Project Proposal: Analysis about the Impact of Smartphone Production in the US on Metal Prices

Introduction:

This project explores the correlation between smartphone production in the United States and the demand for metals like silver and copper used in manufacturing these devices. Through analyzing smartphone market share dynamics and metal price fluctuations, It is aimed to uncover the relationship between the thriving smartphone market and its impact on metal markets.

Motivation:

The United States is a significant player in the global smartphone market, with its consumer preferences and technological advancements influencing worldwide trends. Smartphones utilize various metals, including copper, silver, and rare earth elements, critical for their functionality. The extraction and processing of these metals pose environmental and economic challenges. Given the finite nature of metal resources and the environmental implications of mining, understanding the demand dynamics driven by smartphone production is crucial. This knowledge could guide sustainable resource management, inform policy-making, and promote environmentally friendly practices in the tech industry.

Datasets used in the Project:

Stock Market Dataset: This dataset given by the instructor includes the prices and trading volumes of many metals that used during the production of smartphones and contains the stock price and trading of Apple which is one of the leading companies in the Smartphone market share. Source: https://www.kaggle.com/datasets/saketk511/2019-2024-us-stock-market-data?resource=download

Samsung Electronics Co., Ltd. Stock Data: This dataset obtained by Yahoo Finance contains the stock value of Samsung in the time period needed (ie. 2019-2024) which helps determine an accurate result as another lead company in the Smartphone industry. Source: https://finance.yahoo.com/quote/005930.KS/history

Number of smartphones sold to end users worldwide from 2007 to 2023: This dataset obtained by Statista contains the number of smartphones sold to end users worldwide for a large time period to indicate if the manufacture grows each year in order to track the metal usage throughout time. Source:

https://www.statista.com/statistics/263437/global-smartphone-sales-to-end-users-since-2007/

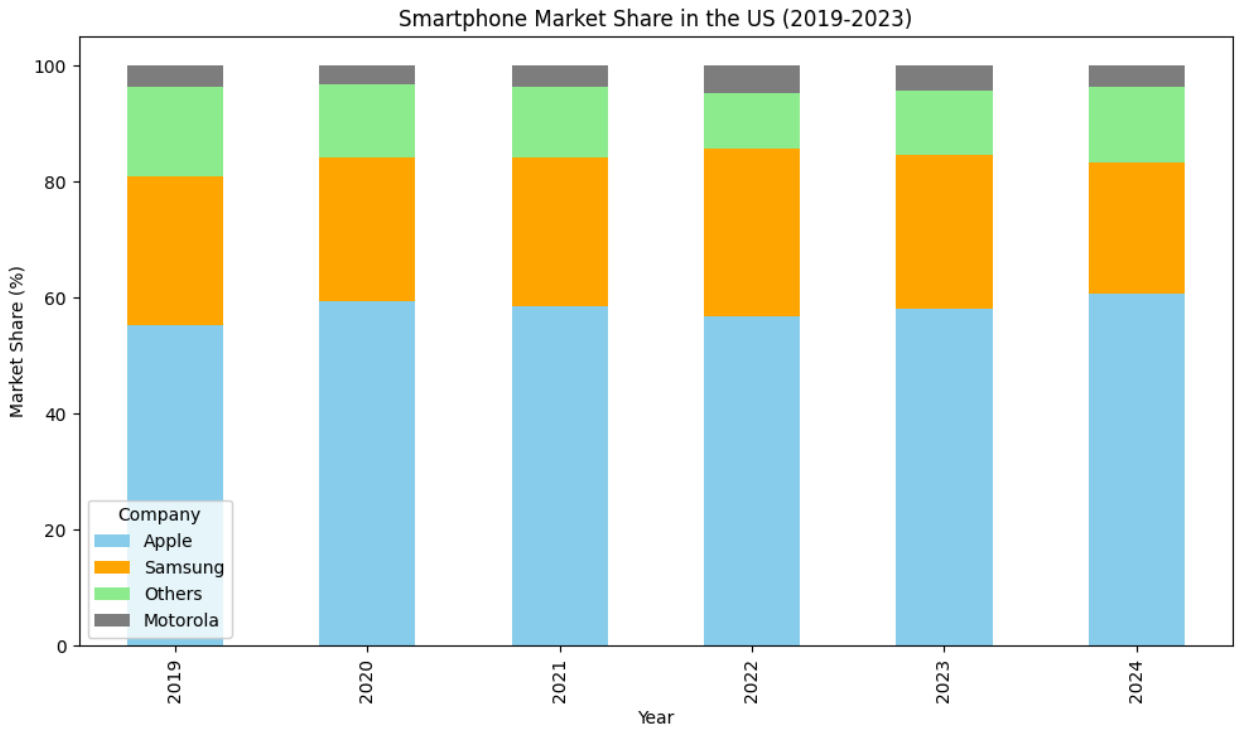
Mobile Vendor Market Share United States of America: This dataset obtained by Statcounter contains the mobile phone market share in the US for the expected time period that shows the leading companies to eliminate looking at a wide range of companies. This data indicates that Samsung and Apple dominate most of the market. Source: https://gs.statcounter.com/vendor-market-share/mobile/united-states-of-america

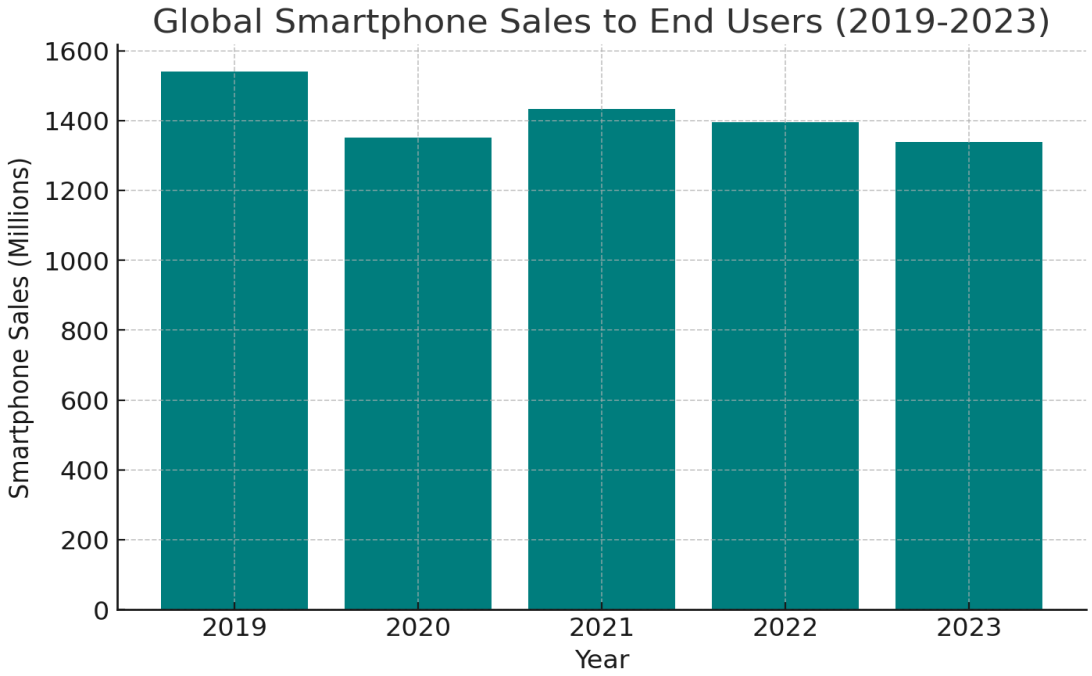
(All of the datasets were either extracted from the websites as csv files or gotten as xlsx files and turned into a csv file.)

Expected Outcomes or Result Anticipation:

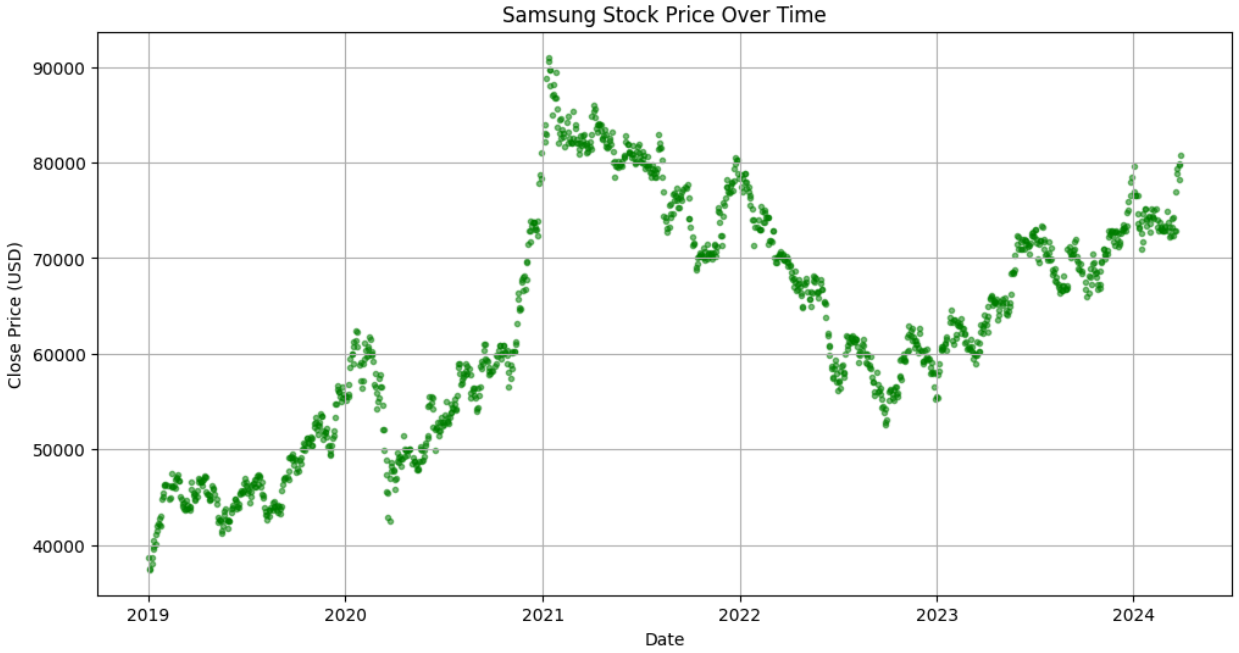
We anticipate revealing significant correlations between the growth of smartphone market shares and fluctuations in metal prices, particularly for copper and silver. This analysis is expected to highlight how technological advancements and consumer demand in the smartphone sector drive metal consumption, influencing global markets. Results may also shed light on the sustainability challenges posed by increased metal demand, providing a foundation for proposing environmentally conscious solutions. Insights derived could prompt the tech industry and policymakers to consider more sustainable practices in smartphone production, emphasizing recycling and efficient use of resources.

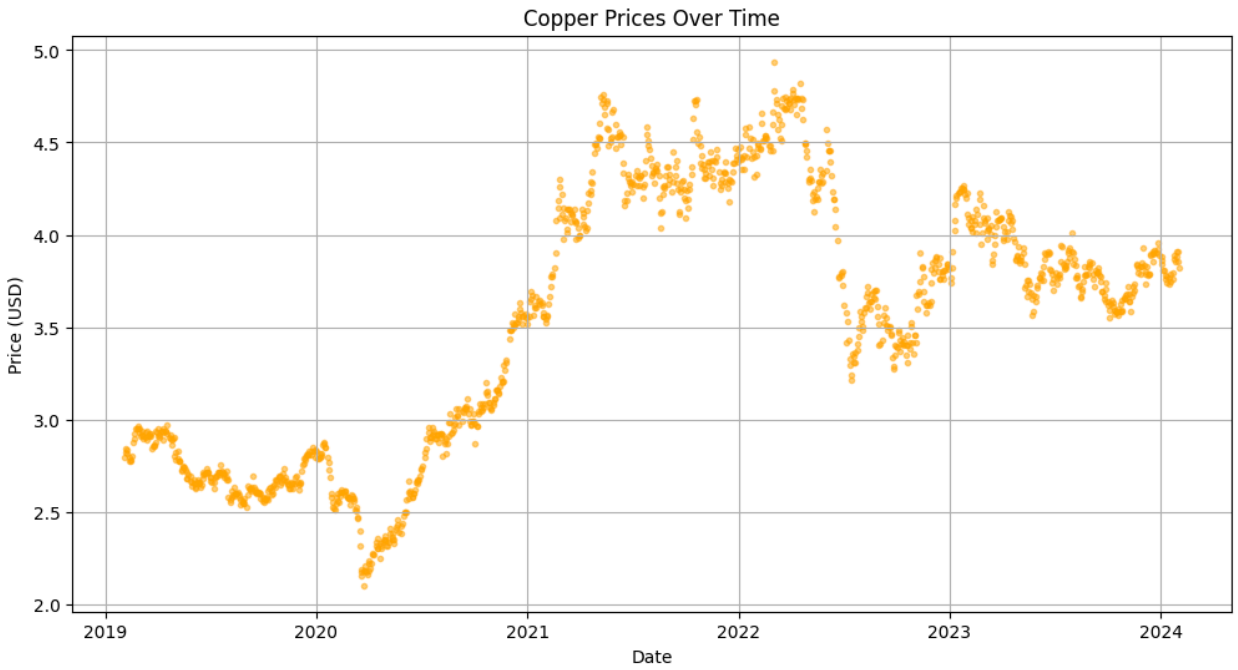
(The histograms and Scatter Plots can be seen below in the next pages.)


Smartphone Market Share in the US (2019-2023)
Market Share (%)
Year
Company
Apple
Samsung
Others
Motorola
0
20
40
60
80
100
2019
2020
2021
2022
2023
2024


Global Smartphone Sales to End Users (2019-2023)
Smartphone Sales (Millions)
Year
0
200
400
600
800
1000
1200
1400
1600
2019
2020
2021
2022
2023


Apple Stock Price Over Time
Price (USD)
200
180
160
140
120
100
80
60
40
2019
2020
2021
2022
2023
2024
Date


Samsung Stock Price Over Time
Close Price (USD)
90000
80000
70000
60000
50000
40000
2019
2020
2021
2022
2023
2024
Date


Copper Prices Over Time
Price (USD)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
2019
2020
2021
2022
2023
2024
Date


Silver Prices Over Time
Price (USD)
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
2019
2020
2021
2022
2023
2024
Date