How does November inflation affect the U.S. Holiday Sales?

By: Marlaina Wakim

I wanted to see if price changes due to inflation would change how much consumers are willing to spend on holiday shopping.

$$\text{Holiday Sales} = \beta_0 + \beta_1(\text{Inflation}) + \varepsilon$$

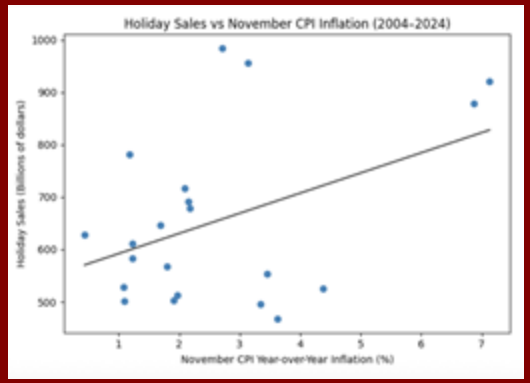
Inflation → independent variable

Holiday Sales → dependent variable

Sources for Data:
https://fred.stlouisfed.org/series/CPIAUCSL
https://capitaloneshopping.com/research/black-friday-statistics/

Graphs

Conclusion: If the current year's inflation is greater than the previous year's, then holiday sales increase more than they did the previous year. Example: If inflation is higher this year than last, you may try to save more by utilizing Black Friday and Cyber Monday deals than if you were not worried about prices/inflation. This conclusion takes on a different meaning than what I originally had anticipated due to the time series limitations.

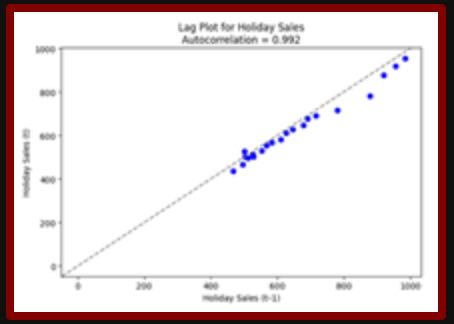


Original Scatterplot + Regression Line

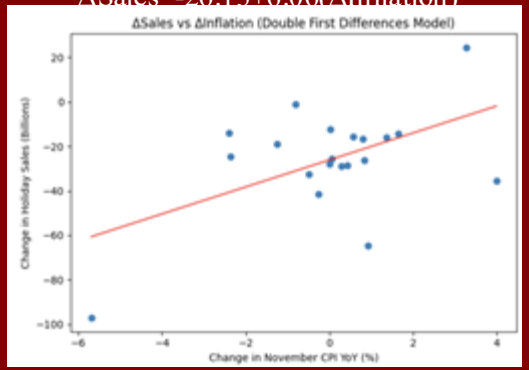
Regression line: Sales=553.65 +38.46(CPI YOY)+ ε

P-value is 0.059 which is not statistically significant. There is not enough statistical evidence to conclude that there is a link between inflation and sales around the holidays.

Since this is a time series conducted a Lag plot and the graph showed heavy autocorrelation - which is a violation of the assumptions of the General Linear Model.



ΔSales=-26.13+6.06(ΔInflation)



Double First Differences Scatterplot +Regression Line

Since there is a strong autocorrelation I attempted to fix it with the double first difference model and I got a new p-value of 0.019 which is statistically significant.

There is statistically significant evidence of a relationship between changes in inflation during November of each year recorded and changes in holiday sales from year to year.