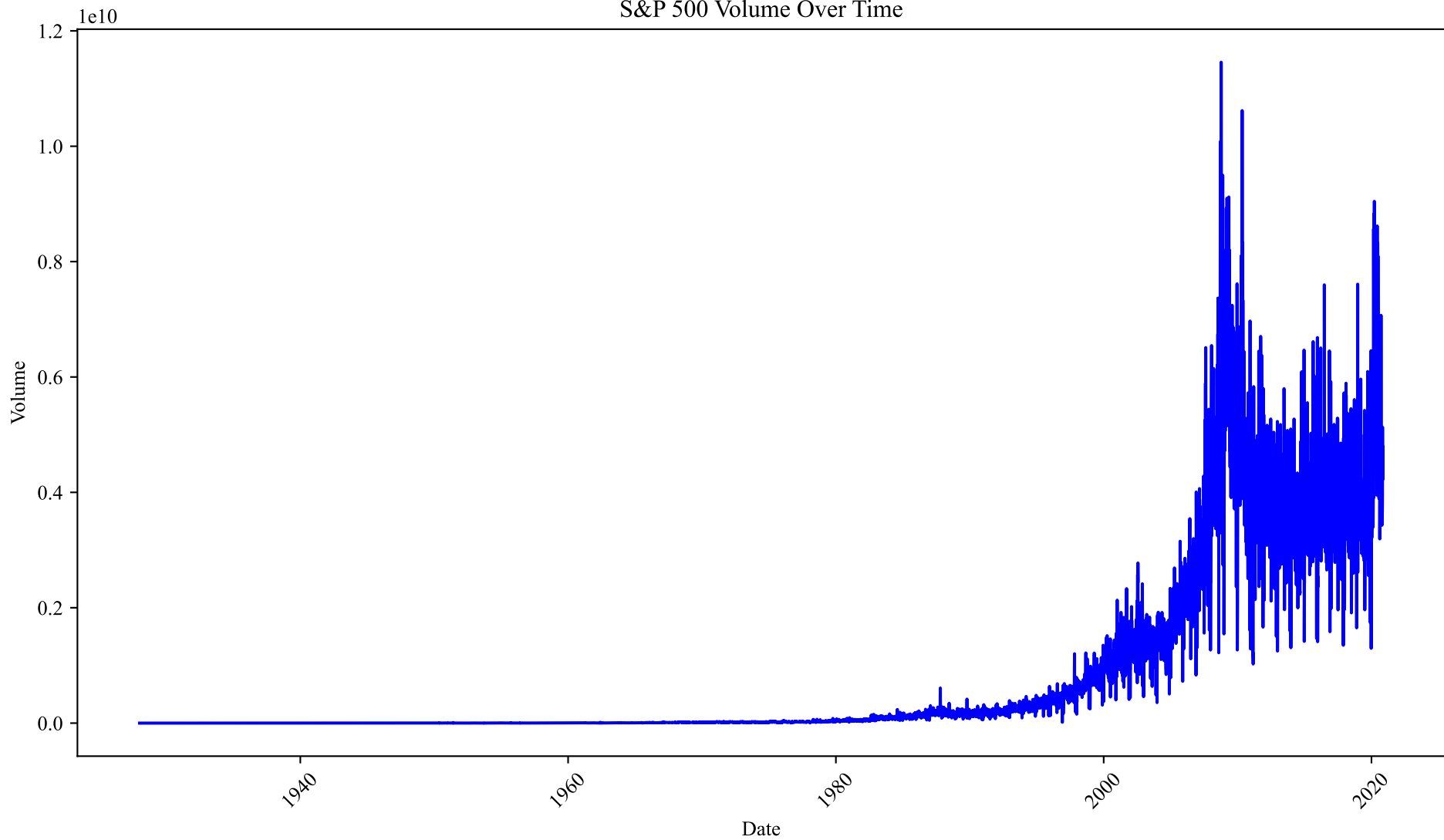
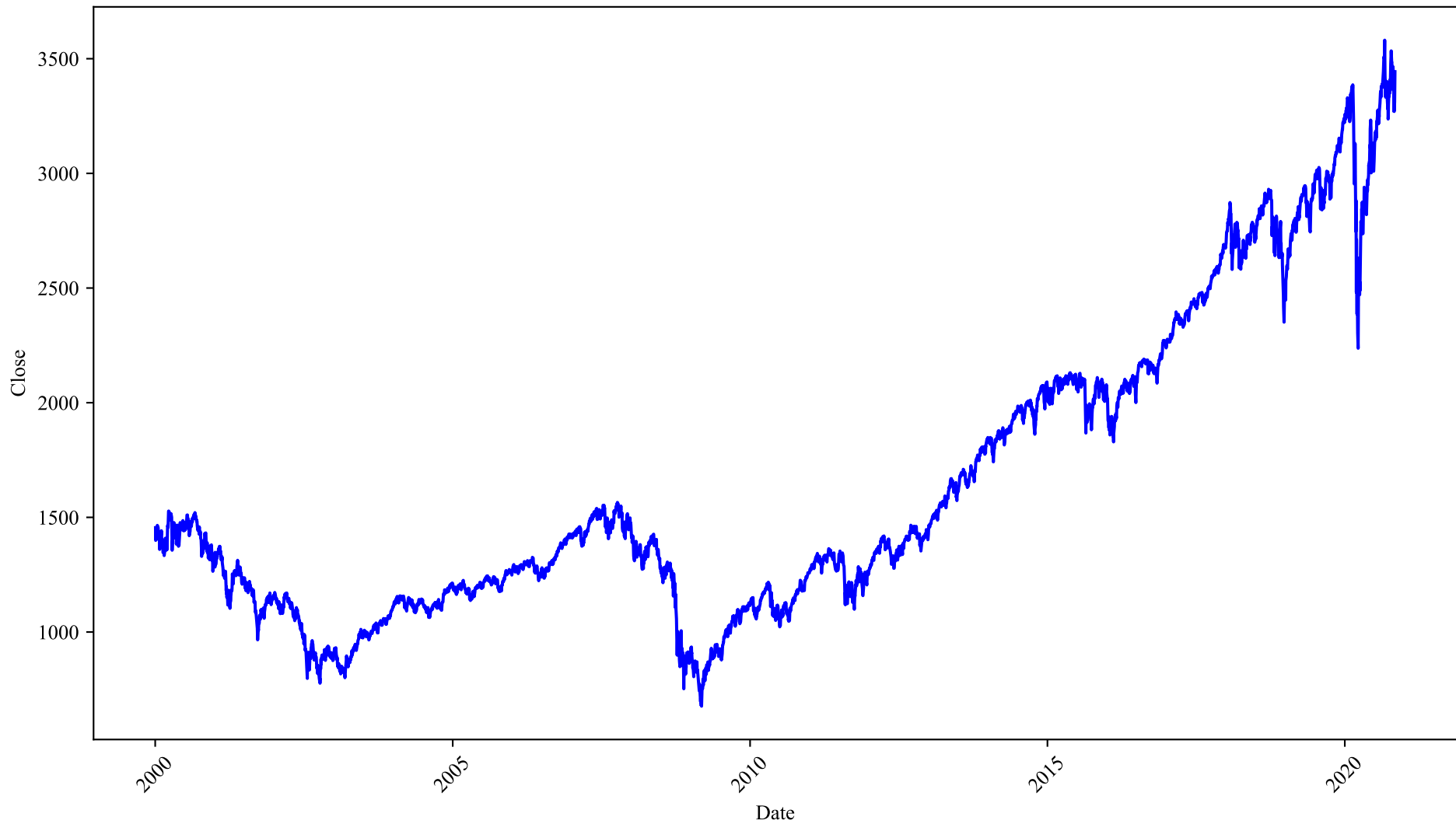


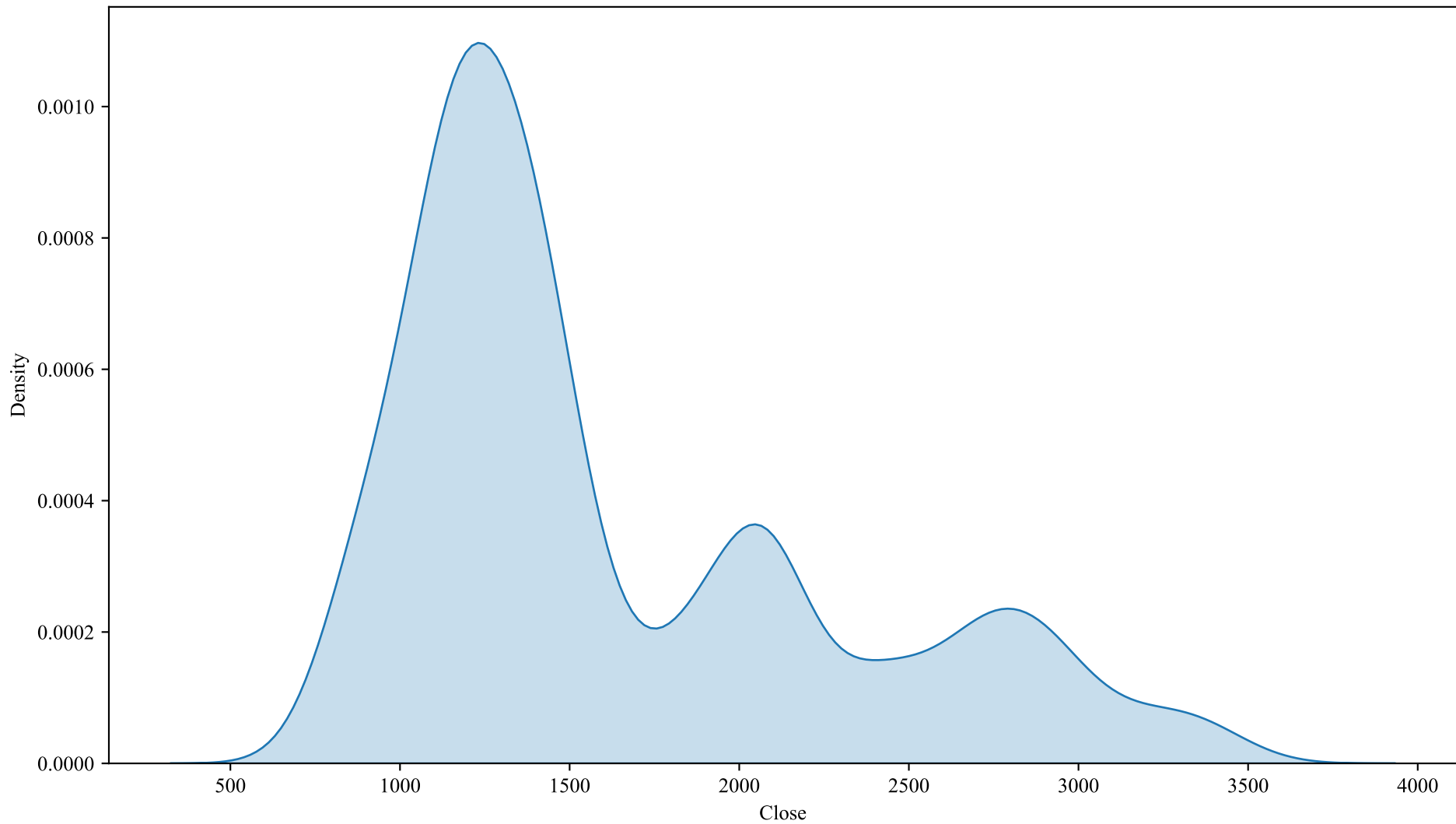
S&P 500 Volume Over Time



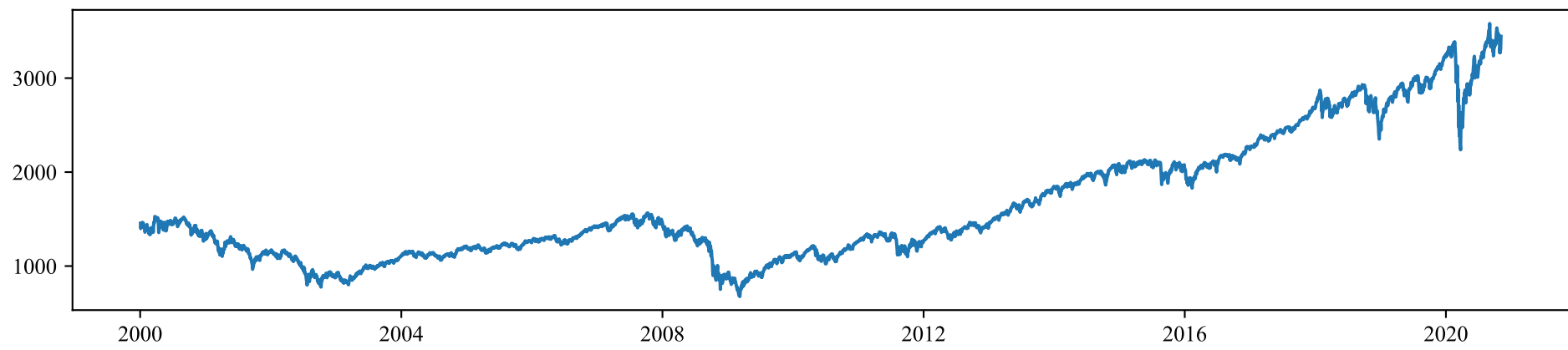
S&P 500 Close Over Time



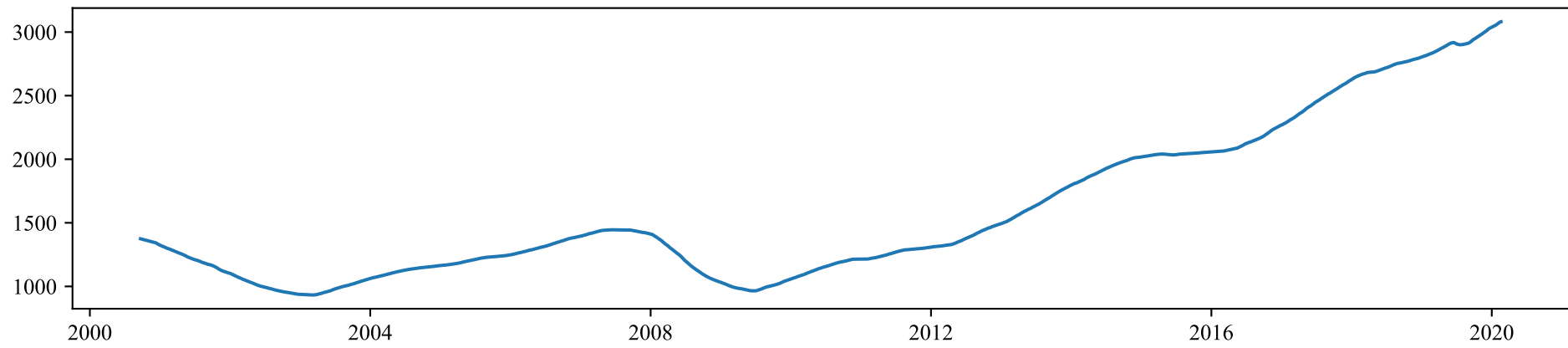
S&P 500 Close Distribution



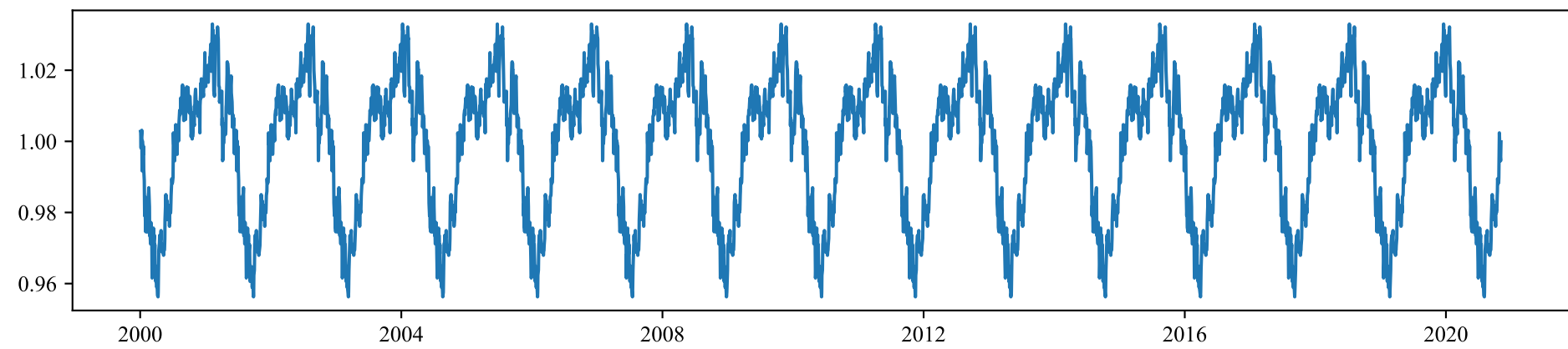
Observed S&P 500 Close Prices



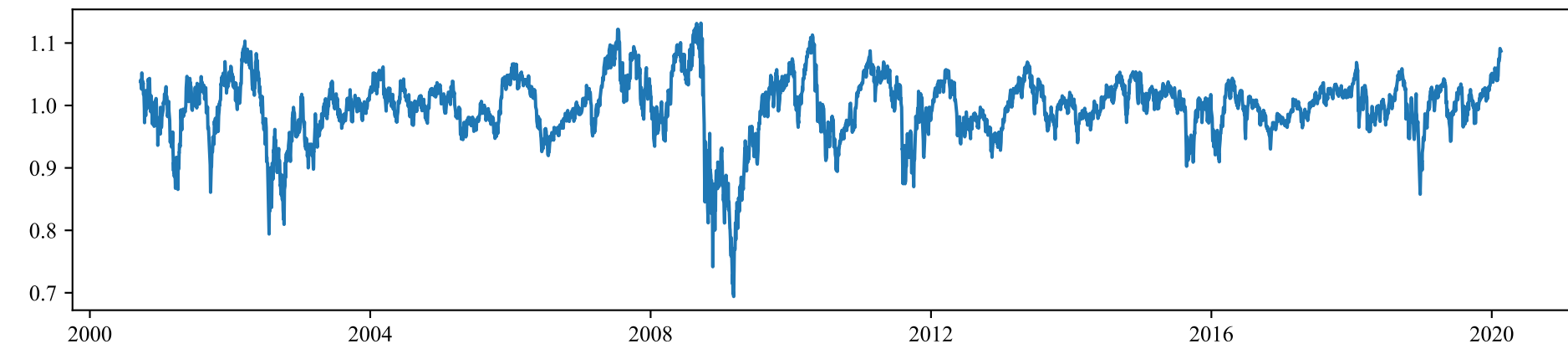
Trend



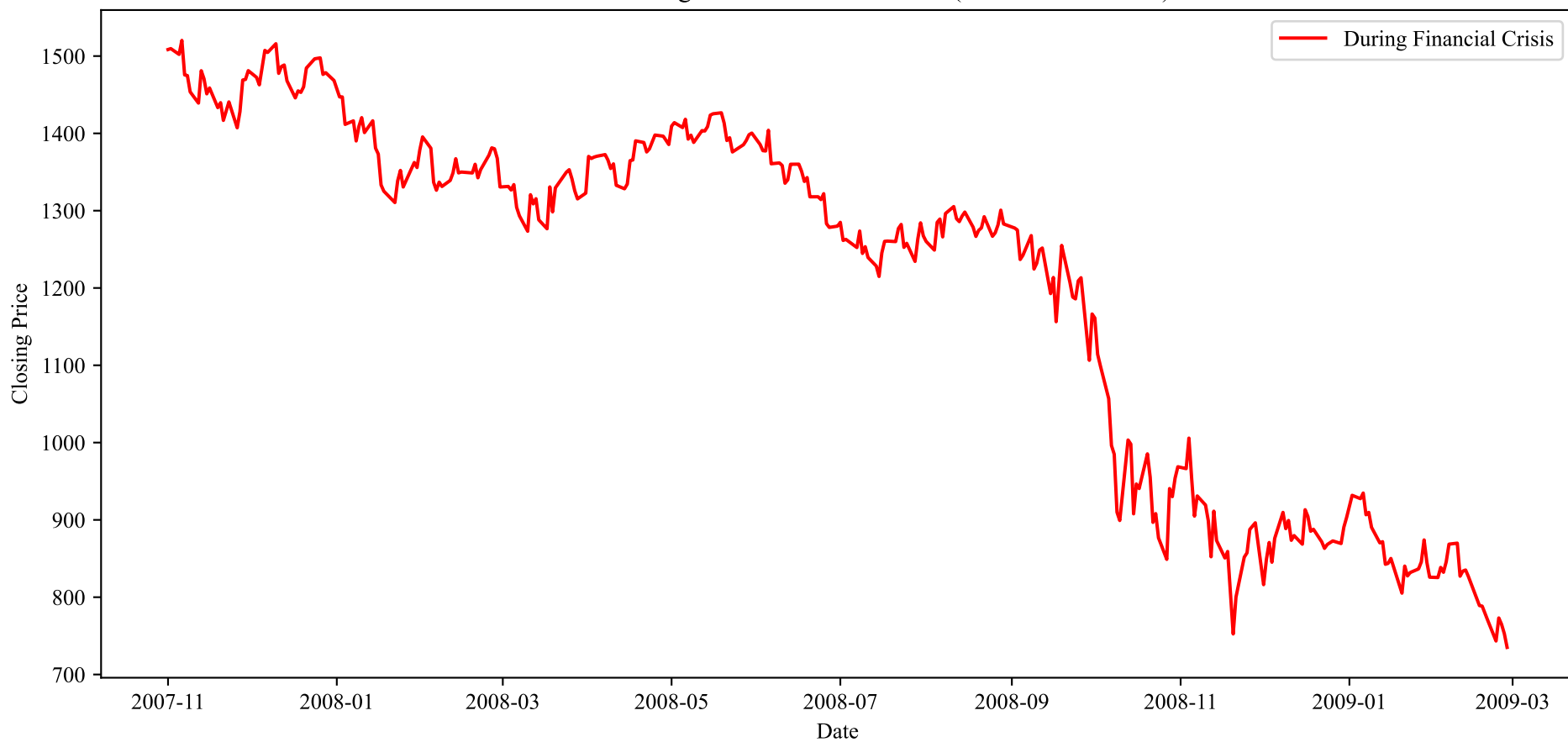
Seasonal



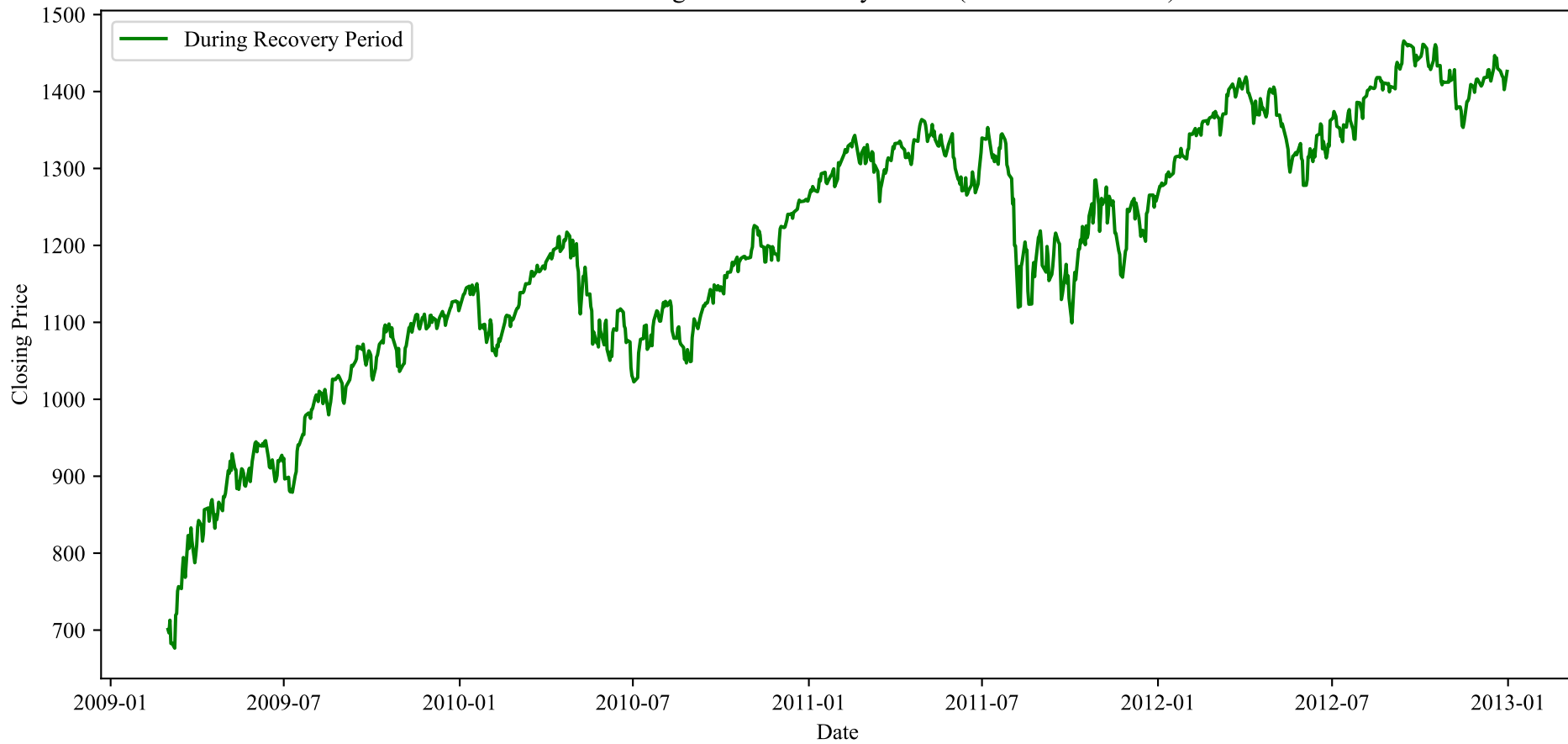
Residuals



S&P 500 Closing Price - Financial Crisis (2007-11 - 2009-03)



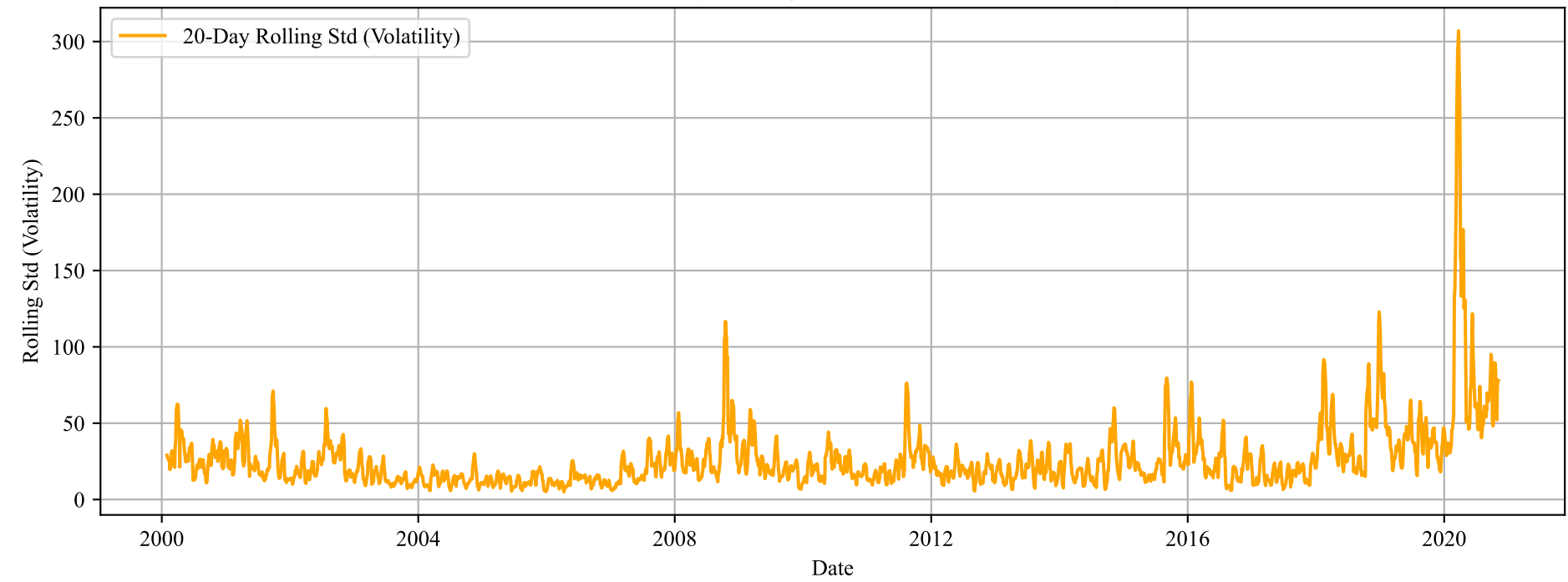
S&P 500 Closing Price - Recovery Period (2009-03 - 2012-12)



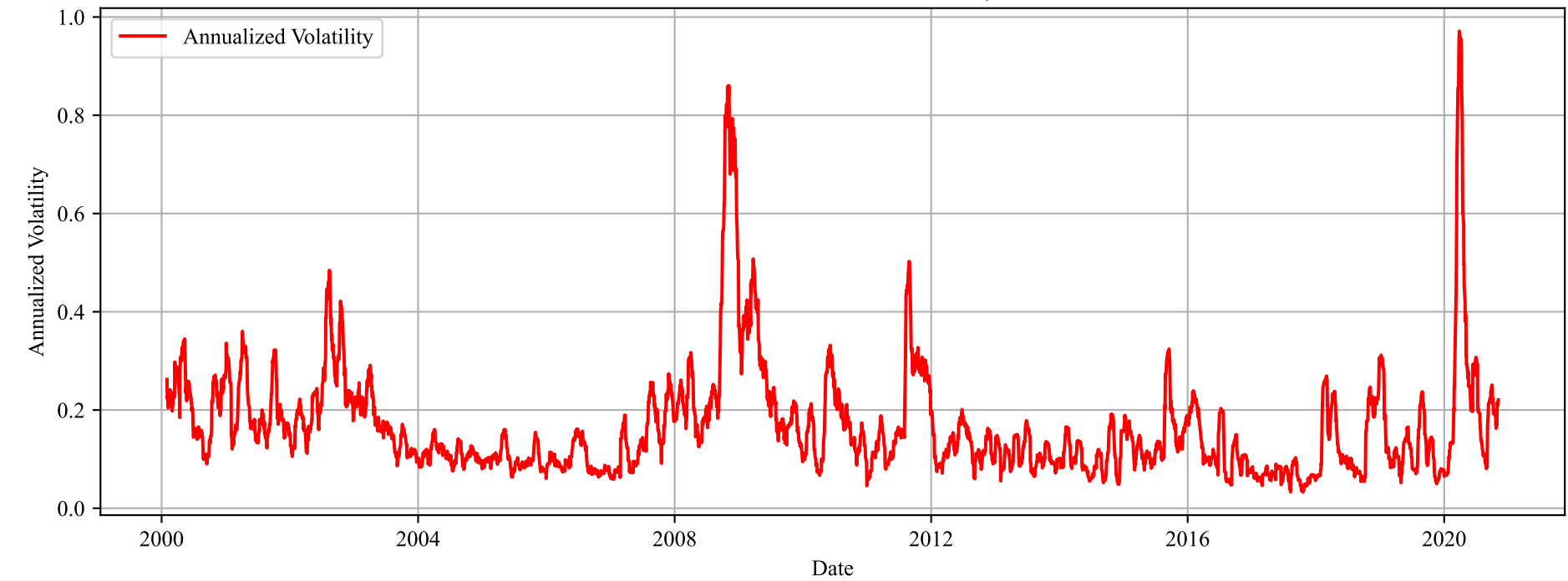
S&P 500 Closing Price



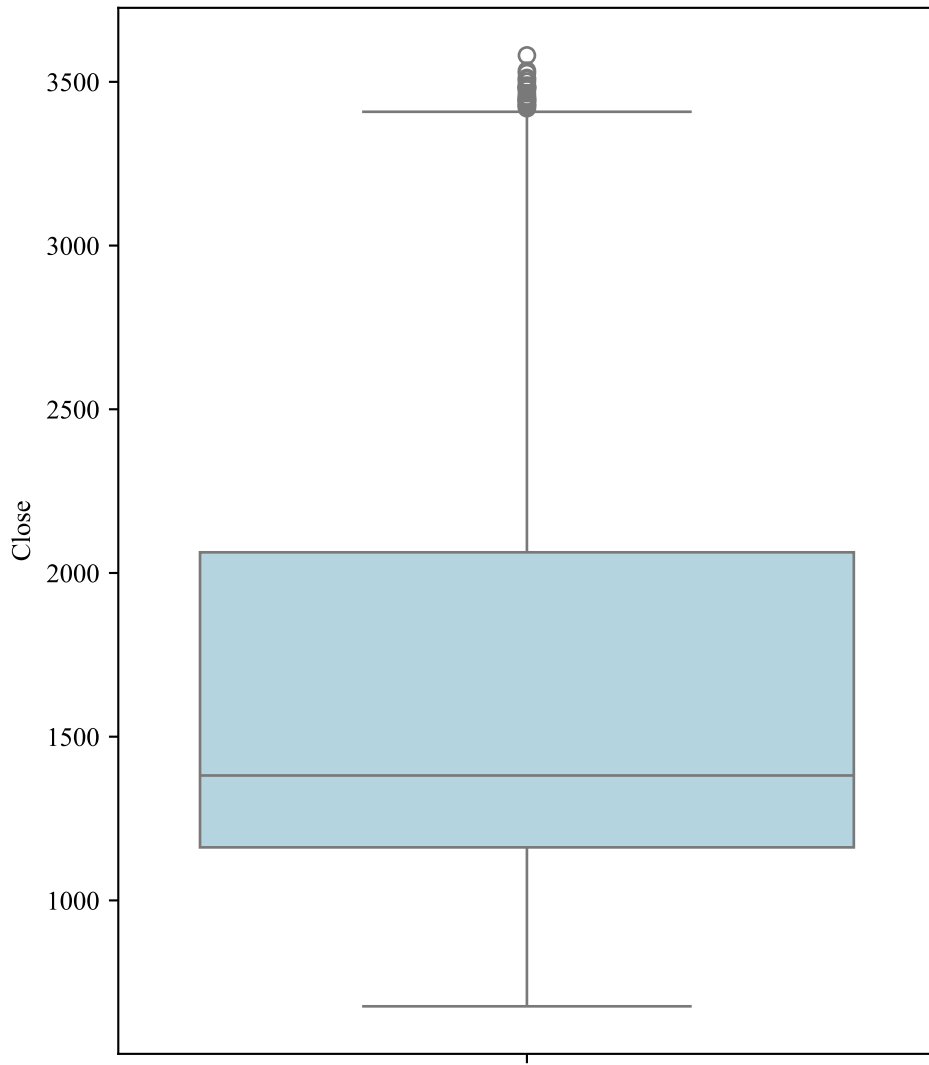
S&P 500 20-Day Rolling Standard Deviation (Volatility)



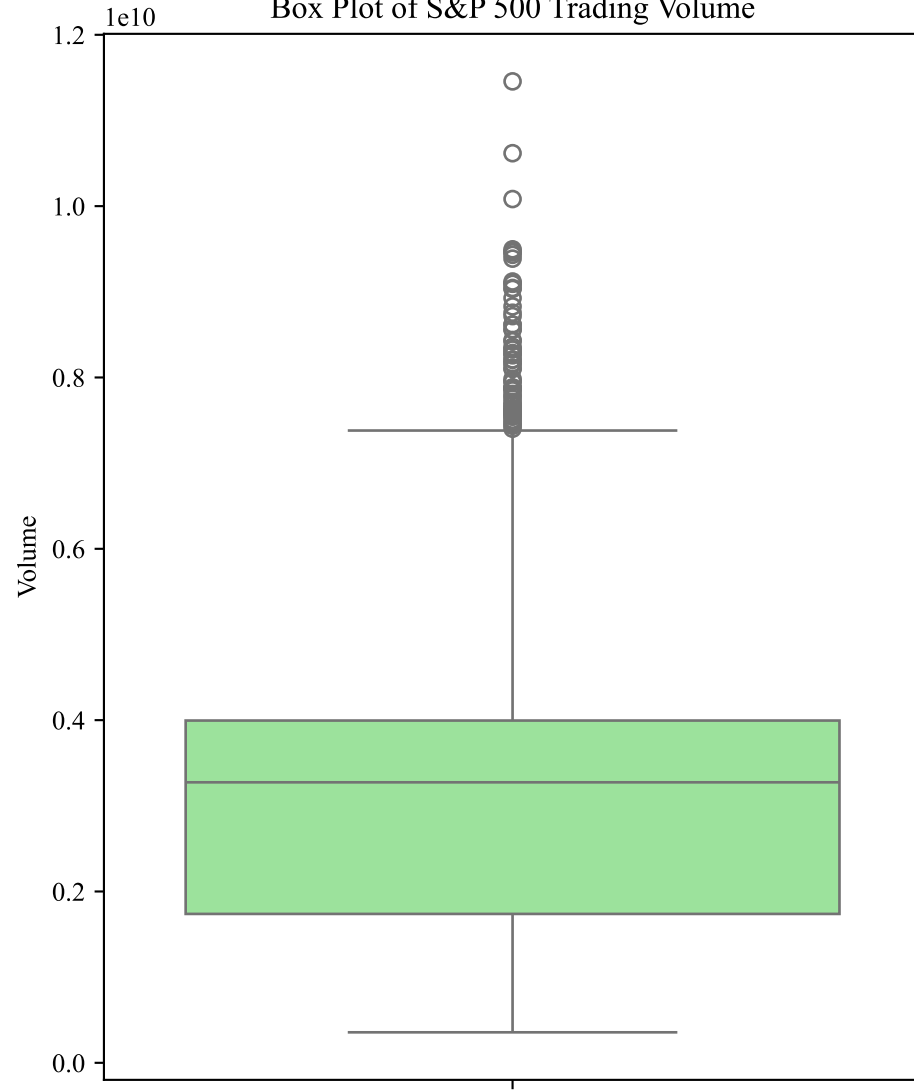
S&P 500 Annualized Volatility



Box Plot of S&P 500 Closing Price



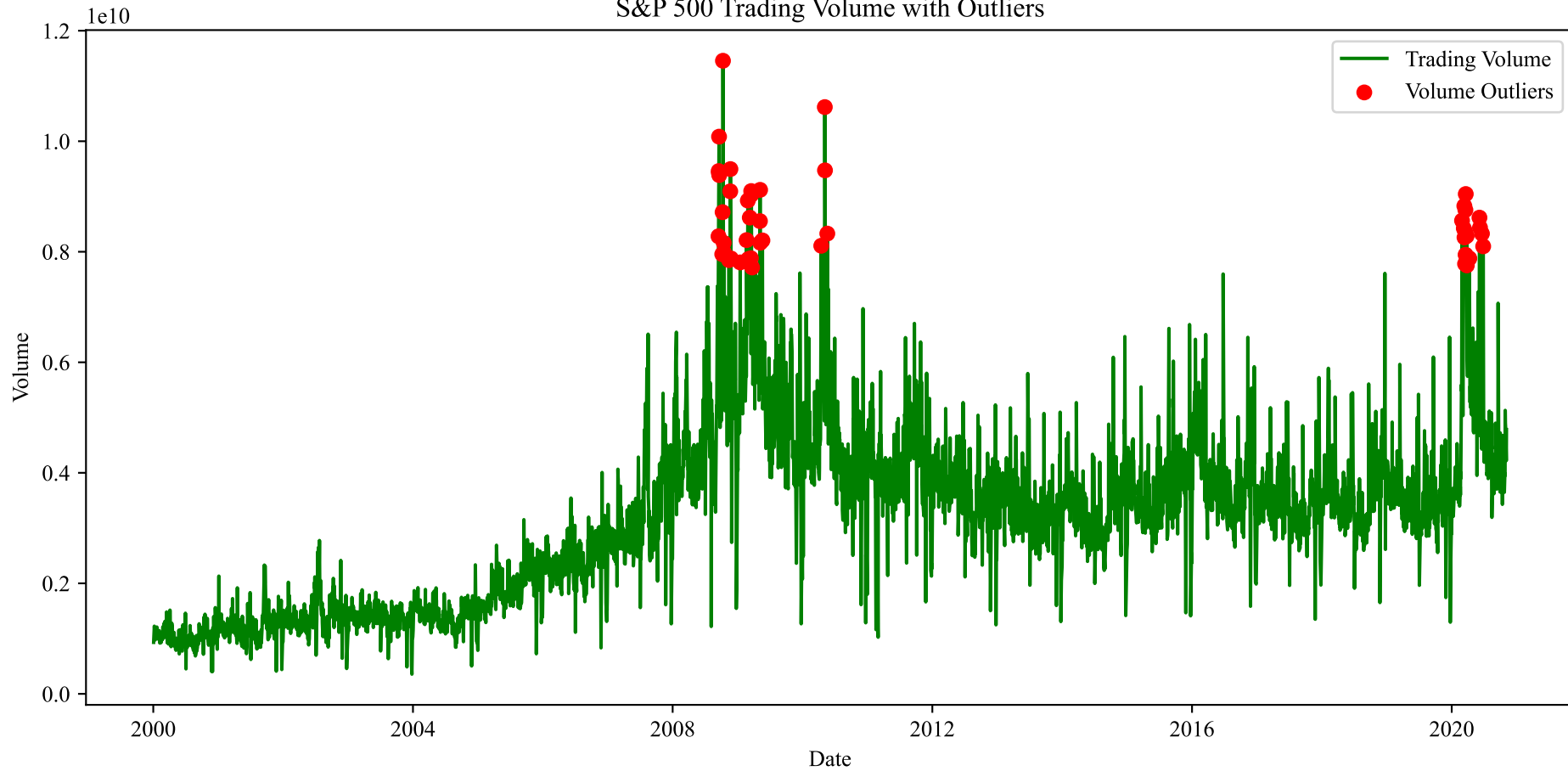
Box Plot of S&P 500 Trading Volume



S&P 500 Closing Price with Outliers



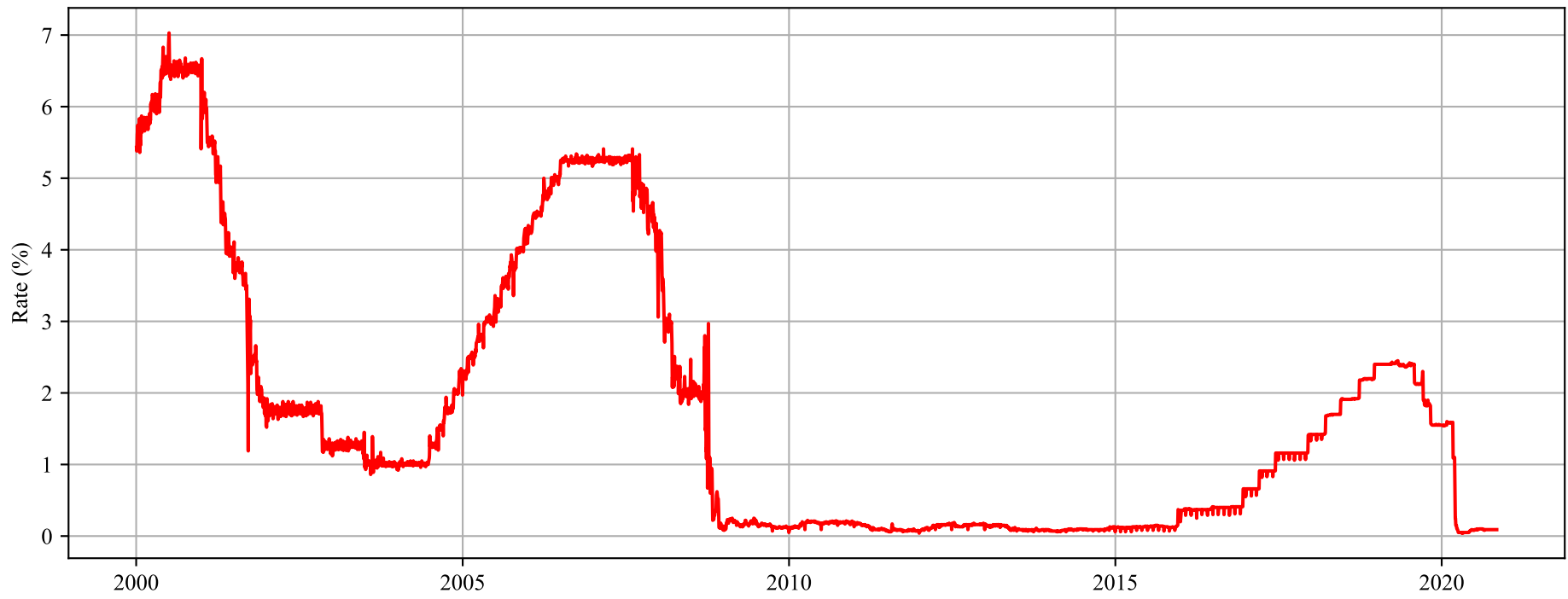
S&P 500 Trading Volume with Outliers



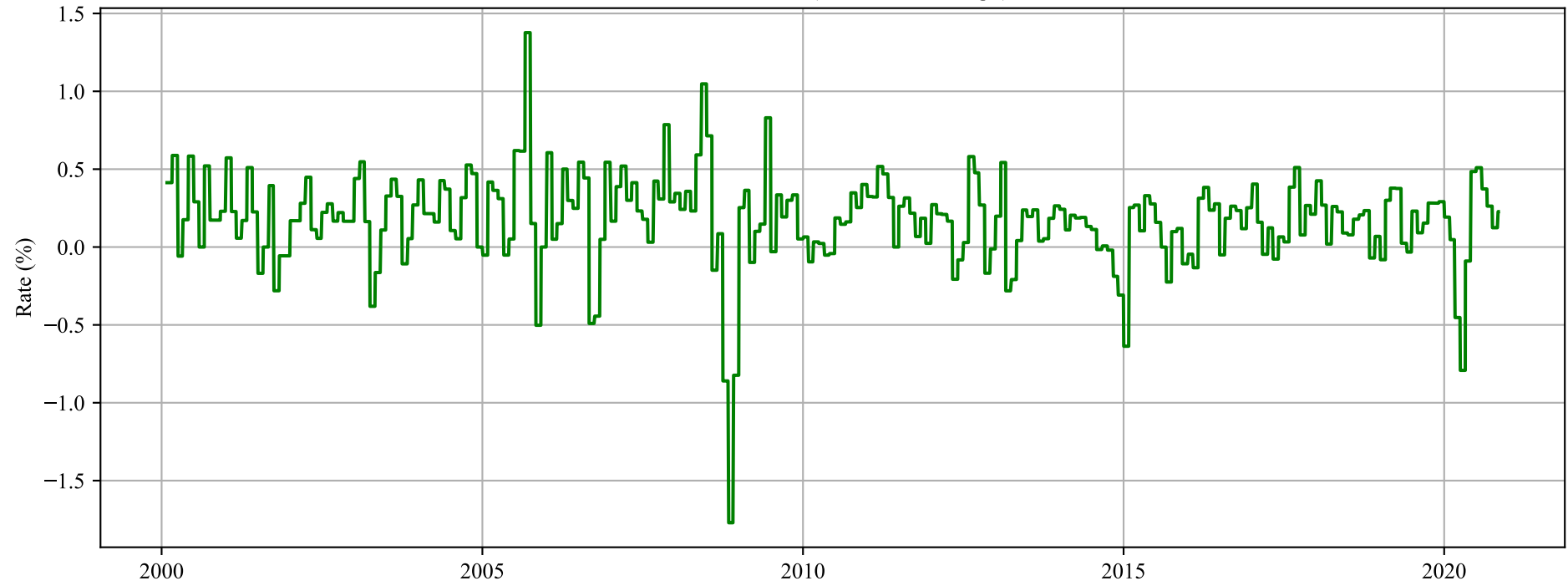
S&P 500 Closing Price



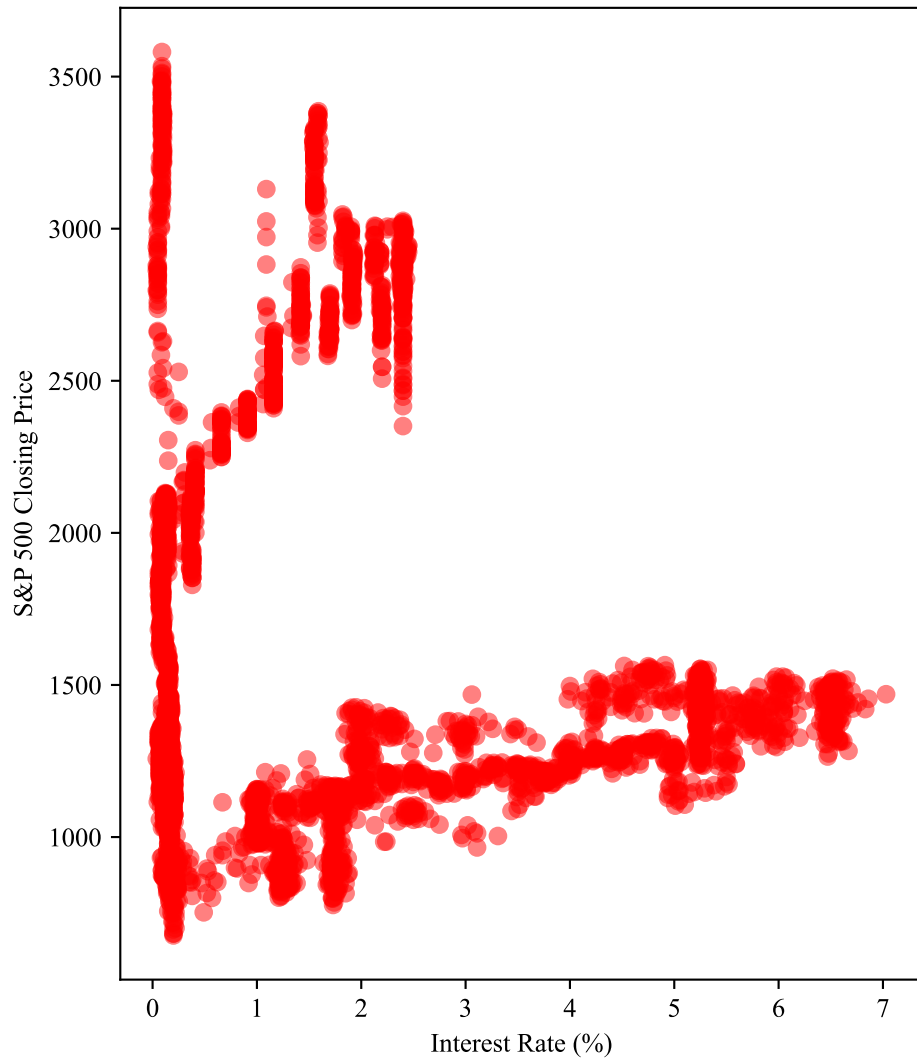
Interest Rate (Federal Funds Rate)



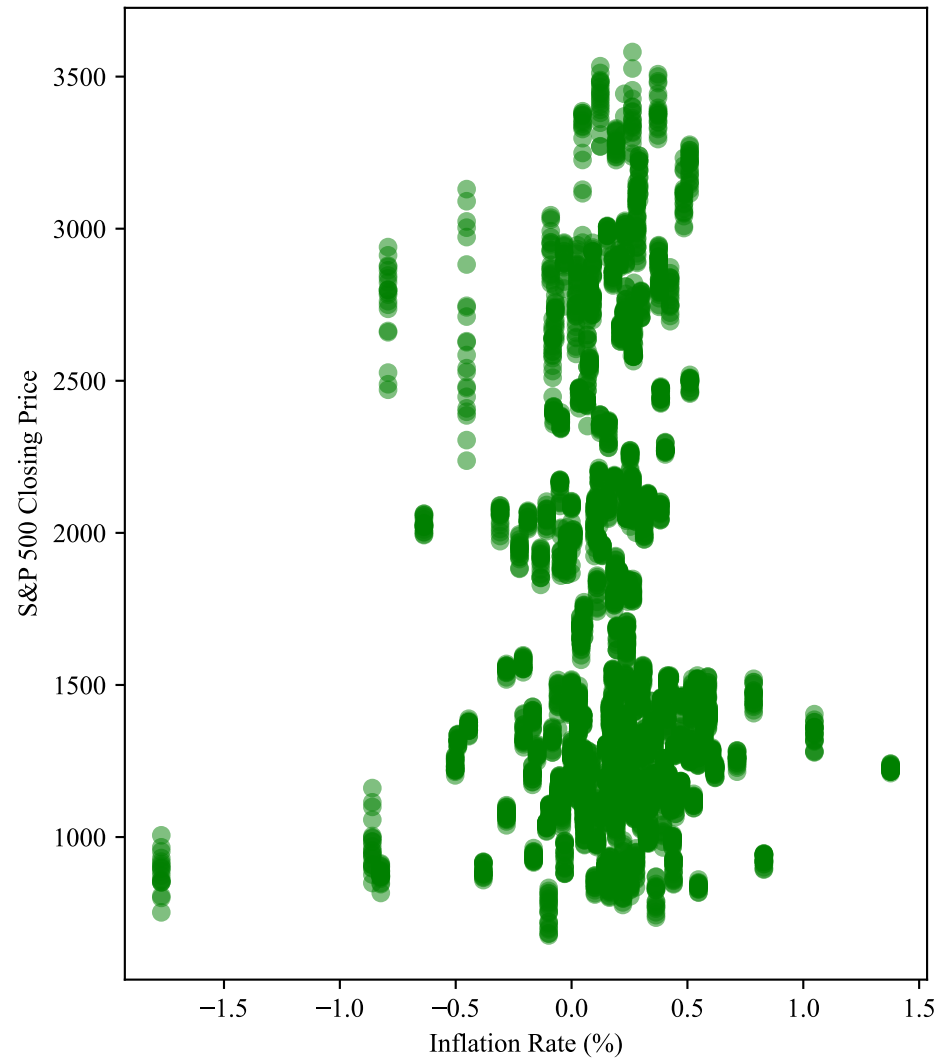
Inflation Rate (CPI YoY Change)



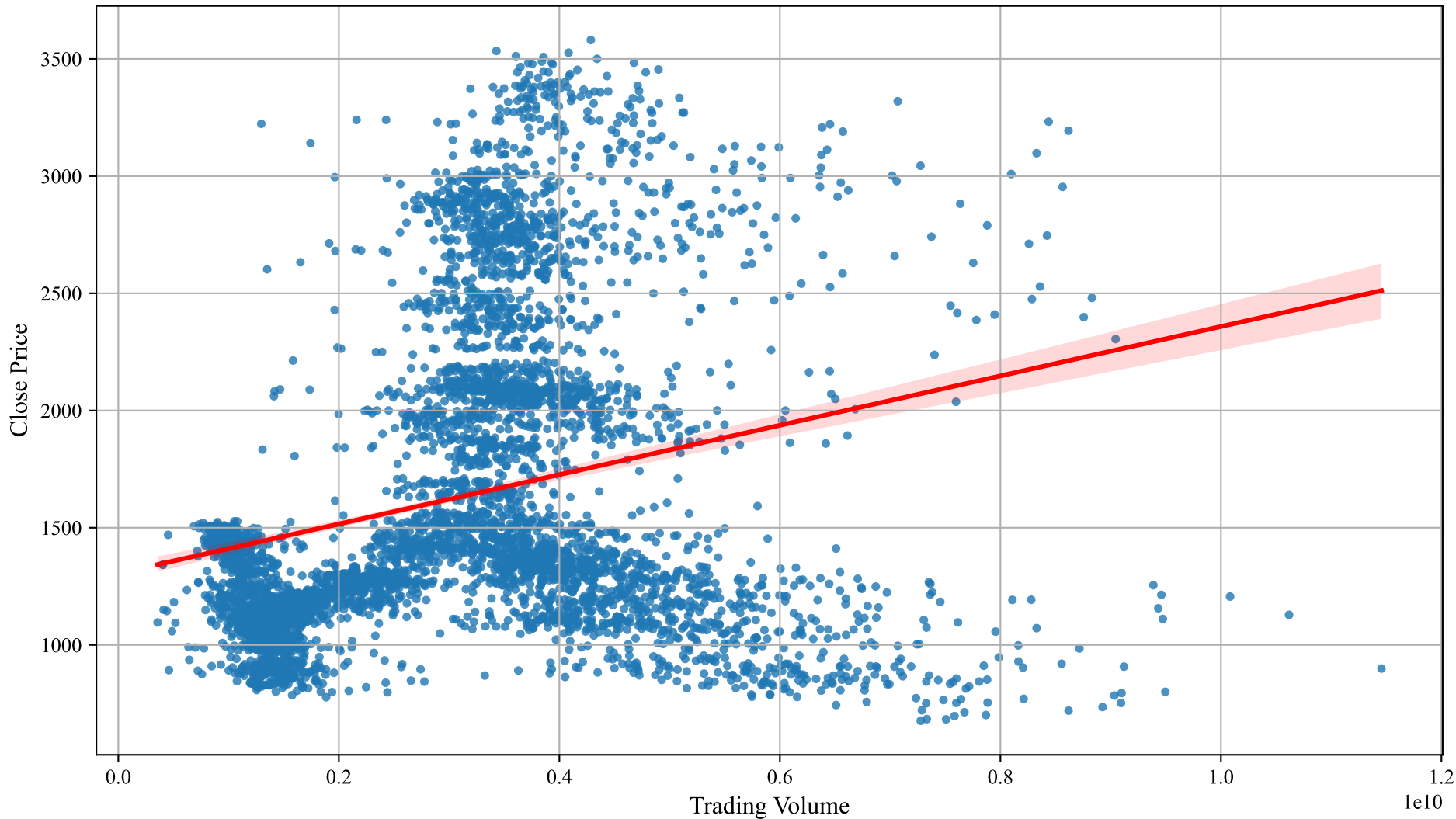
Relationship between interest rate and closing price



Relationship between inflation rate and closing price



Relationship Between Trading Volume and Close Price



Volume-Price Correlation: 0.2438
P-value: 0.0000

S&P 500 Data Exploration Summary

Data Period: 2000-01-03 to 2020-11-04

Total Records: 5245

Detected Price Outliers: 0

Detected Volume Outliers: 47

Volume-Price Correlation: 0.2438 (p-value: 0.0000)

Key Insights:

1. Stock price shows clear trend and seasonal patterns
2. Significant volatility during 2007-2009 financial crisis
3. Volume and price show significant correlation
4. Macroeconomic factors (interest rate, inflation) exhibit relationships with price patterns