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Univ. Moncton Edmunston Campus

Fifty Years of Maine Stumpage Prices: Supplementary Handout

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Project Summary

This is a supplementary chartpak accompanying ECANUSA 2010 Poster

- Fifty years of stumpage trends give insights
- Dramatic changes in markets and utilization
- Real Price Trends over time
- Regional comparisons
- We offer no real conclusions here – up to you!
- Extrapolate with care!

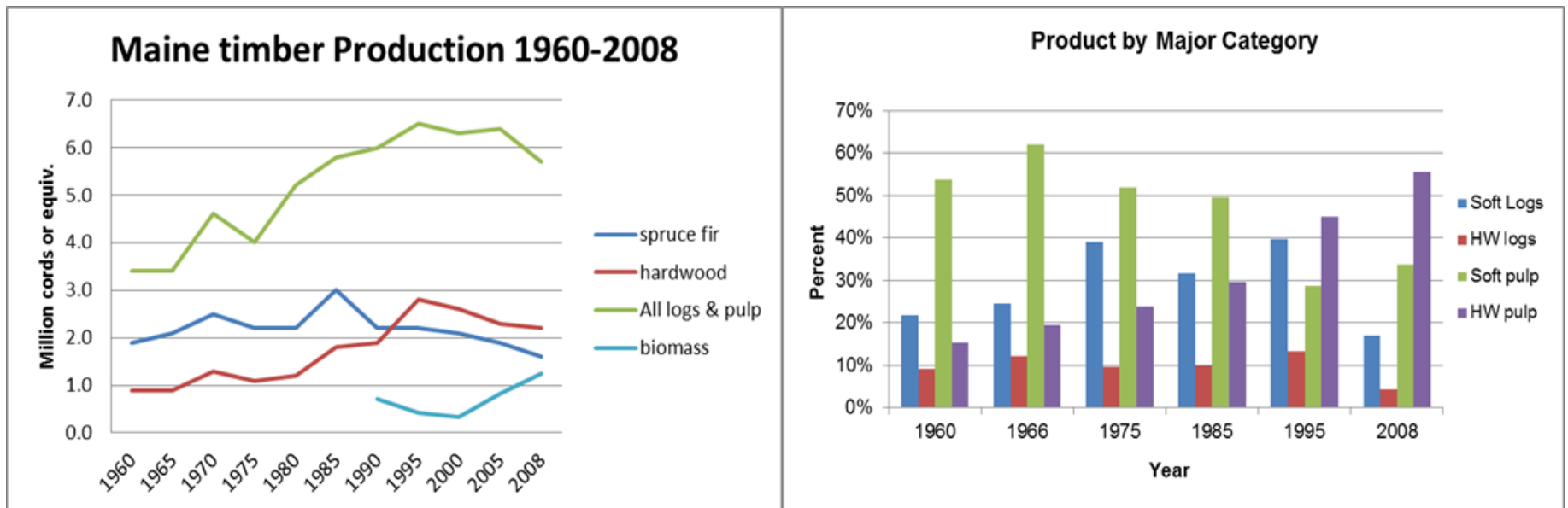
Market Changes: Pulp and Paper

- Pulp and Paper
 - Market growth in P&W through late 90s
 - Loss of newsprint by 1989
 - Sector downturn after 1999
 - Strength in hardwood pulp in 00's
 - Switch to chips
 - Stud mills increasingly compete for large pulpwood (to early '00s)
- Oil prices
 - Cogen and biomass electricity
 - Pellet industry competing for pulpwood
- Major Impacts
 - Huge growth in market for hardwood & secondary spp.
 - Smaller market for “groundwood”

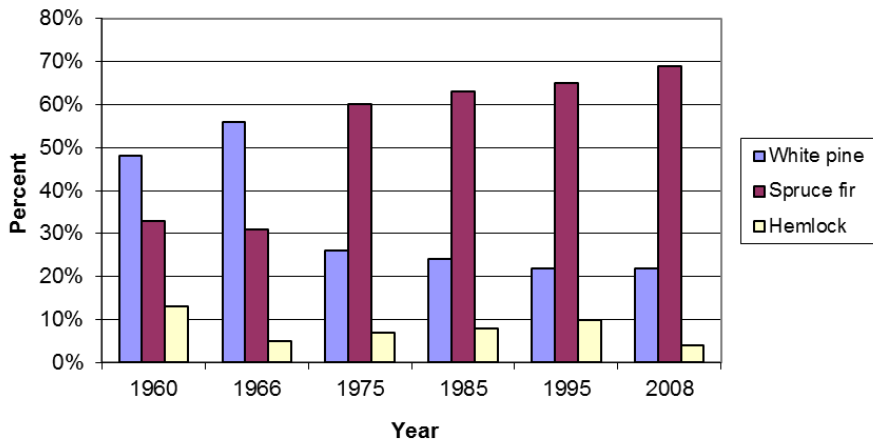
Market Changes: Lumber

- 1960's: most capacity in South of Maine
- White pine was king, some hardwood
- By mid 70's, invention of "stud mill"
- & Revival of spruce market in East led to
- Strong growth in spruce-fir lumber production
- Housing downturn post 2006 worst since Great Depression

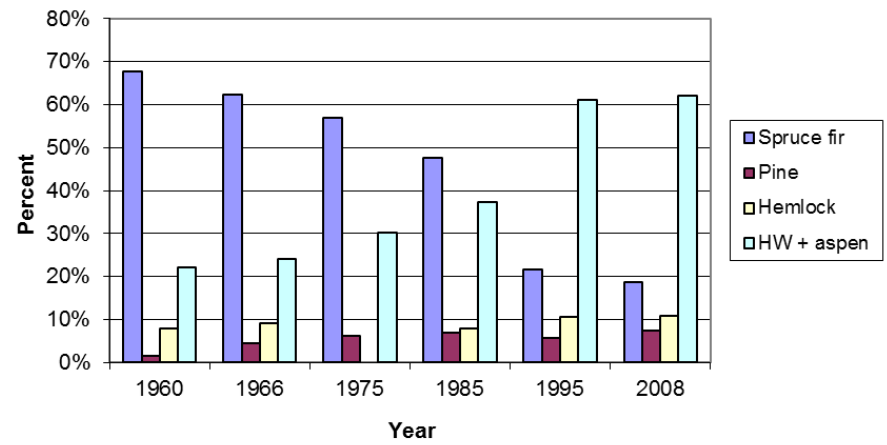
Trends in Consumption by Species/Product

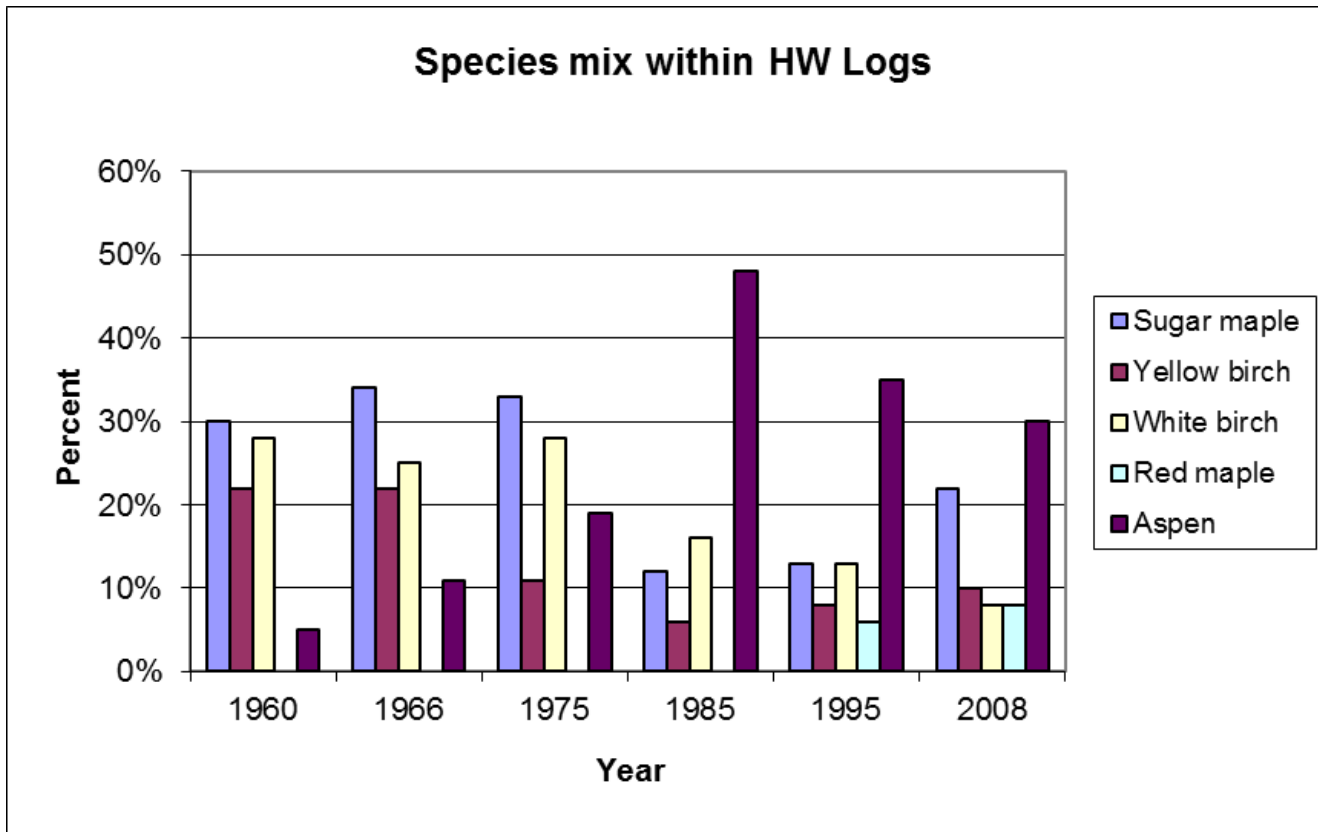


Species mix within SW Logs



Roundwood: Species mix within Pulp





Note: not certain of aspen numbers here...

Markets: Specialties

- White birch
- Veneer
- Pine VA items
 - Loss of markets to nonwood substitutes
 - Radiata annexes many VA markets

Trimmed data # reports				
by selected product, species group, and report year				
Product	Species Group	2000	2008	% Increase
Biomass	MXD SPP	102	532	422%
Firewood	MXD SPP	289	520	80%
Pulpwood	Spruce-Fir	537	681	27%
	Hemlock	384	568	48%
	Aspen	390	460	18%
	MXD HWD	716	983	37%
Boltwood	White Birch	150	88	-41%
Palletwood	MXD HWD	270	350	30%
Studwood	Spruce-Fir	214	342	60%
Sawlogs	Spruce-Fir	526	531	1%
	White Pine	807	887	10%
	Cedar	27	88	226%
	Hemlock	376	288	-23%
	Red Maple	291	457	57%
	Sugar Maple	204	452	122%
	Yellow Birch	175	411	135%
	White Birch	334	372	11%
	Aspen	165	68	-59%
Veneer	Oak	380	383	1%
	Sugar Maple	46	141	207%
	Yellow Birch	57	158	177%
	White Birch	62	132	113%
	Grand Total*		8853	10960
Source: MFS.				
* includes items not itemized in this table.				

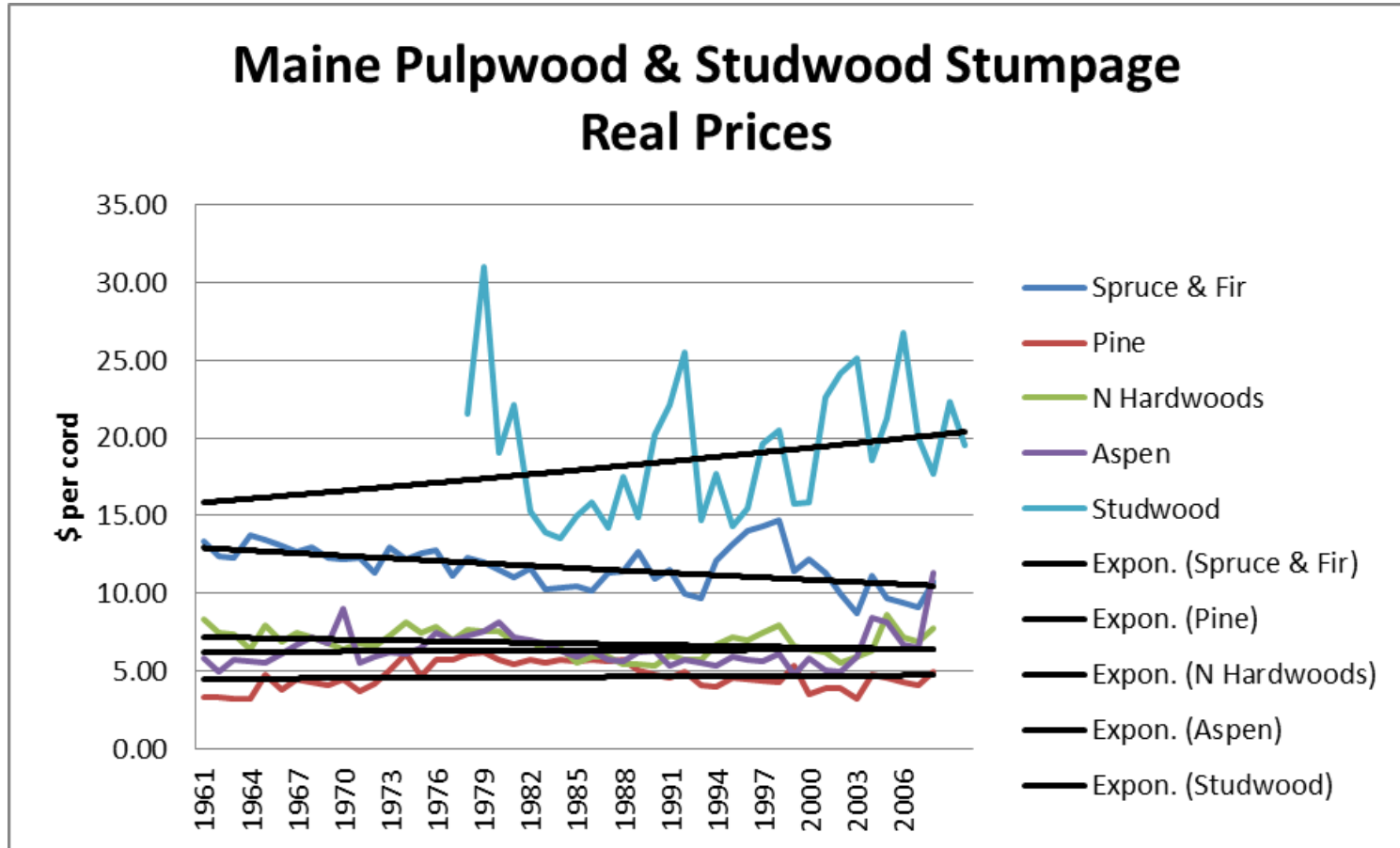
Number of (trimmed) reports
Illustrates changes in markets:

- Large reductions in no. reports for birch boltwood, hemlock logs, and aspen logs
- Large increases in biomass, fuelwood, cedar logs, and maple and yellow birch veneer

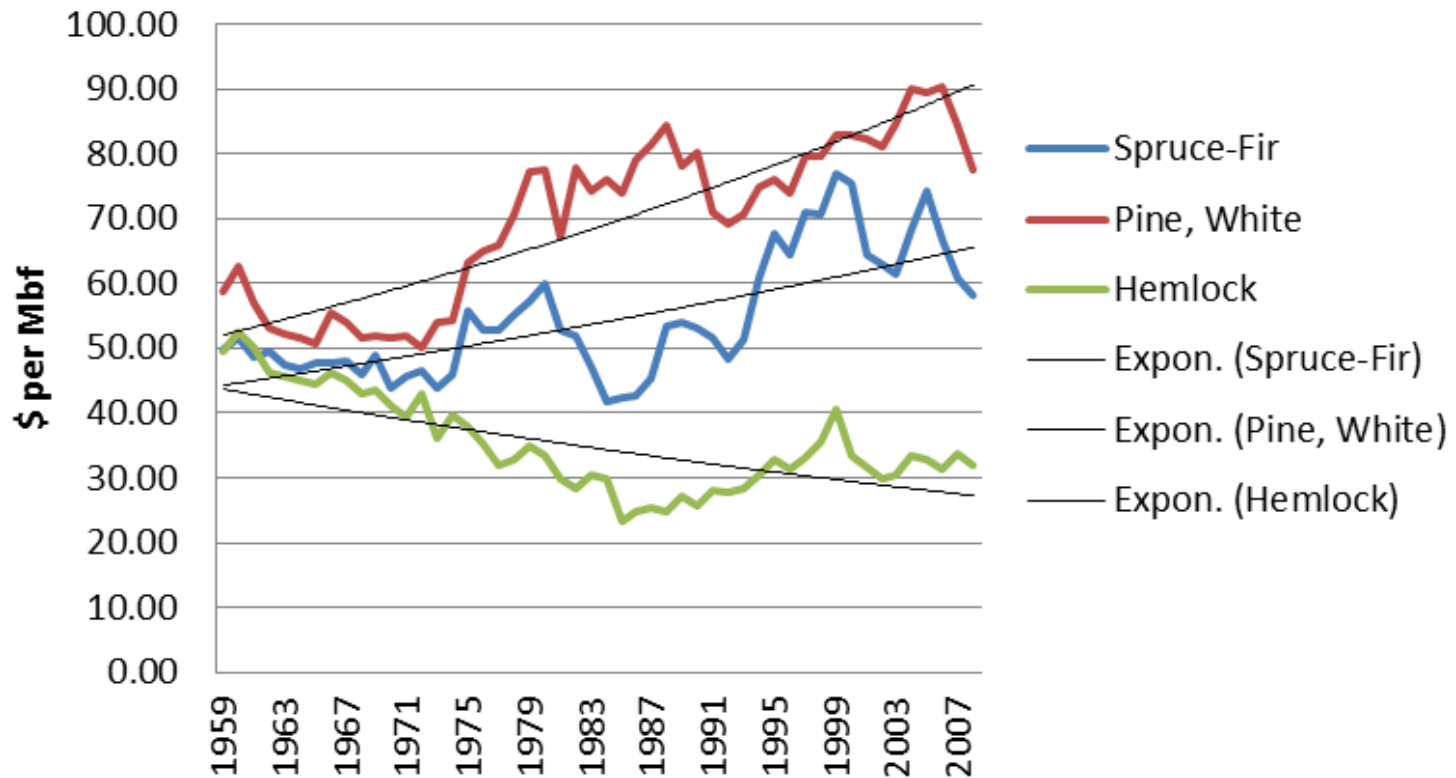
Utilization: Apples to Oranges?

- The market's definition of products changed
- 1960's: no studwood, spruce logs to 9" or higher. All stick scaled
- 1980's: Hy-Grade; fitted logs, studwood.
- 1990's Spruce to 2.5" top at some mills, all T/l; by the ton
- Similar for others...
- *So, the product in 2009 is NOT same as in 1959.*

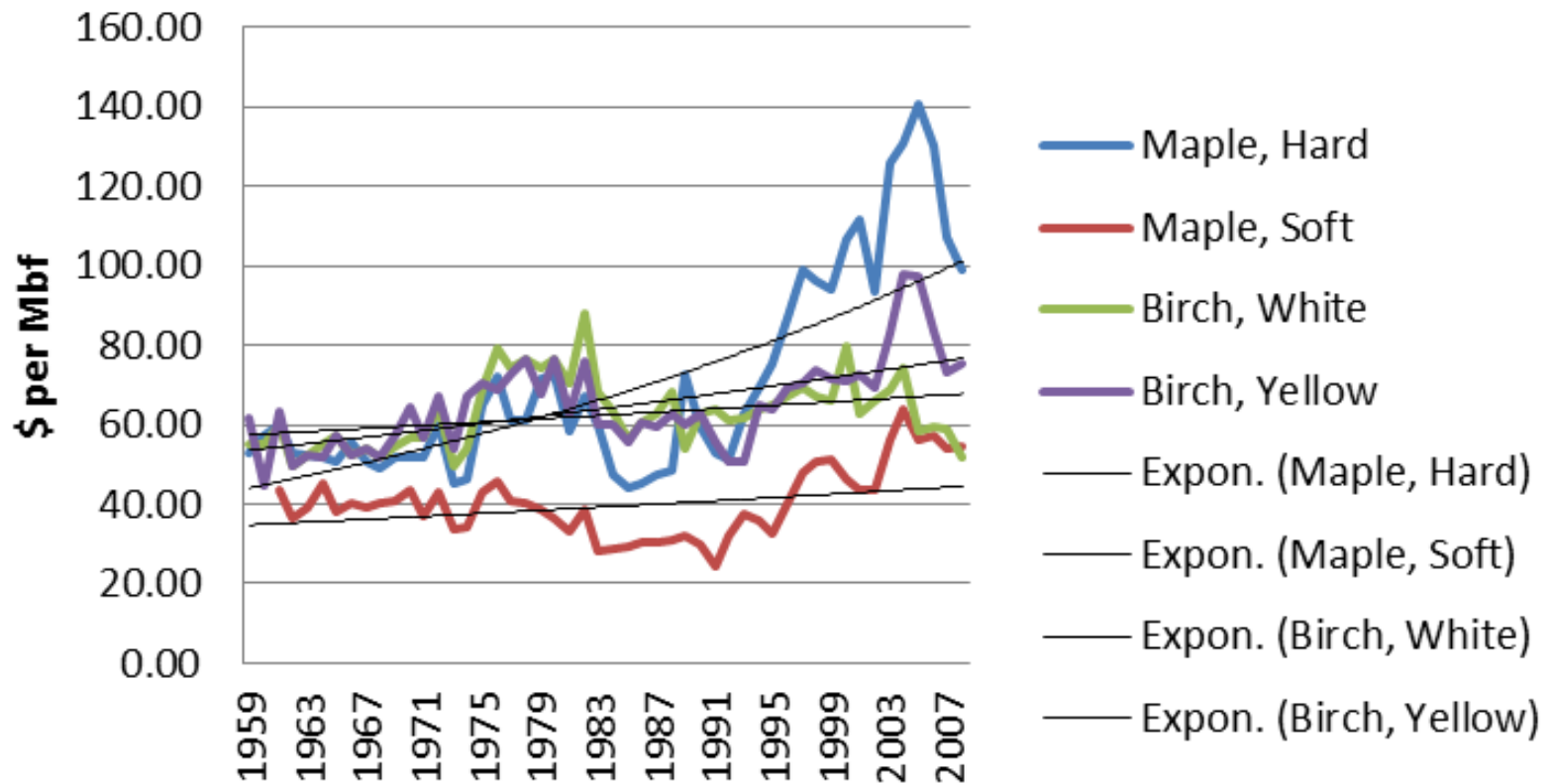
Longterm Trends, Real Prices



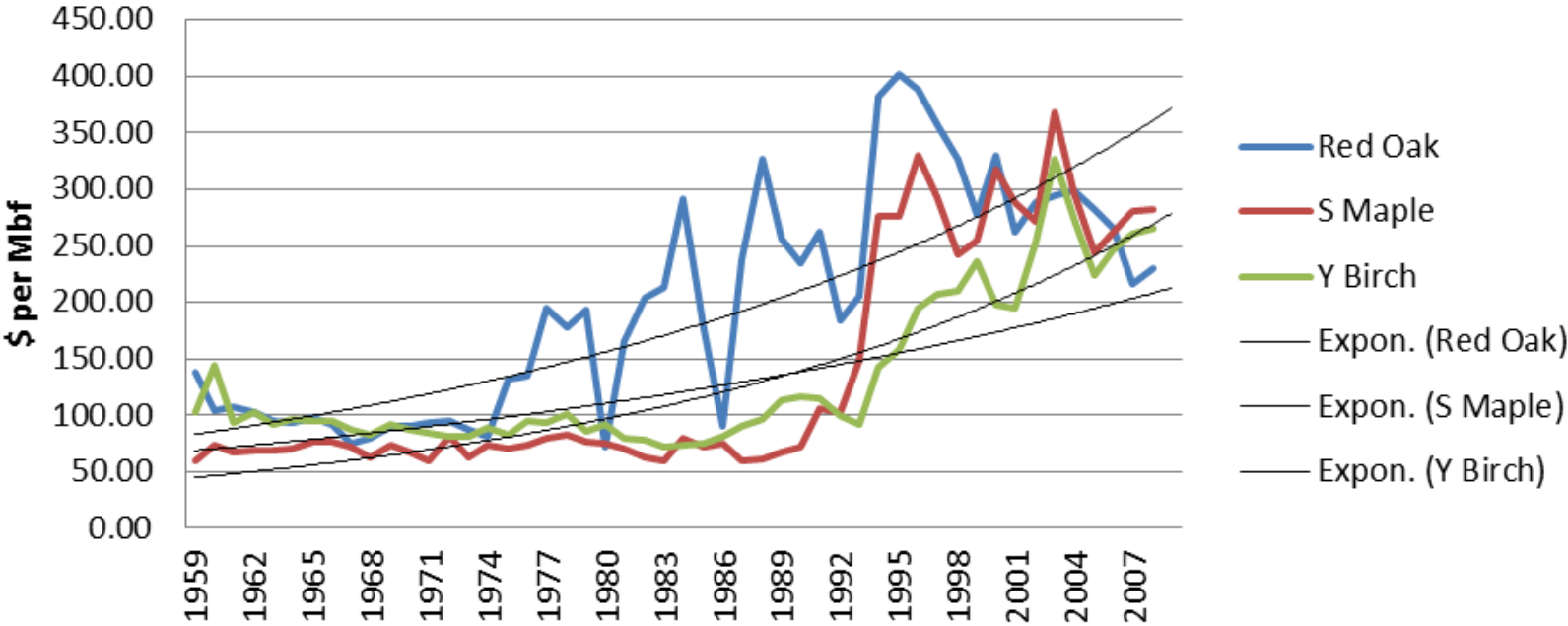
Softwood sawtimber Real Prices



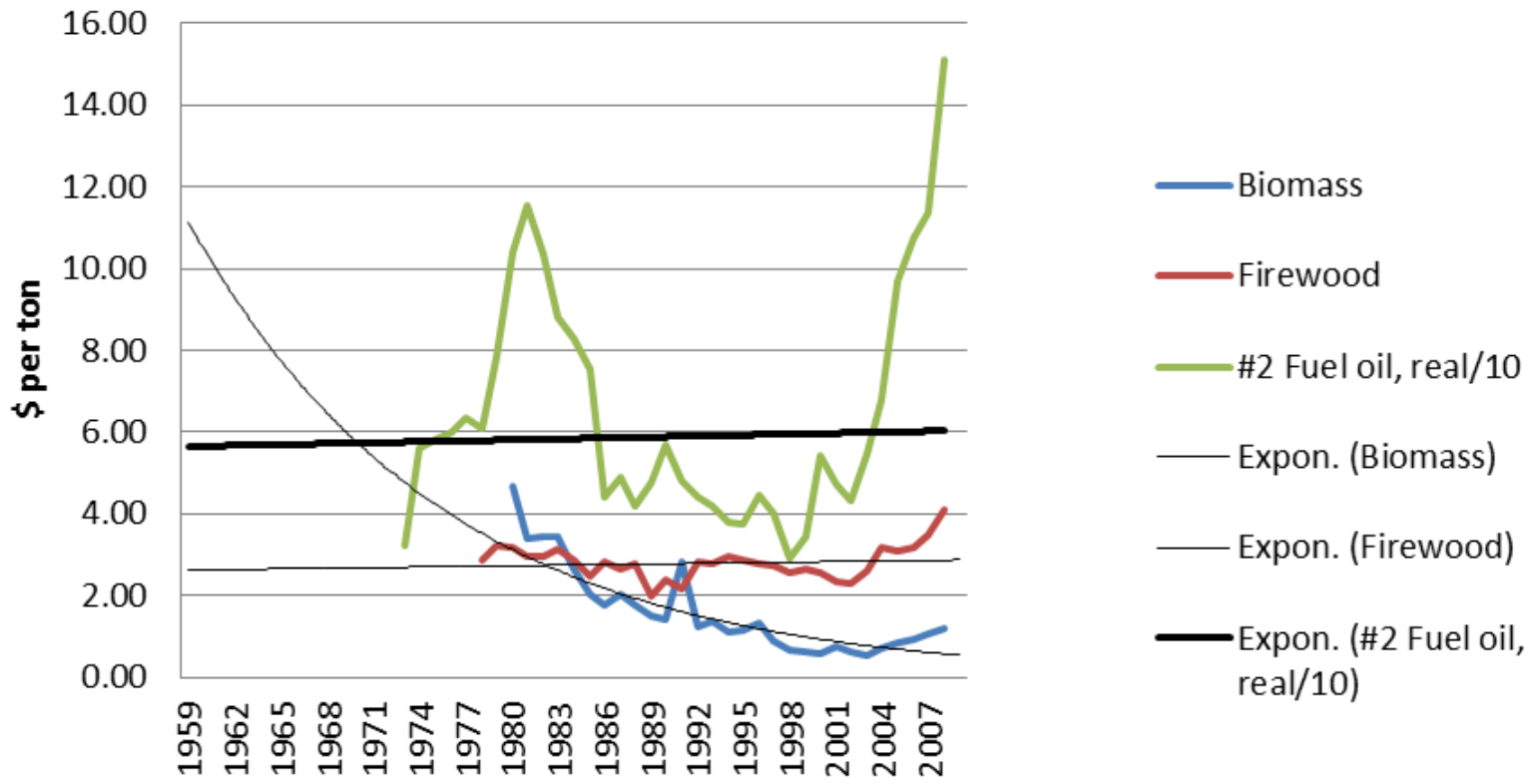
Hardwood sawtimber real prices



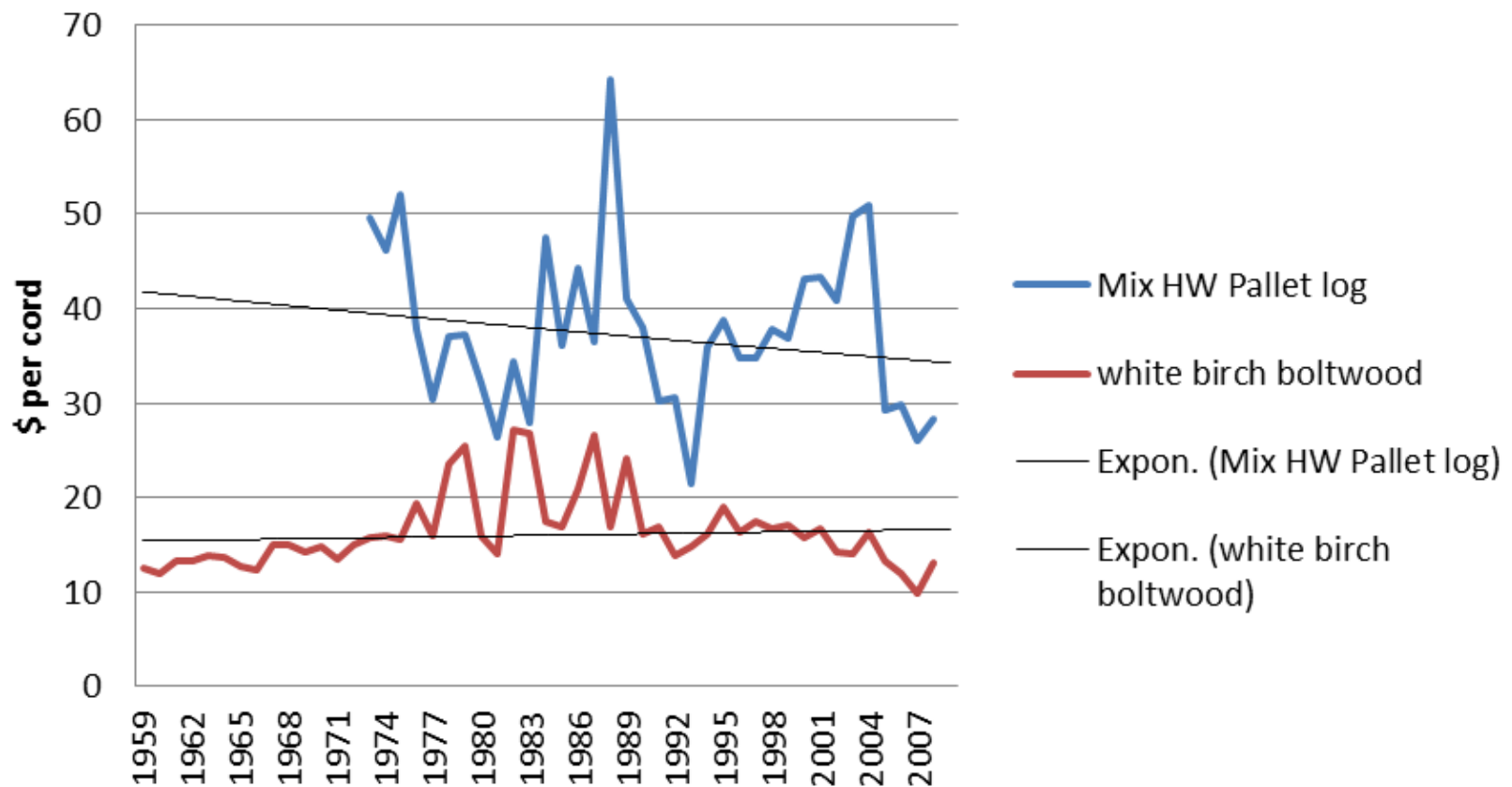
Maine Veneer Log Real Prices



Maine stumpage real prices: Energy



Maine real stumpage prices: Specialties



		Summary Table AAROC			
		PERCENT/YR			
		Nominal AAROC	R2	Real AAROC	R2
		(from "Data")		(from "PPI & CPI")	
Pulpwood	Spruce Fir	4.26	0.93	-0.44	0.26
	Pine	4.81	0.86	0.11	0.01
	N. Hardwoods	4.77	0.93	-0.25	0.08
	Aspen	5.41	0.93	0.06	0.00
	Studwood	4.22	0.84	0.51	0.05
Sawtimber	Spruce Fir	5.47	0.97	0.80	0.50
	White Pine	5.80	0.95	1.13	0.76
	Hemlock	3.70	0.96	-0.96	0.46
	Hard Maple	6.36	0.96	1.70	0.57
	Soft Maple	5.21	0.97	0.50	0.11
	White Birch	5.00	0.92	0.34	0.13
	Yellow Birch	5.40	0.96	0.73	0.40
Veneer	Red Oak	7.66	0.90	2.99	0.67
	Sugar Maple	8.31	0.93	3.65	0.67
	Yellow Birch	6.93	0.95	2.26	0.56
Energy	Biomass	-2.90	0.40	-6.04	0.73
	Firewood	3.60	0.86	0.18	0.01
	#2 Fuel Oil Real / 10	NO DATA		0.13	0.00
Specialty	Mix HW Pallet Log	4.82	0.84	0.40	0.03
	White Birch Boltwood	3.69	0.74	0.15	0.01
Note: AAROC = average annual reate of change, or compound annual growth rate. Calculated by running an exponential regression on the time series. This exploits the entire body of the data and not just beginning and end points So, calculation method will affect result.					

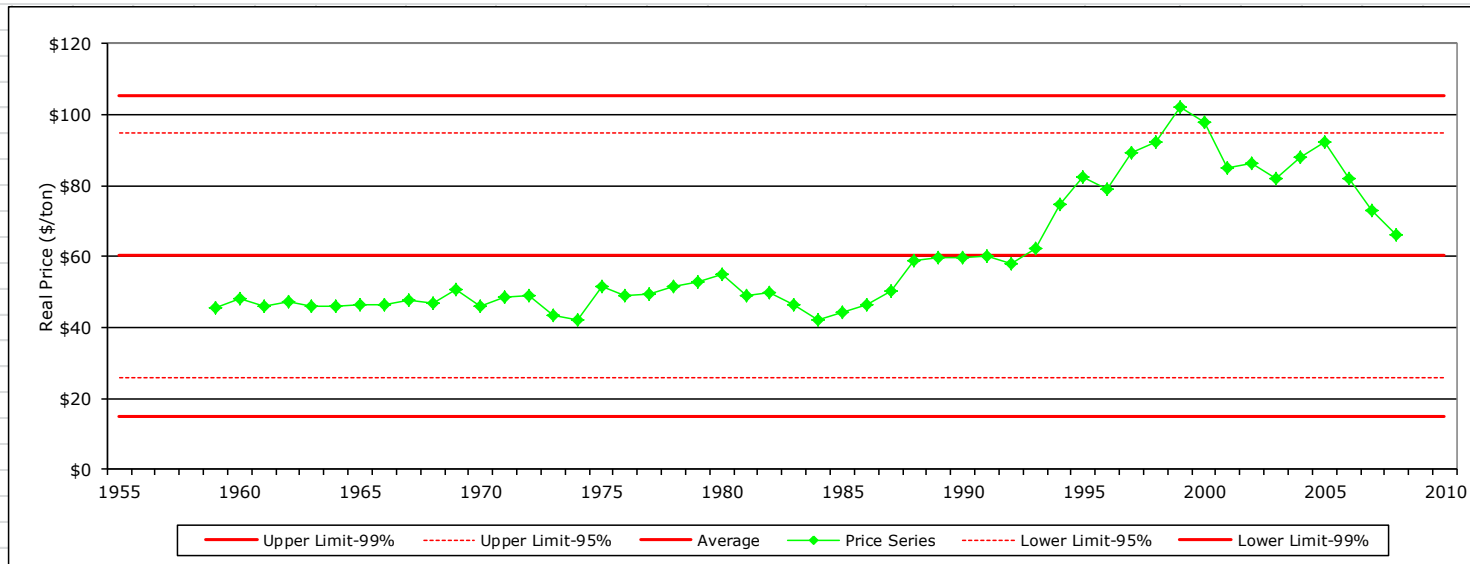
Over this period, AAROC on CPI was 4.61%. This overestimates inflation compared to just comparing end point years.

Price Analysis using Control Charts

Price Analysis

Mean Control Chart--Price Series

Maine Statewide Spruce/Fir Sawtimber Stumpage Prices (Real 1982\$)--Mean Control Chart--Price Series



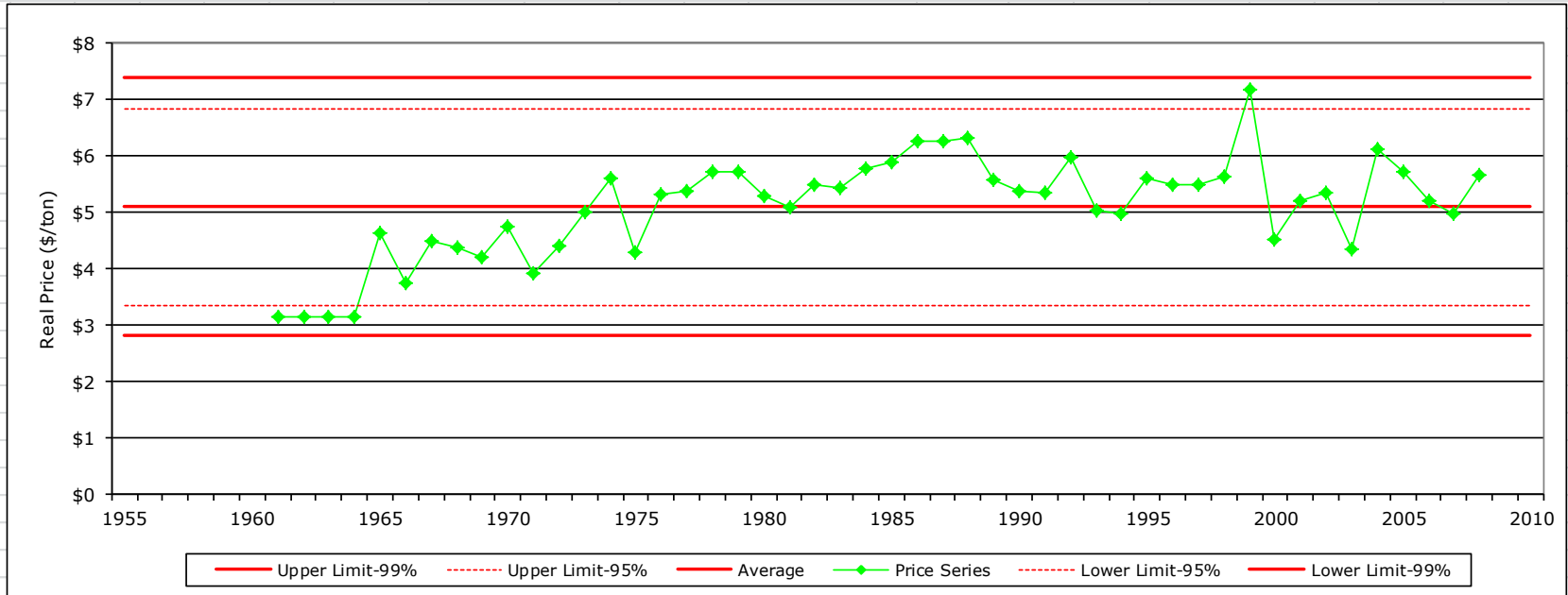
	n:	Avg Price	1st Diff	2nd Diff		Test	Actual	Result
Prices 1985-2008-Q4	50	\$60.29	\$0.41	-\$0.20	1.960 Std Dev	95.00%	2.5	2 ACCEPT
Current Reported \$/MBF		\$65.93			2.000 Std Dev	95.44%	2.3	2 ACCEPT
					2.576 Std Dev	99.00%	0.5	0 ACCEPT
					3.000 Std Dev	99.73%	0.1	0 ACCEPT

Control charts used in industry to track quality parameters. This shows Maine real spruce fir sawtimber stumpage prices to be mean-reverting over this period.

Price Analysis

Mean Control Chart--Price Series

Maine Statewide Pine Pulpwood Stumpage Prices (Real 1982\$)--Mean Control Chart--Price Series

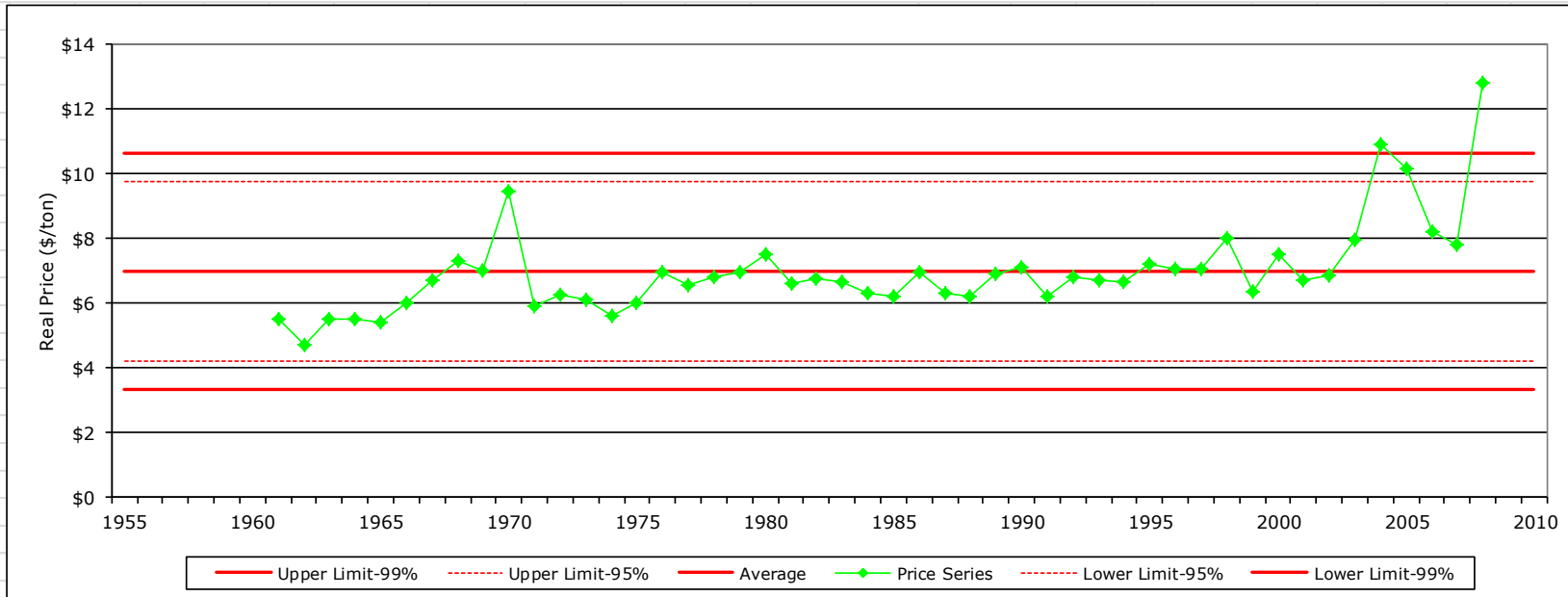


	n:	Avg Price	1st Diff	2nd Diff		Test	Actual	Result
Prices 1985-2008-Q4	48	\$5.10	\$0.05	\$0.02	1.960 Std Dev	95.00%	2.4	5 REJECT
Current Reported \$/MBF		\$5.67			2.000 Std Dev	95.44%	2.2	5 REJECT
					2.576 Std Dev	99.00%	0.5	0 ACCEPT
					3.000 Std Dev	99.73%	0.1	0 ACCEPT

Price Analysis

Mean Control Chart--Price Series

Maine Statewide Northern Hardwood Pulpwood Stumpage Prices (Real 1982\$)--Mean Control Chart--Price Series



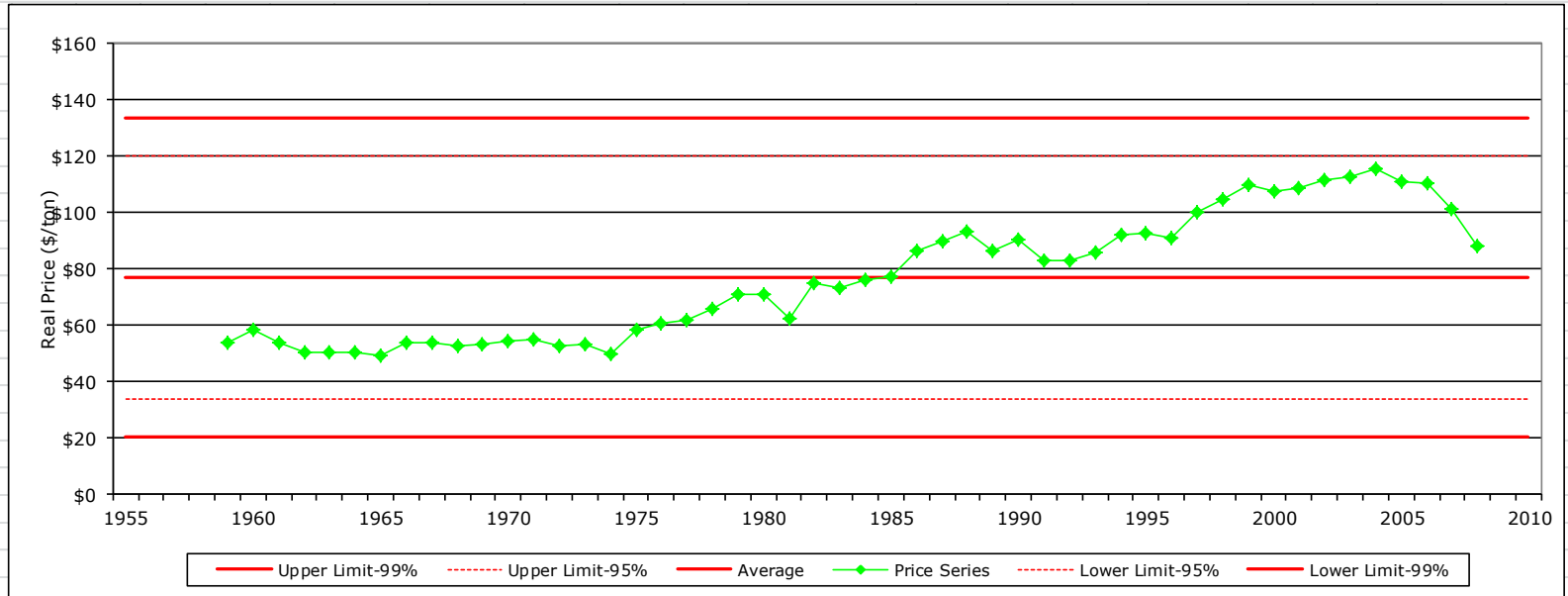
	n:	Avg Price	1st Diff	2nd Diff		Test	Actual	Result
Prices 1985-2008-Q4	48	\$6.98	\$0.15	\$0.13	1.960 Std Dev	95.00%	2.4	3 REJECT
Current Reported \$/MBF		\$12.82			2.000 Std Dev	95.44%	2.2	3 REJECT
					2.576 Std Dev	99.00%	0.5	2 REJECT
					3.000 Std Dev	99.73%	0.1	1 REJECT

Over this period, northern hardwood pulp was not mean-reverting...

Price Analysis

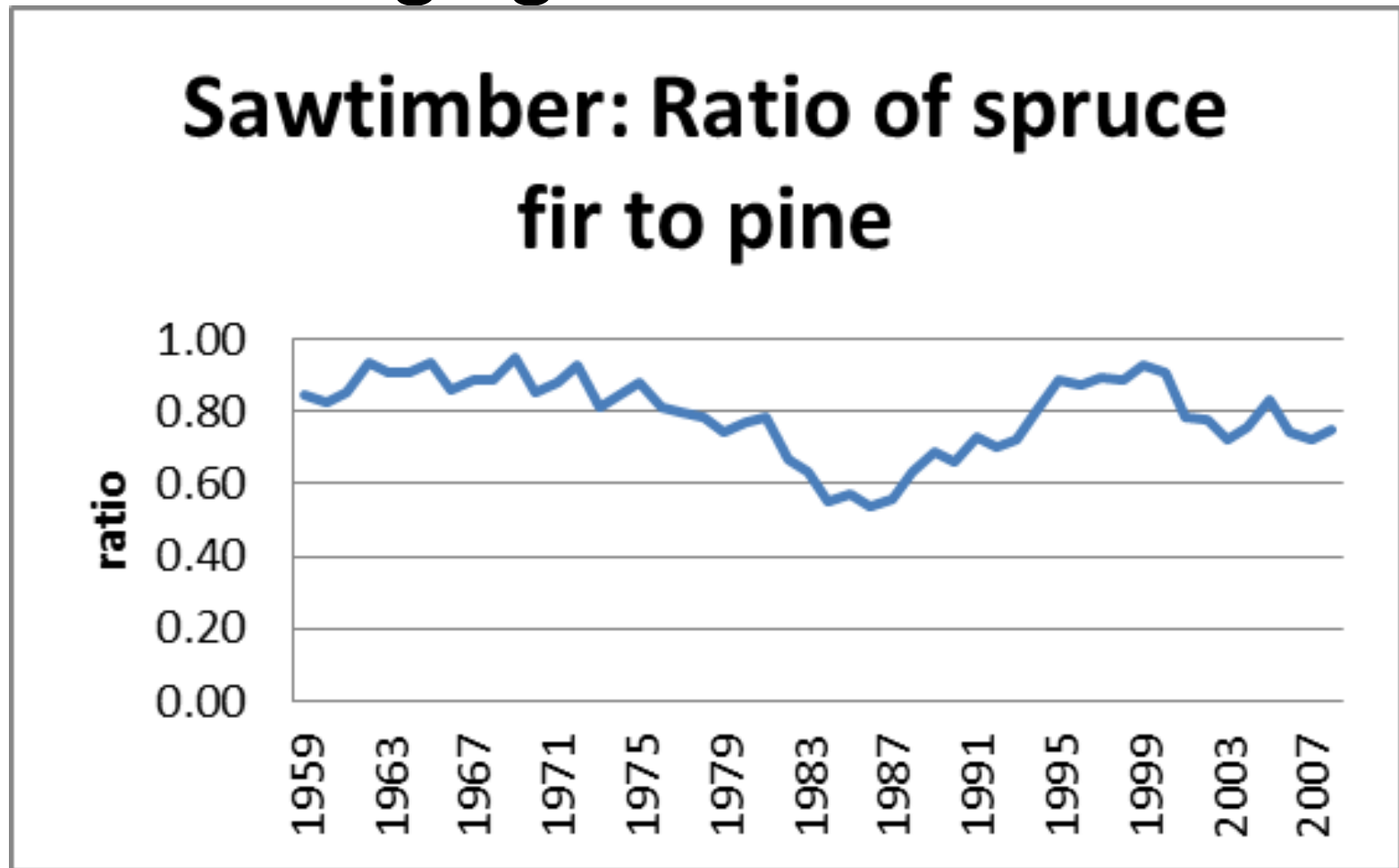
Mean Control Chart--Price Series

Maine Statewide White Pine Sawtimber Stumpage Prices (Real 1982\$)--Mean Control Chart--Price Series

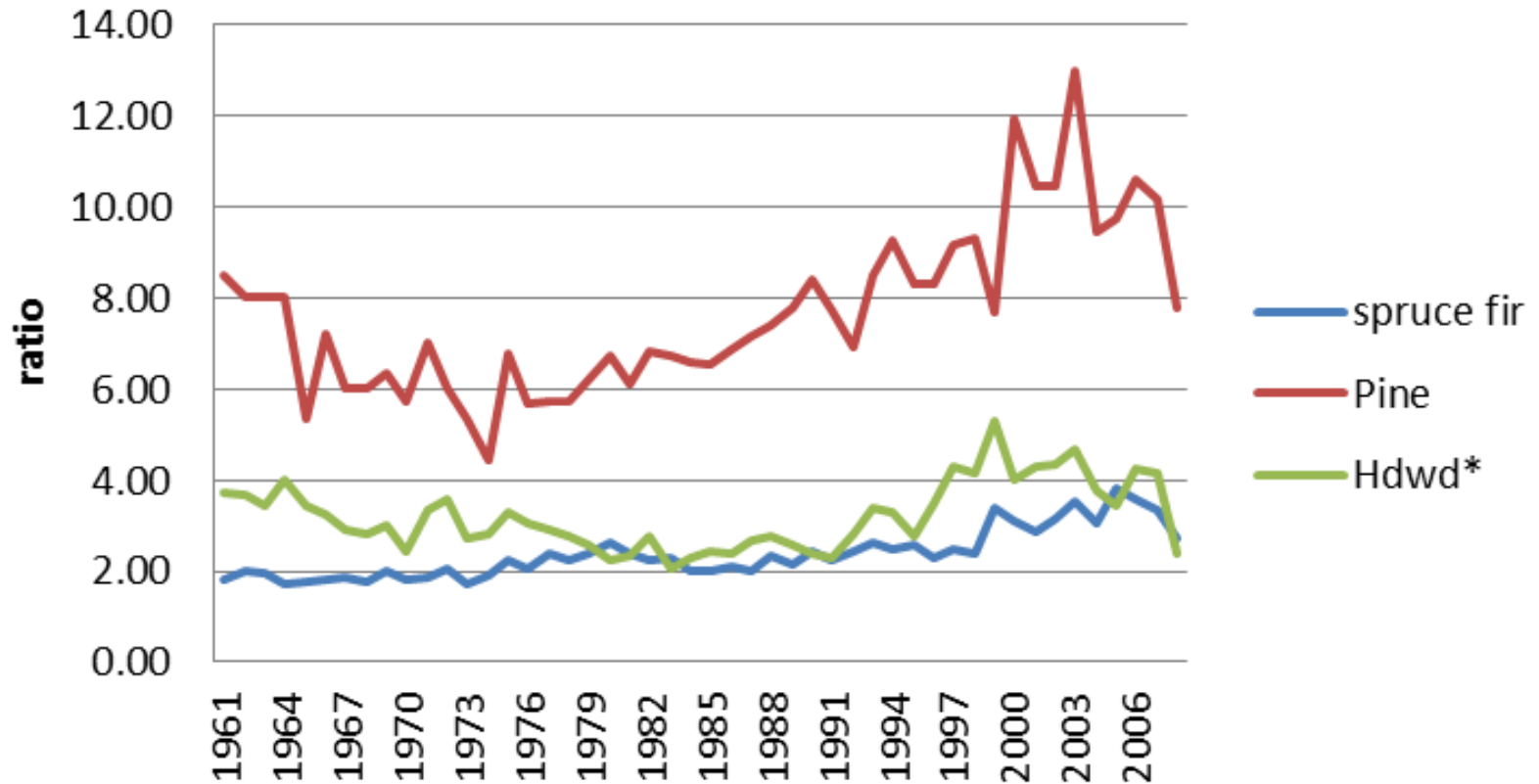


	n:	Avg Price	1st Diff	2nd Diff		Test	Actual	Result
Prices 1985-2008-Q4	50	\$77.12	\$0.70	-\$0.37	1.960 Std Dev	95.00%	2.5	0 ACCEPT
Current Reported \$/MBF		\$88.08			2.000 Std Dev	95.44%	2.3	0 ACCEPT
					2.576 Std Dev	99.00%	0.5	0 ACCEPT
					3.000 Std Dev	99.73%	0.1	0 ACCEPT

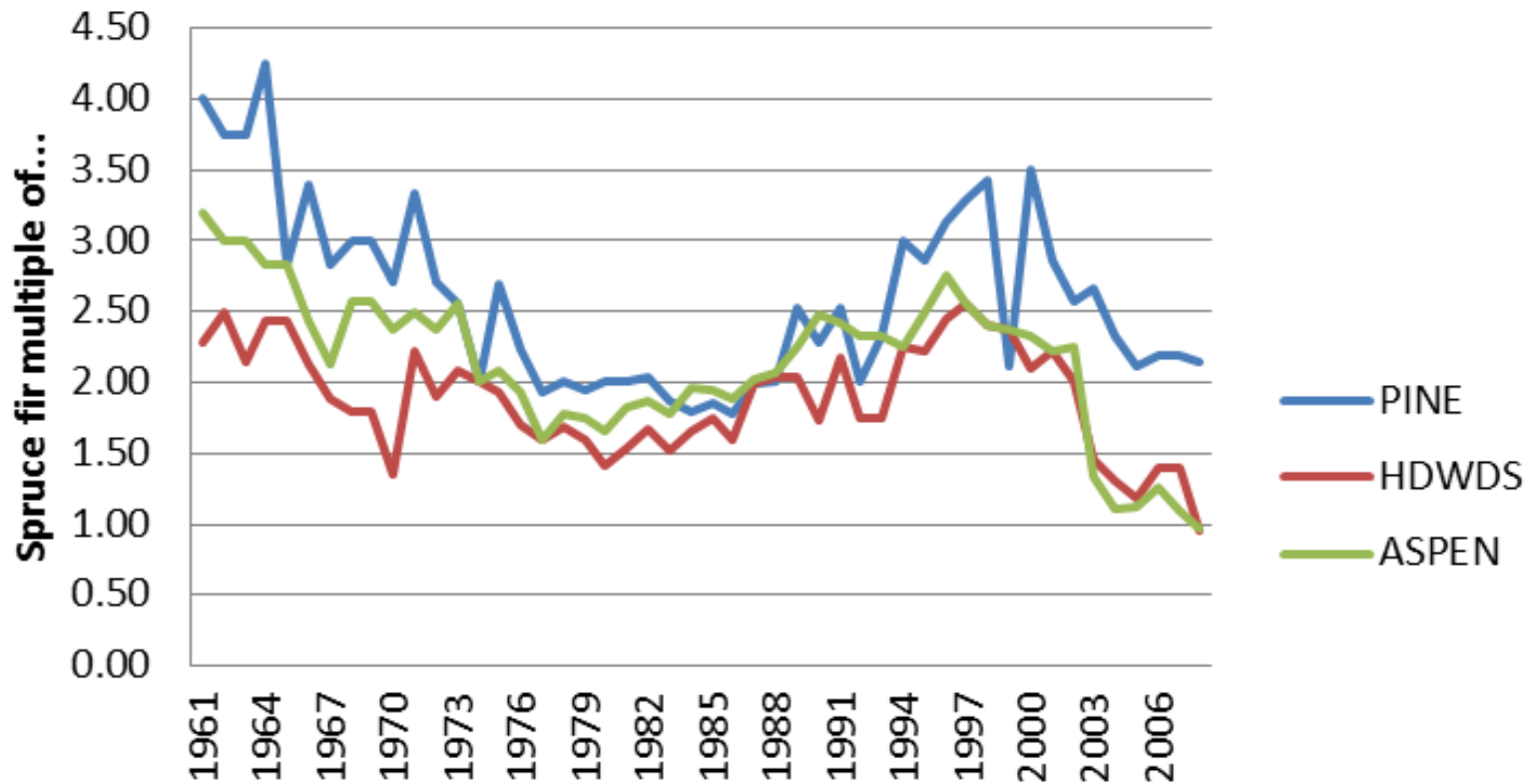
Price Ratios: Tell us something about changing relative values...



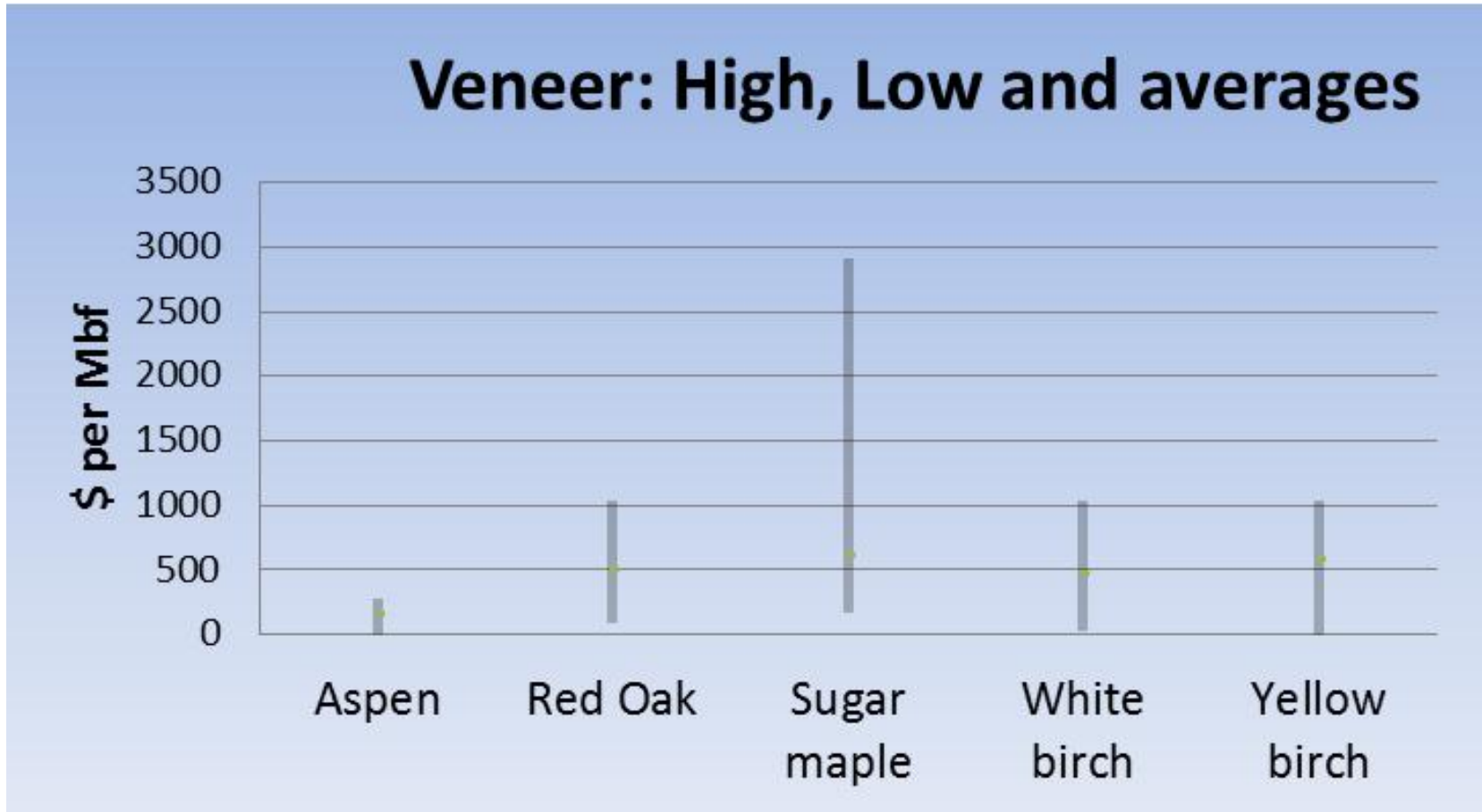
Price of Logs to Price of Pulp: Ratios



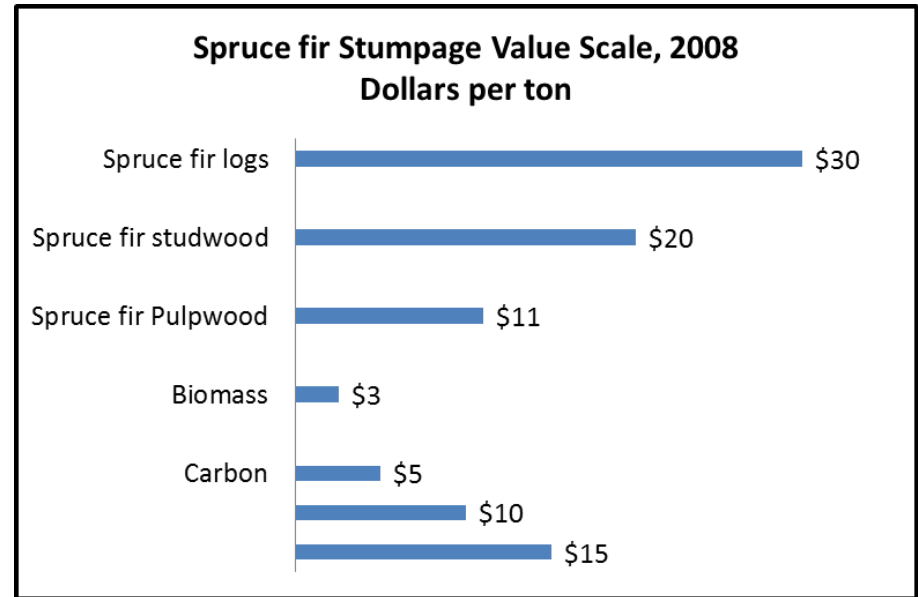
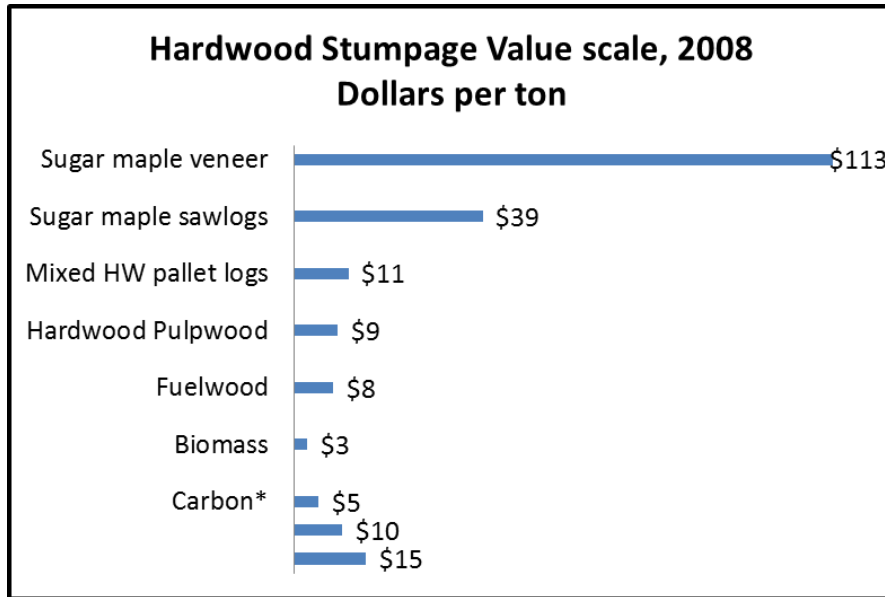
Pulpwood: Spruce-fir as multiple of...



Variability in Data is Huge: see our other handout

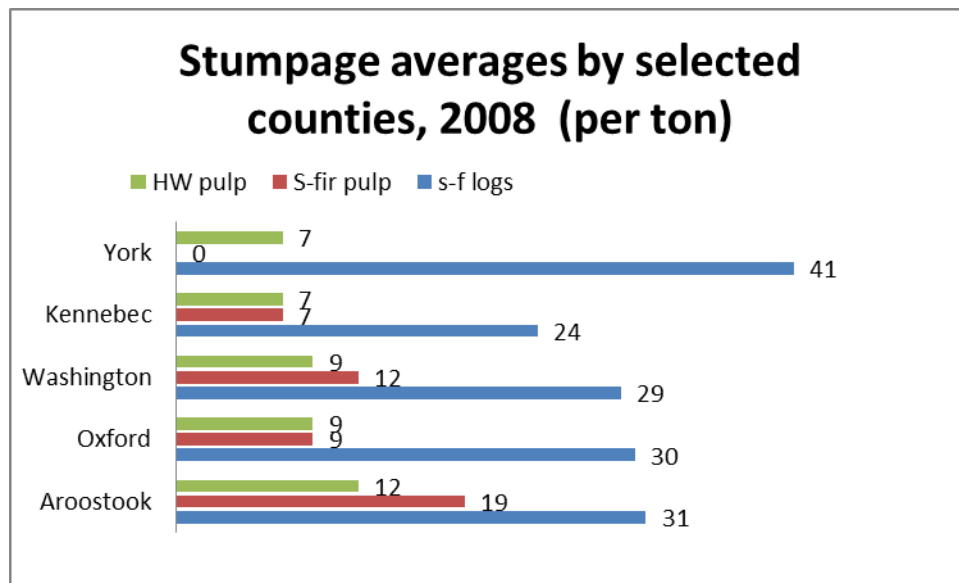


Value Scales



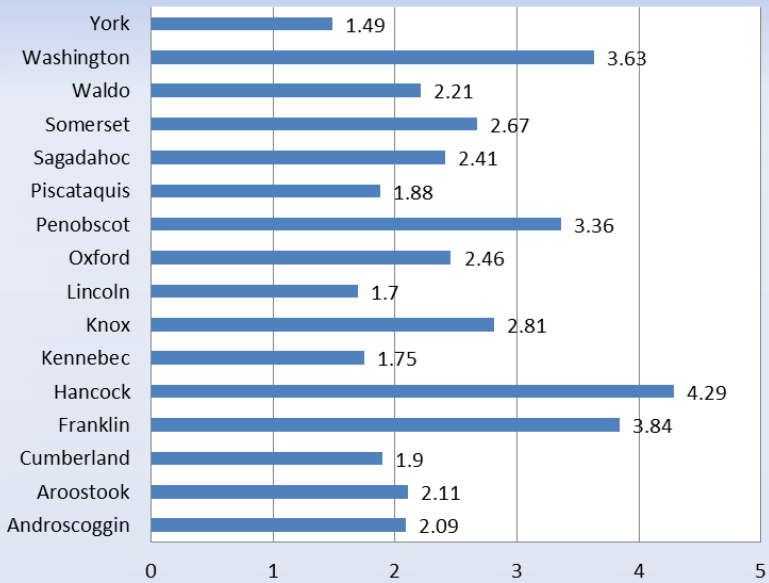
Carbon represents the value of a ton of wood solely for its carbon content, at indic. prices

Differences within State

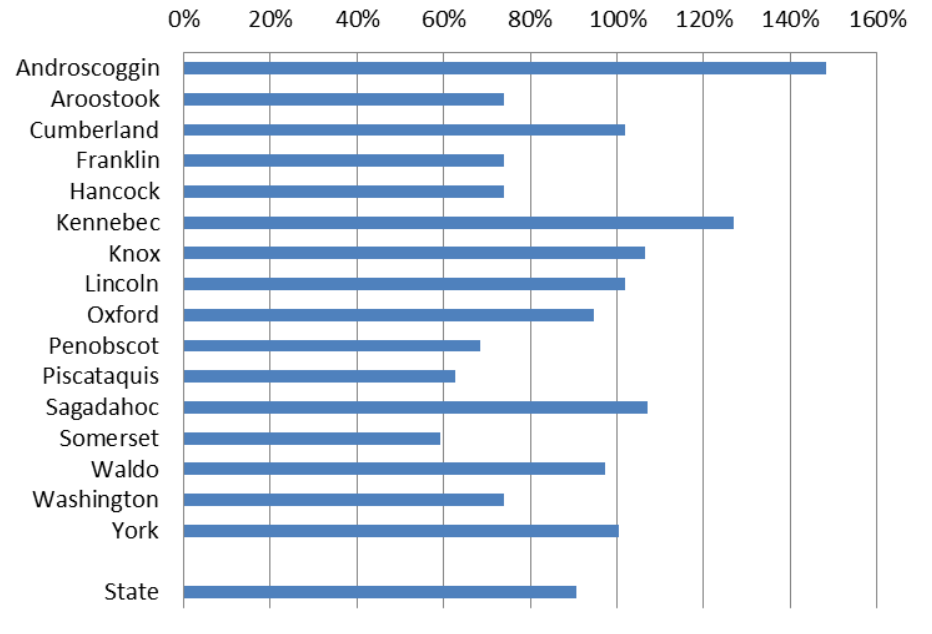


Basemap: US Bureau of Census

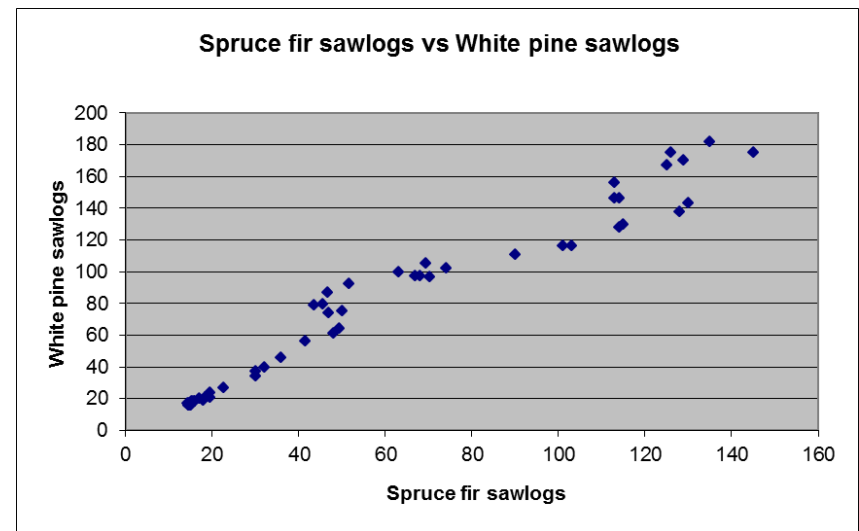
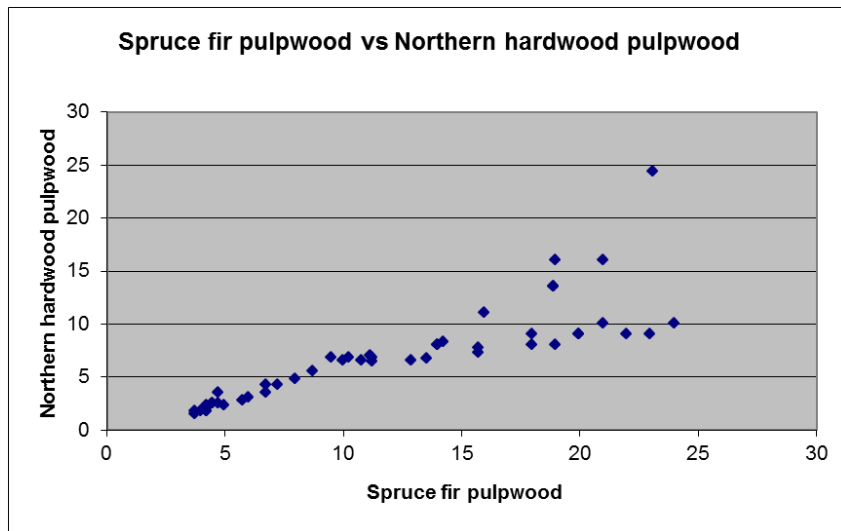
2008 Biomass stumpage prices by County



Ratio of Firewood to HW Pulp, 2008



Correlations breaking down...



Further analysis ?

- More specific comparisons across other US regions
- Develop a “model property” and see how its revenue would have changed, under assumed cutting policy, over this period
- Analyze subperiods within the half-century:
A major break in supply/demand conditions occurred in mid-period, during 70s & 80s – but not at same time for all products
- Big project: How would prices have changed if we could strip out effect of changing utilization standards (e.g a “hedonic” index) (phd dissertation, anyone?)
- Other ideas?

Significance for Forest Investors & Managers

- Generally stumpage kept up with inflation, but only barely (largely due to recent market conditions)
- Veneer, some sawlogs outdid inflation well
- Significant break in market dynamics in mid period means that AAROCs may conceal more than they reveal.
- Investors with 10-20 yr time horizons should beware relying on longterm AAROCs
- To 2008, most of these time series pass a mean-reversion test (e.g not random walk)

Significance...

- Traditional price spreads between products and species no longer stable
- Despite rising energy costs, real prices of fuelwood stumpage barely increased; biomass fell significantly.
 - Your thoughts???