Crypto Market Trends (2020-2024)

1. Bitcoin (BTC) Price Over Time
2. Ethereum (ETH) Price Over Time
3. Market Capitalization (BTC and ETH combined)
4. Trading Volume (BTC vs ETH)
5. Bitcoin Volatility Index

```
# Import necessary libraries
import matplotlib.pyplot as plt
import numpy as np
```

Step 1: Sample Data Preparation

We will now create some sample data that simulates the cryptocurrency market trends for the years 2020 to 2024. You can replace these arrays with real data from any crypto API.

- `btc_prices`: Bitcoin prices over time.
- `eth_prices`: Ethereum prices over time.
- `market_cap`: Combined market cap for Bitcoin and Ethereum.
- `btc_volume`: Trading volume for Bitcoin.
- `eth_volume`: Trading volume for Ethereum.
- `btc_volatility`: Bitcoin's volatility index.

```
# Sample data (replace these with your actual data)
dates = np.array(['2020-01', '2020-06', '2021-01', '2021-06', '2022-
01', '2022-06', '2023-01', '2023-06', '2024-01'])
btc_prices = np.array([8000, 10000, 30000, 40000, 55000, 35000, 45000,
60000, 70000])
eth_prices = np.array([150, 250, 1000, 2500, 3500, 2000, 3000, 4500,
5000])
market_cap = np.array([1500, 2000, 6000, 8000, 12000, 9000, 10000,
13000, 14000])
btc_volume = np.array([100000, 120000, 150000, 180000, 200000, 170000,
220000, 240000, 260000])
eth_volume = np.array([50000, 70000, 90000, 120000, 150000, 110000,
140000, 180000, 190000])
btc_volatility = np.array([0.05, 0.07, 0.10, 0.08, 0.06, 0.09, 0.07,
0.06, 0.08])
```

Step 2: Visualizing Data

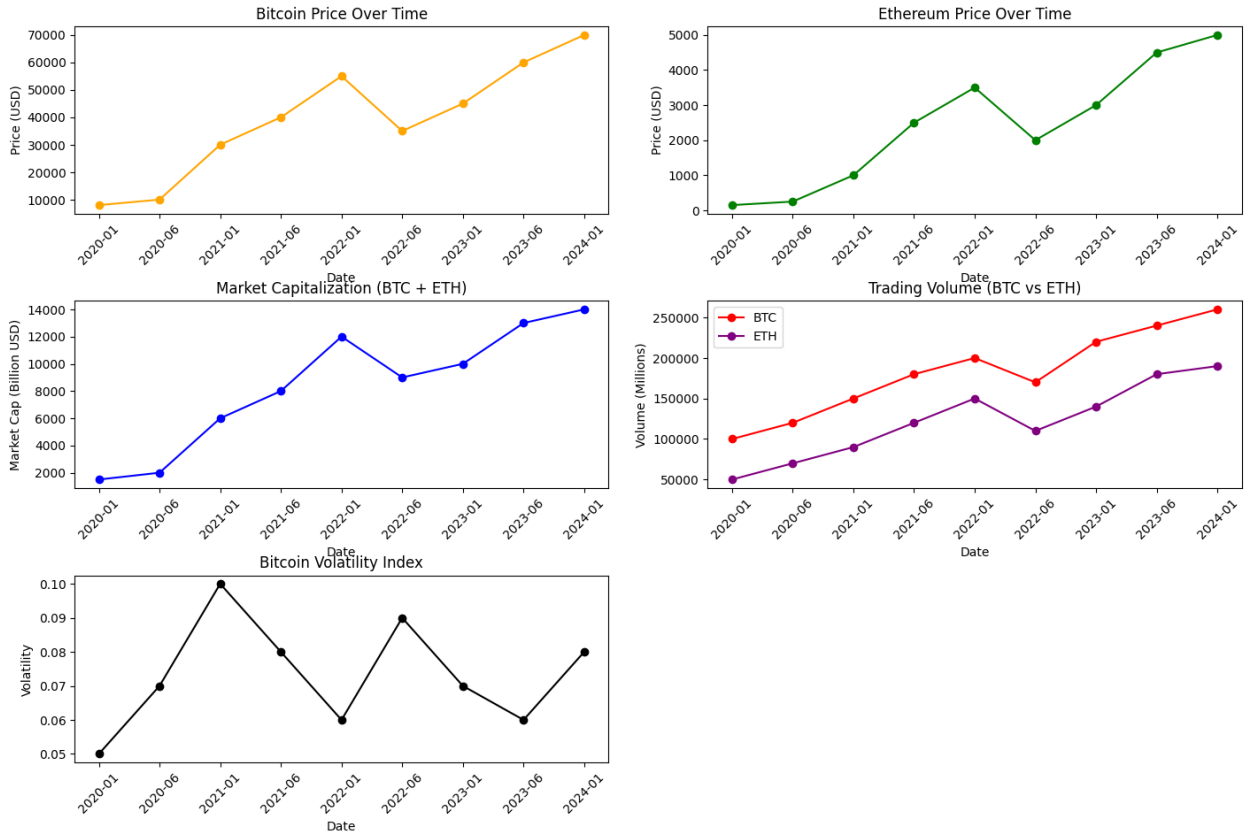
We will now create five separate plots to visualize the trends mentioned earlier. The graphs will be displayed in a 3x2 grid layout.

The graphs include:

1. **Bitcoin Price Over Time**
2. **Ethereum Price Over Time**
3. **Market Capitalization (BTC + ETH)**
4. **Trading Volume (BTC vs ETH)**
5. **Bitcoin Volatility Index**

```
# Create a 3x2 grid for the 5 plots
fig, axs = plt.subplots(3, 2, figsize=(15, 10))
fig.tight_layout(pad=5.0)

# Plot Bitcoin Price Over Time
axs[0, 0].plot(dates, btc_prices, marker='o', color='orange')
axs[0, 0].set_title('Bitcoin Price Over Time')
axs[0, 0].set_xlabel('Date')
axs[0, 0].set_ylabel('Price (USD)')
axs[0, 0].tick_params(axis='x', rotation=45)

# Plot Ethereum Price Over Time
axs[0, 1].plot(dates, eth_prices, marker='o', color='green')
axs[0, 1].set_title('Ethereum Price Over Time')
axs[0, 1].set_xlabel('Date')
axs[0, 1].set_ylabel('Price (USD)')
axs[0, 1].tick_params(axis='x', rotation=45)

# Plot Market Capitalization (BTC + ETH)
axs[1, 0].plot(dates, market_cap, marker='o', color='blue')
axs[1, 0].set_title('Market Capitalization (BTC + ETH)')
axs[1, 0].set_xlabel('Date')
axs[1, 0].set_ylabel('Market Cap (Billion USD)')
axs[1, 0].tick_params(axis='x', rotation=45)

# Plot Trading Volume (BTC vs ETH)
axs[1, 1].plot(dates, btc_volume, marker='o', color='red',
label='BTC')
axs[1, 1].plot(dates, eth_volume, marker='o', color='purple',
label='ETH')
axs[1, 1].set_title('Trading Volume (BTC vs ETH)')
axs[1, 1].set_xlabel('Date')
axs[1, 1].set_ylabel('Volume (Millions)')
axs[1, 1].tick_params(axis='x', rotation=45)
axs[1, 1].legend()

# Plot Bitcoin Volatility Index
axs[2, 0].plot(dates, btc_volatility, marker='o', color='black')
axs[2, 0].set_title('Bitcoin Volatility Index')
axs[2, 0].set_xlabel('Date')
axs[2, 0].set_ylabel('Volatility')
axs[2, 0].tick_params(axis='x', rotation=45)

# Remove empty subplot (since we only have 5 graphs)
```

```
axs[2, 1].axis('off')

# Show the plot
plt.show()
```



Conclusion

In this notebook, we explored several key trends in the cryptocurrency market from 2020 to 2024:

1. **Bitcoin and Ethereum Prices**: Both cryptocurrencies have shown significant fluctuations over time.
2. **Market Capitalization**: The combined market cap of Bitcoin and Ethereum increased dramatically, peaking in recent years.
3. **Trading Volume**: We observed a strong correlation between trading volume and price action for both Bitcoin and Ethereum.
4. **Volatility**: Bitcoin's volatility index reveals its market risk over time.