



Timber Market Analysis:

Driving factors and market risk of Central Georgia

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Introduction

- Stumpage prices
 - Determinants of revenue and cost
- Defined by intersection of demand (wood procurement, buyer) and supply (tract, seller)
- Supply and demand formed by observed and unobserved preferences and characteristics
 - Sources of volatility (risk)

Market Analysis 101

Wood Consumption

Available Inventory

DEMAND

SUPPLY



Stumpage Price

Usually, one or two (out of three) are readily available



Market Analysis - data

- In the South, the most readily available data sources include:
 - Daily transactions – wealth of data!
 - Forest2Market (F2M)
 - Timber Transaction Price Service (RISI)
 - Quarterly averages – market overview
 - Timber Mart-South (TMS)

Market Risks

- Observable (“diversifiable” in portfolio theory) factors = observable (manageable) risk
- Non-observable (non-diversifiable) factors = non-manageable risk. Market risk.
- Identifying observed characteristics:
 - Improves understanding of stumpage price movements
 - Reduces market volatility (by known factors)



Market Analysis

- The stumpage model (bid)
 - Associates product price with observed characteristics of the sale
- Hedonic price modeling (regression)
 - Procedure used to establish and quantify a relationship between stumpage prices and timber(land) characteristics

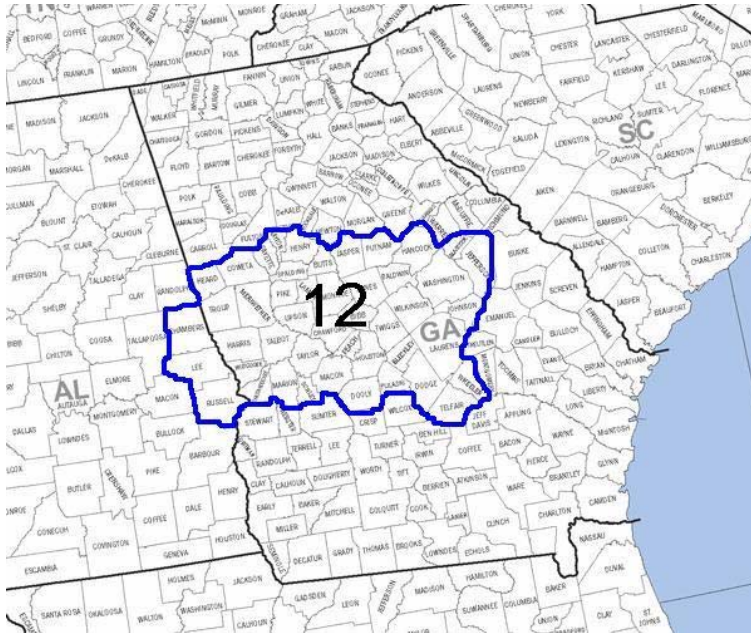
Market Analysis – model

$$\mathbf{price} = a + \mathbf{b} * \mathbf{DBH} + \mathbf{c} * \mathbf{volume} + \mathbf{d} * \mathbf{logbty} + \mathbf{e}$$

- **b, c, d** – unit “price” of each characteristic
- **e** – price fluctuation due to unexplained or unobserved factors

e - this is market risk

MA Objectives



- Central GA, sawtimber
 - Identify and quantify characteristics assoc. with price volatility
 - Reduce total price volatility - measure
 - Temporal risk comparisons

MA – 2004 price factors

Product size (average), \$ per unit	
DBH (inch)	1.86
Volume (* 1000 tons)	0.32
Tract size (base = 25 to 50 acres)	
< 25 acres	-
51 to 200 acres	-
>200 acres	-
Loggability (base = all weather logging)	
Loggable 0-3 months/year	-
Loggable 4-6 months/year	-
Loggable 7-9 months/year	-
Loggable 10-11 months/year	3.55
Timber quality (base = good)	
Fair	-2.43
Excellent	1.91
Product volume ratios (\$ per %)	
PST/(PST + Plylogs)	
CNS/(CNS + PST + Plylogs)	4.27
PPWD/(PPWD + CNS + PST)	-6.55
Other	
Consultant used (base=no)	-1.89
Timber Type: Plantation, Age 21-25 (base=Natural Pine)	-2.38

- Positive factors
 - Size, DBH
 - Loggability
 - Timber Quality
 - Valuable products
- Negative factors
 - Timber Quality
 - Less valuable products

Market Risks

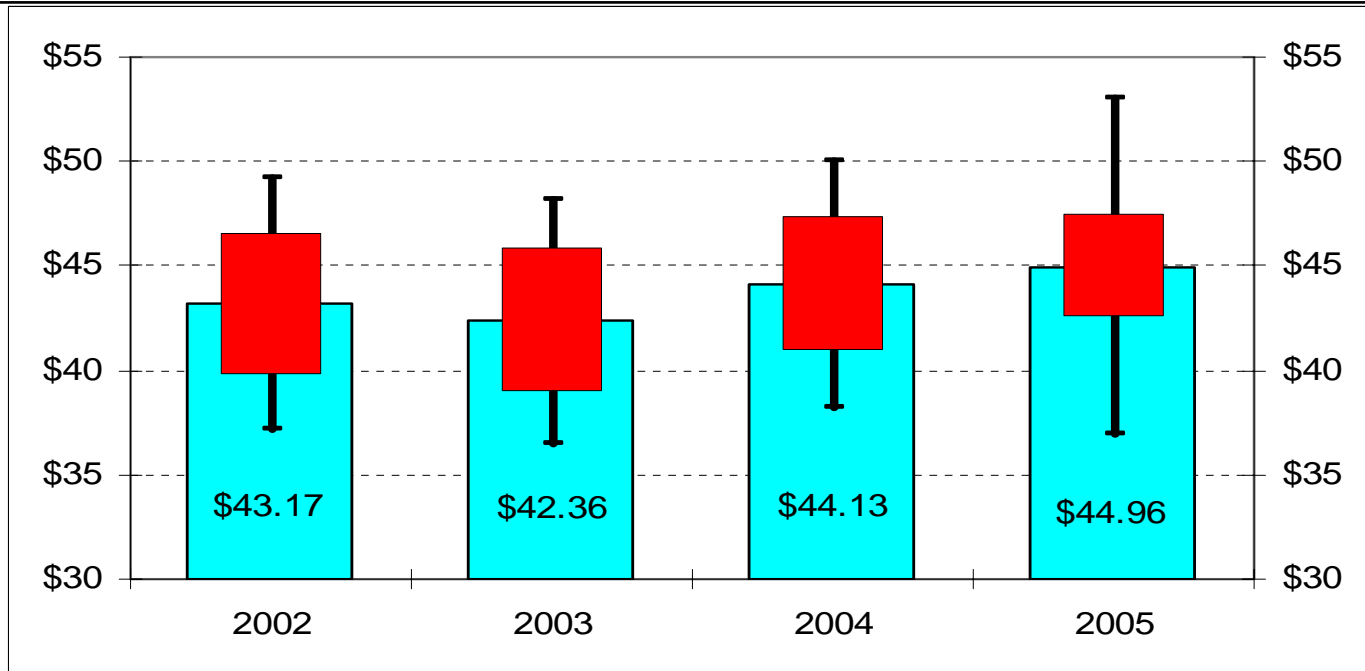
Price volatility	PST	Pine CNS	Pine pulpwood
Total (\$/ton)	5.95 (13.5%)	3.70 (14.6%)	1.09 (16.5%)
Explained	2.67 (6.1%)	1.34 (5.3%)	0.27 (4.1%)
Market	3.28 (7.43%)	2.36 (9.28%)	0.82 (12.42%)

- Total risk
 - Standard deviation
- Explained risk
 - Portion of total risk that can be explained by hedonic factors

- Market risk

- Stumpage price changes from factors other than those observable prior to the sale

Temporal Risk Comparisons



	<i>GA 2002</i>	<i>GA 2003</i>	<i>GA 2004</i>	<i>GA 2005</i>
Ave Price	\$43.17	\$42.36	\$44.13	\$44.96
Total StDev.	\$6.00	\$5.85	\$5.95	\$8.07
Market Risk	\$3.43	\$3.49	\$3.28	\$2.48
CV - total	0.139	0.138	0.135	0.179
CV - market	0.079	0.082	0.074	0.055



Price factors and risk - applications

- Bid models – use **all** observable factors to guide – **not forecast** – bidding activity
 - Sellers: Reserve prices
 - Buyers: Ceiling prices
- Supply agreements - unbiased, “custom-fitting” market price



Market Analysis - applications

- Acquisitions – historic, comparative product price volatility (timberlands?)
- Market Risk – mostly unobservable factors, relationship with mill closures/openings, regulations, gov. programs... better understand regional timber market



Concluding remarks

- Market Analysis: identify and quantify important historic price drivers
 - Improves our **understanding** of price movements
- Factors (values) continuously change... as well as the predictability of the model...
- Forecasting...