Analysis of Underlying assets, Equity Future instruments of CANFINHOME and POWERGRID

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ECON F354: Derivatives and Risk Management

Birla Institute of Technology and Science, Pilani
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DATE: 08/12/2022

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Group 37

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Acknowledgement

We would like to express our sincere gratitude to Prof. Thota Nagaraju, for giving us an opportunity to work under him for this assignment and taking his valuable time to provide us with his guidance wherever required. His input proved to be very vital for the assignment. We would like to thank him for providing us with such a wonderful opportunity to apply our course knowledge on real-life data and get hands-on experience. We are indebted for all his help and guidance throughout the course and this assignment.

Abstract

This paper's primary goal is to examine the performance of the equity stocks and their futures for Can fin home (CANFINHOME) and Powergrid (POWERGRID) over the course of one year, from 1st December,2021 to 31st November, 2022, on a daily, weekly, and monthly basis. This study is done to determine which investment instruments will maximise profits for a given level of risk. The returns are modified using the government T-Bill returns in order to compare these instruments. The risk and the corresponding returns of each instrument on each of the distinct frequencies are evaluated using the Sharpe ratio. The report also uses the CAPM model to observe if the stocks underperformed or overperformed and checks liquidity position of all investment instruments analysed. The report finally concludes and advises the optimal trading strategy and frequency of trading for the given 2 stocks.

Contents

1. CANFINHOME

1.1 Introduction

1.1.1 Nature of Business

Can Fin Homes Ltd. (CFHL) is a leading housing finance institution approved by National Housing Bank (NHB) the apex authority of housing in the country. The Company offers housing loans for individual homes and affordable housing along with composite and top-up loans.Main objective of setting up the Company was promoting home ownership & increasing the housing stock in the country.

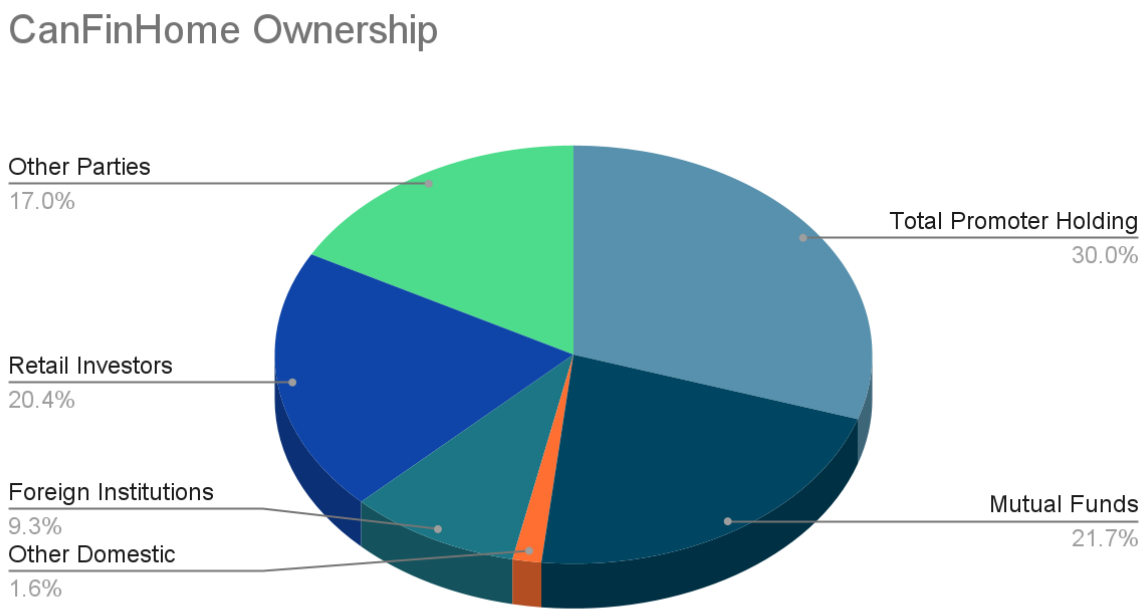
1.1.2 Ownership

It is a publicly traded corporation that is listed on the NSE and BSE. The promoters own 29.99% of the company, while foreign institutions own 9.30%, mutual funds own 21.72%, and retail owners own 20.38% and other parties own 17.04%.

As of September 2022.

Description	Share
Total Promoter Holding	29.99%
Mutual Funds	21.72%
Other Domestic Institutions	1.56%

Foreign Institutions	9.30%
Retail Investors	20.38%
Other Parties	17.04%



1.1.3 Business Commencement Circumstances

Can Fin Homes Ltd, a Housing Finance Company promoted by Canara Bank, in 1987, the International Year of Shelter for the Homeless. The Company is incorporated under Companies Act, 1956.The initial shareholders of the company were, Canara Bank, Can Bank Financial Services, HDFC and UTI.

1.1.4 Industry of the Business

CanFinHome is in the business of housing finance.It gives both housing loans and mortgage loans mainly to low and middle income individuals and first time house buyers.

1.1.5 Greatness of the Company

It was the first HFC(**Housing finance company**) floated by any Nationalised Bank in the country.It is one of the very few HFCs permitted by NHB for taking deposits from the public.This company was established to promote home ownership across the country with a motto of Friendship Finance.

1.2 Underlying stock returns:

From table 2.1, we can see the average daily, weekly and monthly returns are all negative. The annualized mean of daily return is -18.98%. That implies daily trading is a loss-making strategy for CANFINHOME. For weekly returns, it is around -19.27%. Similarly, the annualized monthly return has a negative value of -12.32%. That implies investing in CANFINHOME will give one negative return on investment.

Metric	Daily	Weekly	Monthly
Minimum	-0.0792	-0.2128	-0.2784
Maximum	0.0815	0.0994	0.3351
Mean	-0.1898	-0.1927	-0.1232
Standard Deviation	0.4018	0.4898	0.5878

Table 2.1: Comparison between daily, weekly and monthly risk- unadjusted returns(in fractions)

The values in the table need to be Multiplied with 100 to get the returns in per annum.

1.3 Underlying stock risk-adjusted return:

In table 3.1, it is clear that for daily, weekly and monthly returns, the risk-adjusted returns are negative. The annualized mean of daily return is -23.57%, whereas it is -25.02% for weekly returns and -71.84% for monthly returns.

Metric	Daily	Weekly	Monthly
Minimum	-0.0794	-0.2137	-0.2835
Maximum	0.0813	0.0987	0.1051
Mean	-0.2357	-0.2502	-0.7184
Standard Deviation	0.4018	1.0712	2.2729

Table3.1: Comparison between daily, weekly and monthly risk-adjusted returns

The values in the table need to be Multiplied with 100 to get the returns in per annum.

1.4 Economic Interpretation of risk adjusted and risk unadjusted returns

As previously said, risk plays a significant role in assessing if an investment is suitable. Without taking risk into consideration, the returns are unfinished and provide a false impression of how an investment should be made.

When the risk is considered, the return shows if it is worthwhile to take on more risk to earn a higher return than the risk-free rate. The risk-free return is always positive since it is backed by a sovereign nation.

As a result, the risk-adjusted return will never be exactly the same as the unadjusted return. When the Sharpe ratio is negative, investing in risk-free assets is preferable for the investor to do so in the company's assets. The Sharpe ratio has to be higher than zero to turn a profit.

Using the Sharpe ratio, we alter the returns to take into account the investment's risk:

Sharpe ratio = E [Rx − Rf]/σ[Rx − Rf]

Rx = Risk unadjusted return
Rf = Risk-free rate or T-bills rate
E= Expected value of return
σ = Standard deviation

Time-frequency	Sharpe ratio
Daily Weekly Monthly	-0.5864 -0.4869 -0.2876

Observation:

- The only difference between the graphs for the risk-adjusted and risk-unadjusted returns is the low T-Bill rates.

- The risk-adjusted annualised returns on the daily, weekly and monthly basis are negative.
- The standard deviation is more significant than the average return, making the share price more volatile. Volatility is higher for the monthly return. Volatility decreases from monthly to daily basis.
- The Sharpe ratio is negative in all cases. So, it is not favorable to invest in those assets, rather invest in risk-free assets.

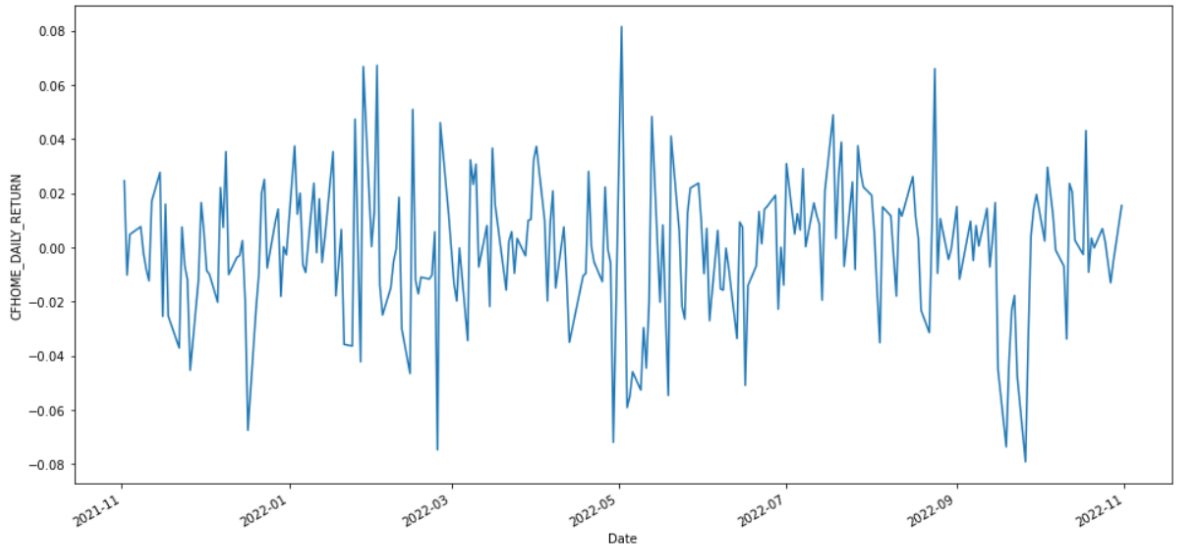


Fig2.1: Daily returns

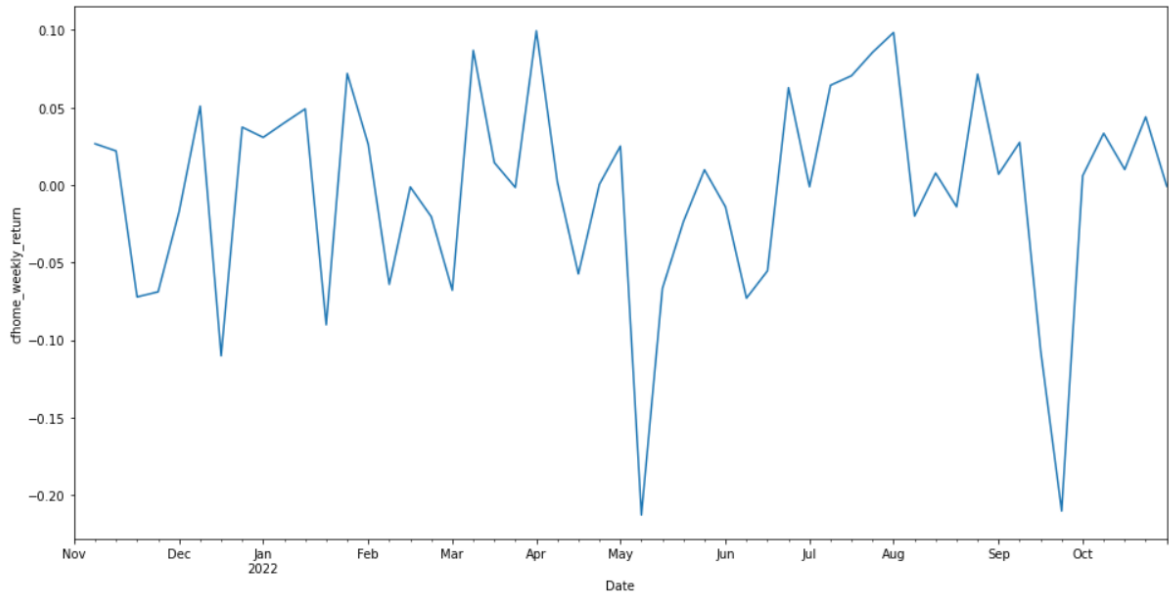


Fig2.2: Weekly returns

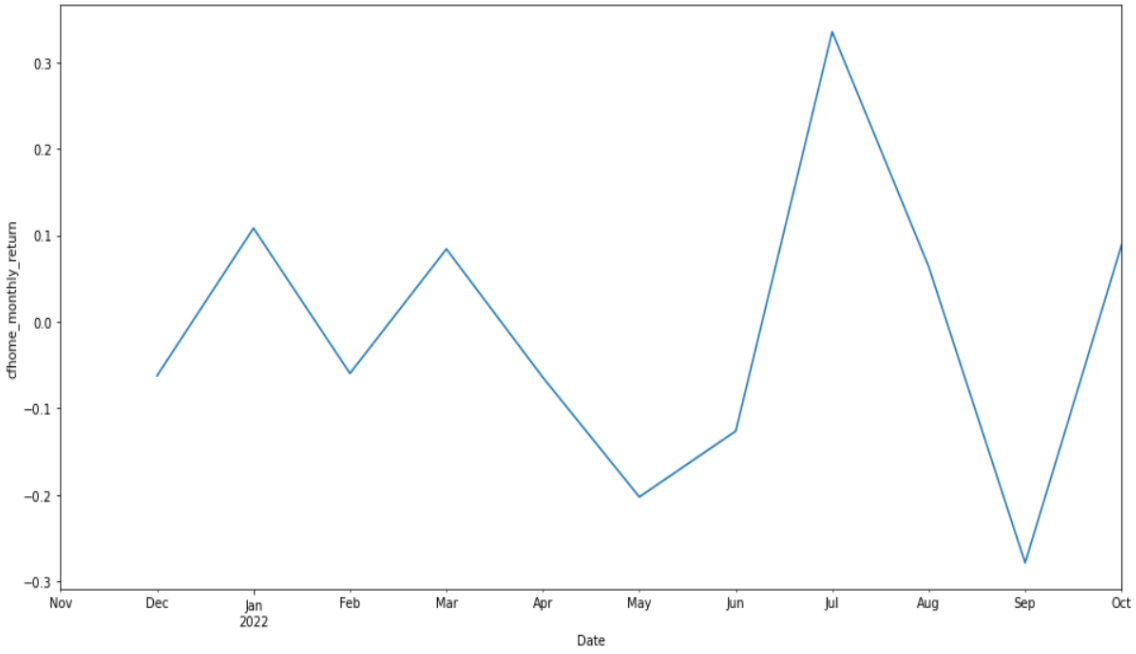


Fig2.3: Monthly returns

1.5. Equity Futures

1.5.1 Commencement of Equity Futures

The future contracts for CANFINHOME started to trade from

1st January,2016

1.5.2 Lot size and Contract Specifications

CANFINHOME is currently trading in the Futures and Options market of the NSE with a lot size of 975 and a total of around 1509 near, next and far month contracts.

SYMBOL	CANFINHOME
INSTRUMENT	FUTSTK
LOT SIZE	975

EXPIRY DATE	Last Thursday of every week. If Thursday is a holiday, expiry is previous trading day
TRADING CYCLE	3-month trading cycle – the near month (one), the next month (two), and the far month (three).
TRADING HOURS	As per equity derivatives segment

1.5.3 Greatness of Equity Futures

Specification	Value
Traded Volume (shares)	1,471,275
Traded Value (Lakh)	8,124.09
Market Lot	975
Open Interest	4,231,500
Change in Open Interest	-166,725

1.6 Near month returns:

Near month futures expire within one month of purchase of contract. From the below table we can see that returns on any frequency are negative returns and hence is not a profitable venture. So, comparing the returns on daily, weekly and monthly frequencies, we can conclude that the best-case return is obtained at -19.58 % p.a on a daily frequency.

Metric	Daily	Weekly	Monthly
Minimum	-0.1753	-0.1987	-0.1231
Maximum	0.1028	0.1212	0.1979
Mean	-0.1958	-0.2294	-0.3470
Standard Deviation	0.4721	0.4685	0.5736

The values in the table need to be Multiplied with 100 to get the returns in per annum.

1.7 Risk Adjusted Near Month Returns:

Adjusting returns with risk ensures that any excess return observed due to standard deviation is taken into consideration. From the below table, we can observe that returns in all frequencies considered are negative and hence this is not a profitable venture. The best-case return is -24.06 % p.a if traded on a daily basis.

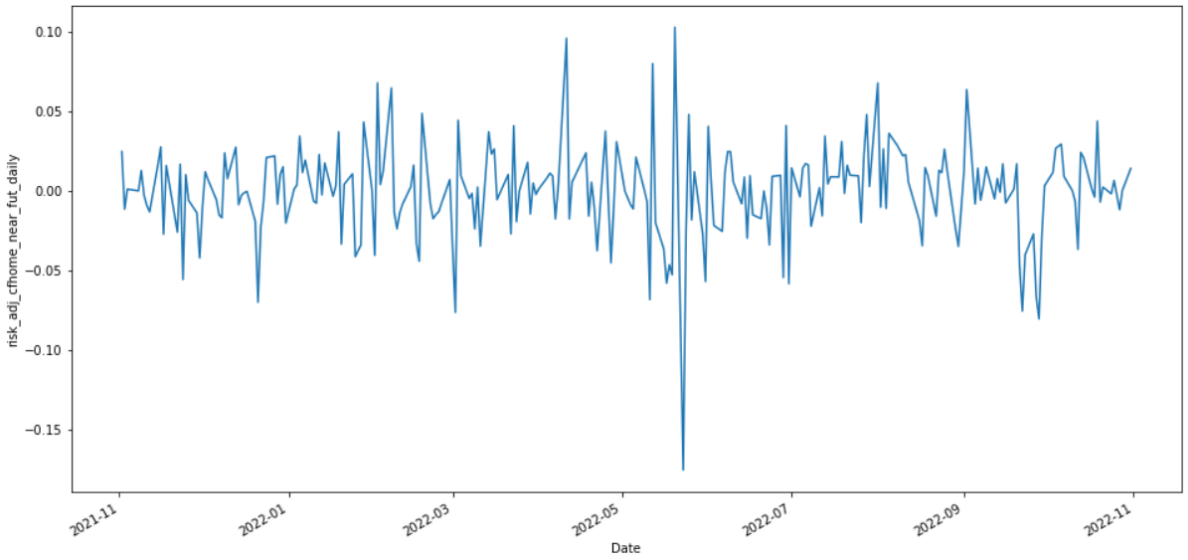
Metric	Daily	Weekly	Monthly
Minimum	-0.1755	-0.2303	-0.3511
Maximum	0.1026	0.1201	0.1187
Mean	-0.2406	-0.3009	-0.8425
Standard Deviation	0.4721	1.0183	2.4966

The values in the table need to be Multiplied with 100 to get the returns in per annum.

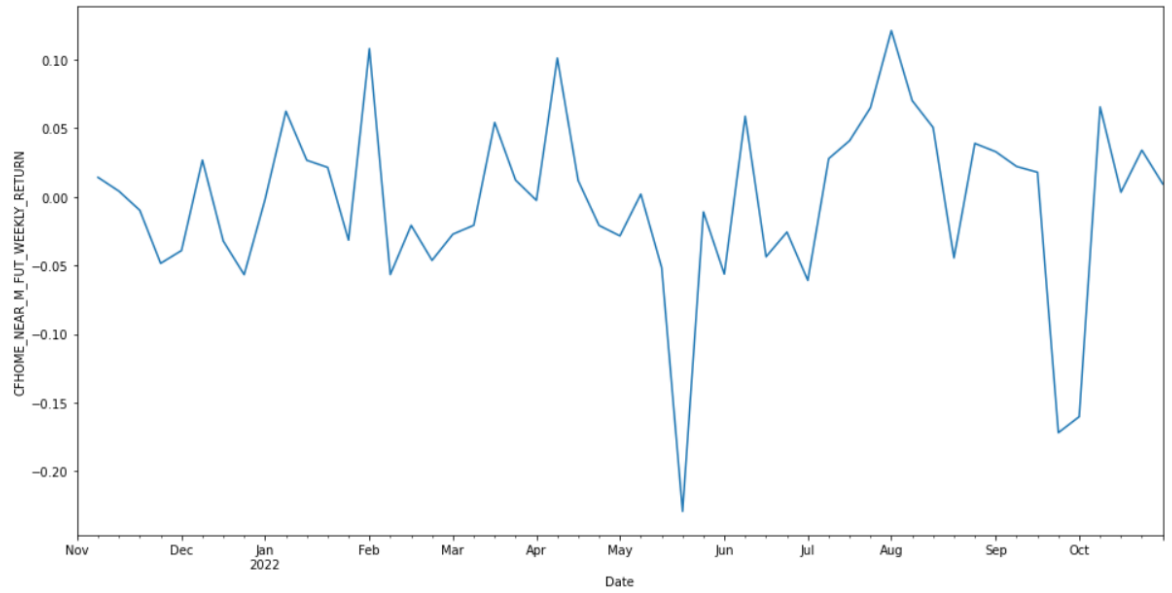
1.8 Economic Interpretation of unadjusted returns VS risk-adjusted returns:

From Table and Table we can have observed that for both unadjusted and risk-adjusted returns are negative irrespective of time frequency. However, the returns recorded for risk- adjusted returns are lower when compared to unadjusted returns. Hence if an investor doesn't account for the excess returns due to underlying standard deviation of the returns, they will be entrapped with the idea of expecting higher returns from their investment.

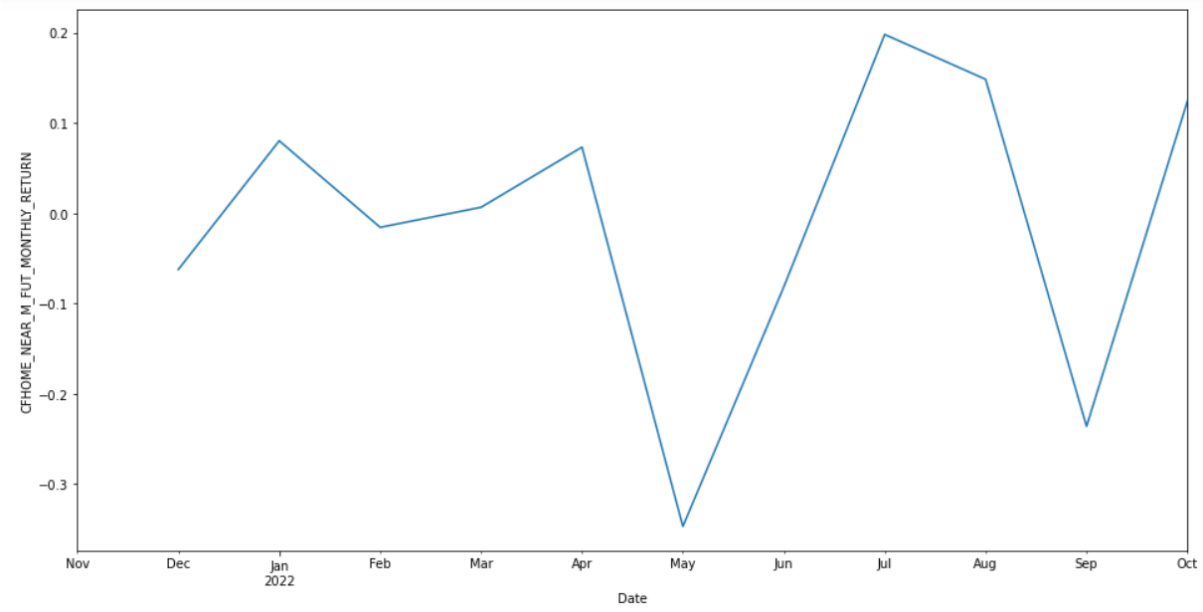
Near Month Returns Graphs:



Near Month Daily Frequency



Near Month Weekly Frequency



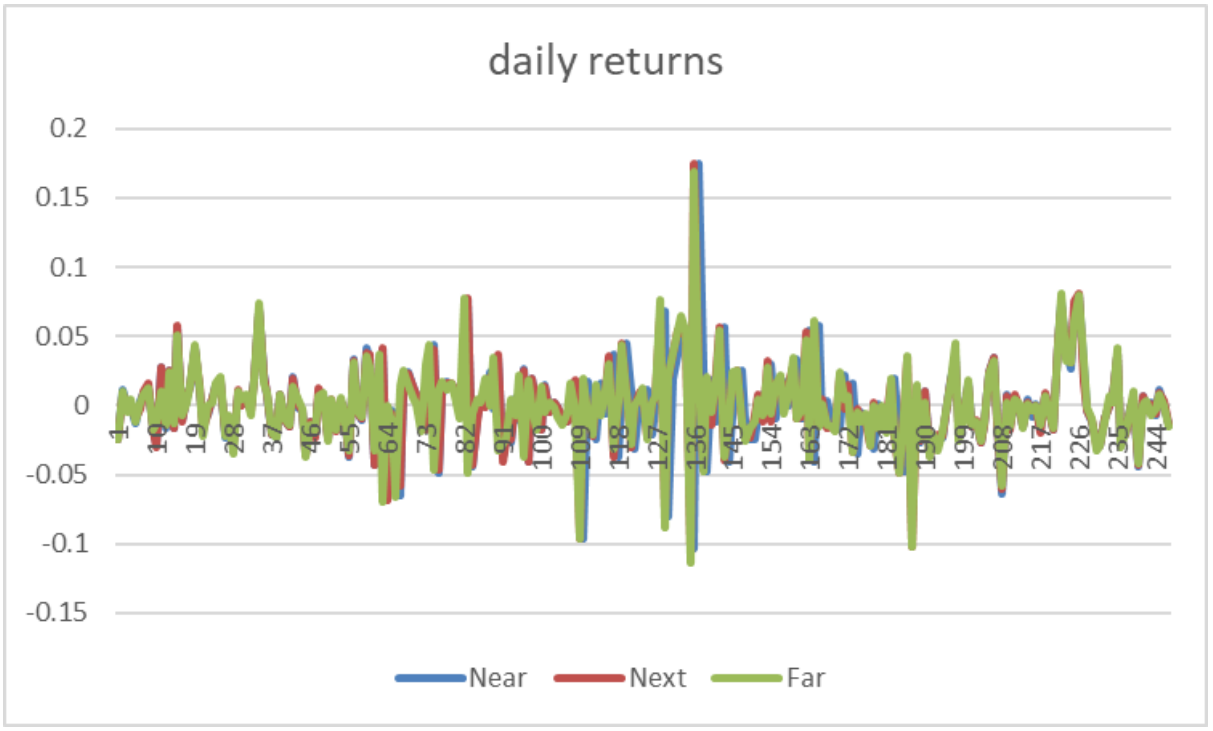
Near Month Monthly Frequency

1.9 Comparing Near, Next and Far Future Returns:

Comparing the daily frequency, we observe that all 3 types of futures contracts on the stock are giving negative returns on a per annum basis. From the table we observed that the far month futures contracts have the best returns among the three and will lead to the least amount of losses

Metric	Near	Next	Far
Minimum	-0.1755	-0.1751	-0.1698
Maximum	0.1026	0.1059	0.1133
Mean	-0.2406	-0.2428	-0.2337
Standard Deviation	0.4721	0.4797	0.4797

The values in the table need to be Multiplied with 100 to get the returns in per annum.



1.10 Using CAPM model for finding Expected Returns:

CAPM model is a model which utilizes a parameter beta(b) which measures sensitivity of stock price movement to corresponding market movements. This beta parameter is found by Top-Down approach via Regression analysis where the dependent variable is kept as market returns. For our analysis, we have chosen the NIFTY 50 index as the stock belongs to the same index.

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

where:

ER_i = expected return of investment

R_f = risk-free rate

β_i = beta of the investment

$(ER_m - R_f)$ = market risk premium

CAPM model formula utilized for finding expected return.

The Beta for CANFINHOME found is 1.3724

$ER_i = R_f + b(R_m - R_f)$

$R_m = 0.45\%$, $R_f = 4.58\%$(daily)

solving for ER_i we get the value as -1.0781%

comparing with observed returns which we found as -18.98 %

jensen's alpha = -0.1898 +0.010781 = -0.1790

Since jensen's alpha is negative, the stock performed worse than expected

1.11 Comparing Stock returns to future returns:

It is quite clear from the tables of Risk unadjusted and risk-adjusted return that all the mean values are negative implying negative annualized return. However, The annualized return of the underlying stock is more on a daily, weekly and monthly basis than the near month, next month and far month future.

Risk unadjusted mean comparison:

Metric	Spot Market	Near month	Next month	Far month
Daily Weekly Monthly	-0.1898 -0.1927 -0.1232	-0.1957 -0.1987 -0.1323	-0.1979 -0.2009 -0.1258	-0.1889 -0.1916 -0.1180

The values in the table need to be Multiplied with 100 to get the returns in per annum.

Risk adjusted mean comparison:

Metric	Spot Market	Near month	Next month	Far month
Daily Weekly Monthly	- 0.2357 -0.2502 -0.7184	-0.2406 -0.3009 -0.8453	-0.2428 -0.3015 -0.8320	-0.2337 -0.3001 -0.8222

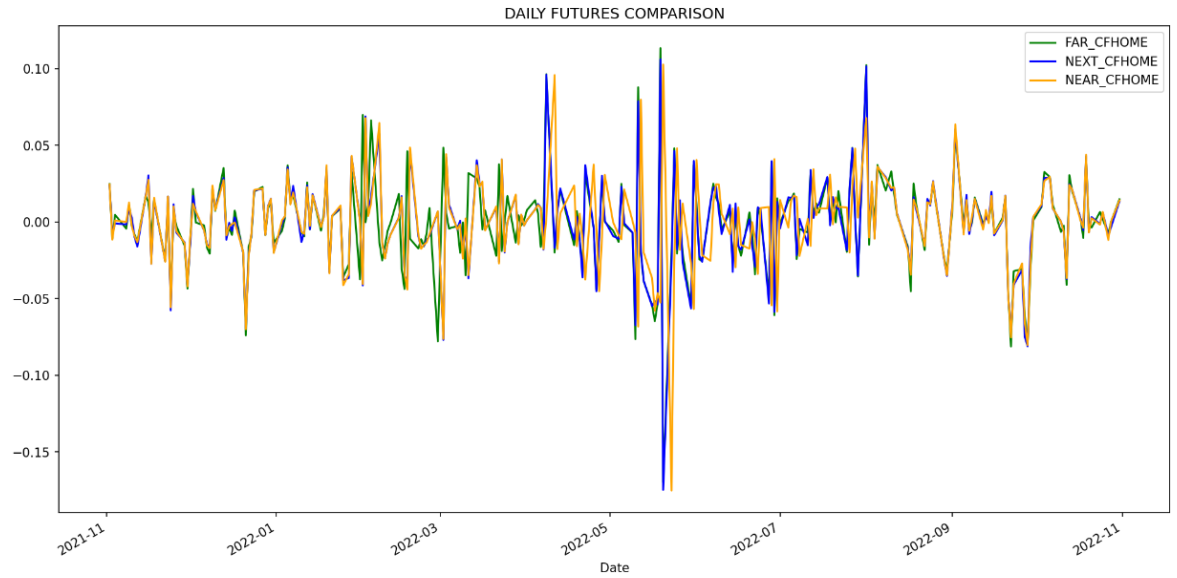
The values in the table need to be Multiplied with 100 to get the returns in per annum.

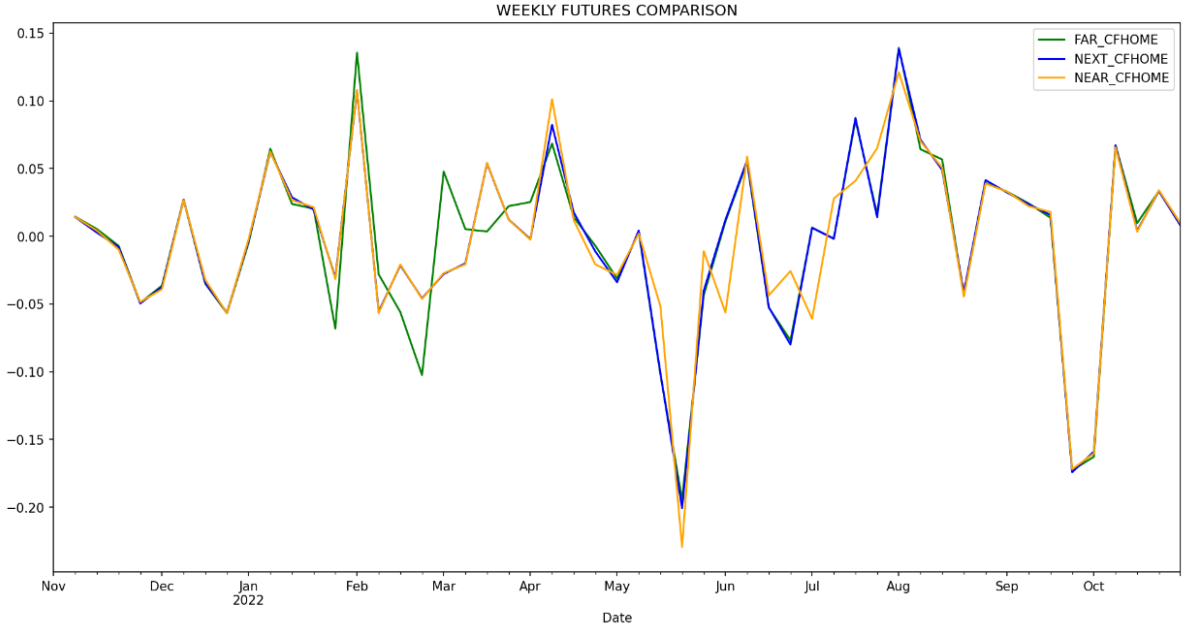
There is a significant difference between the risk-adjusted and risk unadjusted data. Due to the significant risk of loss they carry, risk-adjusted returns are always a superior statistic to use when comparing stock and futures returns.

The volatility of both risk-adjusted and unadjusted returns is highest for monthly returns and lowest for daily returns

The far month future gives a better return on the monthly basis, whereas the near month future shows the lowest return. On the other hand, the near month shows better returns on a daily basis than that of the next month and the far month. Again, on a weekly basis, the next month shows a poorer return than that of the near and far month.

Therefore it is encouraged to invest in the spot market rather than equities futures since, with the exception of the daily time period, the Sharpe ratio is far more favourable for spot market investors as on a weekly and monthly basis, the Sharpe ratio is higher for the spot market.


DAILY FUTURES COMPARISON
FAR_CFHOME
NEXT_CFHOME
NEAR_CFHOME
0.10
0.05
0.00
−0.05
−0.10
−0.15
2021-11
2022-01
2022-03
2022-05
2022-07
2022-09
2022-11
Date


WEEKLY FUTURES COMPARISON
FAR_CFHOME
NEXT_CFHOME
NEAR_CFHOME
0.15
0.10
0.05
0.00
−0.05
−0.10
−0.15
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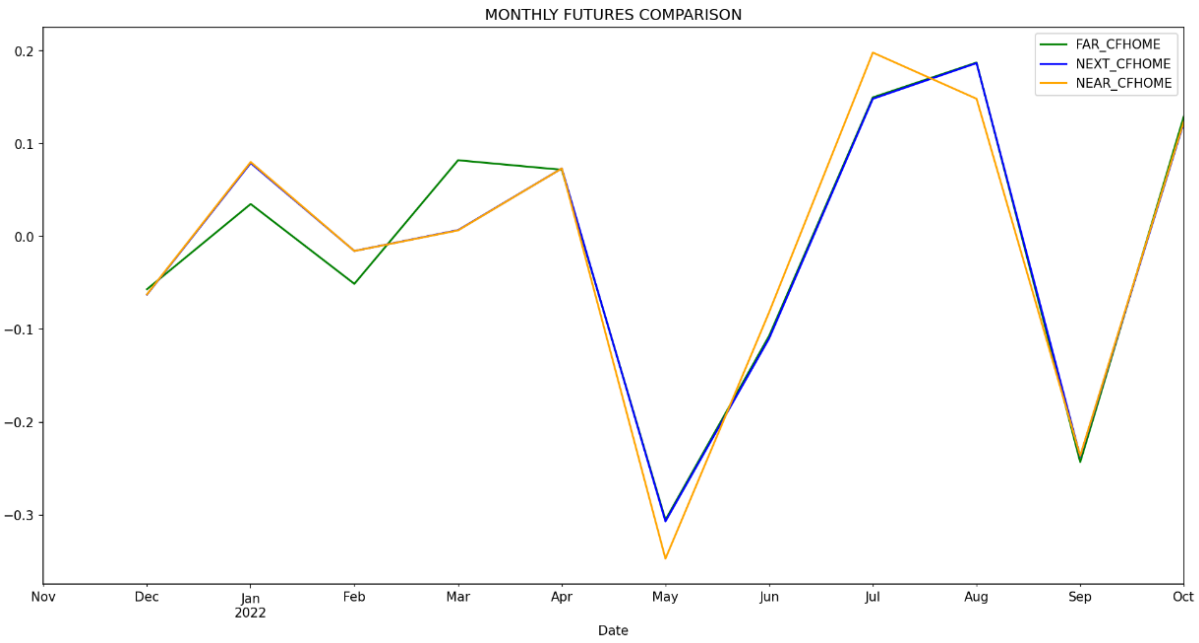


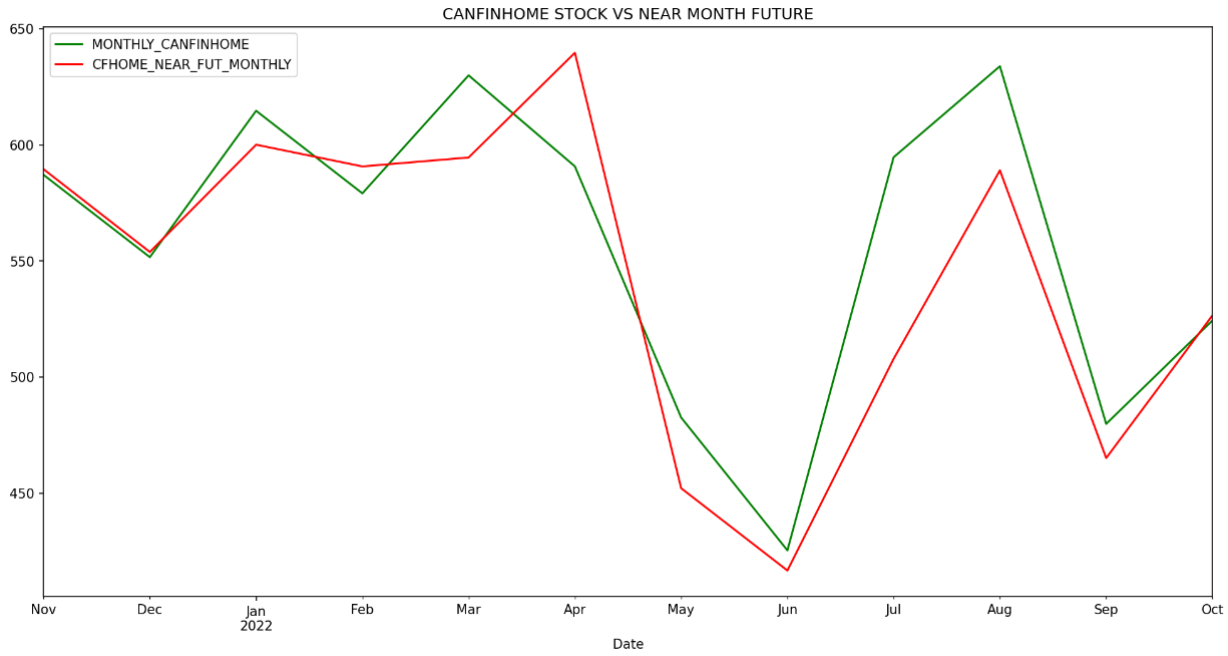
1.12 Sharpe ratio comparison:

Frequency	Spot Market	Near month	Next month	Far month
Daily Weekly Monthly	-0.5864 -0.4869 -0.2876	-0.5116 -0.5219 -0.2946	-0.5082 -0.5283 -0.3142	-0.4890 -0.4919 -0.2958

But as the Sharpe is negative all over it is better to invest on the risk-free market than the futures and spot market.

1.13 Contango or Backwardation of CANFINHOME futures:

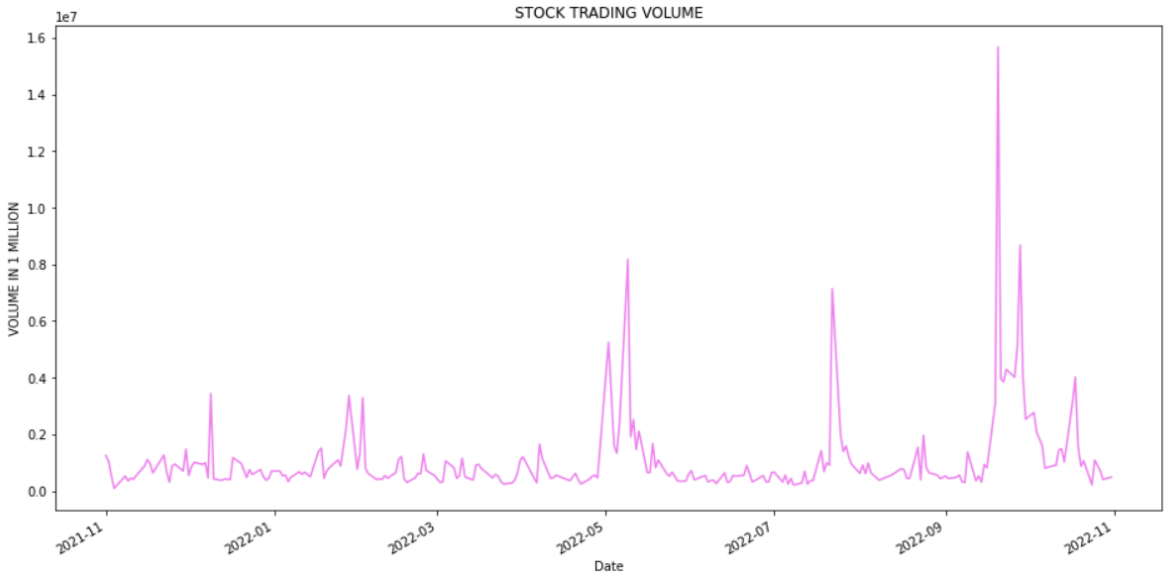
From the below graph plot showing futures price vs stock price over a one year time period, we can observe that the futures of the stock underwent backwardation from Dec 2021 to Mid-March 2022 followed by a brief contango period till May 2022 after which it continuously exhibited backwardation.

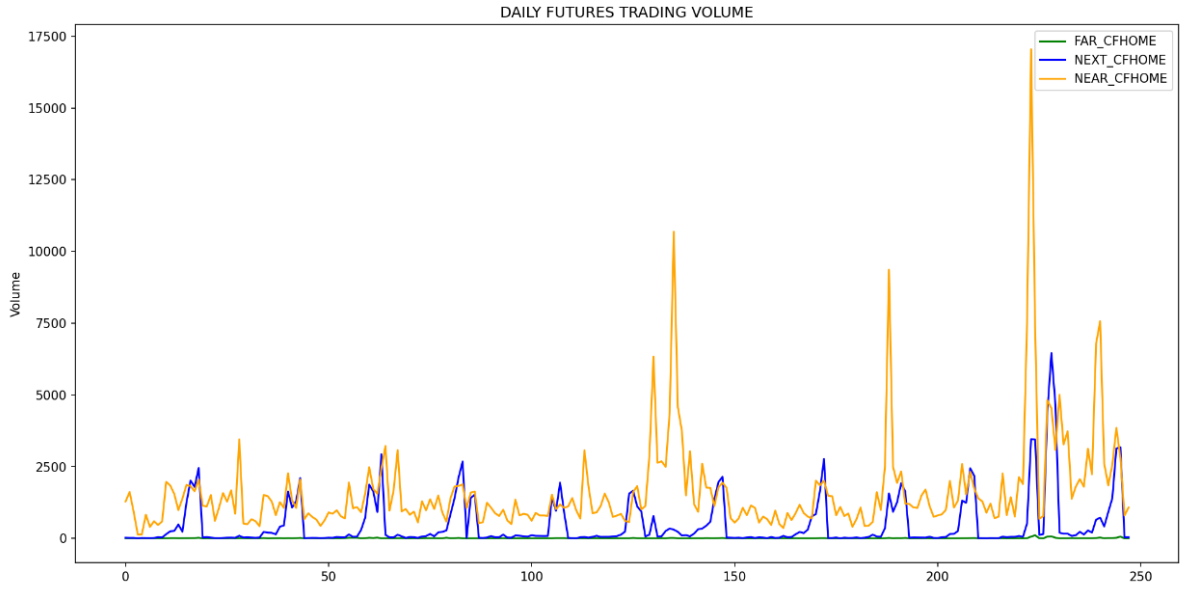


1.14 Optimal Frequency for trading stocks and futures:

Considering the risk adjusted returns obtained for both the stock and underlying future contract, the daily returns are the best case scenario at -23.57% and hence the optimal frequency for trading stocks is daily.For a trader investing in near futures, the daily returns give the best case scenario at -24.06% and hence the optimal frequency for trading stocks is daily.

1.15 Liquidity:





We can observe from the above graphs that the stock and near futures contracts have a good liquidity position on the basis of number of shares outstanding/ contracts traded while next futures have low liquidity and for far futures, the liquidity is negligible. Therefore it is advised to the investor to trade in stock or its underlying near month future contracts to ensure consistent returns.

1.16 Conclusion:

To summarize the report, we concluded after conducting analysis on risk-adjusted returns on Canfinhome stocks and its underlying futures that all the returns obtained from both asset types are negative . In stocks the best case returns comes with the daily frequency at -23.57% p.a

If an investor does intend to invest in Canfinhome future contracts, on the basis of comparative analysis of risk adjusted returns of the three types of futures available, we concluded that following daily frequency, far month futures gives the highest return of -23.04% and is the best case scenario for future trading returns. For near and next months too daily frequency is the best case giving -24.06% and -24.28% returns respectively. From the CAPM model, we concluded that the stock returns underperformed expected returns and overall the stock is not doing well in the market.Also using graphical analysis of stock prices vs future prices, we concluded that futures of the stock underwent backwardation for most of the time period under which the prices were observed.

Hence we conclude that investing in the stock or its underlying futures is not a profitable venture.

2 POWERGRID

2.1 Introduction

2.1.1 Nature of Business

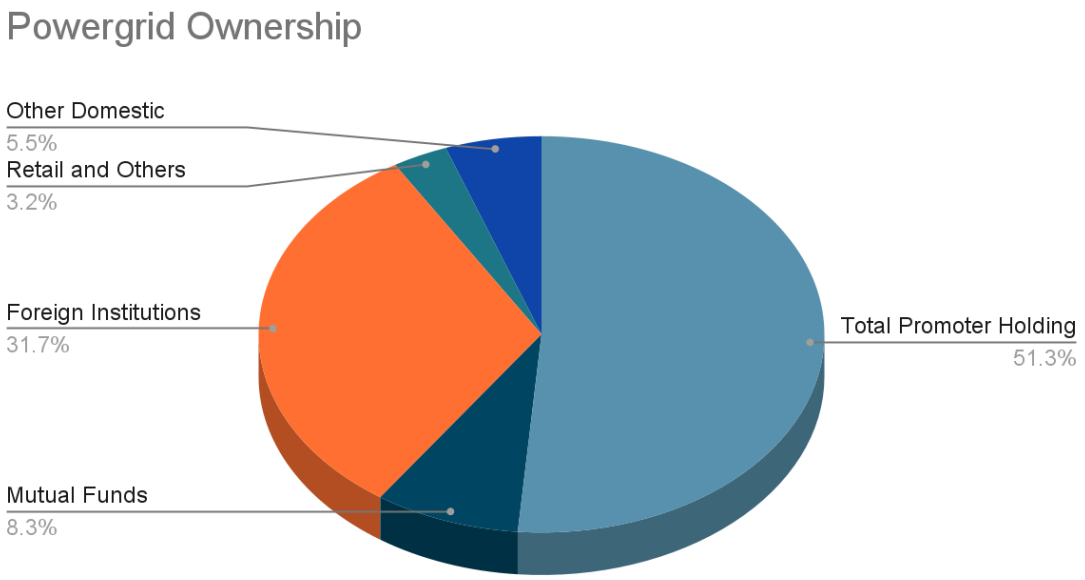
Power Grid Corporation of India Limited is a central government undertaking in India. Its primary activity is the bulk power transmission between the various Indian states. In order to ease the flow of power within and between the Regions with dependability, security, and economy based on solid commercial principles, it is also responsible for setting up and running national and regional power grids.

2.1.2 Ownership

It is a publicly traded corporation that is listed on the NSE and BSE. The promoters own 51.34% of the company, while foreign institutions own 31.69%, mutual funds own 8.31%, and retail owners and others own 3.16%.
As of September 2022.

Description	Share
Total Promoter Holding	51.34%
Mutual Funds	8.31%
Foreign Institutions	31.69%
Retail and Others	3.16%

Other Domestic Institutions	5.50%



2.1.3 Business Commencement Circumstances

The Power Grid Corporation of India Limited was established on October 23, 1989, in accordance with the Companies Act, 1956, with a Rs. 5,000 crore authorised share capital.

The "National Power Transmission Corporation Limited," as it was originally known, was tasked with organising, implementing, owning, running, and maintaining the nation's high-voltage transmission networks.

2.1.4 Industry of the Business

Powergrid falls in the industry of electricity transmission throughout the country.

Its business segments include Transmission, Consultancy, Telecom and ULDC/ RLDC.

2.1.5 Greatness of the Company

Power Grid is present throughout India and accounts for 90% of the country's interstate and interregional electric power transmission infrastructure.

In addition to providing a transmission system for the evacuation of central sector power, the corporation is in charge of setting up and running regional and national power grids to facilitate the transfer of power within and between the

Regions in a reliable, secure, and cost-effective manner based on sound business principles. In October 1998, the company received recognition as a Mini-Ratna Category-I Public Sector Undertaking based on its performance. The Indian government granted it "Navratna" status in May 2008 and "Maharatna" status in October 2019.

2.2 Underlying Stock Returns

From Table 2.1, we can see that the average daily,weekly and monthly return are all positive.The annual mean of daily stock returns is 24.7% this means that daily trading can be profitable.For weekly the returns are around 25.1% and the same for annual returns is 16.3%.From this we can say that trading the stock weekly was more profitable than annual and daily.

Metric	Daily	Weekly	Monthly
Minimum	-0.083	-0.149	-0.094
Maximum	0.0583	0.068	0.0803
Mean	0.247	0.251	0.163
Standard Deviation	0.265	0.265	0.195

Table2.1: Comparison between daily, weekly and monthly risk- unadjusted returns(*100%)

The values in the table need to be Multiplied with 100 to get the returns in per annum.

2.3 Underlying Stock Risk-Adjusted Returns

In table 3.1, it is clear that for monthly returns, the risk-adjusted returns are negative. The annualized mean of daily return is 20.18%, whereas it is 18.20% for weekly returns and -3.03% for monthly returns.Here we can obtain more profit by trading daily compared to weekly and annually.

Metric	Daily	Weekly	Monthly
Minimum	-0.083	-0.15	-0.098
Maximum	0.0581	0.068	0.0671
Mean	0.2018	0.182	-0.0303
Standard Deviation	0.265	0.579	0.948

Table3.1: Comparison between daily, weekly and monthly risk-adjusted returns

The values in the table need to be Multiplied with 100 to get the returns in per annum.

2.4 Economic Interpretation of risk adjusted and risk unadjusted returns

As previously said, risk plays a significant role in assessing if an investment is suitable. Without taking risk into consideration, the returns are unfinished and provide a false impression of how an investment should be made.

When the risk is considered, the return shows if it is worthwhile to take on more risk to earn a higher return than the risk-free rate. The risk-free return is always positive since it is backed by a sovereign nation.

As a result, the risk-adjusted return will never be exactly the same as the unadjusted return. When the Sharpe ratio is negative, investing in risk-free assets is preferable for the investor to do so in the company's assets. The Sharpe ratio has to be higher than zero to turn a profit.

Using the Sharpe ratio, we alter the returns to take into account the investment's risk:

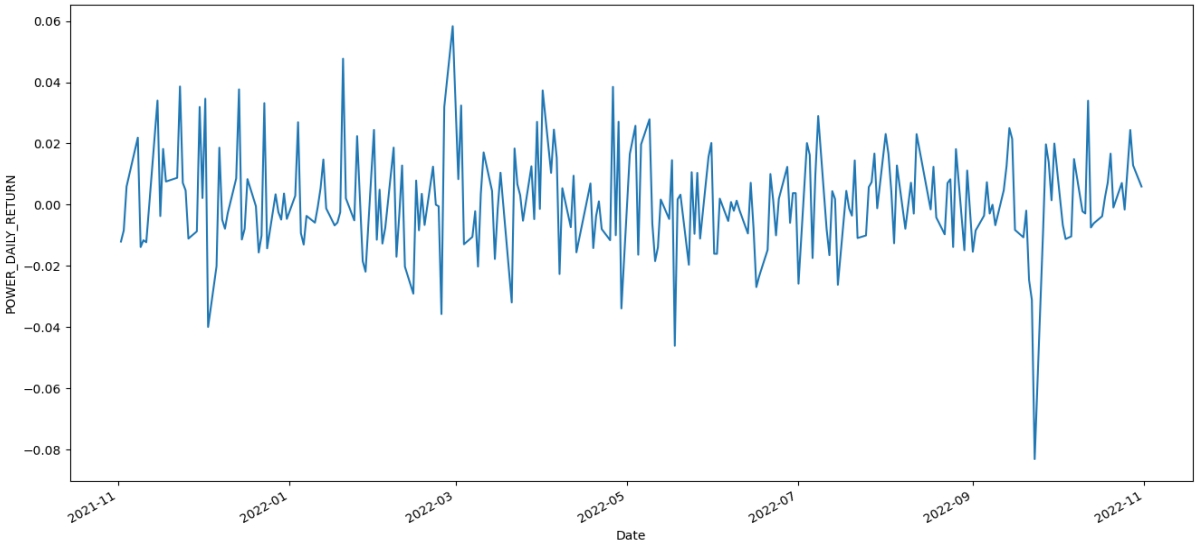
Sharpe ratio = E [Rx − Rf]/σ[Rx − Rf]

Rx = Risk unadjusted return
Rf = Risk-free rate or T-bills rate
E= Expected value of return
σ = Standard deviation

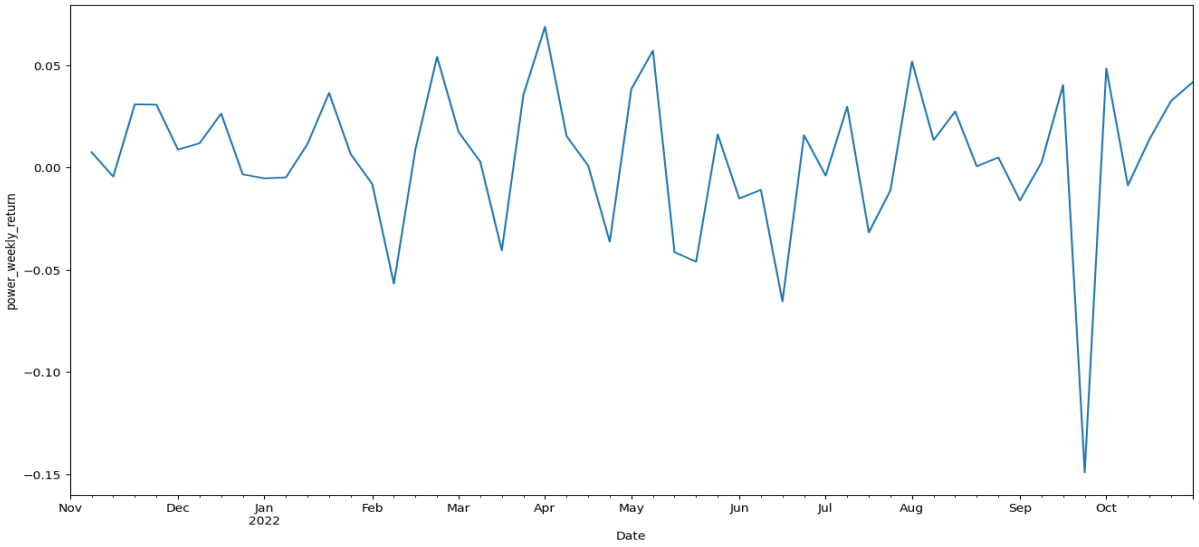
Time-frequency	Sharpe ratio
Daily Weekly Monthly	0.759 0.773 0.604

Observation:

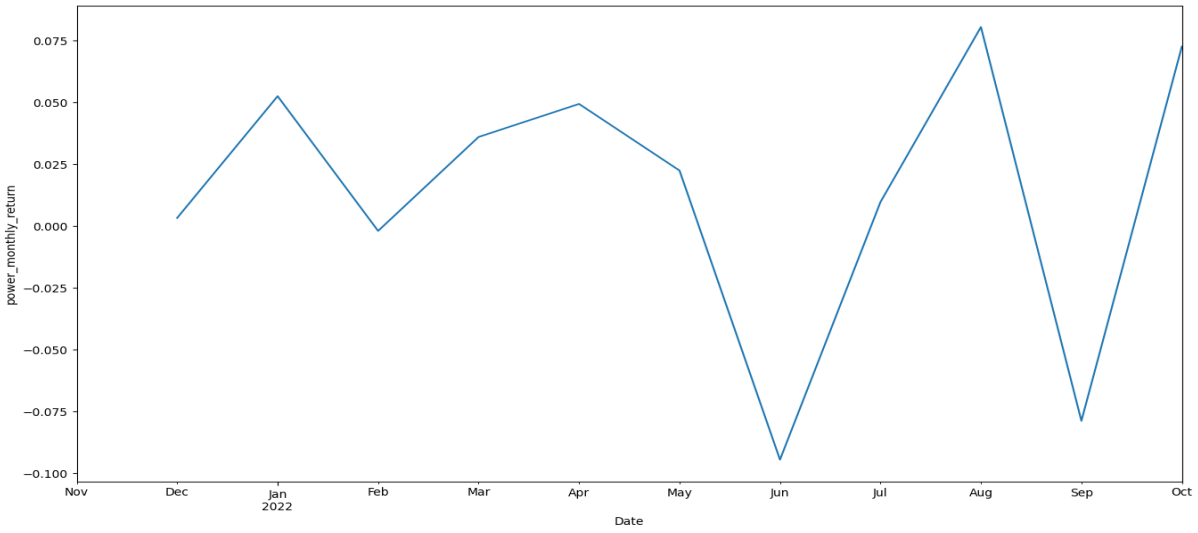
- The only difference between the graphs for the risk-adjusted and risk-unadjusted returns is the low T-Bill rates.
- The risk-adjusted annualized returns on the daily, weekly and monthly basis are all positive.
- The standard deviation is more significant than the average return, making the share price more volatile. Volatility is higher for the monthly return. Volatility decreases from monthly to daily basis.
- Careful investment in POWERGRID in all three daily, weekly and monthly frequencies is advised due to their positive Sharpe ratios



Daily returns



Weekly returns



Monthly returns

2.5 Equity Futures

2.5.1 Commencement of Equity Futures

The future contracts for POWERGRID started to trade from 3rd February,2016

2.5.2 Lot size and Contract Specifications

POWERGRID is currently trading in the Futures and Options market of the NSE with a lot size of 2700 and a total of around 1263 near, next and far month contracts.

SYMBOL	POWERGRID
INSTRUMENT	FUTSTK
LOT SIZE	2700
EXPIRY DATE	Last Thursday of every week. If Thursday is a holiday, expiry is previous trading day
TRADING CYCLE	3-month trading cycle – the near month (one), the next month (two), and the far month (three).
TRADING HOURS	As per equity derivatives segment

2.5.3 Greatness of Equity Futures

Specification	**Value**
Traded Volume (shares)	3,410,100
Traded Value (Lakh)	7,626.35
Market Lot	2700
Open Interest	34,065,900
Change in Open Interest	78,300

2.6. Near Month Returns

From the below table we can see that the returns on any frequency are positive , so it will be profitable to invest in near month futures for this asset.
On comparing the returns of Daily,Weekly and Monthly frequency we can say that Weekly offers the best return of 19.97 % p.a.

Metric	Daily	Weekly	Monthly
Minimum	-0.111	-0.0876	-0.0903
Maximum	0.069	0.0816	0.0913
Mean	0.197	0.1997	0.1594
Standard Deviation	0.286	0.2289	0.2383

The values in the table need to be Multiplied with 100 to get the returns in per annum.

2.7.Near Month Risk-Adjusted Returns

Adjusting returns with risk ensures that any excess return observed due to standard deviation is taken into consideration.

From the table given below we can see that the returns in all the frequencies except monthly are positive so it is advisable to trade in those frequencies.

The best case return that we can get is 12.58% p.a returns where we trade on a weekly basis.

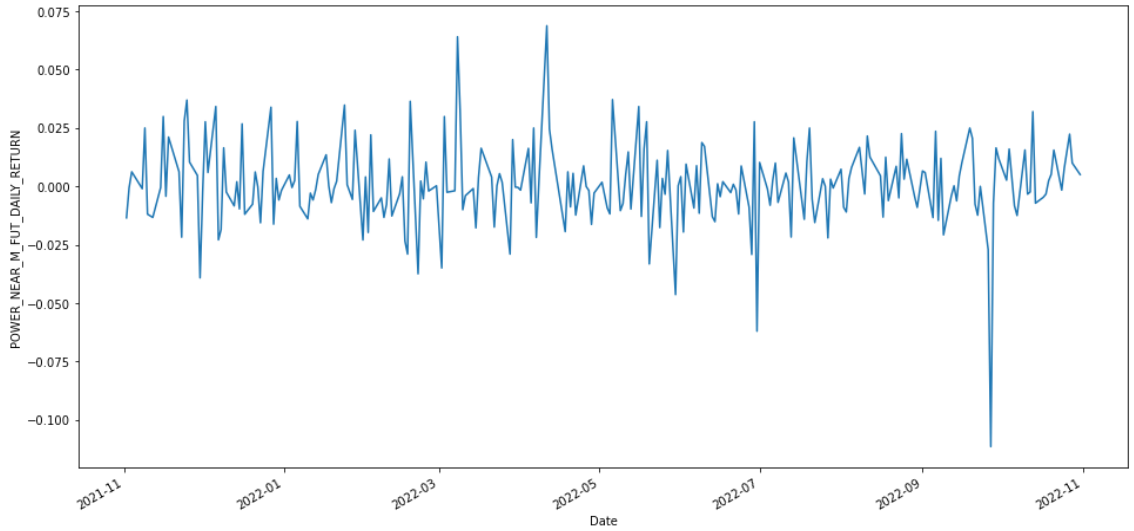
Metric	Daily	Weekly	Monthly
Minimum	-0.112	-0.0887	-0.09546
Maximum	0.069	0.0808	0.0860
Mean	0.150	0.1258	-0.0708
Standard Deviation	0.286	0.4976	1.1606

The values in the table need to be Multiplied with 100 to get the returns in per annum.

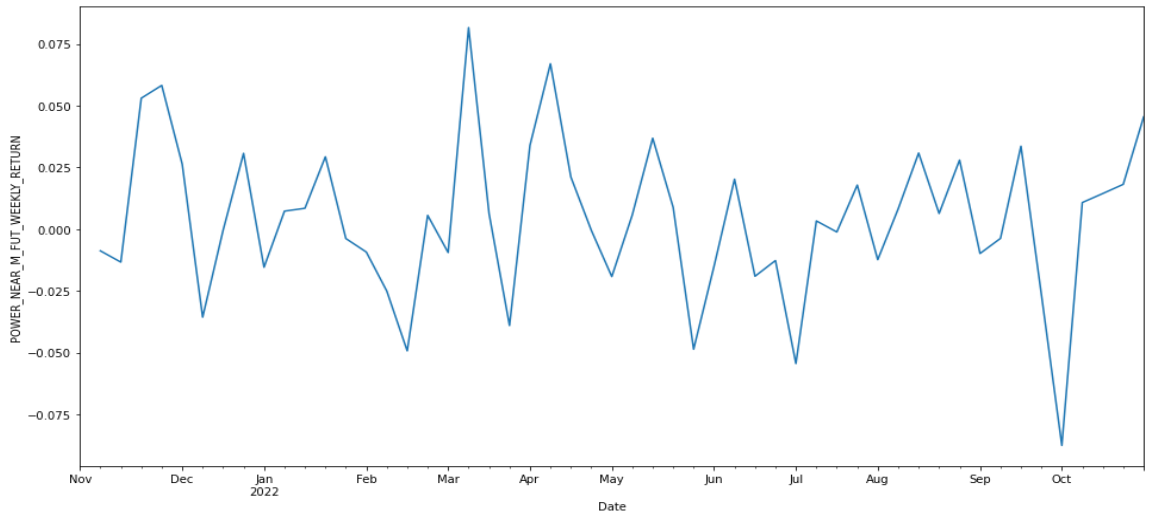
2.8.Economic interpretation of risk-adjusted and unadjusted near month returns

From both risk unadjusted and risk adjusted returns of near month we have positive values and we can see that risk adjusted returns are lesser than risk unadjusted returns.

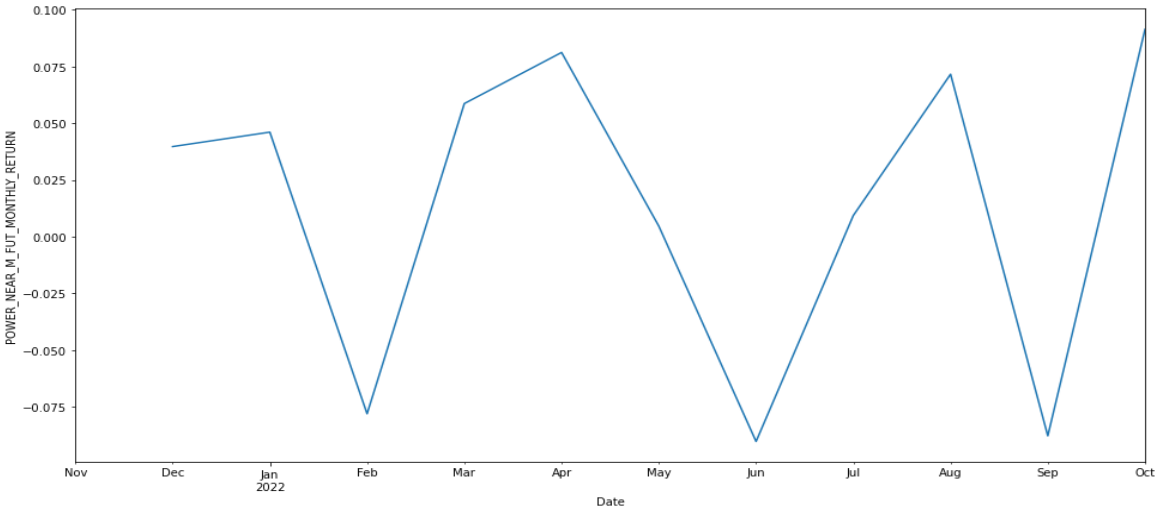
Hence if an investor doesn't account for the excess returns due to underlying standard deviation of the returns, they will be entrapped with the idea of expecting higher returns from their investment



Near Month Daily Frequency



Near Month Weekly Frequency



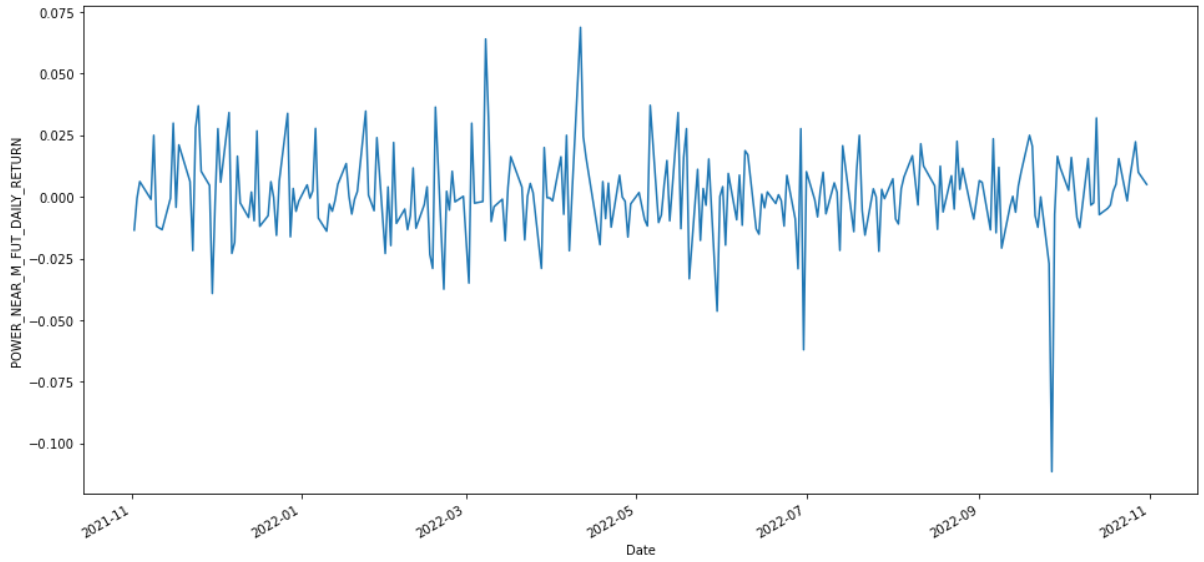
Near Month Monthly Frequency

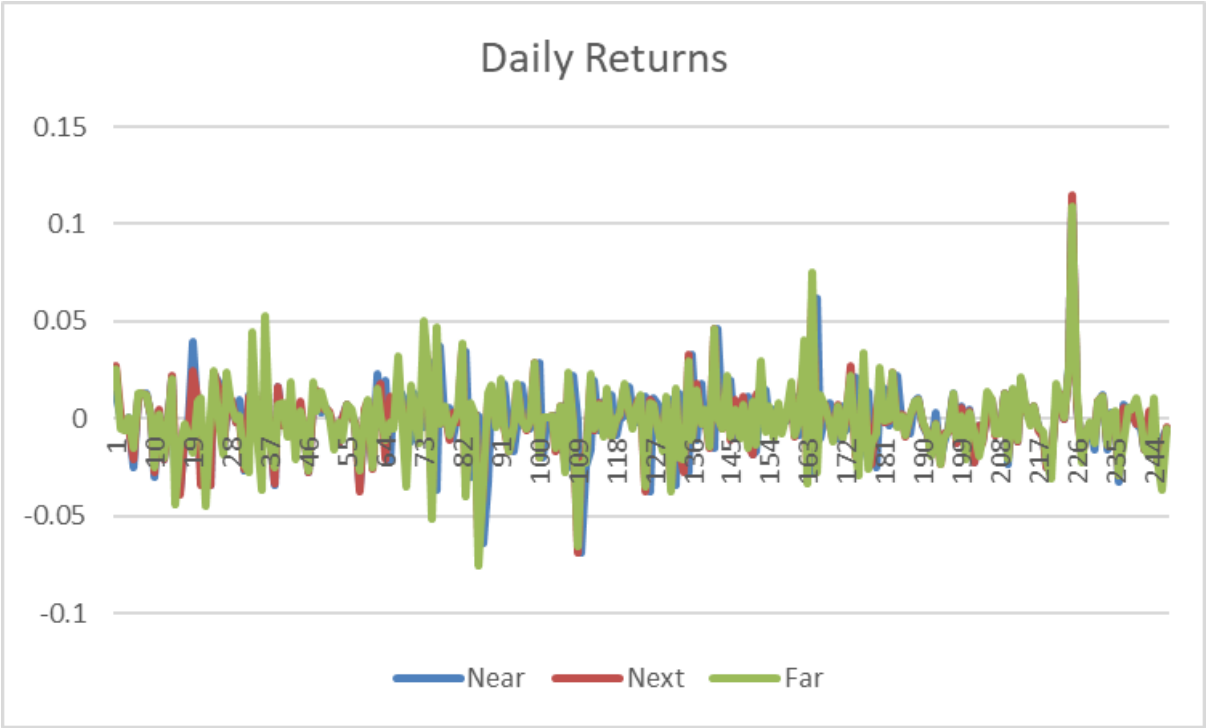
2.9.Comparison between Near, Next, Far month risk adjustment daily risk-adjusted returns:

Comparing the daily frequency, we observe that all 3 types of futures contracts on the stock are giving positive returns on a per annum basis. From the table we observed that the near month futures contracts have the best returns among the three and will lead to the highest amount of profit if traded daily.

Metric	Near	Next	Far
Minimum	-0.112	-0.115	-0.115
Maximum	0.069	0.069	0.069
Mean	0.150	0.140	0.007
Standard Deviation	0.286	0.286	0.286

The values in the table need to be Multiplied with 100 to get the returns in per annum.





2.10.Using CAPM model for finding Expected Returns:

CAPM model is a model which utilizes a parameter beta(b) which measures sensitivity of stock price movement to corresponding market movements. This beta parameter is found by Top-Down approach via Regression analysis where the dependent variable is kept as market returns. For our analysis, we have chosen the NIFTY 50 index as the stock belongs to the same index.

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

where:

ER_i = expected return of investment

R_f = risk-free rate

β_i = beta of the investment

$(ER_m - R_f)$ = market risk premium

CAPM model formula utilized for finding expected return.

The Beta for POWERGRID found is 0.4745

$ER_i = R_f + b(R_m - R_f)$

$R_m = 0.45\%$, $R_f = 4.58\%$(daily)

solving for ER_i we get the value as -3.818%

comparing with observed returns which we found as 24.7 %

jensen's alpha = 0.247 +0.03818 = 0.28518

Since jensen's alpha is positive, the stock performed better and gave excess returns then expected

2.11.Comparing Stock returns to future returns:

It is quite clear from the tables of Risk unadjusted and risk-adjusted return that all the mean values are positive implying positive annualized return. However, The annualized return of the underlying stock is more on a daily, weekly and monthly basis than the near month, next month and far month future.

Risk adjusted mean comparison:

Metric	Spot Market	Near month	Next month	Far month
Daily Weekly Monthly	0.2018 0.1821 -0.0303	0.150 0.1258 -0.0708	0.140 0.1116 -0.0611	0.007 0.1672 -0.0913

The values in the table need to be Multiplied with 100 to get the returns in per annum.

Risk unadjusted mean comparison:

Metric	Spot Market	Near month	Next month	Far month
Daily Weekly Monthly	0.247 0.261 0.163	0.1967 0.1997 0.1594	0.1861 0.1890 0.1626	0.1977 0.2470 0.1388

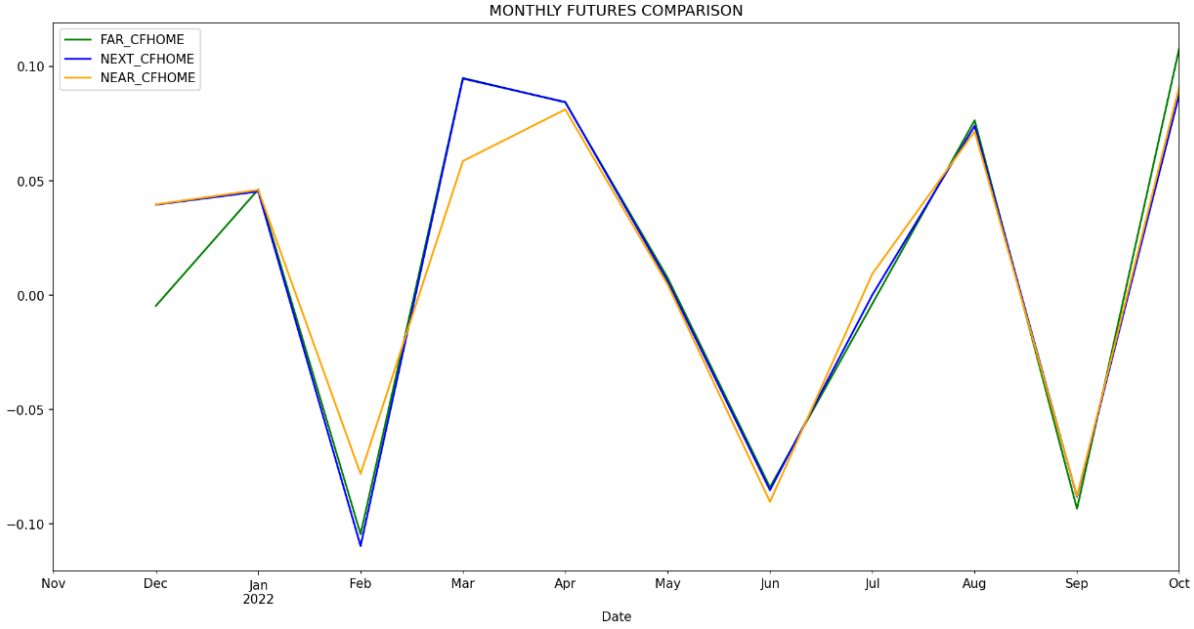
The values in the table need to be Multiplied with 100 to get the returns in per annum.

There is a significant difference between the risk-adjusted and risk unadjusted data. Due to the significant risk of loss they carry, risk-adjusted returns are always a superior statistic to use when comparing stock and futures returns.

The volatility of both risk-adjusted and unadjusted returns is highest for monthly returns and lowest for daily returns

The Near month future gives the best return on a daily basis, the Far month future shows the best return on a weekly basis and the Next Month Futures gives the best returns on a monthly basis .

Therefore it is encouraged to invest in the spot market rather than equities futures since the Sharpe ratio is far more favorable for spot market investors as on a daily, weekly and monthly basis.


MONTHLY FUTURES COMPARISON
FAR_CFHOME
NEXT_CFHOME
NEAR_CFHOME
0.10
0.05
0.00
−0.05
−0.10
Nov
Dec
Jan
2022
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Date


WEEKLY FUTURES COMPARISON
FAR_CFHOME
NEXT_CFHOME
NEAR_CFHOME
0.100
0.075
0.050
0.025
0.000
−0.025
−0.050
−0.075
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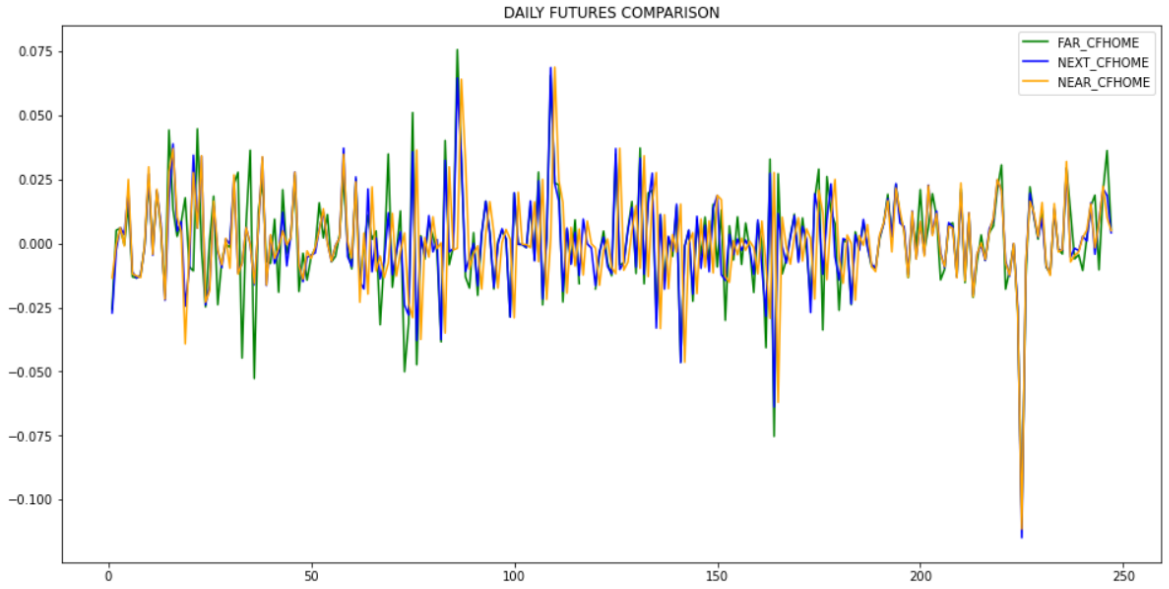


2.12.Sharpe ratio comparison:

Here, Sharpe ratio is positive all over the spot market and equity futures. The higher Sharpe ratio provides more return over risk.

Frequency	Spot Market	Near month	Next month	Far month
Daily	0.7596	0.5276	0.4907	0.4675
Weekly	0.7737	0.6724	0.6037	0.7884
Monthly	0.6041	0.4765	0.4427	0.3438

On an average, on a monthly basis, the spot market Sharpe ratio is much higher than the equity futures. So, it is encouraged to invest in the spot market on the monthly basis. Whereas, for the weekly basis the far month future Sharpe ratio is more favorable than the spot market and for the daily basis it is encouraged to invest in the spot market rather than equity as the Sharpe ratio is far more favorable in the spot market.

2.13.Contango or Backwardation of POWERGRID futures:

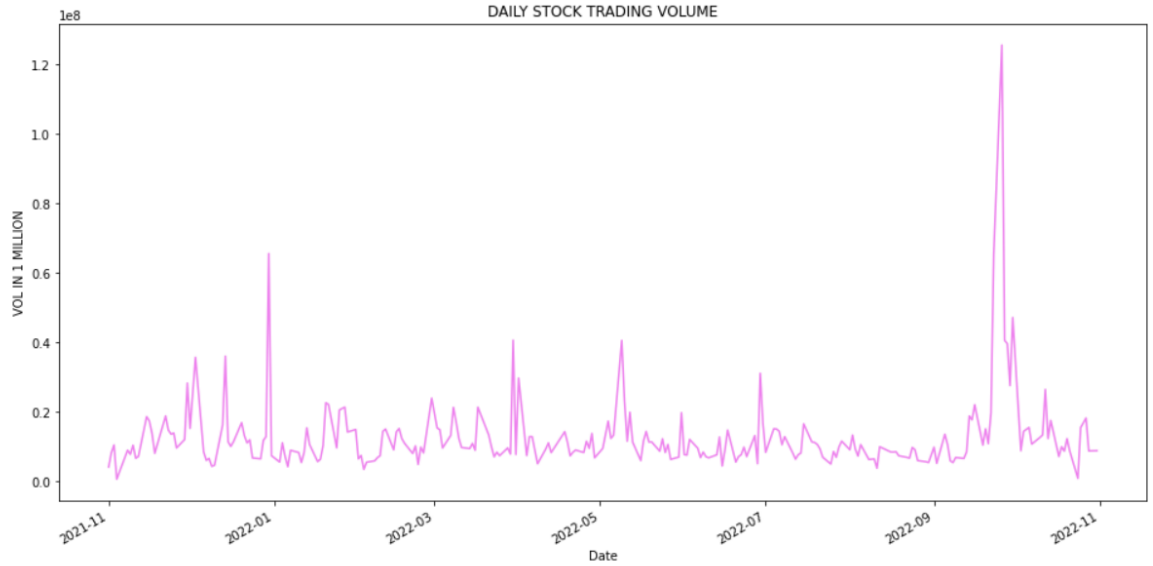
From the below graph plot showing futures price vs stock price over a one year time period, we can observe that the futures of the stock underwent contango for most of the time period under which the prices were observed , it was in backwardation for a brief period during February 2022 to March 2022.

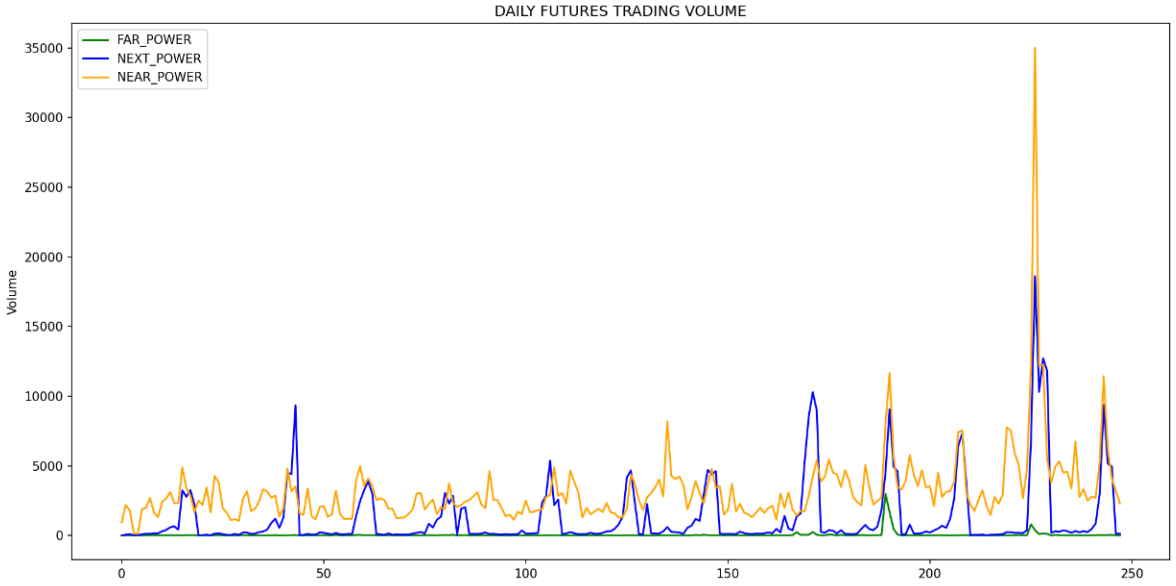
2.14.Optimal Frequency for trading stocks and futures:

Considering the risk adjusted returns obtained for both the stock and underlying future contract, we can observe that trading on a daily basis for both investments gives us the best returns and highest profits.

For futures, a particular optimal frequency could not be established as different future types gave the best return at different time periods.

2.15.Liquidity:





We can observe from the above graphs that the stock and near futures contracts have a good liquidity position on the basis of number of shares outstanding/ contracts traded while next futures have low liquidity and for far futures, the liquidity is negligible. Therefore it is advised to the investor to trade in stock or its underlying near month future contracts to ensure consistent returns.

2.16.Conclusion:

To summarize the report, we concluded after conducting analysis on risk-adjusted returns on Powergrid stocks and its underlying futures that investing in stocks gives you a higher return in general. In stocks the optimum trading frequency is daily trading which gives the investor a 20.1% return p.a compared to weekly returns of 18.2% weekly and negative returns on monthly returns.

If an investor does intend to invest in Powergrid future contracts, on the basis of comparative analysis of risk adjusted returns of the three types of futures available, we concluded that for daily frequency, near futures gives the highest return of 15%, for weekly frequency far futures gave the highest return at 16.72% and for monthly frequency, next futures gave the best case negative return at -6.11%. From the CAPM model, we concluded that the stock returns outperformed expected returns and overall the stock is doing well in the market.Also using graphical analysis of stock prices vs future prices, we concluded that futures of the stock underwent contango for most of the time period under which the prices were observed

Hence we conclude that investing in the stock or its underlying futures is in overall a profitable venture.

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