

ISA 444: Business Forecasting

13: Fixed Forecasting Windows

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 Automated Scheduler for Office Hours

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Quick Refresher from Last Class

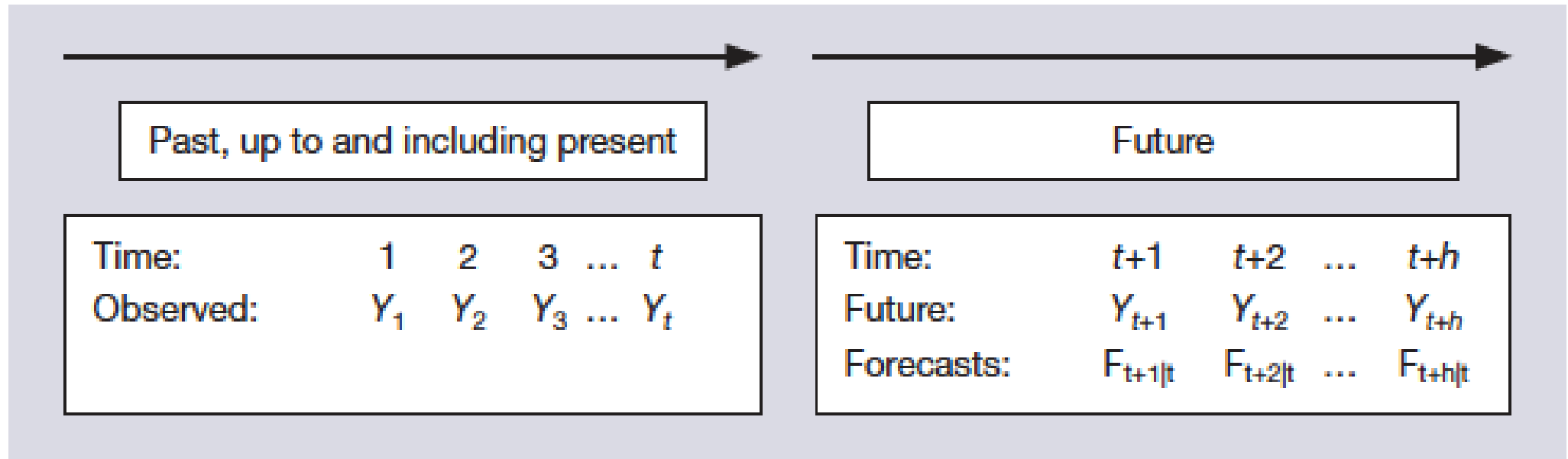
- ✓ Explain when to use an additive vs. multiplicative model for a time series.
- ✓ Use classic decomposition methods to detrend and deseasonalize a time series.
- ✓ Recognize time series that are appropriate for triple exponential smoothing (HW).
- ✓ Use HW to forecast future observations of a time series.

Learning Objectives for Today's Class

- Explain the difference between fixed window and rolling origin forecasting.
- Apply several forecasting methods to the fixed forecasting window strategy.

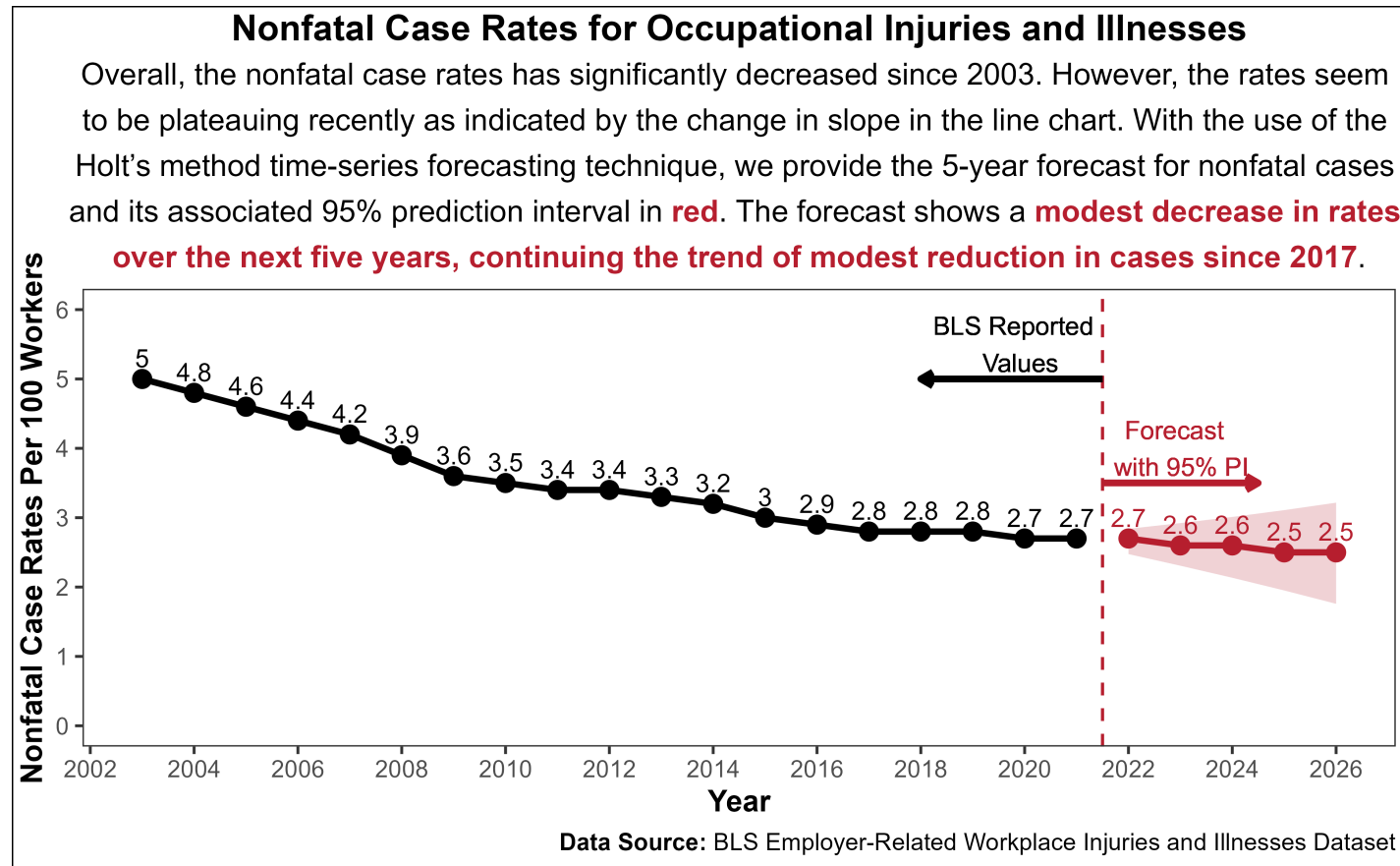
Fixed vs. Rolling Origin Forecasting

Extrapolative Fixed Origin Forecasting



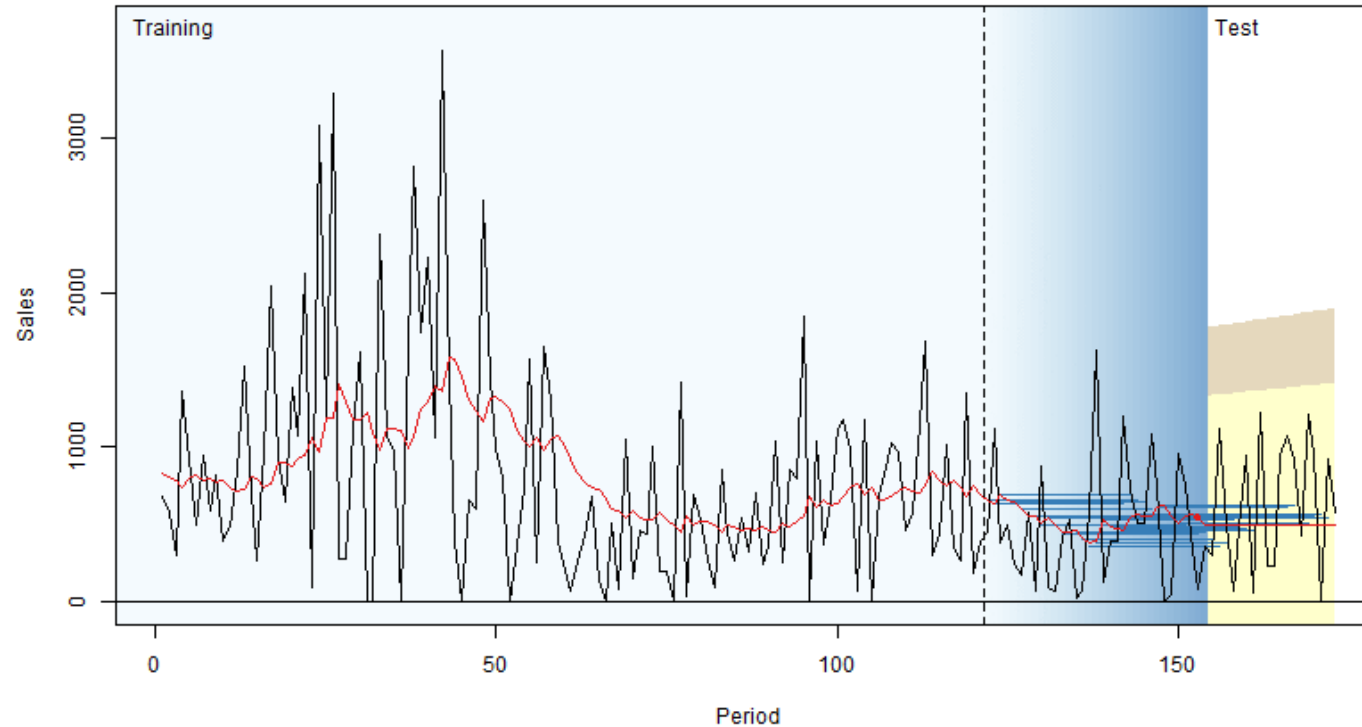
General Framework for Forecasting with a Single Series

Extrapolative Fixed Origin Forecasting



A demonstration of the extrapolative fixed origin forecasting framework on nonfatal case rates for occupational injuries and illnesses

Extrapolative Rolling Origin Forecasting



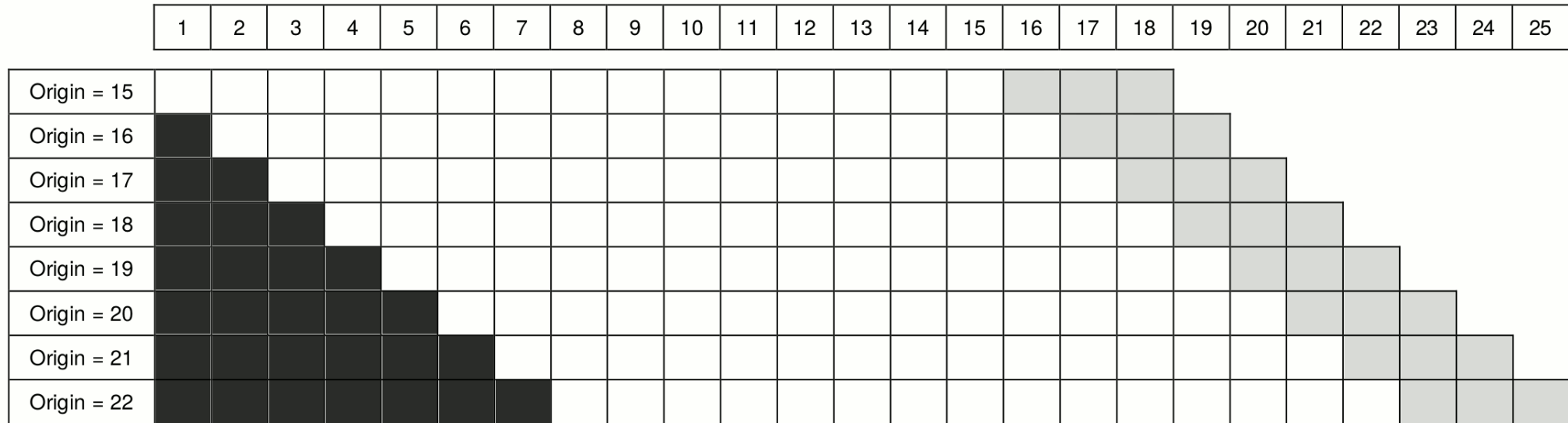
Visualization of rolling origin by Nikos Kourentzes

Extrapolative Rolling Origin Forecasting

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Origin = 15																									
Origin = 16																									
Origin = 17																									
Origin = 18																									
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Rolling origin with constant holdout size

Extrapolative Rolling Origin Forecasting

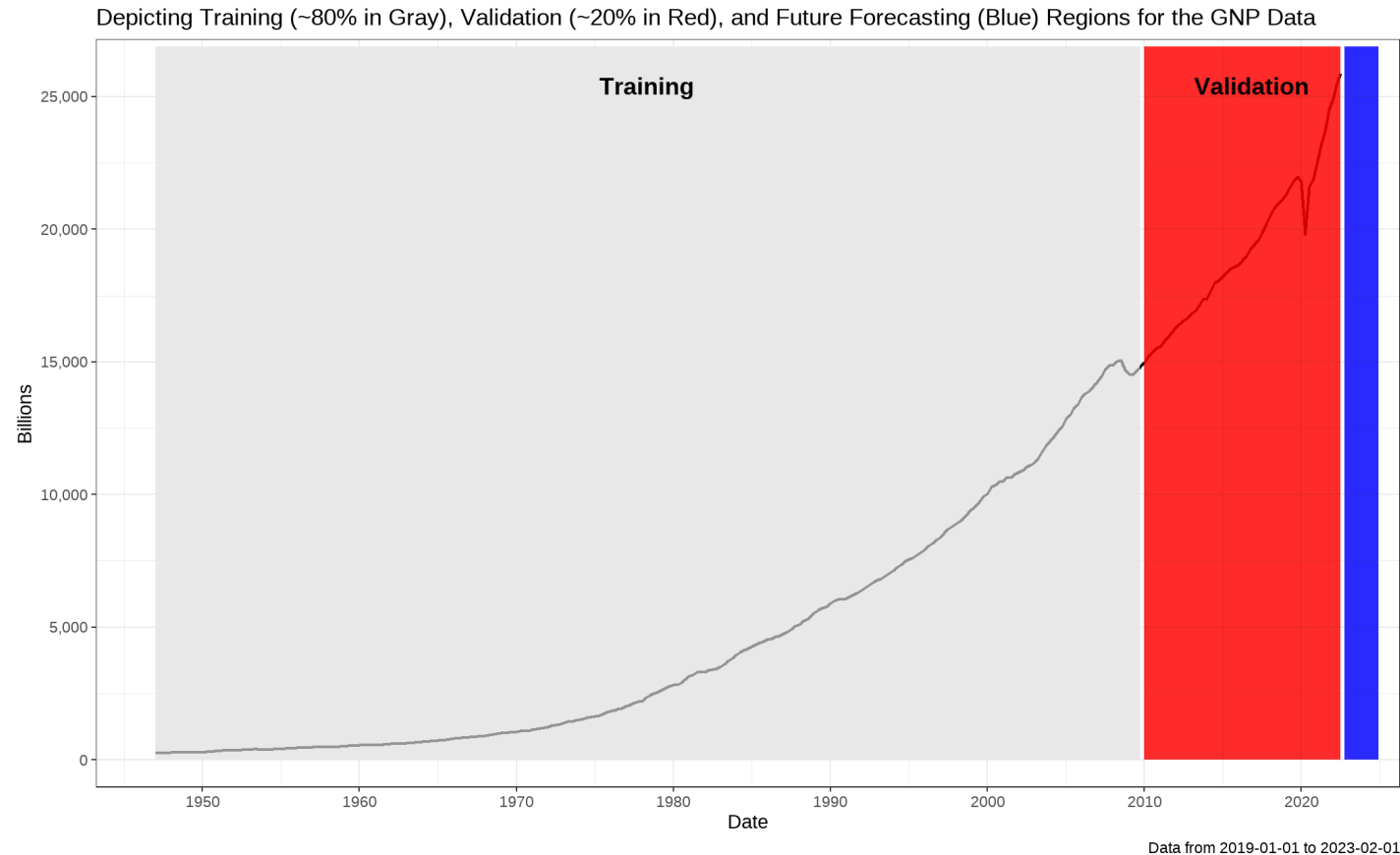


Rolling origin with constant in-sample size

Live Demo

Live Demo: Fixed Origin

Let us apply an appropriate smoothing-based forecasting method for the **GNP data**.



Live Demo: Fixed Origin

Let us apply an appropriate smoothing-based forecasting method for the **GNP data**.

- We will start with applying `forecast::holt()` on the log of the GNP.
 - We will attempt to optimize for α and β , using `initial='simple'` for a change. We will use data up to and including 2009-10-01 to find the optimal values for the smoothing parameters.
 - Then, we will use the validation dataset to check how well our model performs.
 - We will also obtain the forecasts for the two years post how our last observation.

Live Demo: Fixed Origin - Multiple TS and Methods

Let us apply what we learned to multiple time-series.

Recap

Summary of Main Points

By now, you should be able to do the following:

- Explain the difference between fixed window and rolling origin forecasting.
- Apply several forecasting methods to the fixed forecasting window strategy.

Things to Do to Prepare for Our Next Class

- **Recommended:** Thoroughly read [Chapter 4.1-4.4](#) and [Chapter 4.6-4.7](#) of our reference book.