

Business Report

SMDM Project Business Report DSBA



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Problem - 1

Summary

The dataset contains 6 years of information (weekly stock information) on the stock prices of 10 different Indian Stocks.. This dataset has stocks for 10 company for 6 years.

Introduction

The purpose of this exercise is to find the stock prices of the company with good returns with low risk rate.

Data Description

1. Date – 6 year date from 2014- 2021
2. Company – 10 different company stock prices across 6 years.

Sample of the dataset:

	Date	Infosys	Indian Hotel	Mahindra & Mahindra	Axis Bank	SAIL	Shree Cement	Sun Pharma	Jindal Steel	Idea Vodafone	Jet Airways
0	31-03-2014	264	69	455	263	68	5543	555	298	83	278
1	07-04-2014	257	68	458	276	70	5728	610	279	84	303
2	14-04-2014	254	68	454	270	68	5649	607	279	83	280
3	21-04-2014	253	68	488	283	68	5692	604	274	83	282
4	28-04-2014	256	65	482	282	63	5582	611	238	79	243

Fig 1.1 Dataset Sample Before Changing Column Names

	Date	Infosys	Indian_Hotel	Mahindra_&_Mahindra	Axis_Bank	SAIL	Shree_Cement	Sun_Pharma	Jindal_Steel	Idea_Vodafone	Jet_Airways
0	31-03-2014	264	69	455	263	68	5543	555	298	83	278
1	07-04-2014	257	68	458	276	70	5728	610	279	84	303
2	14-04-2014	254	68	454	270	68	5649	607	279	83	280
3	21-04-2014	253	68	488	283	68	5692	604	274	83	282
4	28-04-2014	256	65	482	282	63	5582	611	238	79	243

Fig 1.2 Dataset Sample After Changing Column Names

Exploratory Data Analysis

Let us check the types of variables in the data frame.

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 314 entries, 0 to 313
Data columns (total 11 columns):
Date                314 non-null object
Infosys             314 non-null int64
Indian_Hotel        314 non-null int64
Mahindra_&_Mahindra 314 non-null int64
Axis_Bank           314 non-null int64
SAIL                314 non-null int64
Shree_Cement        314 non-null int64
Sun_Pharma          314 non-null int64
Jindal_Steel        314 non-null int64
Idea_Vodafone       314 non-null int64
Jet_Airways         314 non-null int64
dtypes: int64(10), object(1)
memory usage: 27.1+ KB
```

Fig- 1.3. Sample Datatypes of the variable

There are total 314 rows and 10 columns in the dataset.

2.1 Draw Stock Price Graph (Stock Price vs. Time) for any 2 given stocks with inference

Plotting of each company's stocks in the scatter plot.

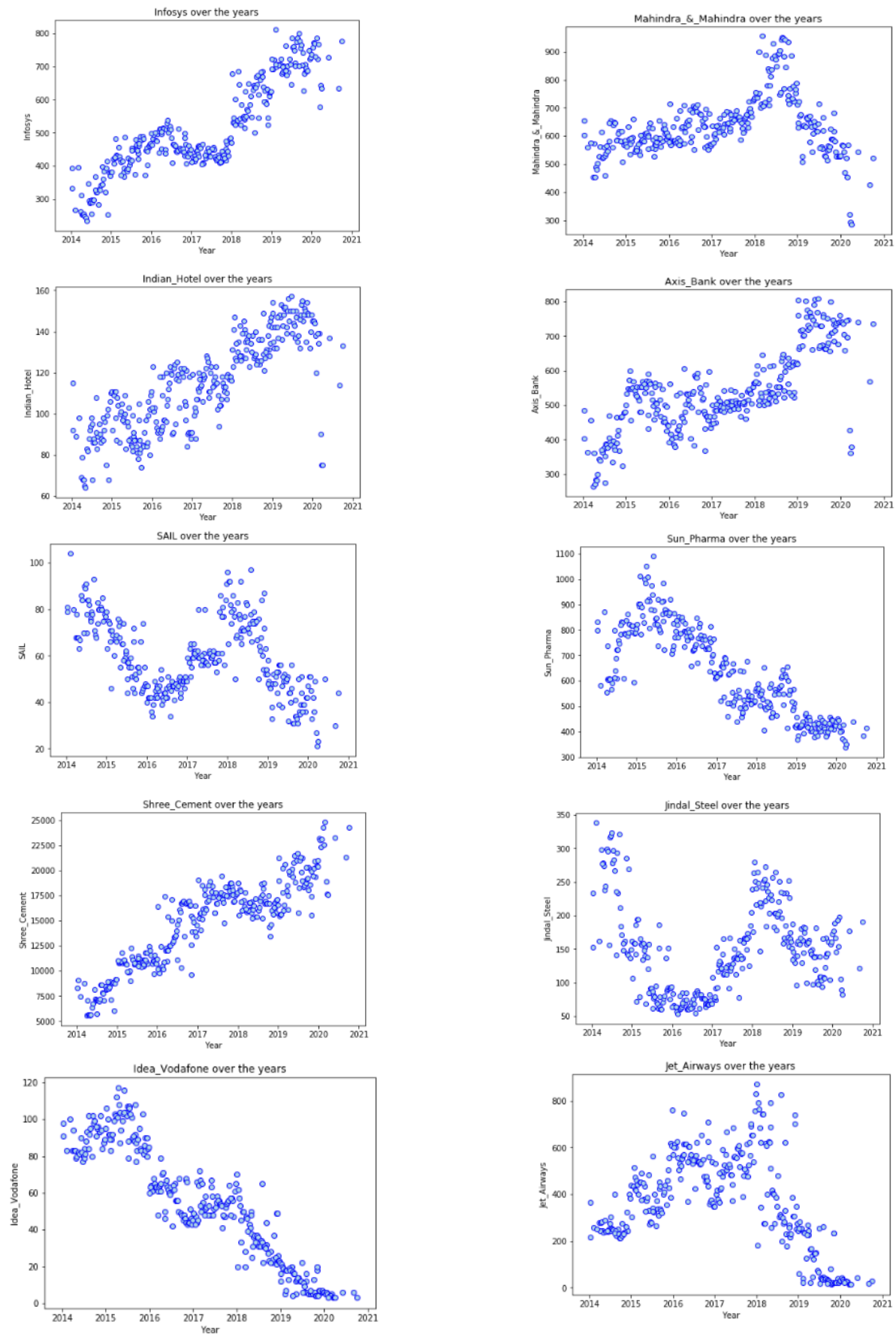


Fig- 1.4 Scatter plot for the stock prices of every company.

Inference from the above stock Graph

Infosys stock:

The stock price of the increases from 2014-21. Sudden dip in the stock price is due to recession (layoff of the employee) and brokerage houses lowered margin estimates this leads to slow growth.

Idea Vodafone stock:

The stock price of the Idea_Vodafone started falling when Jio has been launched in 2015. The plans were cheaper and good coverage of network leads to fall of the stock price of the Idea_Vodafone shares in the market.

Jet Airways stock:

The fall of jet airways share price, The Company was ceased in 2019 due to financial crunch in the market. This leads to fall of the share price in the market.

2.2 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
5	-0.031749	-0.015504	0.040856	0.061875	0.061558	0.011400	-0.008217	0.024898	0.012579	-0.018598
6	0.019961	0.080825	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	-0.014842	-0.023530	0.048090	0.044835	-0.010084	-0.012270	-0.181630
9	0.135668	0.081917	-0.003559	0.071154	0.213574	0.105167	-0.018724	0.132686	0.024391	0.072031

Fig- 1.5 Sample Return calculation dataframe.

Formula for Stock Return value across time (t):

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Inference: To return are calculated by the difference of new price from old price by old price. From this we can get the change in stock return can be identified.

2.3 Calculate Stock Means and Standard Deviation for all stocks with inference

```
Infosys          0.002794
Indian_Hotel     0.000266
Mahindra_&_Mahindra -0.001506
Axis_Bank        0.001167
SAIL             -0.003463
Shree_Cement     0.003681
Sun_Pharma       -0.001455
Jindal_Steel     -0.004123
Idea_Vodafone    -0.010608
Jet_Airways      -0.009548
dtype: float64
```

Fig- 1.6 Mean value for every company Stock price

```
Infosys          0.035070
Indian_Hotel     0.047131
Mahindra_&_Mahindra 0.040169
Axis_Bank        0.045828
SAIL             0.062188
Shree_Cement     0.039917
Sun_Pharma       0.045033
Jindal_Steel     0.075108
Idea_Vodafone    0.104315
Jet_Airways      0.097972
dtype: float64
```

Fig- 1.7 Standard deviation value for every company Stock price

	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

Fig – 1.8 Loading Mean and standard deviation into a dataframe.

Inference :

Mean – Gives the average value of stock return..

Standard deviation – Gives the standard deviation value of stock prize.

2.4 Draw a plot of Stock Means vs Standard Deviation and state your inference

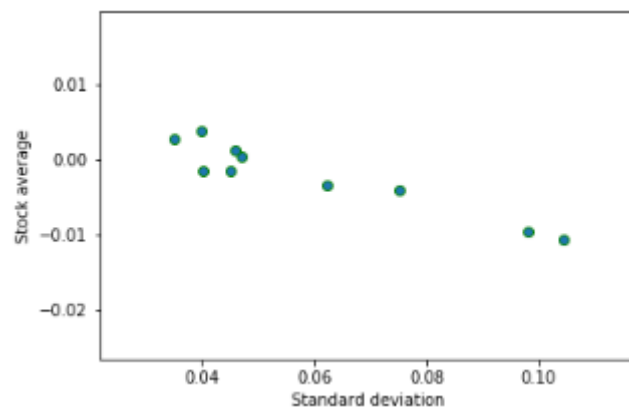


Fig – 1.9 Stock means vs. Stock deviation

	Average	Volatility
Infosys	0.002794	0.035070
Shree_Cement	0.003681	0.039917
Mahindra_&_Mahindra	-0.001506	0.040169
Sun_Pharma	-0.001455	0.045033
Axis_Bank	0.001167	0.045828
Indian_Hotel	0.000266	0.047131
SAIL	-0.003463	0.062188
Jindal_Steel	-0.004123	0.075108
Jet_Airways	-0.009548	0.097972
Idea_Vodafone	-0.010608	0.104315

Fig – 1.10 Sorting Volatility in ascending order.

	Average	Volatility
Infosys	0.002794	0.035070
Shree_Cement	0.003681	0.039917
Axis_Bank	0.001167	0.045828
Indian_Hotel	0.000266	0.047131

Fig – 1.11 Taking average values greater than 0.

Taking the stocks which are having the stock average greater than 0.

These 4 stocks are having higher average and lower volatility with high return with lower risk.

4 stocks are having higher returns in the different sector.

Ones with higher return for a comparative or lower risk are considered better.

2.5 Conclusion and Recommendations

From the above dataframe,

Stock with a lower mean & higher standard deviation does not play a role in a portfolio that has competing stock with more returns & less risk. Thus for the data we have here, we are only left few stocks:

Ones with higher return for a comparative or lower risk are considered better

From this we can infer that Investing in the Infosys can get higher return in the future with low risk and investment needs to be done for long term. Short term investment can lead to lower return or null return.