

DATA SCIENCE & ANALYTICS



SECTOR WISE 2018- 2022 DIVIDEND ANALYSIS





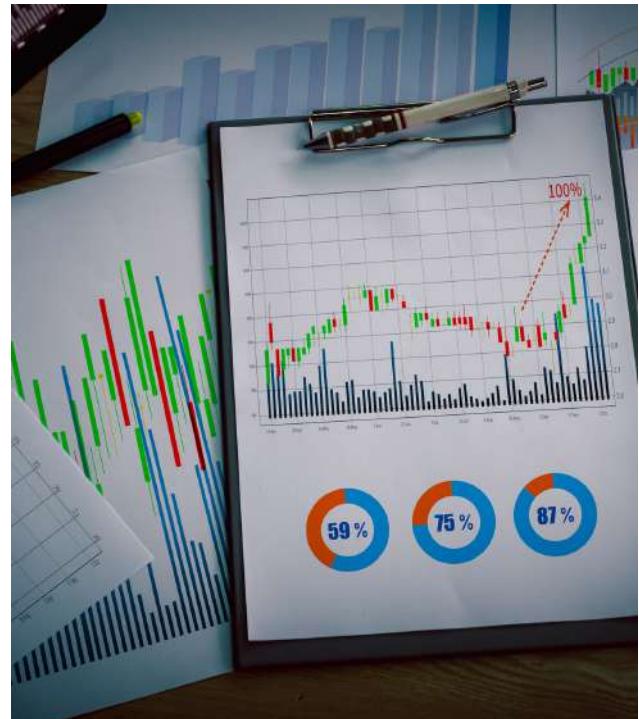
**Sector wise dividend analysis of nifty
50 data can tell us which sector
performs well in case of dividends ,the
correlation ,risks and expected returns
of each stock in a sector**

analysis done by

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WHAT'S DIVIDEND ?

A dividend is a monetary or non-monetary compensation given to shareholders by a firm. Dividends may be distributed in a number of ways, including stock dividends, cash payments, and other forms. The board of directors of a firm determines its dividend, which requires shareholder approval. A firm is not required to pay dividends, though. Dividend is often a portion of the company's profit that is distributed to its shareholders.



Companies, on the other hand, may choose to keep their accumulated profits and reinvest them in the business or save them for future use. Furthermore, declarations of dividend income typically coincide with a significant change in the stock price of the company.

TYPES OF DIVIDENDS



A company may pay a dividend to its shareholders in different forms. Similarly, depending on the frequency of declaration, there are two major types of dividend that shareholders are rewarded with, namely –

Special Dividend -

This type of dividend is paid on common stock. It is often issued under a particular circumstance when a company has accumulated substantial profits over several years. Mostly such profits are looked at as excess cash that does not need to be used at the given moment or in the immediate future.



Preferred Dividend -



Preferred Dividends - Such a dividend is issued to the preferred stock owners and usually accrues a fixed amount that is paid quarterly. Also, this kind of dividend is earned on shares that function more like bonds.

Interim Dividend -

Interim Dividend - Interim dividend is declared by companies before the preparation of the final full-year accounts. Here, in the Indian context, the 'year' being referred to is the period between April of one year and March of the next year. This is the duration for one financial year in India.



Final Dividend -

A final dividend is declared after the accounts for the year are prepared.

DIVIDEND PAYING COMPANIES OF WHICH DATA IS ANALYZED

We have analyzed the dividend data of the companies listed in Nifty50 of NSE. The Nifty 50 index is a well-diversified 50 companies index reflecting overall market conditions. Nifty 50 Index is computed using free float market capitalization method.





Nifty 50 can be used for a variety of purposes such as benchmarking fund portfolios, launching of index funds, ETFs and structured products.



COMPANIES LIST

- Adani Enterprises
- Adani Ports
- Apollo Hospital
- Asian Paints
- Axis Bank
- Bajaj Auto
- Bajaj Finance
- Bajaj Finserv
- Bharti Airtel
- BPCL
- Britannia
- Cipla
- Coal India
- Divis Labs
- Dr Reddys Labs
- Eicher Motors
- Grasim
- HCL Tech
- HDFC
- HDFC Bank
- HDFC Life
- Hero Motocorp
- Hindalco
- HUL
- ICICI Bank

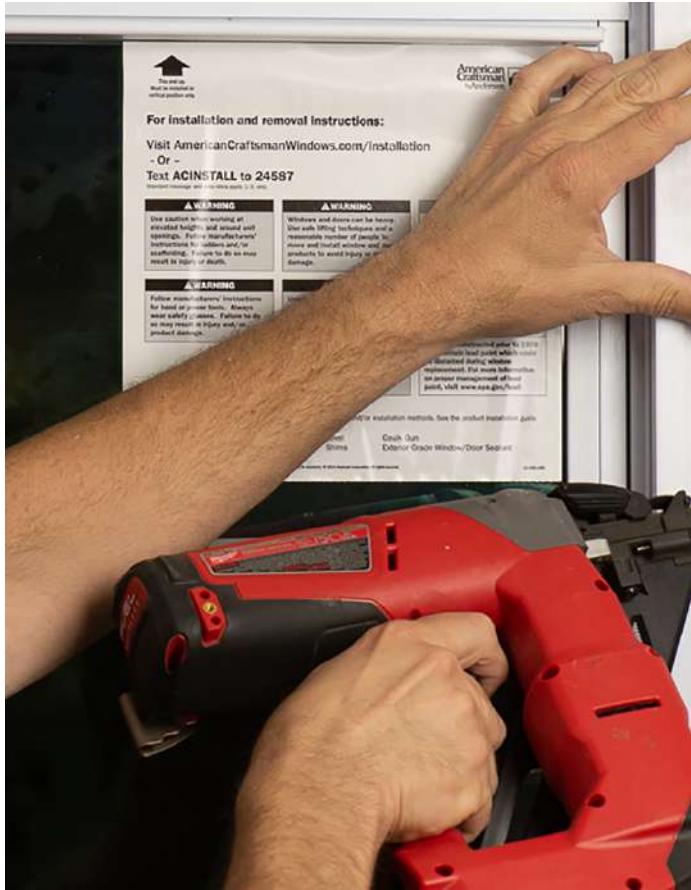
- IndusInd Bank
- Infosys
- ITC
- JSW Steel
- Kotak Mahindra
- Larsen & Toubro
- M&M
- Maruti Suzuki
- Nestle
- NTPC
- ONGC
- Power Grid Corp
- Reliance
- SBI
- SBI Life Insurance
- Sun Pharma
- TATA Cons. Prod
- Tata Motors
- Tata Steel
- TCS
- Tech Mahindra
- Titan Company
- UltraTechCement
- UPL
- Wipro

GATHERING THE DATA



We have used Python to gather the dividend data of the companies listed above. In python we have used the library yfinance. yfinance offers a threaded and Pythonic way to download market data from Yahoo! finance. With the help of the yfinance module, we retrieve and collect the company's financial information (such as financial ratios, etc.) as well as the histories of marketing data by using its functions. But, before we start learning more about this module and its implementation as well as applications, we have to install the yfinance module in our system (as it is not a built-in module in Python)..

**yahoo!
finance**



Once the installation process is done, we will proceed to the implementation part of the yfinance module. When we are using the yfinance module in our program, we have to pass the ticker as an argument inside the function (Here, Ticker is referred to as the ticker of a company).

A ticker is basically a stock symbol or unique series of alphabets for the company names, and it is assigned to add an extra security layer for trading purposes. We have collected the dividend data based on the dividend declare date and ex dividend date of each company for 5 years i.e., 2018 to 2022.



SECTOR WISE SEPARATION OF DATA

Here we have separated the nifty 50 stocks into 11 different sectors to analyze its dividend according to the sectors



Automobile

Bajaj Auto
Eicher Motors
Hero Motocorp
Mahindra & Mahindra
Maruti Suzuki
Tata Motors

Banking

Axis Bank
HDFC Bank
ICICI Bank
IndusInd Bank
SBI
Kotak Mahindra Bank



Chemicals

Asian Paints
UPL

Consumer Goods

Titan Company

HUL

Nestle

Britannia

ITC

TATA Consumer Product



Construction

Larsen and turbo

UltraTechCement

Grasim



Finance and Insurance

Bajaj Finance

Bajaj Finserv

HDFC

HDFC Life

SBI Life Insurance



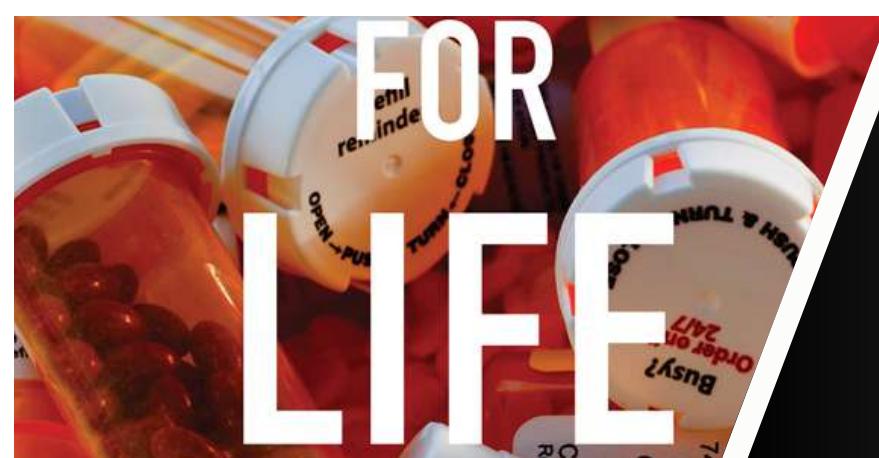
Health and Pharmacuticles

Apollo Hospital

Cipla

Divis Labs

Sun Pharma



Information Technology

HCL Tech

Infosys

TCS

Tech Mahindra

Wipro





Natural Resources

BPCL
ONCG
Reliance
Coal India
Hindalco
JSW Steel
Tata Steel

Others

Bharti Airtel
Adani ports
Adani Enterprise

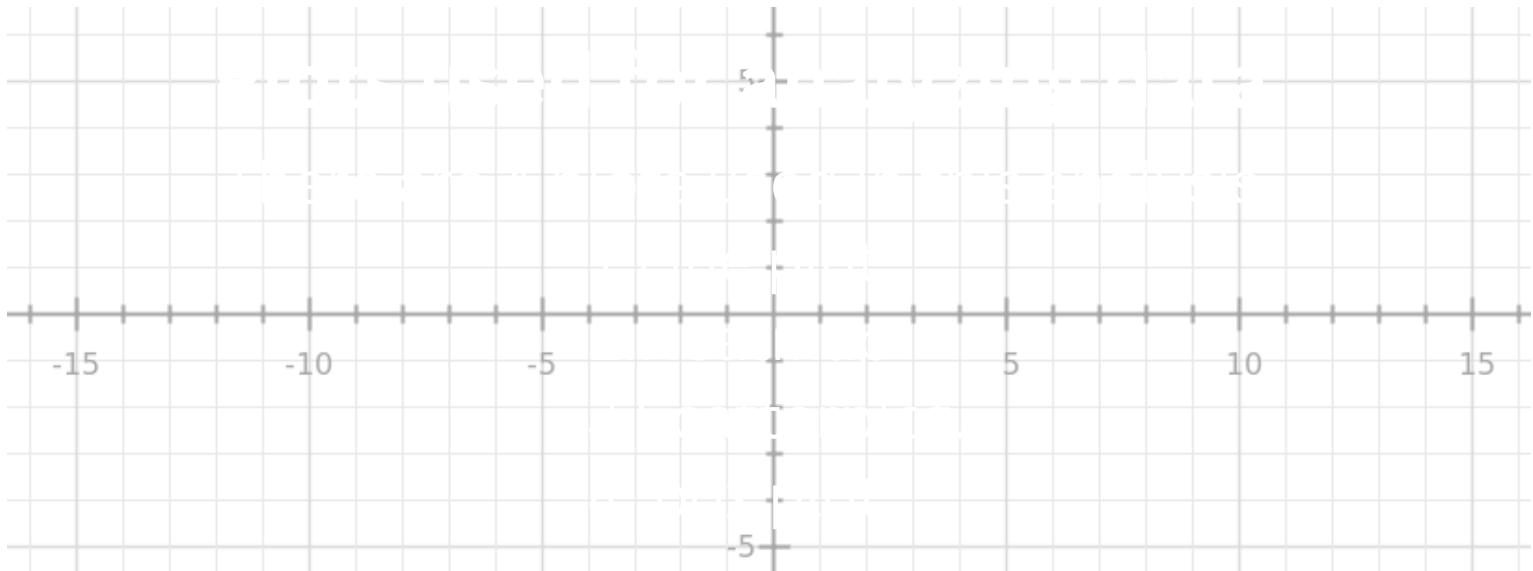


Power source

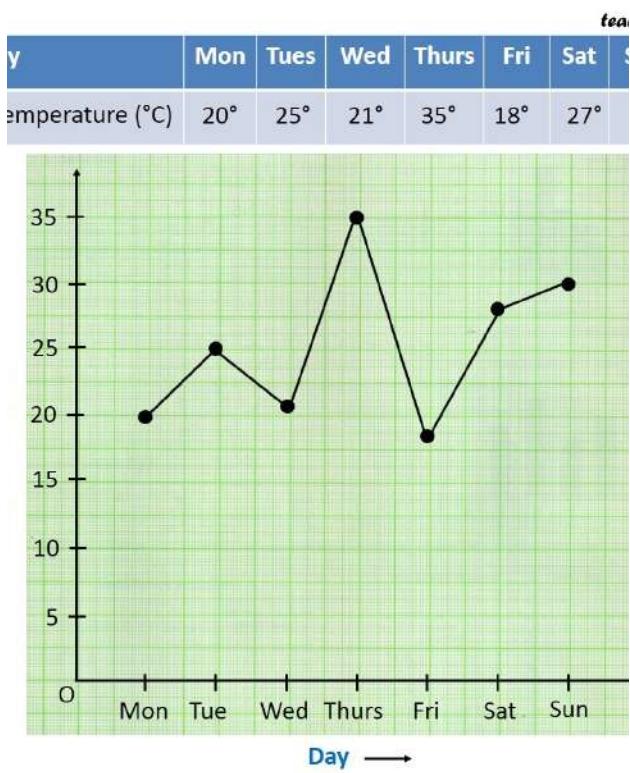
NTPC
Power grid corp



SECTOR WISE ANALYSIS OF DATA(2018-2022)



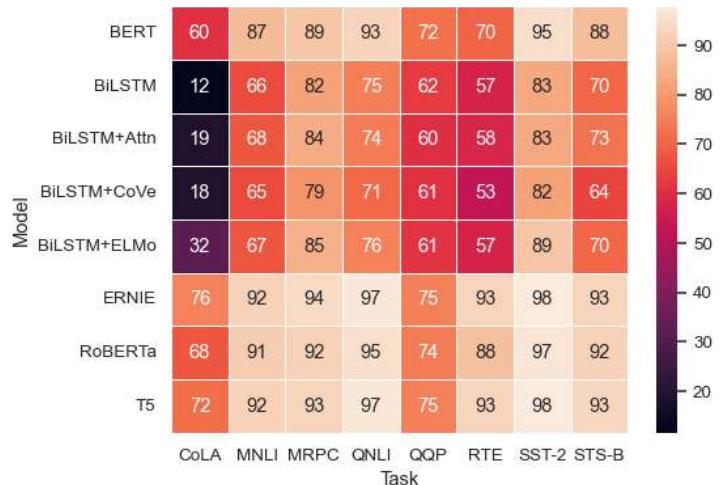
1. Line plot



The line chart for each sector according to respective dates between dividend declare date and ex dividend date .where each company is distinct by color where we can see the movements of each company and how the price of a stock changes between announcement of dividend declare date and Ex dividend date

2. Heatmap

The heatmaps are plotted upon the correlation data of each sector according to respective dates between dividend declare date and ex dividend date .It follows pearson

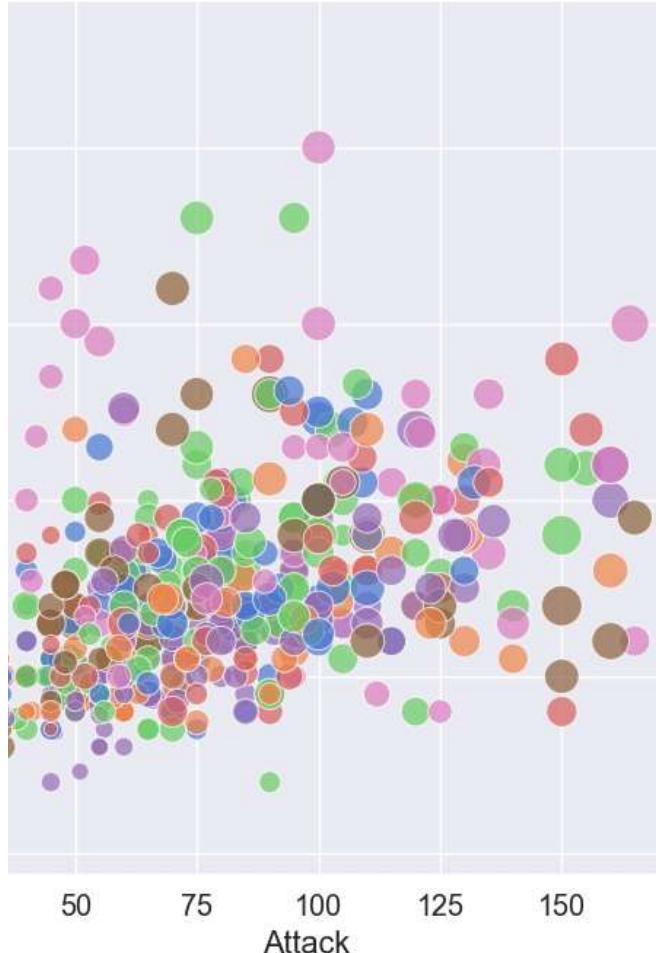


correlation where correlation between each company to itself is 1, the greener the color of correlation the higher the correlation is , if the correlation between 2 companies is higher then it follows positive correlation if one company price go up there is a high chance that the other companies price will also go up

	1	2	3	4	5	6	7	8	9	10	11	12
1	22%	19%	13%	19%	16%	23%	19%	20%	11%	14%	16%	10%
2	23%	21%	21%	24%	24%	29%	24%	18%	22%	14%	14%	12%
3	19%	19%	13%	21%	19%	20%	24%	21%	16%	14%	13%	10%
4	23%	21%	22%	22%	26%	27%	29%	26%	21%	21%	17%	15%
5	21%	16%	20%	24%	27%	23%	20%	19%	15%	15%	12%	12%
6	24%	24%	24%	24%	21%	21%	18%	20%	16%	15%	15%	18%
7	19%	16%	25%	19%	23%	28%	22%	18%	13%	10%	5%	
8	24%	20%	24%	22%	23%	17%	18%	15%	13%	7%		
9	22%	19%	19%	20%	20%	17%	19%	18%	12%			
10	18%	18%	24%	24%	23%	19%	20%	8%				
11	24%	23%	18%	16%	24%	22%	16%					
12	24%	18%	20%	18%	21%	10%						

3.Scatterplot

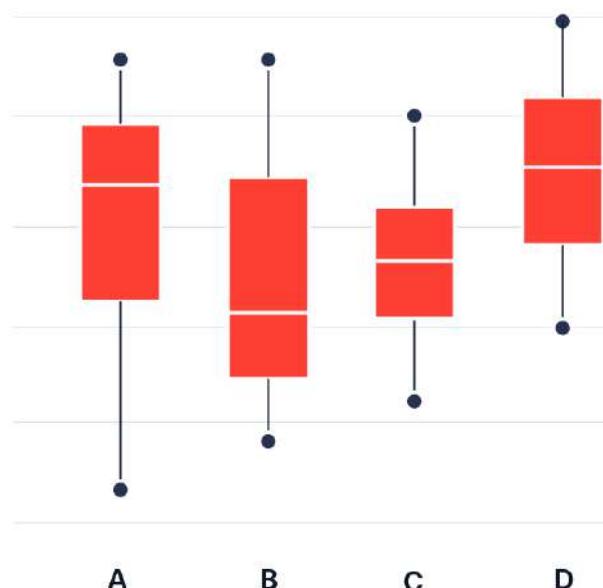
Properties of Pokemons by Type



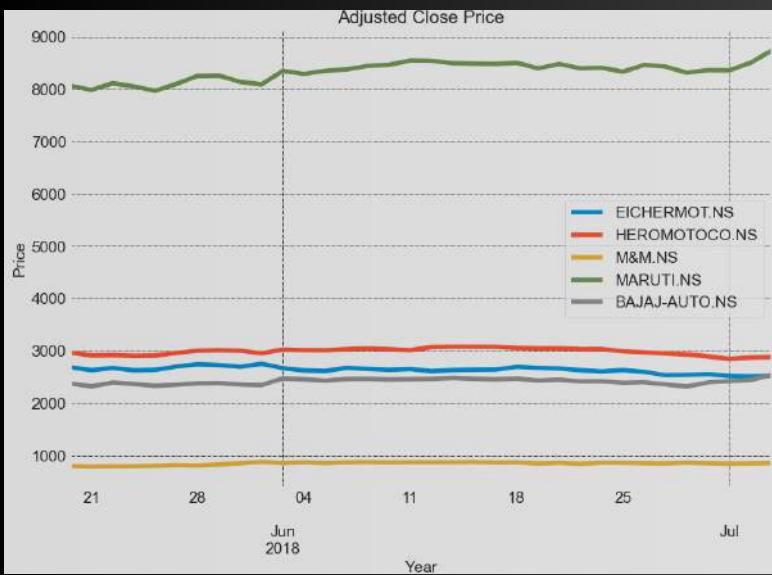
Here the given scatter plot is called as risk return plot also known as an investment opportunity set of each sector according to respective dates between dividend declare date and ex dividend dates ,where x axis is expected return and y axis is risk the companies at top left corner of the plot is low expected return and high risk plots and the bottom right corner of the plot are the high expected return and low risk plots

4. Box plot

The given box plots are 5 years stock data of each sector where x axis is stocks ,data lable and y, axis as adjusted close price the adjusted close price is the price at which stock is closed after providing the dividend. The boxplot show highest closing price and lowest closing price for each company here higher the distance of the whisker the higher volatile the adjusted close price is

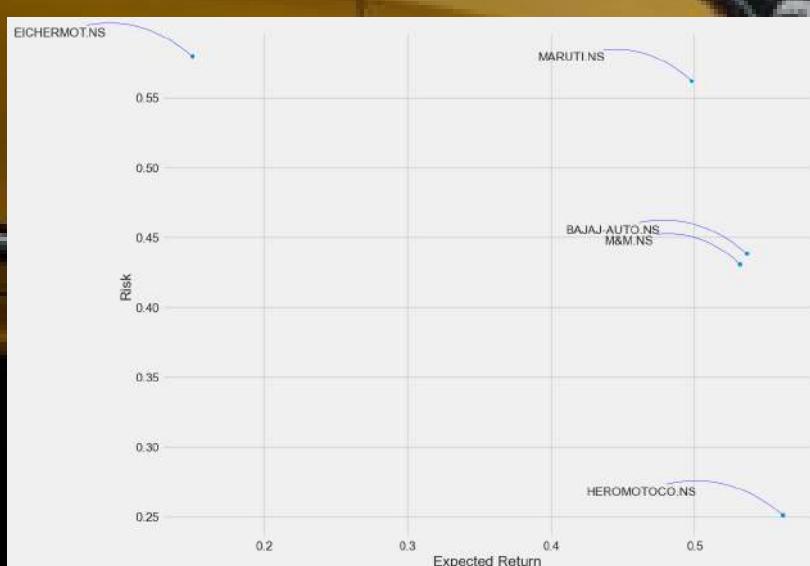


2018 DIVIDEND DATA OF AUTOMOBILE SECTOR



It is evident from the chart that there is no significant change in the stocks of MAHINDRA & MAHINDRA and BAJAJ AUTO. There is a slight increase in the stocks of HERO MOTOCORP and MARUTI SUZUKI. But there is also a slight decrease in the stocks in EICHER MOTORS. Overall there is no big change in this sector.

We can see that the correlation between MARUTI SUZUKI and BAJAJ AUTO has a value of 0.81. This means that the stocks of both these companies are doing good. Also MARUTI SUZUKI stocks are doing good with respect to MAHINDRA & MAHINDRA stocks.



The stocks of EICHER MOTORS has high risk and Low return as seen from the plot alongside. The stocks of HERO MOTOCORP has low risk and high return. So HERO MOTOCORP stocks look good here.

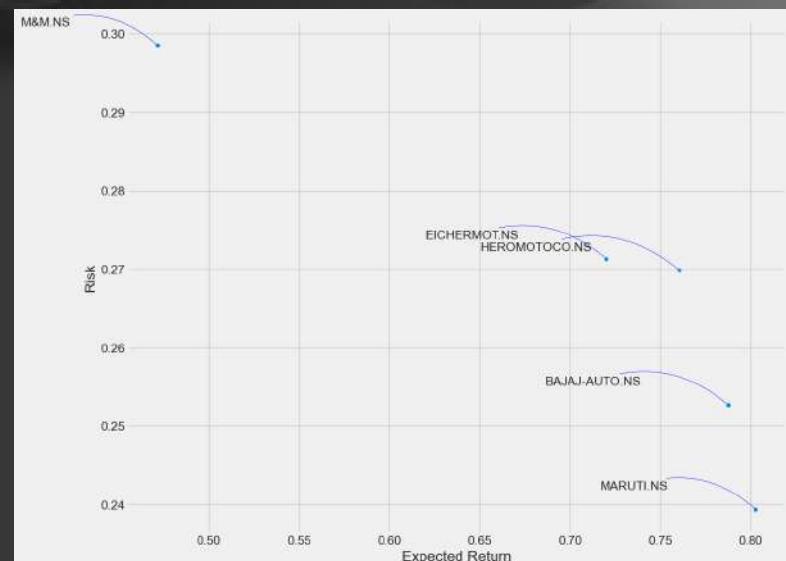
2019 DIVIDEND DATA OF AUTOMOBILE SECTOR

It is seen from the Plot that the stocks of MAHINDRA & MAHINDRA and EICHER MOTORS have no change whereas the stocks of MARUTI SUZUKI had a increase just after the dividend announcement date and has decreased to a low value when the ex dividend date is approached. Same is the case with HERO MOTOCORP and BAJAJ AUTO.

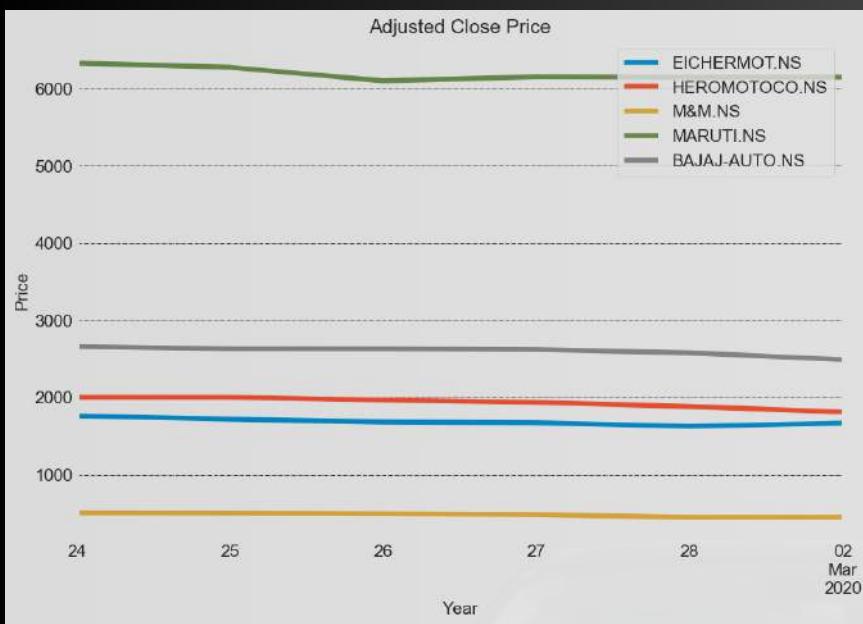


As it appears the correlation value for the companies MARUTI SUZUKI and HERO MOTOCORP is 0.94 which signifies the high performing rates of the stocks when compared with each other. Also the stocks of Maruti Suzuki is has good correlation with Bajaj Auto. Moreover the stocks of HERO MOTOCORP has good correlation with BAJAJ AUTO. Hence we can say that all these three companies have more or less similar performances with respect to stocks.

From the Plot the stocks of MAHINDRA & MAHINDRA has high risk and low return so the company's shares are less rewarding. The stocks of MARUTI SUZUKI has low risk and high return which puts this company's shares in a good position.



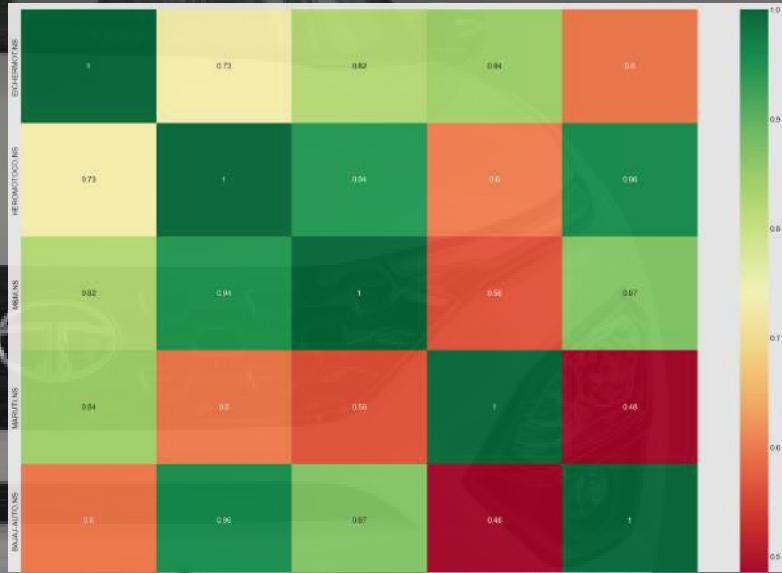
2020 DIVIDEND DATA OF AUTOMOBILE SECTOR



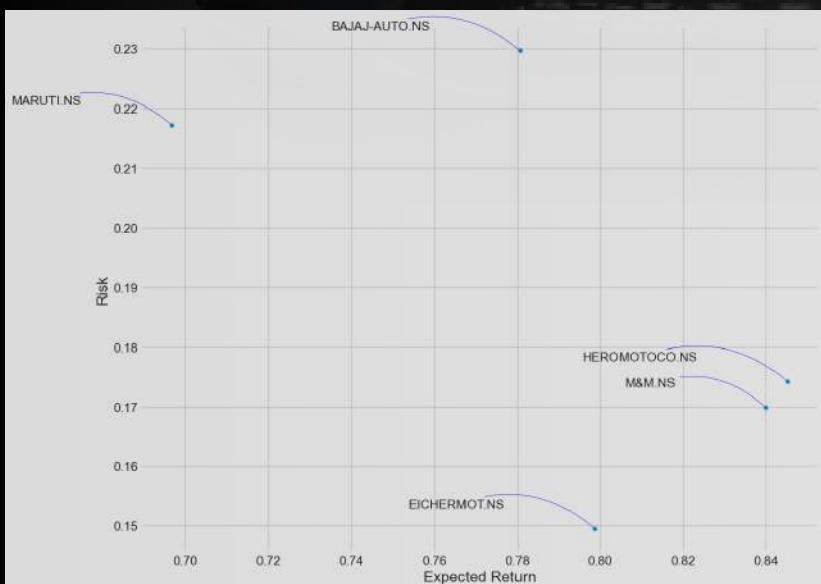
The stocks of MAHINDRA & MAHINDRA has no change. The stocks of EICHER MOTORS has a slight increase as the ex dividend date is approached. The stocks of MARUTI SUZUKI, HERO MOTOCORP and BAJAJ AUTO have decreased significantly. There is no significant movement in the stocks as seen from the graph.

The correlation between HERO MOTOCORP and BAJAJ AUTO is good with a correlation value of 0.96.

Also HERO MOTOCORP has high correlation with MAHINDRA & MAHINDRA. Moreover MAHINDRA & MAHINDRA has 0.87 correlation value with BAJAJ AUTO. Therefore all these three companies have performed similarly.



From the Plot the stocks of MAHINDRA & MAHINDRA has Low risk and High return so the company's shares are rewarding. The stocks of MARUTI SUZUKI has high risk and low return which puts this company's shares are not in a good position.



2021 DIVIDEND DATA OF AUTOMOBILE SECTOR

It is seen from the Plot that the stocks of MAHINDRA & MAHINDRA has no significant change whereas the stocks of MARUTI SUZUKI has significantly increased as the ex dividend date is nearing. All Other companies have more or less similar performances.

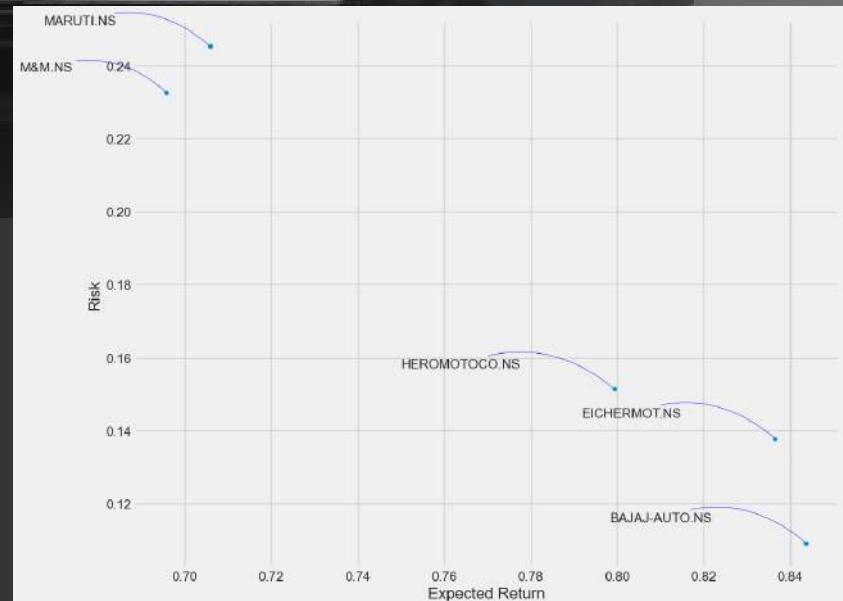


The correlation between EICHER MOTORS and BAJAJ AUTO is good with a correlation value of 0.9.

Also EICHER MOTORS has high correlation with MARUTI SUZUKI. Moreover HERO MOTOCORP has 0.82 correlation value with BAJAJ AUTO. Therefore all these three companies have performed similarly.

The stocks of MAHINDRA & MAHINDRA has high risk and Low return as seen from the plot alongside.

The stocks of BAJAJ AUTO has low risk and high return. So BAJAJ AUTO stocks look good here.



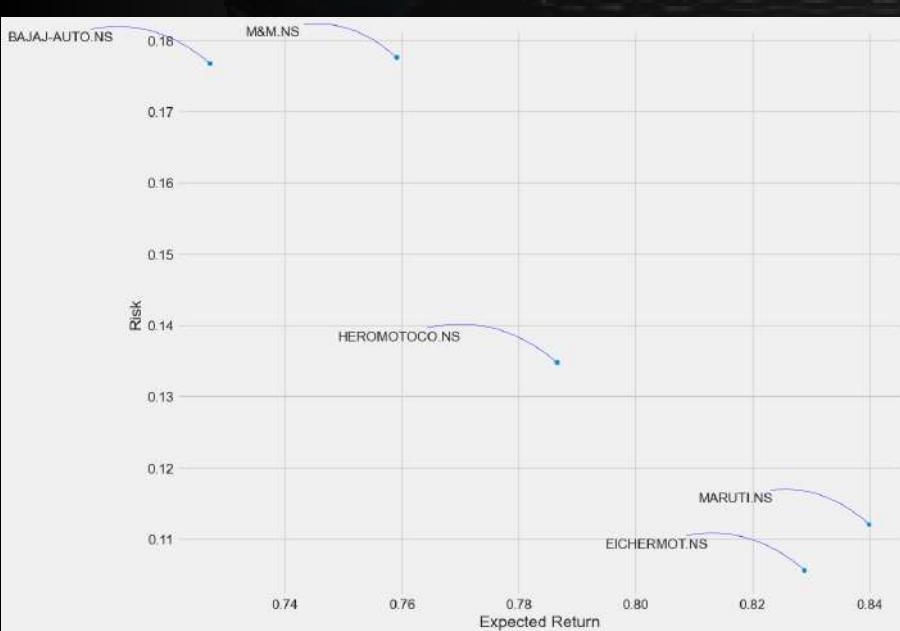
2022 DIVIDEND DATA OF AUTOMOBILE SECTOR



The stocks of MARUTI SUZUKI, BAJAJ AUTO and EICHER MOTORS has a slight decrease initially but has increased as the ex dividend date is approached. All the stocks have increased when the ex dividend date is approached

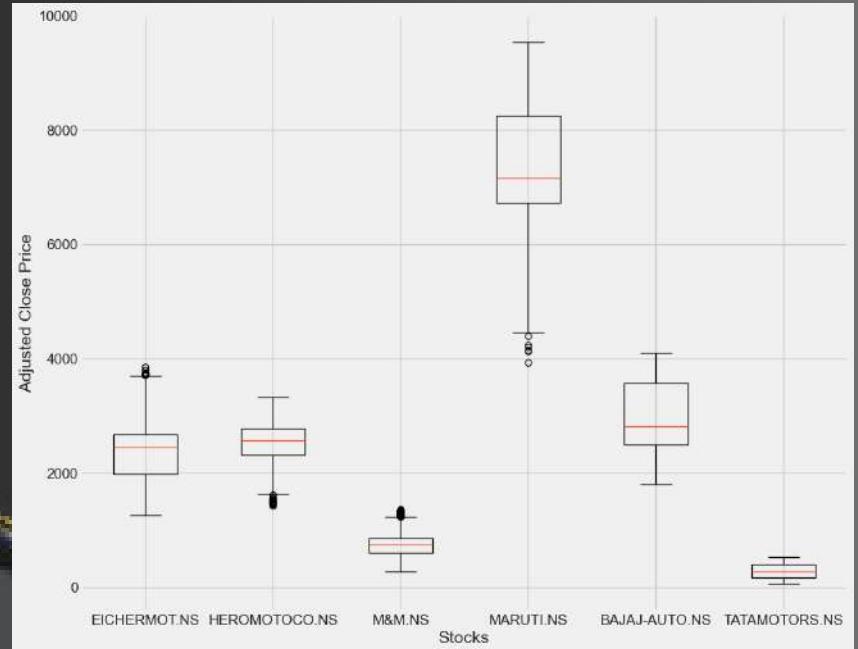
The correlation between EICHER MOTORS and MARUTI SUZUKI is good with a correlation value of 0.86.

Also MAHINDRA & MAHINDRA has high correlation with MARUTI SUZUKI. Hence we can say that MARUTI SUZUKI has performed more or less similar with respect to other companies with some exceptions.



From the Plot the stocks of BAJAJ AUTO has high risk and low return so the company's shares are less rewarding. The stocks of MARUTI SUZUKI has low risk and high return which puts this company's shares in a good position.

From the given Box plot of all the companies we can see that the box plot of MARUTI SUZUKI has long whisker. Hence the stocks of MARUTI SUZUKI is more volatile. This is also evident from the line graph. The boxplot of both MAHINDRA & MAHINDRA and TATA MOTORS has small whisker and look symmetrical. Hence these two companies are less volatile and the stocks of these companies are stable.



sector	2018		2019		2020		2021		2022		Volatili ty	overall
	risk	return	risk	return	risk	return	risk	return	risk	return		
EICHER MOTORS	high	low	medium	high	low	high	low	high	low	high	medium	recommended
HERO MOTOCORP	low	high	medium	high	low	high	medium	high	medium	medium	low	recommended
MAHINDRA & MAHINDRA	medium	high	high	low	low	high	high	low	high	low	low	not recommended
MARUTI SUZUKI	high	high	low	high	high	low	high	low	low	high	high	not recommended
BAJAJ AUTO	medium	high	low	high	high	medium	low	high	high	low	low	recommended
TATA MOTORS	--	--	--	--	--	--	--	--	--	--	low	no dividend data to analyse

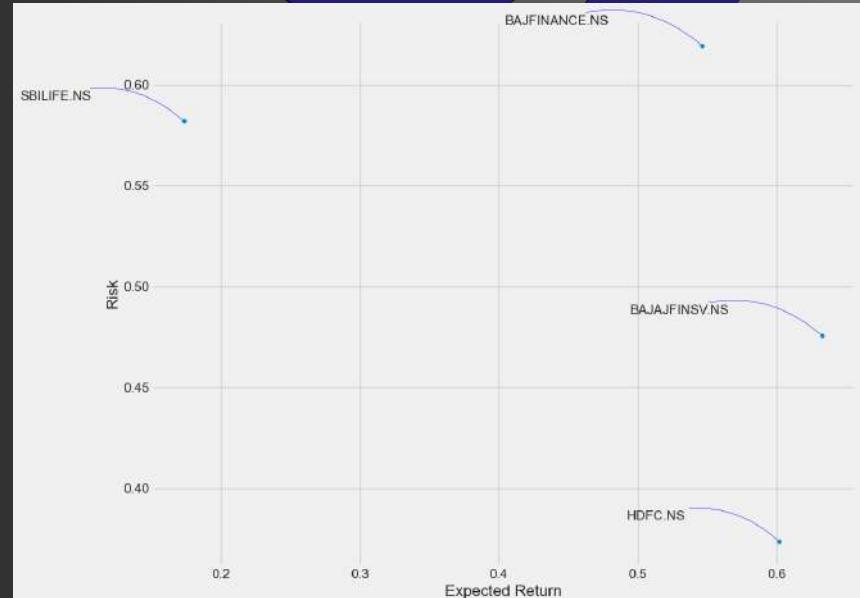
2018 FINANCE AND INSURANCE SECTOR

The stocks of BAJAJ FINANCE and has a very significant increase as the ex dividend date is approached. All the stocks have increased when the ex dividend date is approached



The correlation between BAJAJ FINANCE and BAJAJ FINSERV is good with a correlation value of 0.91. Also HDFC has high correlation with Bajaj Finserv. Hence we can say that BAJAJ FINSERV has performed more or less similar with respect to these companies.

From the Plot the stocks of SBI LIFE INSURANCE has high risk and low return so the company's shares are less rewarding. The stocks of HDFC has low risk and high return which puts this company's shares in a good position.

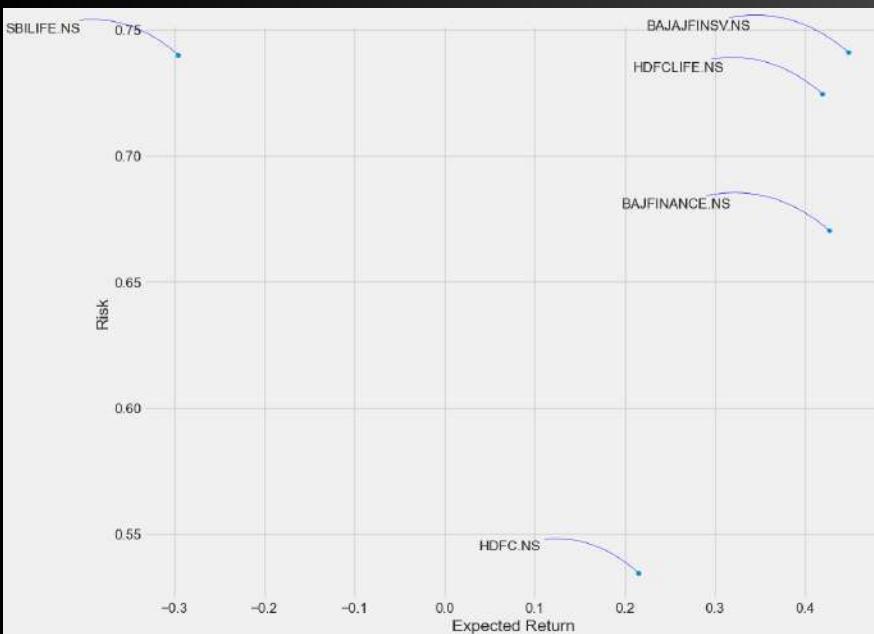
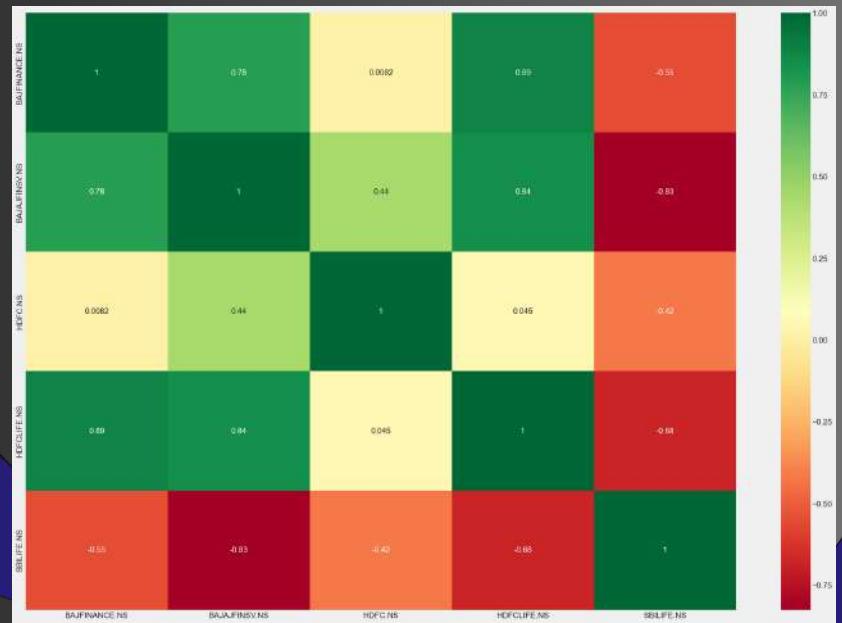


2019 FINANCE AND INSURANCE SECTOR



The stocks of SBI LIFE INSURANCE has no change. The stocks of BAJAJ FINANCE has a slight increase as the ex dividend date is approached. There is no significant movement in the stocks as seen from the graph.

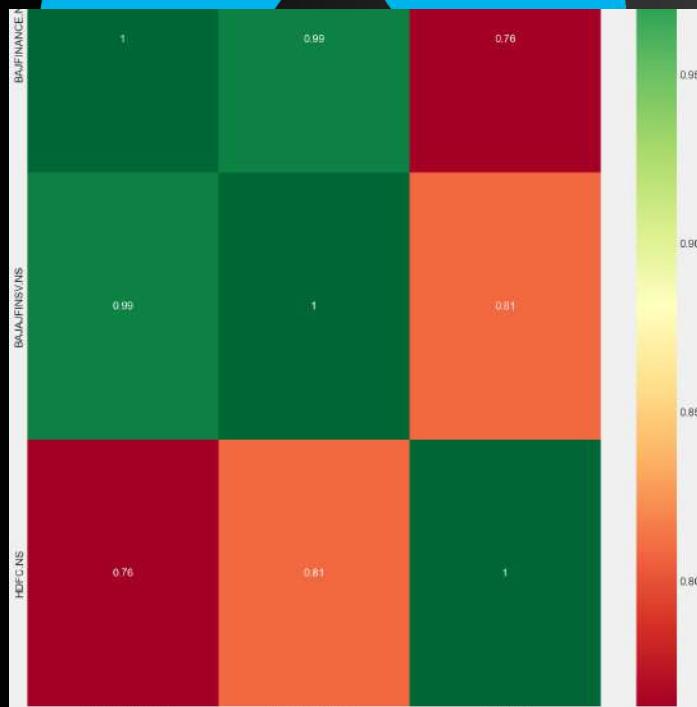
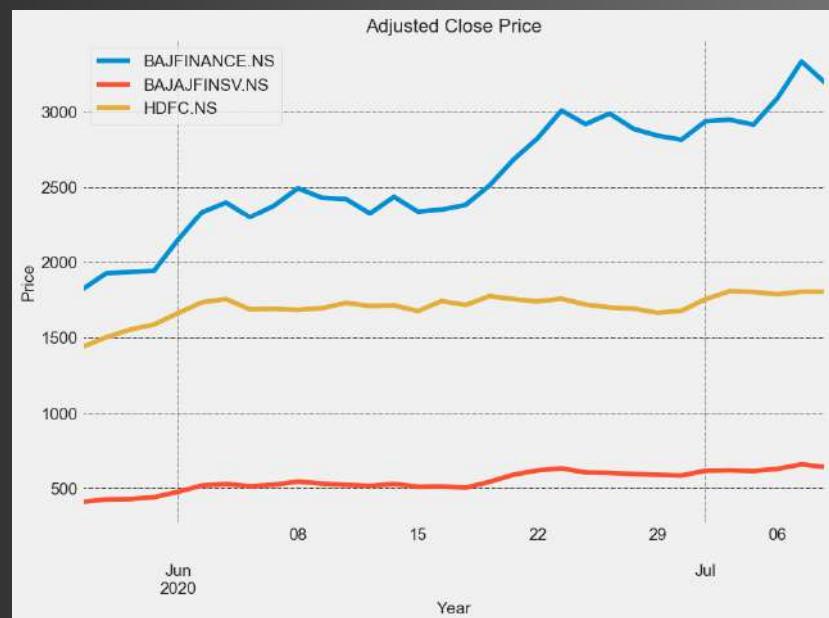
The correlation between BAJAJ FINANCE and HDFC LIFE is good with a correlation value of 0.89. Also HDFC LIFE has high correlation with BAJAJ FINSERV. The correlation between BAJAJ FINANCE and BAJAJ FINSERV is good. Therefore all the stocks of these companies have similar performances.



The stocks of SBI LIFE INSURANCE has high risk and Low return as seen from the plot alongside. The stocks of HDFC has low risk and high return. Also BAJAJ FINSERV has high risk and high return.

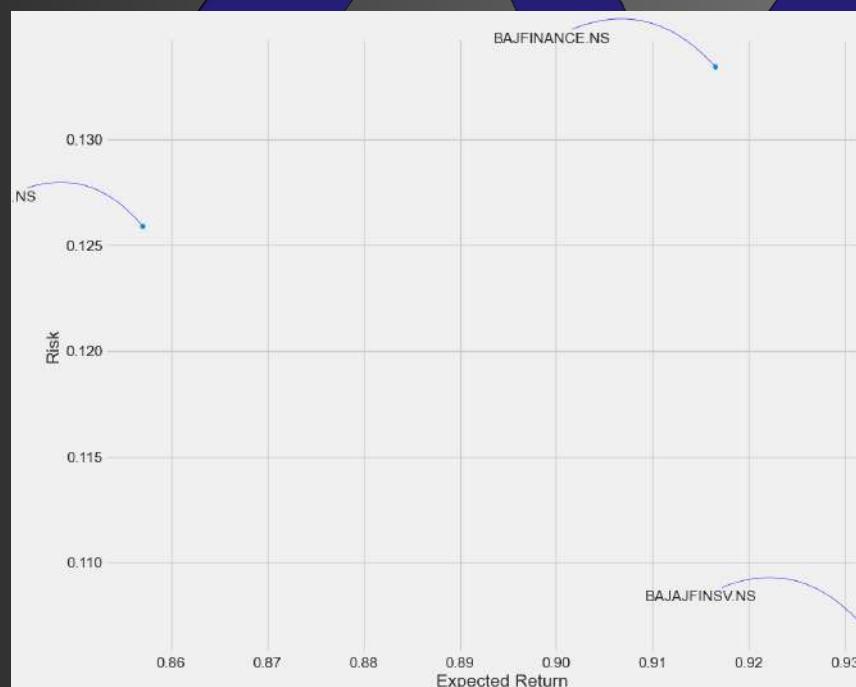
2020 FINANCE AND INSURENCE SECTOR

The stocks of BAJAJ FINANCE has a very significant increase as the ex dividend date is approached. All the stocks have increased as the time progressed and they have increased significantly while nearing the ex dividend date.

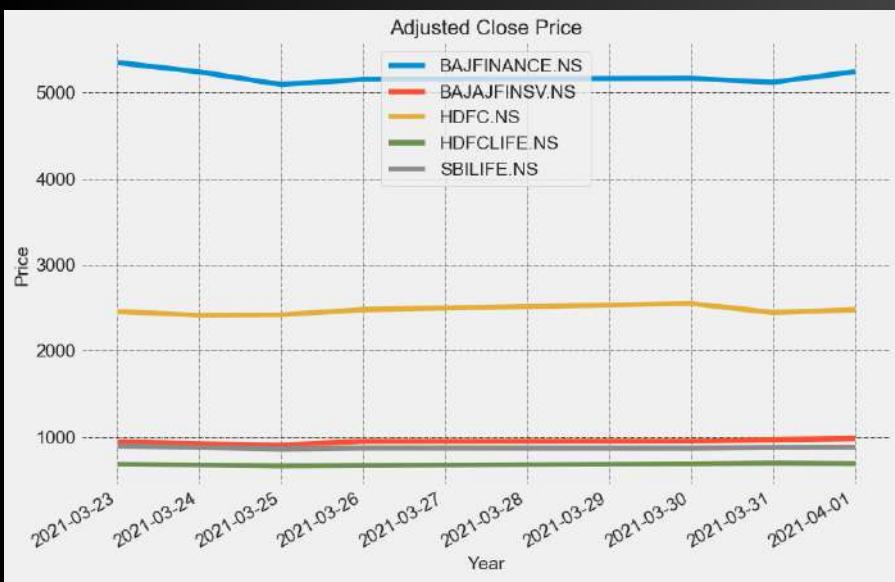


The correlation between BAJAJ FINANCE and BAJAJ FINSERV is good with a correlation value of 0.89. The correlation between BAJAJ FINANCE and BAJAJ FINSERV is good. Therefore all the stocks of these two companies have similar performances.

The stocks of HDFC has high risk and Low return as seen from the plot alongside. The stocks of BAJAJ FINSERV has low risk and high return. Also BAJAJ FINANCE has high risk and high return.

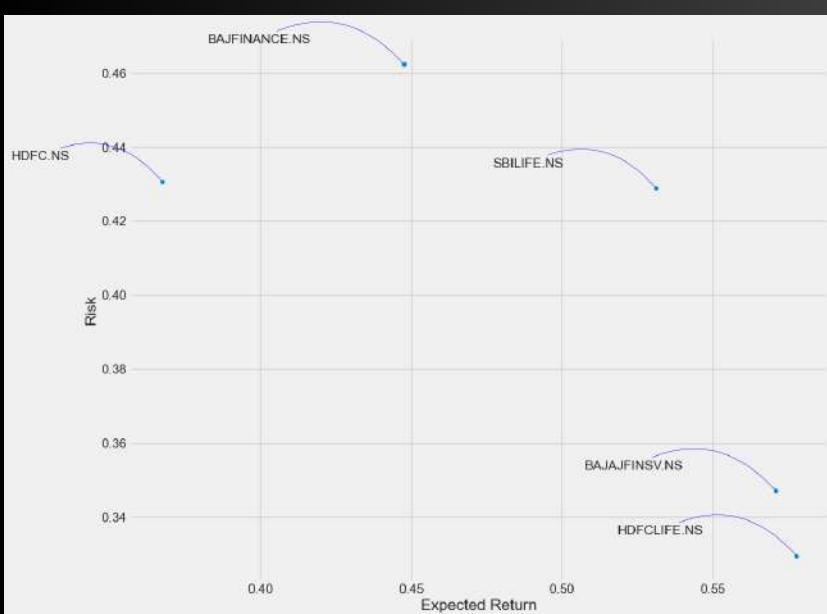


2021 FINANCE AND INSURANCE SECTOR



The stocks of SBI LIFE INSURANCE and HDFC LIFE has no change. The stocks of BAJAJ FINANCE and HDFC have a slight increase as the ex dividend date is approached. There is no significant movement in the stocks as seen from the graph.

The correlation between SBI LIFE INSURANCE and BAJAJ FINANCE is good with a correlation value of 0.89. Moreover HDFC LIFE has 0.83 correlation value with BAJAJ FINSERV. Therefore all these companies have performed similarly.



From the Plot the stocks of HDFC LIFE has Low risk and High return so the company's shares are rewarding. The stocks of HDFC has high risk and low return which makes this company's shares less rewarding.

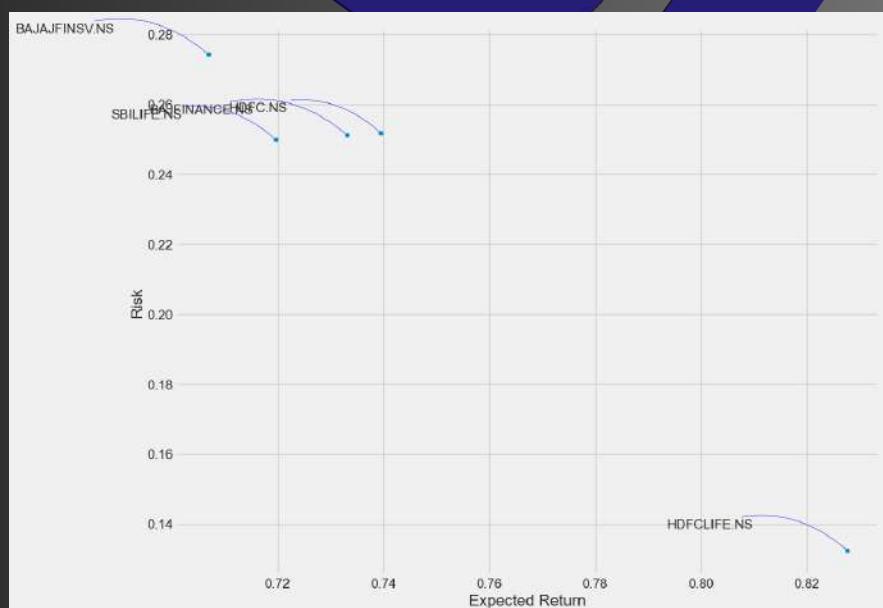
2022 FINANCE AND INSURANCE SECTOR

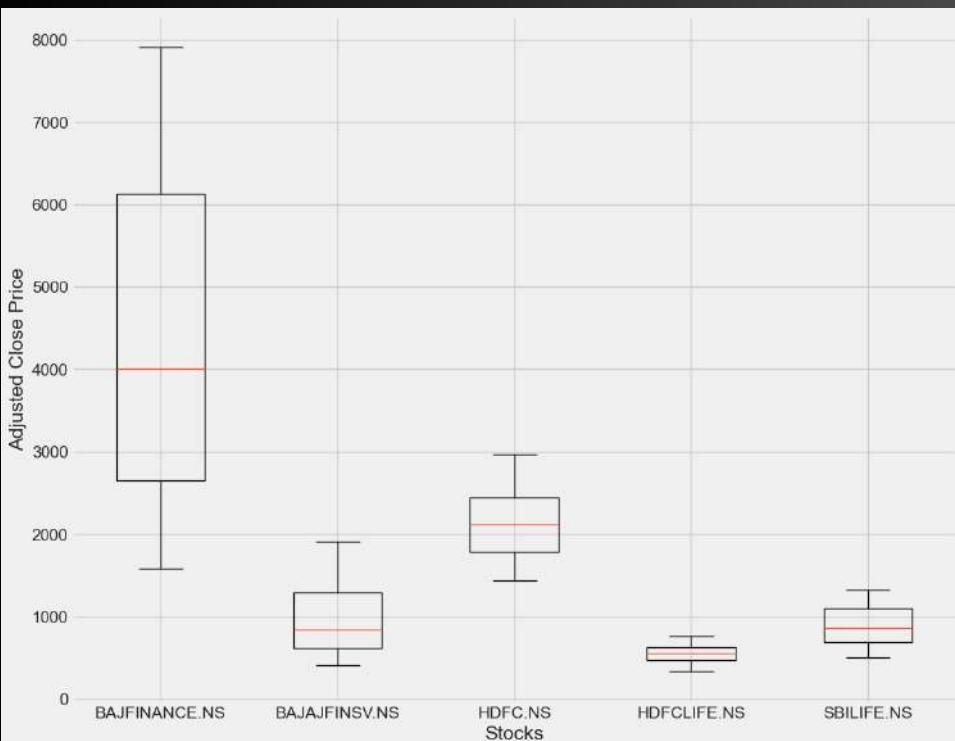
The stocks of SBI LIFE INSURANCE, HDFC LIFE and HDFC have small changes. There is no significant movement of the SBI LIFE INSURANCE stocks as seen from the graph.



The correlation between BAJAJ FINSERV and BAJAJ FINANCE is good with a value of 0.97. Hence these two have high performing rates with respect to stocks. All the other companies have less correlation as seen.

It is evident from the plot that the stocks of BAJAJ FINSERV has high risk and Low return as seen from the plot alongside. The stocks of HDFC LIFE has low risk and high return.





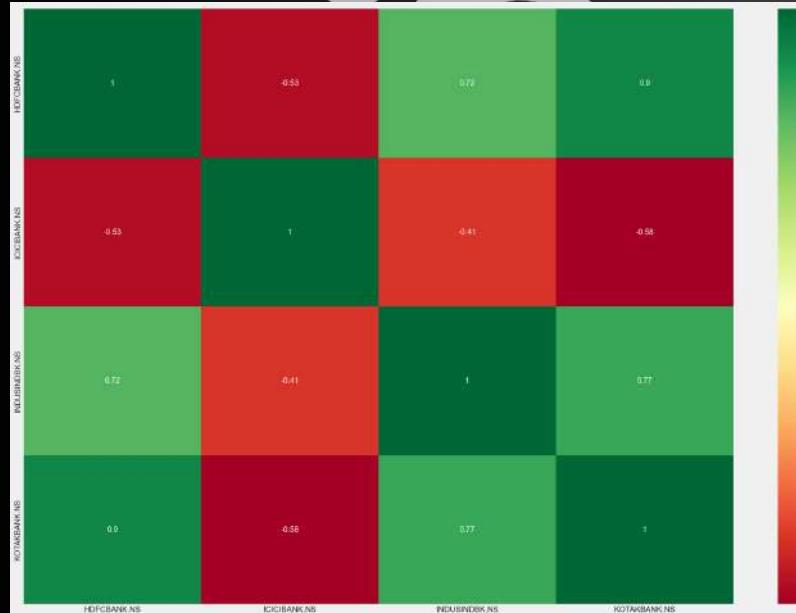
From the given Box plot of all the companies we can see that the box plot of BAJAJ FINANCE has long whisker. Hence the stocks of BAJAJ FINANCE is more volatile. This is also evident from the line graph. The boxplot of both HDFC LIFE and SBI LIFE INSURANCE has small whisker and look symmetrical.

Hence these two companies are less volatile and the stocks of these companies are stable.

sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return	risk	return	risk	return	risk	return	risk	return		
BAJAJ FINANCE	high	high	high	medium	high	high	high	low	high	low	high	not recommended
BAJAJ FINSERV	medium	high	high	high	low	high	low	high	high	low	medium	recommended
HDFC	low	high	low	medium	high	low	high	low	high	low	low	not recommended
HDFC LIFE	--	--	high	high	--	--	low	high	low	high	low	recommended
SBI LIFE INSURANCE	high	low	high	low	--	--	high	high	high	low	low	not recommended

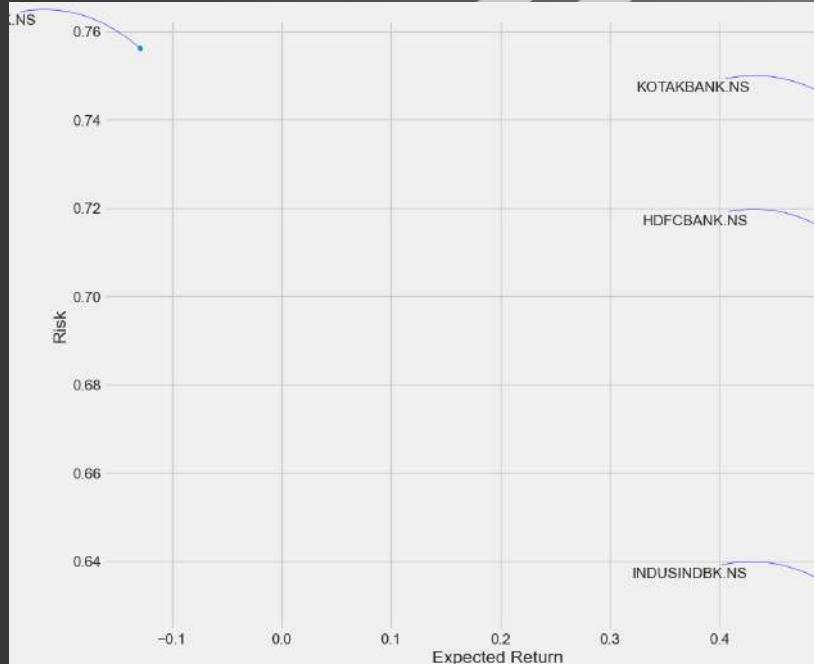
2018 BANKING SECTOR

The stocks of ICICI BANK has no significant change but has slightly increased as the ex dividend date is approached. The stocks of INDUSIND BANK and KOTAK MAHINDRA BANK have a slight increase as the ex dividend date is approached.



The correlation between KOTAK MAHINDRA BANK and HDFC BANK is good with a correlation value of 0.9. Moreover KOTAK MAHINDRA BANK has 0.77 correlation value with INDUSIND BANK which is also slightly good value of correlation. Therefore all these companies have performed similarly.

From the Plot the stocks of INDUSIND BANK has Low risk and High return so the company's shares are rewarding. The stocks of ICICI BANK has high risk and low return which makes this company's shares less rewarding.

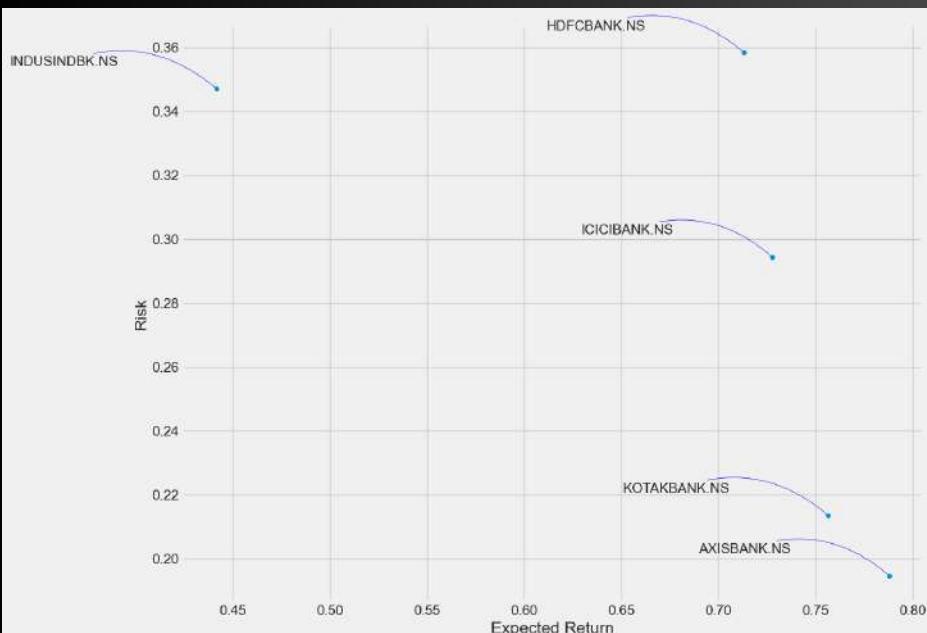


2019 BANKING SECTOR



The stocks of ICICI BANK has slightly increased as the ex dividend date is approached. There is a lot of movement with the stocks of INDUSIND BANK. The stocks of AXIS BANK and HDFC BANK have a slight increase as the ex dividend date is nearing.

The correlation between ICICI BANK and HDFC BANK is good with a correlation value of 0.87. Also KOTAK MAHINDRA BANK has 0.85 correlation value with AXIS BANK which is also slightly good value of correlation. Therefore all these companies similar performances.



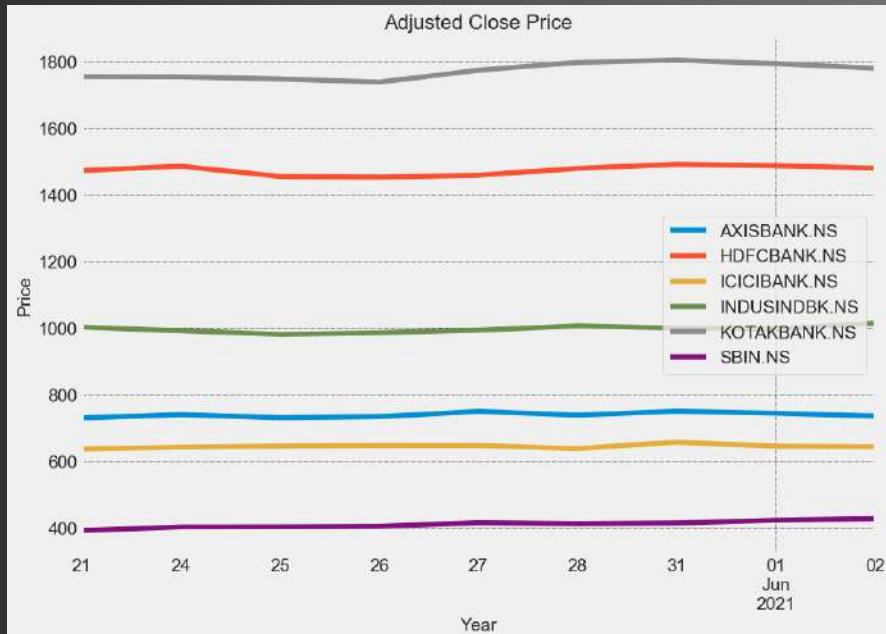
It is evident from the plot that the stocks of INDUSIND BANK. has high risk and Low return as seen from the plot alongside. The stocks of AXIS BANK has low risk and high return.

2020 BANKING SECTOR

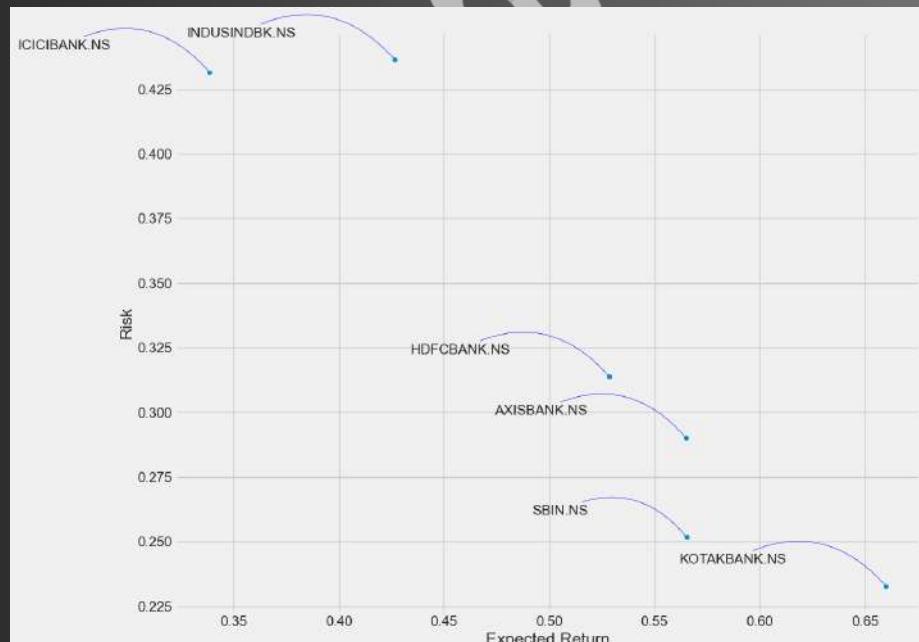
**NO
DIVIDEND
PROVIDED**

2021 BANKING SECTOR

The stocks of SBI BANK has no significant change but has slightly increased as the ex dividend date is approached. There is a no big movement with the stocks of all banks. The stocks of INDUSIND BANK has a slight increase as the ex dividend date is nearing. Some have decreased nearing the ex dividend date.

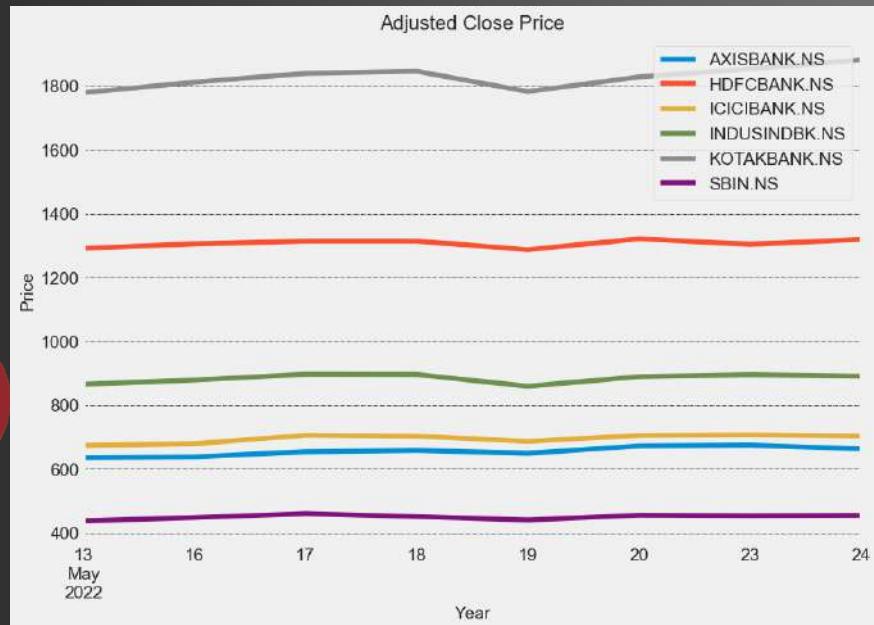


From the plot that the stocks of ICICI BANK has high risk and Low return as seen from the plot alongside. The stocks of KOTAK MAHINDRA BANK has low risk and high return.



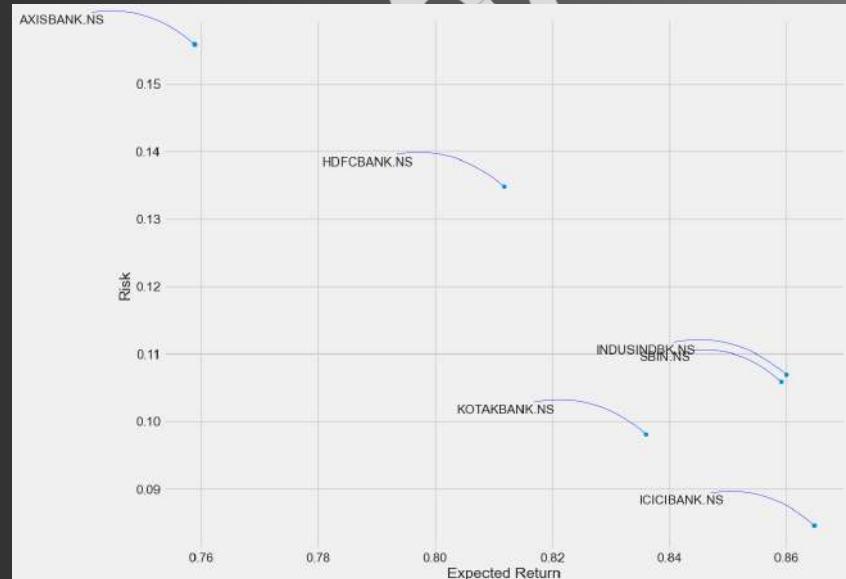
2022 BANKING SECTOR

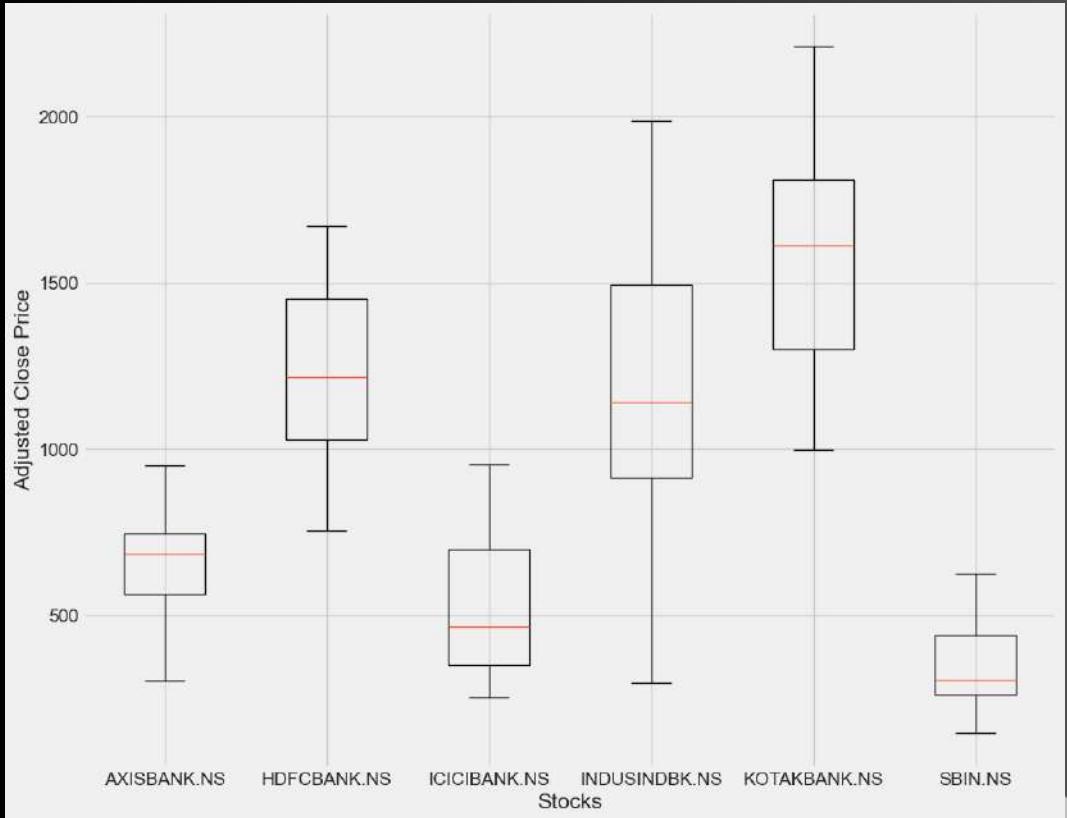
The stocks of KOTAK MAHINDRA BANK has significant change but has slightly increased as the ex dividend date is approached. There is a movement with the stocks of all banks in a similar sequence. All the stocks of all banks have gradually increased as the ex dividend date is nearing.



The correlation between INDUSIND BANK and SBI BANK is good with a correlation value of 0.91. Also ICICI BANK has 0.85 correlation value with AXIS BANK which is also slightly good value of correlation. Therefore all these companies similar performances.

From the plot that the stocks of AXIS BANK has high risk and Low return as seen from the plot alongside. The stocks of ICICI BANK has low risk and high return.





From the given Box plot of all the companies we can see that the box plot of INDUSIND BANK has long whisker. Hence the stocks of INDUSIND BANK is more volatile. This is also evident from the line graph. The boxplot of KOTAK MAHINDRA BANK also has long whisker showing its volatility.

SBI BANK is stable compared to all other banks as its wishker is smaller when comapred with the whiskers of other banks.

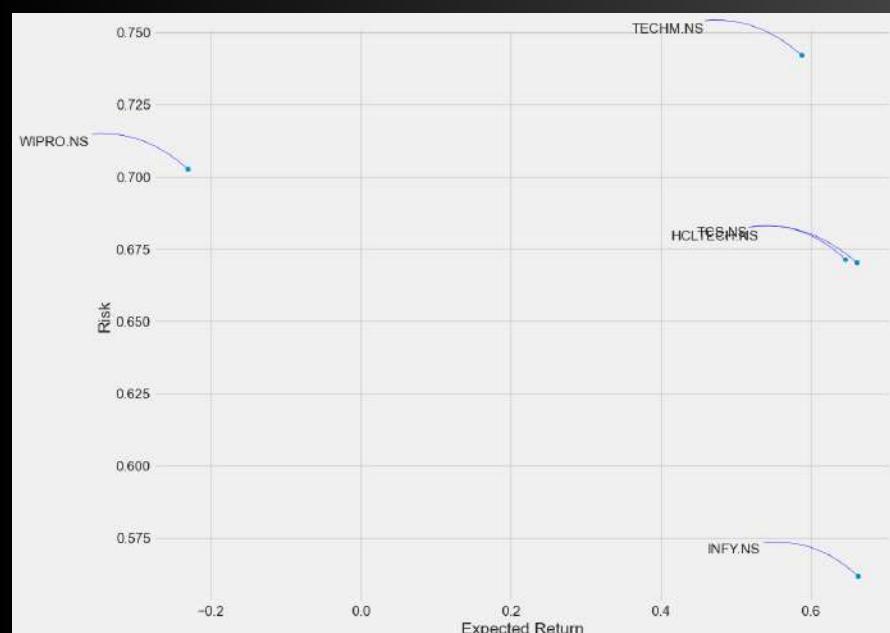
sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return	risk	return	risk	return	risk	return	risk	return		
AXIS BANK	--	--	low	high	--	--	low	high	high	low	high	recommended
HDFC BANK	high	high	high	high	--	--	medium	high	medium	medium	high	not recommended
ICICI BANK	high	low	medium	high	--	--	high	low	low	high	medium	recommended
INDUSIND BANK	low	high	high	low	--	--	high	low	low	high	high	not recommended
KOTAK MAHINDRA BANK	high	high	low	high	--	--	low	high	low	high	high	recommended
SBI	--	--	--	--	--	--	low	high	low	high	low	recommended

2018 INFORMATION TECHNOLOGY SECTOR



The stocks of TCS has a very significant increase as the ex dividend date is approached. All the stocks have increased as the time progressed and they have increased gradually while nearing the ex dividend date. The stocks of Wipro has no significant change.

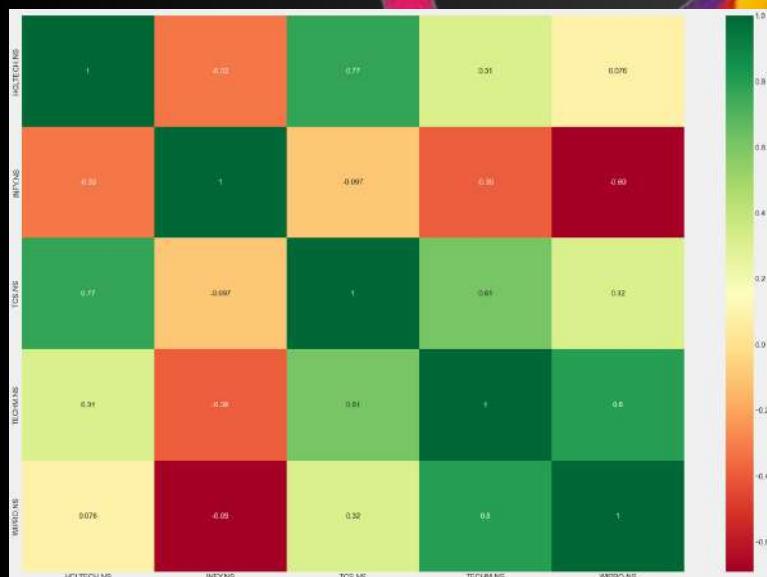
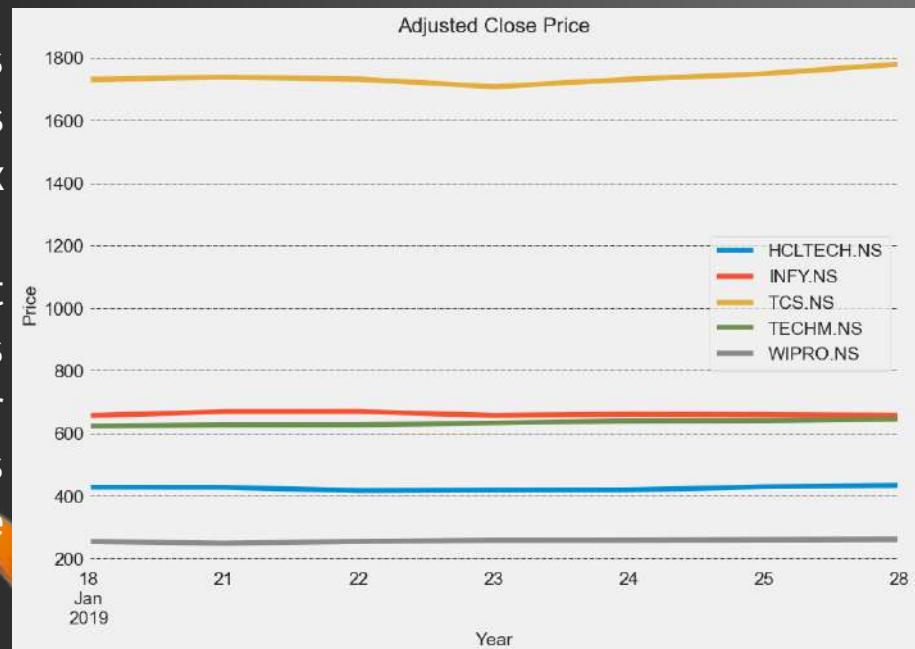
The Heatmap is more greener here implying that all major of the companies are correlated. The correlation between HCL TECH and TCS is very good with a correlation value of 0.96. Also TCS has 0.85 correlation value with TECH MAHINDRA which is also good value of correlation. Therefore all these companies similar performances.



The stocks of WIPRO has high risk and Low return as seen from the plot alongside. The stocks of INFOSYS has low risk and high return. So Infosys stocks look good here.TECH MAHINDRA has high risk and high return.

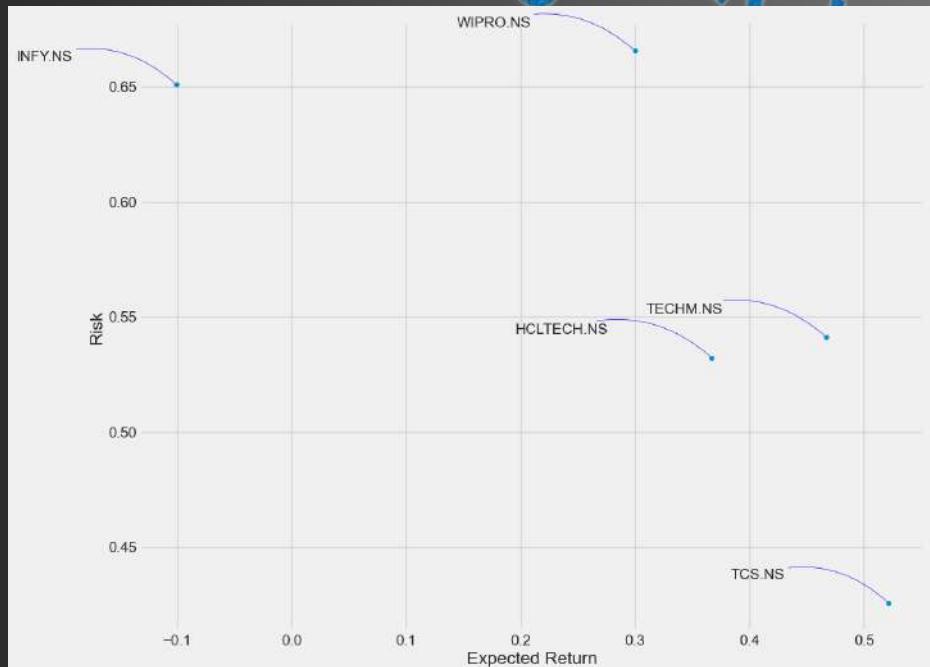
2019 INFORMATION TECHNOLOGY SECTOR

The stocks of TCS has noticeable change and has slightly increased as the ex dividend date is approached. There is no significant movement with other stocks and they appear in a similar sequence. The WIPRO stocks and HCL TECH stocks have similar pattern.

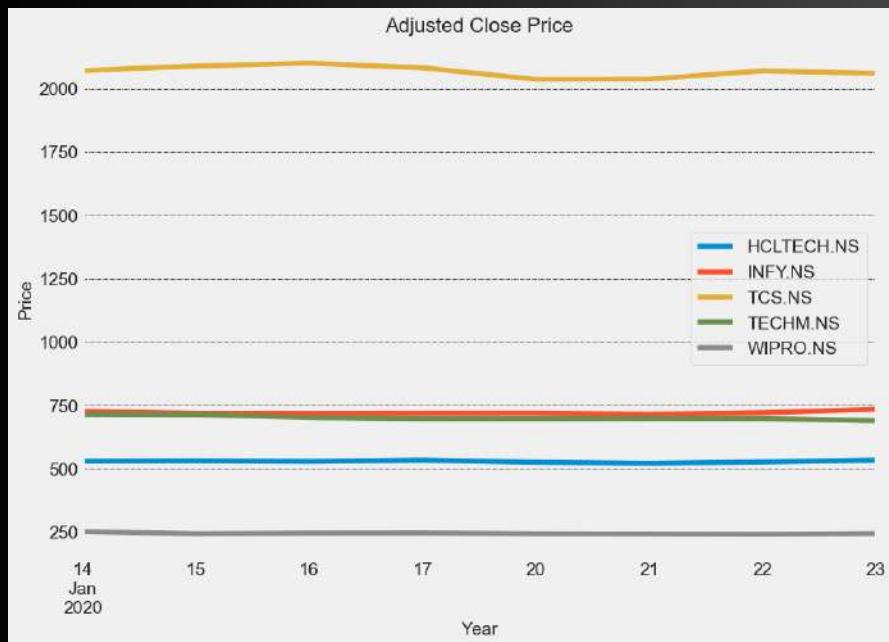


The correlation between TECH MAHINDRA and WIPRO is good with a correlation value of 0.8. Which shows their good performance. Also TCS has 0.77 correlation value with HCL TECH which is also good value of correlation. Therefore all these companies similar performances.

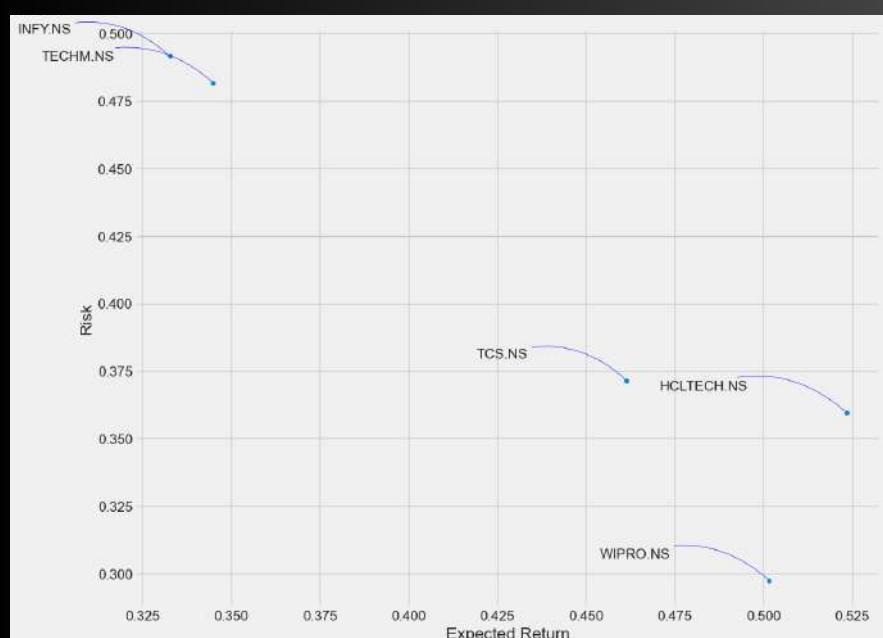
From the Plot the stocks of TCS has Low risk and High return so the company's shares are rewarding. The stocks of INFOSYS has high risk and low return which makes this company's shares less rewarding.



2020 INFORMATION TECHNOLOGY SECTOR



There is no strong correlation between the stocks this year. The correlation between HCL TECH and TCS is slightly good with a correlation value of 0.61. Also INFOSYS has 0.61 correlation value with HCL TECH which is also slightly good value of correlation.

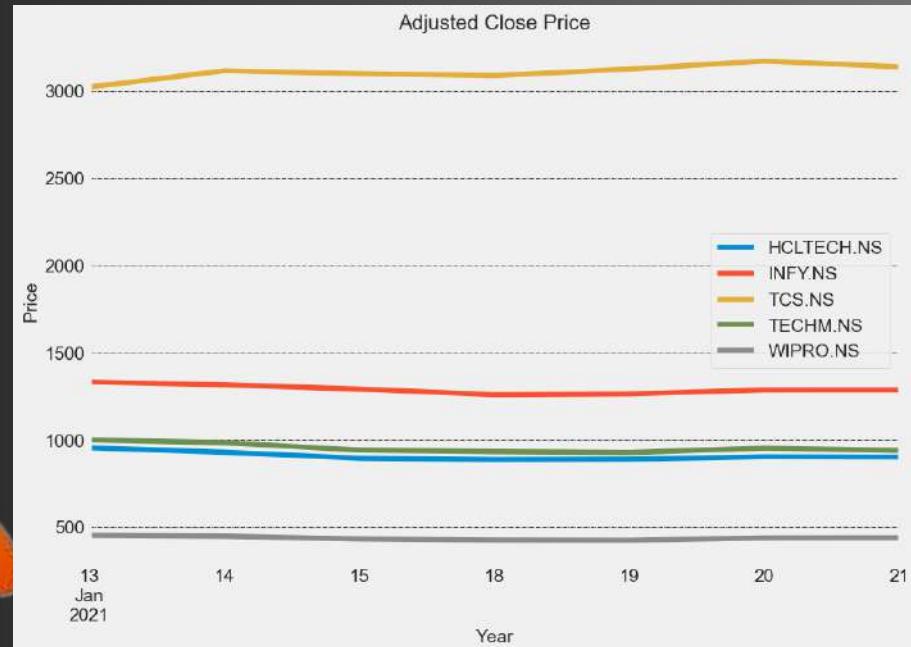


The stocks of TCS has significant change and has slightly increased as the ex dividend date is approached. There is a no significant movement with WIPRO stocks. The TECH MAHINDRA stocks have slightly decreased while approaching the ex dividend date. There is no big change otherwise with other stocks.

It is evident from the Plot the stocks of HCL TECH has relativily Low risk and High return so the company's shares are rewarding. The stocks of INFOSYS has high risk and low return which makes this company's shares less rewarding.

2021 INFORMATION TECHNOLOGY SECTOR

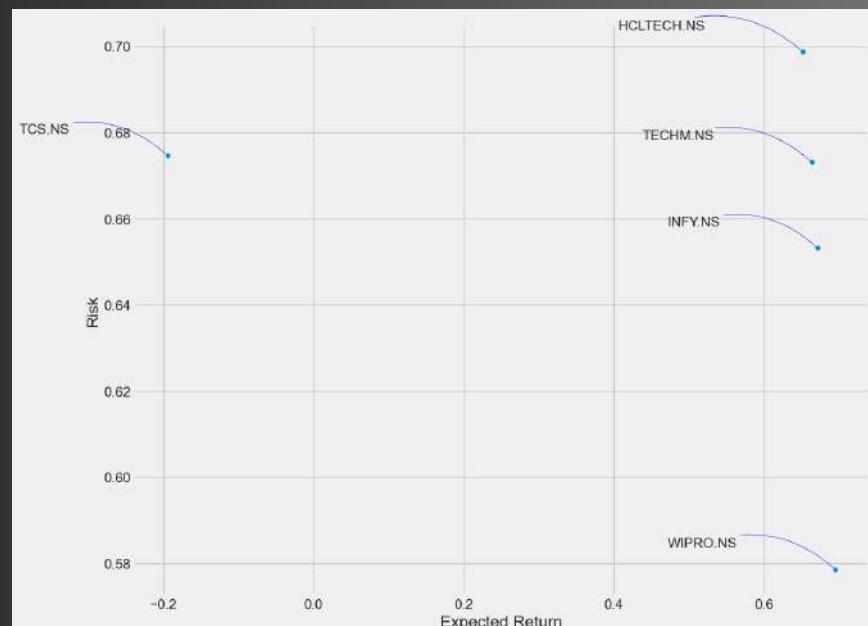
The stocks of TCS has small change and has slightly decreased as the ex dividend date is approached. There is a no significant movement with WIPRO stocks. There is slight drop in all the stocks as they close towards the ex dividend date



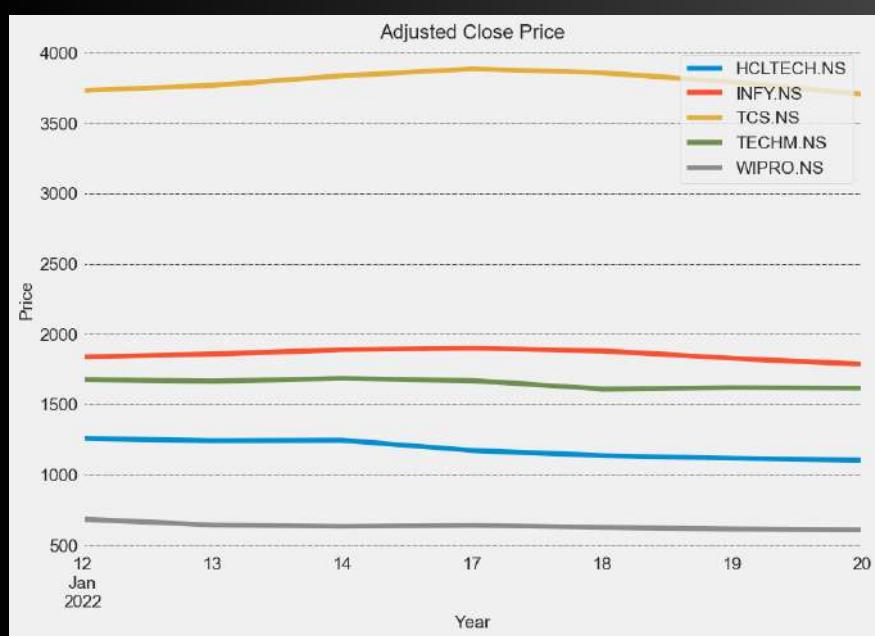
The Heatmap is more greener here also implying that all major of the companies are correlated. The correlation between HCL TECH and TECH MAHINDRA is very good with a correlation value of 0.98. Also with TCS this year it has less correlation values with other companies which is a concern.

The stocks of TCS has high risk and Low return as seen from the plot alongside.

The stocks of WIPRO has low risk and high return. So WIPRO stocks look good here. HCL TECH has high risk and high return.

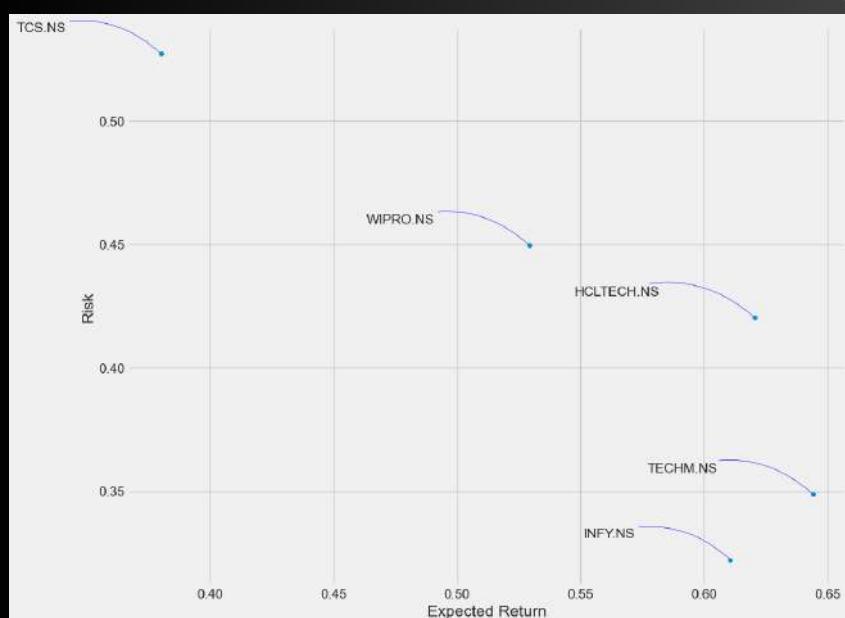


2022 INFORMATION TECHNOLOGY SECTOR



The stocks of TCS has small change and has slightly decreased as the ex dividend date is approached. Same is with INFOSYS and HCL TECH this year. There is a no significant movement with WIPRO stocks. There is slight drop in all the stocks as they close towards the ex dividend date.

The correlation between TECH MAHINDRA and HCL TECH is good with a correlation value of 0.9. Which shows thier good performance. Also WIPRO has 0.8 correlation value with HCL TECH which is also good value of correlation. Therefore all these companies have similar performances.

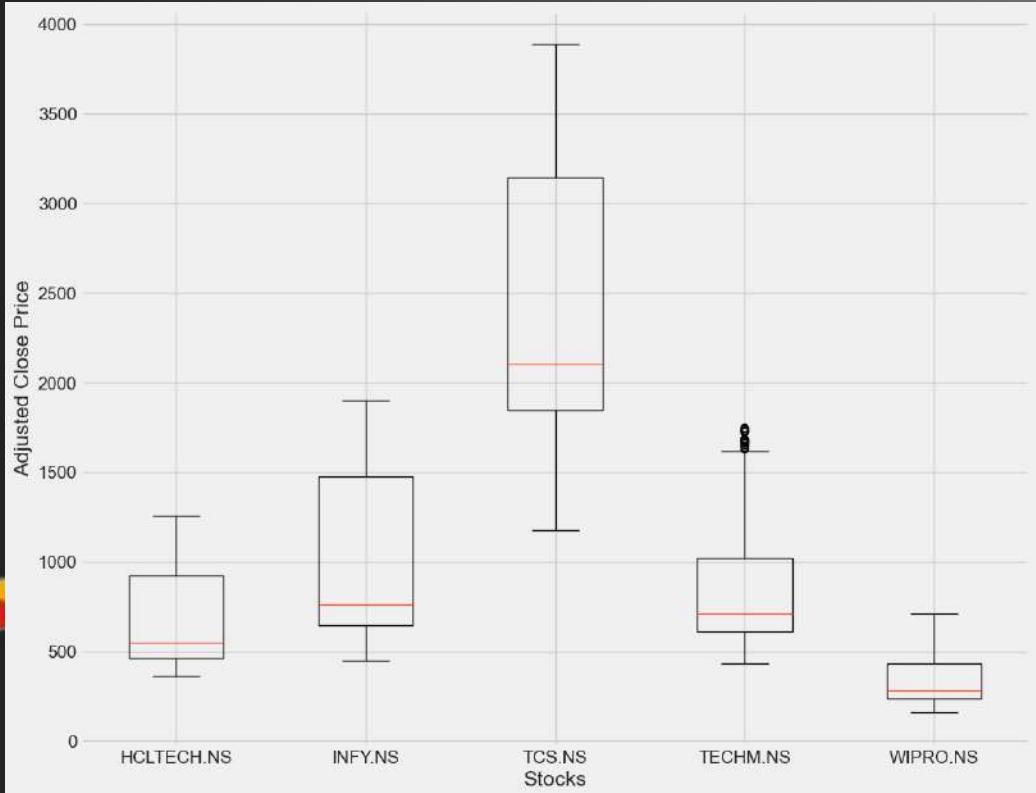


It is evident from the Plot the stocks of INFOSYS has Low risk and High return so the company's shares are rewarding. The stocks of TCS has high risk and low return which makes this company's shares less rewarding.

From the given Box plot of all the companies we can see that the box plot of TCS has long whisker.

Hence the stocks of TCS is more volatile. This is also evident from the line graph. The boxplot of TECH MAHINDRA also has slightly long

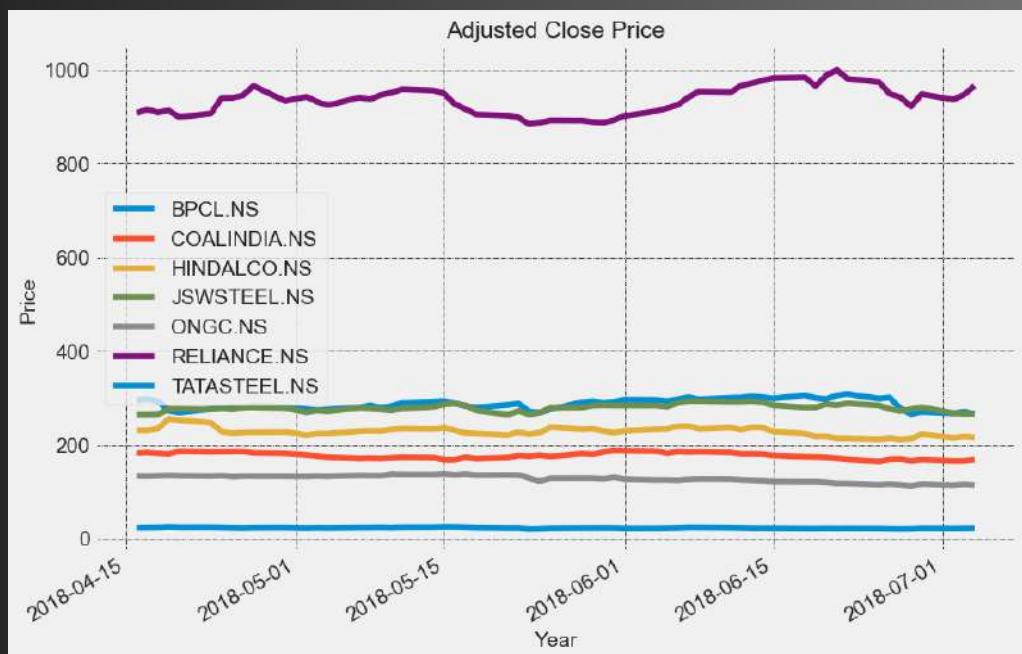
whisker showing its volatility. WIPRO stocks is stable compared to all other stocks as its wishker is smaller when comapred with the whiskers of other banks.



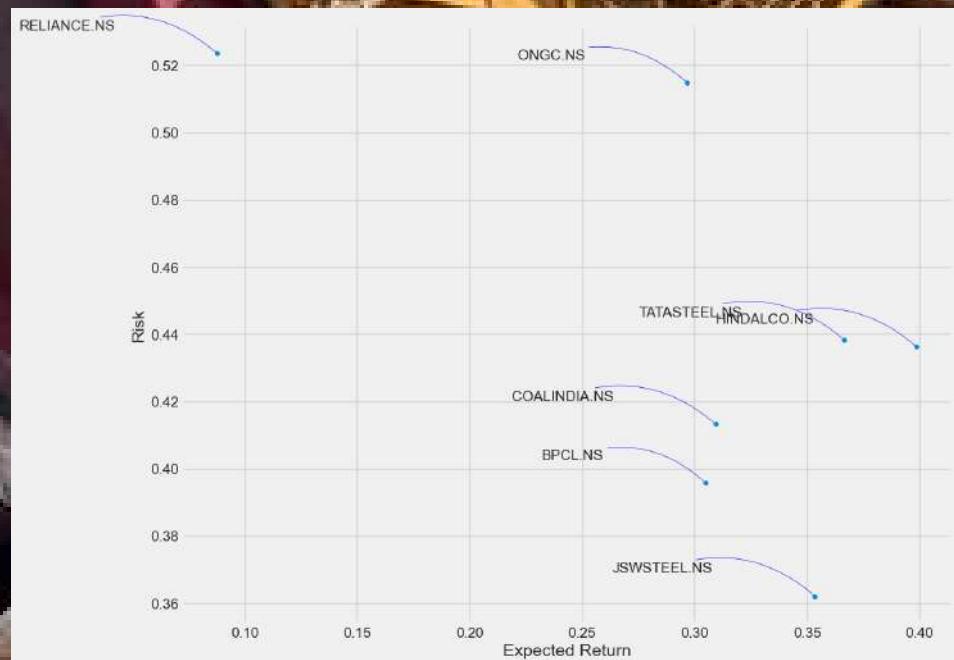
sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return	risk	return	risk	return	risk	return	risk	return		
HCL TECH	medium	high	medium	high	low	high	high	high	medium	high	medium	recommended
INFOSYS	low	high	high	low	high	low	medium	high	low	high	high	recommended
TCS	medium	high	low	high	low	high	high	low	high	low	high	recommended
TACH MAHINDRA	high	high	medium	high	high	low	high	high	low	high	high	not recommended
WIPRO	high	low	high	medium	low	high	low	high	medium	medium	low	recommended

2018 NATURAL RESOURCES SECTOR

From the line chart, it can be seen that there is a very minimal spike in the stocks of TATA STEEL and ONGC. however, the stock of RELIANCE has given a very volatile spike. other stocks have given a very decent roundabout much incline or decline is not observed.



In the heat map we can see that the TATA STEEL and ONGC has correlation value of 0.78 this implies that both the stocks are performing well. whereas COAL INDIA and RELIANCE are not performing well with correlation value(-0.35). JSWSTEEL and BPCL have correlation value of 0.61



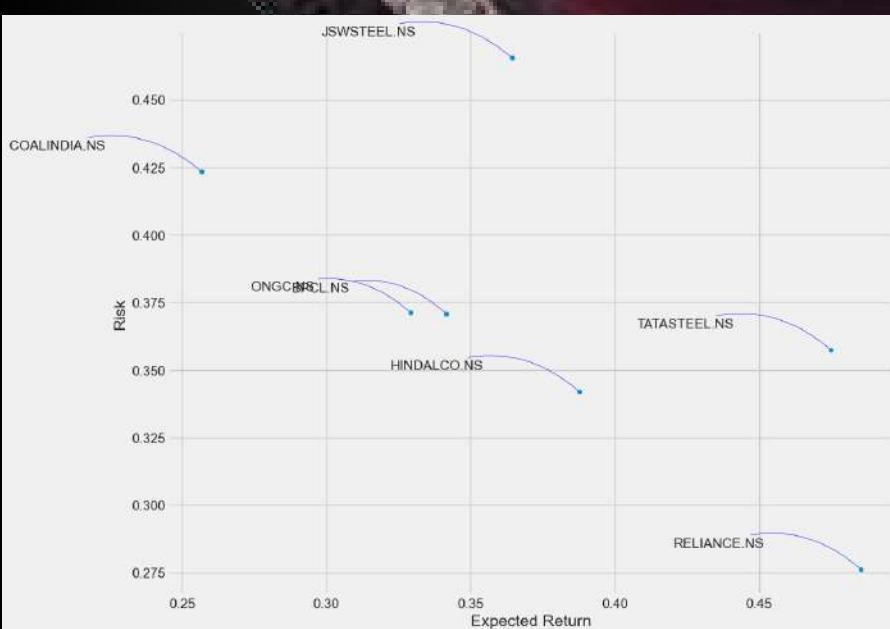
The stock of REALIANCE has high risk and low return factor in referral to the plot. But the stocks of JSWSTEEL has low risk and high return. so JSWSTEEL is a good option to opt for.

2019 NATURAL RESOURCES SECTOR



TATA STEEL in the year of 2019 has minimal performance which has continued from 2018. BPCL AND JSWSTEEL have performed well and RELIANCE has fluctuated and has further declined by the end of the annual report. COAL INDIA and HINDALCO are also very well-performing stocks.

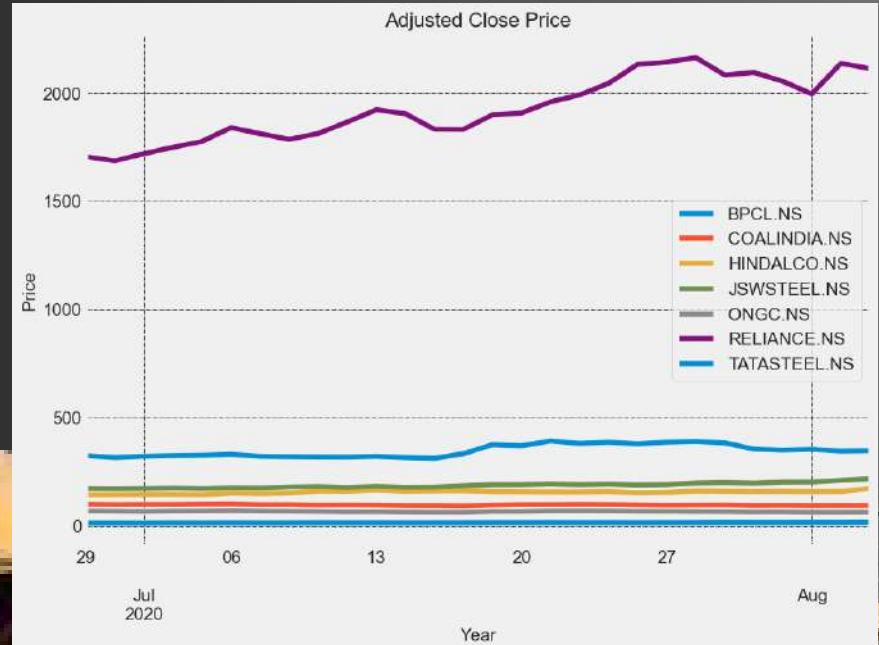
In the heat map, we observe that TATA STEEL and JSWSTEEL have a correlation value of 0.71 which means they have performed well in the. but RELIANCE and COAL INDIA have a low correlation value of 0.22 which implies that the stocks haven't performed well this year. ONGC and BPCL have a correlation value of 0.47 which has shown a better performance than RELIANCE so far



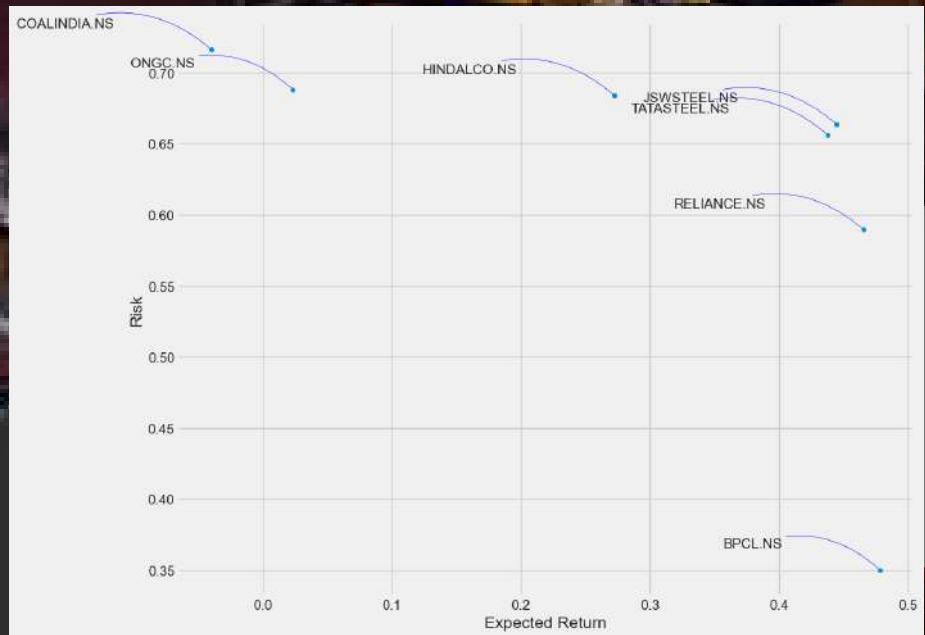
In the scatter plot, we can see that JSWSTEEL have a high-risk and low return rate, but RELIANCE has low risk and high return rate which makes it a good stock option. HINDALCO and TATASTEEL have minimal risk factor along minimal return rate.

2020 NATURAL RESOURCES SECTOR

In the line chart, we can imply that HINDALCO, TATASTEEL, JSWSTEEL, ONGC, and COAL INDIA have given average performance. whereas BPCL has extensively performed better than the other above-mentioned stocks. lastly, RELIANCE stock has performed really well and has given promising adjusted close prices gradually increasing throughout the year.

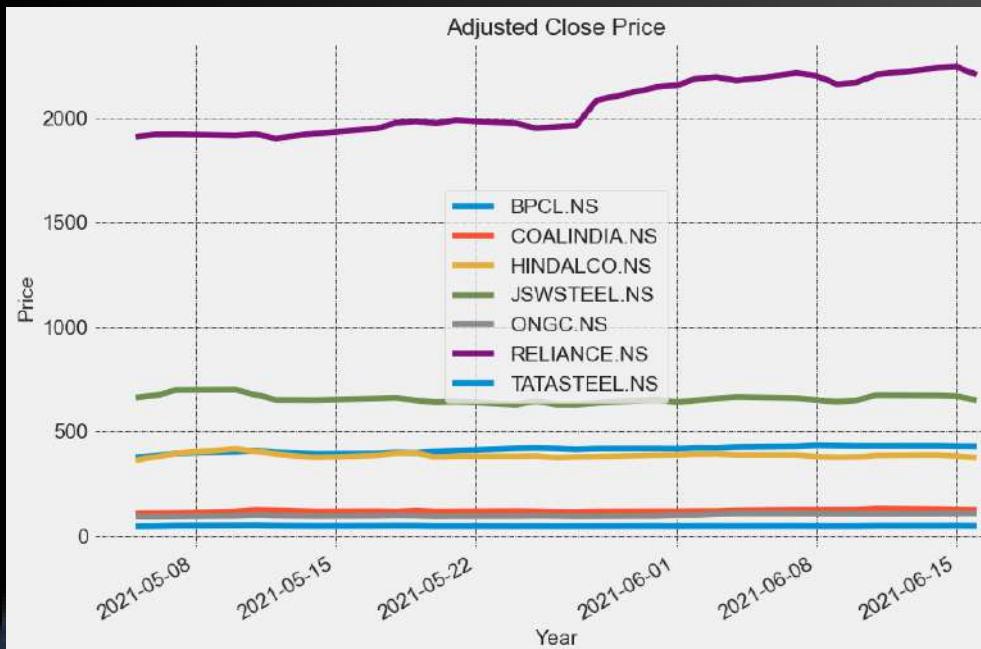


The correlation value between JSWSTEEL and RELIANCE is 0.85 which implies that the stock has performed really well. HINDALCO and TATA STEEL have correlation value of 0.71 tells us that they have performed just as well as JSWSTEEL AND RELIANCE.



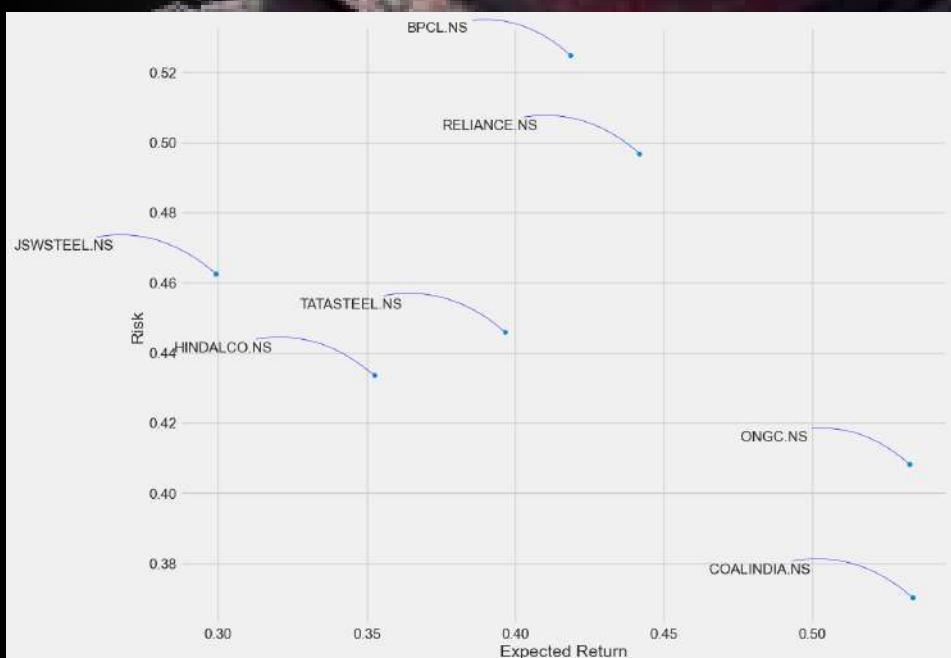
COAL INDIA, ONGC and HINDALCO have high risk and low expected returns, but JSWSTEEL, TATA STEEL, and RELIANCE have high-risk factors and reasonable expected return rates. lastly, BPCL has the most negligible risk factor and more expected return rate.

2021 NATURAL RESOURCES SECTOR



In the line chart, we can see that BPCL, COAL INDIA and HINDALCO have given very low adjusted prices which implies that these stocks have not performed well. Whereas JSWSTEEL has apparently given a reasonable adjusted close price and RELIANCE has gradually increased its adjusted price and has performed really well.

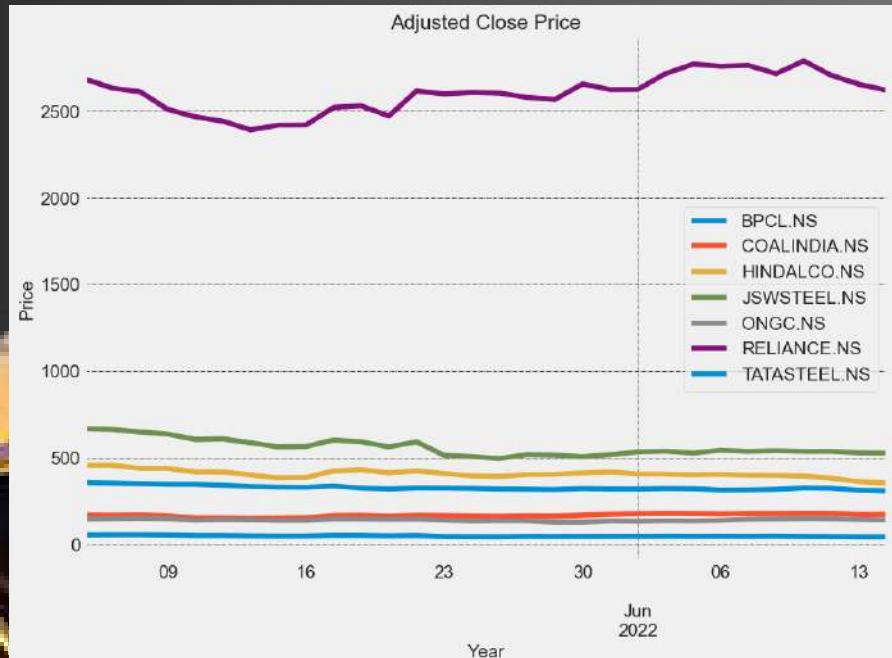
In the heat map, we can see that ONGC and RELIANCE have a correlation value of 0.85 which says that the stock option is really good. Other stocks like ONGC and BPCL have also performed well with a correlation value of 0.75 which is just as good as the previously mentioned stock. TATA STEEL and HINDALCO have also a correlation value of 0.79 which poses a better option than BPCL and ONGC.



In the scatter plot, we can see that BPCL and RELIANCE have high-risk factors and average return rates. whereas JSWSTEEL, HINDALCO and TATASTEEL have average risk factors and the expected return is also minimal. lastly, COAL INDIA and ONGC have very low-risk factors and high expected return rates.

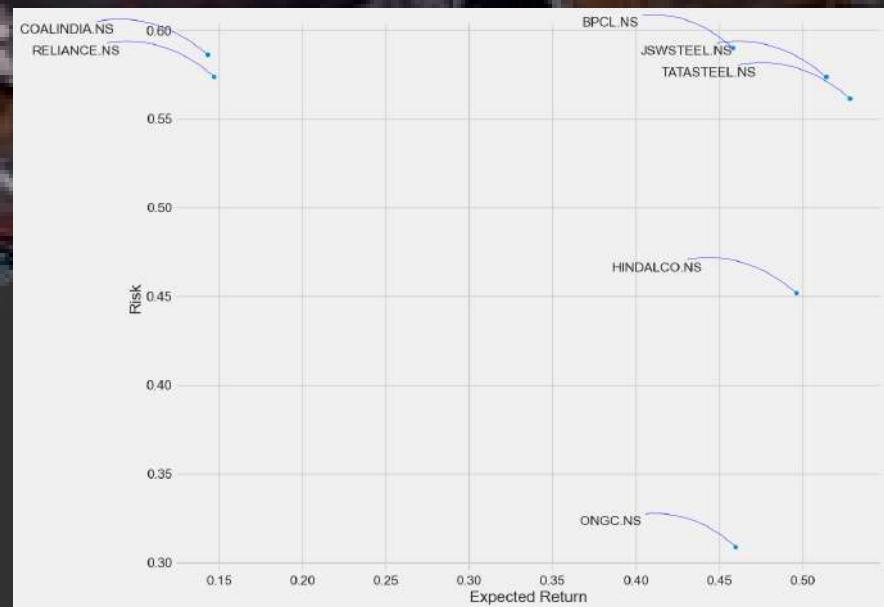
2022 NATURAL RESOURCES SECTOR

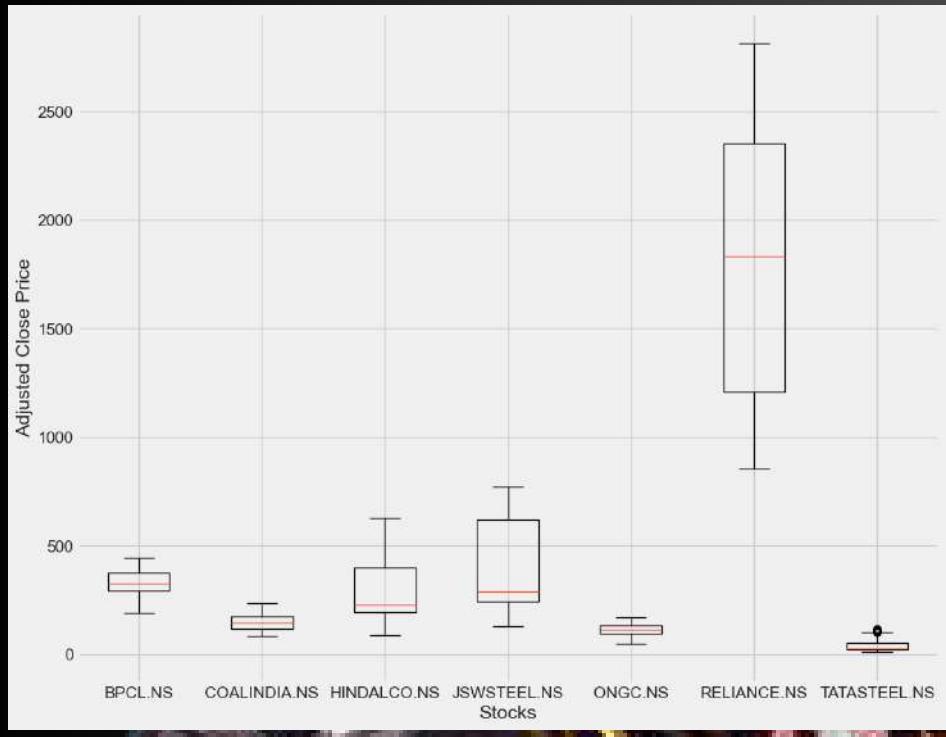
In the line chart we can see that BPCL, COAL INDIA and HINDALCO have given very low adjusted price which implies that these stocks have not performed well. Whereas JSWSTEEL have apparently given reasonable adjusted close price and RELIANCE have gradually increased its adjusted price and have performed really well.



In the heat map, we can see that HINDALCO and TATA STEEL have a correlation value of 0.85 which says that the stock option is really good. Other stocks like ONGC and BPCL have performed poorly with a correlation value of 0.44. TATA STEEL and BPCL have also a correlation value of 0.86 which poses as a better option than BPCL and ONGC and HINDALCO and TATA STEEL.

In the scatter plot, we can see that BPCL, COAL INDIA, and RELIANCE have high-risk factors and very low return rates whereas JSWSTEEL, TATA STEEL and BPCL have high-risk factors and high return rates. HINDALCO have average risk factors and the expected return is also minimal. lastly, ONGS have very low-risk factors and high expected return rates.

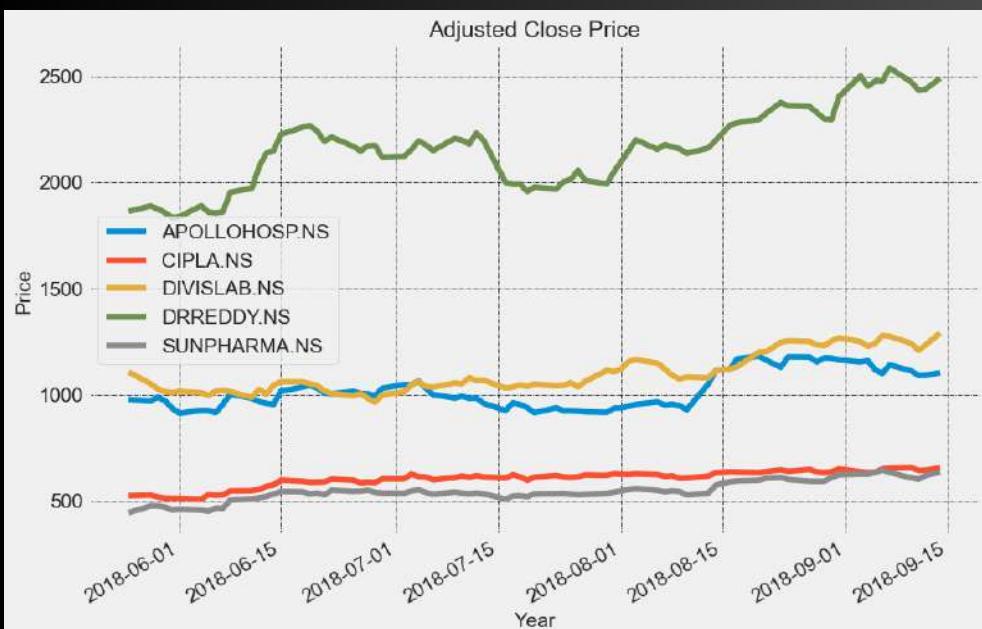




In the box plot, we can see that TATA STEEL, ONGC have very less whisker and is more stable. But stocks like RELIANCE, HINDALCO, and JSWSTEEL have long whiskers which implies that the stocks are volatile. lastly, BPCL and COAL INDIA have low whiskers and are symmetrical and are more stable like TATA STEEL and ONGC.

sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return										
BPCL	low	high	medium	medium	low	high	high	medium	high	high	low	recommended
ONGC	high	medium	medium	medium	high	low	low	high	low	high	low	recommended
Reliance	high	low	low	high	medium	high	high	medium	high	low	high	not recommended
Coal India	medium	high	high	low	high	low	low	high	high	low	low	recommended
Hindalco	medium	high	medium	medium	high	medium	medium	low	medium	high	medium	not recommended
JSW Steel	low	high	high	medium	high	high	medium	low	high	high	medium	not recommended
Tata Steel	medium	high	medium	high	high	high	medium	medium	high	high	low	recommended

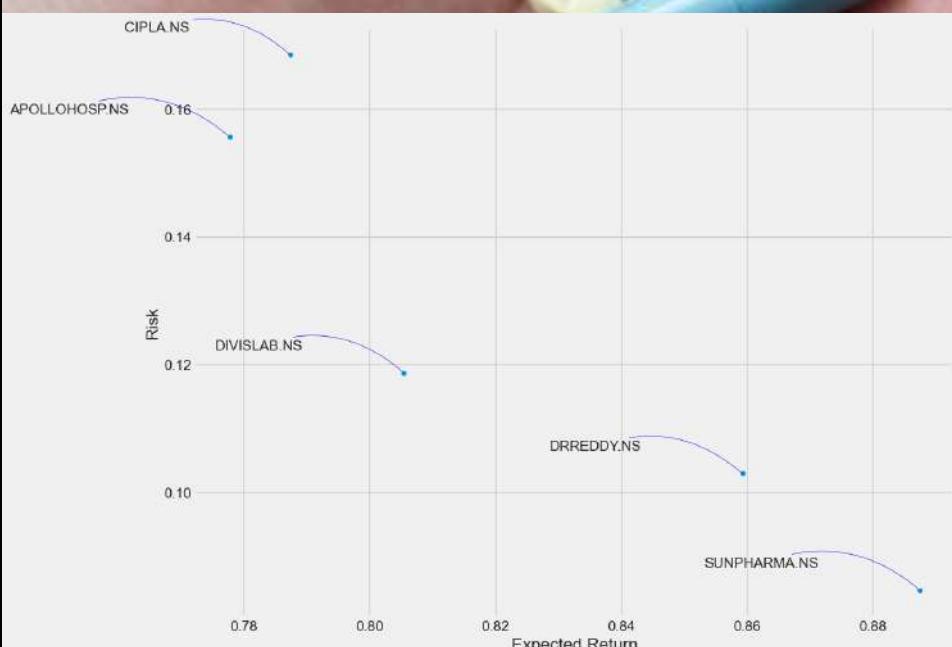
2018 DIVIDEND DATA OF HEALTH & PHARMASUTICALS



In the line chart, we can observe that APOLLOHOSP has gradually increased their performance in giving the best adjusted close price. whereas CIPLA and SUNPHARMA haven't performed that much well in giving a decent adjusted price, DIVILAB and DRREDDY have given a decent adjusted close price.



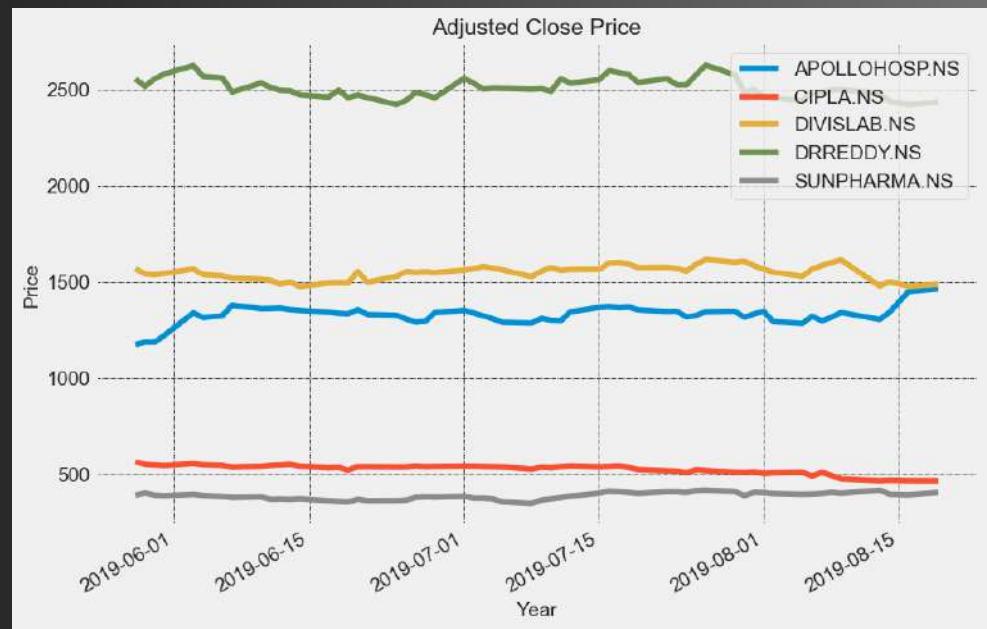
DRREDDY and SUNPHARMA have a correlation value of 0.94 which tells that the stocks have performed well, SUNPHARMA and CIPLA have a correlation value of 0.89 which is just as good as the previous mentioned stocks.



CIPLA and APOLLOHOSP according to the scatter plot have more risk factor and very low return rate. DIVISLAB and DRREDDY have average and minimal risk along with very low and reasonable return rate respectively.

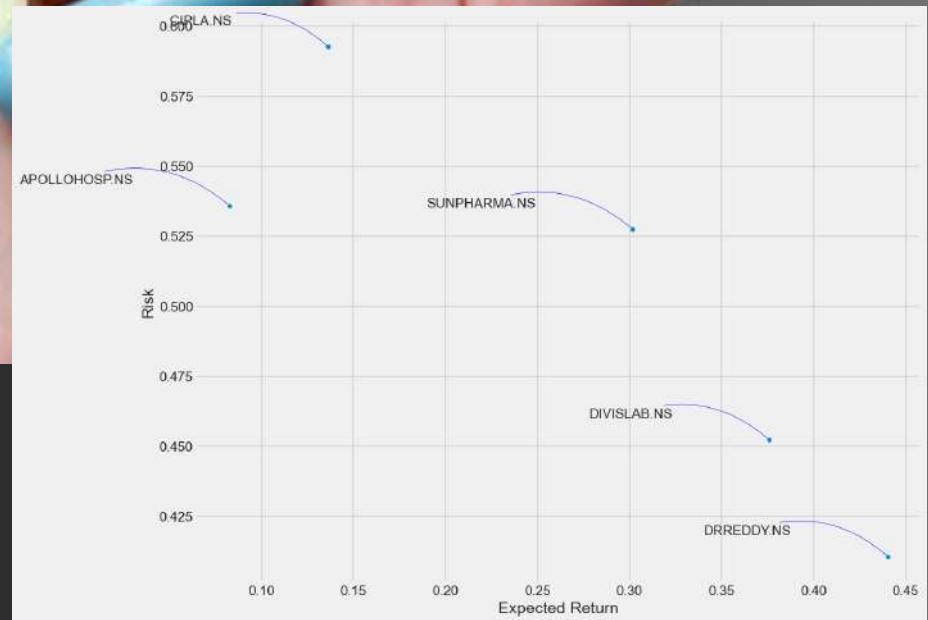
2019 DIVIDEND DATA OF HEALTH & PHARMASUTICALS

In the line chart, we can observe that APOLLOHOSP has gradually increased their performance in giving the best adjusted close price. whereas CIPLA and SUNPHARMA haven't performed that much well in giving a decent adjusted price, DIVILAB and DRREDDY have given a decent adjusted close price.



DRREDDY and DIVISLAB have a correlation value of 0.53 which tells that the stocks have performed well, DRREDDY and CIPLA have a correlation value of 0.42 which is just as good as the previously mentioned stocks.

CIPLA and APOLLOHOSP according to the scatter plot have more risk factors and very low return rates. APOLLOHOSP and SUNPHARMA have average and minimal risk along with very low and reasonable return rates respectively. DIVISLAB and DRREDDY have a very low-risk factor and a very high return rate.

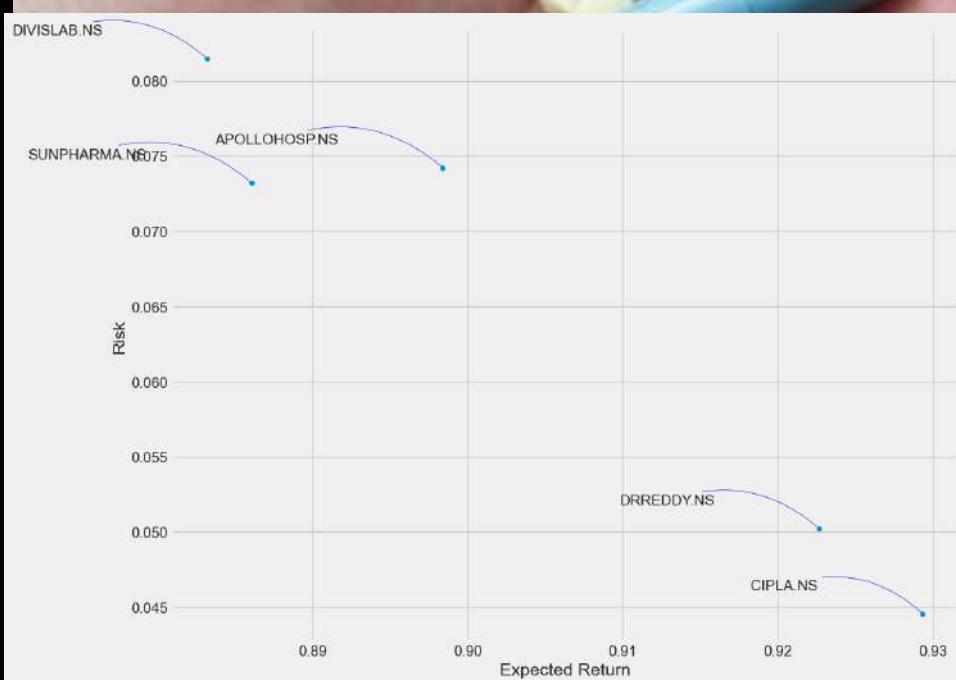


2020 DIVIDEND DATA OF HEALTH & PHARMASUTICALS



In the line chart, we can observe that APOLLOHOSP has gradually increased their performance in giving the best adjusted close price. whereas CIPLA and SUNPHARMA haven't performed that well in giving a decent adjusted price, DIVILAB and DRREDDY have given promising adjusted close prices.

DRREDDY and APOLLOHOSP have a correlation value of 0.92 which tells that the stocks have performed well, DRREDDY and SUNPHARMA have a correlation value of 0.9 which is just a decent score than the previously mentioned stocks.



In the scatter plot DIVISLAB, SUNPHARMA AND APOLLOHOSP have more risk factors and very low return rates. CIPLA and DRREDDY have a very low-risk factor and a very high return rate.

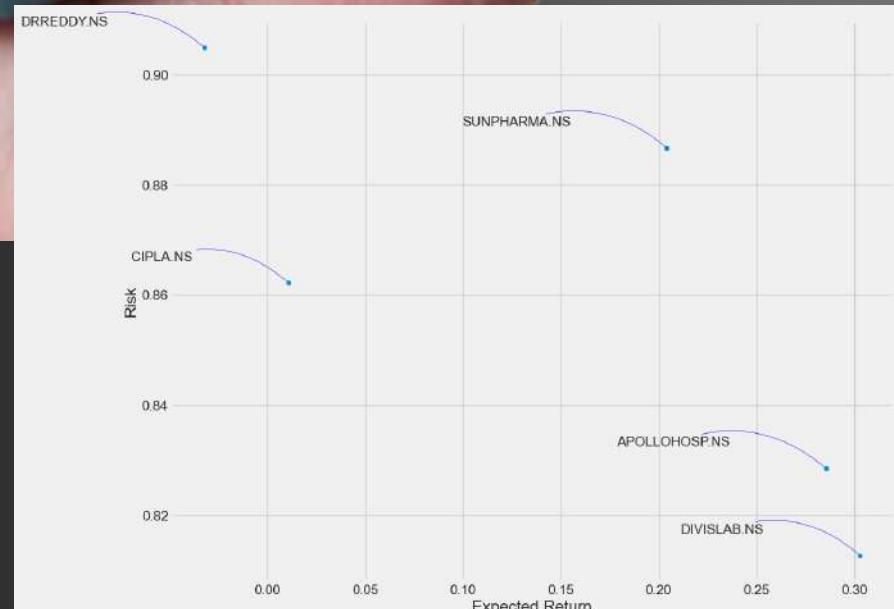
2021 DIVIDEND DATA OF HEALTH & PHARMASUTICALS

In the line chart, we can observe that APOLLOHOSP, DIVISLAB and DRREDDY have performed extensively well, DRREDDY had a slight decline, but the other two stocks have performed really well in giving the best adjusted close price. whereas CIPLA and SUNPHARMA haven't performed that well in giving a decent adjusted price.



In the heat map we can see that DIVISLAB and SUNPHARMA have correlation value of 0.78 which says that the stocks have performed really well. Whereas CIPLA and SUNPHARMA have correlation value of -0.68 which says that the stocks haven't performed well. lastly CIPLA and DRREDDY have performed really well with a correlation value of 0.91.

DRREDDY and SUNPHARMA both the stocks have high risk factor and low expected return, but SUNPHARMA has a better chance of expected return. CIPLA also has quite the risk factor and very poor return rate. Stocks such as APOLLOHOSP and DIVISLAB have very low risk factor but have promising return rate.

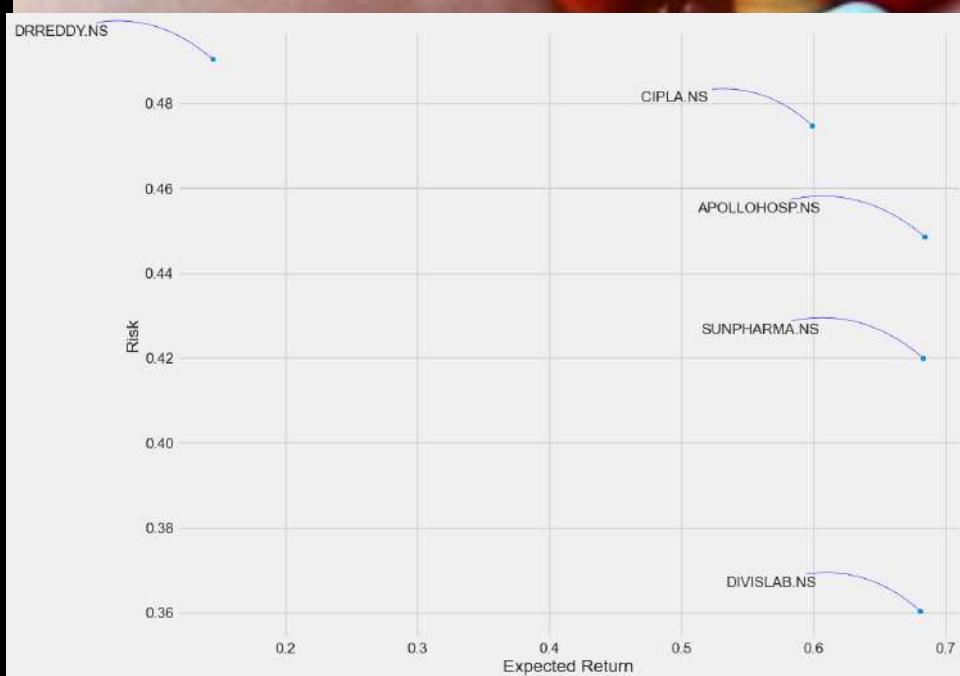
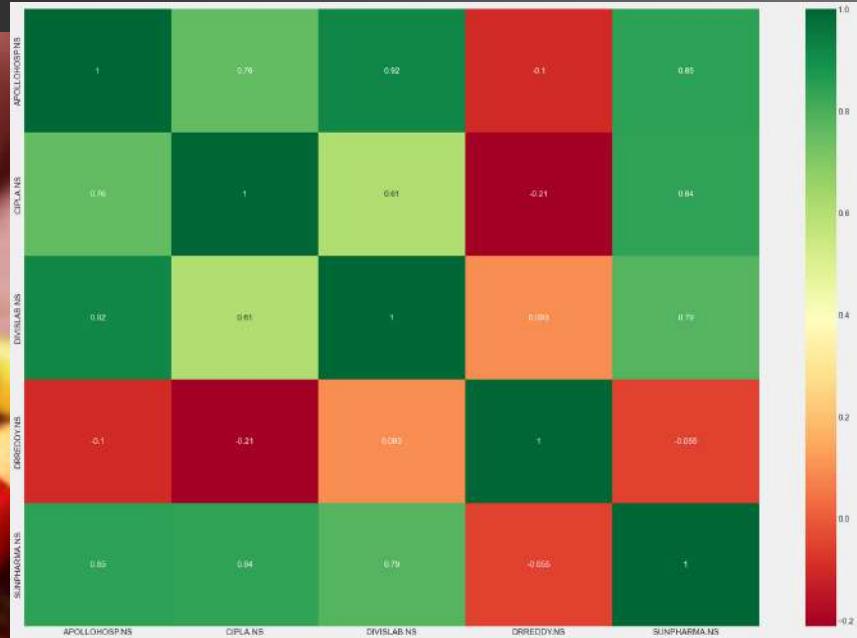


2022 DIVIDEND DATA OF HEALTH & PHARMASUTICALS



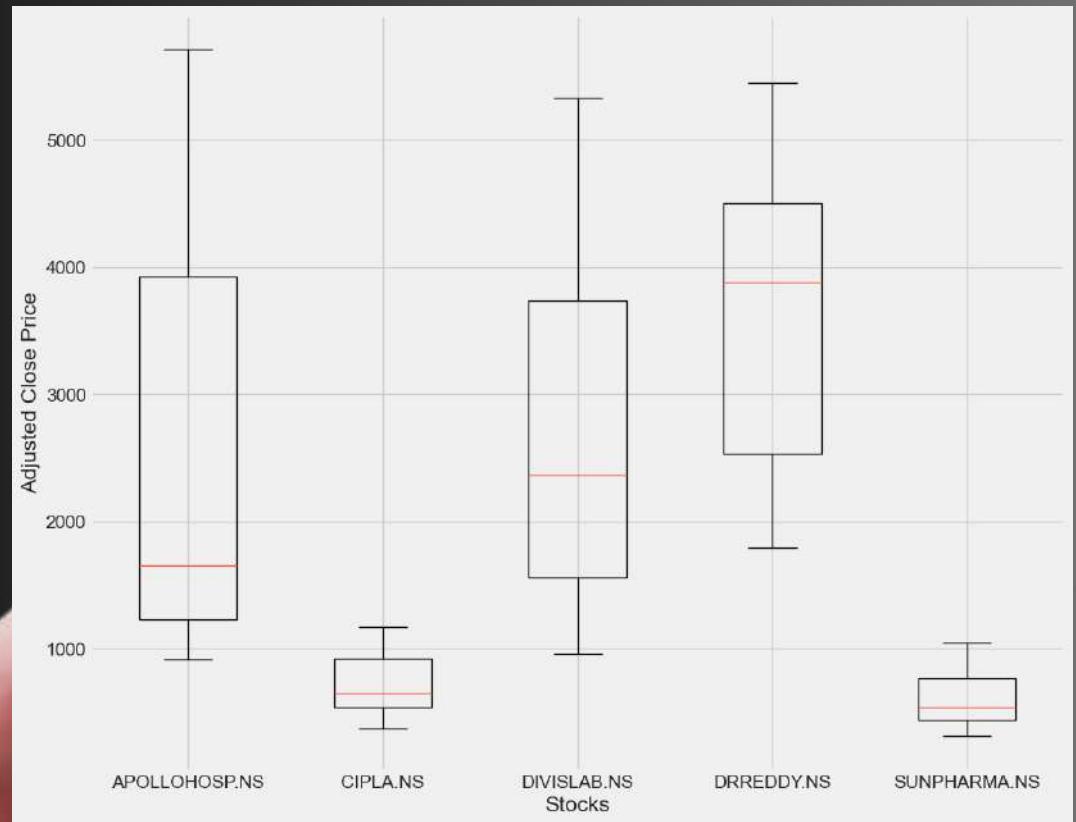
In the line chart, we can observe that APOLLOHOSP, DIVISLAB and DRREDDY have performed extensively well, DRREDDY had a slight decline, but the other two stocks have performed really well in giving the best adjusted close price. whereas CIPLA and SUNPHARMA haven't performed that well in giving a decent adjusted price.

SUNPHARMA and APOLLOHOSP have a correlation value of 0.85, this stock is stable and has performed really well. DIVISLAB and APOLLOHOSP also have a correlation value of 0.92 which tells us that these two stocks have performed better than the previously mentioned stocks. CIPLA and DRREDDY have a correlation value of 0.21, which means that the stocks have performed poorly.



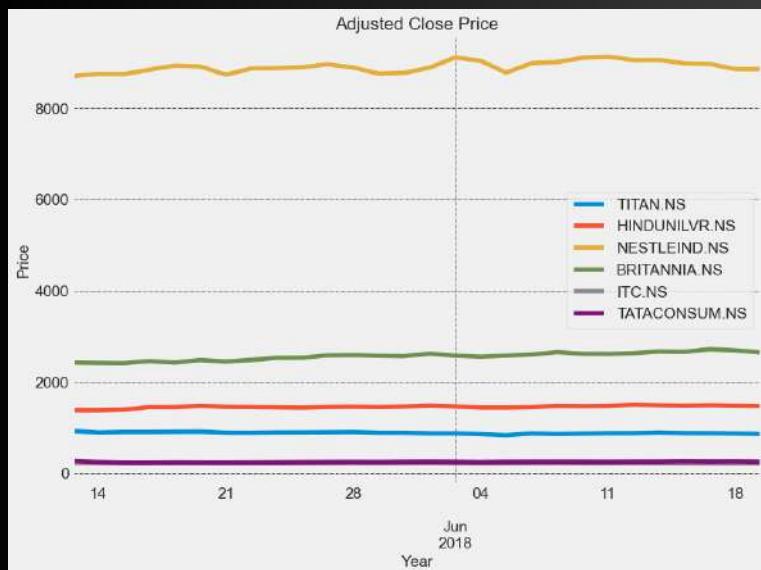
In the scatter plot we can see that DRREDDY has high risk factor and very low return rate. CIPLA has high risk factor along with high return rate as well. APOLLOHOSP and SUNPHARMA almost have the same risk factor and same return rate. lastly DIVISLAB have low risk factor but high return rate.

As we can see from this box plot APOLLOHOSP has a very long whisker which means that the stocks is volatile. Same goes for DIVISLAB & DRREDDY both have the same long whisker which means the same both stocks are volatile. lastly CIPLA and SUNPHARMA both the stocks have very small whiskers and they are symmetrical which means that the stocks are stable.



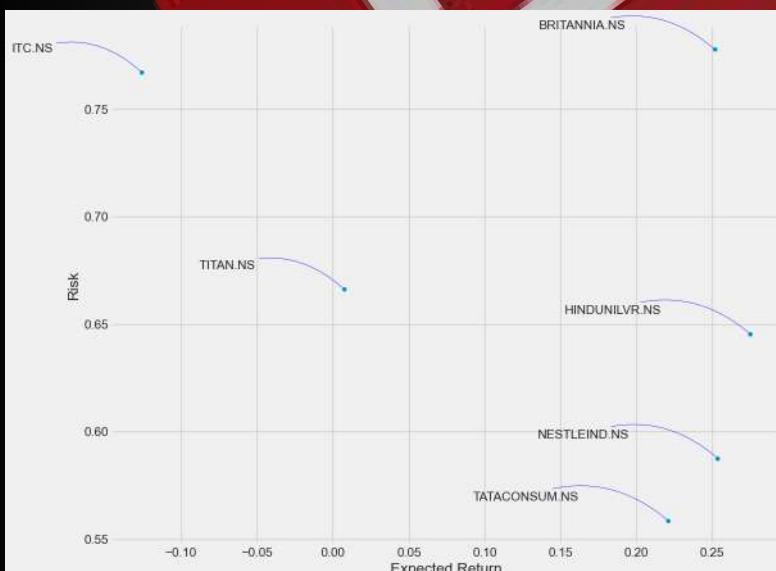
sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return	risk	return	risk	return	risk	return	risk	return		
Apollo Hospital	high	low	medium	low	high	medium	low	high	high	high	high	not recommended
Cipla	high	low	high	low	low	high	medium	low	high	high	low	not recommended
Divis Labs	medium	low	low	high	high	low	low	high	low	high	high	not recommended
Dr Reddys Labs	low	high	low	high	low	high	high	low	high	low	high	recommended
Sun Pharma	low	high	medium	high	high	tow	high	medium	medium	high	low	recommended

2018 DIVIDEND DATA OF CONSUMER GOODS SECTOR



In the line chart, we can observe that the NESTLEIND has performed really well and has given an excellent adjusted close price. Other stocks BRITANNIA, TATACONSUM, and HINDUUNILVR have performed gradually and have given reasonable adjusted prices throughout the year. whereas TATACONSUM have given a very poor adjusted close price and there hasn't been any improvement throughout the year.

HINDUUNILVR and BRITANNIA have a correlation value of 0.77 both the stocks have performed well. TITAN and ITC have a correlation value of 0.69 which is as good as the previous stocks. NESTLEIND and BRITANNIA have a correlation value of 0.56 but it is not as good as the previous mentioned stocks.



From the box plot, we can see that ITC and BRITANNIA both have high-risk factors but ITC has a very poor return rate and BRITANNIA has a reasonable return rate. TITAN has quite a risk factor lesser than ITC, but the return rate is the same as ITC. HINDUUNILVR have fewer risk factor and a very high return rate. NESTLEIND and TATACONSUM have less risk factor and very high return rate.

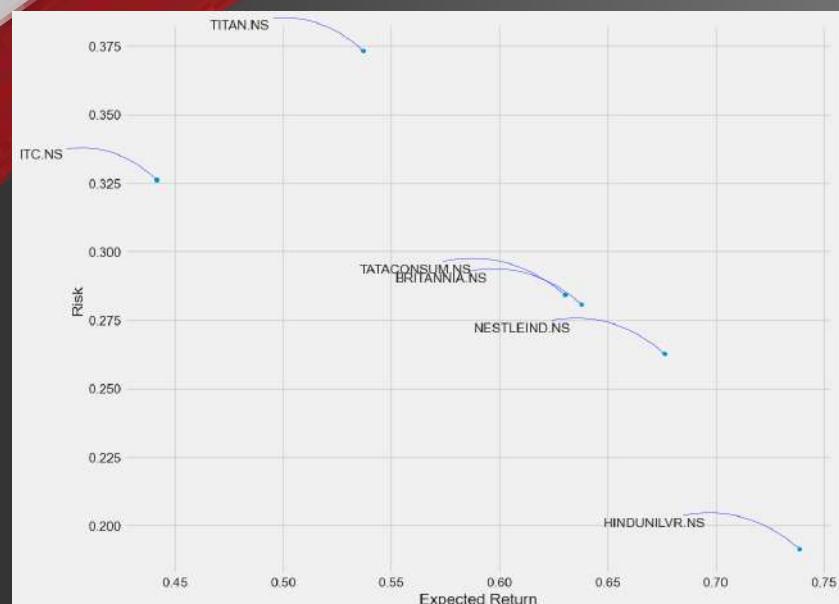
2019 DIVIDEND DATA OF CONSUMER GOODS SECTOR

In the line chart, we can observe that the NESTLEIND has performed really well and has given an excellent adjusted close price. Other stocks BRITANIA, TATACONSUM, and HINDUUNILVR have performed gradually and have given reasonable adjusted prices throughout the year. whereas TATACONSUM have given a very poor adjusted close price and there hasn't been any improvement throughout the year.



In the heat map, we can see that NESTLEIND and BRITANNIA have a correlation value of 0.89 which implies that they are high-performing stocks. TATACONSUM and HINDUUNILVR also have a correlation value of 0.75 which is as good as the previously mentioned stocks. TATACONSUM and TITAN both also have a correlation value of 0.86 which is better than HINDUUNIL. ITC AND NESTLEIND have a correlation value of 0.52 which is an average score for a stock.

In the scatter plot we can see that TITAN has high risk factor and very poor return rate. ITC Also has high risk factor but its return rate is more low than TITAN. TATACONSUM, BRITANNIA both the stocks have quite the risk factor but the return rate is average. NESTLEIND has risk factor which is quite reasonable but the return rate is average. HINDUUNILVR has very low risk factor but very high return rate.



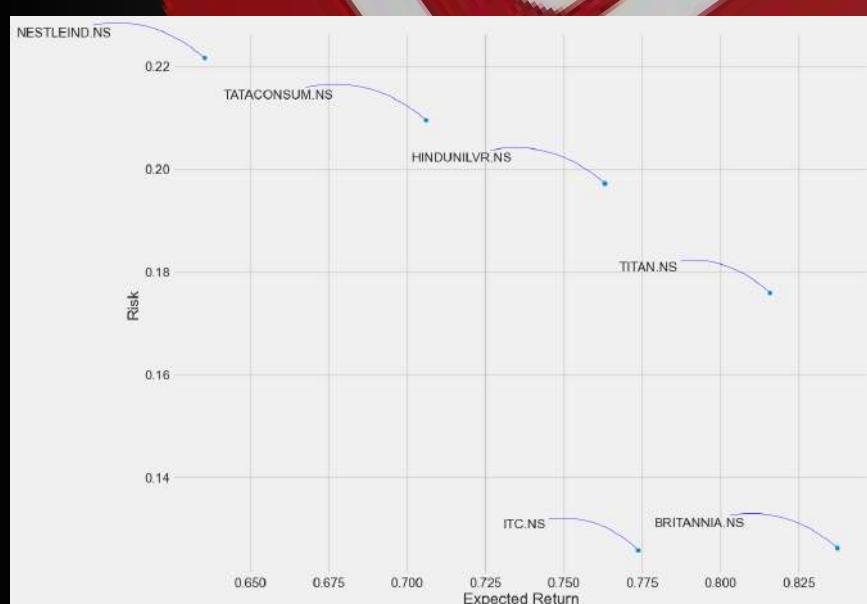
2020 DIVIDEND DATA OF CONSUMER GOODS SECTOR



In the line chart, we can observe that the NESTLEIND has performed really well and has given an excellent adjusted close price. Other stocks BRITANIA, TATACONSUM, and HINDUUNILVR have performed gradually and have given reasonable adjusted prices throughout the year. whereas TATACONSUM have given a very poor adjusted close price and there hasn't been any improvement throughout the year.



In the heat map we can see that BRITANNIA and TITAN have a correlation value of 0.93, both are stocks are performing really well. ITC and TATACONSUM have a correlation value of 0.76 which just as good as BRITANNIA and TITAN. HINDUNILVR and TATACONSUM have a correlation value of 0.62 which is just as reasonable as ITC and TATACONSUM.



NESTLEIND has a high-risk factor and a very poor return rate. TATACONSUM and HINDUNILVR also have a very high-risk factor and a very poor return rate. Also, TITAN has quite a risk factor and a reasonable return rate. ITC and BRITANNIA both have very low-risk factors but have a very high return rate.

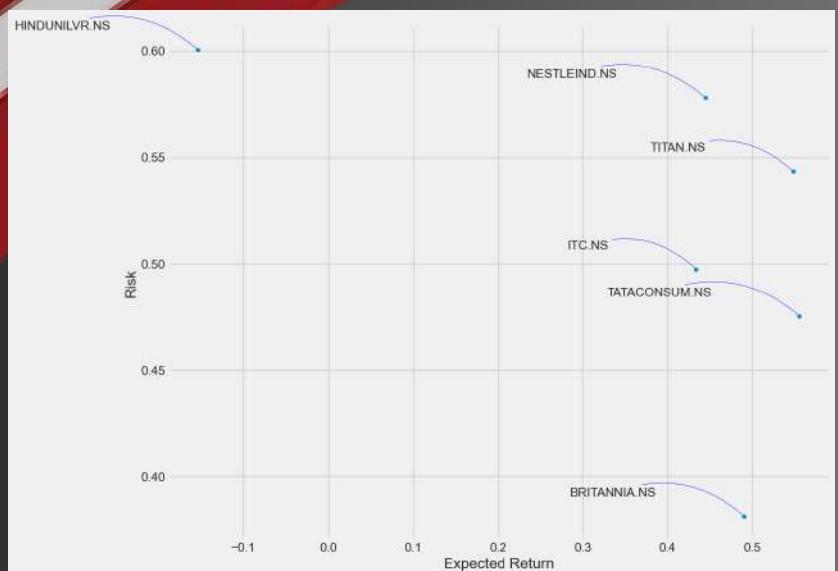
2021 DIVIDEND DATA OF CONSUMER GOODS SECTOR

In the line chart, we can observe that the NESTLEIND has performed really well and has given an excellent adjusted close price. Other stocks BRITANIA, TATACONSUM, and HINDUUNILVR have performed gradually and have given reasonable adjusted prices throughout the year. whereas TATACONSUM have given a very poor adjusted close price and there hasn't been any improvement throughout the year.

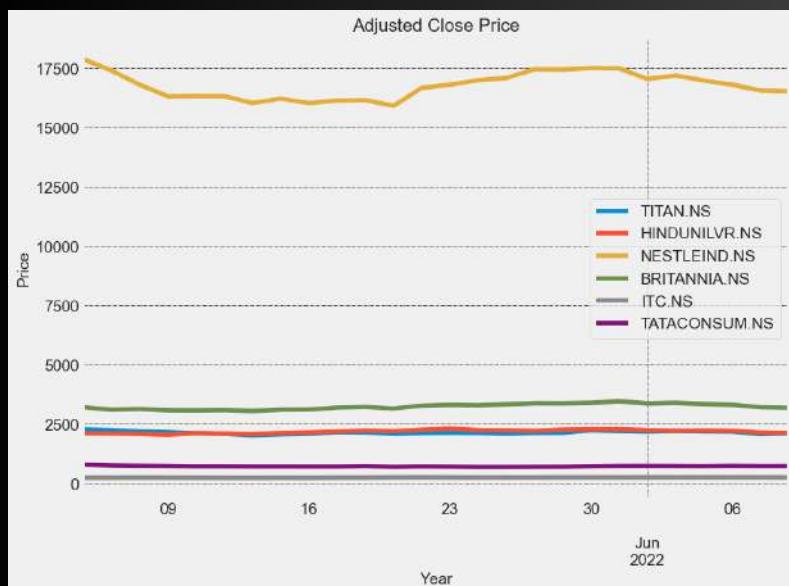


In the heat map, we can observe that BRITANNIA and TATACONSUM both have a correlation value of 0.81 which means both stocks are well-performing stocks. ITC and NESTLEIND have a correlation value of 0.74 which is as good as TATACONSUM and BRITANNIA. TITAN and NESTLEIND have a correlation value of 0.77 which is apparently better than ITC and NESTLEIND.

In the scatter plot, HINDUNILVR has a very high-risk factor and a very poor return rate. NESTLEIND, TITAN, ITC and TATACONSUM have some risk factors and promising return rates. whereas BRITANNIA has a very less risk factors and an outstanding return rate.

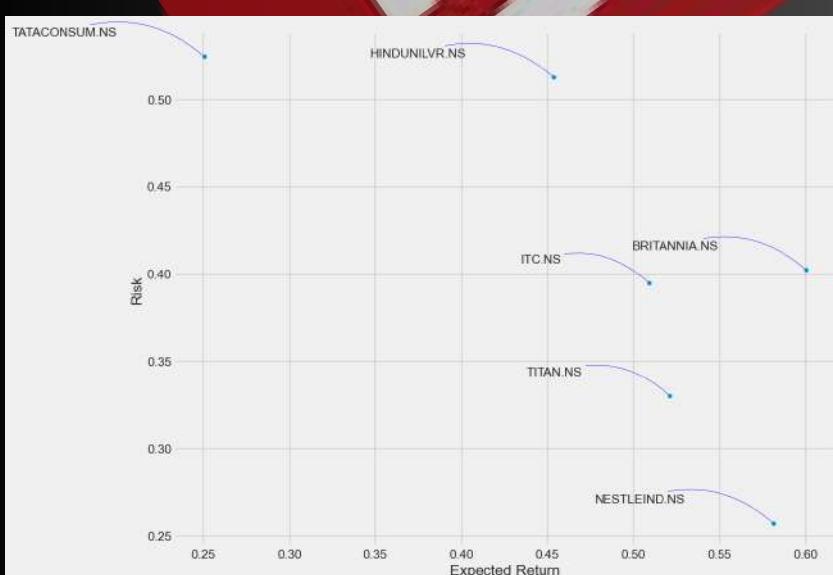


2022 DIVIDEND DATA OF CONSUMER GOODS SECTOR



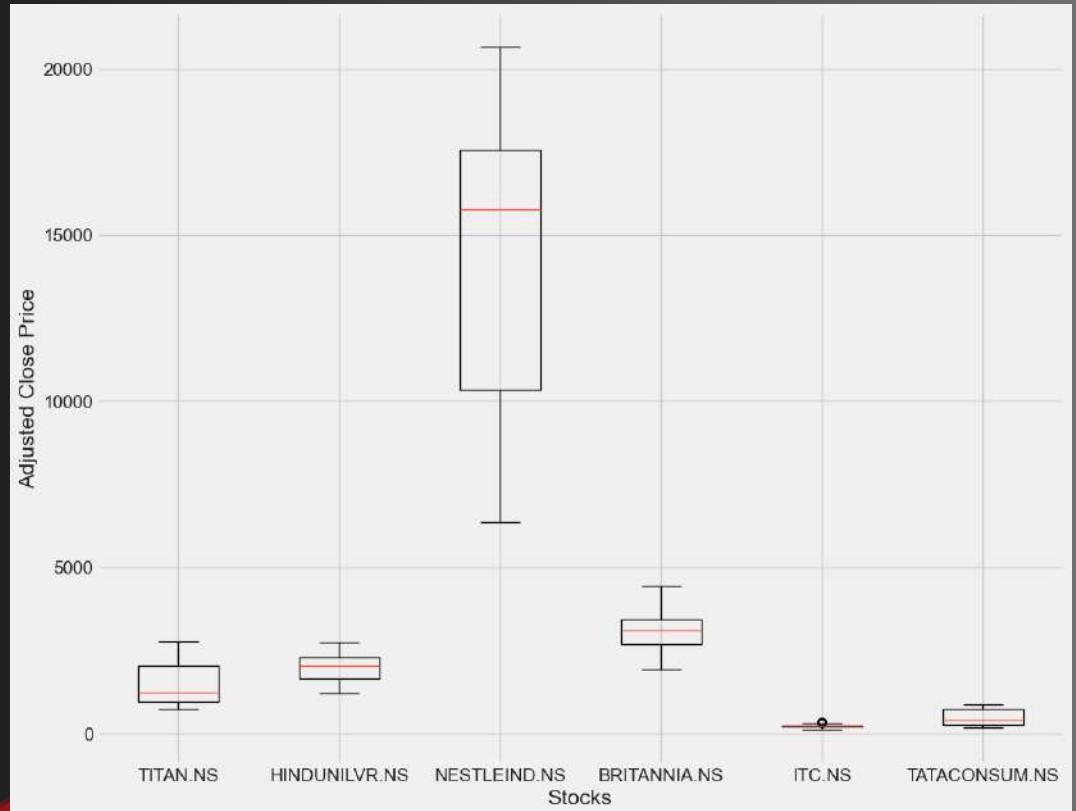
In the line chart, we can observe that the NESTLEIND has performed really well and has given an excellent adjusted close price. Other stocks BRITANIA, TATACONSUM, and HINDUNILVR have performed gradually and have given reasonable adjusted prices throughout the year. whereas TATACONSUM have given a very poor adjusted close price and there hasn't been any improvement throughout the year.

As we can see in the heat map that, stocks like BRITANNIA and HINDUNILVR have a correlation value of 0.86 which means that the stock has performed well. ITC and BRITANNIA have a correlation value of 0.79 which is as good as the previous stocks. TITAN and NESTLEIND have a correlation value of 0.69.



In the scatter plot the stock TATACONSUM has high risk factor and very poor expected return rate. HINDUNILVR also has the same risk factor but slightly better expected return rate than TATACONSUM. ITC and BRITANNIA both have the same risk factor and average expected return rate. NESTLEIND has the lowest risk factor and very high expected return rate.

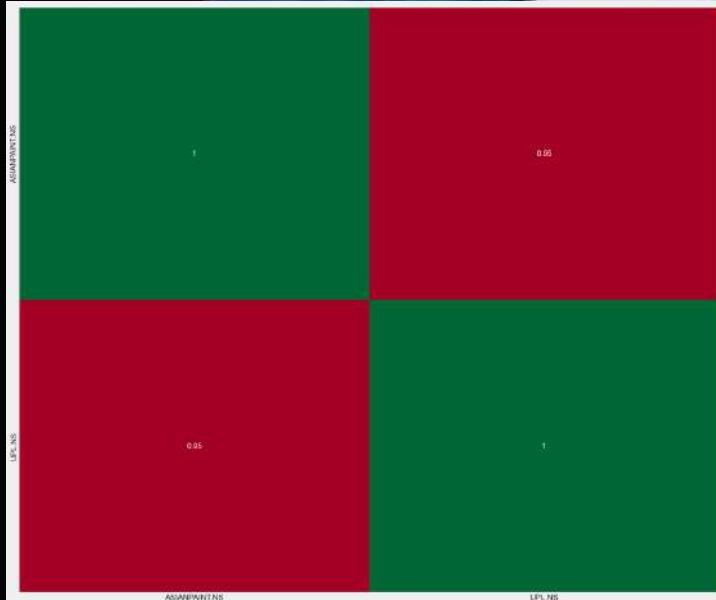
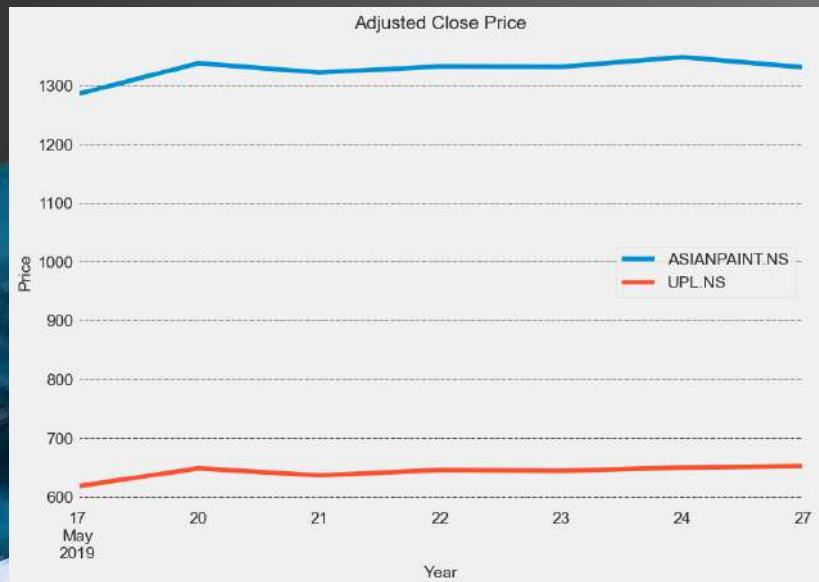
NESTLEIND has the longest whisker which means that the stock is volatile. TITAN and HINDUNILVR both have small whisker and are slightly symmetrical and stable. BRITANNIA stock has short whisker and symmetrical and stable. ITC and TATACONSUM have very short whisker and they are more stable.



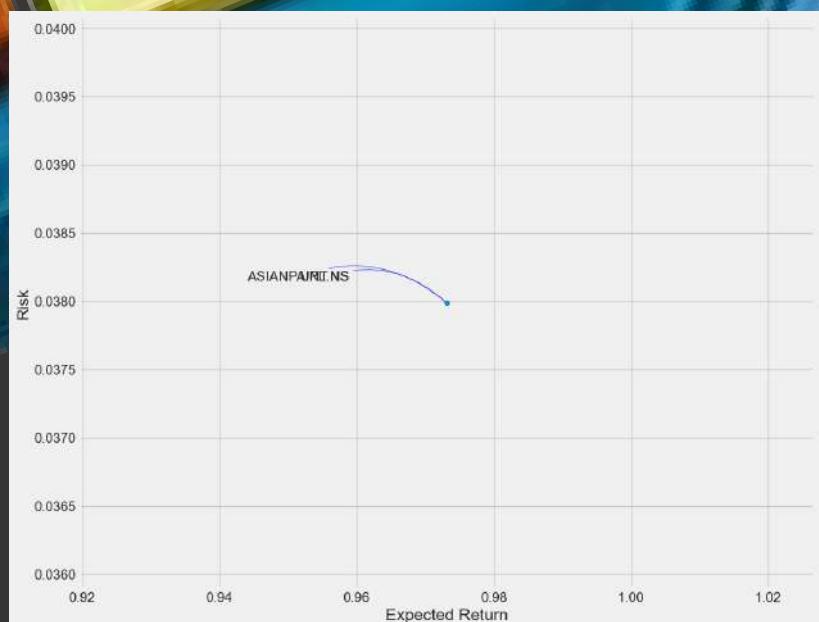
sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return										
Titan Company	medium	medium	high	medium	medium	high	high	high	medium	high	low	recommended
HUL	medium	high	low	high	high	medium	high	low	high	medium	low	recommended
Nestle	low	high	medium	high	high	low	high	high	low	high	high	recommended
Britannia	high	high	medium	high	low	high	low	high	medium	high	medium	recommended
ITC	high	low	high	low	low	high	medium	high	medium	high	low	recommended
TATA Consumer Product	low	high	medium	high	high	medium	medium	high	high	low	low	not recommended

2019 CHEMICAL SECTOR

From the line chart we can see that ASIANPAINTS has apparently performed really well in the year 2019. It has maintained a stable streak but there is a slight decline in the later. whereas UPL has also performed reasonably well and have maintained a streak.



There is no correlation between the stocks, either of the companies goes higher or lower it doesn't affect the other stocks



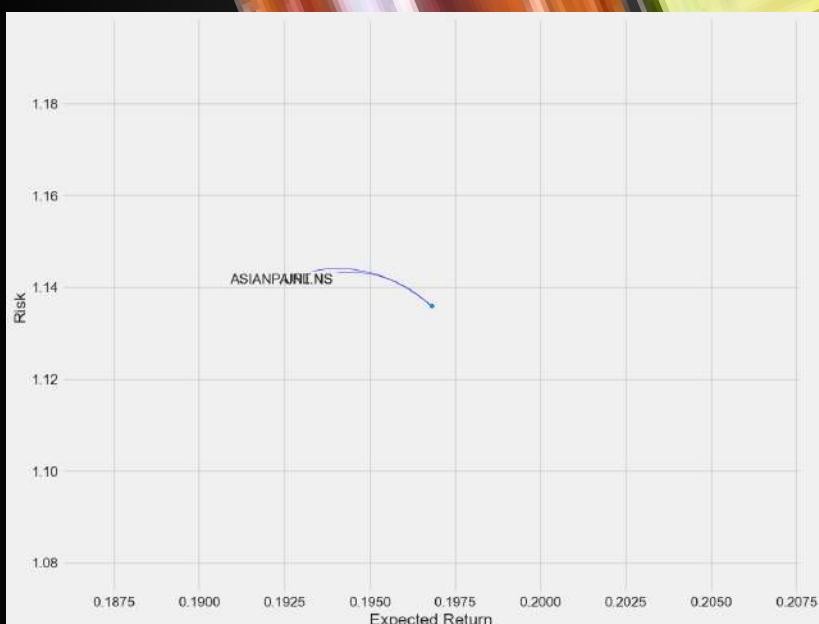
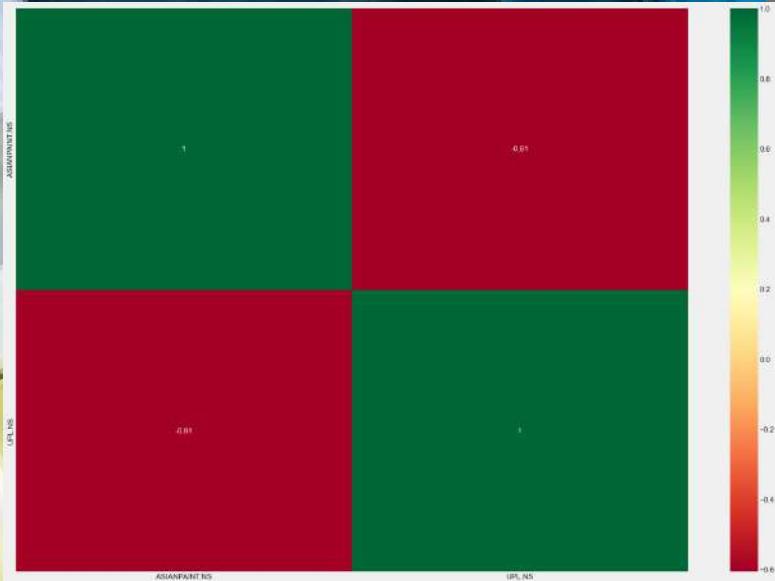
ASIAN PAINTS and UPL both have average risk factors but their expected return rate is also average

2018 CHEMICAL SECTOR



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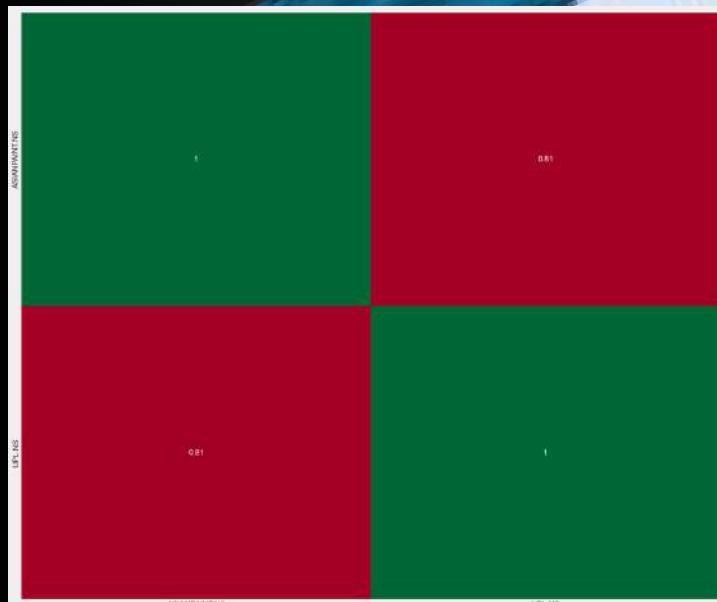
There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks



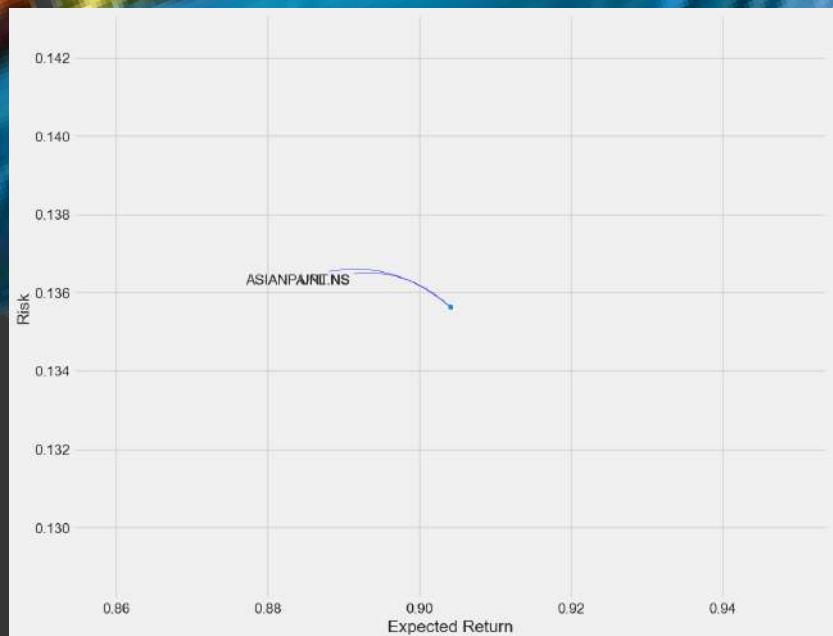
ASIAN PAINTS and UPL both have average risk factors but their expected return rate is also average

2020 CHEMICAL SECTOR

From the line chart, we can see that ASIAN PAINTS has apparently performed really well in the year 2019. It has maintained a stable streak but there is a slight decline in the latter. whereas UPL has also performed reasonably well and has maintained a streak.

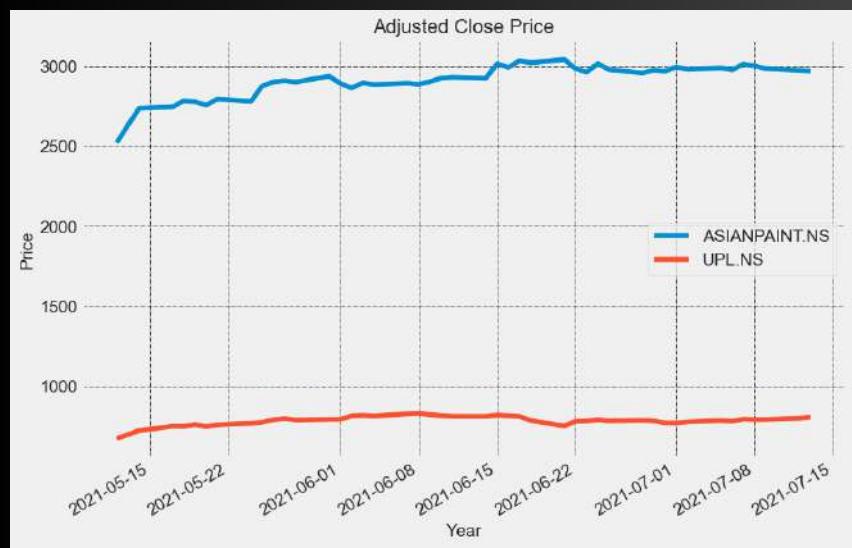


There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks



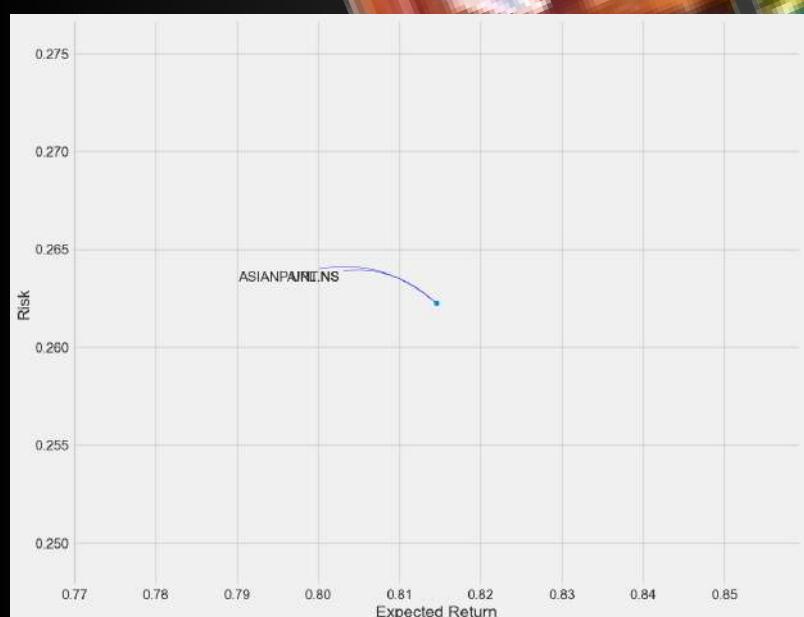
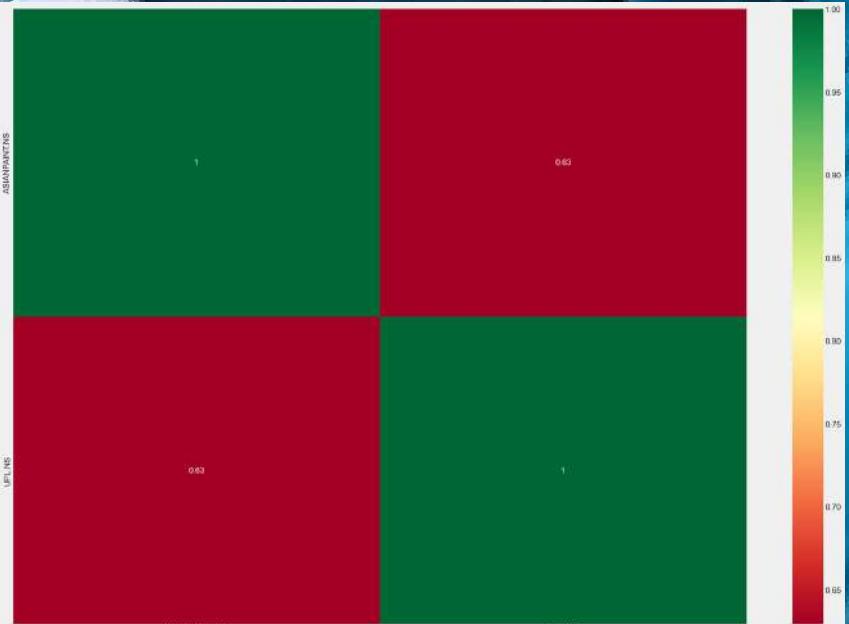
ASIAN PAINTS and UPL both have average risk factors but their expected return rate is also average

2021 CHEMICAL SECTOR



From the line chart, we can see that ASIAN PAINTS has apparently performed really well in the year 2019. It has maintained a stable streak but there is a slight decline in the latter. whereas UPL has also performed reasonably well and has maintained a streak.

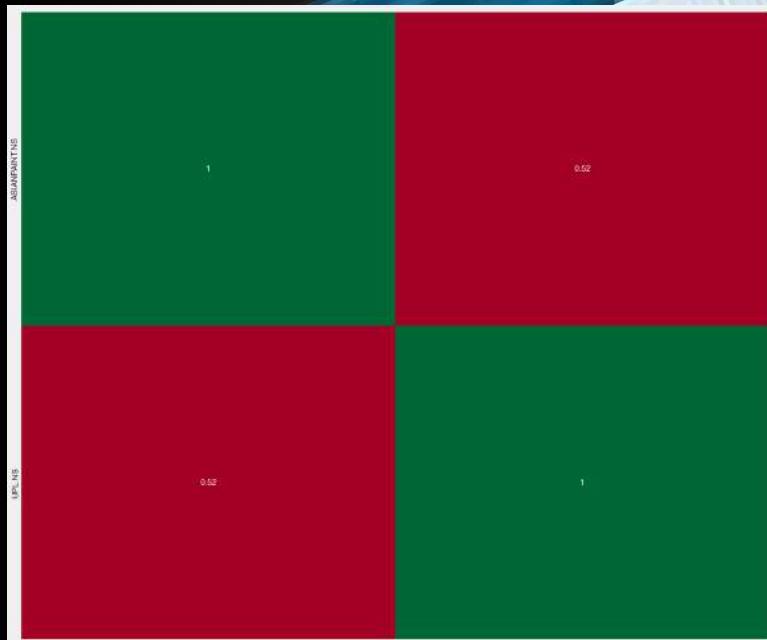
There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks



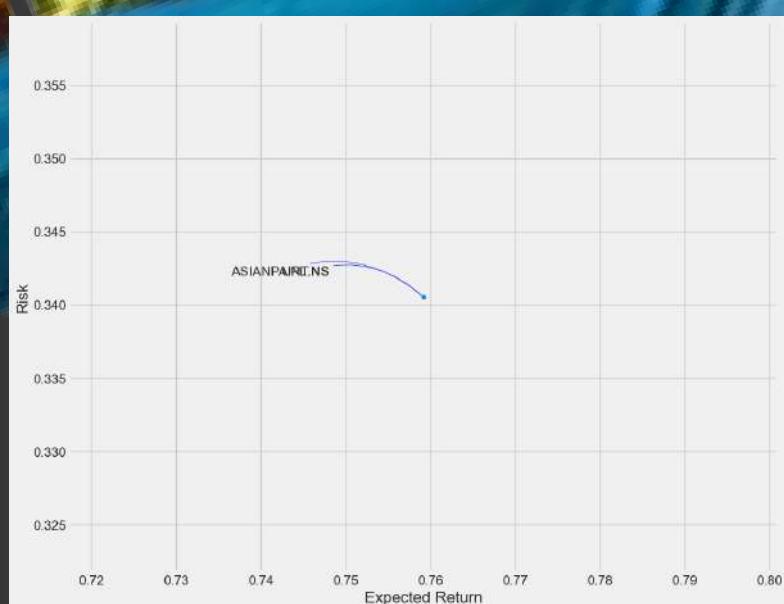
ASIAN PAINTS and UPL both have average risk factors but their expected return rate is also average

2022 CHEMICAL SECTOR

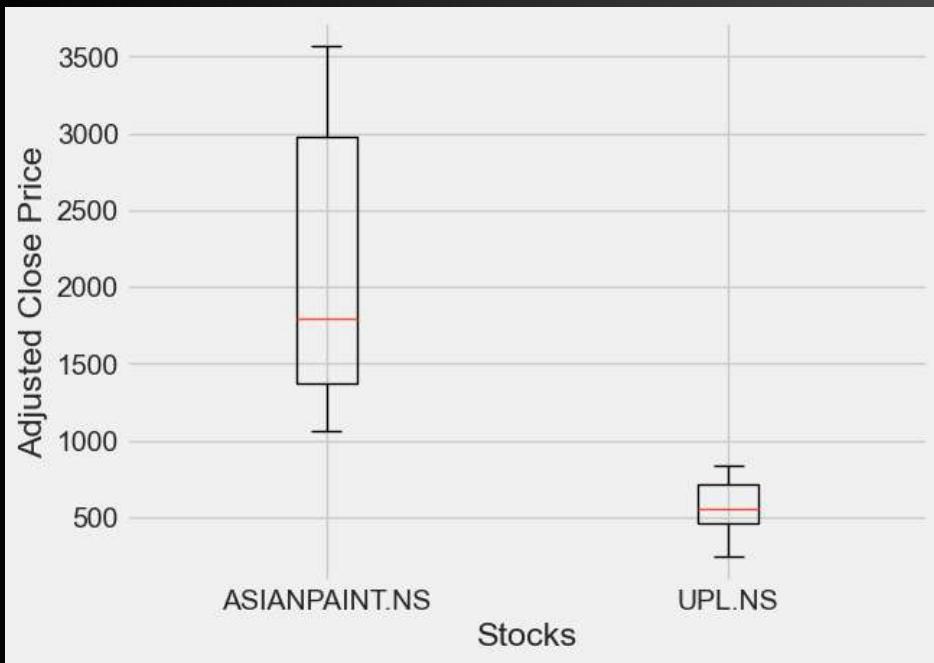
From the line chart, we can see that ASIAN PAINTS has apparently performed really well in the year 2019. It has maintained a stable streak but there is a slight decline in the latter. whereas UPL has also performed reasonably well and has maintained a streak.



There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks



ASIAN PAINTS and UPL both have average risk factors but their expected return rate is also average



In the scatter plot, we can see that the ASIANPAINT stock has a long whisker which implies that the stock is volatile, but UPL stock has a small whisker which tells us that the stock is stable and is a good option.

sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return										
Asian Paints	medium	high	recommended									
UPL	medium	low	recommended									

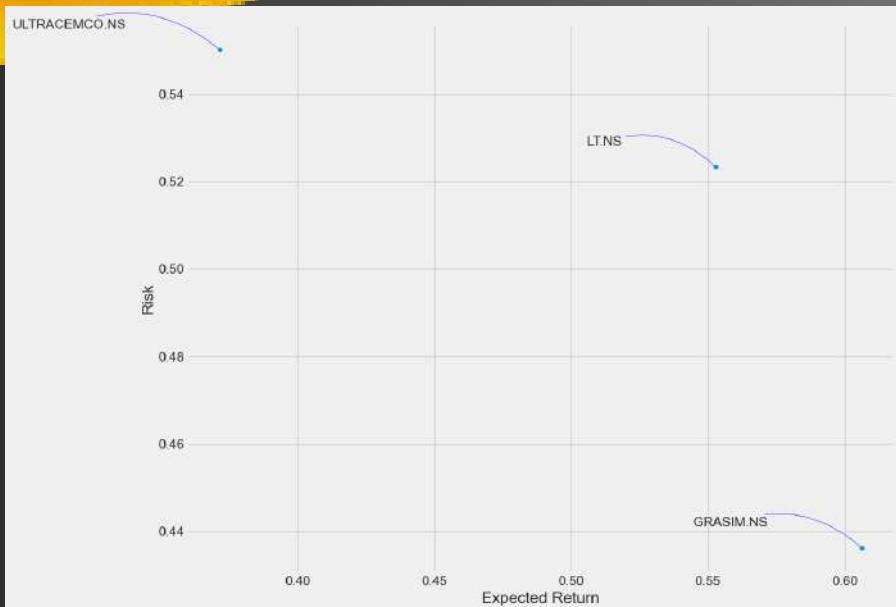
2018 CONSTRUCTION SECTOR

In the line chart, we can see that ULTRACEMCO stock has maintained a very volatile streak which has gradually increased throughout the year. LT and GRASIM stocks have also maintained a streak but there isn't any spike or increase in the adjusted close price.



In the heat map, we can see that LS and GRASIM both the stocks have a correlation value of 0.68 which implies there is a partial correlation and if the other stock increases then there might be an increase or decrease.

In the scatter plot, we can see ULTRACEMECO has a high-risk factor but has a very poor expected return. LT has a risk factor but a reasonable expected return, and GRASIM has low risk and a very high expected return.

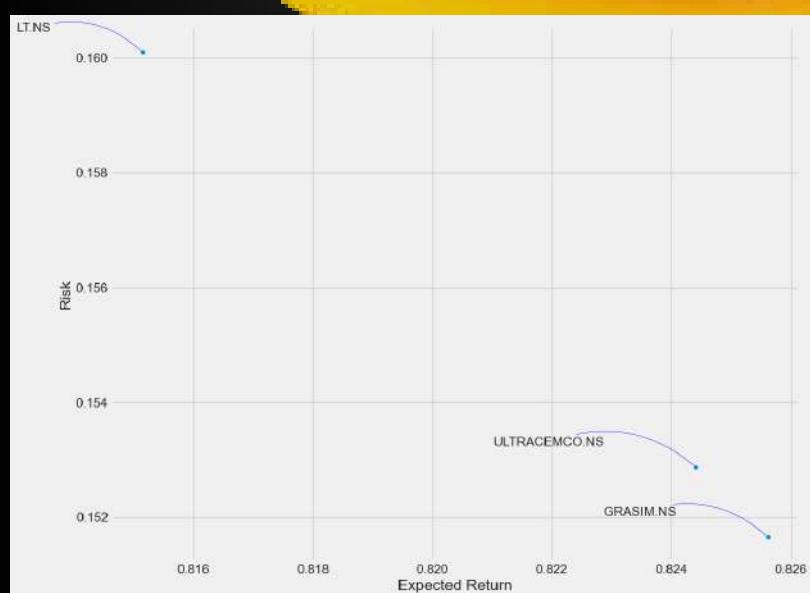


2019 CONSTRUCTION SECTOR



In the line chart, we can see that ULTRACEMCO stock has maintained a very volatile streak which has gradually decreased throughout the year. LT and GRASIM stocks have also maintained a streak but there isn't any spike or increase in the adjusted close price.

There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks



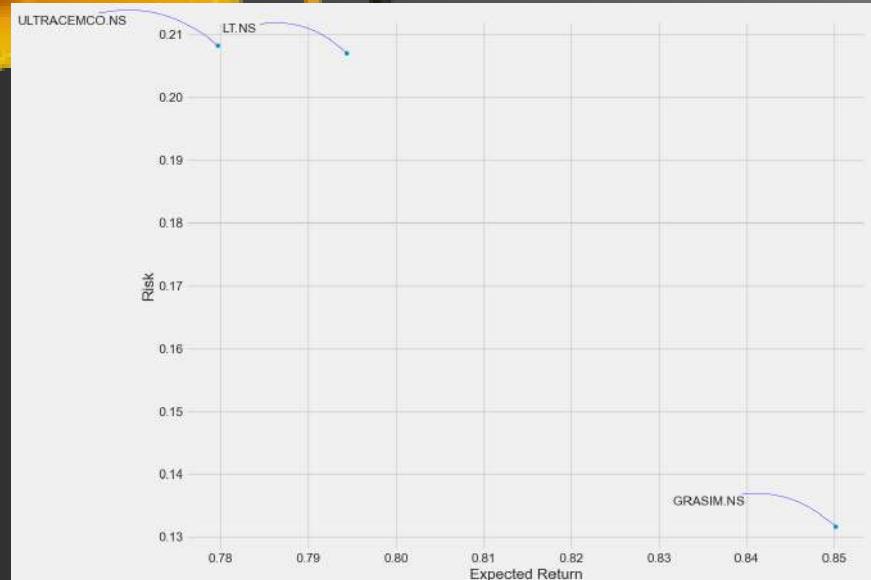
In the scatter plot, we can see LT has a high-risk factor but has a very poor expected return. ULTRACEMCO has a risk factor but a reasonable expected return, and GRASIM has a low risk and a very high expected return.

2020 CONSTRUCTION SECTOR

In the line chart, we can see that ULTRACEMCO stock has maintained a very volatile streak which has gradually increased throughout the year. LT and GRASIM stocks have also maintained a streak but there isn't any spike or increase in the adjusted close price.



LT and ULTRACEMCO have the most risk factor and very poor expected returns. And GRASIM has a low-risk factor and a very high expected return rate.



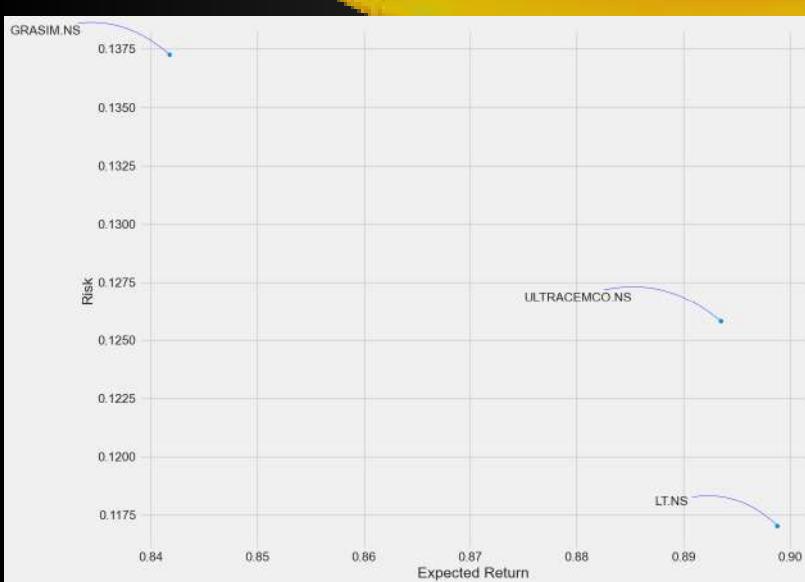
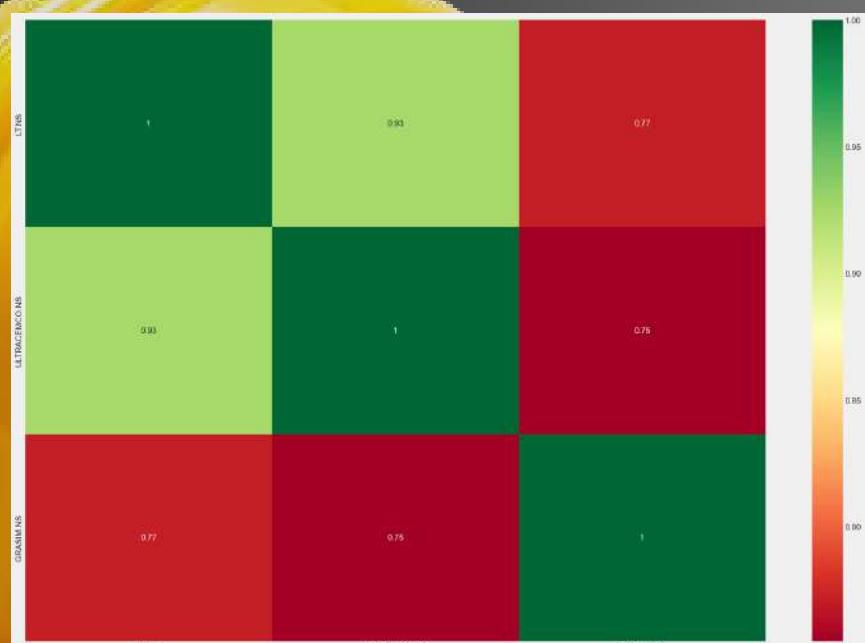
In the heat map, we can see that ULTRACEMCO and GRASIM both stocks have a correlation value of 0.75 which implies there is a partial correlation and if the other stock increases then there might be an increase or decrease.

2021 CONSTRUCTION SECTOR



In the line chart, we can see that ULTRACEMCO stock has maintained a very volatile streak which has gradually increased throughout the year. LT and GRASIM stocks have also maintained a streak but there isn't any spike or increase in the adjusted close price.

There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks



GRASIM have the most risk factor and very poor expected returns. ULTRACEMCO has an average-risk factor reasonable expected return rate. LT has fewer risk factors and more expected returns.

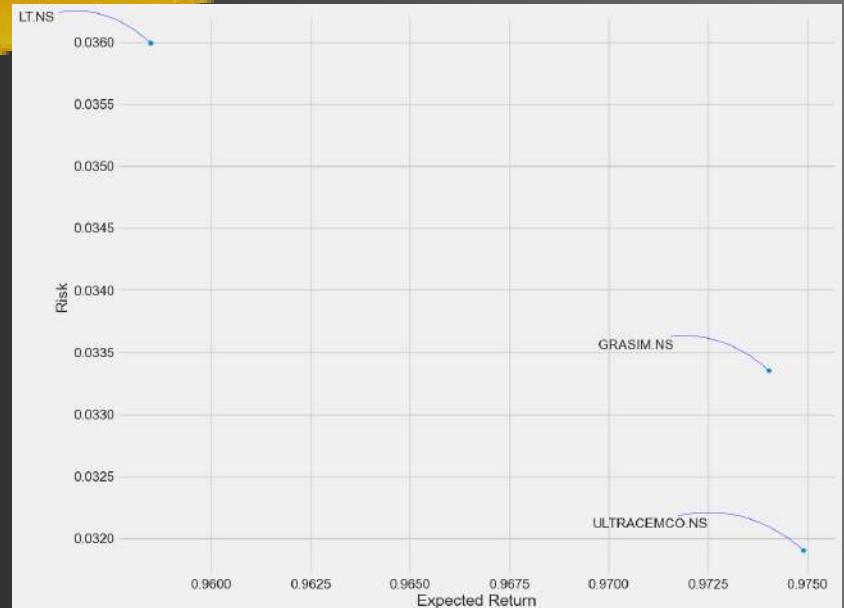
2022 CONSTRUCTION SECTOR

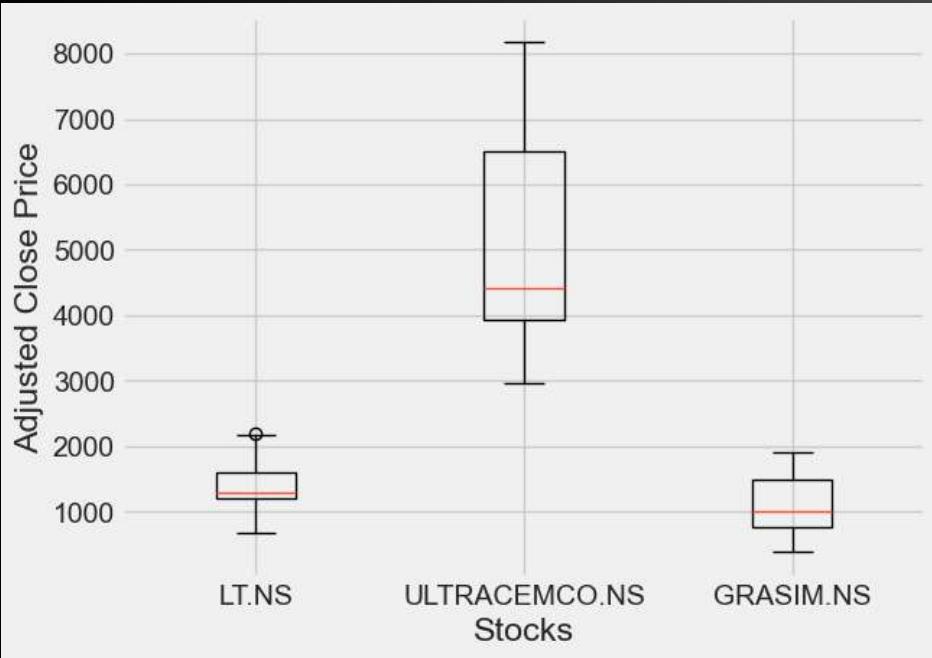
In the line chart, we can see that ULTRACEMCO stock has maintained a very volatile streak which has gradually increased throughout the year. LT and GRASIM stocks have also maintained a streak but there isn't any spike or increase in the adjusted close price.



There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks

LT have the most risk factor and very poor expected returns. GRASIM has an average-risk factor reasonable expected return rate. ULTRACEMCO has fewer risk factors and more expected returns.



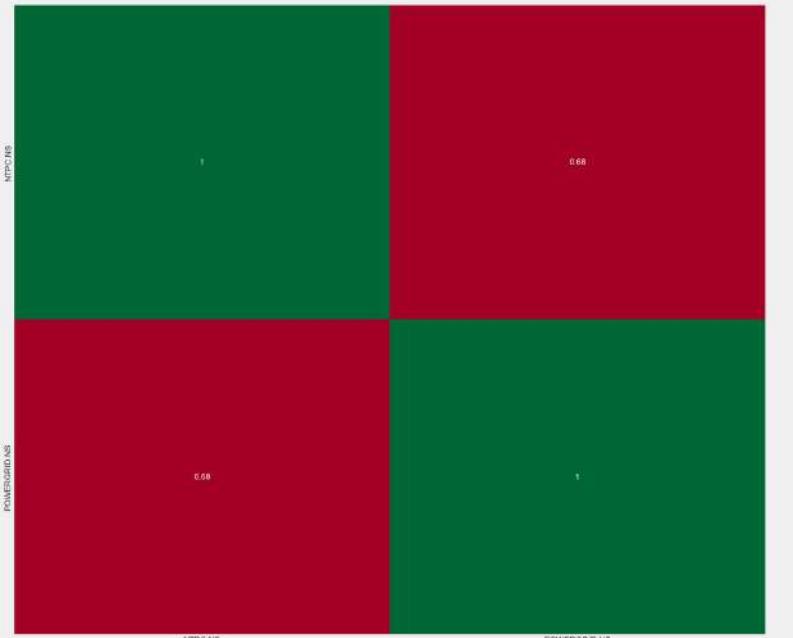


We can see that in the scatter plot that LT and GRASIM stocks have low whisker and are termed to stable stock. whereas ULTRACEMO has long whisker which implies that the stock is volatile and not at all symmetrical

sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return	risk	return	risk	return	risk	return	risk	return		
Larsen and tubro	high	high	high	low	high	low	low	high	high	low	medium	recommended
UltraTech Cement	high	low	low	high	high	low	medium	high	low	high	high	recommended
Grasim	low	high	low	high	low	high	high	low	medium	high	medium	recommended

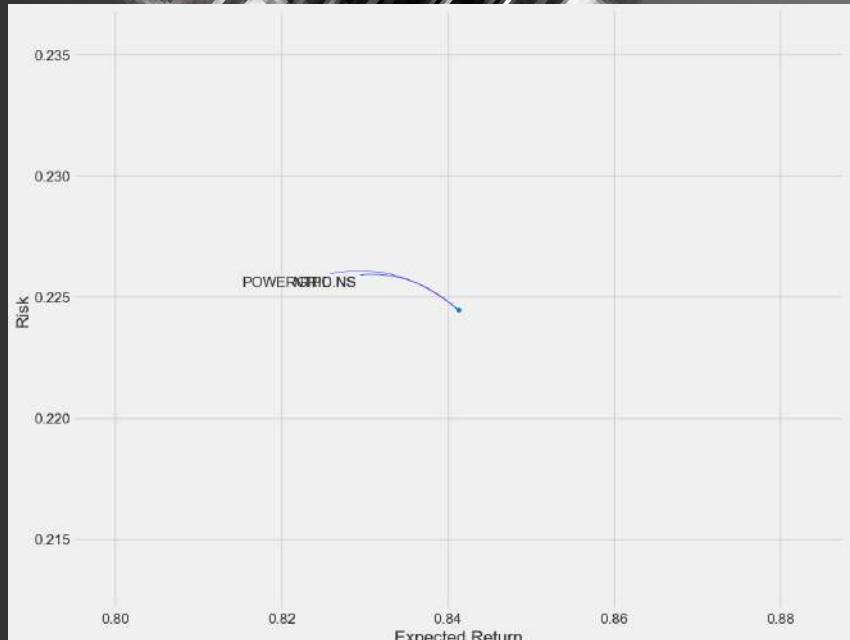
2018 POWER SOURCE SECTOR

In the line chart, we can see that stocks like NTPC have given a very volatile streak throughout the year of 2018 and have declined in the middle but have bounced back to regain the value-added adjusted close price. POWERGRID has also performed extensively well gaining a spike in streak by the end of the year.



There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks

NTPC and POWERGRID both have average risk factors but their expected return rate is also average

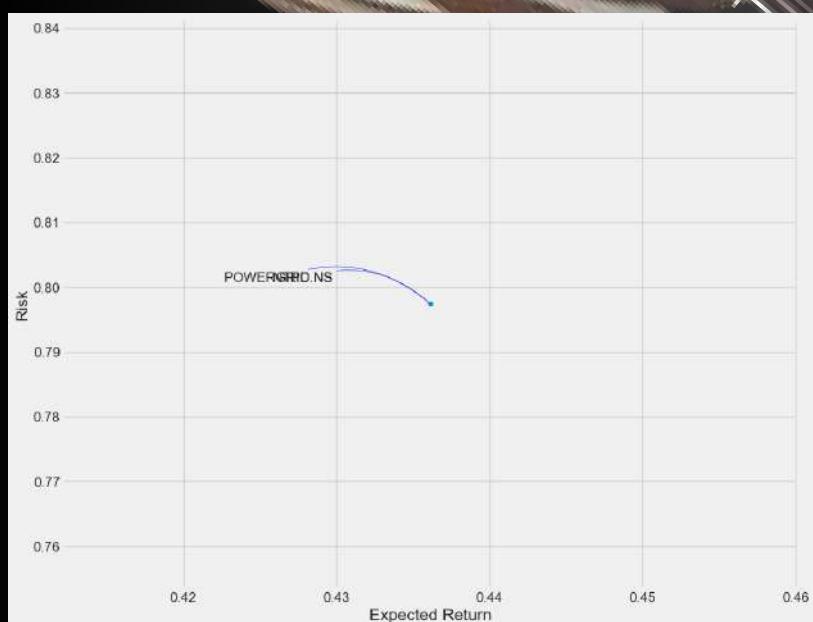
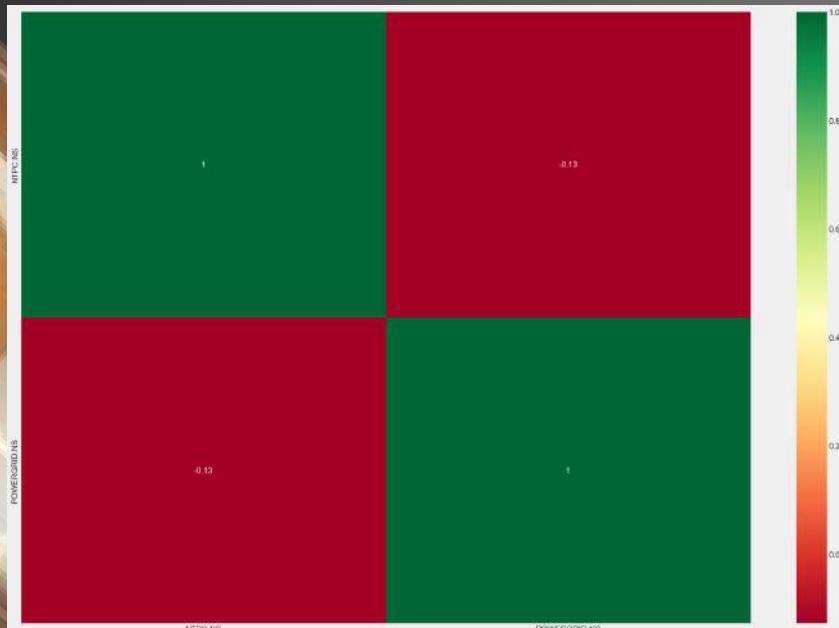


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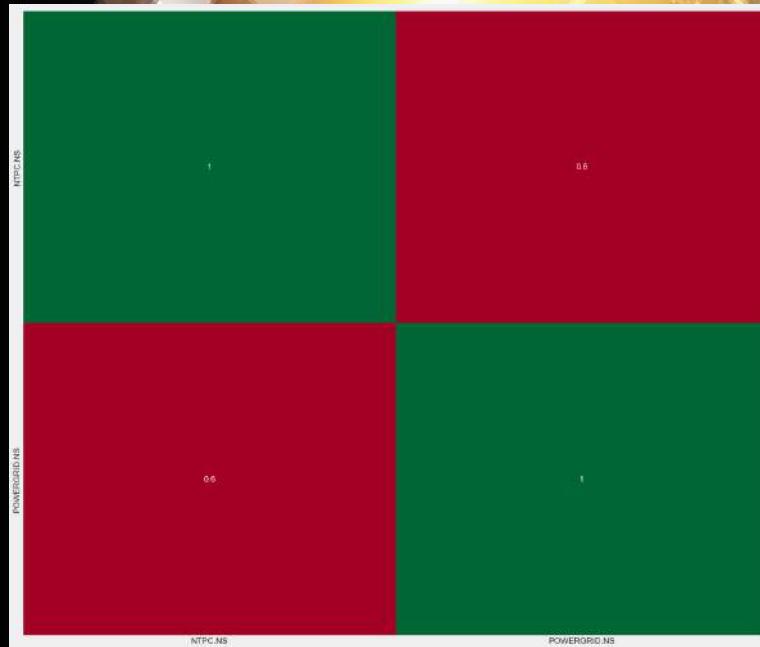
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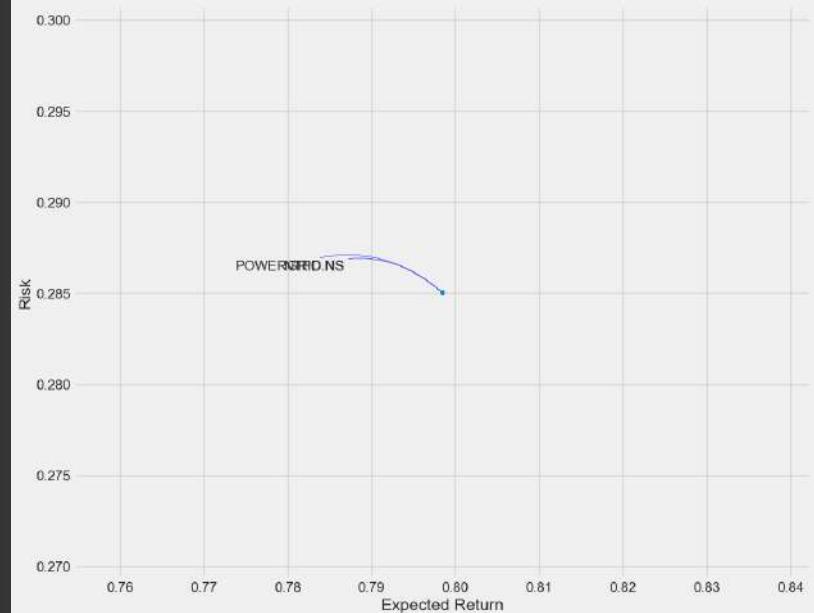
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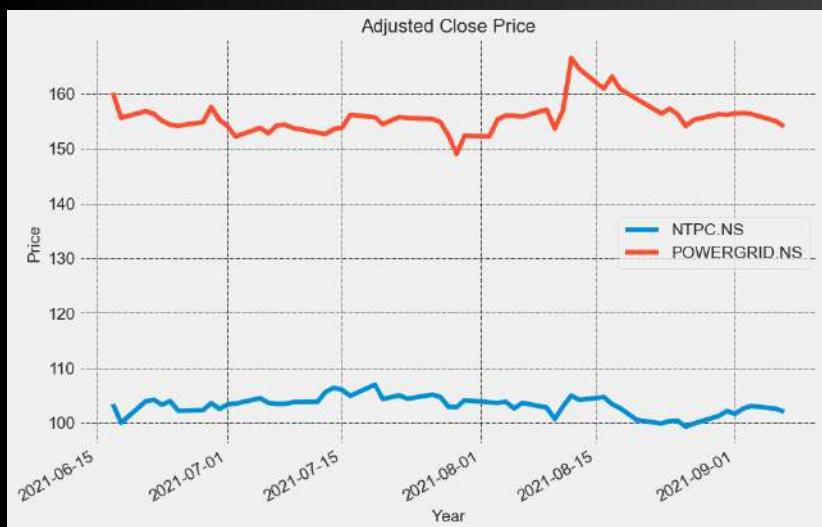


There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks.

NTPC and POWERGRID both have average risk factors but their expected return rate is also average

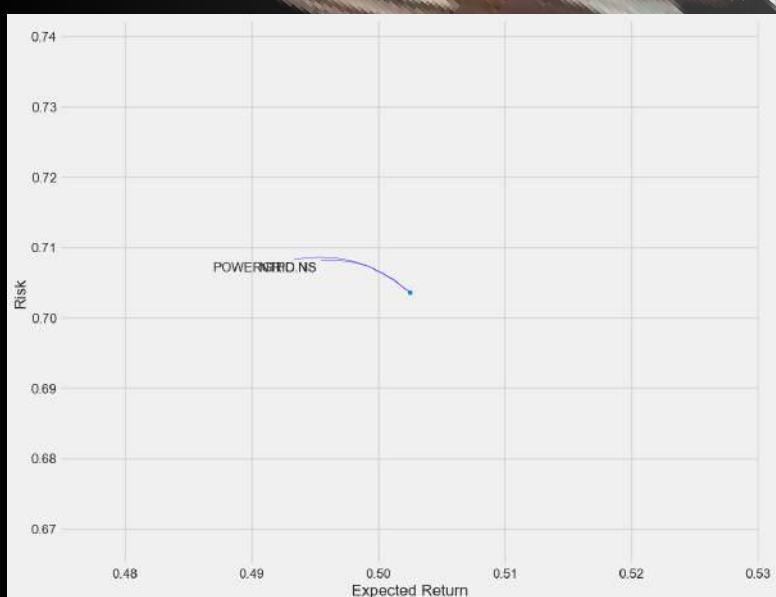
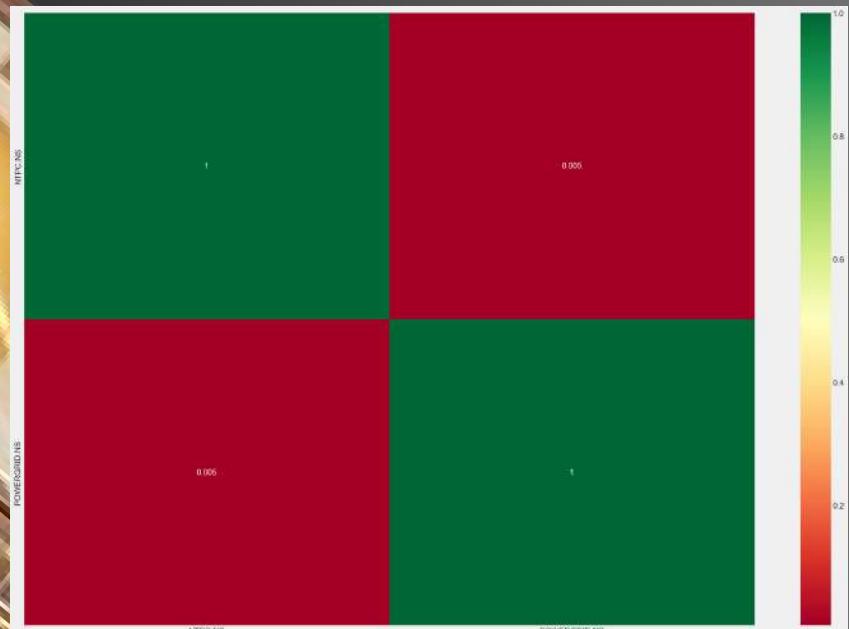


2021 POWER SOURCE SECTOR



In the line chart, we can see that stocks like NTPC have given a very volatile streak throughout the year of 2018 and have declined in the middle but have bounced back to regain the value-added adjusted close price. POWERGRID has also performed extensively well gaining a spike in streak by the end of the year.

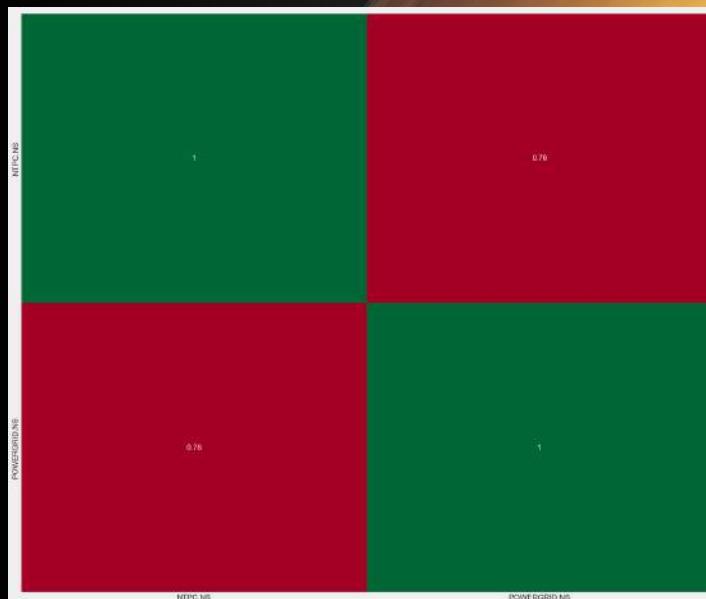
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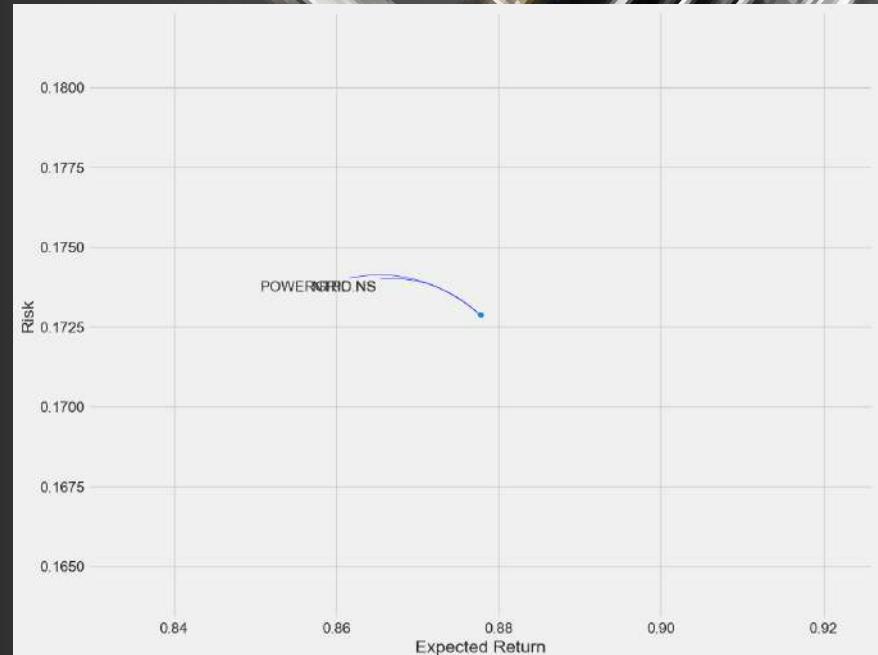
2022 POWER SOURCE SECTOR

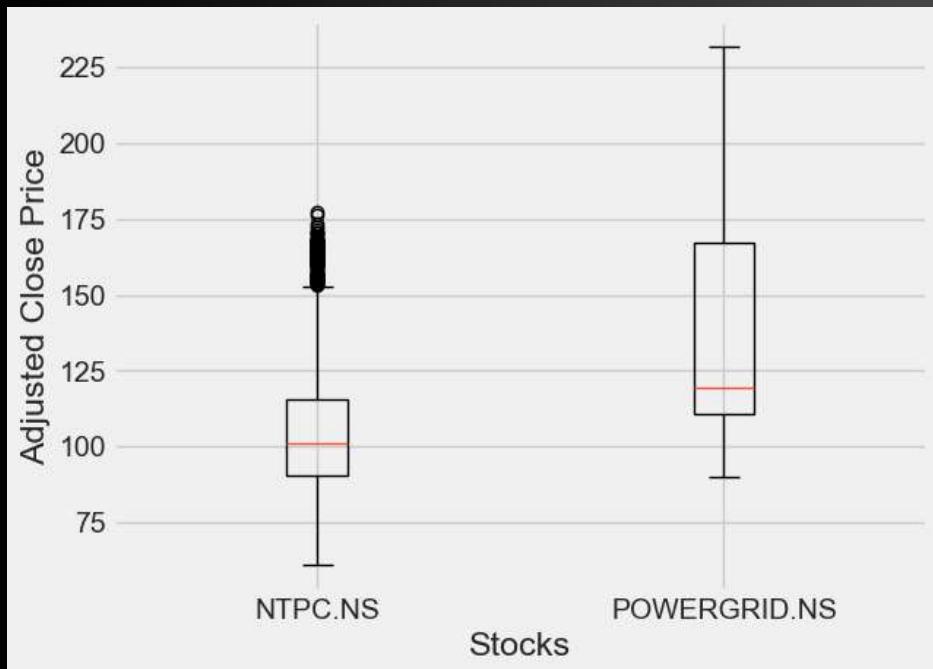
In the line chart, we can see that stocks like NTPC have given a very volatile streak throughout the year of 2018 and have declined in the middle but have bounced back to regain the value-added adjusted close price. POWERGRID has also performed extensively well gaining a spike in streak by the end of the year.



There is no correlation between the stocks, if either of the companies goes higher or lower it doesn't affect the other stocks

NTPC and POWERGRID both have average risk factors but their expected return rate is also average



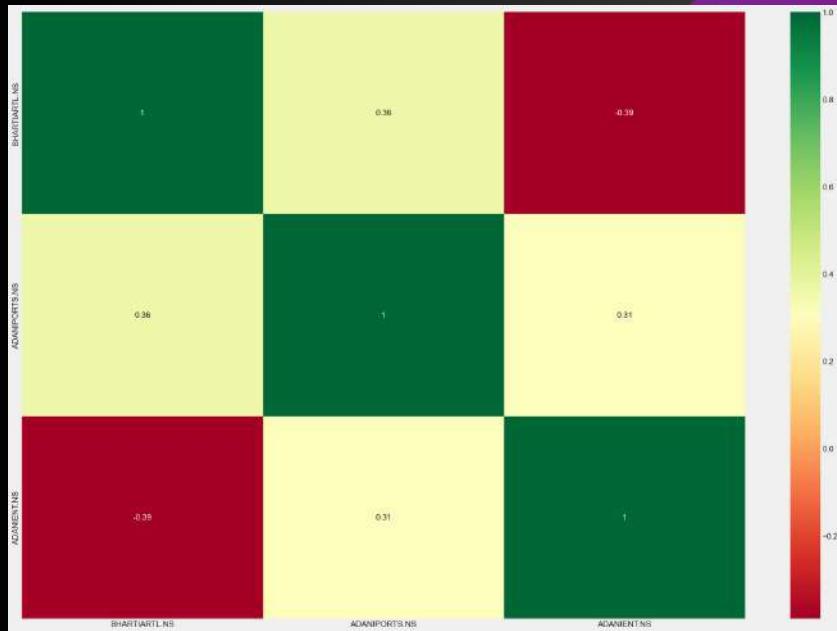


In the box plot, we can see that NTPC has a small whisker which implies that the stock is stable and symmetrical. whereas POWERGRID has a very long whisker and that implies that the stock is volatile and not firm.

sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return										
NTPC	medium	high	recommended									
Power Grid Corp	medium	high	not recommended									

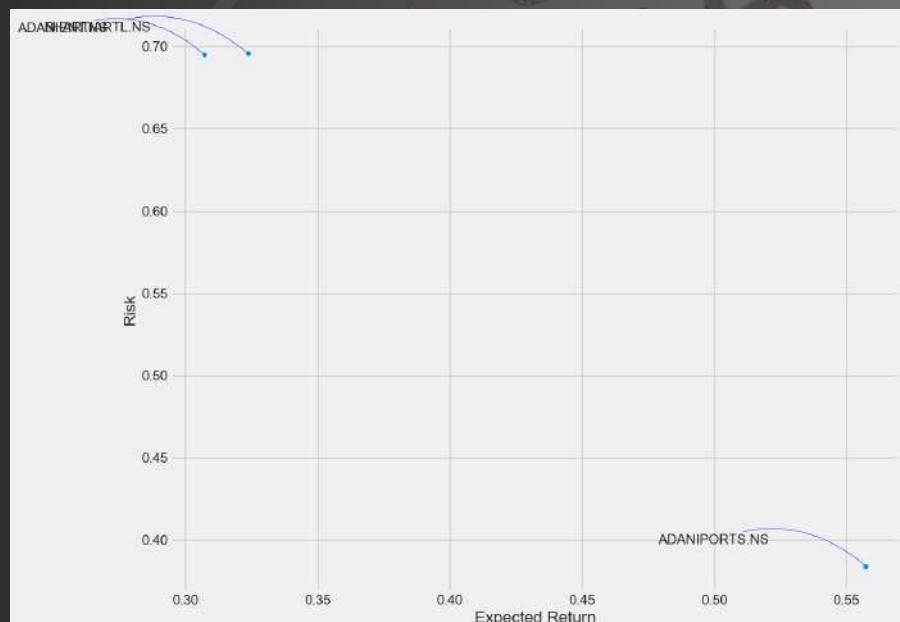
2018 OTHERS

The stocks of ADANI ENTERPRISE has a very significant increase as the ex dividend date is approached. All the stocks have increased as the time progressed and they have increased significantly while nearing the ex dividend date. All the stocks have significant movements.



There is no strong correlation between the stocks this year. The correlation between ADANI PORTS and BHARTI AIRTEL is very weak with a correlation value of 0.36. Also ADANI PORTS has 0.31 correlation value with ADANI ENTERPRISE which is also very poor value of correlation.

The stocks of ADANI ENTERPRISE has high risk and Low return as seen from the plot alongside. The stocks of ADANI PORTS has low risk and high return. So ADANI PORTS stocks look good here.

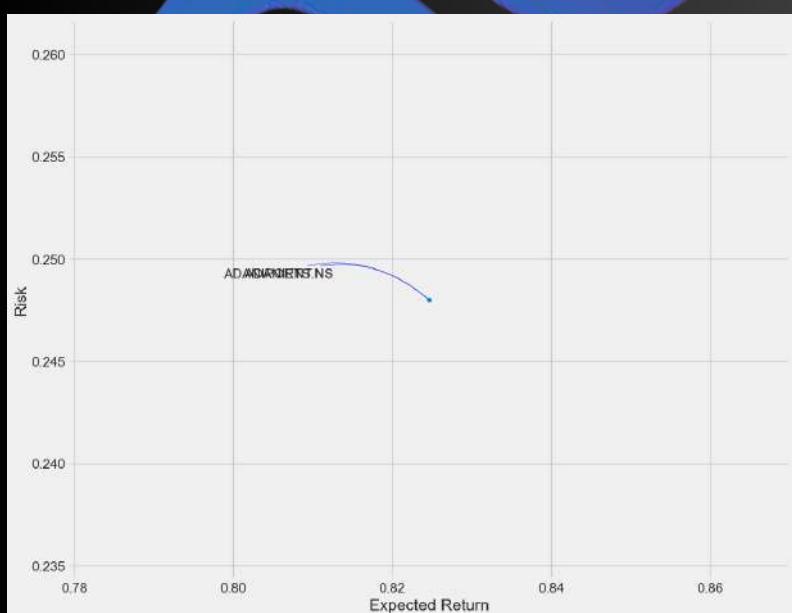
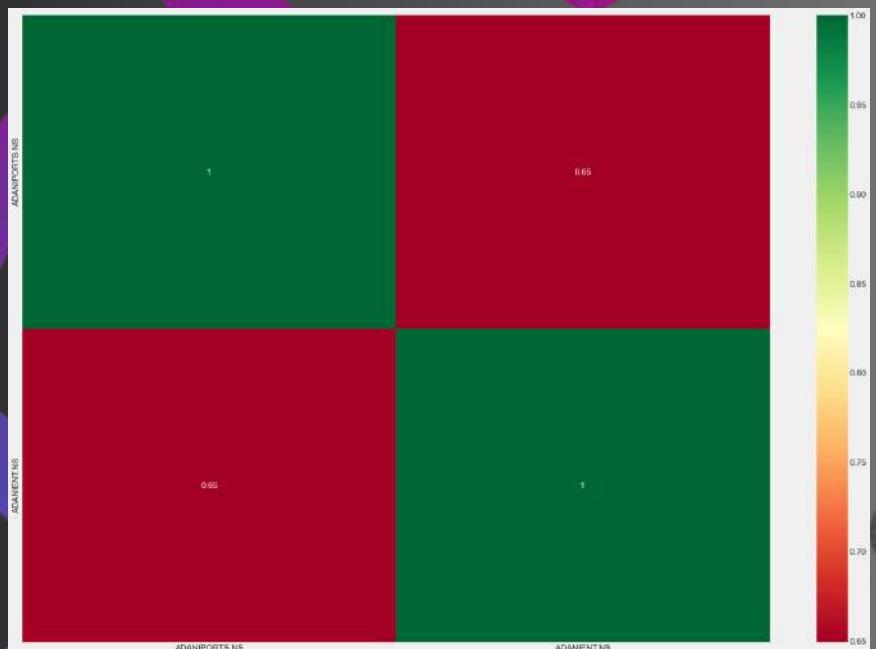


2019 OTHERS



The stocks of ADANI ENTERPRISE has slightly increased as the ex dividend date is approached otherwise there is not significant change. The stocks of ADANI PORTS increased as the time progressed and they have decreased while nearing the ex dividend date. All the stocks have significant movements.

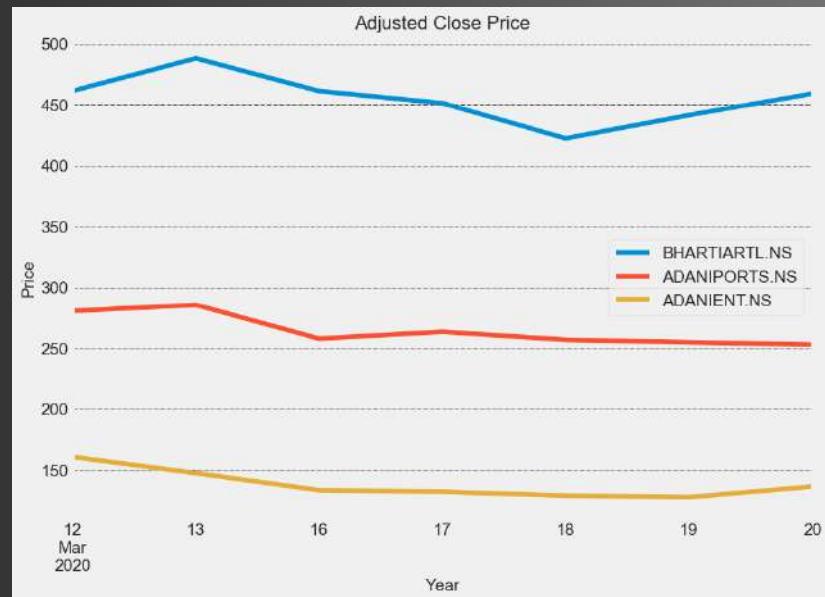
There is very poor correlation between the stocks this year. The correlation of ADANI PORTS with ADANI ENTERPRISE is 0.65 which is also very poor value of correlation in this context.



The stocks of ADANI ENTERPRISE and the stocks of ADANI PORTS has moderate risk and moderate return. As seen from the graph alongside the two stocks have similar risk and return value.

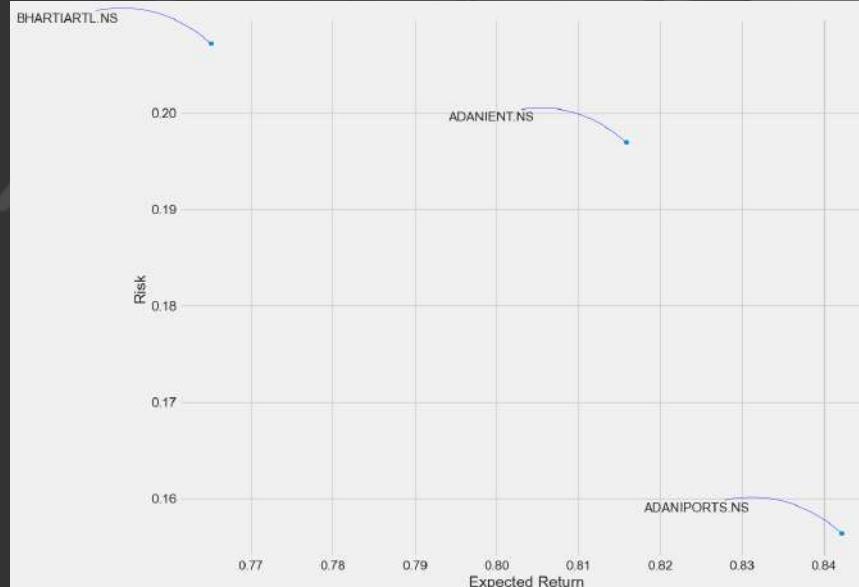
2020 OTHERS

As seen from the graph initially there is a drop but the stocks of BHARTI AIRTEL has a very significant increase as the ex dividend date is approached. The stocks of ADANI ENTERPRISE have increased as the time progressed and they have increased significantly while nearing the ex dividend date. There is a slight decrease with ADANI PORTS.



The correlation between ADANI ENTERPRISE and ADANI PORTS is good with a correlation value of 0.84. Also ADANI PORTS has 0.31 correlation value with BHARTI AIRTEL which is also moderately good value of correlation.

The stocks of BHARTI AIRTEL has high risk and Low return as seen from the plot alongside. The stocks of ADANI PORTS has low risk and high return. So ADANI PORTS stocks look good here.

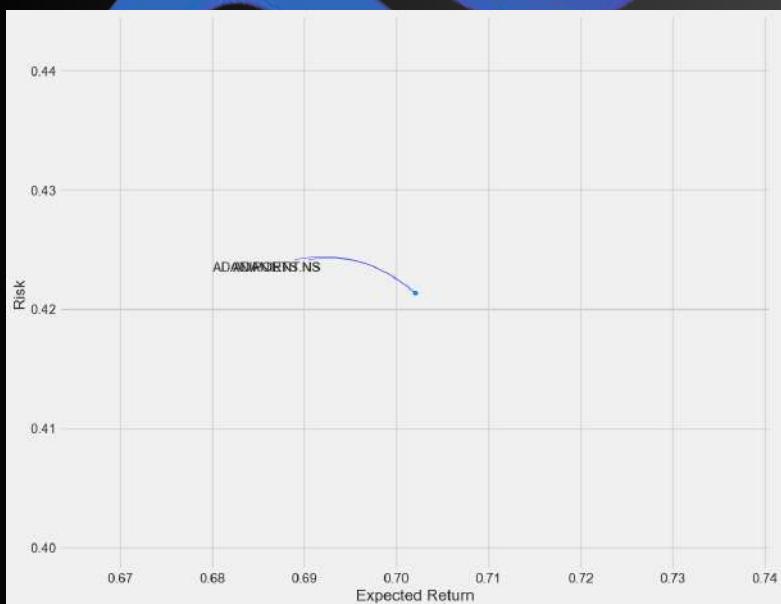
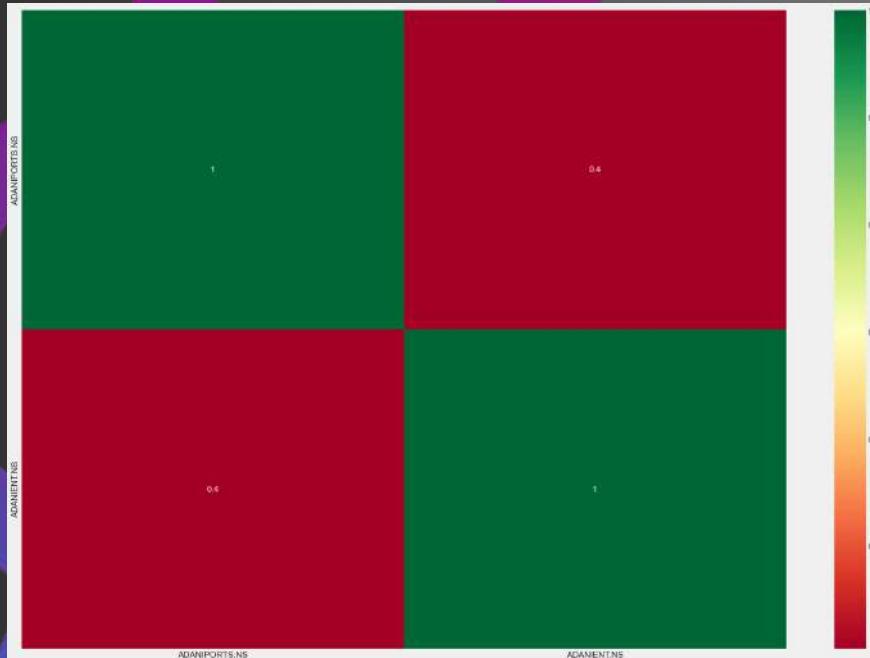


2021 OTHERS



The stocks of ADANI ENTERPRISE has a slight increase as the ex dividend date is approached. The stocks have slightly increased while nearing the ex dividend date. All the stocks have significant movements.

There is very poor correlation between the stocks this year. The correlation of ADANI PORTS with ADANI ENTERPRISE is 0.4 which is also very poor value of correlation in this context.



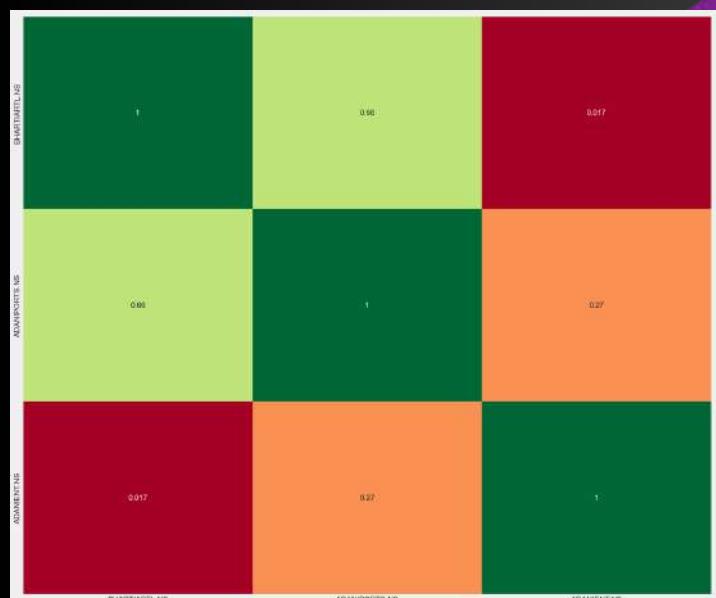
The stocks of ADANI ENTERPRISE and the stocks of ADANI PORTS has moderate risk and moderate return. As seen from the graph alongside the two stocks have similar risk and return value.

2022 OTHERS

The stocks of ADANI ENTERPRISE has a very significant increase as the ex dividend date is approached.

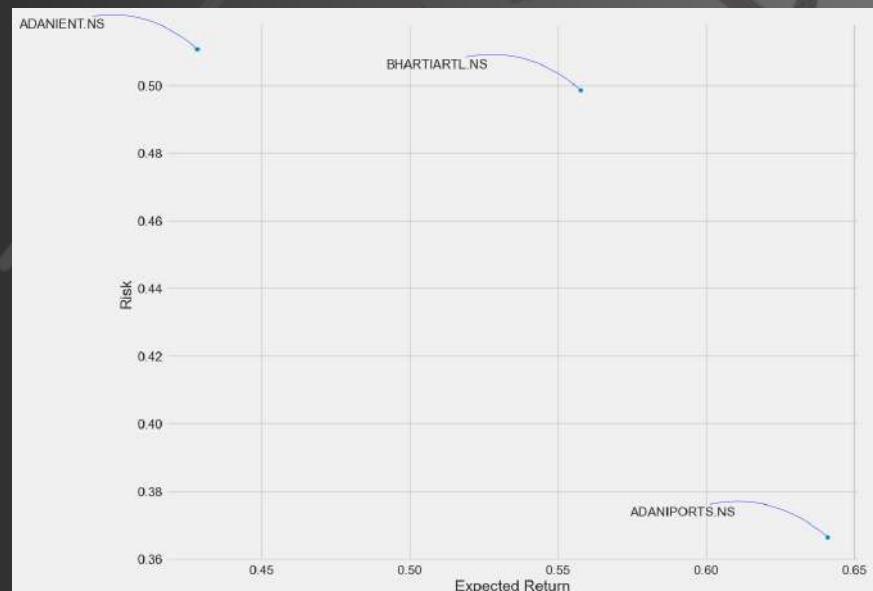
The stocks of BHARTI AIRTEL have decreased slightly while nearing the ex dividend date.

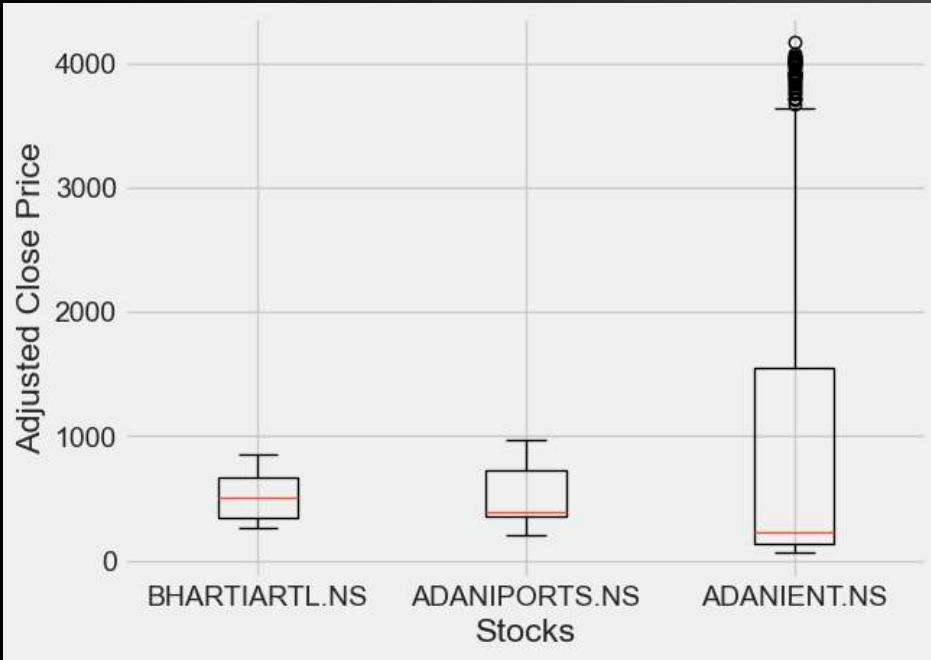
All the stocks have significant movements.



There is moderately good correlation between the stocks this year. The correlation of ADANI PORTS with BHARTI AIRTEL is 0.66 which is a moderately good value of correlation in this context.

The stocks of ADANI ENTERPRISE has high risk and Low return as seen from the plot alongside. The stocks of ADANI PORTS has low risk and high return. So Adani Ports stocks look good here.





From the given Box plot of all the companies we can see that the box plot of ADANI ENTERPRISE has long whisker. Hence the stocks of ADANI ENTERPRISE is more volatile. This is also evident from the line graph.

BHARTI AIRTEL is stable compared to all others as its whisker is smaller when compared with the whiskers of others.

sector	2018		2019		2020		2021		2022		Volatility	overall
	risk	return	risk	return	risk	return	risk	return	risk	return		
BHARTI AIRTEL	high	low	---	--	high	low	--	--	high	medium	low	not recommended
ADANI PORTS	low	high	medium	medium	low	high	medium	medium	low	high	low	recommended
ADANI ENTERPRISE	high	low	medium	medium	high	medium	medium	medium	high	low	high	not recommended

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