



Cannabis Data Science

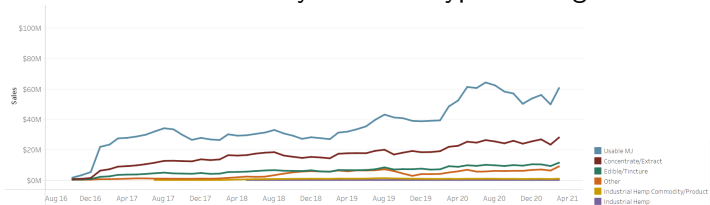
Meetup

April 14, 2021

Total Cannabis Sales in Oregon (y_t)

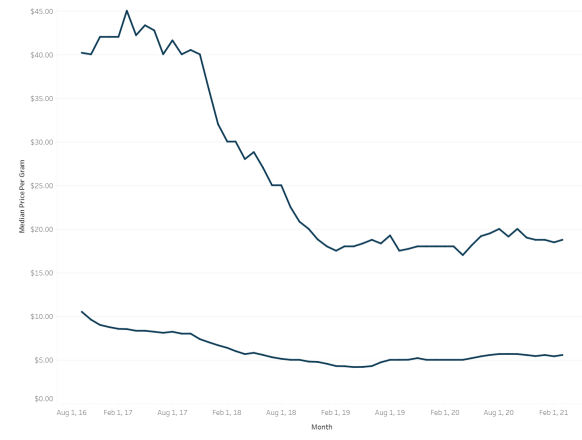


Canabis Sales by Product Type in Oregon



Source: <https://data.olcc.state.or.us/t/OLCCPublic/views/MarketDataTableau/StatewideSalesTrend>

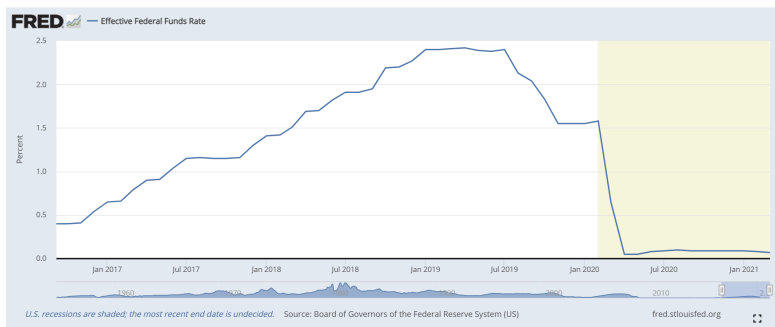
Cannabis Prices in Oregon



Define **inflation** as $\pi_t \equiv \frac{p_t - p_{t-1}}{p_{t-1}}$.

Source: <https://data.olcc.state.or.us/t/OLCCPublic/views/MarketDataTableau/Prices>

Interest Rates



The central bank sets policy to influence the nominal interest rate, i_t , as a function of the realized output gap, x_t , and the rate of inflation, π_t .

Define the **output gap** as $x_t \equiv \hat{y}_t - y_t$, where \hat{y}_t are prior expectations for output.

VAR Models

Assume the following system of linear equations for output, y , inflation, π , and the interest rate, i .

$$\begin{aligned}y_t &= \alpha_y + \cdots + \beta_j y_{t-j} + \cdots + \gamma_j \pi_{t-j} + \cdots + \delta_j i_{t-j} + \mu_t^y \\ \pi_t &= \alpha_\pi + \cdots + \theta_j y_{t-j} + \cdots + \phi_j \pi_{t-j} + \cdots + \lambda_j i_{t-j} + \mu_t^\pi \\ i_t &= \alpha_i + \cdots + \psi_j y_{t-j} + \cdots + \kappa_j \pi_{t-j} + \cdots + \rho_j i_{t-j} + \mu_t^i\end{aligned}$$

VAR Models

The advantages to VAR models are that they are;

- Atheoretical
- Flexible,
- Can fit any frequency data

The major pitfall to VAR models is **overfitting** the model with regressors.

Rational Expectations

- ➊ The rational expectations hypothesis suggests that policymakers cannot affect expectations of inflation, π , or the output gap, x .
- ➋ If firms expect inflation to be higher in the future, then their optimal prices will be higher. Alternatively, if firms expect inflation to be lower in the future, then their optimal prices will be lower.

The 10 Commandments of Forecasting

- 1 Know what you are forecasting.
- 2 Understand the purpose of forecasting.
- 3 Acknowledge the cost of the forecast error.
- 4 Rationalize the forecast horizon.
- 5 Understand the choice of variables.
- 6 Rationalize the forecasting model used.
- 7 Know how to present the results.
- 8 Know how to decipher the forecast results.
- 9 Use recursive methods.
- 10 Understand that forecasting models evolve over time.

Until next time

Make some forecasts and next week we can check our forecasts.