

MARKET RISK ANALYSIS

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- **Problem Statement:**

- The dataset spans six years and encompasses weekly stock data for 10 diverse Indian stocks. The goal is to conduct Market Risk Analysis by computing the mean and standard deviation of stock returns using Python.

- **Approach:**

- **Data Overview:**

- The dataset spans a comprehensive six-year period, offering an extensive historical view of the weekly stock performance of 10 Indian stocks.

- **Mean and Standard Deviation:**

- Computed the mean and standard deviation of stock returns for each company. Utilized Python for efficient data processing, employing statistical functions to derive crucial metrics.

- **Market Risk Analysis:**

- Conducted a thorough analysis of market risk using statistical measures. Focused on mean returns for insights into average stock performance. Examined standard deviation as a gauge of stock return volatility and risk.

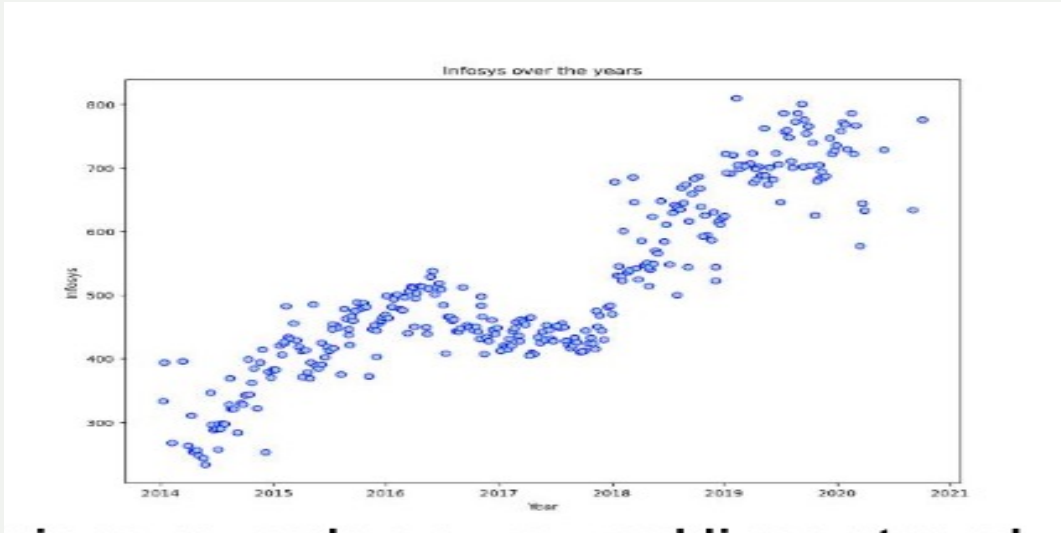
- **Insights and Observations:**

- Identified stocks with positive mean returns, indicating consistent positive performance. Evaluated volatility using standard deviation, identifying stocks with higher price fluctuations. Unearthed trends in individual stock behaviors, distinguishing between stable and volatile performers.

- **Investment Implications:**

- Offered insights to aid investors in comprehending market dynamics. Emphasized the trade-off between potential returns and volatility, providing guidance for investment decisions.

STOCK PRICE GRAPH

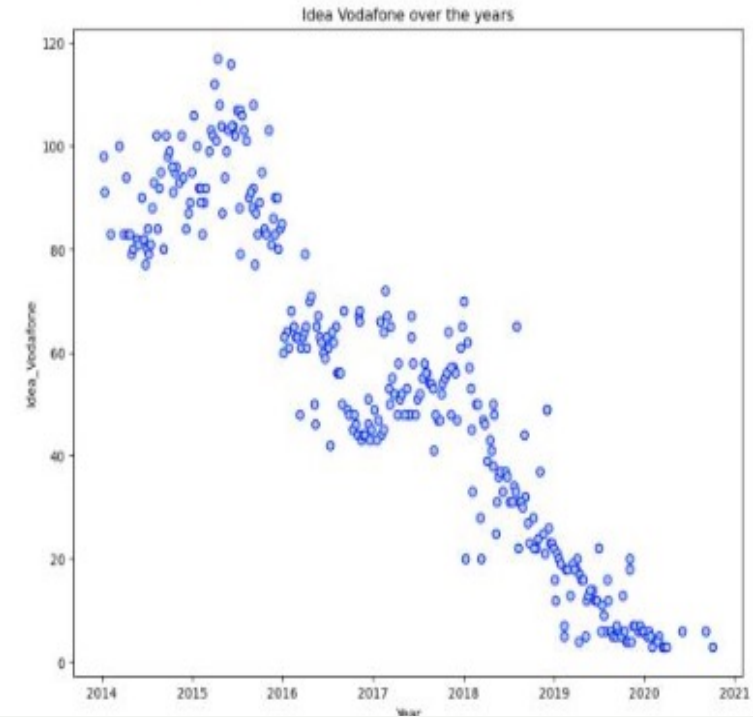


Infosys:

The scatterplot depicting Infosys stock prices illustrates a positive linear trend, indicating a consistent upward correlation over time. This suggests that, on average, Infosys stock prices have been on the rise, presenting a potential investment opportunity for those interested in capitalizing on upward trends in the market.

Idea Vodafone:

In contrast, the scatterplot representing Idea Vodafone stock prices exhibits a declining linear trend, signaling a negative correlation over time. This implies an overall decrease in Idea Vodafone stock prices, prompting investors to exercise caution and investigate the factors contributing to this negative trend before making investment decisions.



RETURNS FOR ALL STOCKS

- The code supplied for calculating stock returns yields values that signify the logarithmic alteration in stock prices across sequential time intervals. Employing logarithmic returns is a prevalent practice in finance to standardize and enhance comprehension of the percentage shift in stock prices. The outcomes in the stock returns Data Frame reflect the extent to which stock prices have changed concerning their preceding values. This is essential for scrutinizing the volatility and performance of the stocks.

	Infosys	Indian_Hotel	Mahindra_&_Mahindra	Axis_Bank	SAIL	Shree_Cement	Sun_Pharma	Jindal_Steel	Idea_Vodafone	Jet_Airways
0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	-0.026873	-0.014599	0.006572	0.048247	0.028988	0.032831	0.094491	-0.065882	0.011976	0.086112
2	-0.011742	0.000000	-0.008772	-0.021979	-0.028988	-0.013888	-0.004930	0.000000	-0.011976	-0.078943
3	-0.003945	0.000000	0.072218	0.047025	0.000000	0.007583	-0.004955	-0.018084	0.000000	0.007117
4	0.011788	-0.045120	-0.012371	-0.003540	-0.076373	-0.019515	0.011523	-0.140857	-0.049393	-0.148846
5	-0.031749	-0.015504	0.040656	0.061875	0.061558	0.011400	-0.008217	0.024898	0.012579	-0.016598
6	0.019961	0.060625	0.011881	0.076961	0.112795	0.067622	-0.016639	0.097543	0.048790	0.020705
7	-0.036221	0.199333	0.038615	0.059898	0.136859	0.056790	-0.049881	0.105732	-0.024098	0.169258
8	-0.041847	-0.012121	0.064183	-0.014642	-0.023530	0.048090	0.044835	-0.010084	-0.012270	-0.181630
9	0.135666	0.081917	-0.003559	0.071154	0.213574	0.105167	-0.018724	0.132686	0.024391	0.072031
10	0.057987	0.065241	-0.001784	-0.083023	-0.111791	-0.053039	0.048627	-0.051605	-0.036814	-0.035367
11	0.041385	-0.032088	-0.072187	0.080272	-0.032790	0.017670	0.003268	-0.012539	0.024693	-0.032523
12	-0.027399	0.021506	0.007648	0.021799	-0.011173	-0.018944	0.044665	0.006289	-0.062914	0.044452
13	0.006920	0.041673	0.064539	0.013387	0.022223	0.009166	0.072212	0.012461	0.038221	0.079739
14	0.023851	-0.031091	-0.055060	-0.063121	-0.154151	-0.009024	0.046784	-0.146441	-0.012579	-0.107797
15	-0.023851	-0.099530	0.016839	0.094537	0.074108	0.015740	-0.001386	0.062520	0.025001	0.032003
16	0.030563	0.022990	0.045339	-0.005168	0.000000	-0.028569	0.051363	-0.048285	0.082888	-0.011881
17	-0.003350	-0.022990	-0.030605	-0.026248	-0.024098	0.033438	-0.017276	-0.058198	0.055263	-0.016065
18	0.042699	-0.084899	0.046437	-0.040711	-0.050010	-0.015803	-0.010782	0.036769	0.010695	-0.012220
19	0.034759	-0.051960	0.072361	0.016484	0.037740	0.010098	0.069354	0.028472	-0.010695	-0.033336

AVERAGES AND VOLATILITY

Company	Average	Volatility
Infosys	0.002794	0.035070
Indian Hotel	0.000266	0.047131
Mahindra & Mahindra	-0.001506	0.040169
Axis Bank	0.001167	0.045828
SAIL	-0.003463	0.062188
Shree Cement	0.003681	0.039917
Sun Pharma	-0.001455	0.045033
Jindal Steel	-0.004123	0.075108
Idea Vodafone	-0.010608	0.104315
Jet Airways	-0.009548	0.097972

- ♦ The provided table shows the average returns and volatility for 10 different companies. Here are some observations and potential insights:

- ♦ **Average Returns:**

- ♦ - Infosys: Demonstrates a positive average return, indicating consistent positive performance, on average.
- ♦ - Indian Hotel, Mahindra & Mahindra, Axis Bank, Shree Cement: Also exhibit positive average returns.
- ♦ - SAIL, Sun Pharma, Jindal Steel, Idea Vodafone, Jet Airways: Display negative average returns, indicating, on average, negative performance.

- ♦ **Volatility:**

- ♦ - Jet Airways: Registers the highest volatility (0.097972), signaling relatively higher price fluctuations or risk.
- ♦ - Idea Vodafone, Jindal Steel: Also show relatively high volatility.
- ♦ - Shree Cement, Infosys, Mahindra & Mahindra, Sun Pharma, Axis Bank, Indian Hotel: Reflect lower volatility.

- ♦ **Risk and Reward:**

- ♦ - Companies with higher average returns do not necessarily correlate with lower volatility. For instance, Shree Cement exhibits a positive average return with relatively lower volatility, while Jet Airways has a negative average return with high volatility.
- ♦ - Investors often consider risk-adjusted metrics like the Sharpe ratio, which factor in both risk and return.

- ♦ **Negative Average Returns:**

- ♦ - Idea Vodafone, Jet Airways, Jindal Steel, Sun Pharma, SAIL: These companies display negative average returns, suggesting that, on average, their stock prices have decreased over the specified period.

- ♦ **Diversification:**

- ♦ - Investors frequently seek a diversified portfolio to mitigate risk. A combination of stocks with diverse average returns and volatilities contributes to a diversified portfolio.

RECOMMENDATIONS

- Investment recommendations are subjective and contingent on diverse factors, encompassing an investor's risk tolerance, financial objectives, and prevailing market conditions. Nevertheless, drawing from the supplied average and volatility figures for each stock, here are some broad observations:

Infosys:

- Average: 0.002794 (Positive)
- Volatility: 0.035070

Infosys exhibits a positive average return, indicating potential profitability. However, investors should be mindful of the moderate volatility.

Indian Hotel:

- Average: 0.000266 (Positive)
- Volatility: 0.047131

Indian Hotel demonstrates a positive average return, yet the relatively high volatility suggests an elevated level of risk.

Mahindra & Mahindra:

- Average: -0.001506 (Negative)
- Volatility: 0.040169

Mahindra & Mahindra displays a negative average return, prompting investors to evaluate the risk-return trade-off.

- ♦ **Axis Bank:**
 - ♦ - Average: 0.001167 (Positive)
 - ♦ - Volatility: 0.045828
 - ♦ Axis Bank presents a positive average return, but investors should exercise caution due to the moderate volatility.
- ♦ **SAIL:**
 - ♦ - Average: -0.003463 (Negative)
 - ♦ - Volatility: 0.062188
 - ♦ SAIL exhibits a negative average return, and the high volatility implies the potential for significant price fluctuations.
- ♦ **Shree Cement:**
 - ♦ - Average: 0.003681 (Positive)
 - ♦ - Volatility: 0.039917
 - ♦ Shree Cement demonstrates a positive average return with relatively low volatility, suggesting a potentially favorable risk-return profile.

- **Sun Pharma:**
 - - Average: -0.001455 (Negative)
 - - Volatility: 0.045033
 - Sun Pharma exhibits a negative average return, and investors should be attentive to the moderate volatility.
- **Jindal Steel:**
 - - **Average: -0.004123 (Negative)**
 - - Volatility: 0.075108
 - Jindal Steel displays a negative average return with high volatility, indicating elevated risk.
- **Idea Vodafone:**
 - - Average: -0.010608 (Negative)
 - - Volatility: 0.104315
 - Idea Vodafone shows a negative average return with high volatility, suggesting a riskier investment.
- **Jet Airways:**
 - - Average: -0.009548 (Negative)
 - - Volatility: 0.097972
 - Jet Airways has a negative average return and relatively high volatility, signaling potential challenges.
- **In summary, investors should thoroughly consider these findings, engage in further analysis, and seek advice from financial professionals before making any investment decisions. Additionally, staying informed about market conditions and company-specific news that may impact these stocks is crucial.**