



FINANCE RISK ANALYTICS

STOCK MARKET RISK ANALYSIS



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PROBLEM STATEMENT

The dataset contains 6 years of information (weekly stock information) on the stock prices of 10 different Indian Stocks. Calculate the mean and standard deviation on the stock returns and share insights. You are expected to do the Market Risk Analysis using Python.

PART B.1: Draw Stock Price Graph (Stock Price vs Time) for any 2 given stocks with inference

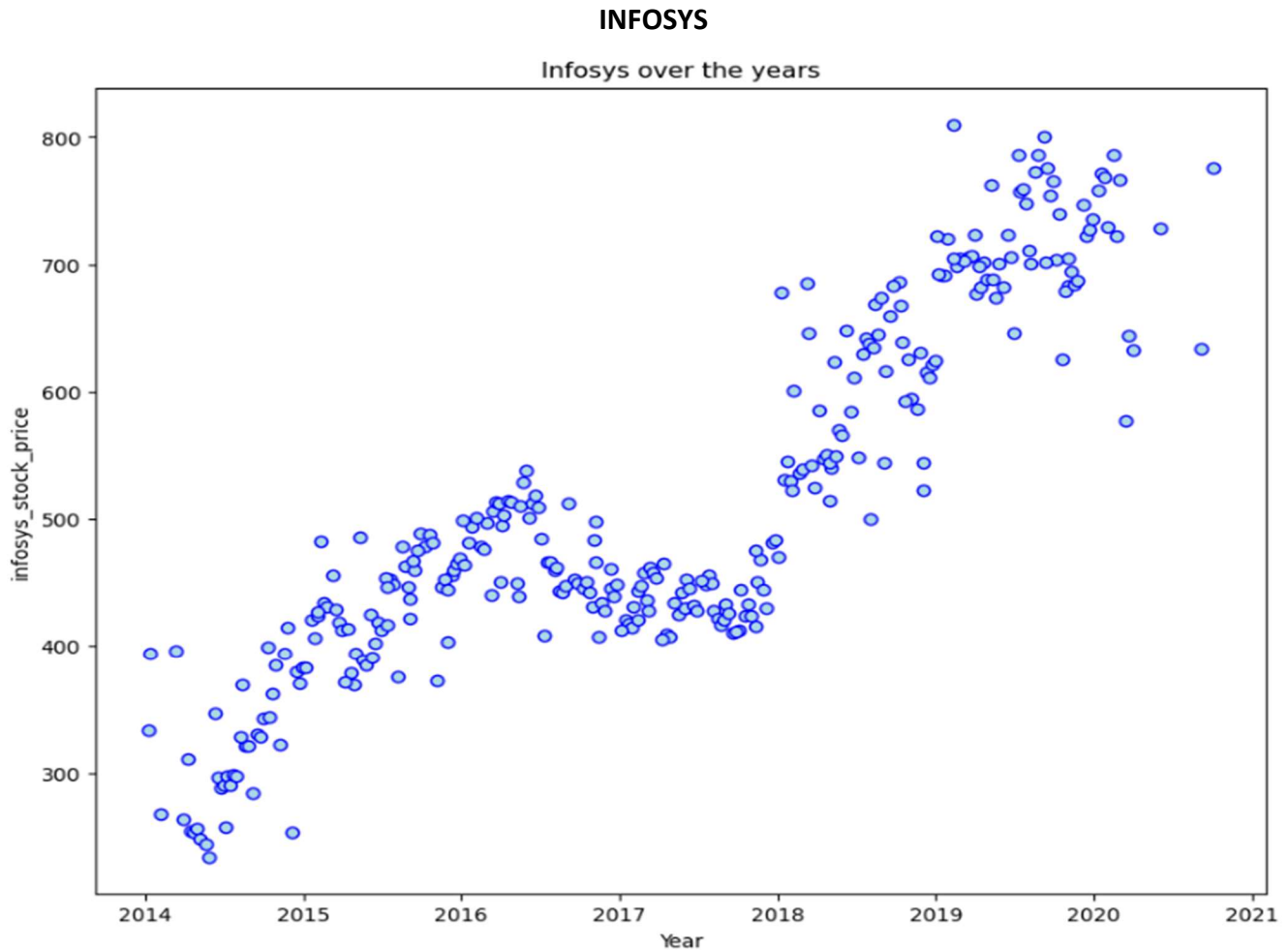


Fig. 1.1A

Infosys Stock Price Over the Years

Inferences: -

- Overall it shows the Upwards trend
- Stock Price increases significantly from 2014 to 2016 i.e., 100 to 500
- Between 2016 & 2018 the stock price slightly drops from 500 to 400
- Again from 2018 to 2021 it picks up and increases significantly from 400 to 800

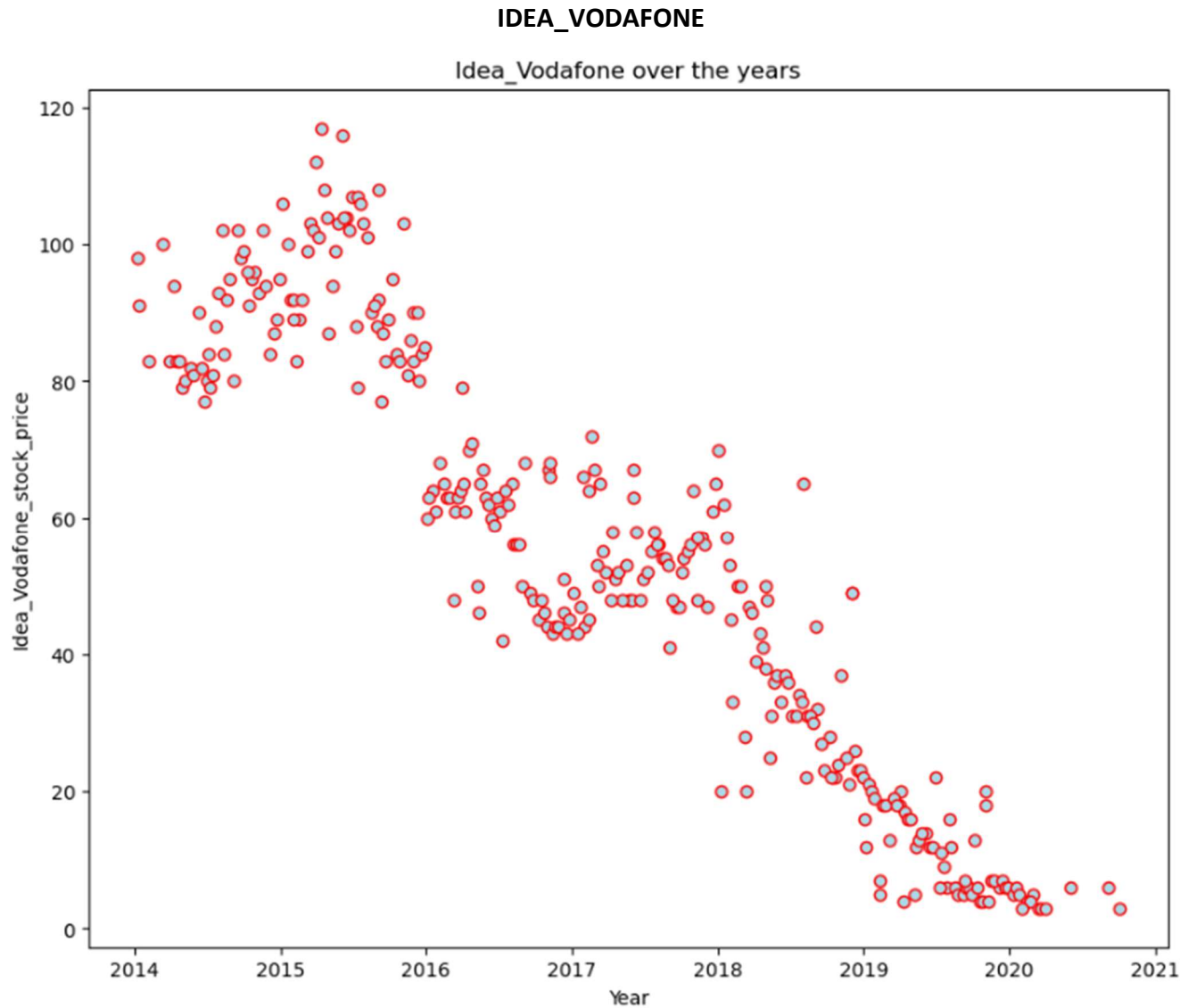


Fig. 1.1B

IDEA_VODAFONE Price Over the Years

Inferences: -

- Overall it shows the Downwards trend.
- From 2014 to 2015 the stock price increases slightly from 80 to 120.
- Stock Price decreases significantly from 2015 to 2017 i.e., 120 to 60.
- Between 2017 & 2018 the stock price remains constant between 60 and 40.
- Again from 2018 to 2021 stocks price drops drastically from 60 to almost 0.
- We can say Idea_Vodafone stock has collapsed.

PART B.2: Calculate Returns for all stocks with inference

	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
...
309	0.009649	-0.110348	0.030305	-0.057580	-0.087011	0.023688	0.072383	-0.053346	-0.287682	-0.127833
310	-0.139625	-0.051293	-0.093819	-0.145324	-0.095310	-0.081183	-0.043319	-0.187816	0.693147	-0.200671
311	-0.094207	-0.236389	-0.285343	-0.284757	-0.105361	-0.119709	-0.050745	-0.141830	-0.693147	-0.117783
312	0.109856	-0.182322	-0.091269	-0.173019	-0.251314	-0.067732	-0.076851	-0.165324	0.000000	-0.133531
313	-0.017228	0.000000	-0.031198	0.051432	0.090972	-0.006816	0.040585	-0.081917	0.000000	0.000000

Fig. 2

Return of All stock (Weekly Basis)

INFERENCES

Week or Week returns for all the stocks has been given in above figure. We have given Top 5 and Bottom 5 weeks return.

PART B.3 : Calculate Stock Means and Standard Deviation for all stocks with inference

STOCKS	MEAN / AVERAGE	VOLATILITY
Infosys	0.002794	0.03507
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

Table 1

INFERENCES: -

- The average / mean price of a stock is the average cost of one share over a certain period of time.
- Volatility / Standard Deviation is how much and how quickly prices move over a given span of time
- Jetairways has highest average/mean stock price i.e., 0.003681 followed by Shree Cement i.e., 0.003463
- Idea_Vodafone has the lowest average stock price i.e., -0.010608. Here negative sign signifies that the stock price has dropped within the span of time
- Idea_Vodafone has also the highest volatility i.e., 0.104315 which means its stock has moved or dropped quickly over the span of time.
- Infosys has the least volatility i.e., 0.03507

PART B.4 : Draw a plot of Stock Means vs Standard Deviation and state your inference.

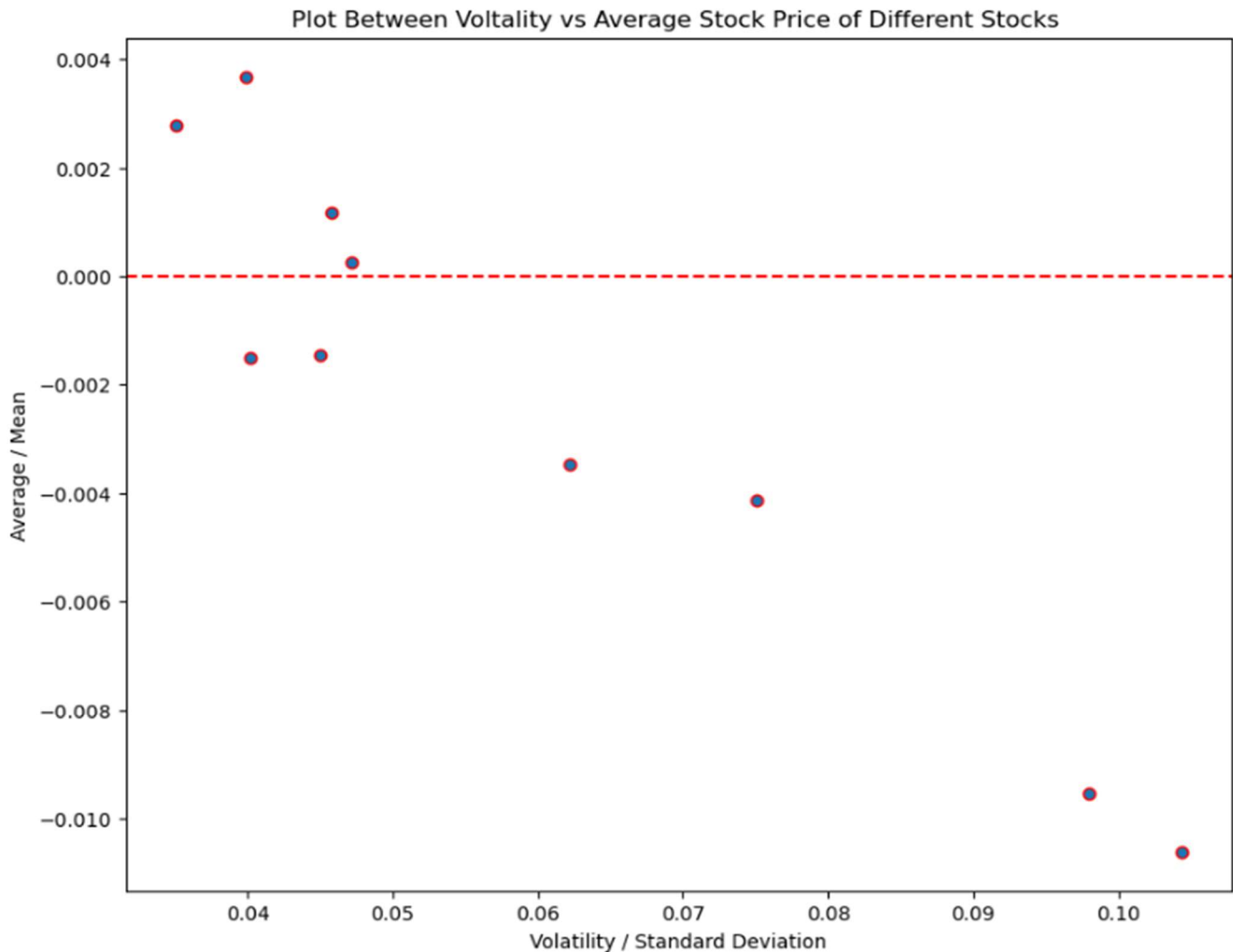


Fig. 4

Plot Between Volatility VS Average Stock Price of Different Stocks

INFERENCES: -

- There are only two stocks which has very high volatility and both of these stocks price are dropping i.e., Idea_Vodafone and Jetairways.
- There are 4 Stocks which has very less volatility and has very high return i.e., Infosys, Indian_Hotel, Axis_Bank and ShreeCement
- There are two stocks which has low volatility which are making losses i.e., Mahindra and Sun_Pharma
- These are some stocks which has average volatility but these stocks are making losses i.e., SAIL and Jindal Steel

PART B.5 : Conclusions and Recommendations

Stocks with lower mean / Average and Higher Standard Deviation / Volatility do not play a role in portfolio that has competing stock with more return & less risk. Thus for the data we have here, we are only left with few stocks

1. One with Highest Return and Lowest Risk
 2. One with Lowest risk and Higher Return
- From pure return perspective, Shree_Cement followed by Infosys & Axis_Bank looks good in this dataset.
 - From Pure Risk Prespective (as measured by Volatility) Infosys followed by Shree_Cement & Mahindra_&_Mahindra looks good

We would recommend using the stock's Average (Mean) VS Volatility (Standard Deviation) plot to assess the risk to reward ratio. More the Volatility in the stock may give short term gains but might not be a good investment in long term. Whereas a low Volatile stock might not be good investment in short term, but might give a good return in long term. Hence Based on the type of investment that one is looking for, a interference should be made from the above mentioned plot.