Priorize data challenge

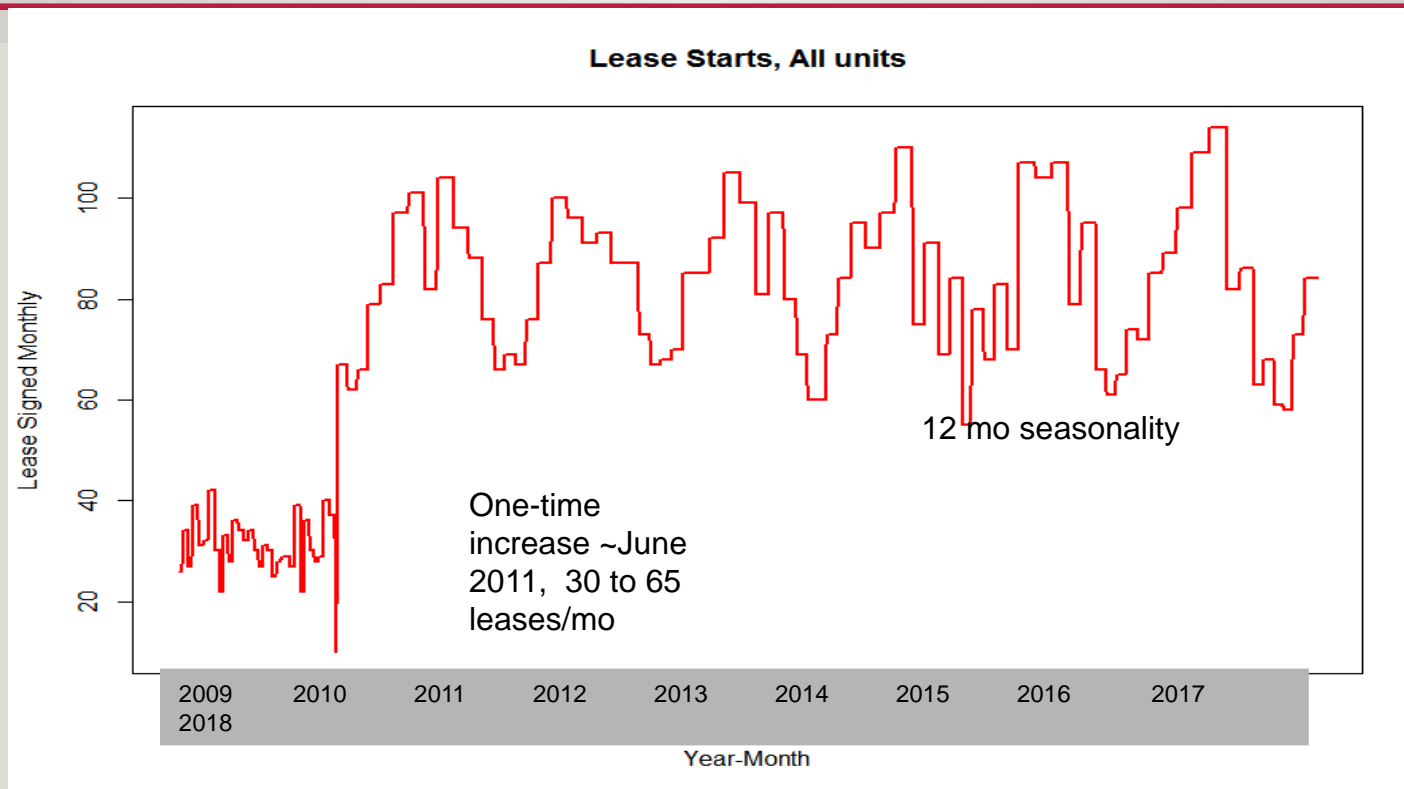## Apartment rental forecasting   - Robert Erdman, candidate. 1/8/2020

A quick look at apartment leases.   Started and terminated – with a forecast.

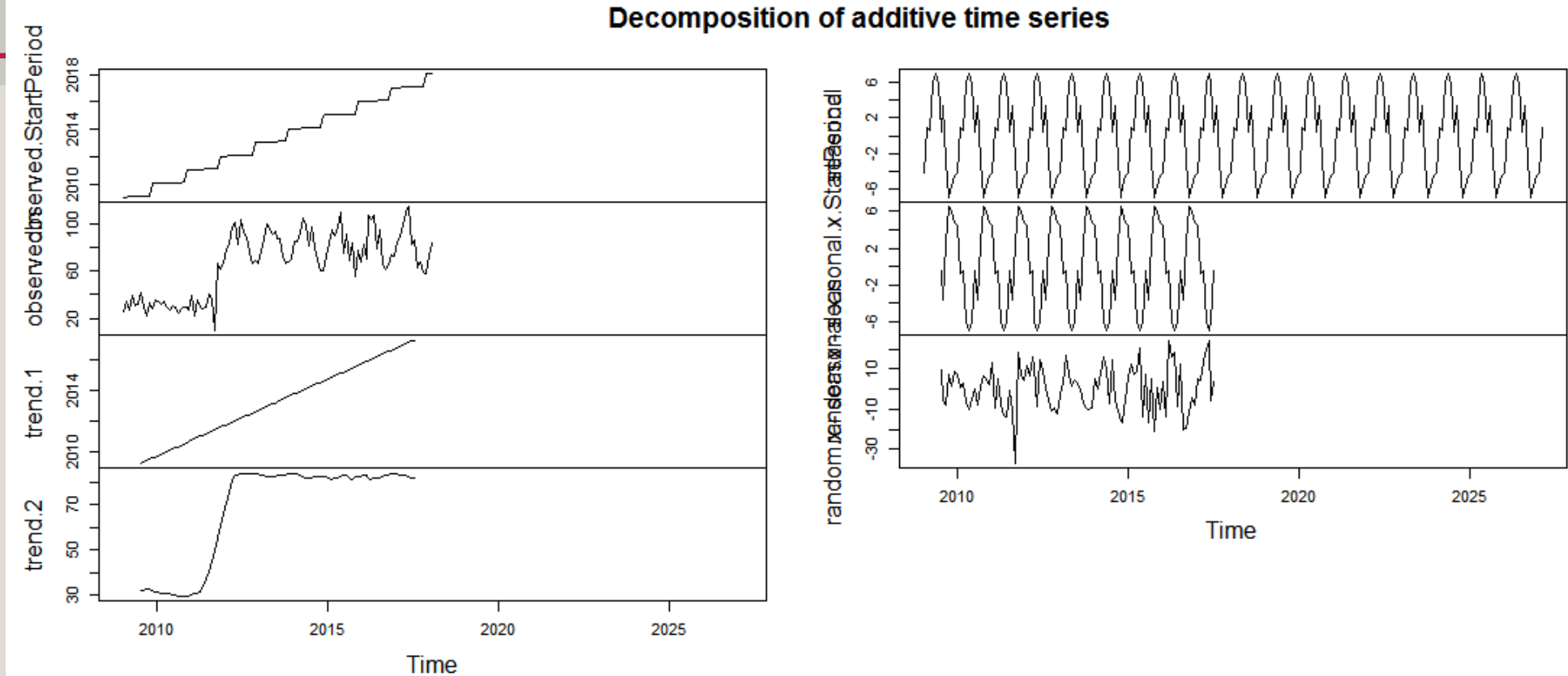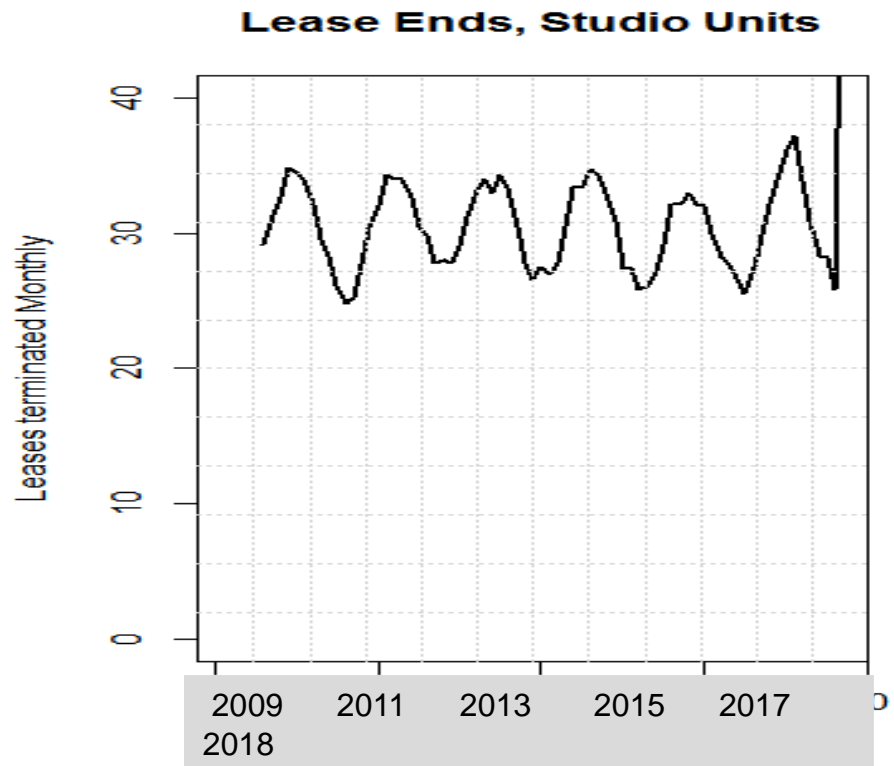# Leases signed 3/2009 – 3/2018.   All unit types

Lease Starts, All units
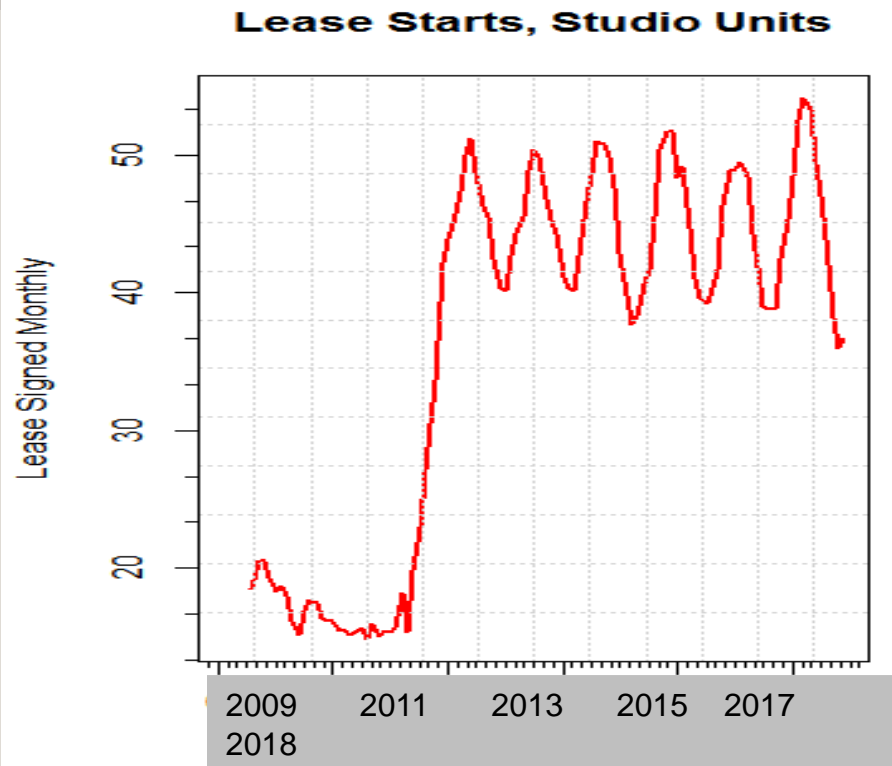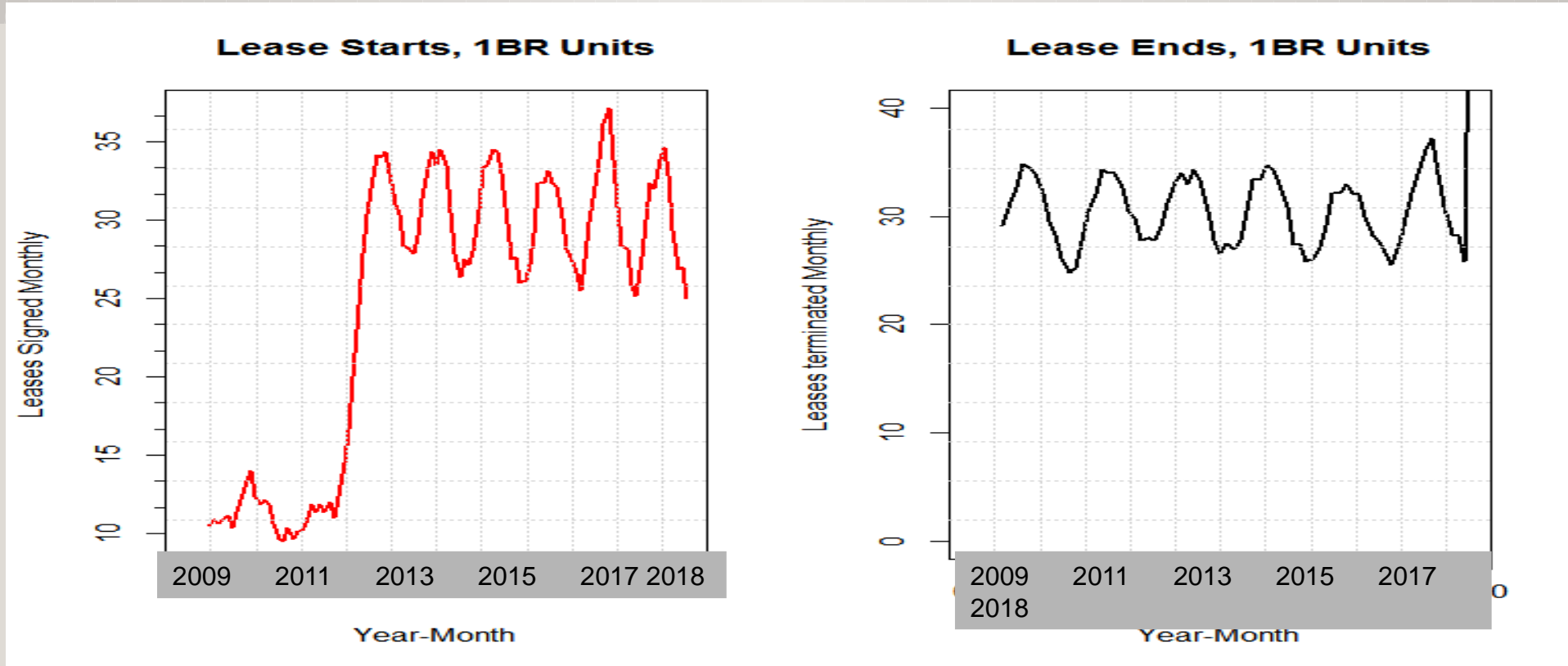
One-time increase ~June 2011, 30 to 65 leases/mo

12 mo seasonality

time series decomposition
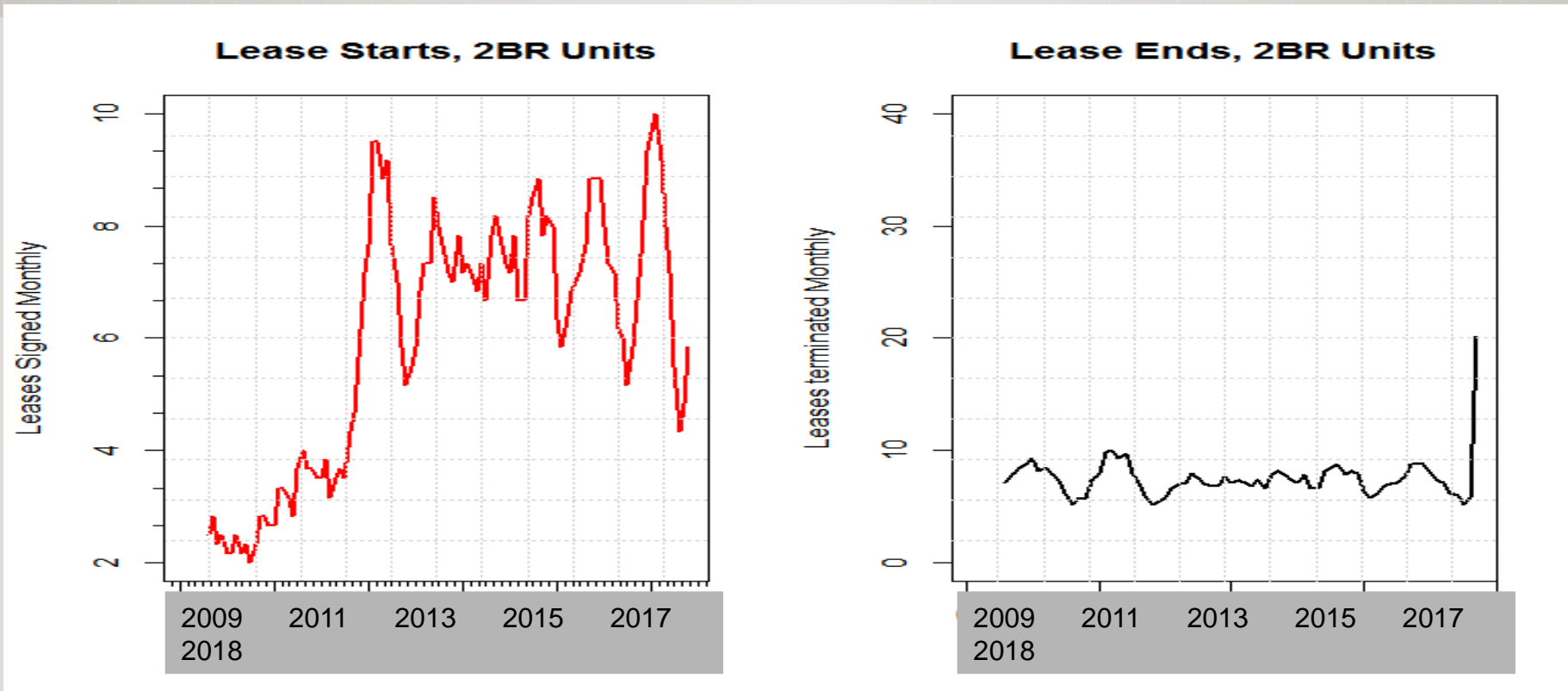

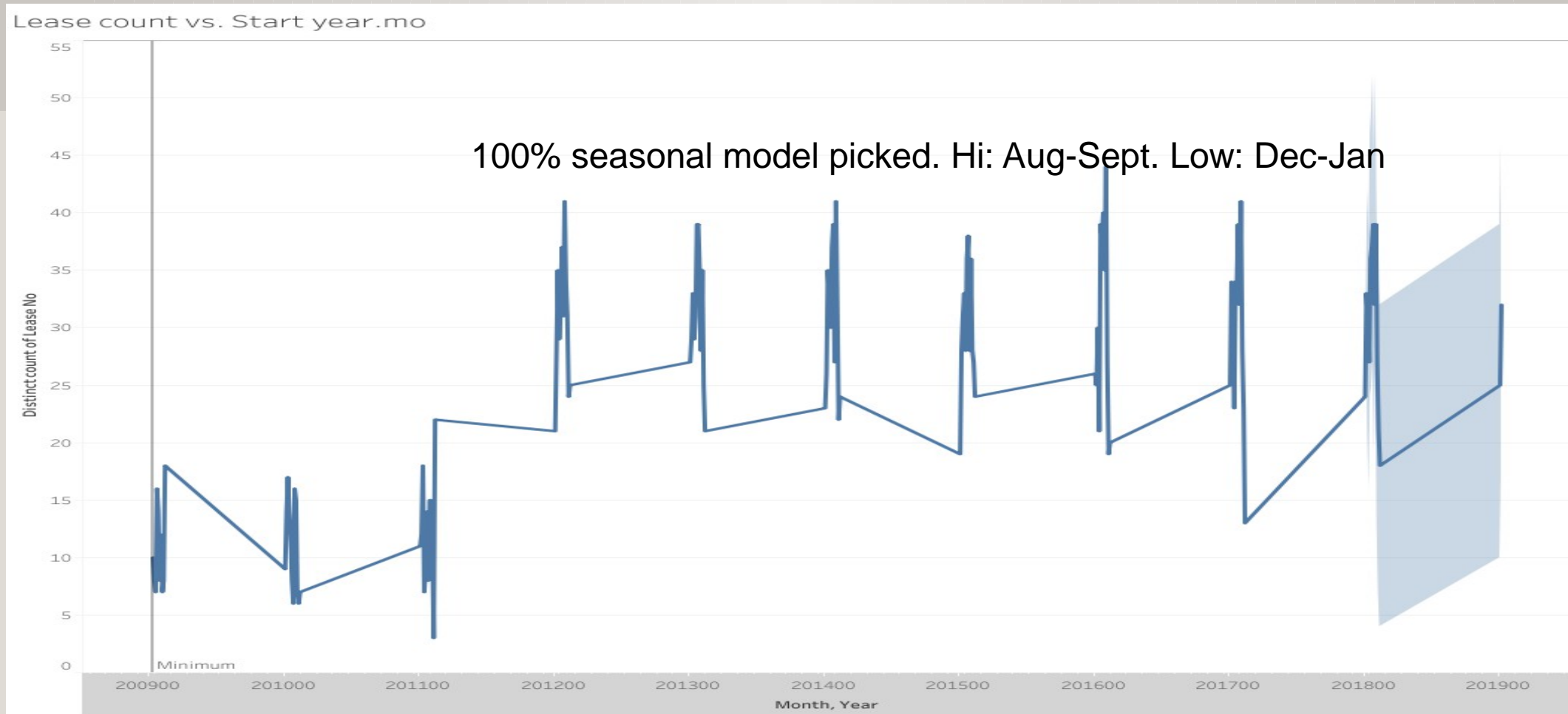Decomposition of additive time series

Studio Rental starts-ends. 2009-2018

1BR rental starts-ends 2009-2018

2BR Rental starts-ends 2009-2018

forecast rentals – all units 2018
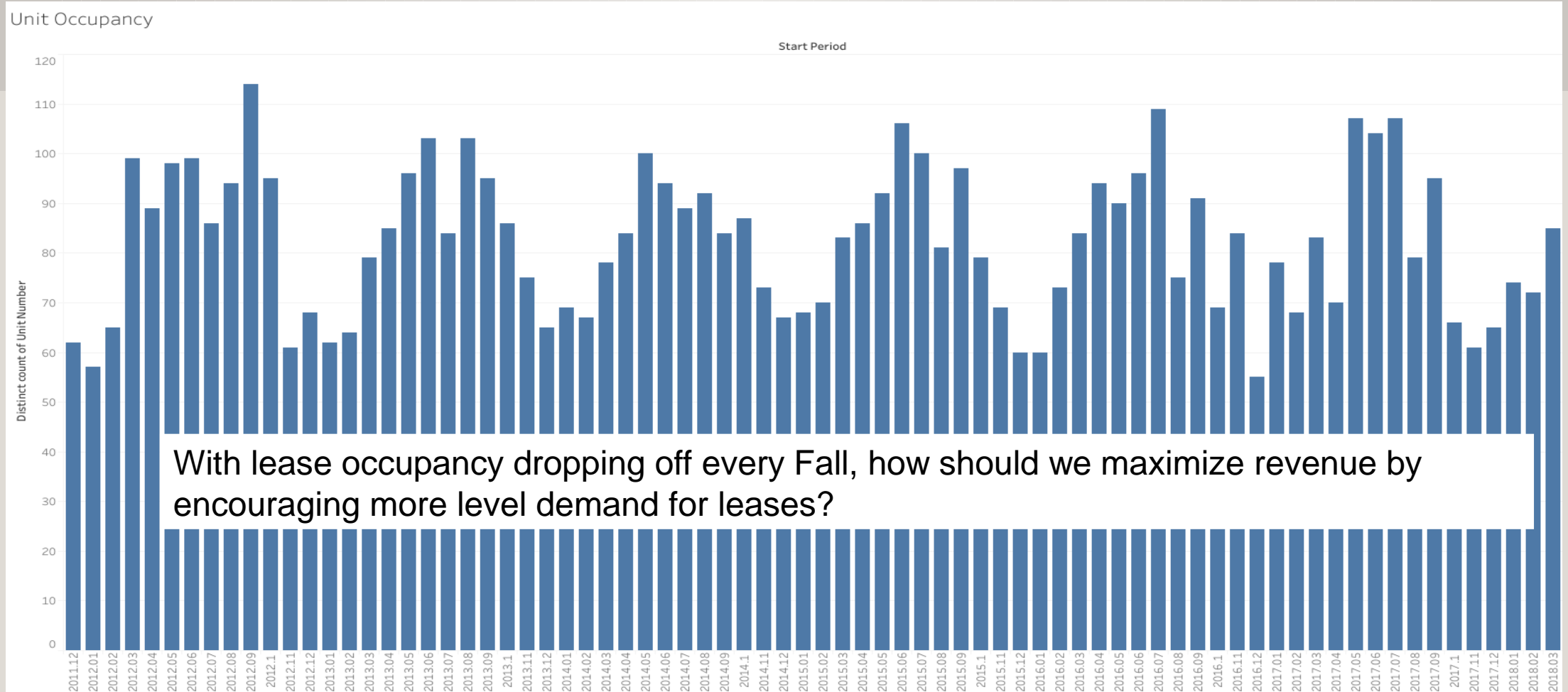

100% seasonal model picked. Hi: Aug-Sept. Low: Dec-Jan

Lease Occupancy – all types

With lease occupancy dropping off every Fall, how should we maximize revenue by encouraging more level demand for leases?
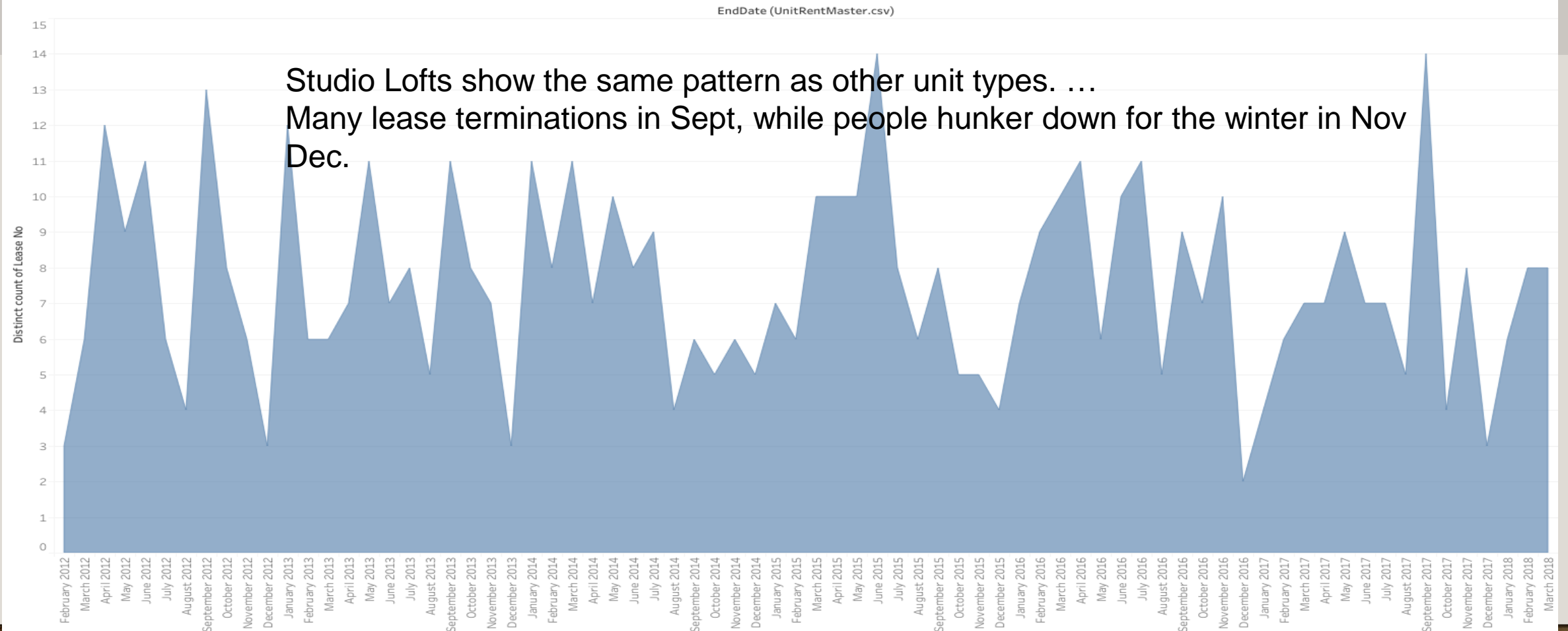
Lease Terminations show similar patterns.
(Studio Lofts 2012-2018)

Lease terminations Studio Lofts (STD-L) 2012-2018

EndDate (UnitRentMaster.csv)

Studio Lofts show the same pattern as other unit types. …
Many lease terminations in Sept, while people hunker down for the winter in Nov Dec.

Forecast accuracy and Thoughts on models

- Forecasts: 3rd Qtr 2018:

- 1BR: seems to decline from 39 in late September, to 18 in December 2018.

- Studios: about 33/mo

- 2BR: 7/mo.

- We used 12 mo moving avg. RMSE: 5. MAPE: 23.2%. Alpha = .283

- This MAPE is quite high. We might improve on this by segregating by unit plan, introducing a negative trend component, or retuning alpha.

- What is causing our seasonal lease Drop-Add cycle, and how should we minimize demand patterns to smooth out unit occupancy? (long-term rent discounts…subletting, etc)