

Gas Price Predictions



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Business Problem:

- Gas prices impact financial decisions.
- Knowledge is power.
- Companies and individuals can benefit from this information.
- Predicting 1 Year into the future.



Data Collection

Retrieved data from: the Energy Information Administration(EIA) Open Data API, Federal Reserve Economic Data, and Matteo Iacovello's Geopolitical Risk Index dataset. All spanning 25 years of information beginning in '95.

Target variable:

- Average gas price in USD

Exogenous variables:

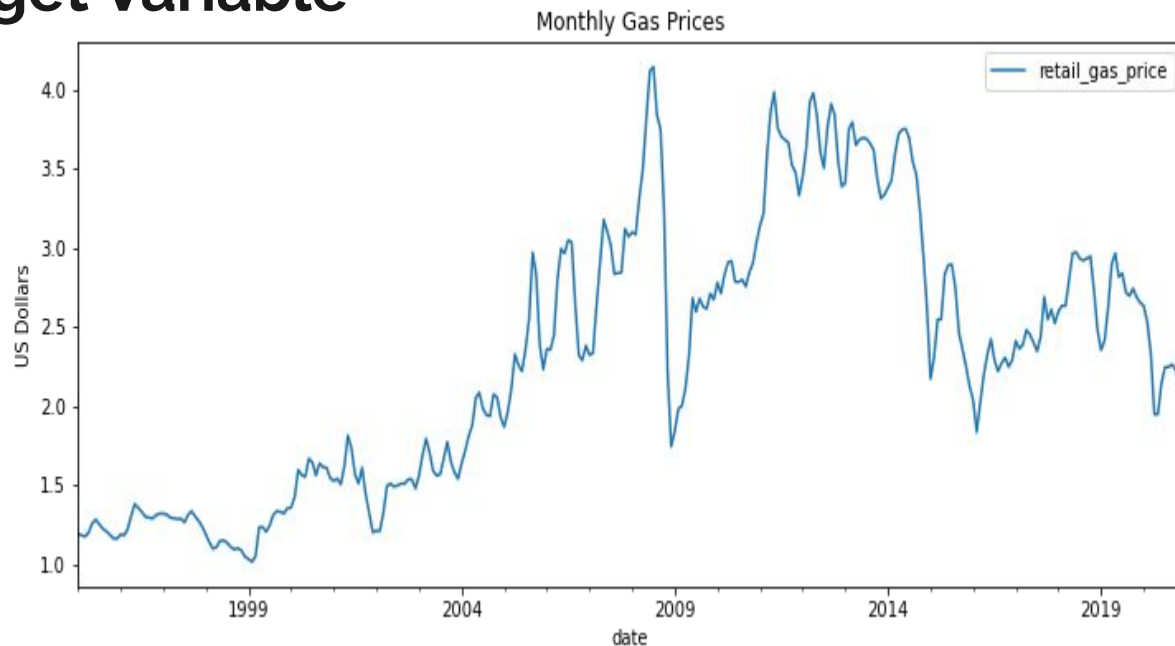
- Crude Oil prices
- Oil Supply
- Oil production
- Imports
- Inflation
- Geopolitical risks



Exploring the Target Variable

Important trends:

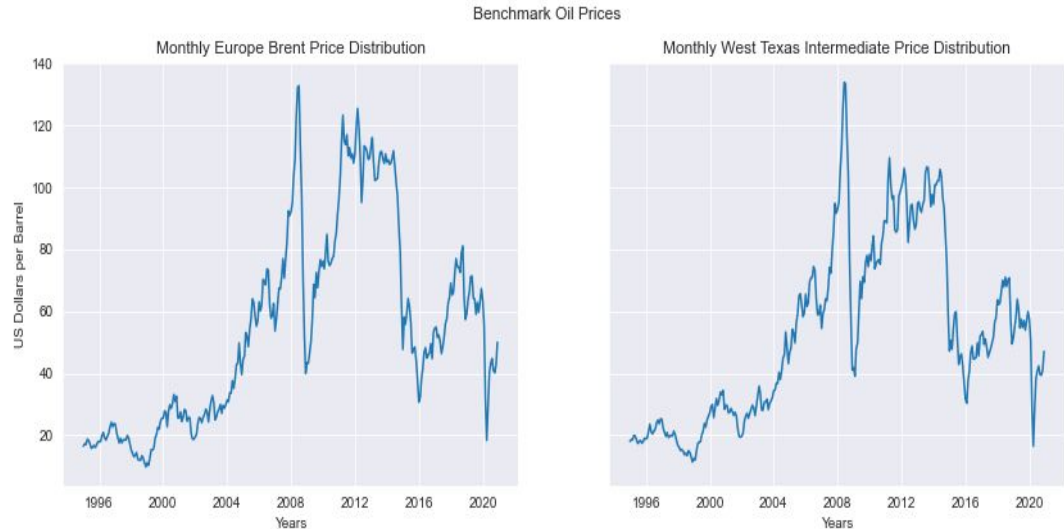
- 2008 recession
- 2014 gas price drop
- 2020 covid gas price drop



Influential Exogenous Variables

Observations

- Europe Brent WTI serve as a benchmark
- Easy to see influence
- Gas prices closely mimic these benchmarks





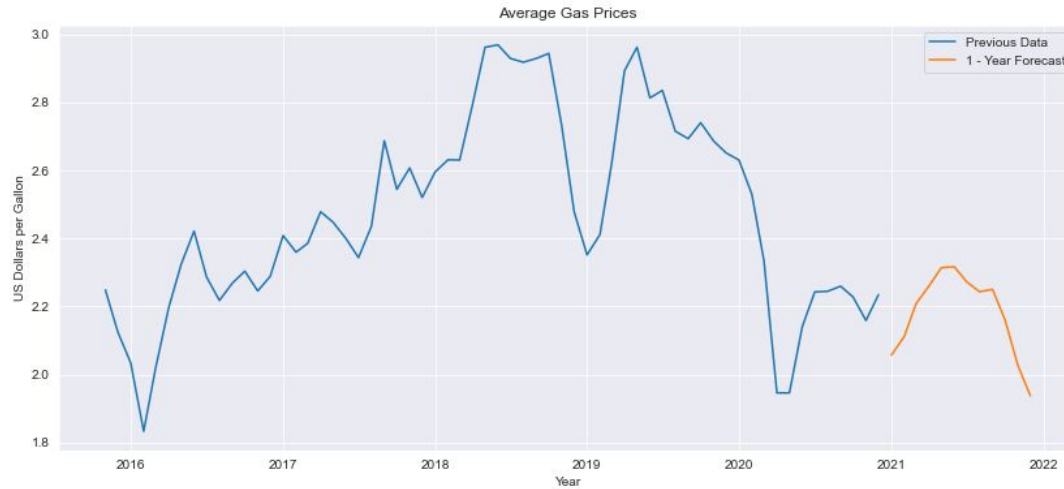
Model results

Model	Train RMSE	Test RMSE
Arima	.144499	.210446
Sarima	.147844	.197893
Facebook Prophet	.365916	.148618
Arimax	.137325	.159185
Sarimax	.144170	.175602

We ran 5 models - Arima, Seasonal Arima, Facebook Prophet, Arima with Exogenous variables, and Seasonal Arima with Exogenous variables to predict the retail gas price

After the predictions, we calculated the Root Mean Squared Error(RMSE) to evaluate each time series, the lower the better

Next Fiscal Year Predictions



predicted gas price	
date	
2021-01-01	2.057189
2021-02-01	2.111994
2021-03-01	2.207844
2021-04-01	2.260065
2021-05-01	2.314176
2021-06-01	2.317410
2021-07-01	2.272633
2021-08-01	2.243652
2021-09-01	2.250692
2021-10-01	2.160796
2021-11-01	2.026207
2021-12-01	1.937391



Next steps

- Add exogenous variables to Facebook Prophet model
- Conduct more inference research into the exogenous variables and influence on gas prices
- Collect smaller scale data, like state or region



References

<https://www.eia.gov/odata/>

<https://fred.stlouisfed.org/>

<https://www.matteoiacoviello.com/gpr.htm#data>



Thank You!

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