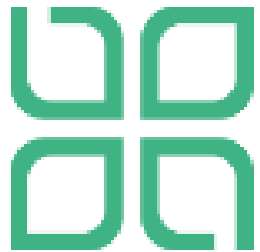


Value Discovery in FRASS

RPA FORECAST TOOL



International
Forest Business
Conference

7-8 December 2020



WASHINGTON STATE
UNIVERSITY

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Real Price Appreciation Forecast Tool

- ▶ **Real Price Appreciation Forecast tool:** Two delivered log market price cycles in the Puget Sound markets of western Washington, USA, from 1992 through 2019
- ▶ Published April 2020
- ▶ Web Domain about FRASS including the RPA Forecast Tool
- ▶ <http://forest-econometrics.com/>

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journal homepage: www.elsevier.com/locate/forpol



Real price appreciation forecast tool: Two delivered log market price cycles in the Puget Sound markets of western Washington, USA, from 1992 through 2019



William E. Schlosser*

Washington State University, School of the Environment, Pullman, WA 99163, USA

- ▶ <https://doi.org/10.1016/j.forpol.2020.102114>

Journal of Forest Policy and
Economics

Forest Econometrics

Timber Sale Type

▶ Stumpage Timber Sale

- Buyer is:
 - Logger
 - Road Builder
 - Merchandiser
 - Logging Truck Contractor
- Buyer is Seller of Logs to Mills

Landowner Sells Trees

▶ Delivered Log Sale

- Landowner Contracts:
 - Logging operator w/ trucking
 - Forestland Owner Decides where logs are delivered and terms of log sales
 - Log Buyer Pays Forestland Owner

Landowner Sells Logs

Real Price Appreciation Forecast Tool

► Nominal Prices

- These are seen every day- cost on the barrel head.
- Cost or Price using today's value in today's terms of the economy.

State The Date

► Real Prices

- Nominal costs adjusted for the terms of your economy to adjust for inflationary forces
- USA: Bureau of Labor Statistics
 - Inflation
 - Recession or Depression
- These are Constant Currency Terms

State the Real Value Pivot Date

USA: Bureau of Labor Statistics

Shaded Bars are Recessions

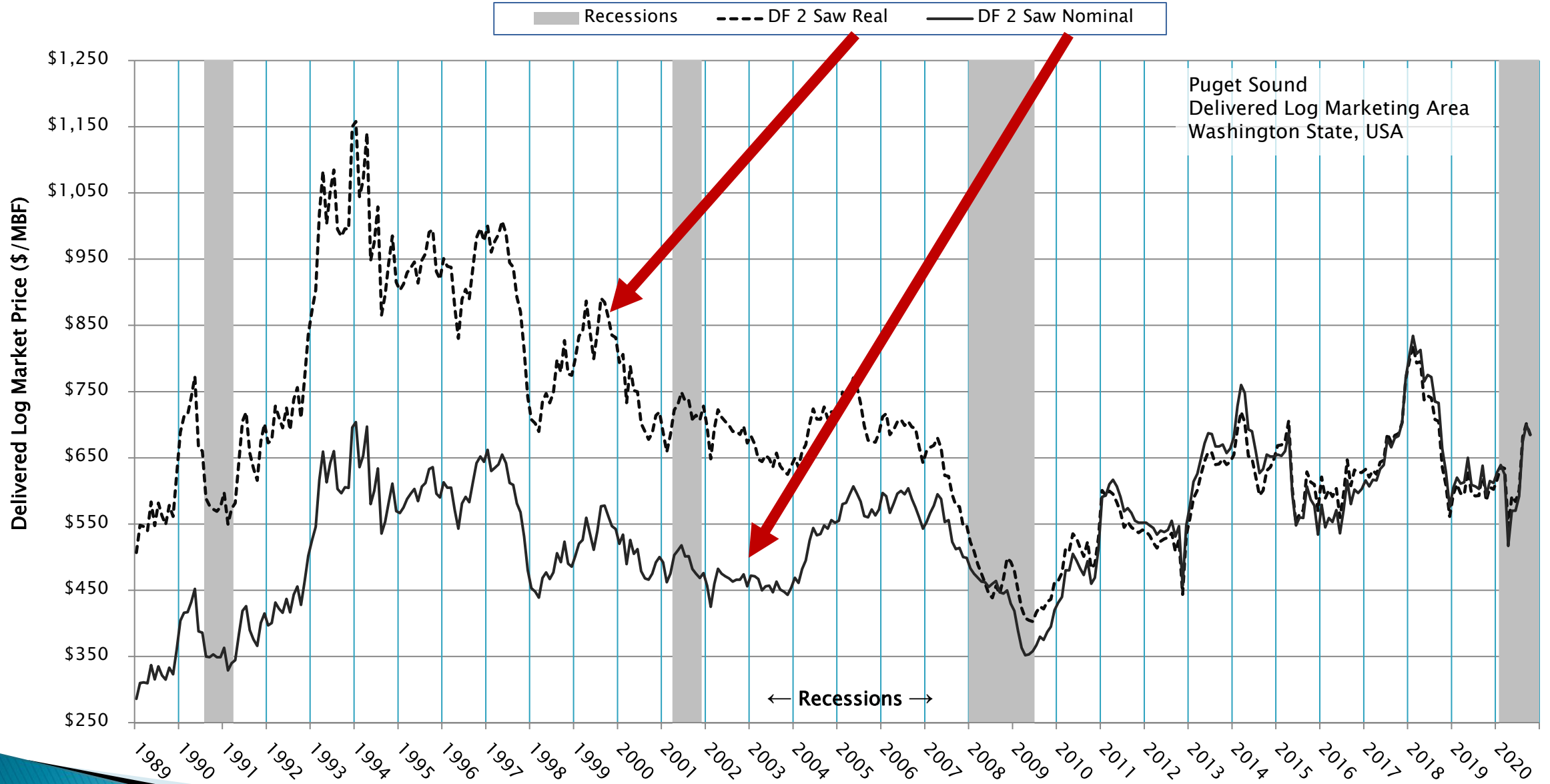


Great Recession

No Recession?

Covid-19 Recession?

Douglas-fir 2 Sawmill Nominal & Real²⁰²⁰¹⁰



Volume, Price & Cost

- Price & Cost Forecasts must be integrated with Growth & Yield Projections



**Biometric
Predictions**

**Delivered Log
Price Forecasts**

**Logging Cost
Expectations**

2019

- Log Prices
- Logging Costs

2020

- Log Prices
- Logging Costs

2021

- Log Prices
- Logging Costs

2022

- Log Prices
- Logging Costs

2023

- Log Prices
- Logging Costs

2024

- Log Prices
- Logging Costs

2025

- Log Prices
- Logging Costs

2030

- Log Prices
- Logging Costs

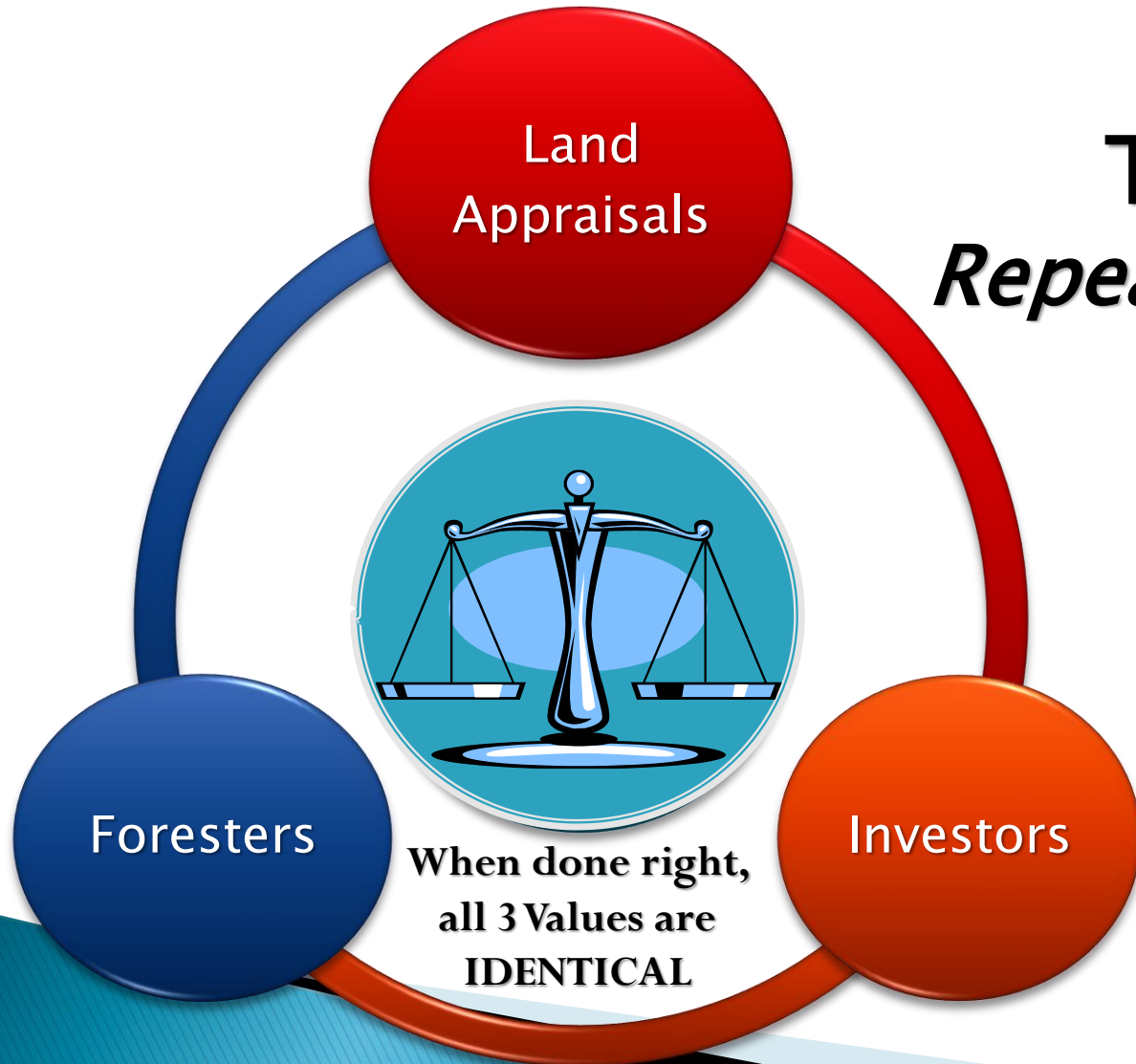
...

2220

- Log Prices
- Logging Costs



Financially Optimal Harvest Timing



Timing is EVERYTHING
Repeatable & Accurate forecasting

- ▶ Land Appraisers need price forecasting to accurately establish timberland value.
- ▶ Investment Managers need to know the value of the asset for financial statement analyses.
- ▶ Forestland Managers need to make revenue and cost projections when deciding when to harvest timber on each stand.

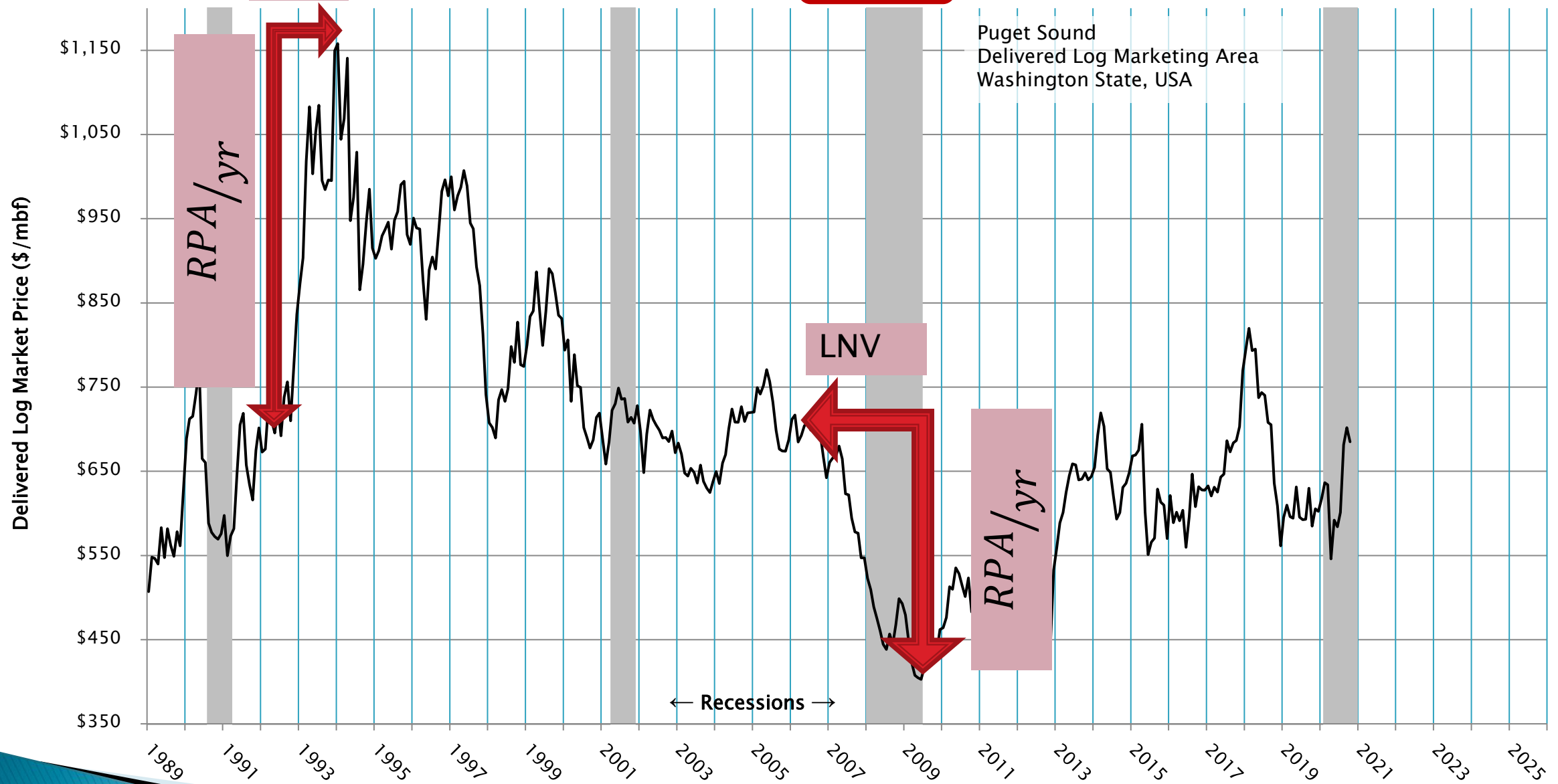
Real Price Appreciation Forecast Tool

- ▶ RPA Forecast Tool is NOT Regression Analysis
- ▶ IS a mathematical model responsive to macroeconomic cycles and commodity valuation forces
- ▶ Predicts price cycles for commodities within a specific market area
- ▶ Markov-chain of order following a random-walk

Created in 2010, during the
aftermath of the Great Recession



Douglas-fir 2 Sawmill Real₂₀₂₀₁₀ with RPA Forecast



RPA Forecast Tool

$$PF_t^{\$} = IP_t^{\$} \times \left\{ 1 + \left([RPA/yr] \times t \times 2^{\left[1 - \left\{ t / (LNV \times \{\ln(2)\}) \right\} \right]} \right) \right\}$$
$$RPA/yr = \left[\frac{LNV \sqrt{TP_t^{\$}}}{\sqrt{IP_t^{\$}}} - 1 \right] = \left[\frac{2.92 \sqrt{402.83^{\$}}}{\sqrt{701.21^{\$}}} - 1 \right] = 0.1729$$

where:

$PF_t^{\$}$: RPA adjusted commodity real price forecast determined for time point “t”

$IP_t^{\$}$ = Cycle initiation real price

RPA/yr : Calculated RPA rate using date specific real price

LNV = Longevity duration from initiation date to turning-point date

t = Number of years from cycle initiation date to the date of price prediction

RPA Forecast Tool

$$PF_t^{\$} = 701.21_t^{\$} \times \left\{ 1 + \left([0.1729] \times 14.42 \times 2^{\left[1 - \left\{ 14.42 / (2.92 \times \{\ln(2)\}) \right\} \right]} \right) \right\}$$

$$PF_t^{\$} = 676.13_{202012}^{\$}$$

where:

$PF_t^{\$}$: RPA adjusted commodity real price forecast determined for time point “t”

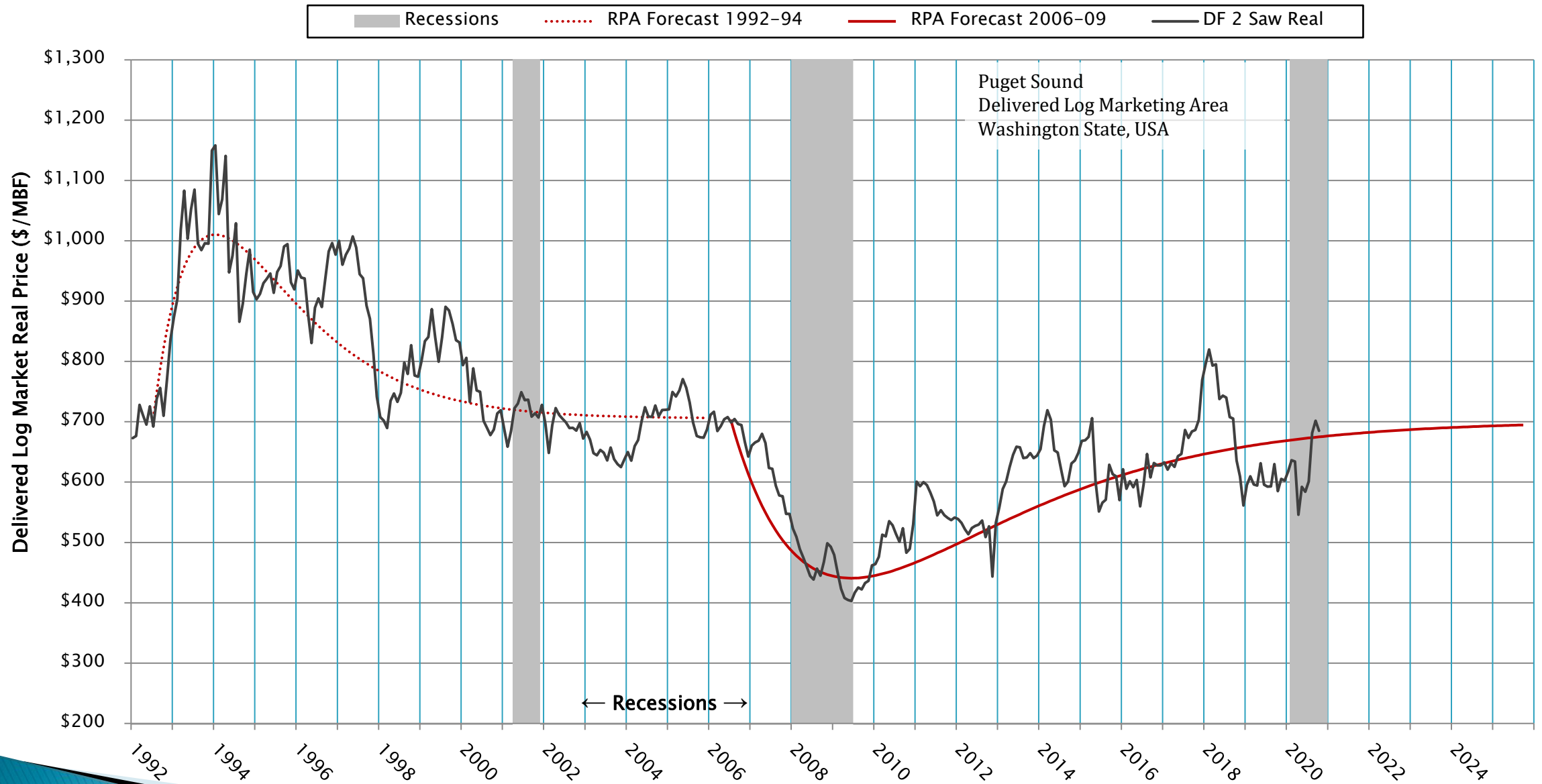
$IP_t^{\$}$ = Cycle initiation real price

RPA/yr : Calculated RPA rate using date specific real price

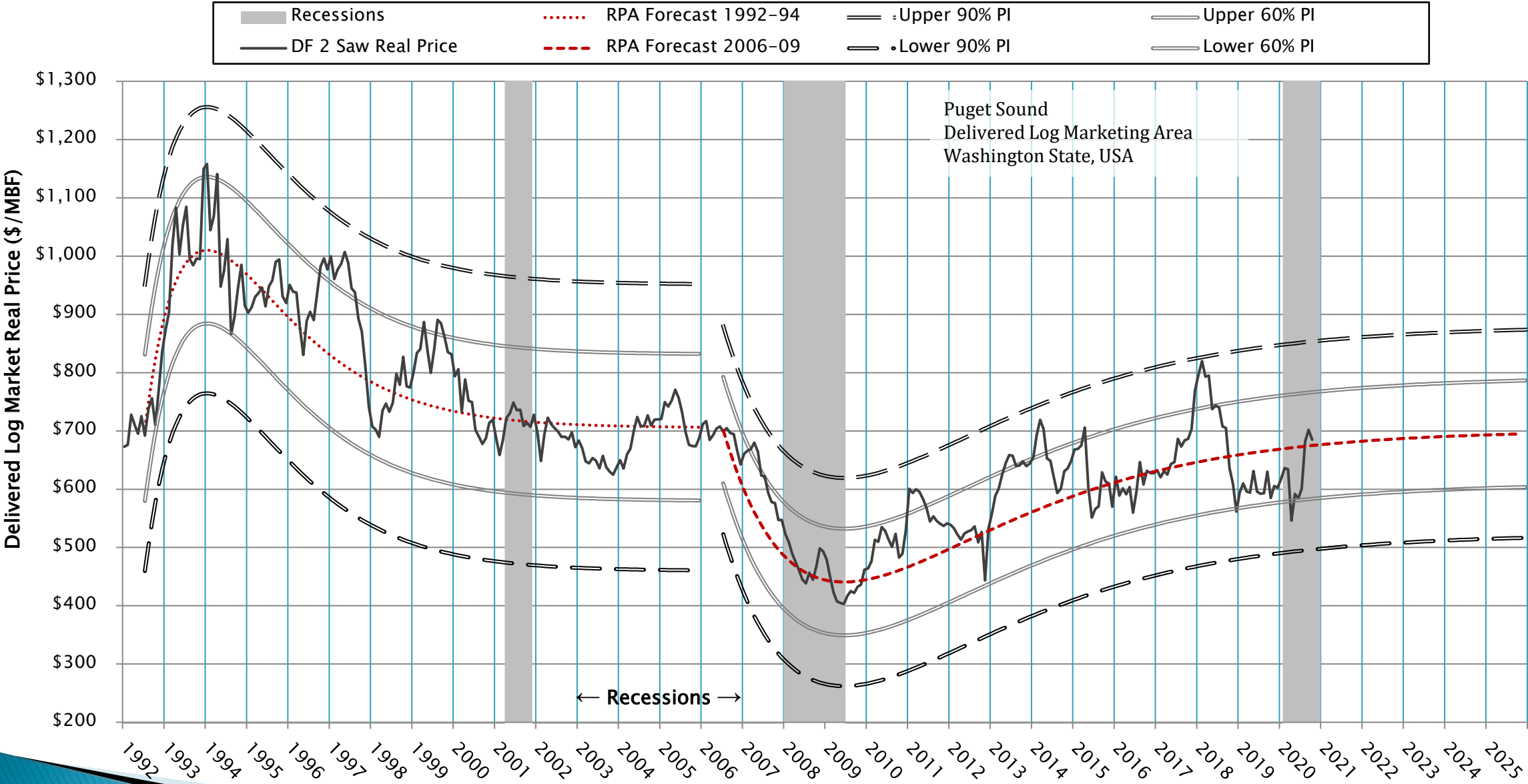
LNV = Longevity duration from initiation date to turning-point date

t = Number of years from cycle initiation date to the date of price prediction

Douglas-fir 2 Sawmill Real₂₀₂₀₁₀ with RPA Forecasts



Douglas-fir 2 Sawmill Real₂₀₂₀10 with Prediction Intervals



Reserve Price Forecasts



Where was your 2020 price prediction?

Douglas-fir SM and Better Real 201807 with RPA Forecast

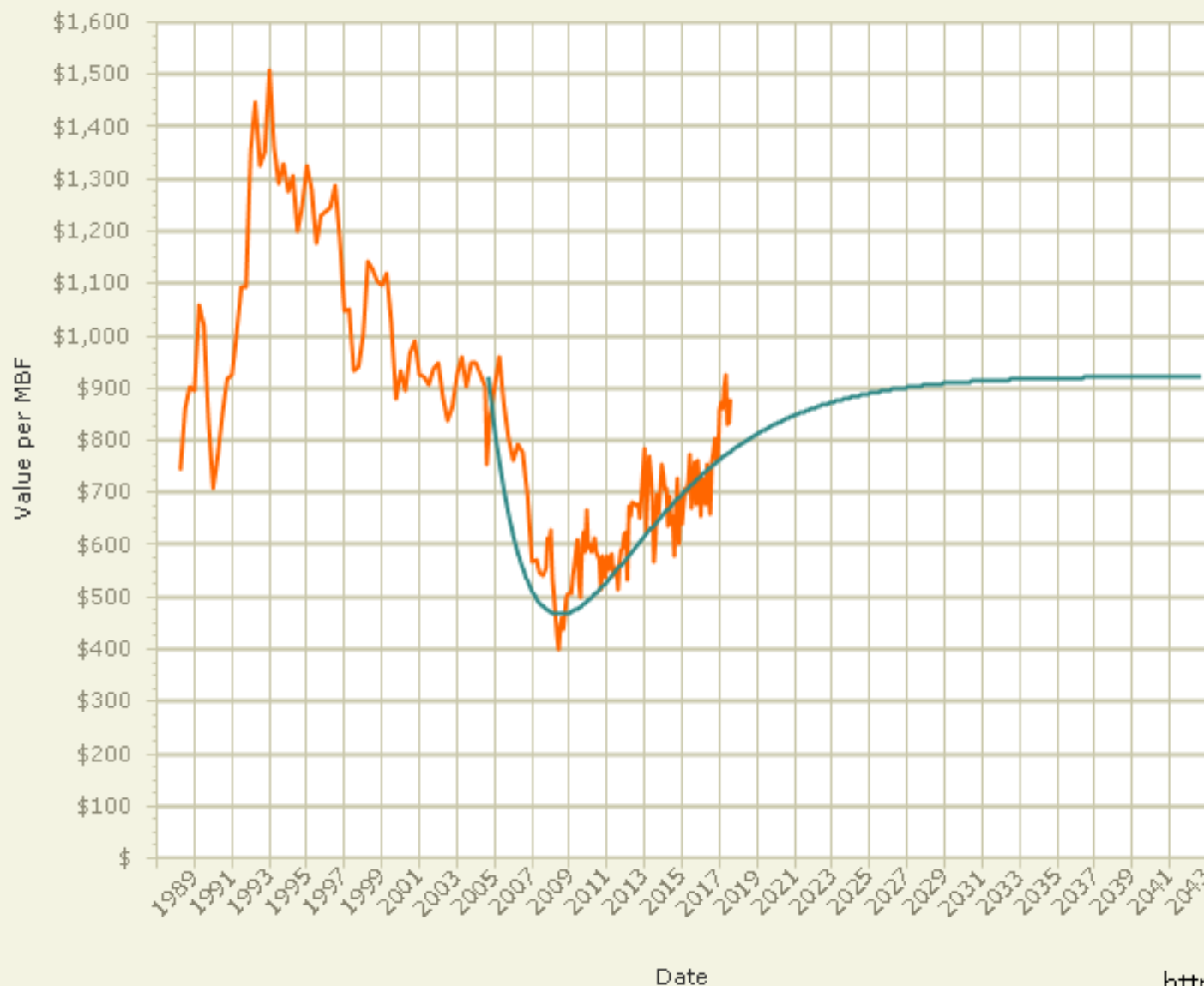


Chart by D&D Larix, LLC,
Delivered Log Market Data:
Washington DNR
Producer Price Index Data



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Delivered Log Price Examples

Were You this close?

Douglas-fir SM and Better Real 202010 with RPA Forecast

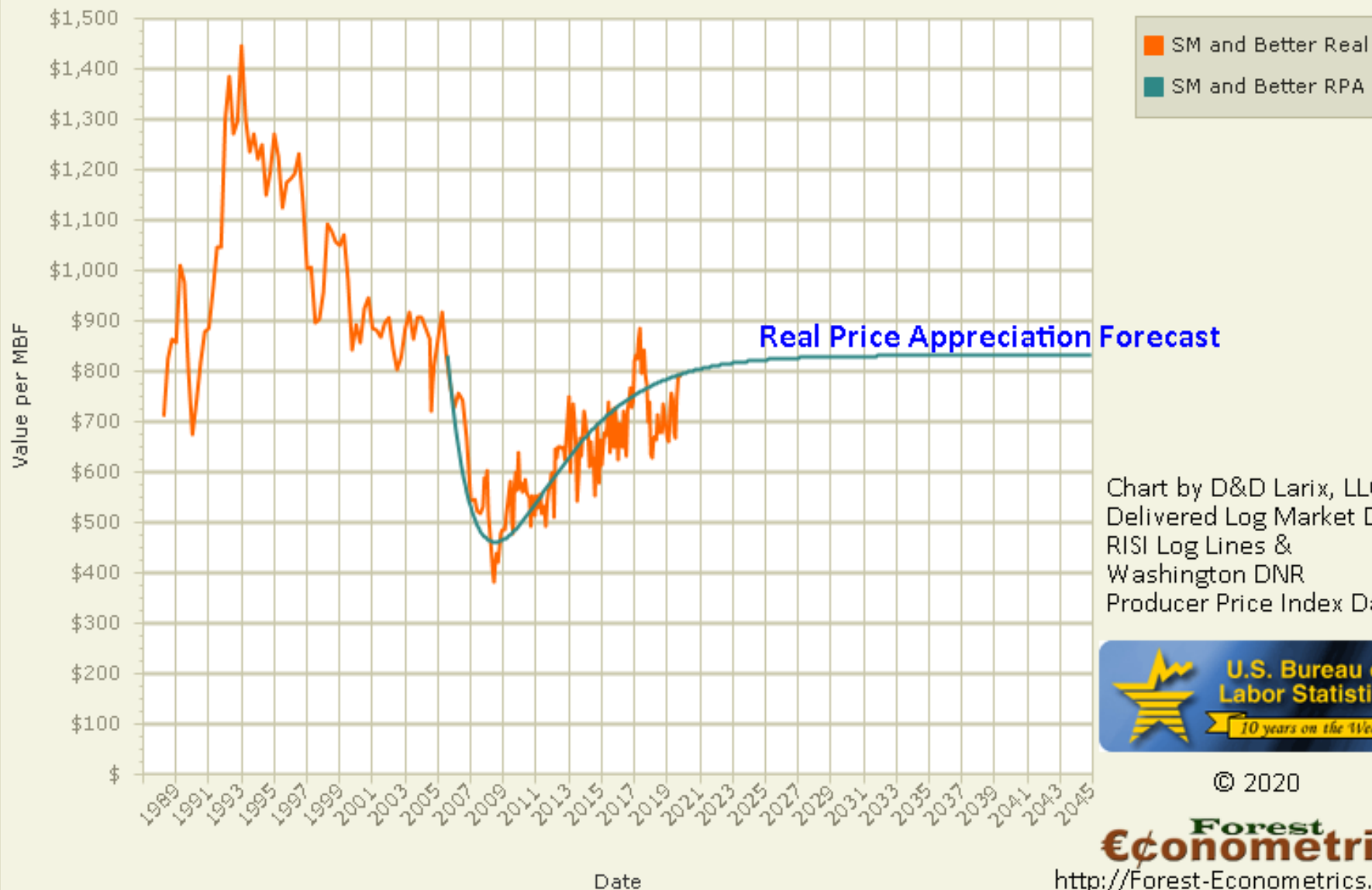


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Delivered Log Market Data:
RISI Log Lines &
Washington DNR
Producer Price Index Data:



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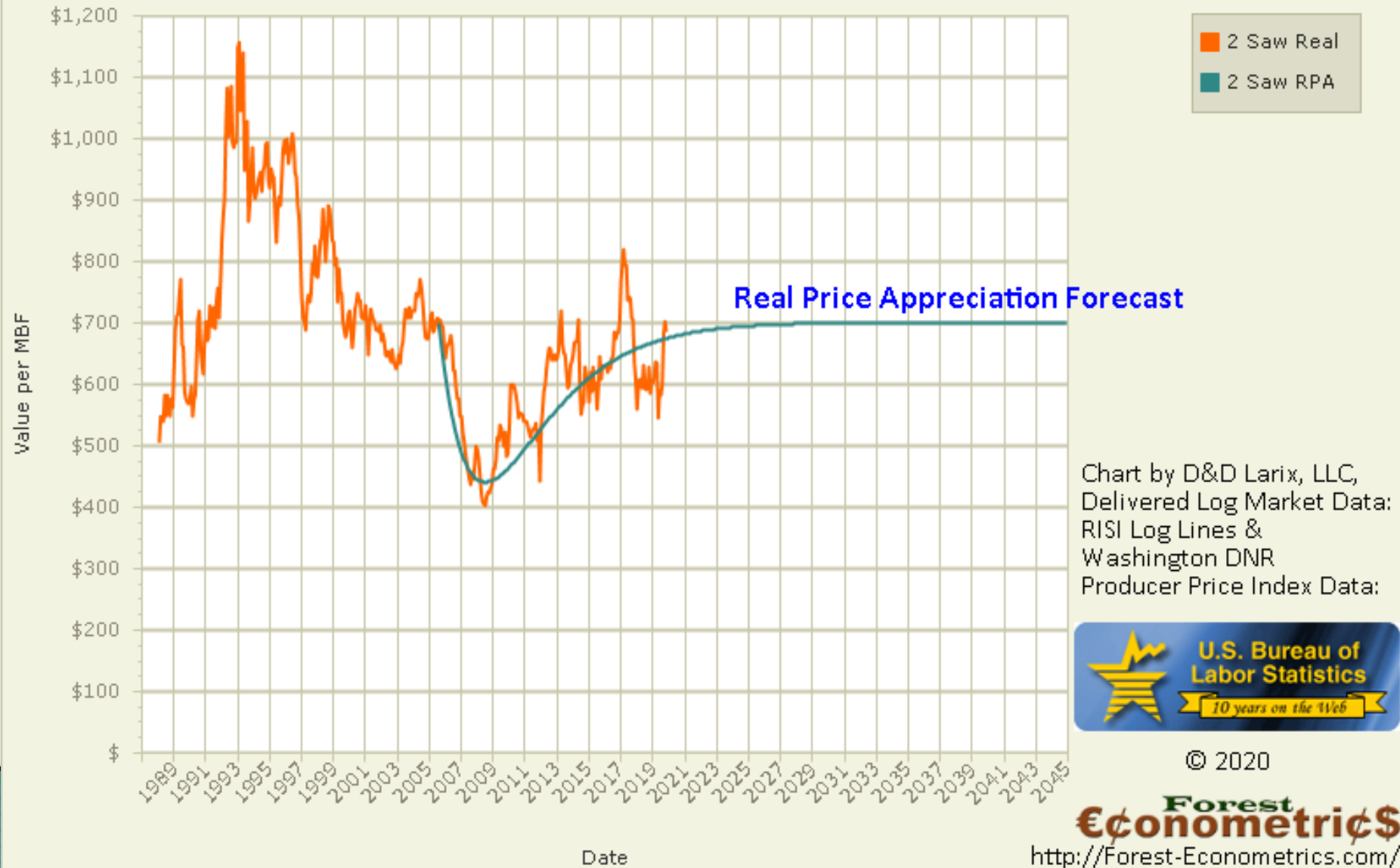
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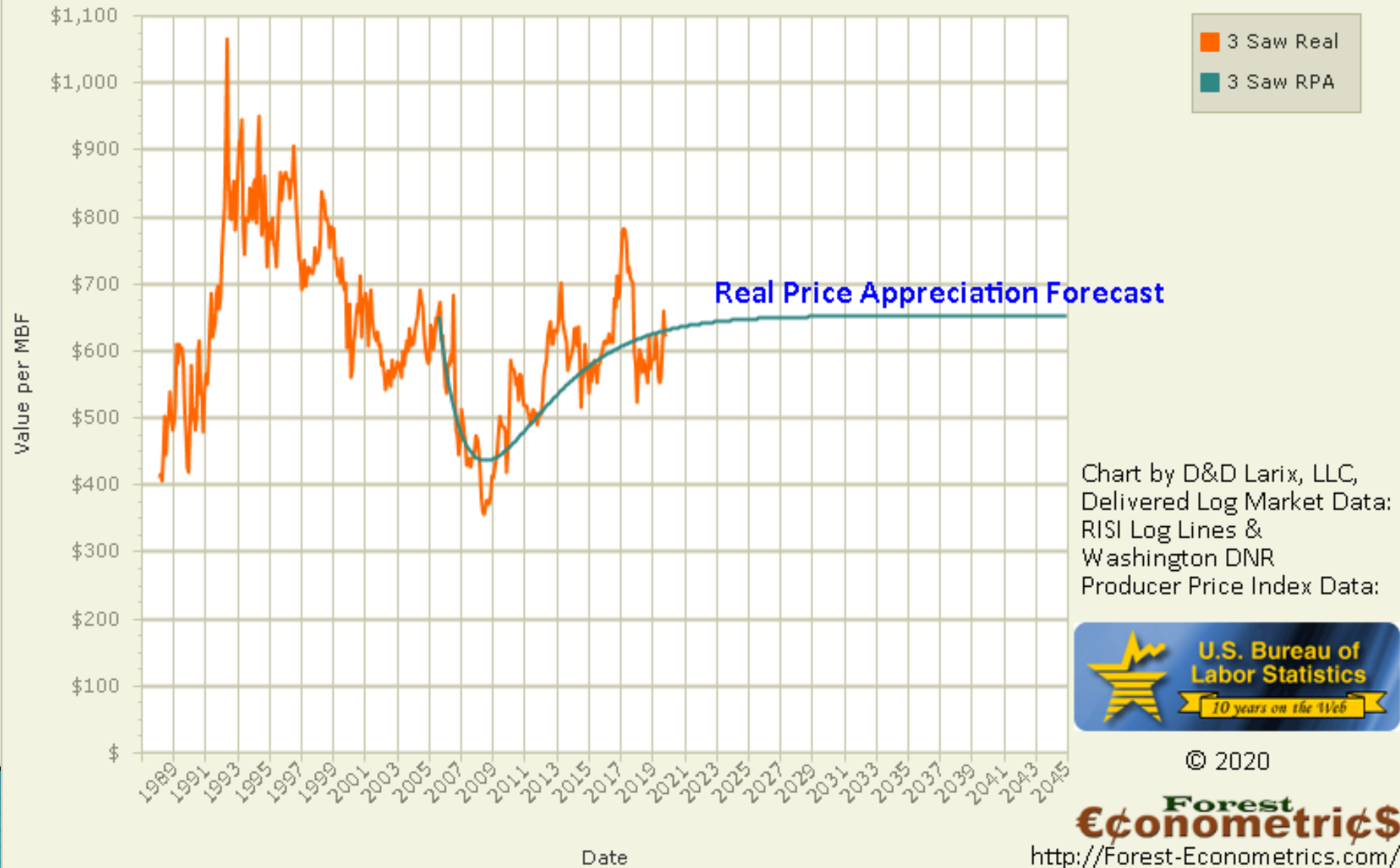
**Forest
Econometrics**

Delivered Log Price Examples

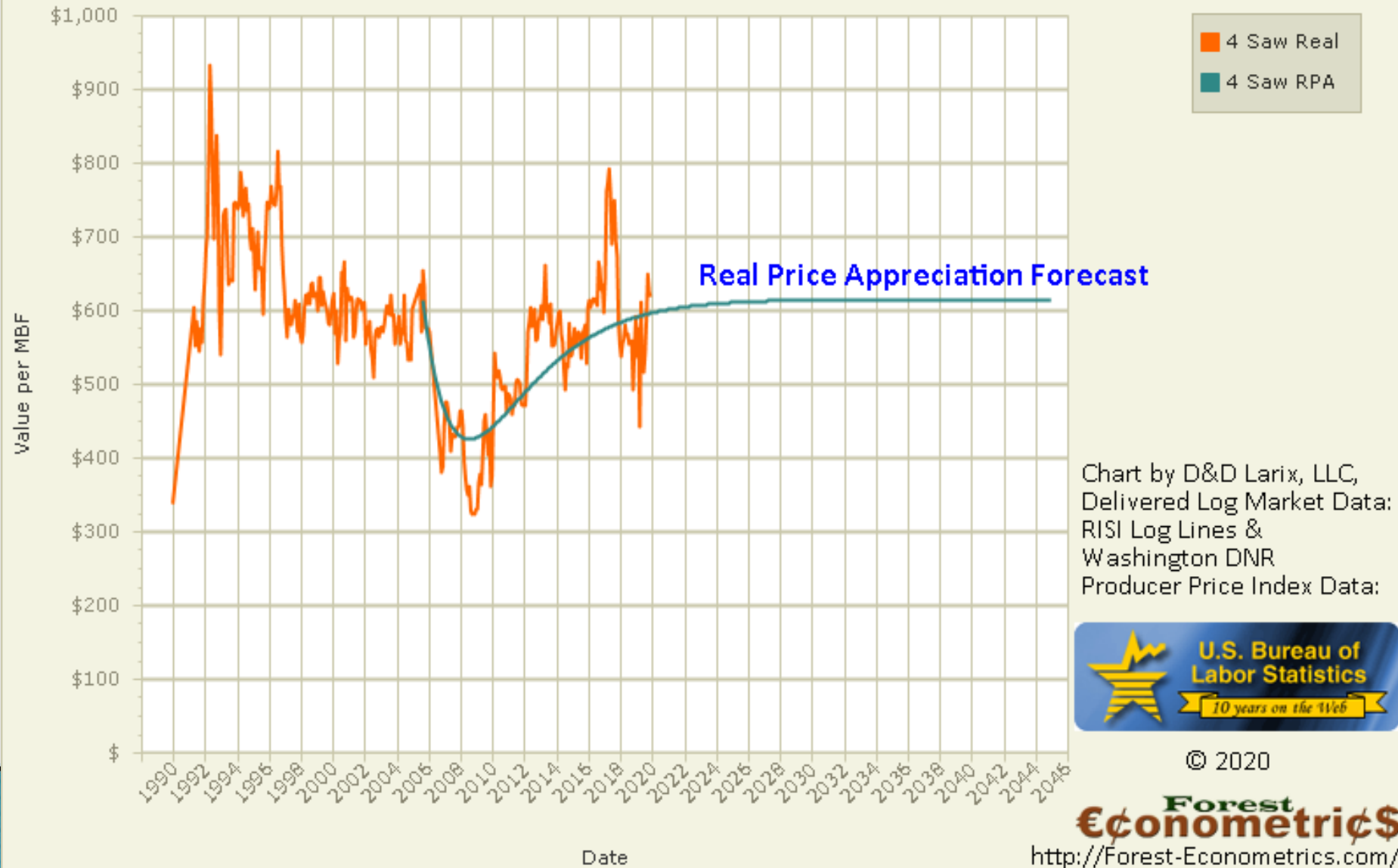
Douglas-fir 2 Saw Real 202010 with RPA Forecast



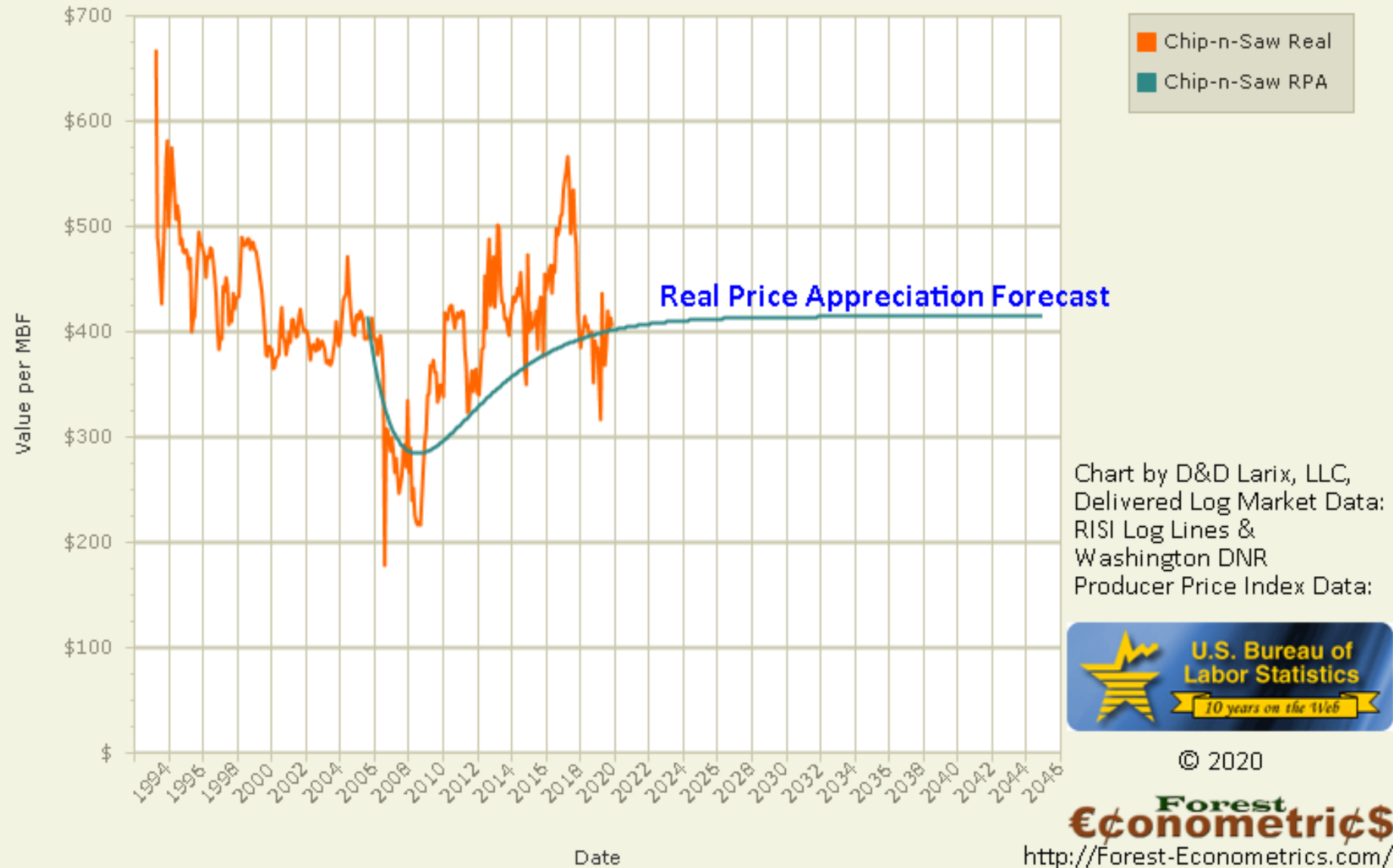
Douglas-fir 3 Saw Real 202010 with RPA Forecast



Douglas-fir 4 Saw Real 202010 with RPA Forecast



Douglas-fir Chip-n-Saw Real 202010 with RPA Forecast



Douglas-fir Pulp Real 202010 with RPA Forecast

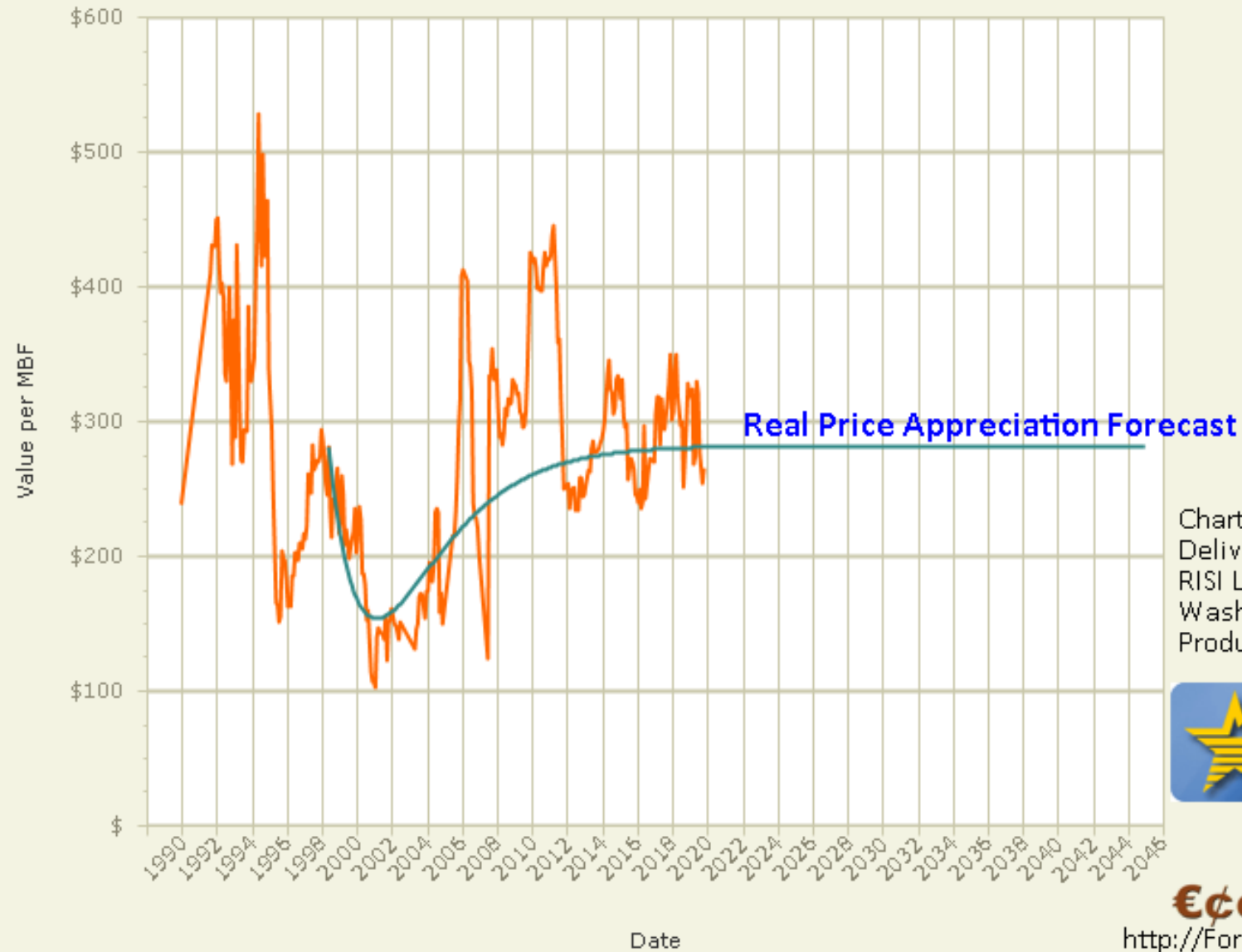
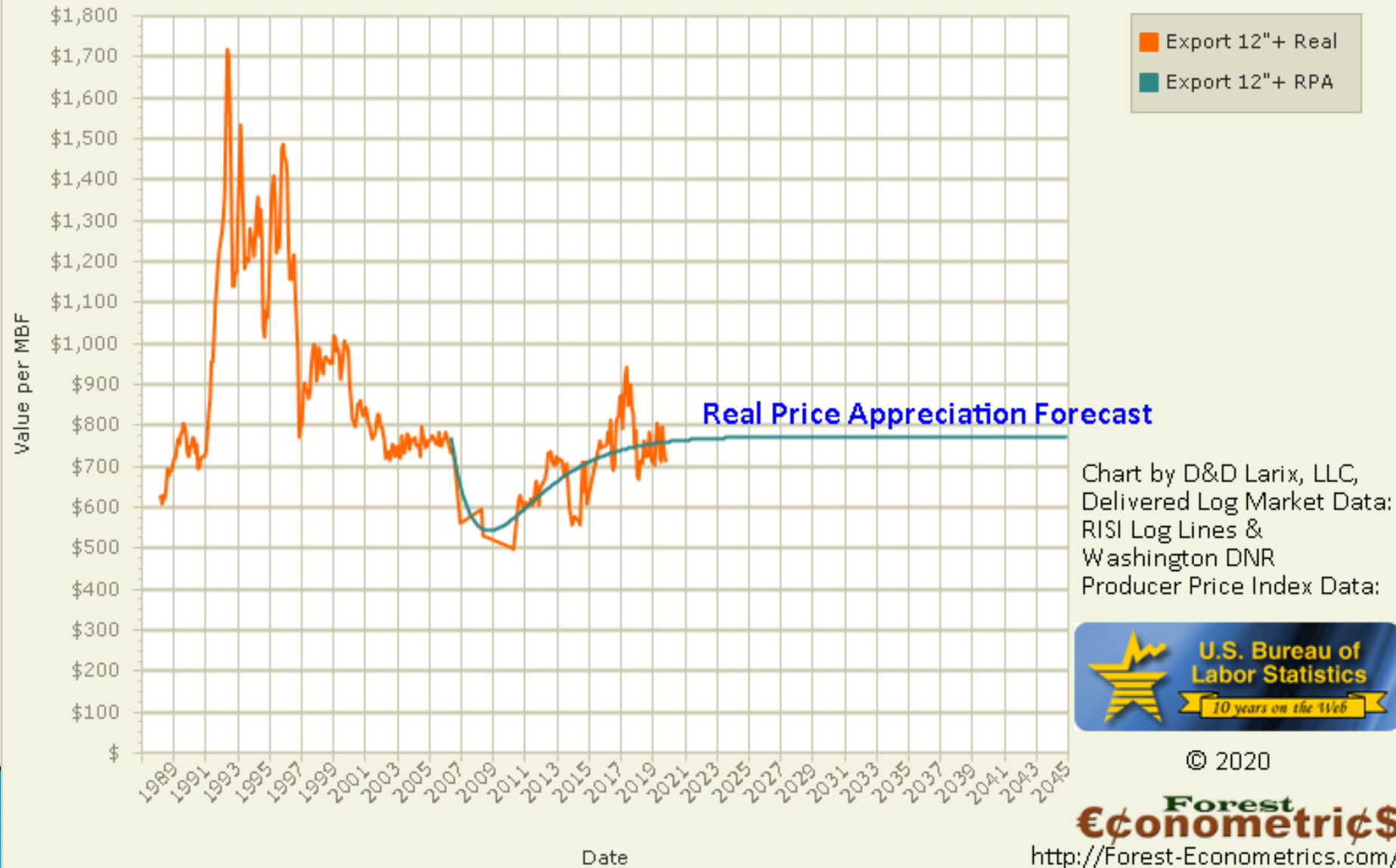


Chart by D&D Larix, LLC,
Delivered Log Market Data:
RISI Log Lines &
Washington DNR
Producer Price Index Data:

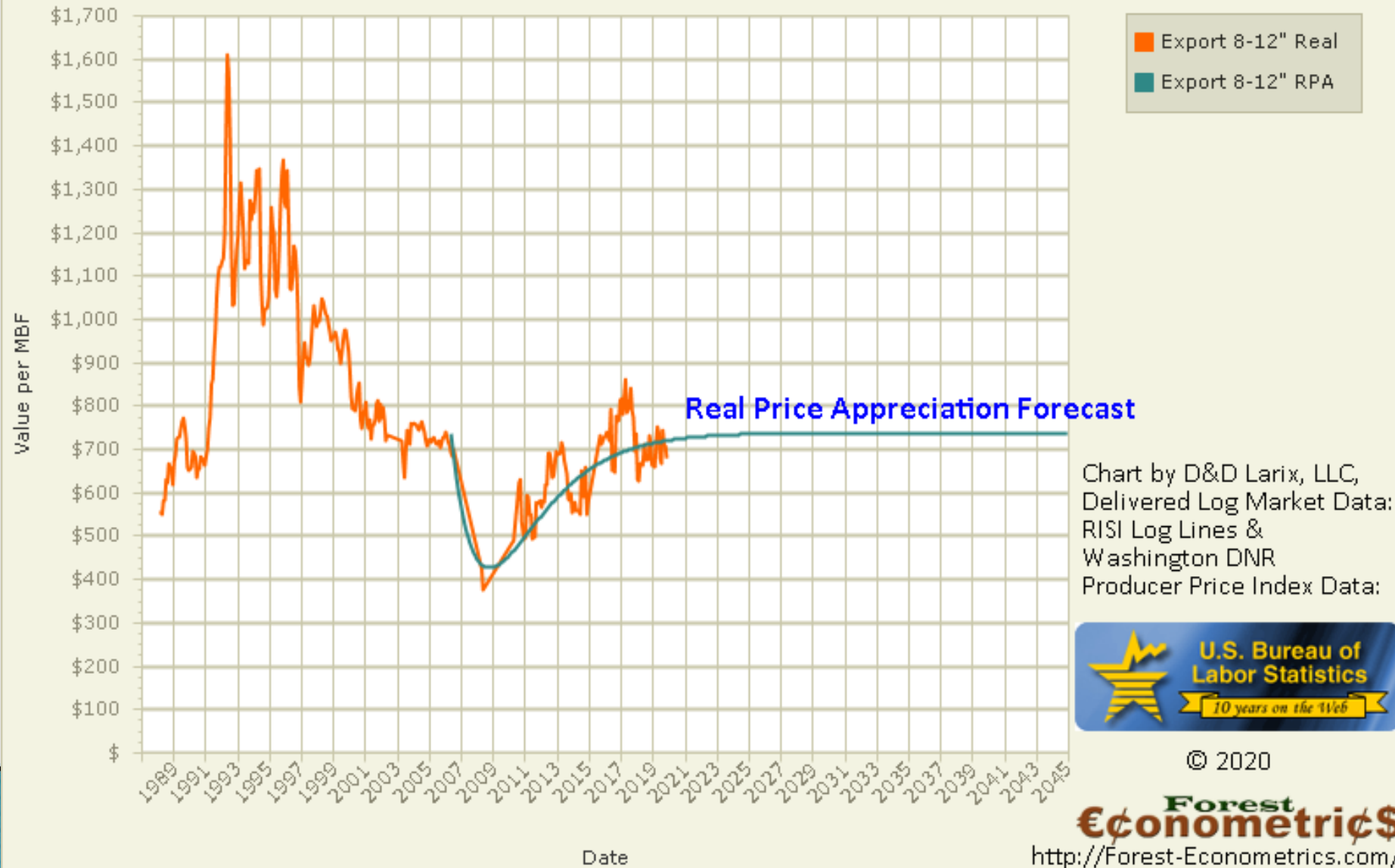


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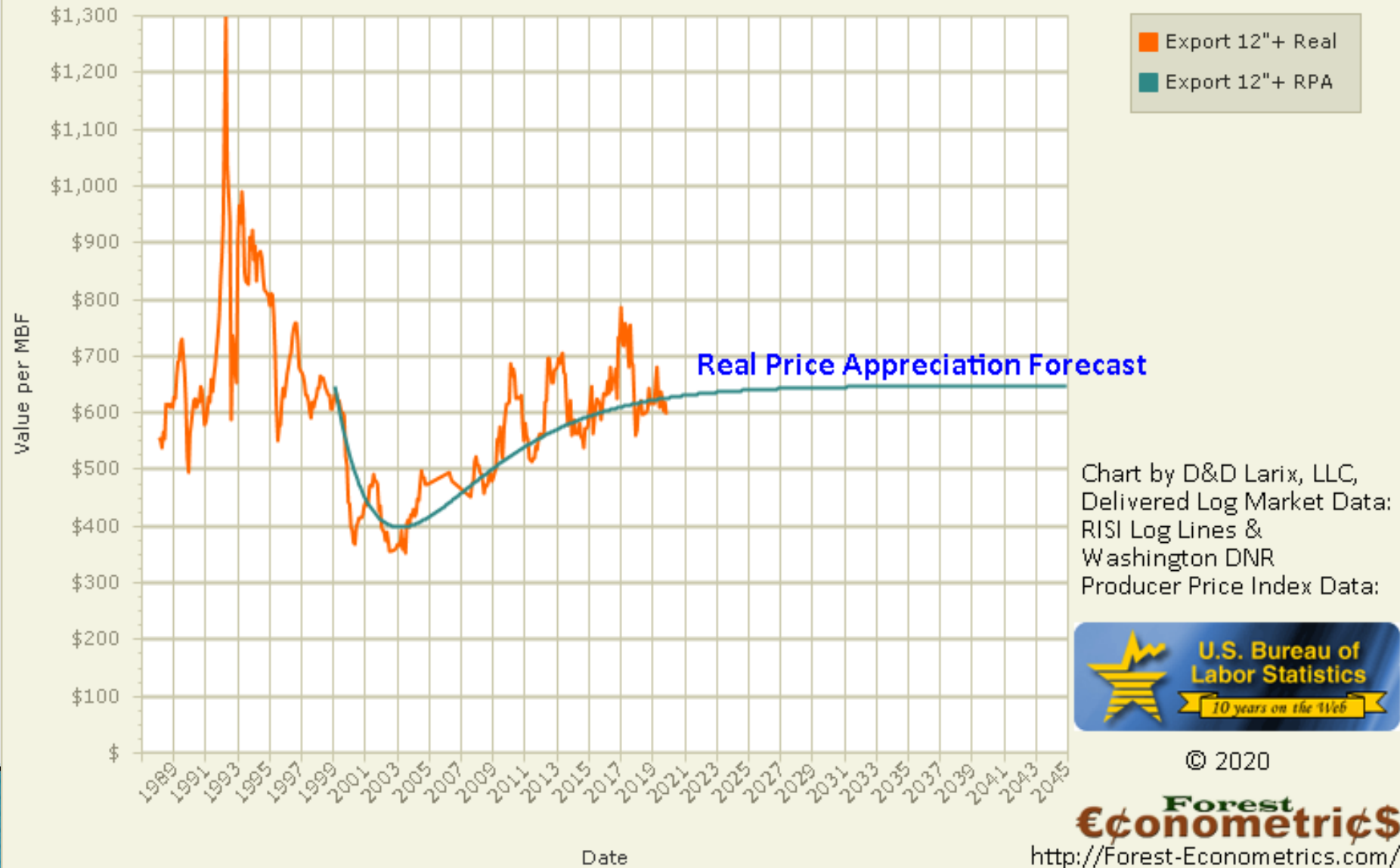
Douglas-fir Export 12"+ Real 202010 with RPA Forecast



Douglas-fir Export 8-12" Real 202010 with RPA Forecast



Western Hemlock Export 12"+ Real 202010 with RPA Forecast



Western Hemlock Export 8-12" Real 202010 with RPA Forecast



Western Hemlock SM and Better Real 20210 with RPA Forecast



Western Hemlock 2 Saw Real 202010 with RPA Forecast

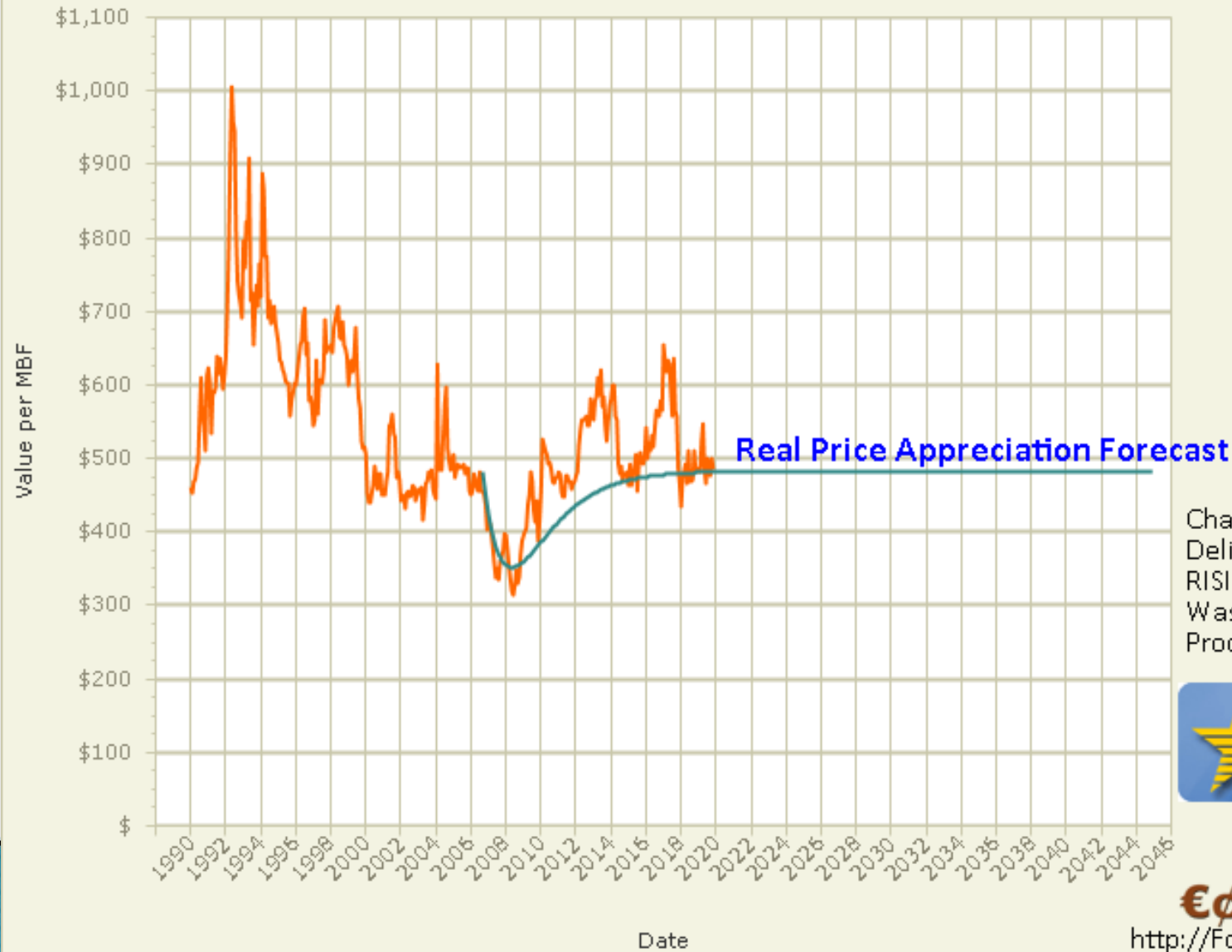


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Producer Price Index Data:

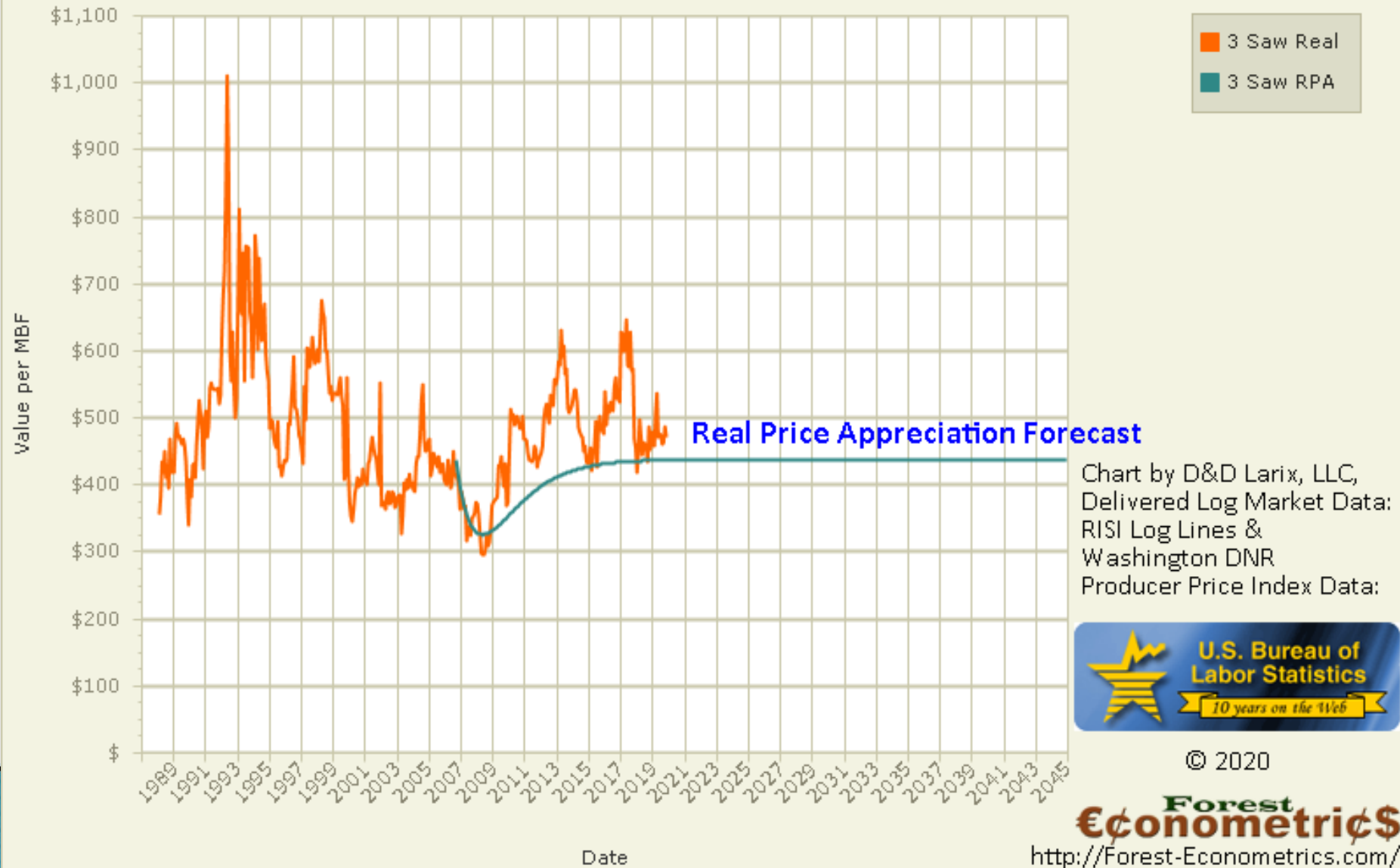


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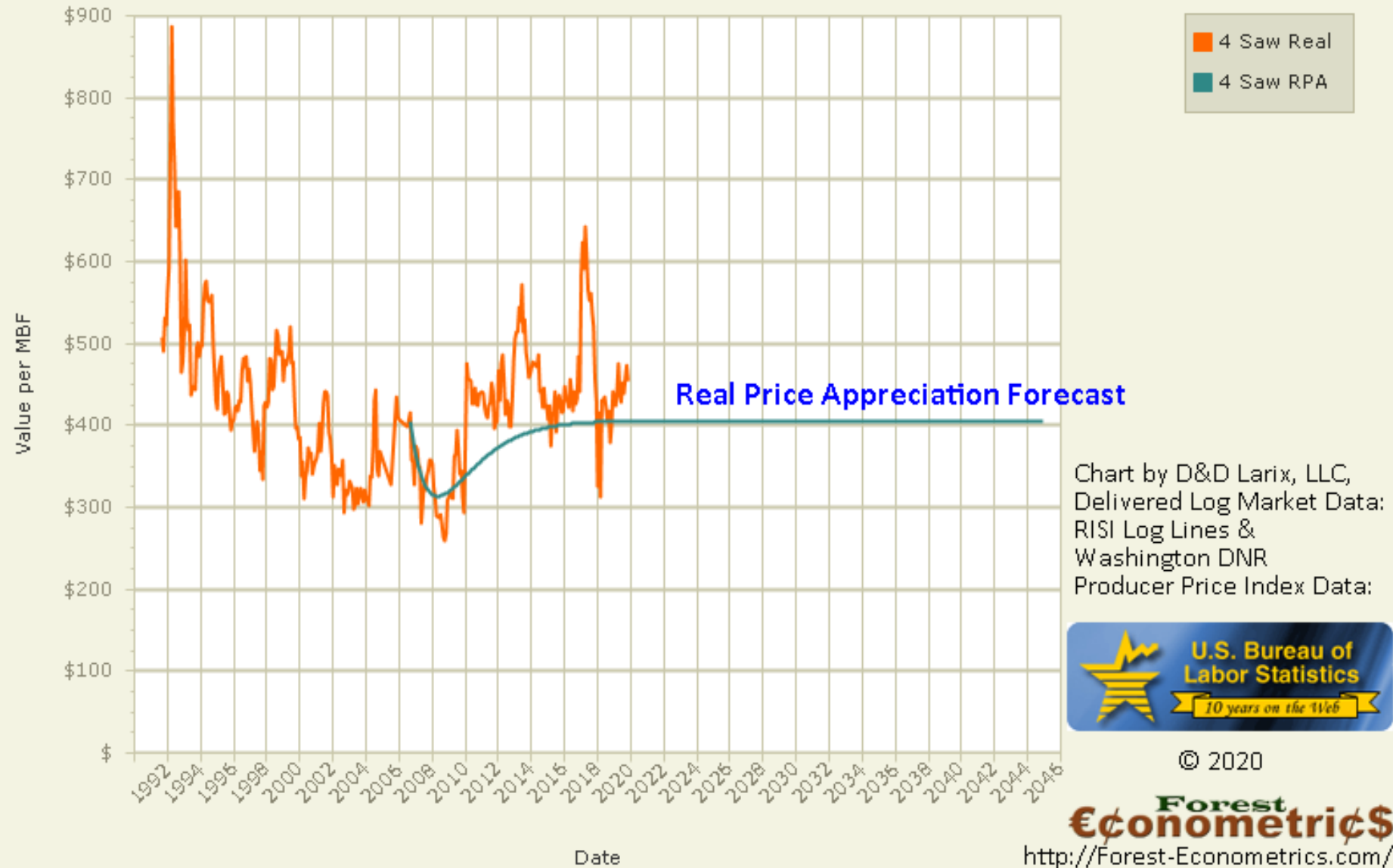
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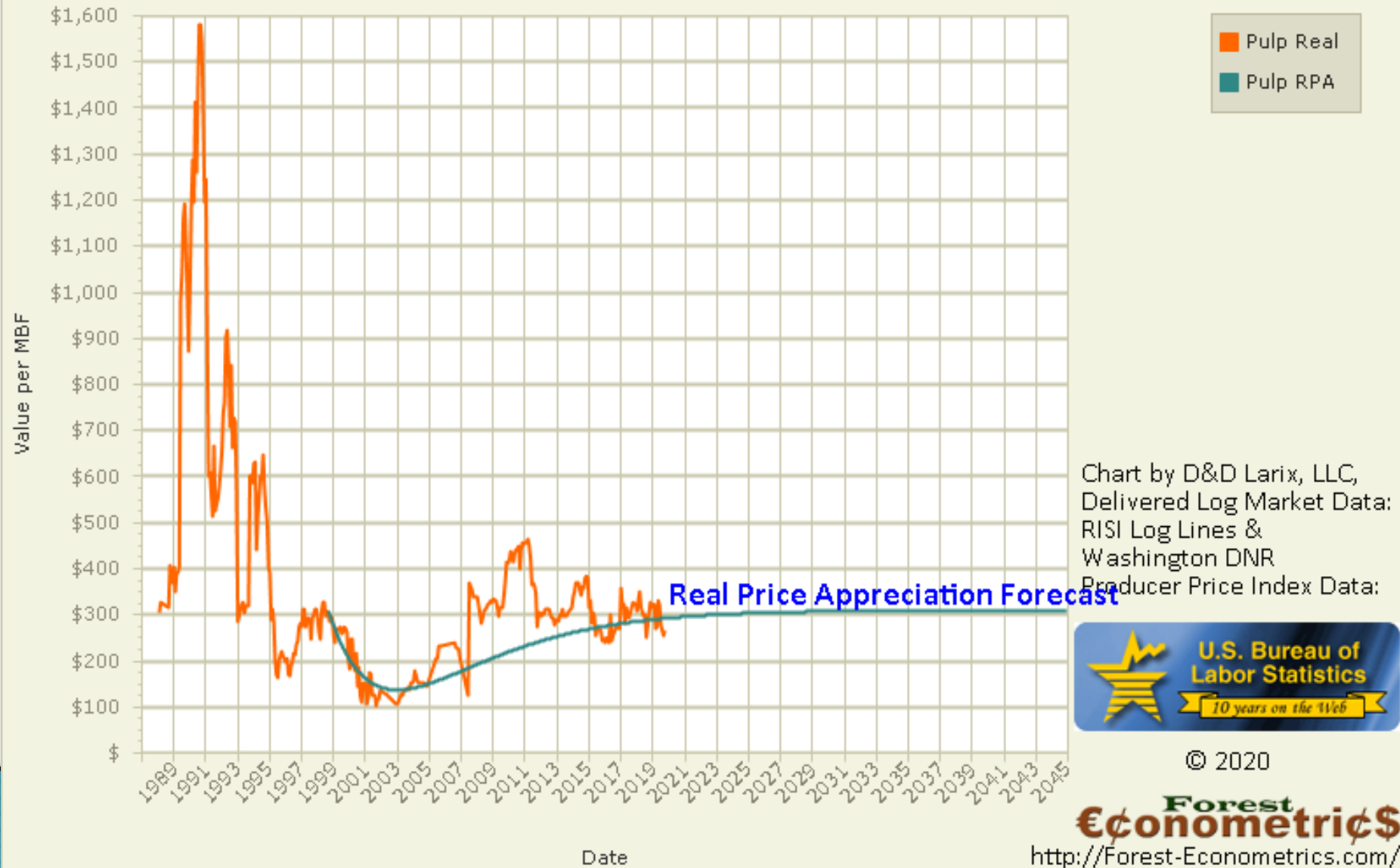
Western Hemlock 3 Saw Real 202010 with RPA Forecast



Western Hemlock 4 Saw Real 202010 with RPA Forecast



Western Hemlock Pulp Real 202010 with RPA Forecast





Exemplified in FRASS – Ready for your Forest

<http://Forest-Econometrics.com>



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