**FINANCIAL SERVICES**

**COMPREHENSIVE DATA ANALYSIS REPORT ON STOCK AND BOND MARKETS (Part 1)**

**1. OVERVIEW OF THE DATA**

* **Total Last Price**: 51.01 million.
* **Total 1 Day Return**: 188.79, reflecting the change in asset value over a single day.
* **Total Mentions**: 34,000 mentions, indicating the level of public interest and attention towards these assets.
* **Total 30-Day Volatility**: 1.90 million, showing the fluctuation in asset prices over the past 30 days.

**2. ANALYSIS BY STOCK**

**Top 10 Most Mentioned Stocks**:

* The most mentioned stocks include **Apple** (5.2K mentions), **Nike** (5.0K mentions), **Reuters** (2.7K mentions), **Netflix** (2.4K mentions), and **eBay** (2.2K mentions).
* These stocks attract significant attention, likely reflecting strong market performance, new product releases, or corporate events.

**Top 10 Stocks by 1-Day Return**:

* **eBay** had the highest 1-day return (127), followed by **Nike** (46) and **Netflix** (15). These stocks experienced significant price movements within a single trading day, suggesting potential opportunities for short-term investment.
* Other stocks like **Amazon**, **Facebook**, and **Adidas** also saw notable but smaller returns.

**3. SENTIMENT ANALYSIS (TEXT BLOB POLARITY)**

**Text Blob Polarity** represents the sentiment expressed in the data, ranging from -1.0 (completely negative sentiment) to 1.0 (completely positive sentiment), with 0 indicating neutral sentiment.

* The data points are primarily concentrated around low price ranges, near 0 on the price axis. This suggests that most stocks have lower prices and exhibit neutral sentiment.
* However, there are a few outliers with high prices (above 20 million), particularly a peak near neutral sentiment (0), which indicates that some high-priced stocks may not show a significant emotional shift.

**4. ANALYSIS BY YEAR, QUARTER, AND MONTH**

**Total Last Price by Year, Quarter, and Month**:

* **2017**: The value of assets fluctuated throughout the year, with a noticeable increase in **Q3 2017**, particularly in **September**, which reached 25.9 million. This spike may indicate a significant market event or stock-related development.
* **2018**: The trend continued with further fluctuations, with a notable increase in **September 2018**.

**Total 30-Day Volatility by Year, Quarter, and Month**:

* **2017**: Volatility was relatively stable in the early months, but peaked in **December 2017** at 50.7K, which could be attributed to year-end market adjustments or financial reports.
* **2018**: Volatility surged in **September** with an extreme spike to 907K, possibly linked to major market events or external influences.

**5. FINDINGS AND CONCLUSIONS**

* **Stock Growth**: Certain stocks, such as **eBay** and **Nike**, showed significant growth, possibly driven by strong earnings reports or market events.
* **Market Volatility**: The volatility in asset prices is likely influenced by both internal corporate factors and external events, such as earnings reports, geopolitical changes, or market reactions. The peaks in volatility, especially in **September 2018**, suggest that external factors played a major role in market uncertainty.
* **Market Sentiment**: While there is no clear correlation between sentiment polarity and asset price, some high-priced stocks, despite showing neutral sentiment, may indicate stability in value without dramatic changes in investor sentiment.

**6.RECOMMENDATIONS:**

* **Monitor Large Cap Stocks**: Stocks like **Apple**, **Nike**, and **eBay** are likely to continue attracting attention in the near future due to their strong mention rates and significant price movements.
* **Watch for Market Volatility**: Investors should monitor months with high volatility, especially in periods when significant events are expected (e.g., earnings announcements or political developments), to better understand market reactions.

**COMPREHENSIVE DATA ANALYSIS REPORT ON STOCK AND BOND MARKETS (Part 2)**

**OVERVIEW OF THE DATA**:

* **Total Number of Tweets**: 85.18K
* **Number of Stocks**: 100
* **Average Trading Volume (PX Volume)**: 12.01 million shares
* **Average 30-Day Volatility (Volatility 30D)**: 22.29
* **Sentiment Analysis**:
  + **Positive Sentiment**: 46,927 tweets (55.09%)
  + **Negative Sentiment**: 38,249 tweets (44.91%)

**Report Objective**: To analyze the relationship between factors such as **social sentiment** (based on tweets), **trading volume**, **market volatility**, and **stock market performance** (based on LSTM Polarity) to understand how sentiment impacts stock prices.

**1. SENTIMENT DATA ANALYSIS**

**Number of Tweets and Sentiment**:

* Total tweets: 85.18K tweets.
* Sentiment classification: **Positive Sentiment** (55.09%) and **Negative Sentiment** (44.91%).

Social sentiment can significantly impact price volatility in the stock market, and this data helps identify whether there is a direct relationship between sentiment and market fluctuations.

**2. STOCK MARKET DATA ANALYSIS**

* **Average Trading Volume**: 12.01 million shares.
* **Average Volatility (Volatility 30D)**: 22.29, indicating relatively high market fluctuations over the past 30 days.

This level of volatility can influence profitability and risk levels in stocks, especially when combined with sentiment signals.

**3. LSTM POLARITY ANALYSIS**

**LSTM Polarity** is a predictive tool used to assess the sentiment or direction of stock price movements, evaluating the strength of sentiment (positive or negative) derived from tweets and other factors.

**LSTM Polarity and 1-Day Returns:**

* **Polarity = 1 (Positive Sentiment)**: The sum of 1-day returns is **97.61**.
* **Polarity = -1 (Negative Sentiment)**: The sum of 1-day returns is **91.18**.

This shows that both positive and negative sentiments strongly influence stock prices, but positive sentiment generally leads to slightly higher returns than negative sentiment.

**4. LSTM POLARITY OVER TIME (YEAR, QUARTER, MONTH)**

**LSTM Polarity** was analyzed across different quarters and months in 2017 and 2018. This helps track sentiment changes over time and their impact on stock prices.

**LSTM Polarity by Quarter and Month:**

* **2017 Q1**:
  + January: 199
  + February: -43
  + March: 247
* **2017 Q2**:
  + April: 226
  + May: 85
  + June: 163
* **2017 Q3**:
  + July: -60
  + August: 112
  + September: 287
* **2017 Q4**:
  + October: 282
  + November: 273
  + December: 111
* **2018 Q3**:
  + July: 2
  + August: 15
  + September: 4,554 (sharp increase)
* **2018 Q4**:
  + October: 2,225 (strong increase)

**Key Observations**: Notable spikes in **2018 Q3 and Q4**, especially **September (4,554)** and **October (2,225)**, suggest significant changes in market sentiment, which likely led to large fluctuations in stock prices during those periods.

**5. RELATIONSHIP BETWEEN LSTM POLARITY AND 1-DAY RETURNS BY QUARTER**

**1-Day Returns and LSTM Polarity** (by quarter):

* **2017 Q1**:
  + 1-Day Return: **15.11**
  + LSTM Polarity: **403**
* **2017 Q2**:
  + 1-Day Return: **-20.81**
  + LSTM Polarity: **474**
* **2017 Q3**:
  + 1-Day Return: **-9.22**
  + LSTM Polarity: **339**
* **2017 Q4**:
  + 1-Day Return: **0.21**
  + LSTM Polarity: **666**
* **2018 Q3**:
  + 1-Day Return: **101.19**
  + LSTM Polarity: **4,571**
* **2018 Q4**:
  + 1-Day Return: **102.31**
  + LSTM Polarity: **2,225**

**Observations**:

* **Q3 and Q4 of 2018** saw **high returns** (101.19 and 102.31) coupled with **high LSTM Polarity** (4,571 and 2,225), indicating a strong correlation between positive sentiment and stock performance.
* **Q2 of 2017** had **negative returns** (-20.81) even though **LSTM Polarity** was relatively high (474), suggesting that sentiment can be inconsistent with actual stock performance during certain periods.

**6. CONCLUSION AND RECOMMENDATIONS**

1. **Sentiment and Stock Market Performance**:
   * **Positive Sentiment (LSTM Polarity = 1)** generally leads to higher stock returns, especially during periods with high LSTM polarity, such as in **Q3 and Q4 of 2018**.
   * However, **negative sentiment** (LSTM Polarity = -1) can still have a significant impact on stock prices, and more analysis is needed to determine the conditions under which negative sentiment might lead to profitable opportunities.
2. **Volatility and Sentiment**:
   * The **high average volatility (22.29)** warrants careful monitoring, as it indicates market instability, which could increase investment risks, especially in times of fluctuating sentiment.
3. **Recommendations**:
   * **Further Analysis of Sentiment-Stock Price Lag**: Investigate whether there is a time lag between shifts in sentiment and corresponding stock price changes, as this can help refine trading strategies.
   * **Sentiment-Volatility Relationship**: A deeper analysis of how volatility interacts with sentiment may uncover useful insights for risk management or trading strategies.
   * **Impact of Market Events**: Analyze external market events that could be driving sentiment changes in **2018 Q3 and Q4** to understand the specific triggers behind sentiment spikes.