# Market-Level Trends in Commercial Rent Prices

ggplot3

Jordan Chiantelli-Mosebach, John Martin, James Winkeler

## Variable of Interest

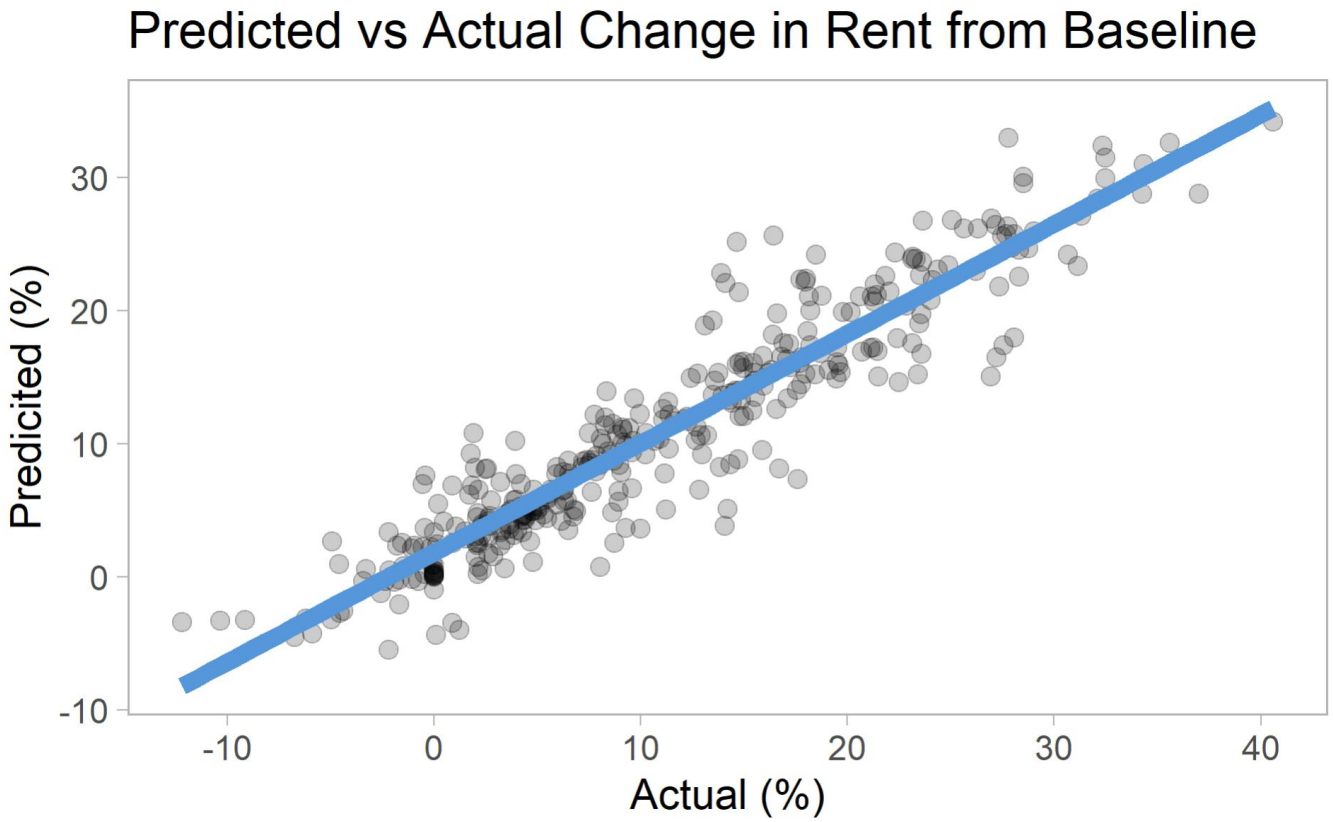
Change in internal-class rent from baseline (%)

$$100 * \frac{rent_q - rent_0}{rent_0}$$

**Internal-class rents are averaged by market and by quarter. Thus, so are predictors.**

# Random Forest

| Predictor | MSE Increase | Node Purity |
|---|---|---|
| **Market (Factor)** | **135.4%** | **37632** |
| Time in Quarters (Num.) | 135.4% | 31080 |
| Availability Prop. (Num.) | 67.6% | 14141 |
| Internal Class (Factor) | 37.1% | 2368 |




**Change in rent ~ Market + Time + Availability + Internal Class**

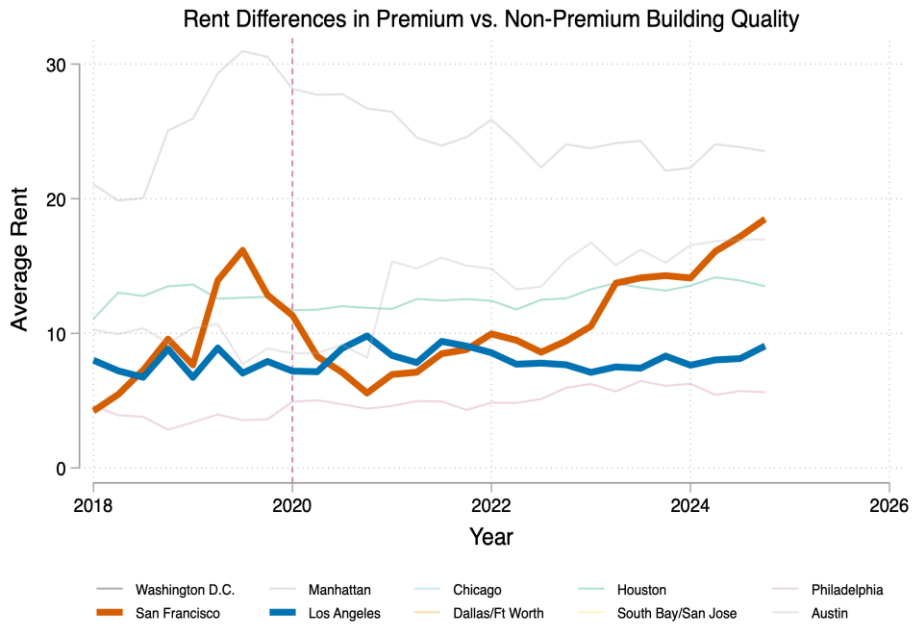
**Despite normalization, the market is still the most important variable in predicting the change in rent.**

**Thus, investigations into trends in individual markets are especially of interest.**

**We trained our model on a randomly selected subset of 70% the data.**

**It was then tested on the remaining 30% of data.**

**Our Random Forest model explained 87.3% of variance in our testing data.**




**Premium vs. Non-Premium:**

- Even within-state, market drives group difference changes in rent
- Seasonal trends observed in the non-premium market, but they were not necessary for the premium markets in general

**Regional Shock Response:**

- All states experienced COVID-19 shock, but recovered
- South had pre-trend