TESLA

Stock Price Analysis

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RESEARCH QUESTION

How do gasoline prices affect consumers' interest in Tesla vehicles, and how might this relationship impact Tesla's stock price?

Scope of the Project

- Year 2024
- United States of America

DATASETS

- Tesla Stock (2024)

https://finance.yahoo.com/quote/TSLA/history/

Source: Yahoo Finance

- Tesla Quarterly Sales Data (2024)

Q1 https://ir.tesla.com/press-release/tesla-vehicle-production-deliveries-and-date-financial-results-webcast-first-quarter-2024

Q2 https://ir.tesla.com/press-release/tesla-vehicle-production-deliveries-and-date-financial-results-webcast-second-quarter-2024

Q3 https://ir.tesla.com/press-release/tesla-third-quarter-2024-production-deliveries-and-deployments

Q4 https://ir.tesla.com/press-release/tesla-fourth-quarter-2024-production-deliveries-and-deployments

Source: Tesla's Investors Relations

- Google Trends Data on the Keyword 'Tesla' in the United States (2024)

https://trends.google.com/trends/

Source: Google Trends

- U.S. Gasoline Prices

https://www.eia.gov/petroleum/gasdiesel/

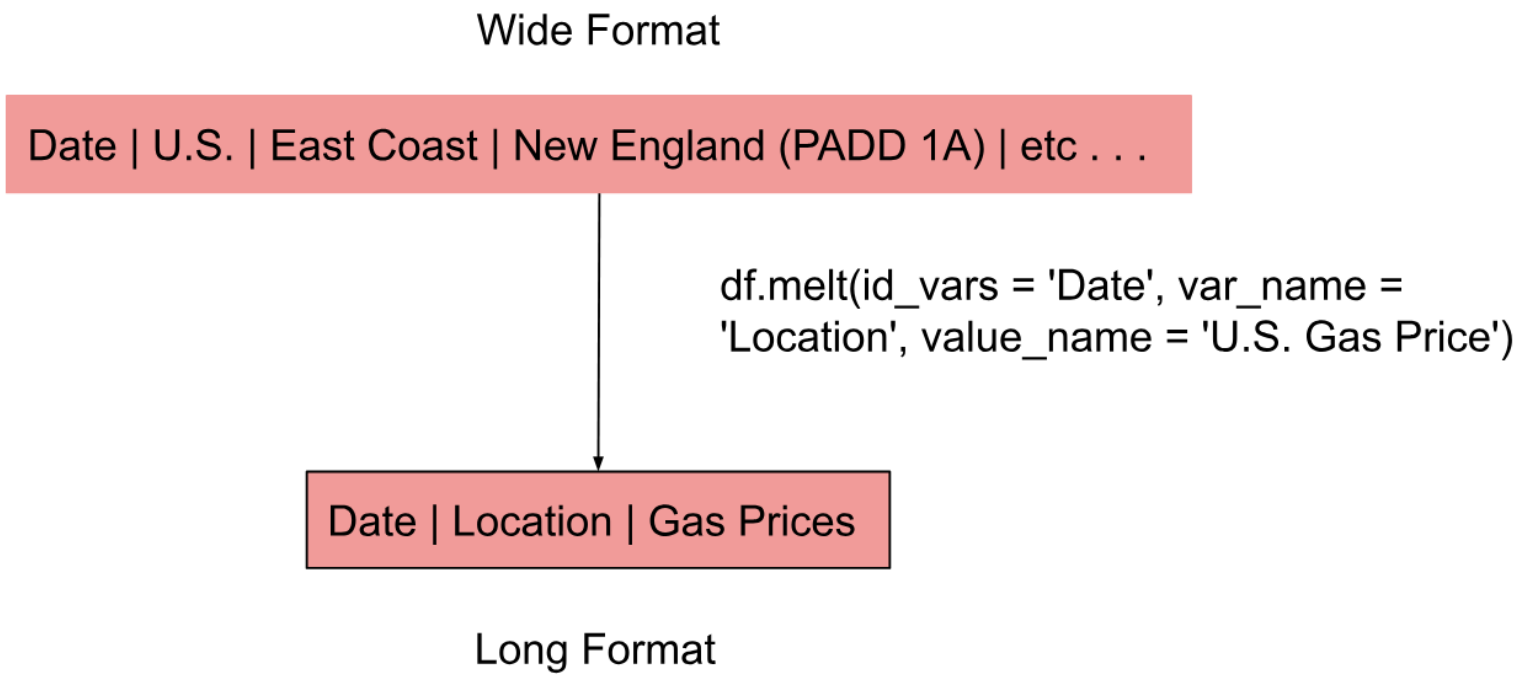
Source: U.S. Energy Information Administrations (E.I.A)

DATA PRE-PROCESSING

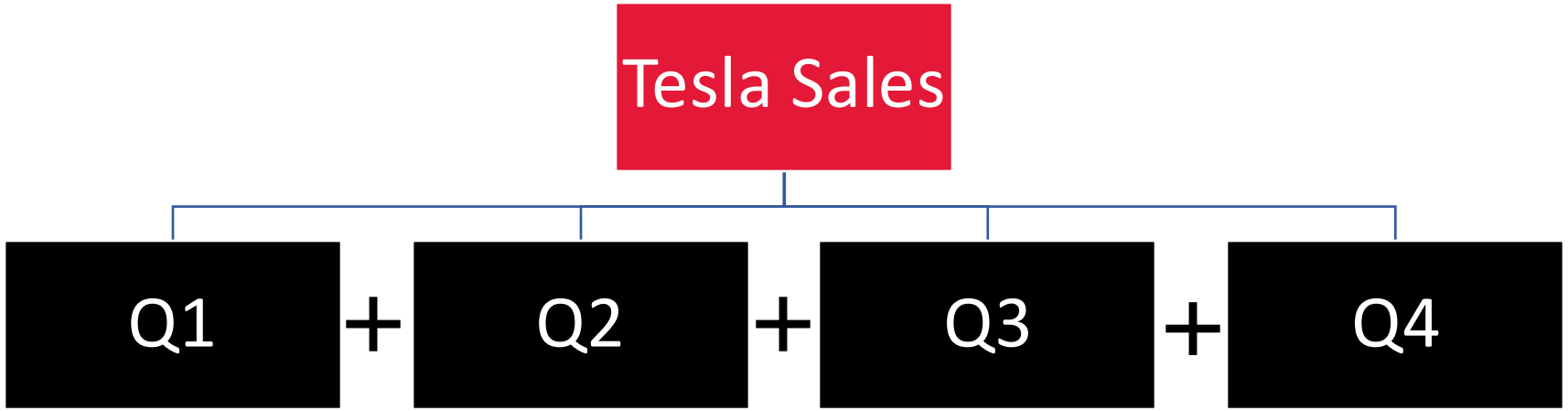
DATA CLEANING

Dataset	Step	Raw	Cleaned
Tesla Stock	Handle Missing Data	Last 2 rows were null	All removed
	Data type conversion	"Date" column stored as an object	Converted to datetime
	Set datetime as index	No index	Date column set as index
	Strip whitespace from column names	Columns had spaces, making it hard to access the df	Removed trailing white space from column names
Gas Prices	Update column names	Columns were unnamed; the actual headers were in the 2nd row	Set the 2nd row as the header, removed the first 2 rows, reset the index
	Reformat column names	Column names included full descriptions (ex. "Weekly *Region Name* Regular All Formulations Retail Gasoline Prices) with regions across the United States	Extracted region names with string manipulation, increasing readability
	Filter data	Dataset included values from multiple years (1990-2025)	Kept 2024 data
	Filter data	Data included U.S. and subregions, cities, and states	Focused only on national data by keeping rows where 'Location' == 'U.S.'
	Data type conversion	"U.S. Gas Prices" column stored as an object	Converted to numeric
	Data type conversion	"Date" column stored as an object	Converted to datetime
	Set datetime as index	No index	Date column set as index
Tesla Sales	Rename columns	Some headers were unnamed or not properly aligned with their data	Assigned correct column names and ensured each name matched the right data
	Add 'Period' column	Datases didn't include which quarter they represented	Added a period column to each dataframe with their respective quarter
	Add 'Date' column	No consistent data reference across datasets	Added a "Date" column that represents the start date of each quarter
	Data type conversion	"Deliveries" and "Production" columns as objects	Removed the commas in the numbers and converted it to an integer (ex. 100,000)
	Data type conversion	"Date" column as object	Converted to datetime
	Set datetime as index	No index	Converted to datetime
Google Trends	Fix column and index name	The headers, "Date" and "Tesla Search Interest", were in the first row	Renamed the column and index and dropped the first row
	Filter data	Dataset included values from multiple years (2004-2025)	Kept 2024 data
	Data type conversion	"Date" index was stored as strings	Converted to datetime
	Data type conversion	Tesla Search Interest column was an object	Converted to numeric

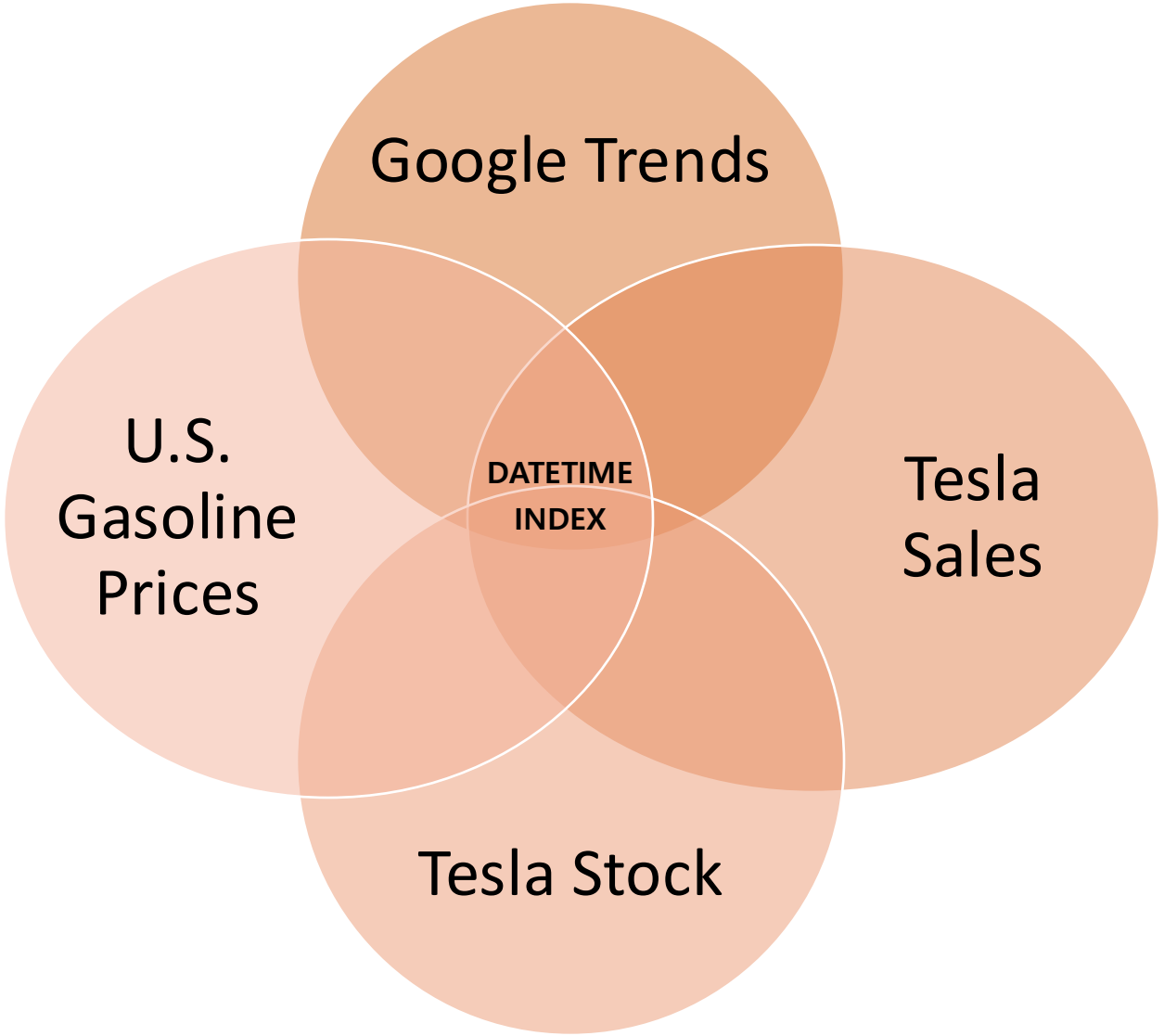
DATA WRANGLING:
Melt U.S. Gasoline Prices



DATA WRANGLING:
Concatenate Tesla Quarterly Sales Data



DATA WRANGLING:
Join All Datasets

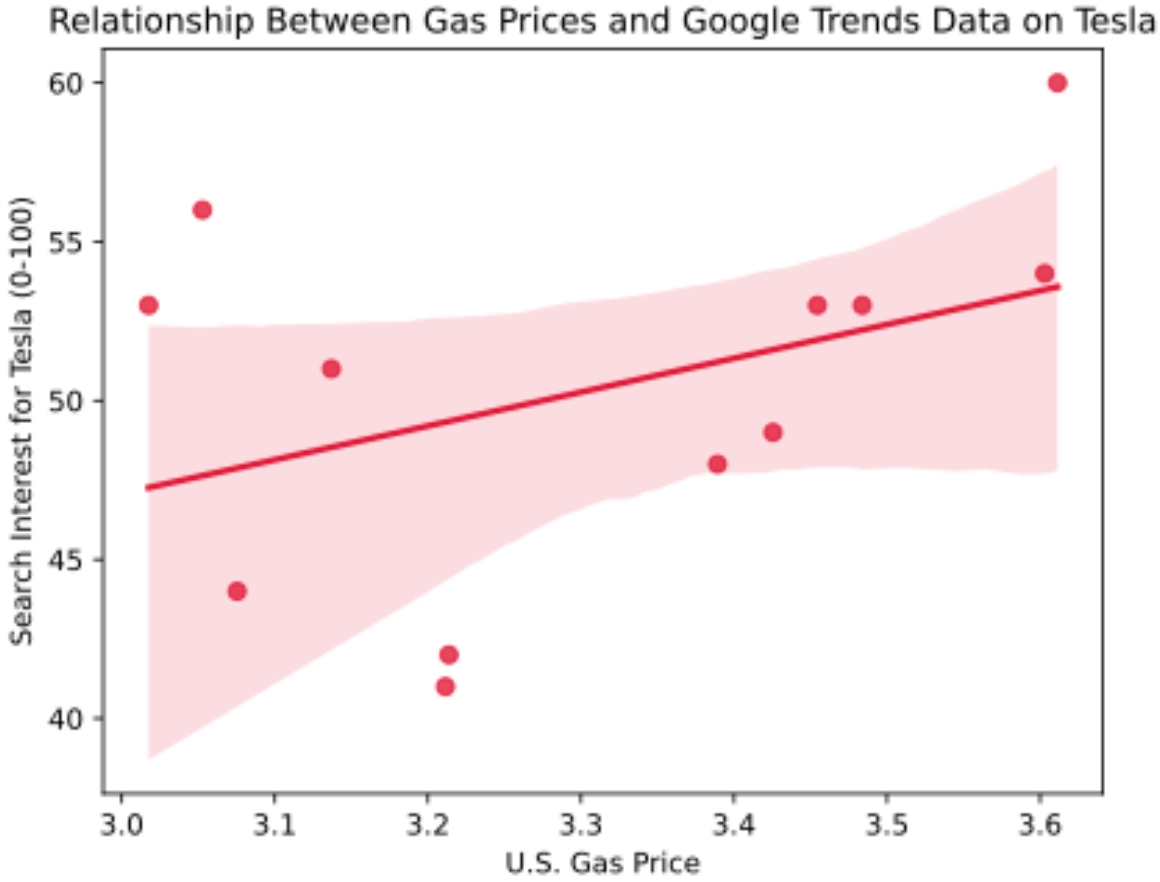


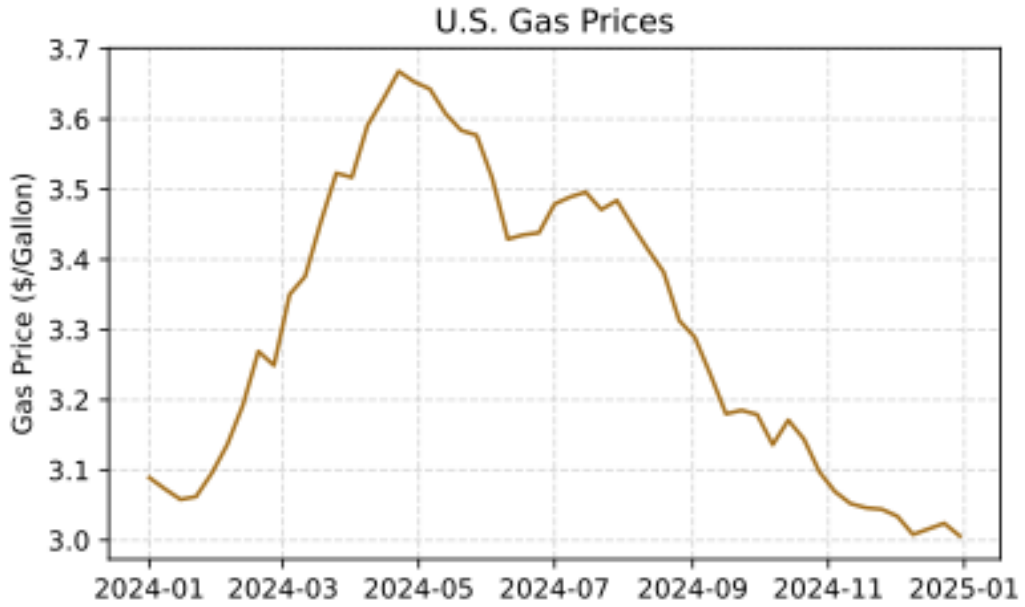
Data-Driven Insights

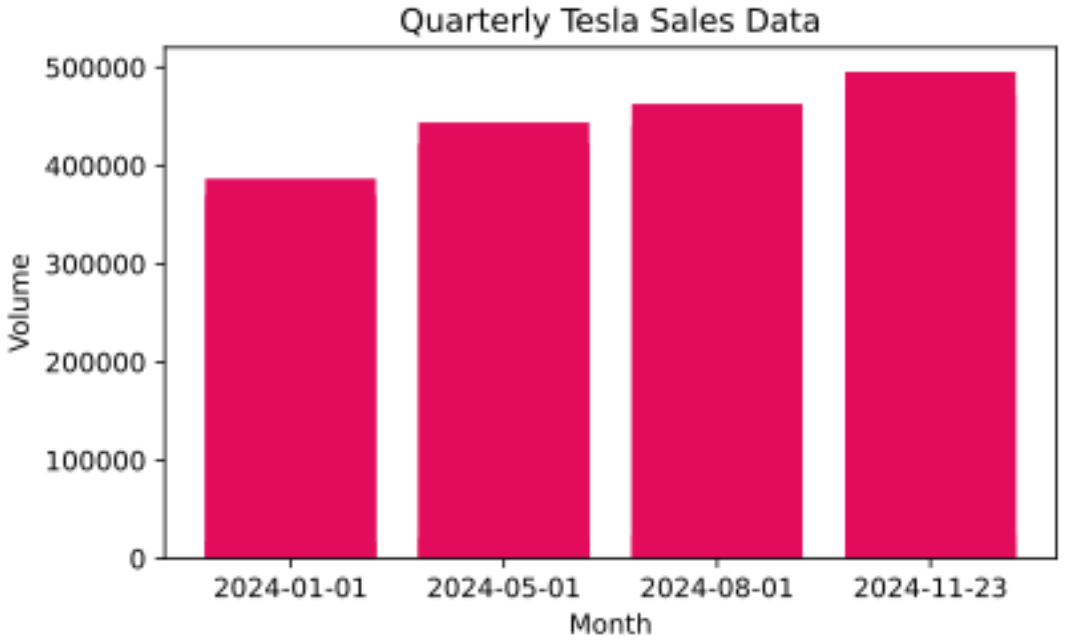
Do Higher Gas Prices Drive Tesla Curiosity?

Insight

The positive correlation between gas prices and Google search interest in Tesla suggests that rising fuel costs may increase consumer curiosity in Tesla vehicles. This trends highlights a potential shift in consumer behavior as gas becomes more expensive.







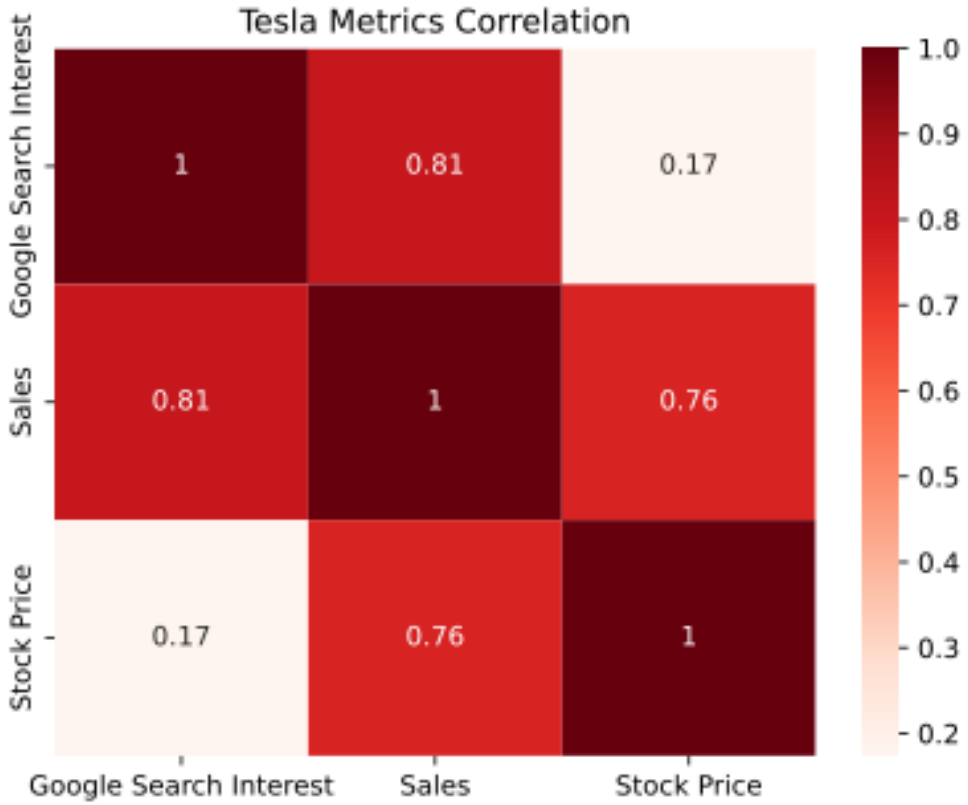
Tesla's Sales Climb Despite Lower Gas Prices

This subplot compares gas prices throughout 2024 with Tesla's quarterly sales. While gas prices fluctuate—spiking in April before trending downward–Tesla's sales consistently increase each quarter. Although high gas prices may trigger consumers to research Tesla, gas prices do not directly impact sales.

Sales Are the Bridge Between Curiosity and Market Value

Insight

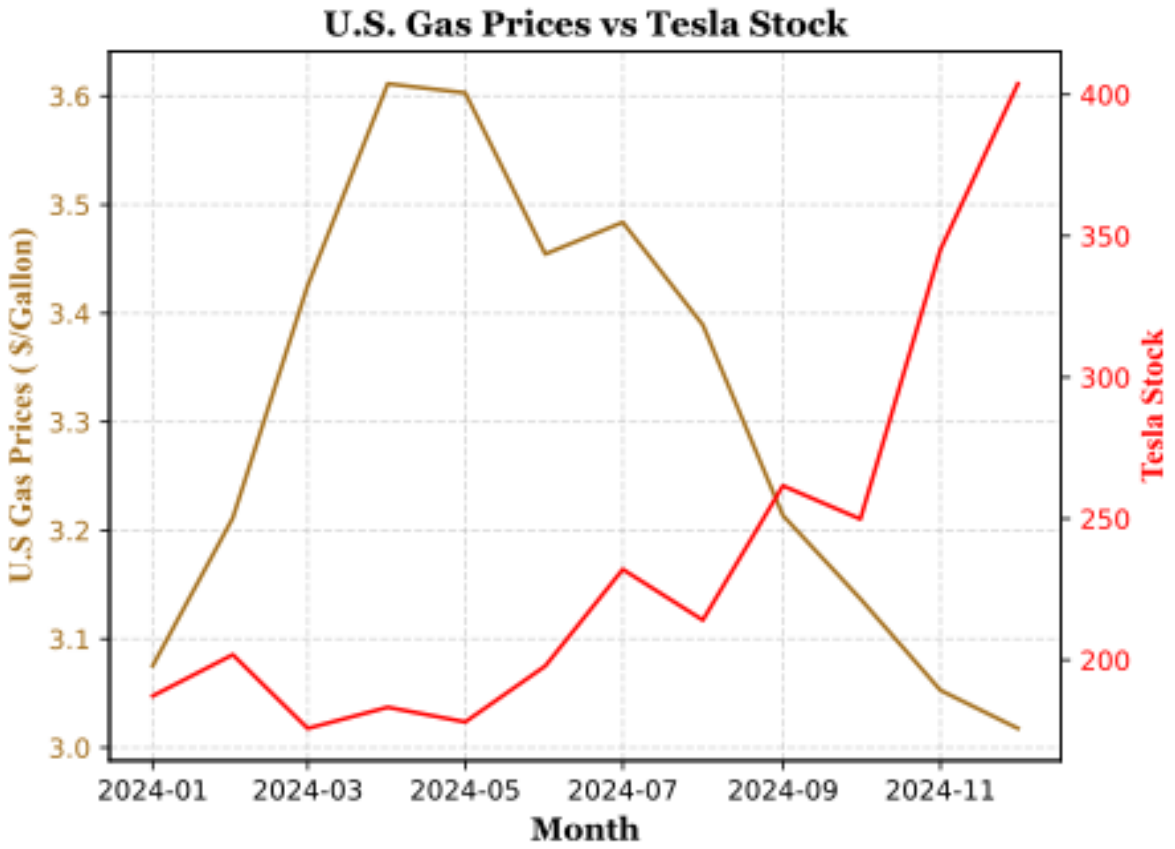
This correlation matrix reveals a potential chain of influence. Google search interest strongly correlates with Tesla's sales (r = 0.81), and sales strongly correlate with Tesla's stock price (r = 0.76). This heatmap suggests that consumer curiosity may lead to more purchases, which then drive investor's confidence and stock performance.



Tesla's Climb Following the April Gas Price Spike: A Delayed Reaction?

Insight

This dual y-axis graph compares U.S. gas prices with Tesla's stock price over time. Gas prices have a noticeable spike in April. In contrast, Tesla's stock price experiences a significant spike approximately six months later. While there is no immediate correlation between the two variables, the delayed increase in Tesla's stock may suggest a lagging consumer response—potentially as individuals begin researching and transitioning to electric vehicles in reaction to elevated fuel costs.

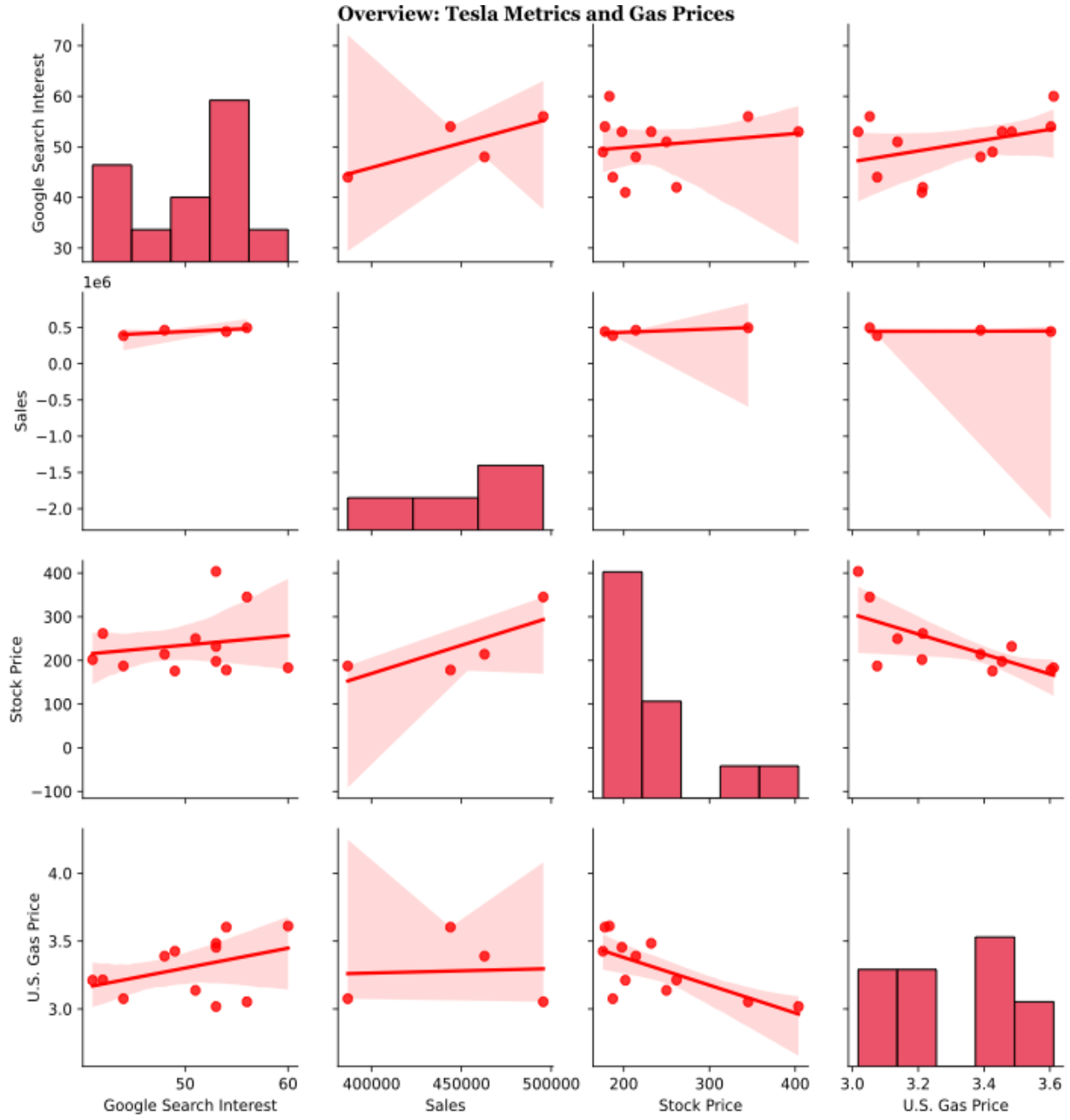


SUMMARY OF FINDINGS

The data suggests that gasoline prices influence consumer interest in Tesla vehicles, as seen through a strong correlation between gas prices and Google search trends. This increased interest appears to translate into higher sales, which are strongly linked to Tesla's stock performance.

Results

While higher gas prices do not directly impact Tesla's stock, they may initiate a chain of events—sparking curiosity in consumers to research Tesla vehicles, leading to purchases, and ultimately contributing to Tesla's stock growth.



THANKS

QUESTIONS and ANSWERS