

Market Competitiveness for Raw Materials in the U.S. South: Measuring Relationships Between Market Demand and Stumpage Prices

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Outline

- Markets for timber in US South
- Competitiveness
- Stumpage prices-demand relationship
- “Real-time” elasticity of demand: market level
- Lessons learned

Markets for Timber: US South

- Markets for timber are local
 - Timber inventory
 - Consumer fragmentation
 - Procurement costs
- All factors have direct/indirect effect on competitiveness for raw materials within the market

Competitiveness

- Competitiveness: ability to compete for raw materials
 - Function of size (demand, number of consumers)
- Competitiveness has direct effect on price (stumpage)
 - H_0 : higher competitiveness \rightarrow higher price

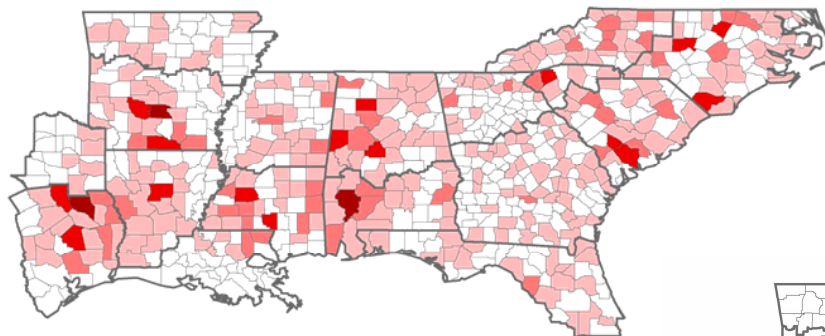
Competitiveness: temporal

- Temporal competitiveness: market's flexibility
 - Responsiveness to price, η

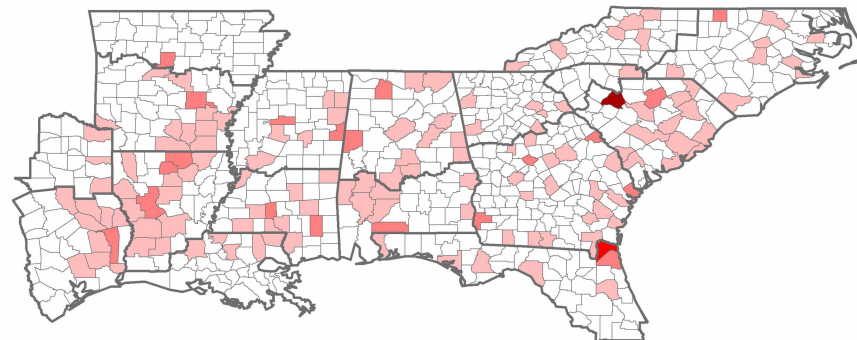
$$\eta = \frac{\% \Delta Q}{\% \Delta P} = \frac{\partial \ln(Q)}{\partial \ln(P)}$$

- Knowledge of market's competitiveness: primary info for timberland investors and new or future timber consumers

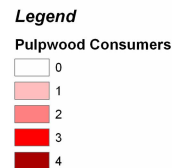
Stumpage – Demand relationship



Stumpage: Timber Mart-South



Demand: Wood Demand Report



Map: Timber Market Profiles & Rankings: US South. 2007. Forisk Consulting & Timber Mart-South, SOFEW-2008, Savannah, GA March 9-11, 2008

2006: PST demand and stumpage

Rank	Market Name	Pine Sawtimber Demand
1	South AR	13,092
2	South GA	10,381
3	Southeast TX	9,832
4	East NC	9,726
5	South AL	8,660
6	North LA	8,120
7	East SC	7,499
8	South MS	6,756
9	North AL	6,267
10	North FL	6,133
11	North MS	5,232
12	Northeast TX	2,180
13	South LA	1,705
14	North GA	1,604
15	North AR	1,193
16	West NC	641
17	West SC	133

Rank	Market Name	Pine Sawtimber
1	South AL	\$46.10
2	South GA	\$44.86
3	South AR	\$44.42
4	North AL	\$43.52
5	Southeast TX	\$43.23
6	East SC	\$42.41
7	North MS	\$42.24
8	East NC	\$41.31
9	North LA	\$40.95
10	South MS	\$40.31
11	North GA	\$39.86
12	West SC	\$38.96
13	North FL	\$38.19
14	Northeast TX	\$37.64
15	North AR	\$36.53
16	South LA	\$35.20
17	West NC	\$28.85

SOFEW-2008, Savannah, GA March 9-11, 2008

Stumpage – Demand relationship

	Pine PW	Pine CNS	Pine ST
Facilities	0.293	0.214	0.684*
2006 demand	0.328	-0.319	0.764*
Total demand, tons	88,722,108	11,309,160	99,120,776

* - significant at 5%

- PPW and PCNS small and insignificant
 - PCNS negative vs. demand
- PST is positive and significant

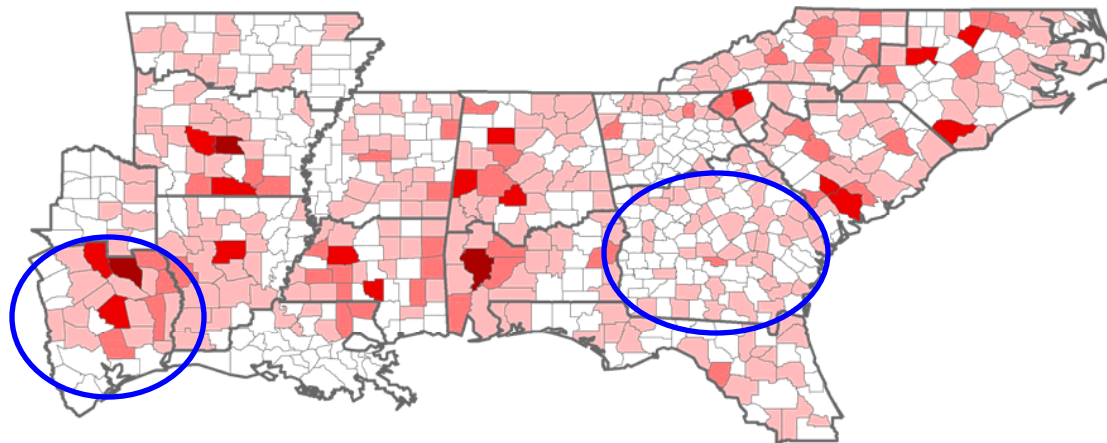
Source: Timber Market Profiles & Rankings: US South 2007

SOFEW-2008, Savannah, GA March 9-11, 2008

Competitiveness: real-time

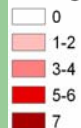
- Static competitiveness does not answer real-time questions
 - Market development over time (using almost real-time data)
 - Between-market comparisons
 - Market-based scenarios (openings/curtailments)
- Many questions may be answered with market-based estimation of η

Estimating market-specific η



Legend

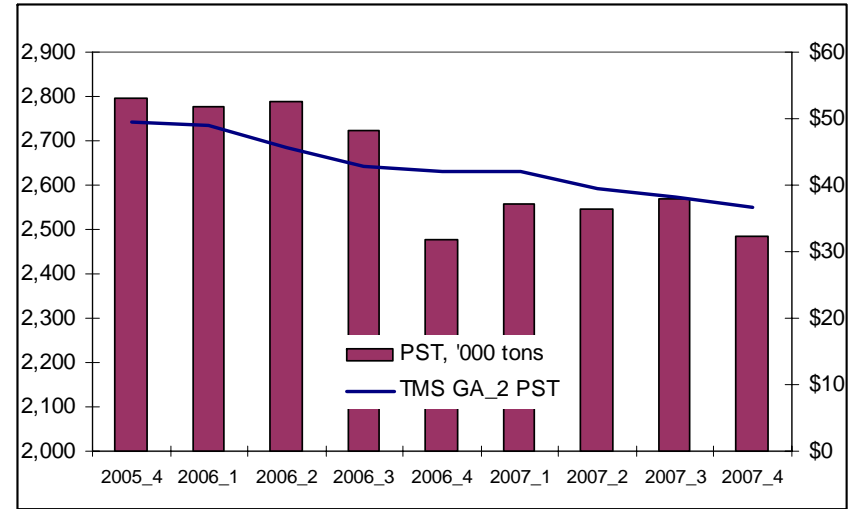
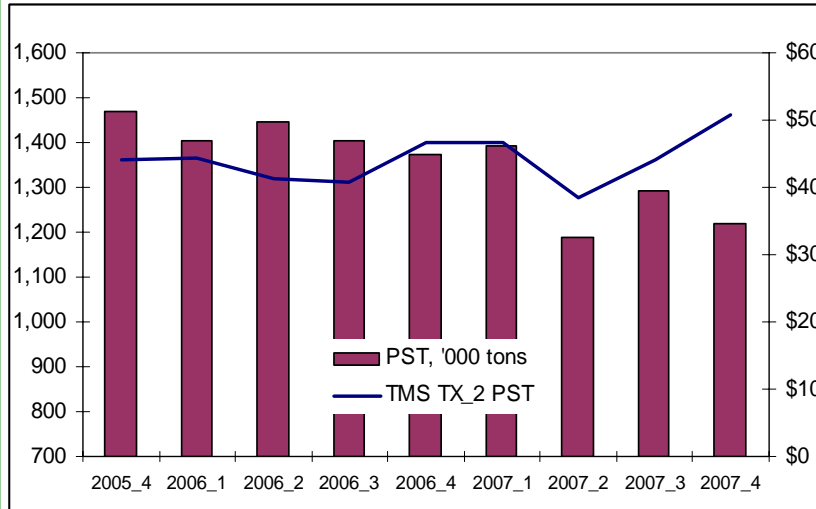
Sawlog Consumers



$$\eta = \frac{\% \Delta Q}{\% \Delta P} = \frac{\partial \ln(Q)}{\partial \ln(P)}$$

- Timeframe:
Q4 2005 – Q4 2007
- Quarterly
- Pine Sawtimber

Demand and stumpage in two markets



- Trends match, but no clear relationship

Elasticity in two markets

- Timber procurement: time lag (6 -12 month) between bidding (stumpage) to delivery (demand)
- PST Elasticity estimates:

Quarters	TX_2	GA_2
Time lag= 0	-0.03	0.41*
Time lag= -1	-0.32	0.48*
Time lag= -2	-0.30	0.51*

* - significant at 5%

Lessons

- No (clear) relationship, inconsistent estimates
- Influencing factors:
 - Modeling horizon (post-Katrina, post-housing...)
 - Random sample? Coverage?
 - Mill inventories, weather patterns and tract characteristics influence stumpage prices
 - Substitution (short-term, scale) - PCNS
 - Wood supply agreements

Lessons

- Price = f(stand/bid characteristics, weather patterns, mill inventory, else...)
- Fine-tuning elasticity estimates:

$$\text{Price} = a + B^*(\text{stand and bid characteristics}) + E_p$$

$$\eta = \frac{\% \Delta Q}{\% \Delta E_p} = \frac{\partial \ln(Q)}{\partial \ln(E_p)}$$

Questions?

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