Feature Correlation Analysis Report:

During the Recession:

Introduction:

This report provides an in-depth analysis of the correlation matrix, which represents the relationships between different features during the period of the Recession from 1999 to 2009.

Key Findings:

1. **Dominant Correlation among Core Stock Metrics**:
   - **Open, High, Low, SMA,** and **EMA** share a near-perfect correlation. This is attributed to their shared origin - daily stock prices.
2. **Trading Volume's Relationship with Price:**
   - The correlation values between **Volume** and **Open, High, Low** fall in the moderate range (0.57 to 0.59), suggesting that daily stock price movements have a reasonably linear relationship with trading volume.
3. **Significance of Trend**:
   - **Trend** shares a strong positive correlation of around 0.96 with the core stock metrics.
   - This reflects the influence of the underlying trend in the stock's price movements.
4. **Interest Rates Mild Influence**:
   - **Interest Rate** exhibits a mild negative correlation with **Open, High,** and **Low,** highlighting potential external economic factors that might be at play.
5. **Seasonality's Limited Impact**:
   - Almost negligible correlation values with most features indicate that seasonal patterns didn't play a major role in stock dynamics during this period.
6. **Residuals and Stock Metrics**:
   - The residual values, have a mild positive correlation with core stock metrics, signifying the presence of some residual factors influencing stock prices.
7. **RSI's Unique Dynamics**:
   - The **RSI** shows very low correlation with all other features, emphasizing its role in capturing distinct momentum patterns in stock prices.
8. **Volume and Trend:**
   - The positive correlation of 0.64 between Trend and Volume underscores the likelihood of increased trading activity during definitive stock trends.

Conclusion:

The correlation matrix reveals strong relationships between core stock metrics (**Open, High, Low, SMA,** and **EMA**) during the Recession from 1999 to 2009. While **Trend** shows a close association with these core metrics, **Seasonality** has a negligible impact. **Interest Rate** and **RSI** offers unique dynamics, suggesting external economic influences and momentum factors, respectively. Understanding these correlations is crucial for informed decision-making in stock market analysis during this period.

During the COVID Period:

Key Observations:

1. **Core Stock Metrics**:
   - The **Open, High, Low, SMA**, and **EMA** metrics are almost perfectly positively correlated with one another, as indicated by their correlation values close to 1.
   - This suggests that these metrics tend to move in the same direction simultaneously, which is expected given their nature.
2. **Volume**:
   - The **Volume** shows a weak positive correlation with the core stock metrics (**Open, High, Low, SMA**, and **EMA**), hovering around 0.28.
   - This indicates that as stock prices rise, the trading volume tends to slightly increase and vice versa.
3. **Interest Rate**:
   - The Interest Rate has a moderately negative correlation with the core stock metrics, with values around -0.62.
   - This suggests that as interest rates decrease, stock prices may tend to rise, and vice versa.
4. **Trend**:
   - **Trend** has an almost perfect correlation with the core stock metrics, close to 0.99.
   - This is expected since the trend is a smoothed version of the original stock price data.
5. **Seasonality**:
   - The correlation values for **Seasonality** with most of the other features are close to zero, suggesting that seasonality doesn't strongly influence these features during this period.
6. **Residual**:
   - The **Residual** component has a weak positive correlation with RSI (0.15) and shows minor correlations with other metrics.
7. **RSI (Relative Strength Index)**:
   - The RSI, used to gauge momentum, does not show a strong correlation with any of the features, with most values close to zero. This suggests that the RSI is largely independent of the other features during this period.

Conclusion:

During the timeframe from 1999 to 2021, encompassing major financial events including the COVID-19 pandemic, core stock metrics (**Open, High, Low, SMA**, and **EMA**) showed consistent patterns of movement. The **interest rate's** influence on stock prices is evident, suggesting potential economic policy implications. **Seasonality** appears to be less impactful, and the **RSI** suggests the unique insights it provides in market analysis. This matrix is crucial for understanding inter-feature relationships and aids in predictive modeling.