

Project 13: Avocado Market Volatility Review

Strengths

- Different plots and models are used to investigate the time series data of the avocado market.
- The project clearly identifies some interesting patterns during the exploratory analysis such as the seasonality of sell volume and revenue.
- The project proposed a simple AR(3) model to predict the average price, and it did a good job.
- The cross-correlation function is used to find out the casualty relationship between the avocado price and sell quantities. It gives us a logical conclusion that the price will have a ten-week negative effect on the sell quantities.

Points for consideration

- The X-axis of figure one is a bit confusing, it'll be better if months are labeled.
- The exploratory analysis states there's a negative relationship between volume and price, so it may be helpful to plot them together.
- Since there's clear seasonality in the volume as well as revenue, why not conduct a frequency analysis on these two fields, especially revenue,
- The formula used for the cross-correlation function is actually a cross-variance function, and it needs to be corrected.
- Four frequencies at which we have a peak in coherency. It'll be better to change the unit and see what it actually represents in the real world.
- The project is called market volatility review, but there is not so much analysis related to the volatility. Further work can be done by using a time series model to predict the standard deviation of price, volume or revenue.
- It would be better to provide some details about the models, such as the actual value of unit roots, p-value, and standard deviation of the models' parameters.
- The AR(3) model's fitting is so good that I think we can do more validation to check if there is overfitting.

Project 19: Stores Sales Data

Strengths

- The html uses a nice format by providing the sidebars and buttons to show the codes.
- Did a good job showing the seasonality of the transaction data, also providing reasons why store 39 is selected for further analysis.
- Use different time series models to clearly identify the seasonality and frequency in the transactions data, and get consistent results.
- The spectrum analysis does a good job at decomposing the trend, cycles, and noise.
- The argument proposed in the report is convincing and with detailed explanation.

Points for consideration

- Some plots are too small, and very hard to see the axis or details.

- When applying the ARMA model, why do we only take 7 periods into consideration and omit the one-year period?
- The number of parameters used for the likelihood ratio test is a bit confusing, because we only have 12 parameters for the model specified in the model selection section.
- The model used is a bit too complex, further work can be done by checking the performance of models with less parameters.
- The residuals have a heavy tail, and I doubt whether the test for normality is valid.
- We can check whether the SARIMA model can be successfully applied on other groceries stores to make sure we're not overfitting the data.