual delivered prices for hardwood as well as for pine. □

Literature Cited

DAVENPORT, E.L. 1987. Pulpwood prices in the Southeast, 1986. USDA For. Serv. Res. Note SE-348. 4 p.

FRANKLIN, E.C., AND D. HAZEL. 1983. Timber Mart-South—how good is it? South. J. Appl. For. 7:190–194.

GUNTER, J., AND F. CUBBAGE. 1987. Data collection for Timber Mart-South. For. Farmer 46(8):17–18.

MAY, D.M. 1988a. Southern pulpwood production, 1986. USDA For. Serv. Resour. Bull. SO-138. 40 p.

MAY, D.M. 1988b. Midsouth pulpwood prices, 1986. USDA For. Serv. Res. Note SO-344. 3 p.

NORRIS, F. 1987. Timber Mart-South 1986 yearbook. Highlands, NC: Timber Marts, Inc. 285 p.

WIDMAN, R.H. 1988. Pulpwood production in the Northeast—1986. USDA For. Serv. Resour. Bull. NE-103. 26 p.