

Causal Impacts of COVID-19 Pandemic Policies on Timber Markets in the Southern United States

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Agenda

- Background
- Objectives
- Method
- Preliminary Findings
- Moving Forward

COVID-related Preference Changes

Effects on Forest Industry

- Logging and construction not “remote work” (supply side)
- Mill closures (demand side)
- Initial decrease in demand for wood (demand side)
- Stockpiling behavior and DIY home improvements (demand side)

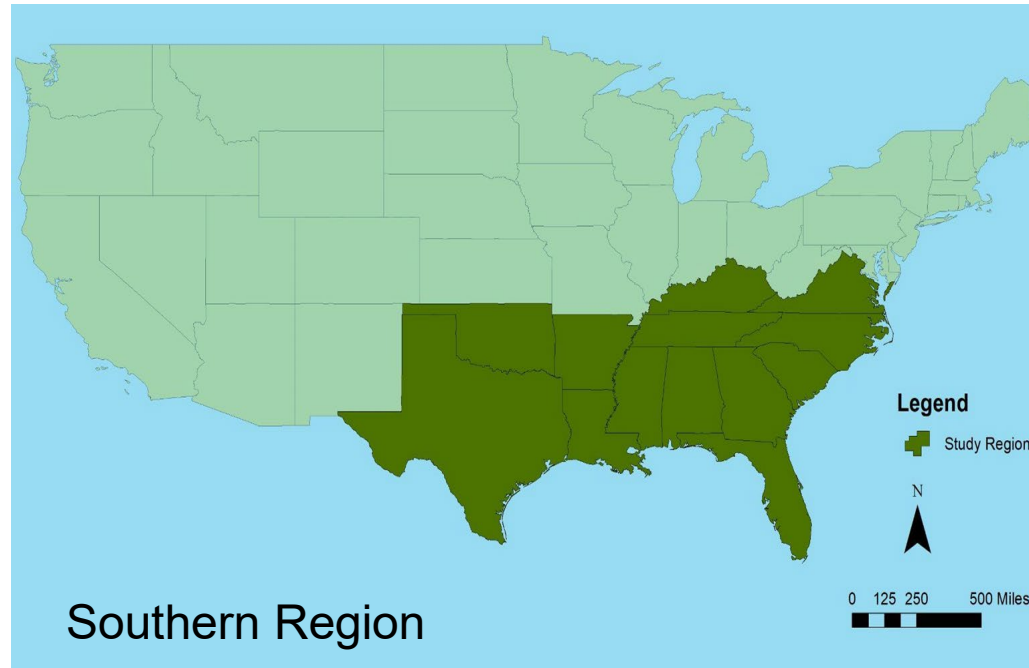
Study Question

How do COVID lockdown policies across counties in the Southern U.S. affect prices of various stumpage products?

Research method

Time Regression Discontinuity Design (T-RD): Causal Inference

Study Region



Forest2Market 39 Micromarkets



FOREST2MARKET

COVID Policies by County

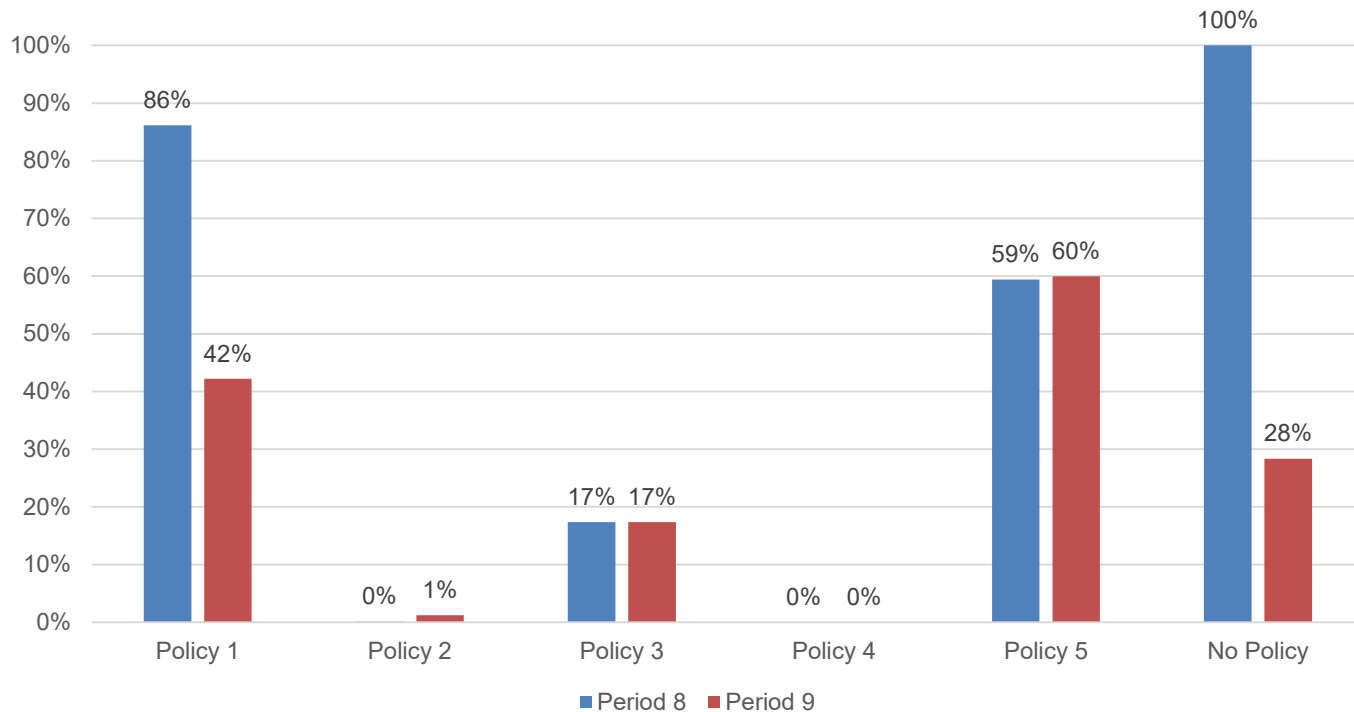
Policy 0	No Policy or Order to Stay Home
Policy 1	Mandatory for all individuals
Policy 2	Mandatory only for all individuals in certain areas of the jurisdiction
Policy 3	Mandatory only for at-risk individuals in the jurisdiction
Policy 4	Mandatory only for at-risk individuals in certain areas of the jurisdiction
Policy 5	Advisory or recommendation to stay at home



Data Broken into Bi-monthly “Periods”

Period 1	Jan-Feb 2019	Period 7	Jan-Feb 2020
Period 2	Mar-April 2019	Period 8	Mar-April 2020
Period 3	May-June 2019	Period 9	May-June 2020
Period 4	July-Aug 2019	Period 10	July-Aug 2020
Period 5	Sept-Oct 2019	Period 11	Sept-Oct 2020
Period 6	Nov-Dec 2019	Period 12	Nov-Dec 2020

Counties in the U.S. South
 (AL, FL, GA, LA, MS, NC, SC, TN, VA, AR, TX)
 with Policies 1-5 that have occurred at least one time during
 Period 8 or 9 (March-April, May-June 2020)



Model

COVID Policy on Timber Price

Dataset is bi-monthly, starting Jan. 2019 and ending Dec. 2020 (Timber price data source: Forest2Market)

$$\ln(\text{Price}_{i,t}) = \beta_0 + \beta_1 \text{After} + \theta_t Z_i + \phi f(\text{time}) + \chi \text{After} * f(\text{time}) + \lambda_i + \delta_t + \lambda_i * \delta_t + \varepsilon_{i,t}$$

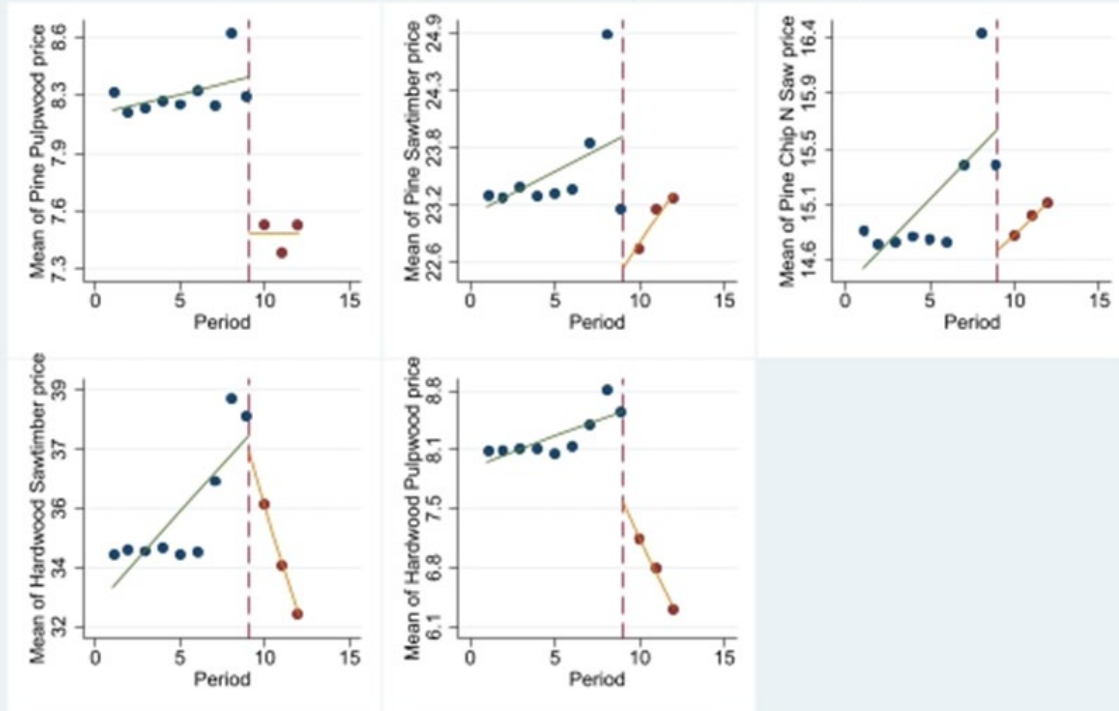
Where β_1 is the coefficient of interest → estimates the effect of COVID-policies on wood products prices

Model Assumptions:

- 1. The price discontinuity at the time period of COVID-policy implementation is the policy itself*
- 2. The identification strategy is violated if there is self-selection at the cut-off*
- 3. Serial dependence is a problem (prices are correlated to their prior value)*
- 4. The time window chosen is important*

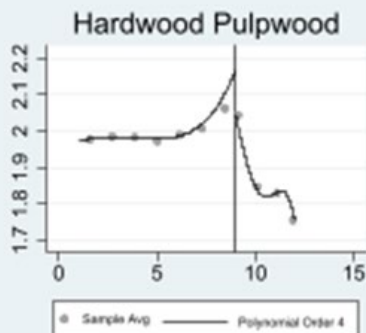
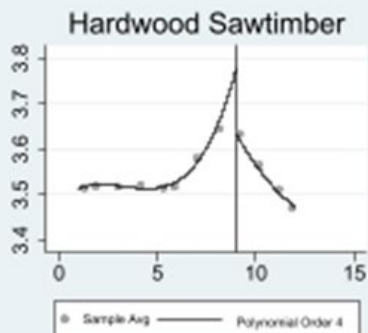
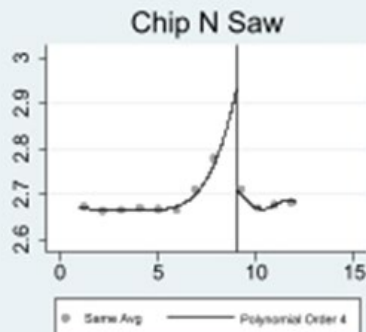
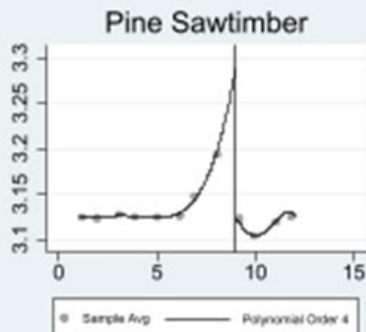
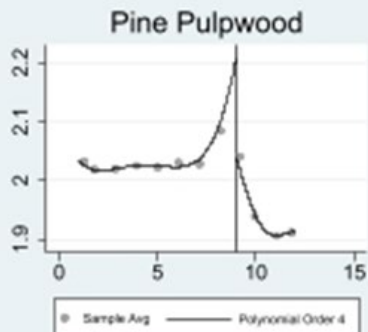
Findings

Mean Price of Roundwood Products in U.S. South
Discontinuity at Period 9 (May-June 2020)



Regression Function Fit

Mean Price (ln) of Roundwood Products in U.S. South



Example: Pine Pulpwood

Pine Pulpwood	Left of Cutoff	Right of Cutoff
Effective Number of Obs.	2751	3668
Rho	0.612	0.612
	Coefficient	Standard Error
Conventional	-0.2634***	-0.0678
Bias Corrected	-0.3126***	-0.0678
Robust	-0.3126***	-0.0905

T-RD Estimates: Causal Inference for COVID-19 Policies in the U.S. South

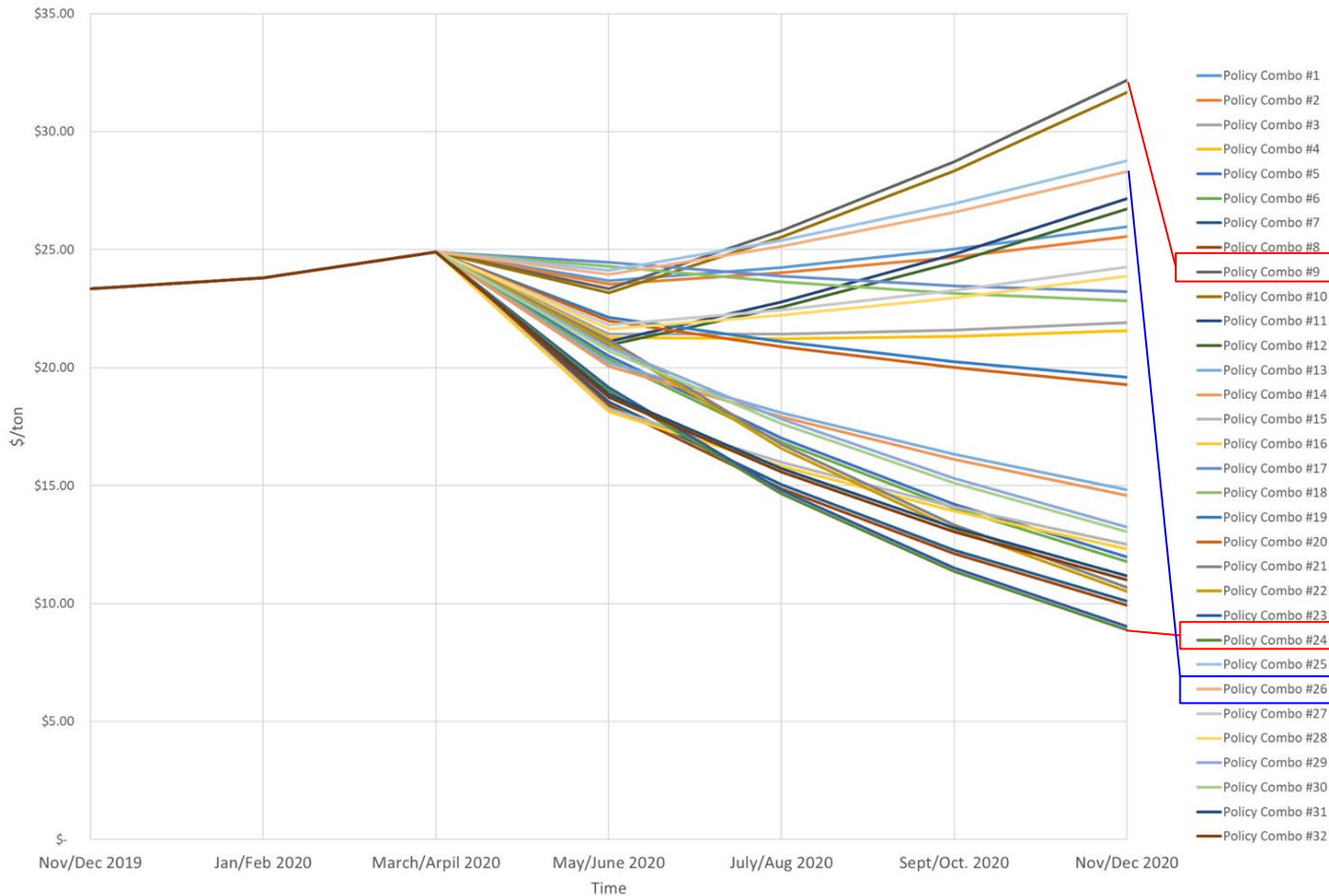
Regression Type	Product Type	Estimated Price Decrease per Ton (Cut Period 9)
Kink T-RD	Pine Pulpwood	26-31%
Kink T-RD	Pine Chip N Saw	5-7%
Kink T-RD	Pine Sawtimber	12-14%
Sharp T-RD	Hardwood Sawtimber	14-16%
Sharp T-RD	Hardwood Pulpwood	30-49%

Policy Combination #26:
Policy 0, Policy 1, Policy 5

Policy Combination #9:
Policy 1

Policy Combination #24:
Policy 0, Policy 2,
Policy 3, Policy 5

Pine Sawtimber Expected Prices with Policies Held Constant



Conclusions & Moving Forward

- Hardwood Pulpwood most affected, Pine Chip N Saw least affected
- Assumptions Tested (not presented today)
- Future market shocks? Demand side shocks?
- Moving Forward → Individual Policies Examined

Thank You!

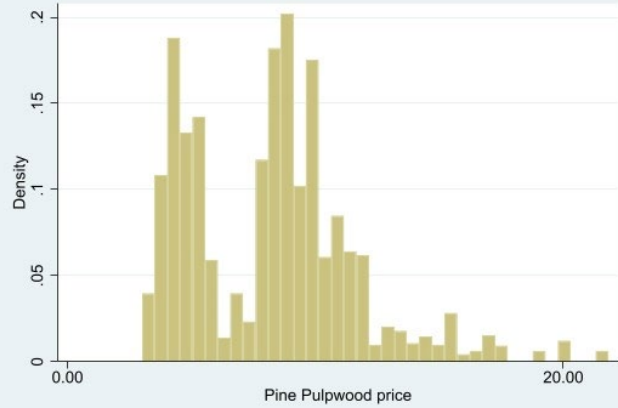
Questions or Comments?

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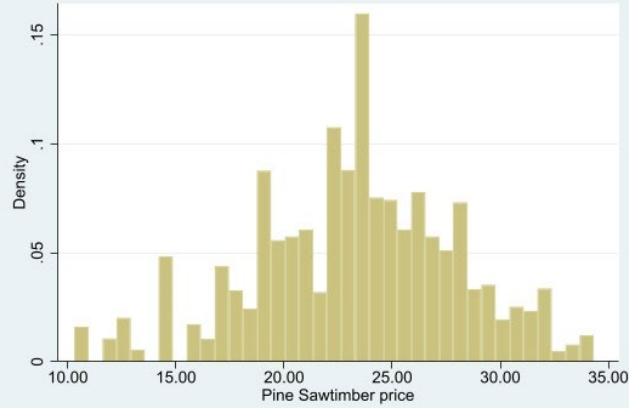
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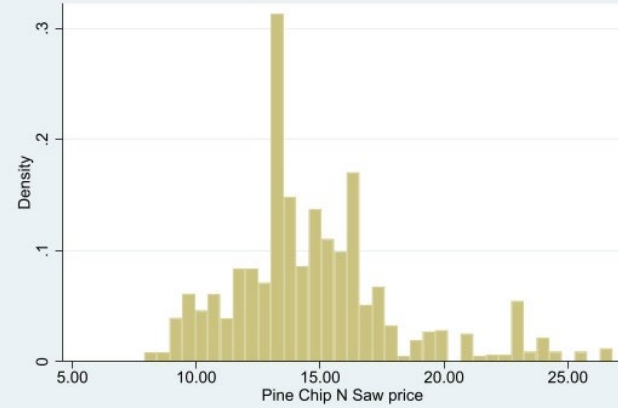
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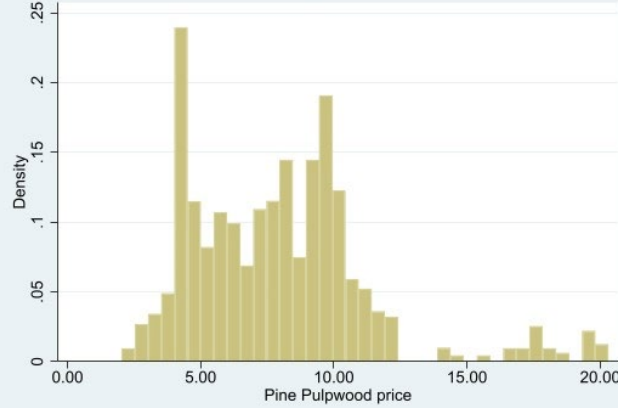
2019



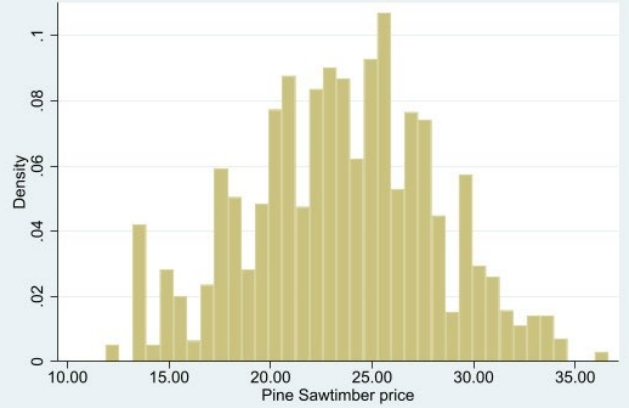
2019



2020



2020



2020

