BITS Pilani Hyderabad Campus

As part of the course

FIN F354 - Derivatives and Risk Management

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Group Number: 10

Instrument Names: TATACONSUM, TECHM, RECLTD

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ABSTRACT

The portfolio research report aims to examine the equities and derivatives of firms from several Indian Market sectors, including **Tata Consumer Products Ltd, Tech Mahindra Ltd and REC Limited**. The corporations have chosen a time from **April 3rd, 2023, to March 28th, 2024**. Each company's report begins with a concise introduction outlining the nature of the business, the pattern of ownership tracing the shareholding pattern, a brief history outlining the significant milestones achieved, the influence of the company and its significance to the industry, and concluding it with the greatness of the company. This gives a background analysis of the companies.

A table showing the mean returns for the three frequencies—daily, weekly, and monthly— formed the basis of the analysis. By contrasting the returns, a detailed study is given. Following that, the returns on equity were calculated and graphed against dates for each of the three frequencies. The returns were then risk-adjusted by subtracting the T-Bill rate for the same frequency to have a clearer picture. This demonstrates the extra returns earned. To understand the excess return per unit of risk taken and the Sharpe Ratio was calculated.

The underlying risk-adjusted and risk-unadjusted returns are compared to the risk-adjusted and risk-unadjusted returns of the futures instrument. An overview of the associated trends and a quick remark on backwardation and contango are included. In a well-diversified portfolio, the best possible portfolio is sought after in this report by using a variety of financial instruments.

ACKNOWLEDGEMENT

We are incredibly grateful to Prof. ACV Subramanyam for allowing us to work on this project. This project was a huge learning curve for us as it gave us an excellent way to apply what we had learned in our course. The project wouldn't have been possible without the help and insights provided by the professor. We want to thank Prof. Subramanyam for being patient with us, giving us his precious time to help us figure out the project, and guiding us through every step. We would also like to thank the Economics Department of BPHC for providing a great opportunity to gain hands-on experience applying what we have learned. The project has helped us develop skills in report making and researching for data, improving our skills to excel in the field. The project was challenging, and every difficulty we encountered encouraged us to do more research and learn more about the topic.

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Section-1 (Underlying Assets-Equity)

1. Introduction

1.1 Tata Consumer Products Limited:

Figure: Logo - Tata Consumer Products Ltd.

A member of the Tata Group, Tata Consumer Products Limited is a transnational holding company with a public listing in India. Tata Consumer Products Limited has been guided by the philosophy of delivering high quality consumer products, serving the underserved areas of India. Since the Company's listing in 1986, under its former name Tata Tea Ltd., it has maximized value for stakeholders while contributing to nation-building. Tata Consumer Products Limited is presently focused on businesses related to beverages, packaged foods, water management, ready-to-eat meals, and nutritional solutions. Its diverse portfolio includes iconic tea brands, coffee, bottled water, and other consumer products.

In 2022–2023, Tata Consumer Products Limited forecasted ₹13,783 crores in revenue. Tata Tea Ltd., the original name of Tata Consumer Products Ltd., was formed in 1964. The business was established in 1964 to capitalize on the growing demand for tea in India and globally. The company was awarded the 'Masters of Risk' award in the FMCG Sector Large Cap category at the 8th CNBC-TV18 India Risk Management Awards for three consecutive years, and ranked as the 5th most chosen FMCG brand in India by Kantar Worldpanel in 2020. It launched its first public offering in 1986.It belongs to the Fast Moving Consumer Products industry.

1.1.2. Nature of Business

TCPL operates in the Fast Moving Consumer Products (FMCP) sector. Its product portfolio includes beverages such as Tea (brands like Tata Tea, Tetley, Goodearth, and Teapigs), Coffee (Tata Coffee Grand and Eight O'Clock Coffee), and water (himalayan waters), packaged food such as Salt (Tata Salt), Pulses and Spices(Tata Sampann), and ready-to-eat and ready-to-cook products. TCPL has a significant market presence overseas and aims to provide high-quality products obtained via sustainable and ethical sourcing practices.

1.1.3. Ownership

As can be seen from Figure 2, Promoters hold 33.55% of the shares in Tata Consumer Products Ltd., while Foreign Institutions hold 25.46% of the shares, Mutual Funds hold 6.58% of the shares, Insurance firms hold 9.86% of the shares and other domestic institutions hold 0.95%, Retail investors hold 18.21% of the shares, and other parties hold 5.40%.

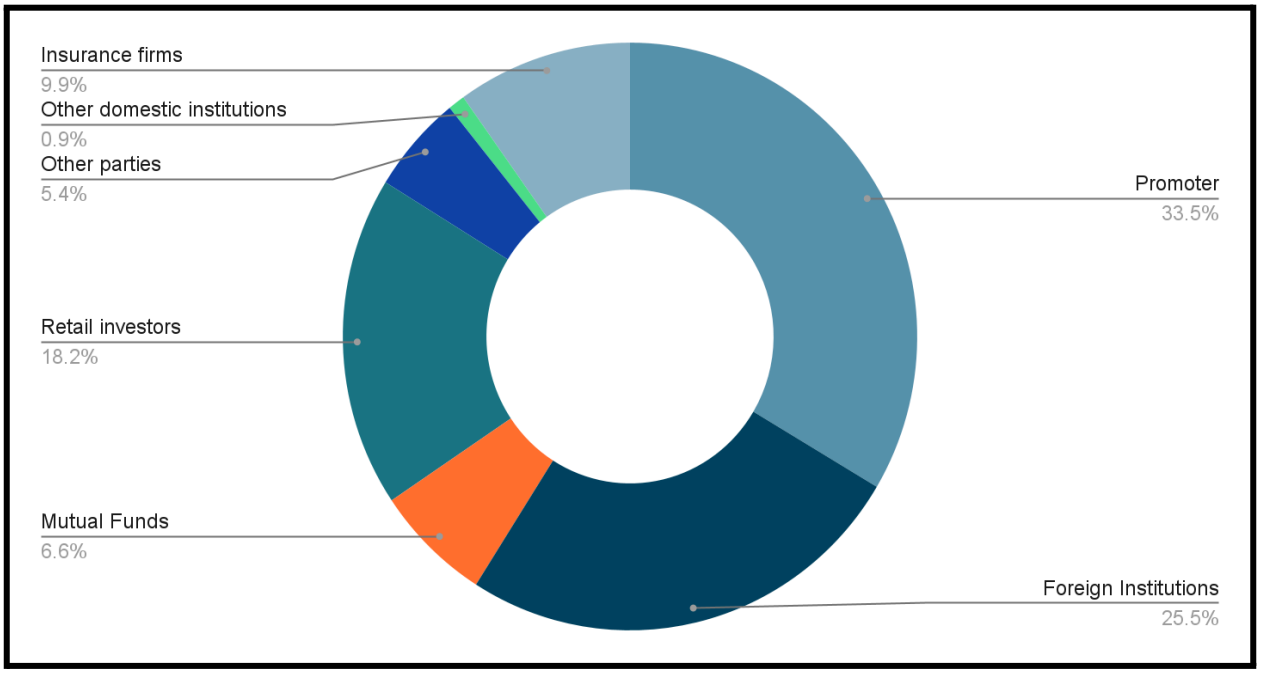


Figure: Shareholding Pattern - Tata Consumer Products Ltd.

1.1.4. Business Commencement Circumstances

- Tata Consumer Products Ltd. was established in February 2020 through a merger between Tata Global beverages and Tata Chemicals Limited. However, its origins can be traced back to 1964 when Tata tea was formed with the aim of producing and marketing high-quality tea. Tata Tea focused on the tea industry and became one of the largest tea companies in the world.
- In the year 2000, Tata tea acquired the iconic brand Tetley and expanded its global footprint in the tea market.
- Tata Tea was rebranded as Tata Global Beverages Limited in 2010 to reflect its broader beverage portfolio.
- Tata Global Beverages Limited entered a 50:50 joint venture with Starbucks Coffee Company in 2012 to operate Starbucks stores in India.
- In May 2018, the Tata Group announced the merger between Tata Chemicals Limited and Tata Global Beverages Limited aiming to create a leading FMCG with a diverse portfolio of products.

- The merger was completed in February 2020 and the combined entity was rebranded as Tata Consumer Products Limited to reflect its product portfolio.
- The merger resulted in a broader product portfolio that includes tea (Tata Tea, Tetley), coffee (Eight O'Clock Coffee, Tata Coffee Grand), water (Himalayan Natural Mineral Water), and food products (Tata Salt, Tata Sampann).
- In April 2020, Sunil D'Souza was appointed as the Managing Director and CEO of Tata Consumer Products Limited.
- For the fiscal year 2023-24, Tata Consumer Products Limited predicted its revenue to be Rs. 15,206 crore.

1.1.5. Overall Greatness of the Company

Tata Consumer Products Limited is a leading company in the FMCG sector because of its diverse product portfolio and vision to build better lives and thriving communities. It ranked 5th among the most used FMCG brands in India in the year 2020 with a global presence in over 40 countries including the USA, the UK, Canada, Poland, Russia etc. Its vision and performance speak for its position in the FMCG sector.

1.2 Tech Mahindra Limited:

Logo - Tech Mahindra Ltd.

A member of the Mahindra Group, Tech Mahindra Limited is a transnational holding company with a public listing in India. Tech Mahindra Limited has been guided by the philosophy of delivering high quality technology solutions, serving various sectors globally. Since the Company's listing in 2006, under its former name Mahindra-British Telecom Ltd., it has maximized value for stakeholders while contributing to nation-building. Tech Mahindra Limited is presently focused on providing IT and consulting services.

In 2022–2023, Tata Consumer Products Limited observed ₹532,902 Mn in revenue. Mahindra-British Telecom,the original name of Tech Mahindra Ltd., was established in 1986 as a joint venture between British Telecom and Mahindra & Mahindra which was renamed to Tech Mahindra after Mahindra & Mahindra took over complete ownership from British Telecom. The company was awarded the National Award for Excellence in Corporate Governance, Best Employer Brand Award, and Excellence in CSR Award multiple times. It launched its first public offering in 2006. It belongs to the IT and Business Services sector.

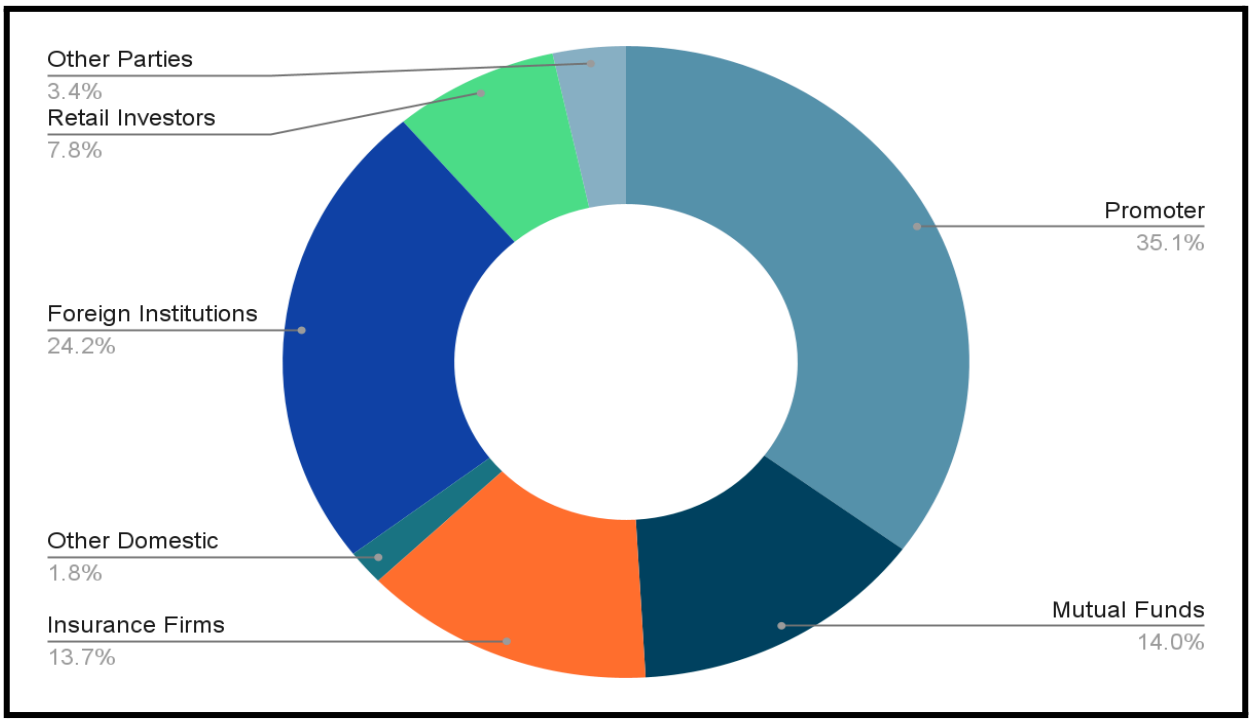
1.2.2. Nature of Business

Tech Mahindra is a transnational company primarily operating in the Information Technology and Business Services sector. It provides services that cater to various industries. The essential services include IT services such as App development, consulting, system integration, and cloud services; Digital Transformation such as digital solutions that include AI, Machine learning, IoT, blockchain, and customer experience management; telecommunication solutions such as network services, 5G solutions, and

telecom infrastructure management, Engineering services like product engineering, lifecycle management, and engineering analytics, Cybersecurity, Data analytics, and Business Process Services.

1.2.3. Ownership

Figure 2 demonstrates that the promoters of Tech Mahindra Ltd. hold 35.09% of the company's shares, while Foreign Institutional Investors have 24.15% shares, Mutual Funds hold 14% shares, Insurance Firms hold 13.74% shares, other domestic institutions hold 1.78% of the shares, Retail Investors hold 7.8% of the shares and Other Parties hold 3.44% shares.



Shareholding Pattern - Tech Mahindra Ltd

1.2.4. Business Commencement Circumstances

- Tech Mahindra, initially known as Mahindra-British Telecom, was established in 1986 as a joint venture between Mahindra & Mahindra and British Telecom to provide IT services to the telecommunication industry.
- In 2006, the company was rebranded to Tech Mahindra to reflect its broader business scope.
- Satyam Computer Services was acquired by Tech Mahindra in 2009 after a major financial scandal. This acquisition significantly expanded Tech Mahindra's Client base and capabilities as it diversified into various sectors such as manufacturing, banking, and healthcare.
- In the year 2013, Tech Mahindra merged with Mahindra Satyam (rebranded Satyam Computer Services).
- In the year 2015, the company expanded its portfolio to include areas such as digital transformation, cloud computing, and cybersecurity.
- In 2018, Tech Mahindra was recognized as one of the top 15 Global IT service providers.
- The company has continued to expand its portfolio to include healthcare, finance, and energy sectors, strengthening its global

presence leveraging innovation and sustainability.

1.2.5. Overall Greatness of the Company

Tech Mahindra is a leading service provider in the IT services sector. The company's commitment to improve employees. It has been recognized by many prestigious awards such as Forbes Global 2000 and NASSCOM. Tech Mahindra solidifies its position in the IT service sector due to its blend of technological expertise and ethical practices.

1.3 REC Limited:

Logo - REC Ltd.

A member of Maharatna Companies,REC Limited (formerly known as Rural Electrification Corporation Limited) is a public infrastructure finance company primarily owned by the Ministry of Power, Government of India with a public listing in India. REC Limited, has been guided by the philosophy of financing and promoting rural electrification projects,serving the energy sector of India. Since the Company's listing in 2008, it has maximized value for stakeholders while contributing to nation-building. REC Limited is presently focused on financing power projects, including generation, transmission, and distribution, with an emphasis on rural electrification and renewable energy.

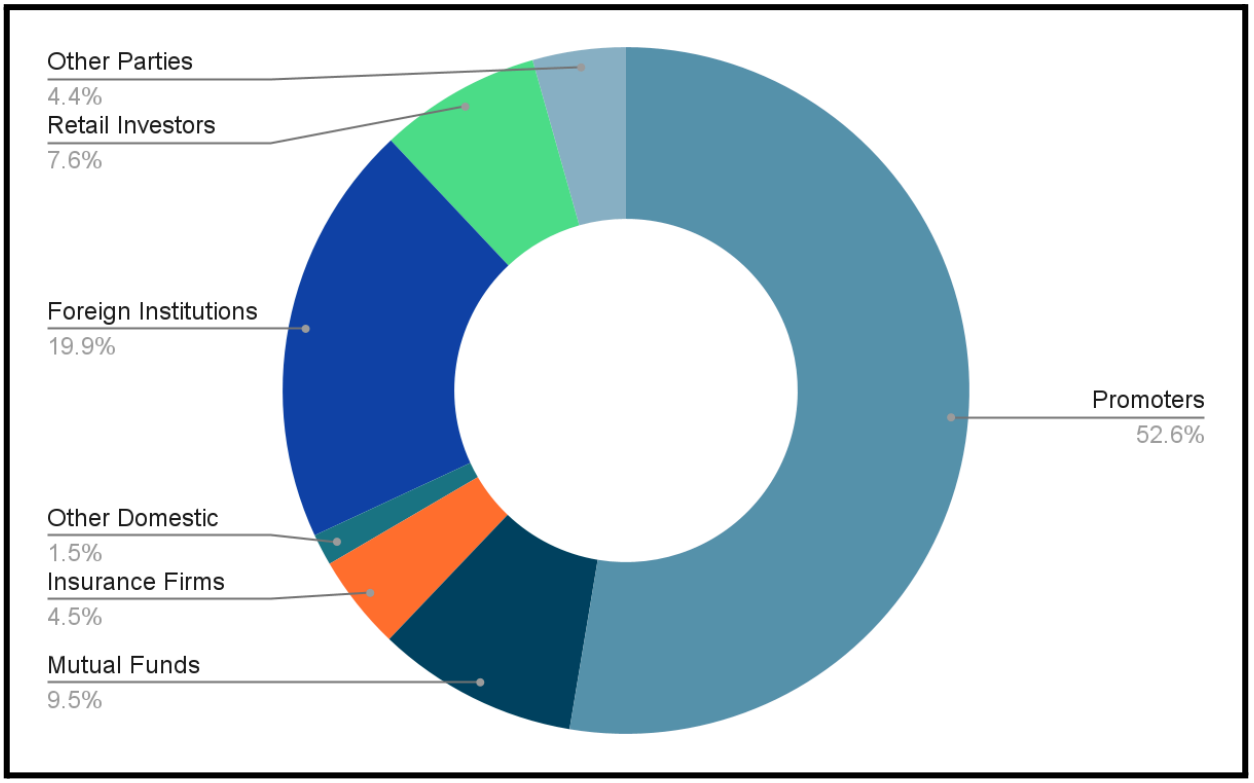
In 2022–2023, REC Limited reported ₹39,252 crores in income. Rural Electrification Corporation Ltd., the original name of REC Ltd., was formed in 1993. The business was established in 1969. The company was awarded the Navratna status by the Government of India in 2008 which enhanced its financial and operational autonomy. It launched its first public offering in February 2008. It belongs to the financial services industry.

1.3.2. Nature of Business

REC Limited, leading infrastructure finance company specializing in the power sector, is a Public Sector Enterprise under the Ministry of Power, Government of India. It provides financial assistance for power projects, offers advisory and consultancy services in areas such as project appraisal, project management, and financial restructuring, administers subsidy schemes and government programs aimed at improving rural electrification, provides capacity building and training programs for stakeholders in the power sector.

1.3.3. Ownership

As can be seen from Figure 2, promoters hold 52.63% of the shares in REC Ltd., while Foreign Institutions hold 19.92% of the shares, Insurance Firms hold 4.47% of the shares and Other Domestic Institutions hold 1.49% shares, Mutual Funds hold 9.48%, Retail Investors hold 7.62% shares and Other Parties hold 4.39% shares.



Shareholding Pattern - REC Ltd.

1.3.4. Business Commencement Circumstances

- REC Limited, formerly known as Rural Electrification Corporation Limited, was founded by the government on July 25,1969 with the aim to fund and promote rural electrification projects across India.
- In the 1970's, REC Limited focused on funding rural electrification schemes and providing electricity to rural areas.

- In the 1980's, it expanded its operations to include financing for the power sector, encompassing generation, transmission, and distribution projects.
- In the 1990's, REC Limited diversified its financing portfolio to include power infrastructure projects and renewable energy projects.
- During the 2000's REC Limited kept growing and offered financial assistance to state electricity boards, power utilities and private sector entities.
- In 2010, REC Limited was granted the Navratna status.
- In 2018, REC Limited was granted the status of an Infrastructure Finance Company (IFC) by the Reserve Bank of India (RBI).
- In 2019, the company was rebranded from Rural Electrification Corporation Limited to REC limited, reflecting its broader focus beyond rural electrification.

1.3.5. Overall Greatness of the Company

REC Ltd, formerly known as Rural Electrification Corporation Limited, a Navratna status holder is dedicated to the improvement of rural India's electrification and has earned a solid reputation because of its strong financial performance and innovative funding solutions. Various awards have been granted to REC limited for its commitment to sustainable practices, support for green energy initiatives and rural electrification. It plays an important role in the funding of power projects and rural development.

2. Risk Unadjusted Returns

Table 1 and 2 reflect the unadjusted returns at daily, weekly and monthly frequencies for TATACONSUM, TECHM and RECLTD. From Tables below, we can observe all the mean returns for all the 3 frequencies, i.e., daily, weekly and monthly mean returns have returns higher than the risk-free rate. Thus, investors were better off trading in the assets below than investing in risk-free T-bills.

Returns	Daily	Weekly	Monthly
MIN (%)	-3.3422	-2.9135	-1.507
MAX (%)	5.2382	11.5274	18.125
MEAN (%)	0.188	1.6143	7.3618
STANDARD DEVIATION	1.3548	3.3024	5.8152

Unadjusted Returns from 3rd April 2023 to 28th March 2024 - ***Tata Consumer Products Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-6.2951	-8.4534	-7.6141
MAX (%)	4.5874	7.4297	10.0514
MEAN (%)	0.0682	0.3323	1.4886
STANDARD DEVIATION	1.4900	3.4779	5.5135

Unadjusted Returns from 3rd April 2023 to 28th March 2024 - ***Tech Mahindra Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-8.5248	-9.8127	-12.1283
MAX (%)	9.5476	18.2475	20.9137
MEAN (%)	0.5756	2.7164	12.0975
STANDARD DEVIATION	2.5912	5.2467	11.3554

Unadjusted Returns from 3rd April 2023 to 28th March 2024 in % - ***REC Ltd.***

3. Risk Adjusted Returns

Tables 3 and 4 present the risk adjusted returns for TATACONSUM, TECHM and RECLTD for daily, weekly and monthly frequencies. Mean returns obtained post adjustment with respect to risk-free rate (T-bill rates) are higher compared to risk-free rates. Thus, profits are expected for investments made in the aforementioned stocks in place of investing in risk-free rates.

Returns	Daily	Weekly	Monthly
MIN (%)	-3.5079	-7.7935	-8.7866
MAX (%)	5.0464	8.9141	13.8593
MEAN (%)	0.1546	0.6850	2.7040
STANDARD DEVIATION	1.3058	3.0995	6.2273

*Table 4: Adjusted Returns from 3rd April 2023 to 28th March 2024 - **Tata Consumer Products Ltd**.*

Returns	Daily	Weekly	Monthly
MIN (%)	-6.3139	-8.5856	-8.1862
MAX (%)	4.5686	7.2975	9.4793
MEAN (%)	0.0494	0.2001	0.9164
STANDARD DEVIATION	1.4900	3.4779	5.5135

*Table 5: Adjusted Returns from 3rd April 2023 to 28th March 2024 - **Tech Mahindra Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-8.5436	-9.9449	-12.7004
MAX (%)	9.5288	18.1153	20.3415
MEAN (%)	0.5568	2.5842	11.5253
STANDARD DEVIATION	2.5912	5.2467	11.3554

*Table 6: Adjusted Returns from 3rd April 2023 to 28th March 2024 - **REC Ltd.***

4. Economic Interpretation

Risk is an integral part of analysis of performance of stock as purely returns may paint a false image about the asset. Risk adjusted returns are superior to risk unadjusted returns as they take into account the impact of risk and tell the returns beyond the risk-free rate. Before investing in an underlying, an informed investor/ trader must keep into consideration the factors such as risk to generate optimal returns for their portfolio.

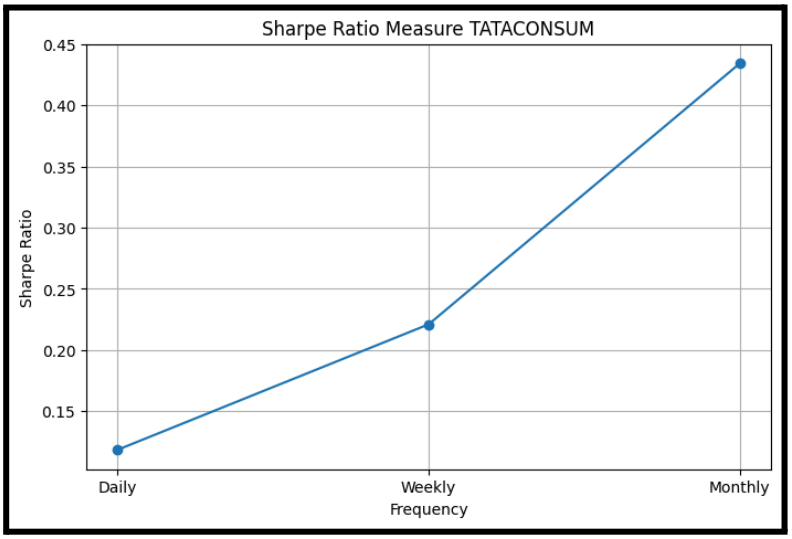
Another measure to gauge the risk adjusted returns to the risk associated with an asset is the Sharpe Ratio. The formula of Sharpe Ratio is as follows:

$$\text{Sharpe Ratio} = \frac{E[r_x - r_f]}{stdev(x)}$$

A high Sharpe ratio indicates a higher risk adjusted return and lower level of risk which is a favorable condition for investment.

4.1 Sharpe Ratio (TATACONSUM):

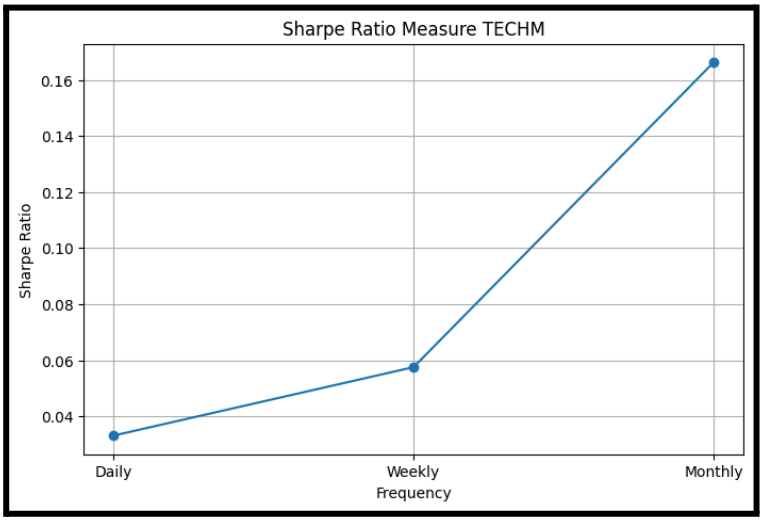
Frequency	Sharpe Ratio measure
Daily	0.1184
Weekly	0.2210
Monthly	0.4342



*Sharpe Ratio Equity – **Tata Consumer Products Ltd.***

4.2 Sharpe Ratio (TECHM):

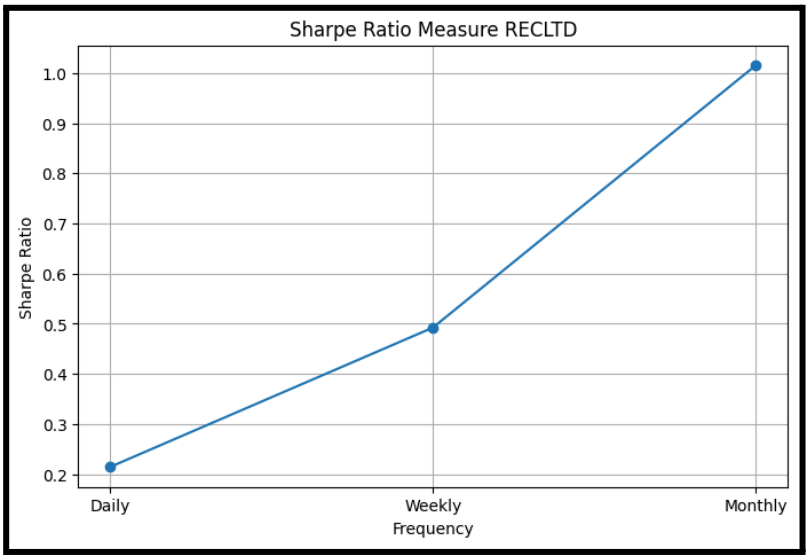
Frequency	Sharpe Ratio measure
Daily	0.0331
Weekly	0.0575
Monthly	0.1662



Sharpe Ratio Equity – TECHM Ltd.

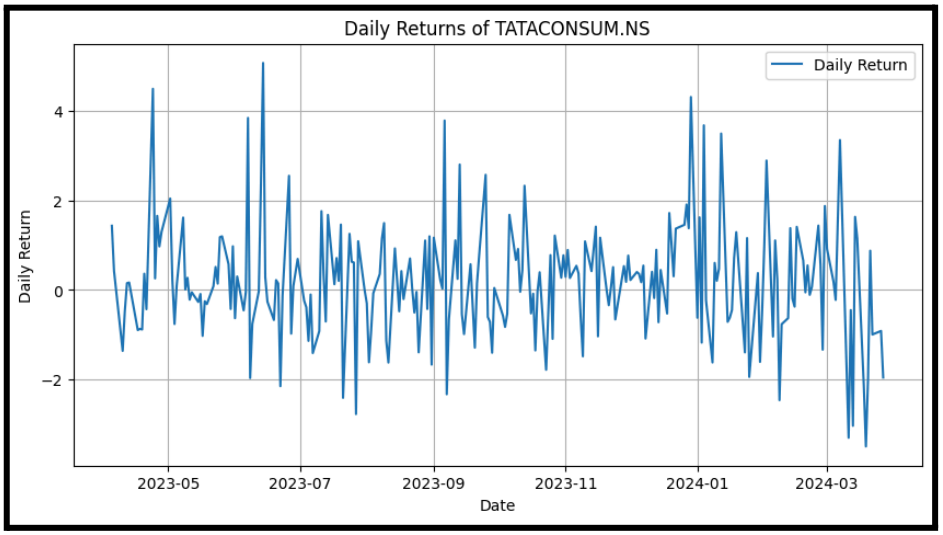
4.3 Sharpe Ratio (RECLTD):

Frequency	Sharpe Ratio measure
Daily	0.2148
Weekly	0.4925
Monthly	1.0149

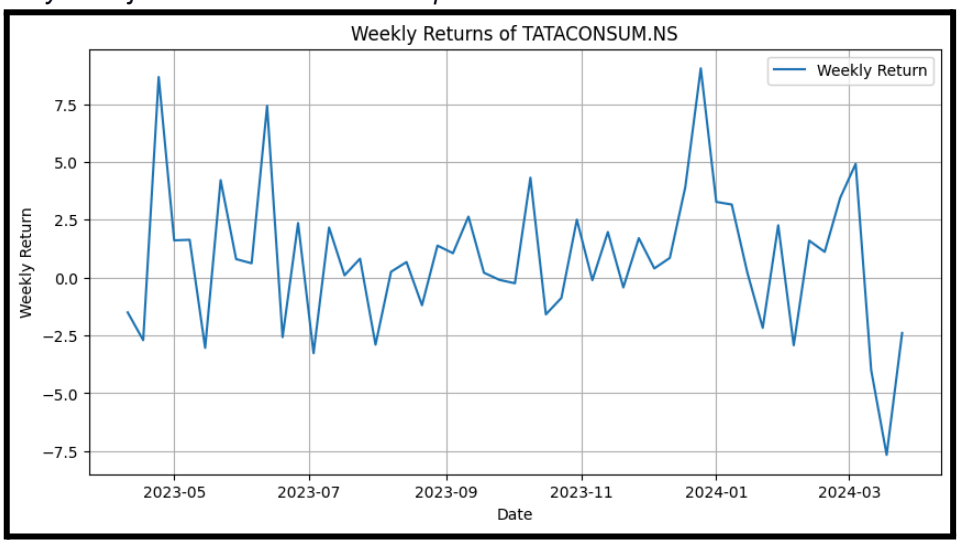


Sharpe Ratio Equity – REC Ltd.

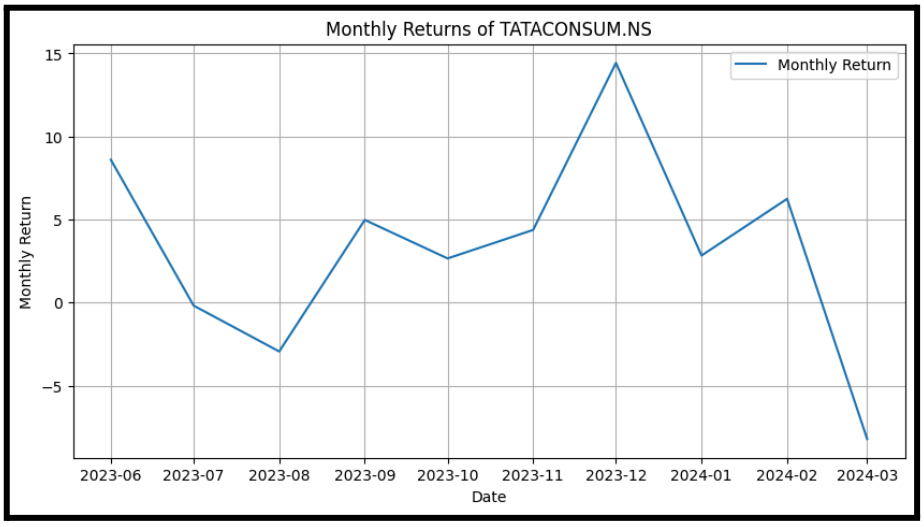
4.4 Plot for Risk Unadjusted Returns (TATACONSUM):



Daily Unadjusted Returns from 3rd April 2023 to 28th March 2024 - ***Tata Consumer Products Ltd.***

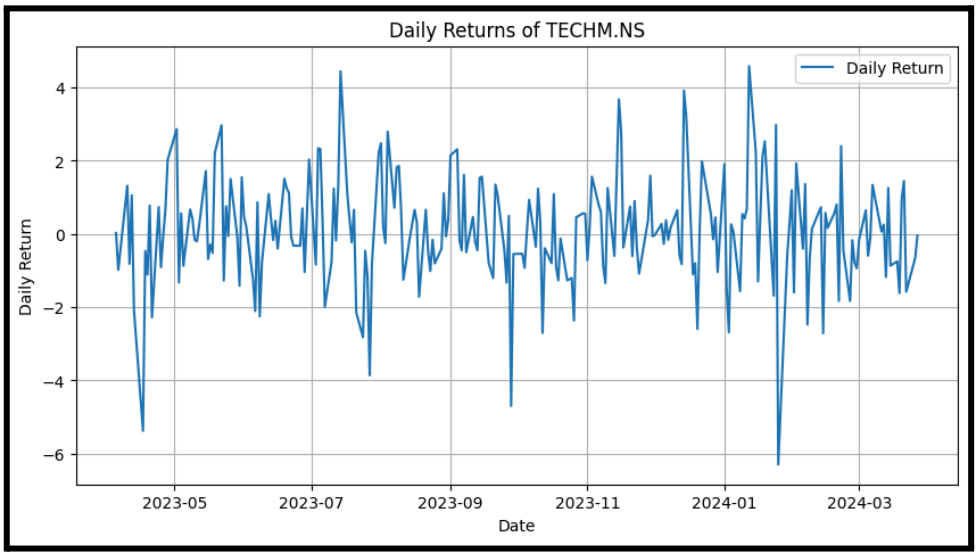


Weekly Unadjusted Returns from 3rd April 2023 to 28th March 2024- ***Tata Consumer Products Ltd.***

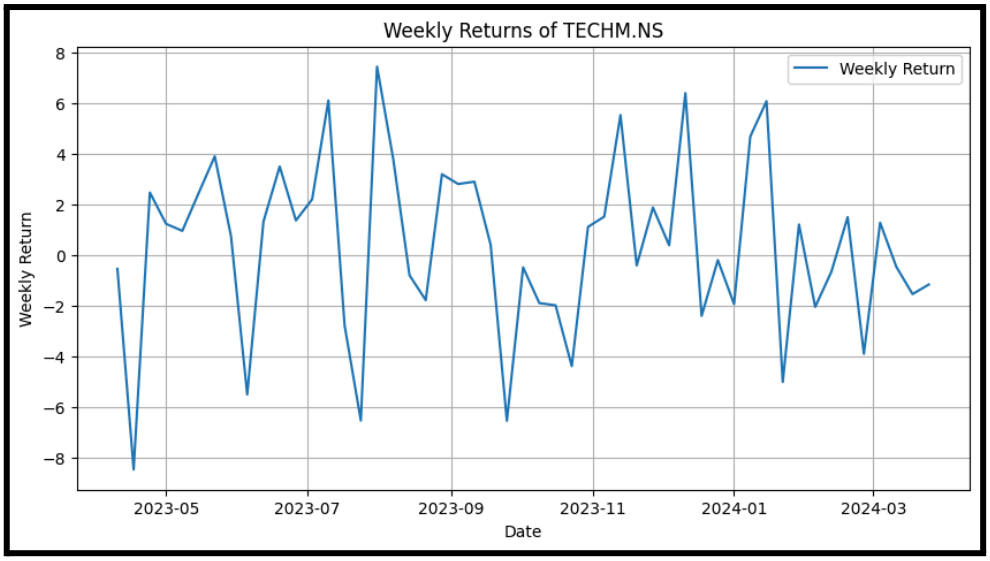


Monthly Unadjusted Returns from 3rd April 2023 to 28th March 2024- ***Tata Consumer Products Ltd.***

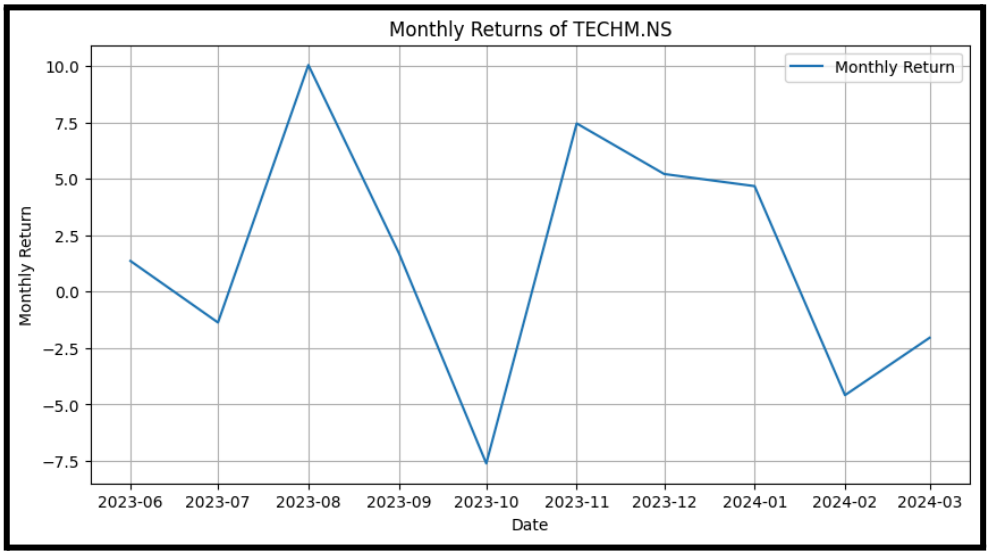
4.5 Plot for Risk Unadjusted Returns (TECHM):



Daily Unadjusted Returns from 3rd April 2023 to 28th March 2024 in % - ***Tech Mahindra Ltd.***

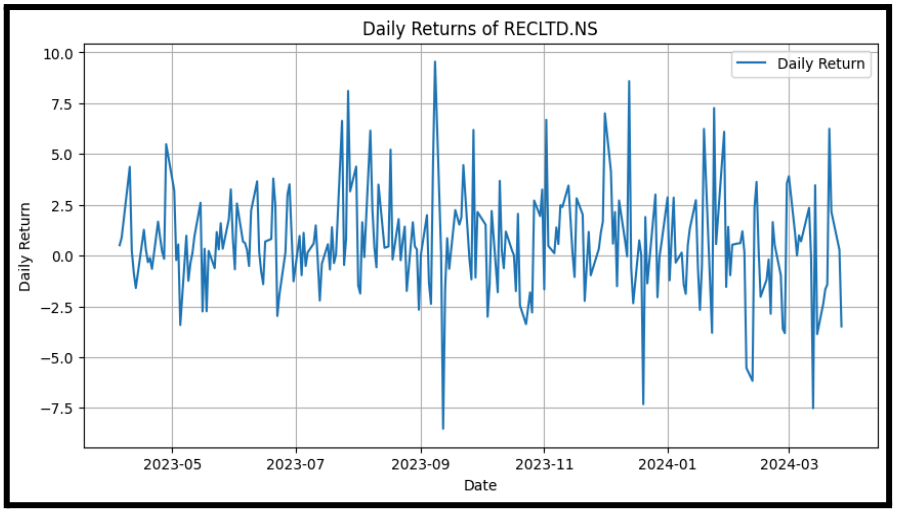


Weekly Unadjusted Returns from 3rd April 2023 to 28th March 2024 in % - ***Tech Mahindra Ltd.***

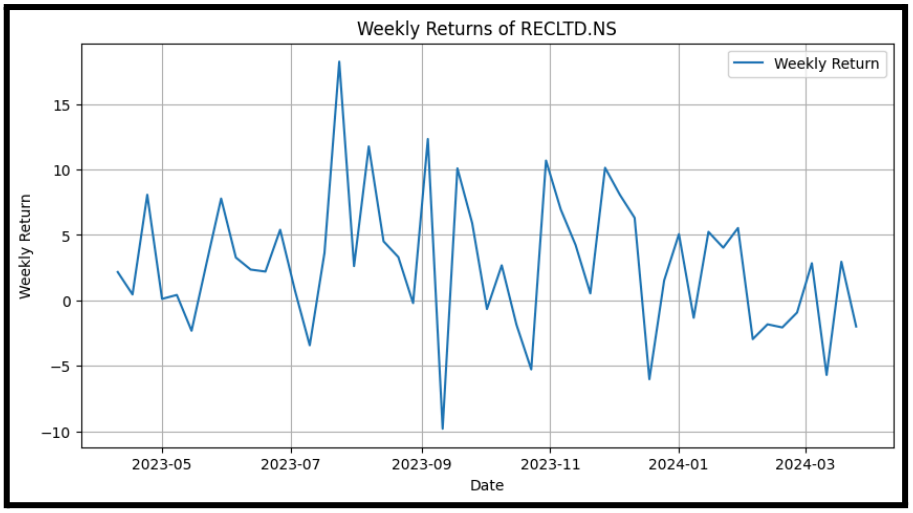


Monthly Unadjusted Returns from 3rd April 2023 to 28th March 2024 in % - ***Tech Mahindra Ltd.***

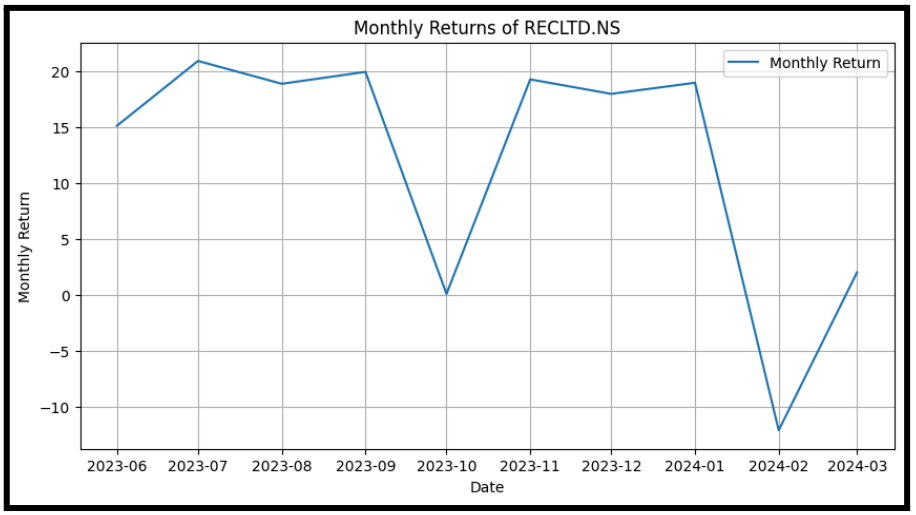
4.6 Plot for Risk Unadjusted Returns (RECLTD):



*Daily Unadjusted Returns from 3rd April 2023 to 28th March 2024 in % - **REC Ltd.***

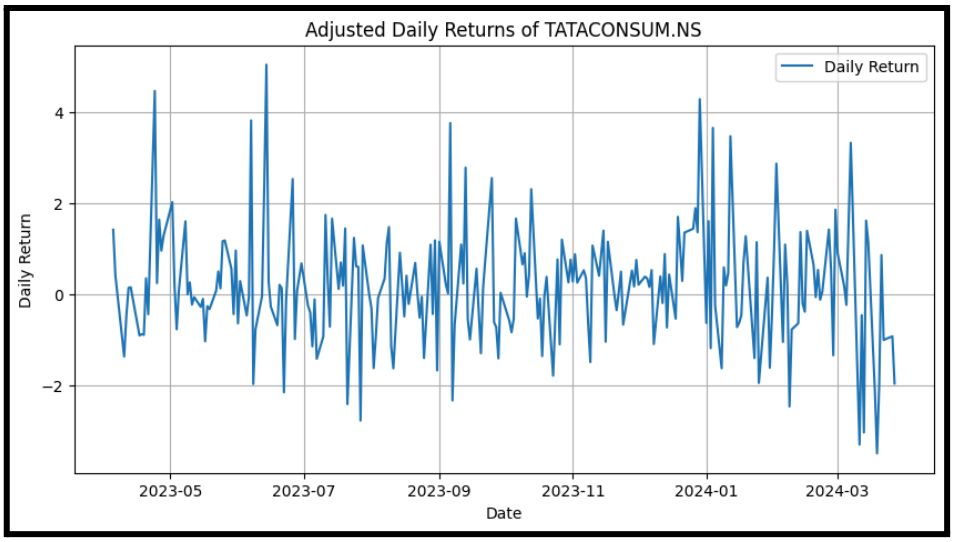


*Weekly Unadjusted Returns from 3rd April 2023 to 28th March 2024 in % - **REC Ltd.***

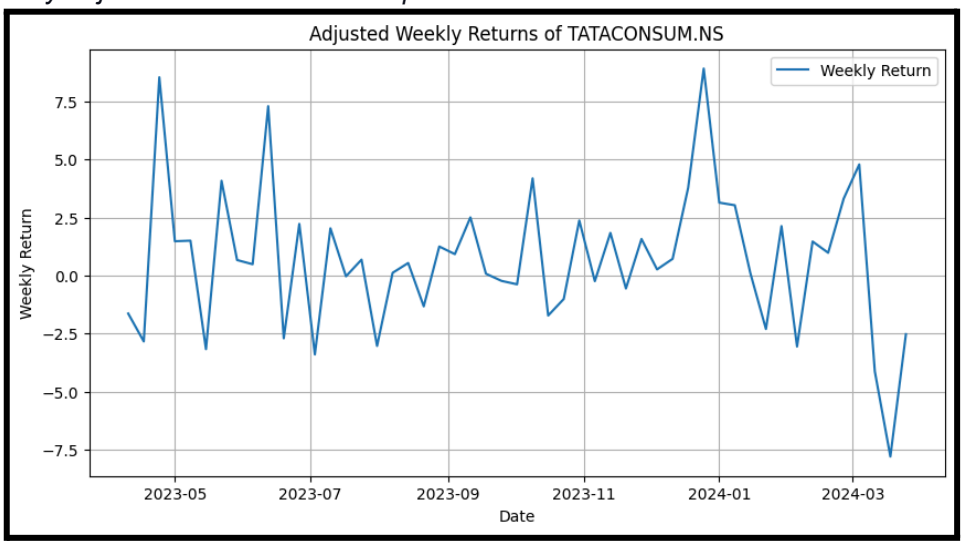


*Monthly Unadjusted Returns from 3rd April 2023 to 28th March 2024 in % - **REC Ltd.***

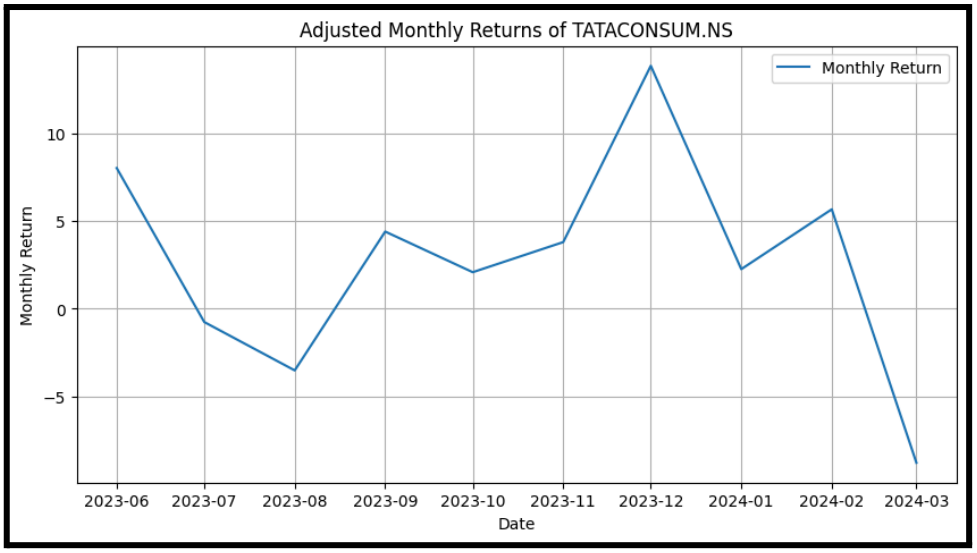
4.7 Plot for Risk Adjusted Returns (TATACONSUM):



Daily Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - ***Tata Consumer Products Ltd.***

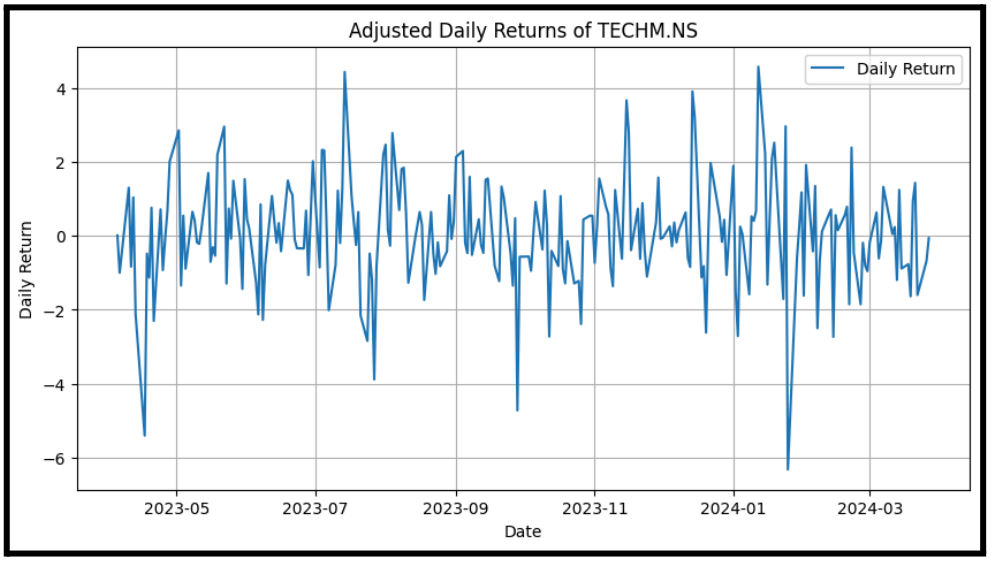


Weekly Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - ***Tata Consumer Products Ltd.***

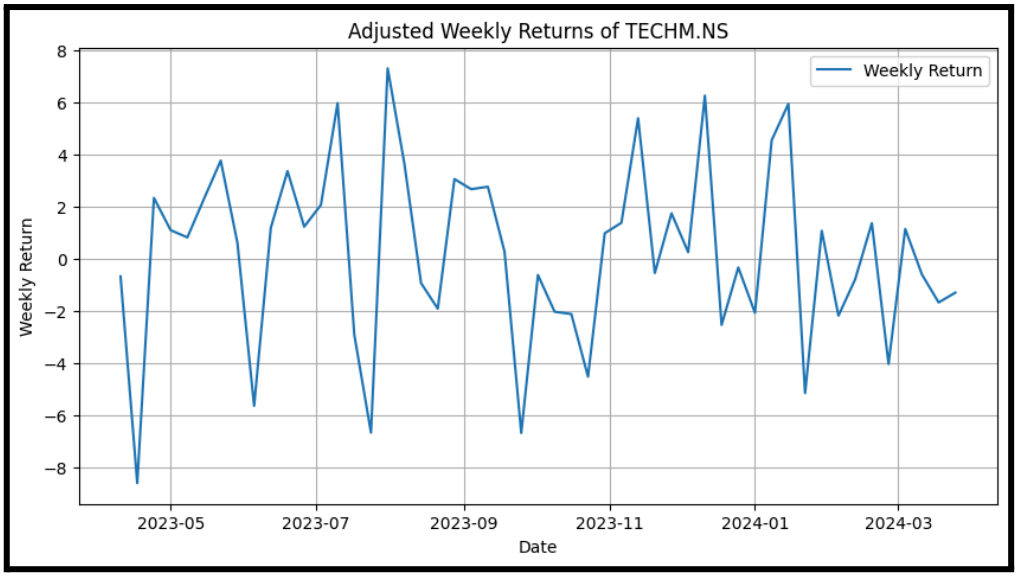


Monthly Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - ***Tata Consumer Products Ltd.***

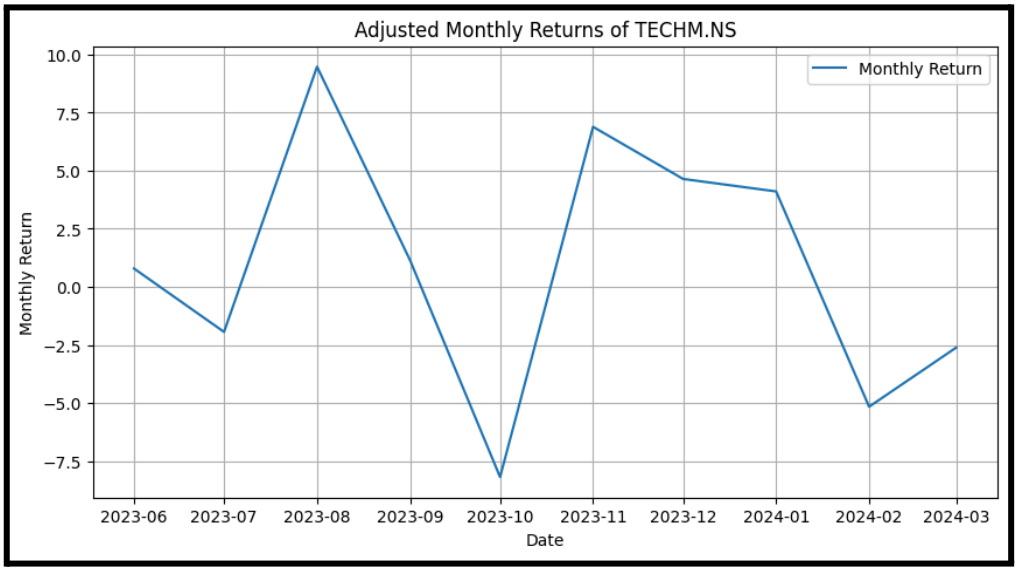
4.8 Plot for Risk Adjusted Returns (TECHM):



*Daily Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - **Tech Mahindra Ltd.***

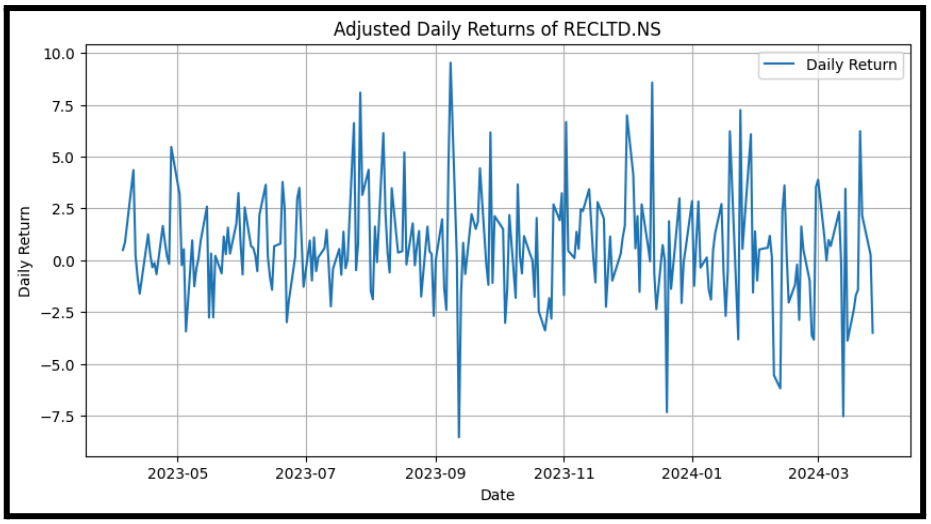


*Weekly Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - **Tech Mahindra Ltd.***

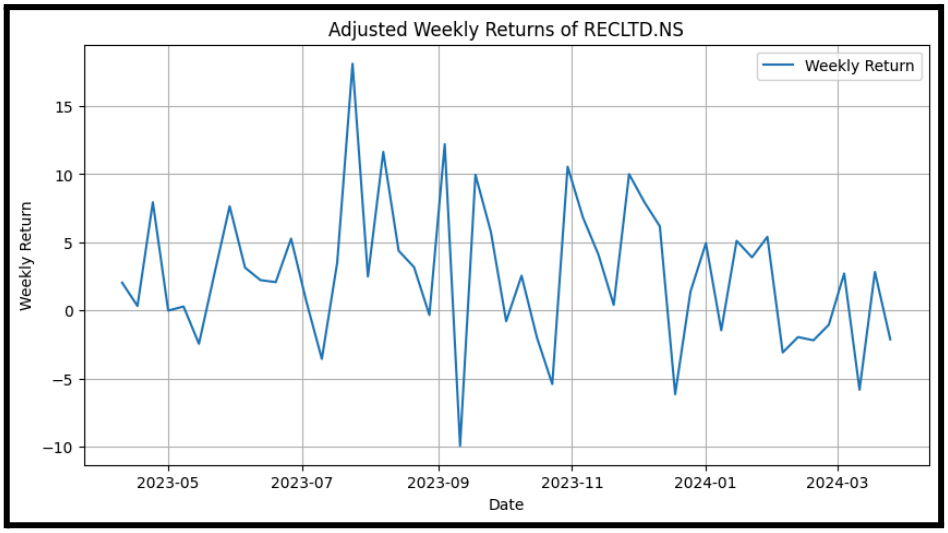


*Monthly Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - **Tech Mahindra Ltd.***

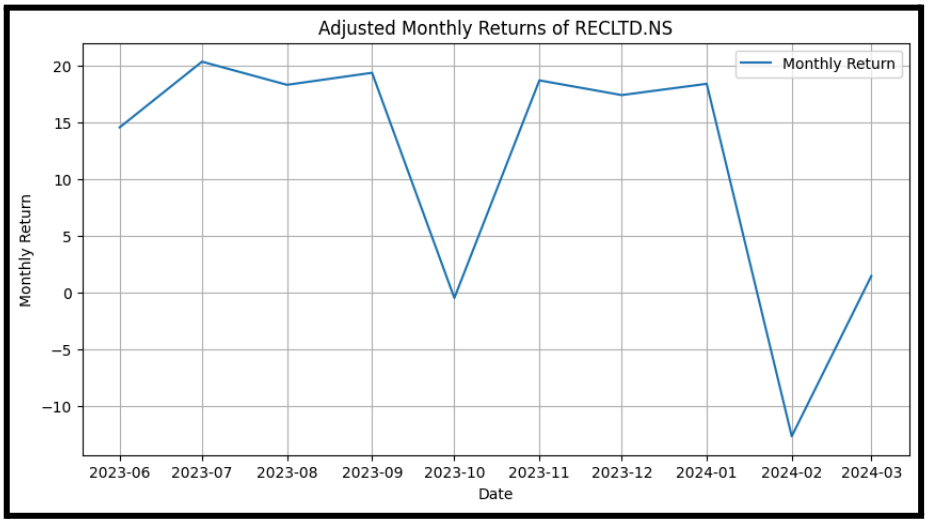
4.9 Plot for Risk Adjusted Returns (RECLTD):



*Daily Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - **REC Ltd.***



*Weekly Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - **REC Ltd.***



*Monthly Adjusted Returns from 3rd April 2023 to 28th March 2024 in % - **REC Ltd***

Section-2 (Equity Futures Instruments)

5. Equity Futures Instruments

5.1 Commencement of Equity Futures:

The derivatives trading segment began in NSE on 12th June 2000. TATA CONSUM (previous name Tata Global Beverage) got listed for the Futures segment on DEC 1st, 2004, with a trading volume of 15.65M, while Tech Mahindra started trading in futures on Sept 3rd, 2007, with a trading volume of 6.34M, while REC Ltd entered into the futures list march 3rd 2008 with a trading volume of 37.71M

5.2 Lot size and contract specification:

Table below lists the contract specifications for TATACONSUM, RECLTD,and TECHM Futures contracts respectively.

Being equity derivatives, these contracts don't involve an element of physical delivery.

SYMBOL	TATACONSUM
INSTRUMENT	FUTSTK
LOT SIZE	450
EXPIRY DATE	Last Thursday of every week. If Thursday is a holiday, expiry is the 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
PRICE STOPS	Rs 0.05
PRICE BAND	Operating range of 10% of the base price

Specifications of Futures Instrument - TATA CONSUMER PRODUCT Ltd.

SYMBOL	REC
INSTRUMENT	FUTSTK
LOT SIZE	2000
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
PRICE STOPS	Rs 0.05
PRICE BAND	Operating range of 10% of the base price.

Specifications of Futures Instrument - REC Ltd.

SYMBOL	TECHM
INSTRUMENT	FUTSTK
LOT SIZE	600
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
PRICE STOPS	Rs 0.05
PRICE BAND	Operating range of 10% of the base price.

Specifications of Futures Instrument - TECH MAHINDRA Ltd

5.3 Overall Greatness of Equity Futures Instruments (TATA CONSUMER):

The greatness of Tata Consumer Products Futures lies in the fact that the daily return trends for futures follow the spot market returns very closely. This helps investors make informed assumptions about the trends and deals with risk.

5.4 Overall Greatness of Equity Futures Instruments (TECH MAHINDRA):

The greatness of Tech Mahindra Futures lies in the fact that the trends for futures daily return trends follow the spot market returns very closely for daily and weekly returns very closely but it shows considerable deviation when we look at the monthly futures value.

5.5 Overall Greatness of Equity Futures Instruments (REC)

The greatness of REC lies in the fact that the trends for futures daily return trends follow the spot market returns very closely for daily returns with a very low deviation, allowing day traders to make some good profits, but it shows considerable deviation when we look at the weekly and monthly futures value.

6. Risk Unadjusted Returns Futures

6.1 Risk Unadjusted Returns Near Month

Returns	Daily	Weekly	Monthly
MIN (%)	-3.3422	-2.9135	-1.507
MAX (%)	5.2382	11.5274	18.125
MEAN (%)	0.188	1.6143	7.3618
STANDARD DEVIATION	1.3548	3.3024	5.8152

*Risk unadjusted returns near month(%) of Futures instrument - **Tata Consumer Products Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-7.4043	-12.5612	-6.5953
MAX (%)	4.8076	9.4212	9.7291
MEAN (%)	0.0534	0.4489	2.0272
STANDARD DEVIATION	1.606	5.0019	6.9788

*Risk unadjusted returns near month(%) of Futures instrument - **TECHM Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-8.6776	-6.7189	5.8213
MAX (%)	9.5623	16.9506	33.3647
MEAN (%)	0.6026	4.2159	19.6117
STANDARD DEVIATION	2.6653	5.5921	11.4620

*Risk unadjusted returns near month(%) of Futures instrument - **REC Ltd.***

6.2 Risk Unadjusted Returns Next Month

Returns	Daily	Weekly	Monthly
MIN (%)	-3.3592	-2.8974	1.3157
MAX (%)	5.2301	11.2166	17.9453
MEAN (%)	0.1899	1.6257	7.3689
STANDARD DEVIATION	1.3539	3.2626	5.7781

*Risk unadjusted returns next month(%) of Futures instrument - **Tata Consumer Products Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-7.4101	-12.5314	-7.7631
MAX (%)	4.9289	9.3427	9.9842
MEAN (%)	0.0541	0.4548	2.0529
STANDARD DEVIATION	1.6103	5.101	7.4092

*Risk unadjusted returns next month(%) of Futures instrument - **TECHM Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-8.4422	-6.7464	5.1768
MAX (%)	9.7629	16.8717	34.5189
MEAN (%)	0.6024	4.2128	19.5795
STANDARD DEVIATION	2.6094	5.4541	11.7673

*Risk unadjusted returns next month(%) of Futures instrument - **REC Ltd.***

6.3 Risk Unadjusted Returns Far Month

Returns	Daily	Weekly	Monthly
MIN (%)	-3.6939	-3.5921	1.2754
MAX (%)	4.8057	13.2128	18.3691
MEAN (%)	0.1925	1.6140	7.2701
STANDARD DEVIATION	1.3941	3.5262	5.9285

*Risk unadjusted returns far month(%) of Futures instrument - **Tata Consumer Products Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-7.5768	-13.1368	-7.7631
MAX (%)	4.8755	9.6537	9.9842
MEAN (%)	0.0543	0.4563	2.0345
STANDARD DEVIATION	1.6262	5.1010	7.4092

*Risk unadjusted returns far month(%) of Futures instrument - **TECHM Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-8.4422	-6.7464	5.7756
MAX (%)	9.7629	16.8455	33.7437
MEAN (%)	0.6052	4.2344	19.6849
STANDARD DEVIATION	2.6094	5.4541	11.1931

*Risk unadjusted returns far month(%) of Futures instrument - **REC Ltd.***

7. Risk Adjusted Returns Futures

7.1 Risk Adjusted Returns Near Month

Returns	Daily	Weekly	Monthly
MIN (%)	-3.361	-3.0457	0.9349
MAX (%)	5.2194	11.3952	17.5529
MEAN (%)	0.1692	1.4821	6.7897
STANDARD DEVIATION	1.3548	3.3024	5.8152

*Risk adjusted returns near month(%) of Futures instrument - **TATA CONSUM Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-7.4261	-12.6934	-7.1674
MAX (%)	4.7888	9.2890	9.1570
MEAN (%)	0.0346	0.3167	1.4551
STANDARD DEVIATION	1.6060	5.0019	6.9788

*Risk adjusted returns near month(%) of Futures instrument - **TECHM Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-8.6964	-6.8511	5.2492
MAX (%)	9.5435	16.8184	32.7926
MEAN (%)	0.5838	4.0837	19.0396
STANDARD DEVIATION	2.6653	5.5921	11.462

*Risk adjusted returns near month(%) of Futures instrument - **REC LTD***

7.2 Risk Adjusted Returns Next Month

Returns	Daily	Weekly	Monthly
MIN (%)	-3.378	-3.0296	0.7436
MAX (%)	5.2113	11.0844	17.3732
MEAN (%)	0.1711	1.4935	6.7968
STANDARD DEVIATION	1.3539	3.2626	5.7781

*Risk adjusted returns next month(%) of Futures instrument - **TATA CONSUM Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-7.4289	-12.6636	-8.5209
MAX (%)	4.9101	9.2105	9.3575
MEAN (%)	0.0353	0.3226	1.4808
STANDARD DEVIATION	1.6103	5.0008	7.4043

*Risk adjusted returns next month(%) of Futures instrument - **TECHM LTD***

Returns	Daily	Weekly	Monthly
MIN (%)	-8.5681	-6.9602	4.6047
MAX (%)	9.6572	16.7395	33.9468
MEAN (%)	0.5836	4.0806	19.0074
STANDARD DEVIATION	2.6552	5.5312	11.7663

*Risk adjusted returns next month(%) of Futures instrument - **REC LTD***

7.3 Risk Adjusted Returns Far Month

Returns	Daily	Weekly	Monthly
MIN (%)	-3.7127	-3.7243	0.7073
MAX (%)	4.8219	13.0806	17.7970
MEAN (%)	0.1737	1.4818	6.6980
STANDARD DEVIATION	1.3941	3.5262	5.9285

*Risk adjusted returns far month(%) of Futures instrument - **TATA CONSUM Ltd.***

Returns	Daily	Weekly	Monthly
MIN (%)	-7.5957	-13.2690	-8.3352
MAX (%)	4.8567	9.5215	9.4121
MEAN (%)	0.0355	0.3241	1.4624
STANDARD DEVIATION	1.6262	5.1010	7.4092

*Risk adjusted returns far month(%) of Futures instrument - **TECHM LTD***

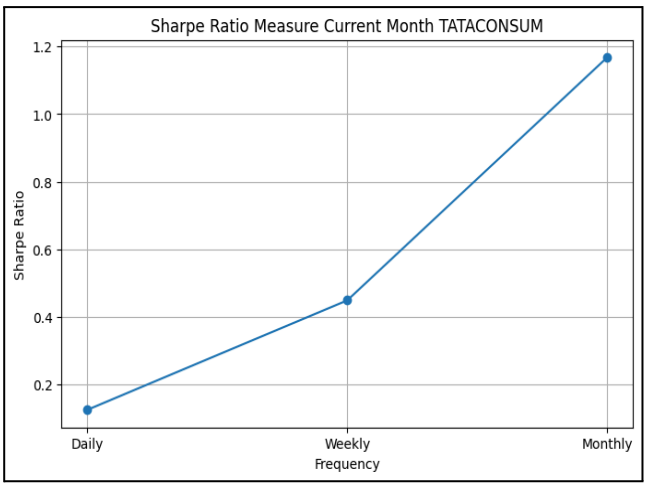
Returns	Daily	Weekly	Monthly
MIN (%)	-8.461	-6.8786	5.2035
MAX (%)	9.7441	16.7133	33.1716
MEAN (%)	0.5864	4.1022	19.1128
STANDARD DEVIATION	2.6094	5.4541	11.1931

*Risk adjusted returns far month(%) of Futures instrument - **REC LTD***

8. Sharpe Ratios

8.1 Sharpe Ratio (TATACONSUM):

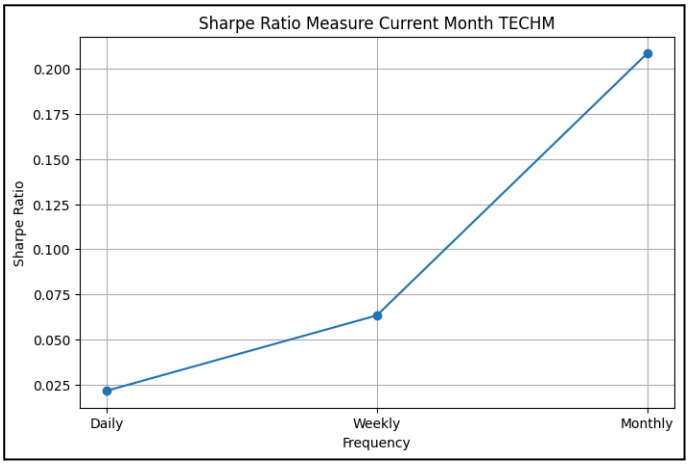
Frequency	Sharpe Ratio measure
Daily	0.1248
Weekly	0.4487
Monthly	1.1675



*Sharpe Ratio Futures – **Tata Consumer Products Ltd.***

8.2 Sharpe Ratio (TECHM):

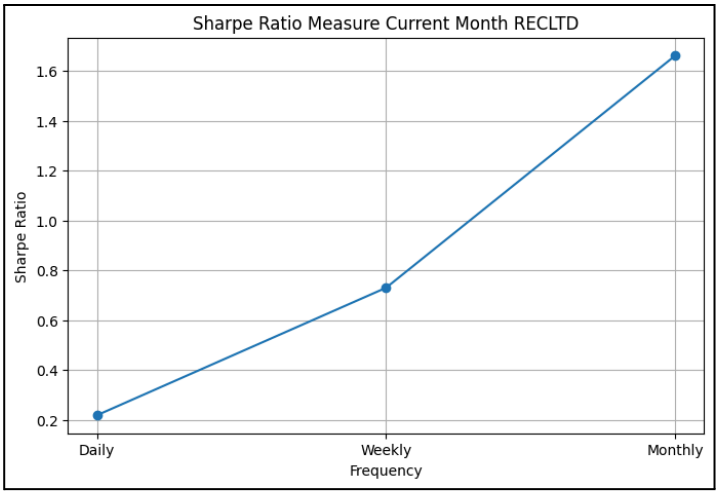
Frequency	Sharpe Ratio measure
Daily	0.0215
Weekly	0.0633
Monthly	0.2085



*Sharpe Ratio Futures – **TECHM Ltd**.*

8.3 Sharpe Ratio (RECLTD):

Frequency	Sharpe Ratio measure
Daily	0.2148
Weekly	0.4925
Monthly	1.0149



*Sharpe Ratio Futures – **REC Ltd**.*

Analysis of Sharpe Ratios:

- The Sharpe ratio for TATA increases significantly from daily to monthly frequency. This indicates that the risk-adjusted return improves as the holding period increases. The high monthly Sharpe ratio of 1.1675 suggests that TATA Consumer Products Ltd. provides a good return for the risk taken when observed over a longer period.
- The Sharpe ratios for TECH Mahindra are relatively low across all frequencies compared to TATA and REC. The increase in the Sharpe ratio from daily to monthly indicates a gradual improvement in risk-adjusted returns over longer periods. However, the overall low values suggest that TECH Mahindra's returns are not as attractive on a risk-adjusted basis as the other companies analyzed.
- REC Ltd. shows a significant increase in the Sharpe ratio from daily to monthly, similar to TATA. The high monthly Sharpe ratio of 1.0149 indicates that REC provides a favorable return for the risk taken when viewed over a longer term. The daily and weekly ratios are also higher compared to TECHM, showing better performance on a risk-adjusted basis in shorter periods as well.

Summary:

- **TATA** and **REC** both show strong performance in terms of risk-adjusted returns, especially over longer periods, with TATA slightly outperforming REC in the monthly frequency.
- **TECHM**, while improving over longer periods, has lower Sharpe ratios across all frequencies, indicating less attractive risk-adjusted returns compared to TATA and REC.
- Investors looking for better risk-adjusted returns may find TATA and REC more appealing, particularly if they have a longer investment horizon.

9. Economic Interpretation for TATA, TECHM, and REC Futures

TATA Consumer Products Limited Futures:

1. **Trend**: The risk-adjusted returns for TATA shows a clear upward trend as the frequency goes from daily to monthly. The positive slope in the graph indicates that longer holding periods result in higher returns as compared to the risk-free rate. This suggests that TATA's performace is more stable and rewarding over extended periods.
2. **Volatility**: The increasing return trend across all frequencies suggests that TATA futures exhibit controlled volatility. The relative stability of returns indicates that TATA is a good choice for investors looking for consistent performance over time. Higher monthly returns reflect the market's confidence in TATA's long-term performance.

TECH Mahindra Limited Futures:

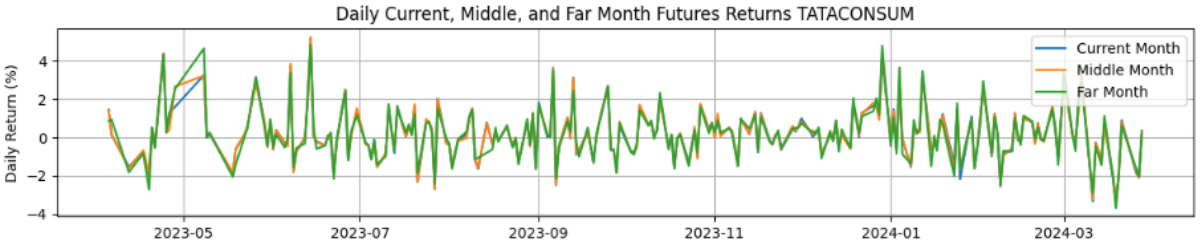
1. **Trend**: The returns for TECHM show a modest increase from daily to monthly, as depicted in the graphs. Although the upward trend is present, it is less pronounced compared to TATA and REC, indicating more moderate gains over time. The slope of the returns graph suggests that while profit opportunities are available, they are not as substantial as with TATA or REC.
2. **Volatility**: The relatively flat trajectory of the returns graph suggests that TECHM experiences less pronounced volatility in its risk-adjusted returns. The lower returns across all frequencies imply that the volatility does not translate into proportionately higher returns, making TECHM less attractive for risk-adjusted performance.

REC Limited Futures:

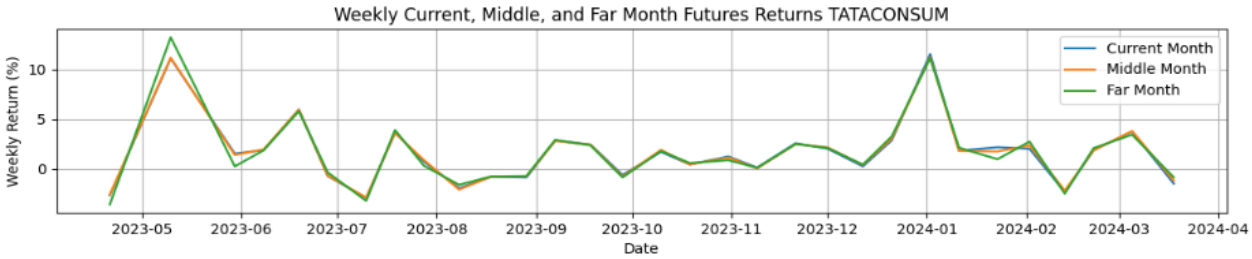
1. **Trend**: The risk-adjusted returns for REC show a significant upward trend from daily to monthly. The steep slope in the graph indicates strong improvement in returns over longer holding periods. This suggests that REC is highly favorable for long-term investors looking out for better returns over time.
2. **Volatility**: The increasing trend in returns, especially evident in the monthly frequency, highlights REC's ability to provide substantial returns relative to the risks taken. The controlled volatility, as shown by the smooth increase in the returns graph, indicates REC's stability and attractiveness for investors looking for solid long-term gains.

9.1 Plot of Risk Unadjusted Returns Near, Middle & Far Month

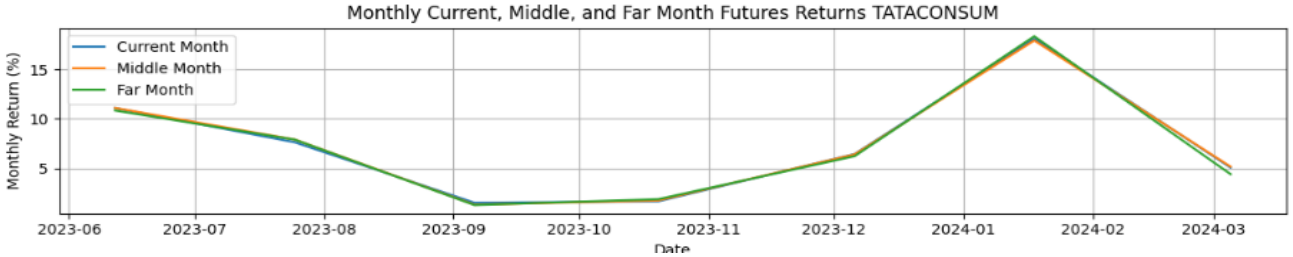
Tata Consumer Products Limited Futures (Unadjusted)



*(Plot of Returns vs Dates for **Tata Consumer Products Limited** Near Month Risk-Unadjusted Returns on Daily frequency)*

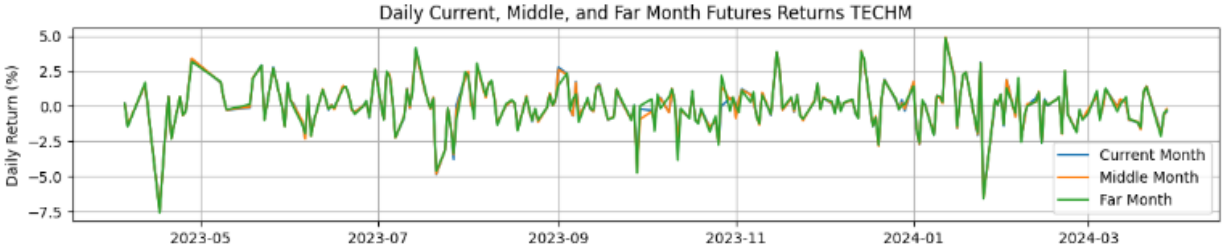


*(Plot of Returns vs Dates for **Tata Consumer Products Limited** Near Month Risk-Unadjusted Returns on Weekly frequency)*

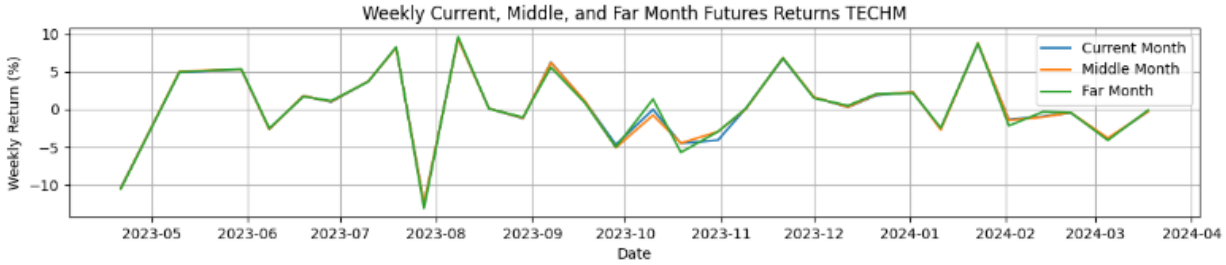


*(Plot of Returns vs Dates for **Tata Consumer Products Limited** Near Month Risk-Unadjusted Returns on Monthly frequency)*

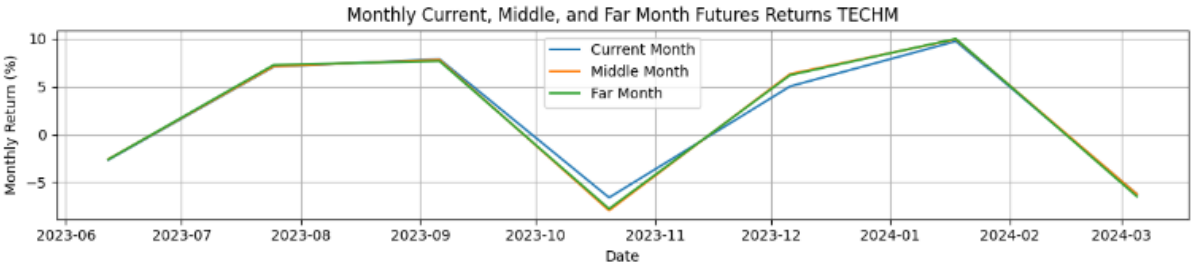
Tech Mahindra Limited Futures (Unadjusted)



*(Plot of Returns vs Dates for **Tech Mahindra Limited** Futures Risk-Undjusted Returns on Daily frequency)*

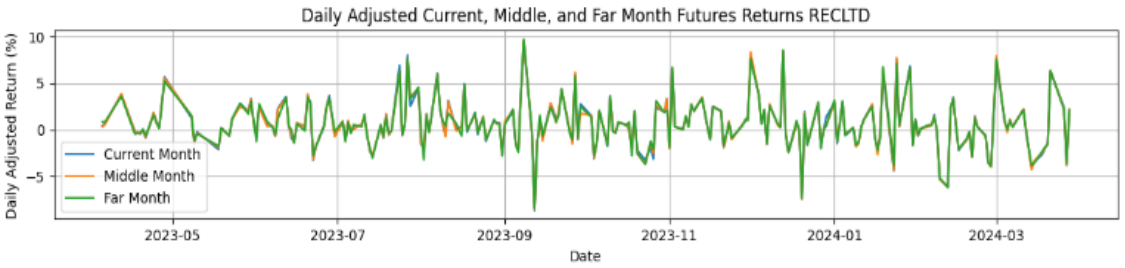


*(Plot of Returns vs Dates for **Tech Mahindra Limited** Futures Risk-Unadjusted Returns on Weekly frequency)*

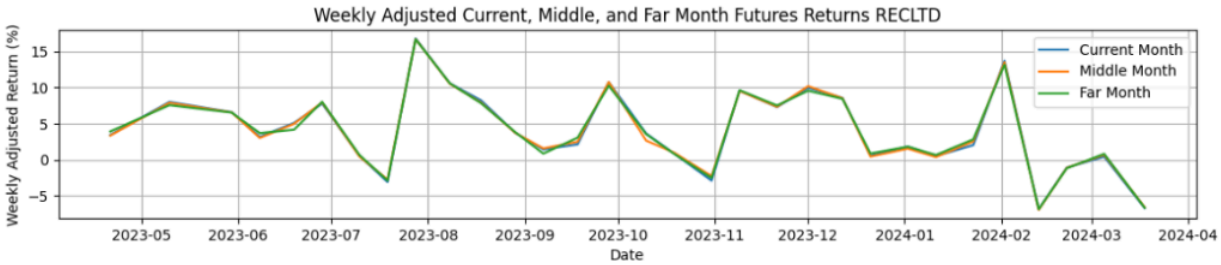


*(Plot of Returns vs Dates for **Tech Mahindra Limited** Futures Risk-Unadjusted Returns on Monthly frequency)*

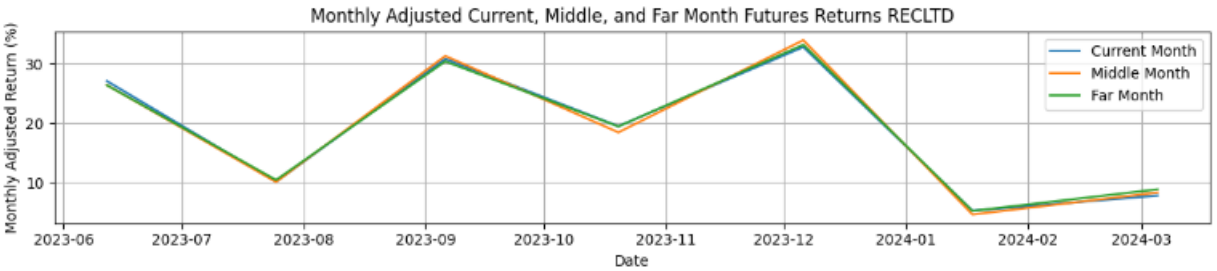
REC Limited Futures (Unadjusted)



*(Plot of Returns vs Dates for **REC Limited** Current, Middle, Far Month Risk-Unadjusted Returns on Daily Basis)*



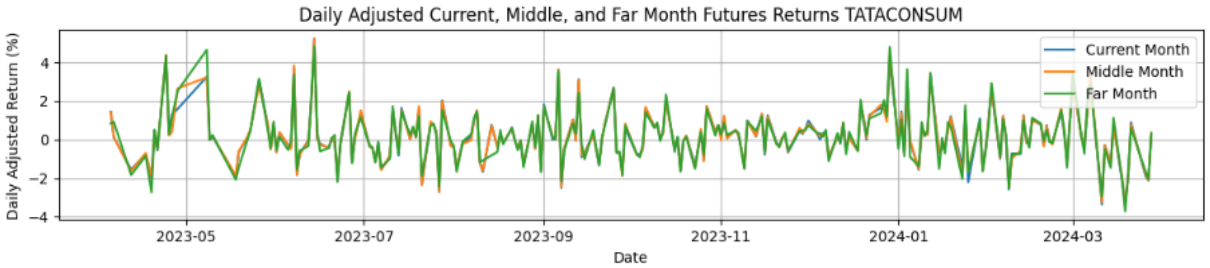
*(Plot of Returns vs Dates for **REC Limited** Current, Middle, Far Month Risk-Unadjusted Returns on Weekly Basis)*



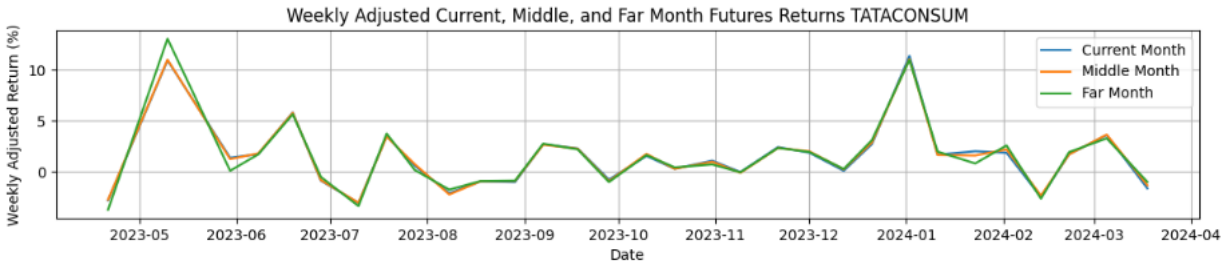
*(Plot of Returns vs Dates for **REC Limited** Current, Middle, Far Month Risk-Unadjusted Returns on Monthly Basis)*

9.2 Plot of Risk Adjusted Returns Near, Middle & Far Month

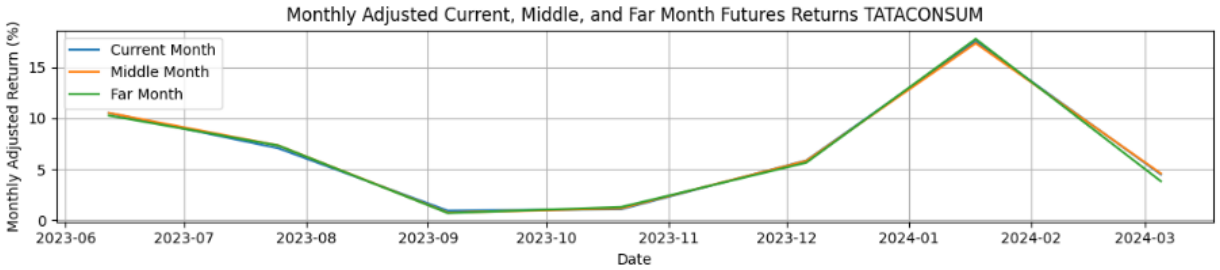
Tata Consumer Products Limited Futures (Adjusted)



*(Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **Tata Consumer Products Limited** Futures on Daily Frequency)*

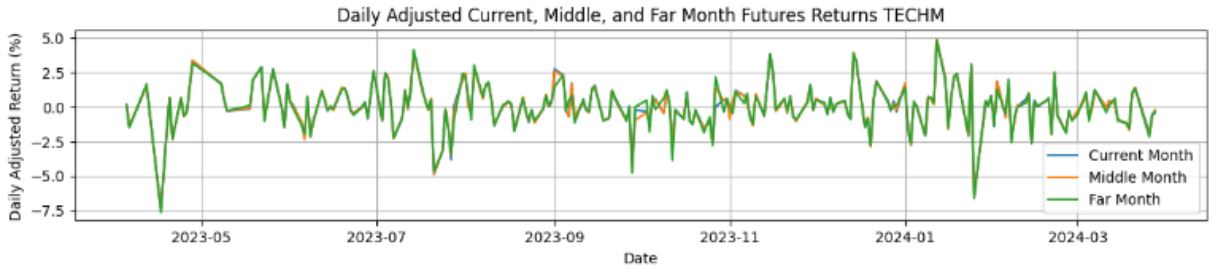


*(Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **Tata Consumer Products Limited** Futures on Weekly Frequency)*

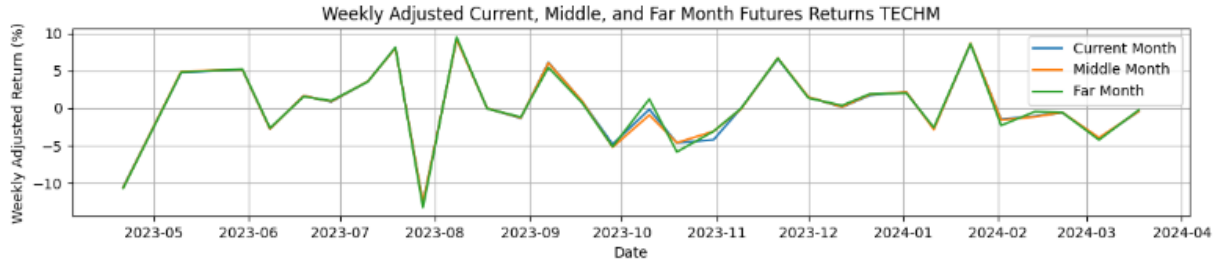


*(Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **Tata Consumer Products Limited** Futures on Monthly Frequency)*

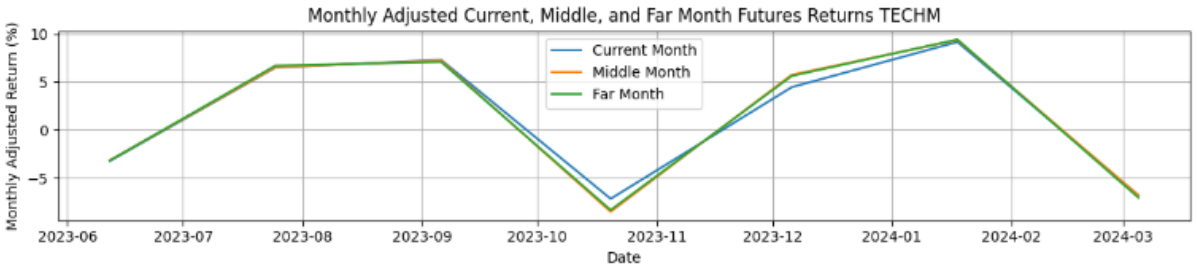
Tech Mahindra Limited Futures (Adjusted)



*(Fig 37 : Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **Tech Mahindra Limited** Futures on Daily Frequency)*

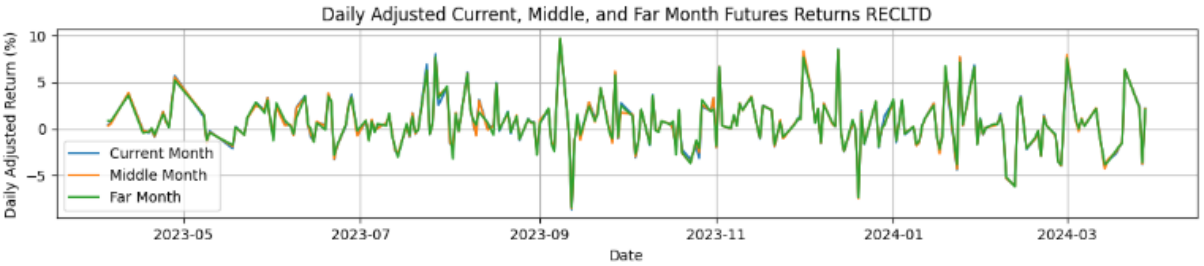


*(Fig 38 : Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **Tech Mahindra Limited** Futures on Weekly Frequency)*

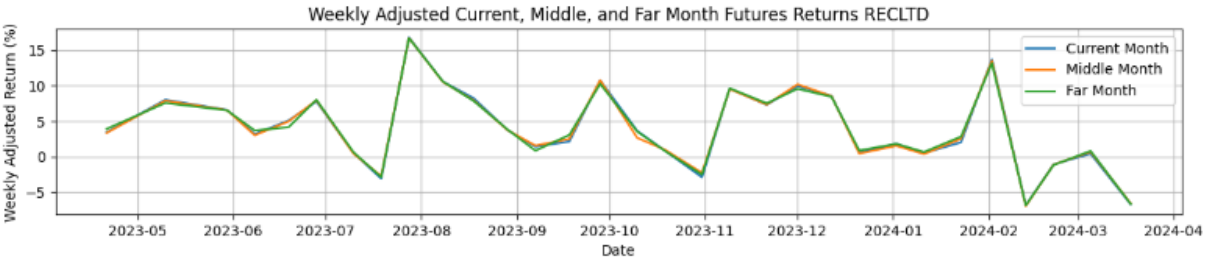


*(Fig 39 : Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **Tech Mahindra Limited** Futures on Monthly Frequency)*

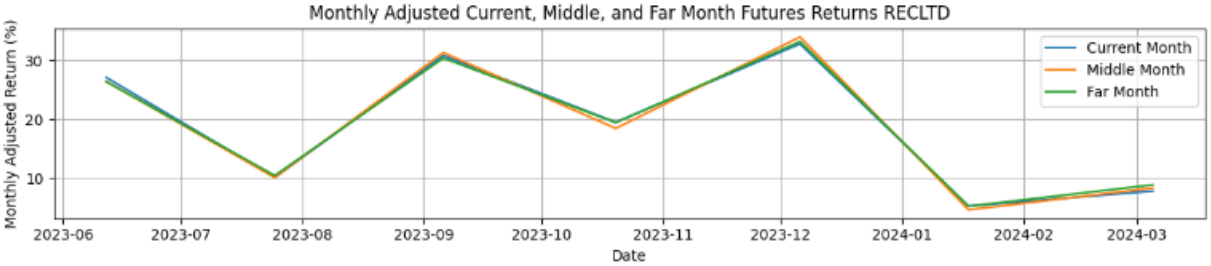
REC Limited Futures (Adjusted)



*(Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **REC Limited** Futures on Daily Frequency)*



*(Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **REC Limited** Futures on Weekly Frequency)*



*(Plot of Returns vs Dates for Risk-Adjusted Current, Middle and Far month Futures Returns for **REC Limited** Futures on Monthly Frequency)*

Conclusion:

- **TATA Consumer Products Limited**: Shows a strong upward trend in returns with relatively controlled volatility, making it an excellent choice for long-term investments.
- **TECH Mahindra Limited**: Exhibits a modest increase in returns with less pronounced volatility, suggesting it is less favorable compared to TATA and REC for risk-adjusted performance.
- **REC Limited**: Demonstrates significant returns over longer periods with controled volatility, making it a solid investment for those seeking substantial long-term gains.

Overall**, TATA and REC futures** exhibit **favorable trends and controlled volatility,** making them **more attractive for long-term investors compared to TECHM**

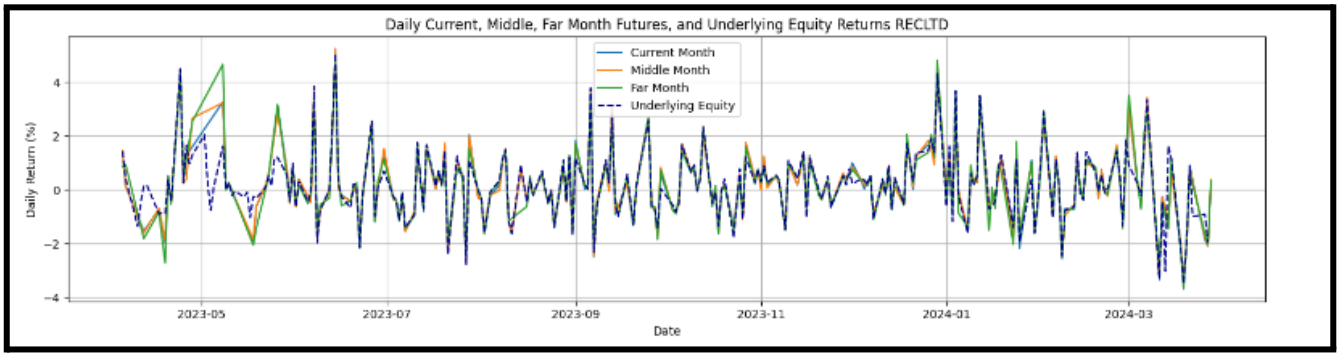
10. Comparing Stock and Future Returns

10.1Daily Adjusted Returns

TATACONSUM

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-3.5079	-3.361	-3.378	-3.7127
Max (%)	5.0464	5.2194	5.2113	4.8219
Mean (%)	0.1546	0.1692	0.1711	0.1737
Std dev	1.3058	1.3548	1.3539	1.3941

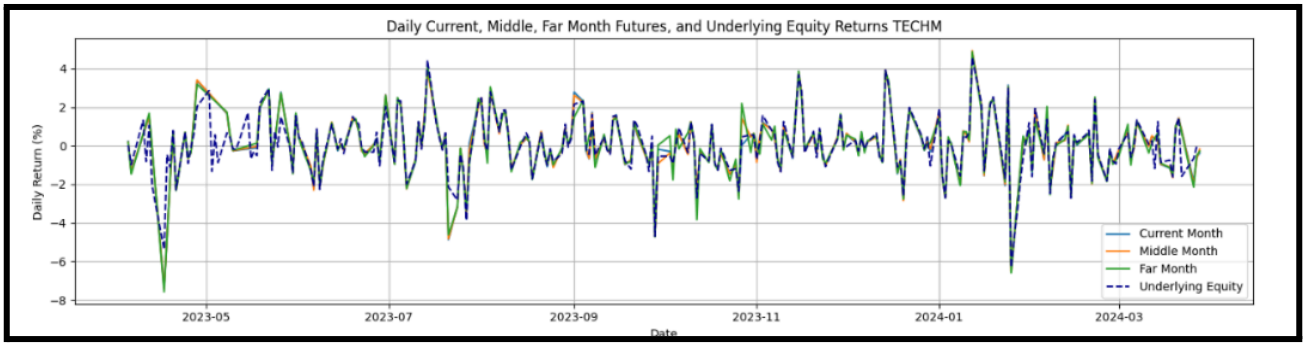
(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)



TECHM

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-6.3139	-7.4261	-7.4289	-7.5956
Max (%)	4.5686	4.7888	4.9101	4.8567
Mean (%)	0.0494	0.0346	0.0353	0.0355
Std dev	1.4900	1.606	1.6103	1.6262

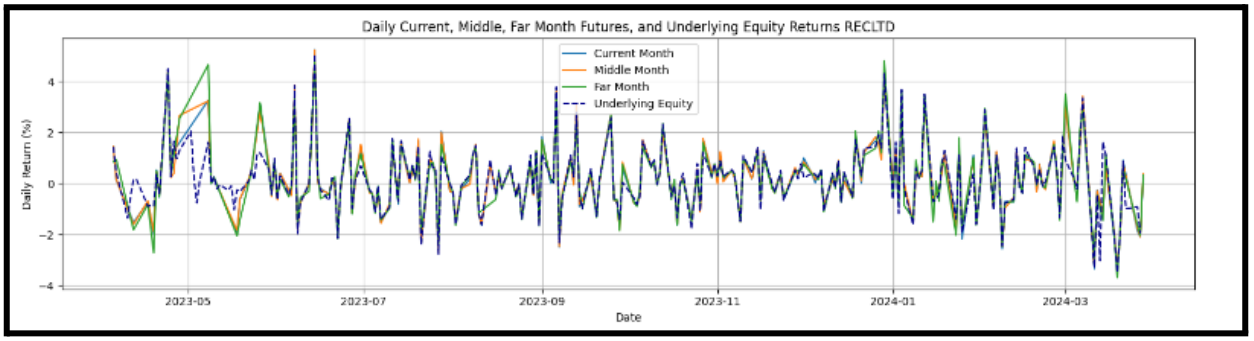
(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)



REC

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	8.5436	-8.6964	-8.5681	-8.4610
Max (%)	9.5288	9.5435	9.6572	9.7441
Mean (%)	0.5568	0.5838	0.5836	0.5864
Std dev	2.5912	2.6653	2.6552	2.6094

(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)

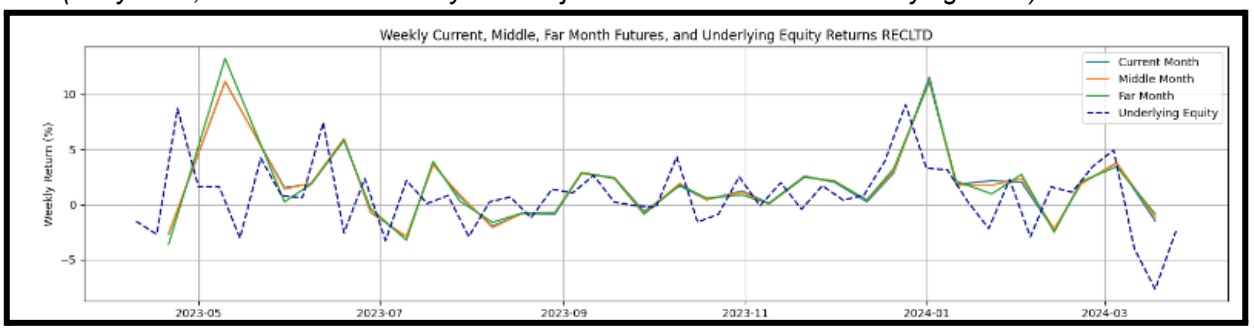


10.2 Weekly Adjusted Returns

TATACONSUM

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-7.7935	-3.0457	-3.0296	-3.7243
Max (%)	8.9141	11.3952	11.0844	13.0806
Mean (%)	0.6850	1.4821	1.4935	1.4818
Std dev	3.0995	3.3024	3.2626	3.5262

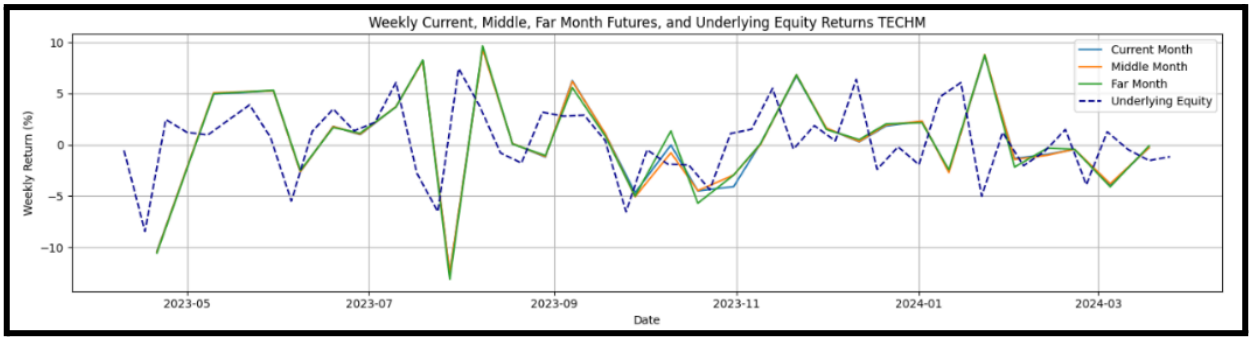
(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)



TECHM

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-8.5856	-12.6934	-12.6636	-13.269
Max (%)	7.2975	9.2890	9.2105	9.5215
Mean (%)	0.2001	0.3167	0.3226	0.3241
Std dev	3.4779	5.0019	5.0008	5.101

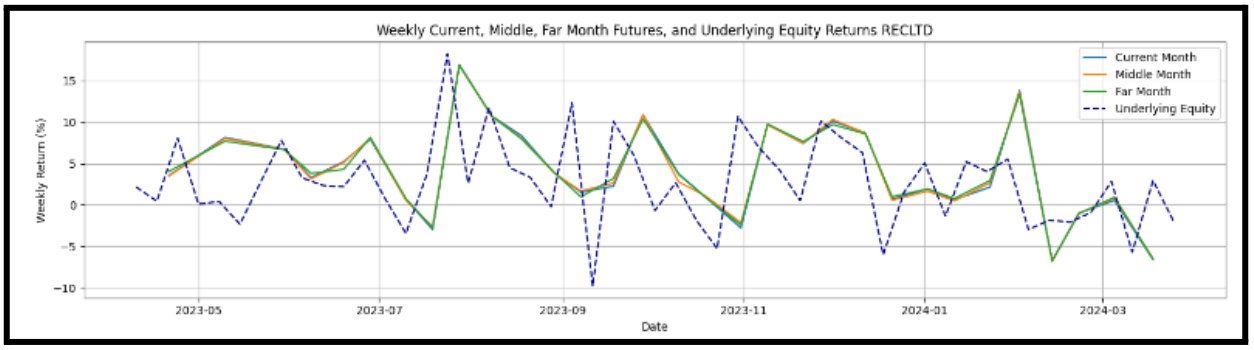
(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)



REC

Risk-Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-9.9449	-6.8511	-6.9602	-6.8786
Max (%)	18.1153	16.8184	16.7395	16.7133
Mean (%)	2.5842	4.0837	4.0806	4.1022
Std dev	5.2467	5.5921	5.5312	5.4541

(Daily Near, Next and Far Monthly Risk-Adjusted Returns with its Underlying asset)

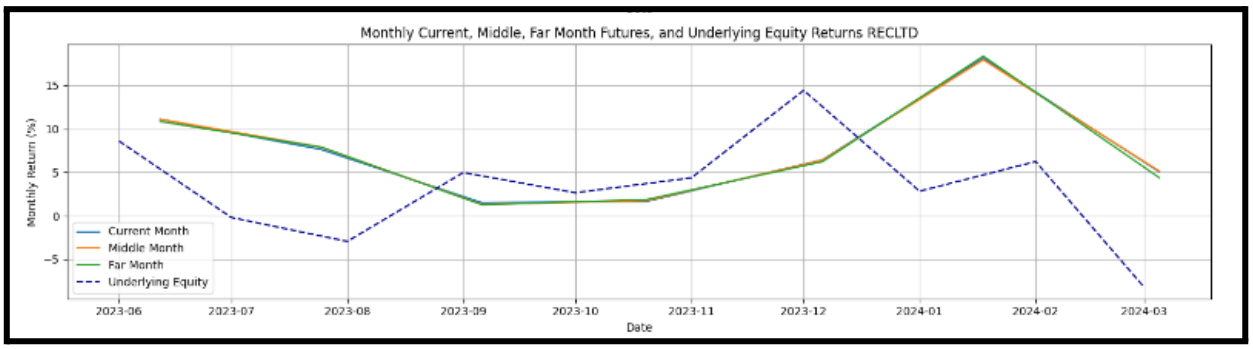


10.3 Monthly Adjusted Returns

TATACONSUM

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-8.7866	0.9349	0.74346	0.7033
Max (%)	13.8593	17.5529	17.3732	17.7970
Mean (%)	2.7040	6.7897	6.7968	6.6980
Std dev	6.2273	5.8152	5.7781	5.9285

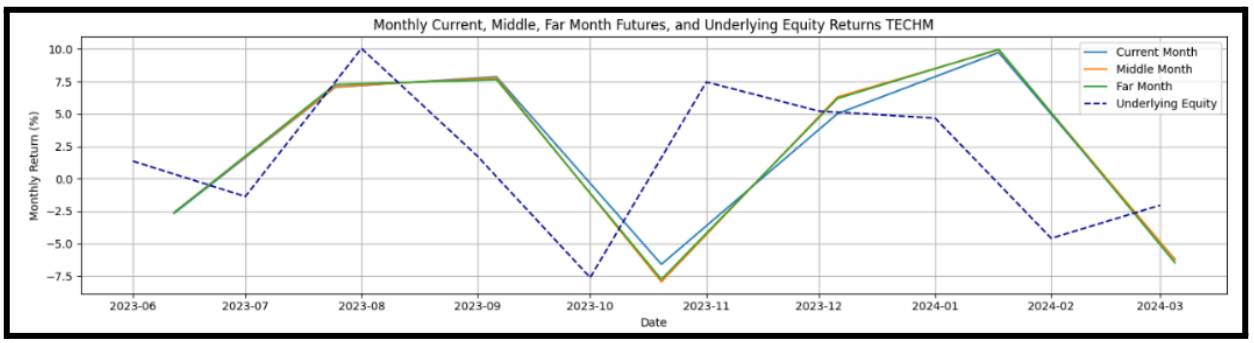
(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)



TECHM

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-8.1862	-7.1674	-8.5209	-8.3352
Max (%)	9.4793	9.1570	9.3575	9.4121
Mean (%)	0.9164	1.4551	1.4808	1.4624
Std dev	5.5135	6.9788	7.4043	7.4092

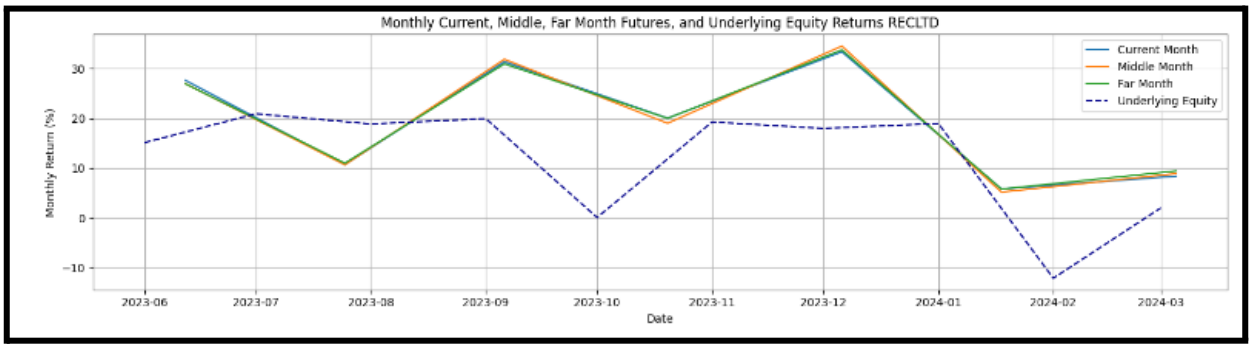
(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)



REC

Risk Adjusted Returns	Underlying Stock	Near	Next	Far
Min (%)	-12.7004	5.2492	4.6047	5.2035
Max (%)	20.3415	32.7296	33.9468	33.116
Mean (%)	11.5253	19.0396	19.0074	11.1128
Std dev	11.3554	11.462	11.7663	11.1931

(Daily Near, Next and Far Monthly Risk Adjusted Returns with its Underlying asset)



11. Liquidity

The liquidity of an asset is its ability to be converted into cash without affecting its market price. Using the bid-ask spread for that asset, one can find the liquidity. A narrow bid-ask spread indicates a highly liquid asset as the transaction can occur without much change in the market price. The liquidity can be calculated by using the average daily trading volume, open interests and number of contracts. For futures derivatives higher trade volume and number of open interests indicate better liquidity.

Month	Near	Middle	Far
Average No of Contracts	3,375	1,200	10
Average Open Interest	88,99,388	16,82,807	19,430

Liquidity of Futures Contracts – TATACONSUM Ltd.

Month	Near	Middle	Far
Average Trading Volume	6947	2652	57
Average Open Interest	1,14,84,455	22,42,666	67,256

Liquidity of Futures Contracts – TECHM Ltd.

Month	Near	Middle	Far
Average No of Contracts	8828	2270	91
Average Open Interest	4,49,06,562	93,24,928	4,56,044

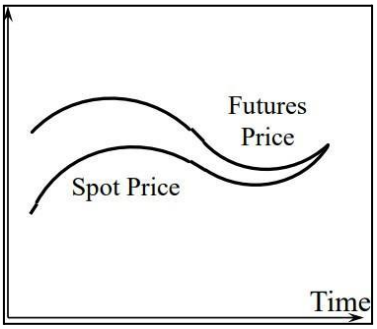
Liquidity of Futures Contracts – REC Ltd.

From the daily trading data, it is evident that considering the average open interest in the market, people prefer the near month over the next and far month futures contracts, as the current month contract gives you a better liquidity position than the next and far month. More liquidity means it would be easier to enter/exit the market if you so choose by squaring off/doubling down upon your current position. Hence, even though far-month contracts give better returns than the current and subsequent months, the open interest will always be heavily toward current-month contracts. Further, investing in far-month contracts is not a good idea directly after issuance of the contract as significant price shifts would subsequently become a liability due to the lack of liquidity and market movement upon the far-month futures.

12. Contango and Backwardation

Contango or **normal market,** is a market situation where the underlying asset's spot price is less than the forward price of the futures contract. Identifying the contango allows one to profit from arbitrage by taking a long position in the equity market and shorting the futures contract.

Assets in contango are also likely to see an increase in spot price, indicating that profits can be locked in by buying now and selling later, especially during times of inflation.

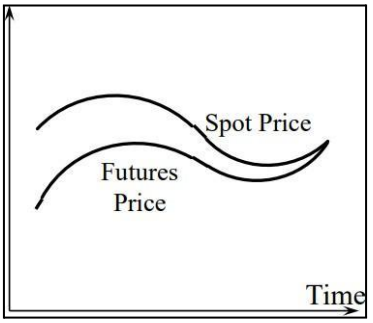


Contango or Normal Market

Backwardation is the exact opposite condition to Contango where the spot price is higher compared to futures price. This is completely opposite to the going concern basis and hence also known as **Reverse market.**

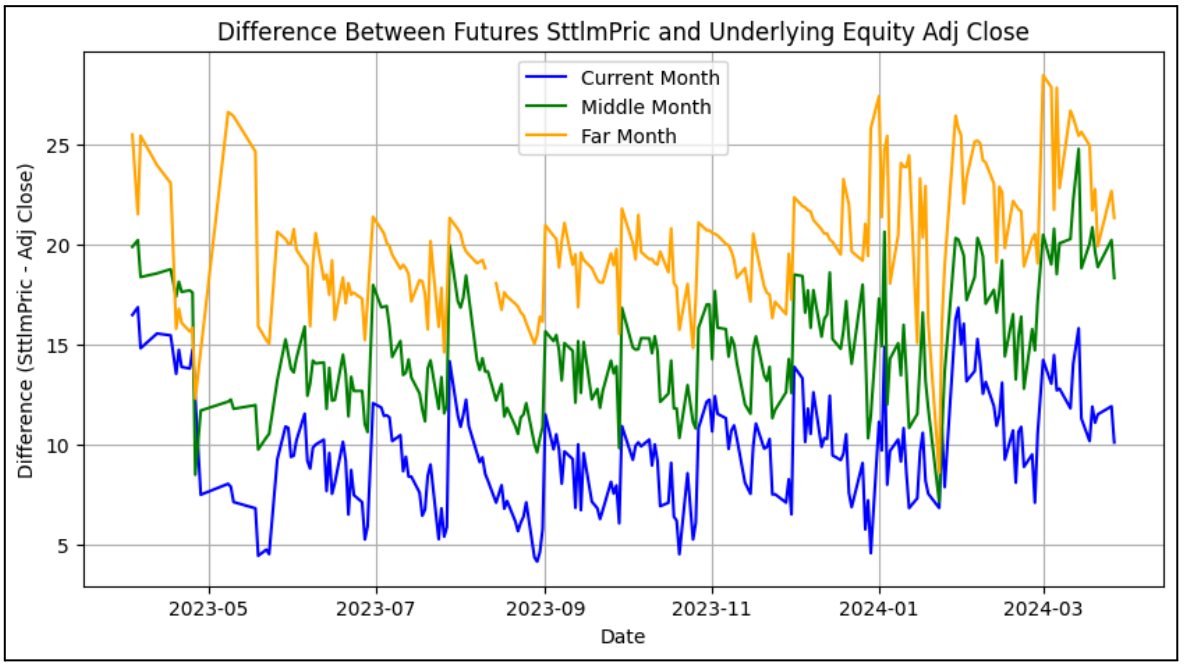
Assets seeing backwardation can expect to see a rise in futures prices as more people would be interested to buy futures and short the asset creating buying and selling pressure respectively, finally converging at one common price at maturity.

B*ackwardation or Reverse Market*



TATACONSUM

Futures Types	Near Month	Next Month	Far Month
Number of Contango's Observed	223	223	223
Number of Backwardation's Observed	0	0	0



12.1 Analysis

Table Interpretation: The table provides a summary of the contango and backwardation observed for the near month, next month, and far month futures of TATA. The observations are as follows:

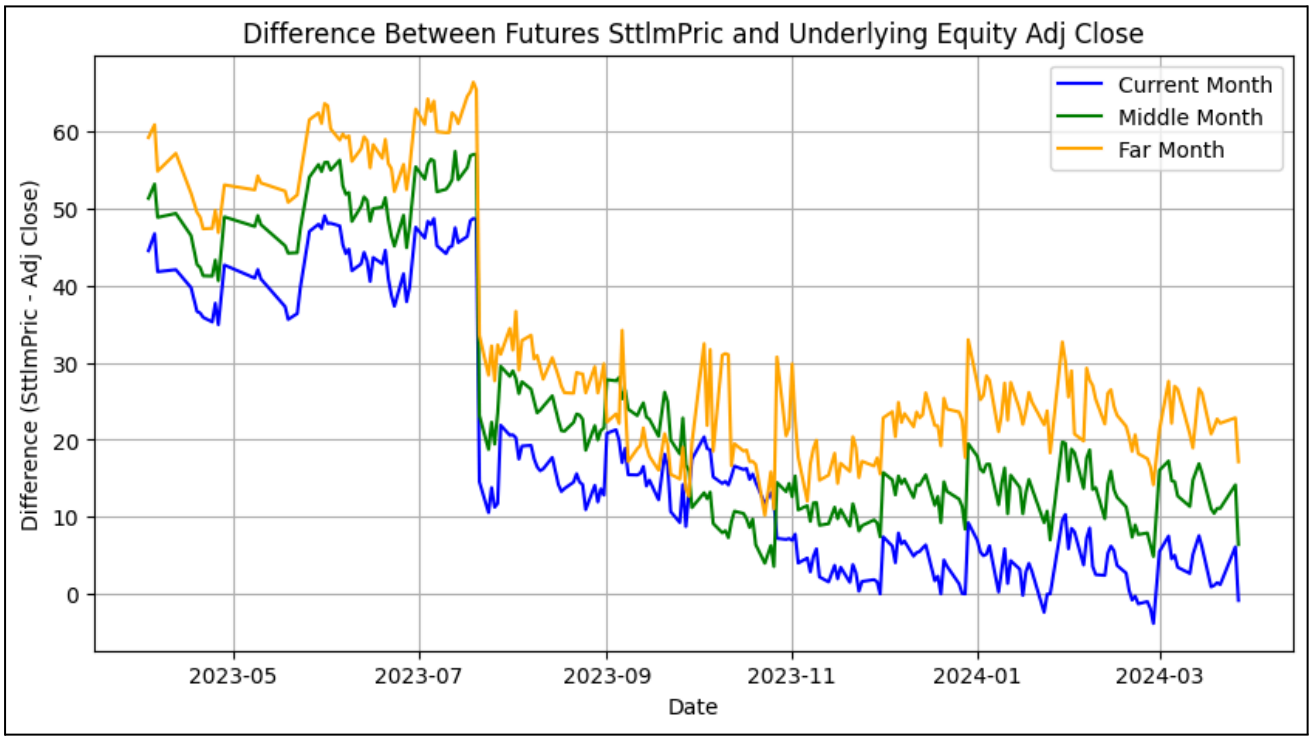
- **Near, Next and Far Month**: There are 223 instances of contango and 0 instances of backwardation.

This indicates that throughout the observation period, the futures prices for TATA were consistently higher than the spot prices (adjusted close) for all three future types. The absence of backwardation suggests that the market does not expect a decrease in futures prices compared to spot prices during this period.

Conclusion: The data and graph collectively indicate a strong and consistent contango market for TATA futures during the observation period. The persistent positive difference between futures and spot prices suggests that market participants expect higher prices in the future, possibly due to factors such as anticipated increases in demand or inflation. The **higher volatility in far month futures reflects greater uncertainty** and **risk** associated with longer-term price forecasts.

TECHM

Futures Types	Near Month	Next Month	Far Month
Number of Contango's Observed	212	223	223
Number of Backwardation's Observed	11	0	0



12.2 Analysis

Table Interpretation: The table provides a summary of contango and backwardation observations for the near month, next month, and far month futures of TECH Mahindra:

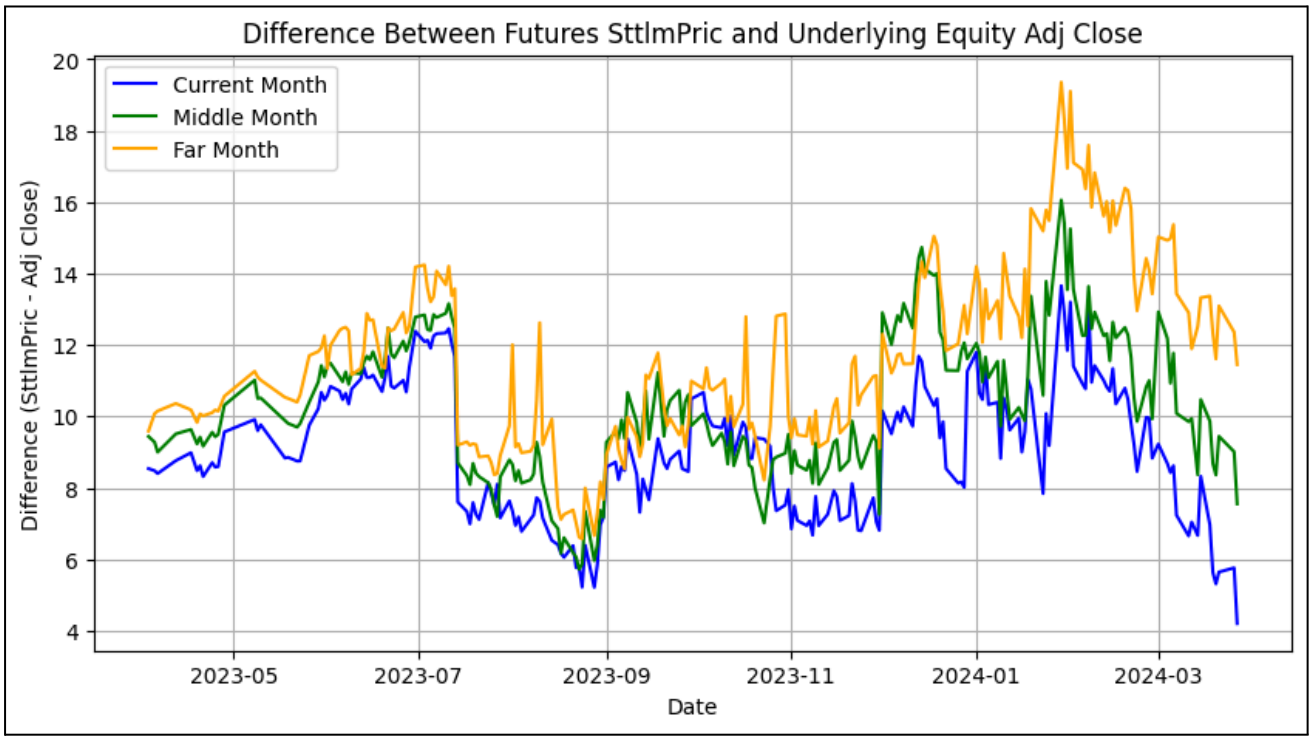
- **Near Month**: 212 instances of contango and 11 instances of backwardation.
- **Next Month**: 223 instances of contango and 0 instances of backwardation.
- **Far Month**: 223 instances of contango and 0 instances of backwardation.

This indicates that while the near month futures primarily exhibited contango, there were 11 instances where backwardation occurred, suggesting occasional shifts in market expectations. The next and far month futures, however, were consistently in contango.

Conclusion: The data and graph suggest that TECH Mahindra futures were predominantly in **contango** across the observation period. The consistent contango in the next and far month futures **reflects stable market expectations of rising prices**. However, the 1**1 instances of backwardation** in the near month futures **indicate short-term shifts** in **market sentiment**, possibly due to immediate market events or changes in demand and supply dynamics. The higher volatility in far month futures underscores the greater uncertainty and risk associated with long-term price predictions.

RECLTD

Futures Types	Near Month	Next Month	Far Month
Number of Contango's Observed	223	223	223
Number of Backwardation's Observed	0	0	0



12.3 Analysis

Table Interpretation: The table shows the summary of contango and backwardation observations for the near month, next month, and far month futures of REC Ltd:

- **Near, Next and Far Month**: There are 223 instances of contango and 0 instances of backwardation.

This indicates that throughout the observation period, the futures prices for REC Ltd. were consistently higher than the spot prices (adjusted close) for all three futures types.

Conclusion: The table and graph indicate that REC futures were consistently in contango during the observation period, with futures prices higher than spot prices across all three futures types. The absence of backwardation suggests stable market expectations of rising prices. The **far month futures exhibit greater volatility and a larger premium** over spot prices, reflecting higher uncertainty and risk associated with longer-term forecasts. This consistent contango market **reflects bullish market** sentiment for REC Ltd's future price performance.

13. Effects of Frequency

The effects of frequency can be felt in the returns of the underlying stock and its Futures derivatives. The mean returns and Sharpe ratio indicate these impacts of trading at different frequencies.

EQUITY:

- Profit by investing in TATACONSUM
  - Daily Frequency: (Risk Adjusted Returns) 0.1546 %*240days= **37.104%**
  - Weekly Frequency: (Risk Adjusted Returns) 0.6850 %*52weeks=35.62%
  - Month Frequency: (Risk Adjusted Returns) 2.7040 %*12 months=32.448%
  - This indicates that **Daily Frequency** is the most profitable
- Profit by investing in TECHM
  - Daily Frequency: (Risk Adjusted Returns) 0.0494 %*240days= **11.856%**
  - Weekly Frequency: (Risk Adjusted Returns) 0.2001 %*52weeks=10.4052%
  - Month Frequency: (Risk Adjusted Returns) 0.9164 %*12 months=10.9968%
    This indicates that **Daily Frequency** is the most profitable
- Profit by investing in REC
  - Daily Frequency: (Risk Adjusted Returns) 0.5568 %*240days=133.632%
  - Weekly Frequency: (Risk Adjusted Returns) 2.5842 %*52weeks=134.3784%
  - Month Frequency: (Risk Adjusted Returns) 11.5253 %*12 months=**138.3036%**
    This indicates that **Monthly Frequency** is the most profitable

FUTURES:

- Profit by investing in TATACONSUM Futures (Next)
  - Daily Frequency: (Risk Adjusted Returns) 0.1711 %*240days=41.064%
  - Weekly Frequency: (Risk Adjusted Returns) 1.4935 %*52weeks=77.662%
  - Month Frequency: (Risk Adjusted Returns) 6.7968 %*12 months=**81.4764%**
    This indicates that **Monthly Frequency** is the most profitable
- Profit by investing in TECHM Futures (Next)
  - Daily Frequency: (Risk Adjusted Returns) 0.0346 %*240days=8.304%
  - Weekly Frequency: (Risk Adjusted Returns) 0.3226 %*52weeks=16.7752%
  - Month Frequency: (Risk Adjusted Returns) 1.4808 %*12 months=**17.7696%**
    This indicates that **Monthly Frequency** is the most profitable
- Profit by investing in REC Futures (Next)
  - Daily Frequency: (Risk Adjusted Returns) 0.5838 %*240days= 140.112%
  - Weekly Frequency: (Risk Adjusted Returns) 4.0806 %*52weeks=212.1912%
  - Month Frequency: (Risk Adjusted Returns) 19.0074 %*12 months=**228.0888%**
    This indicates that **Monthly Frequency** is the most profitable

Frequency does matter as we get different annual returns at different frequencies, and in different situations different frequencies are favorable

Section-5 (Conclusion)

This report aimed to track the spot and settlement prices for futures contracts of TATACONSUM, TECHM, and REC and then draw inferences from them by calculating their respective returns. The period of analysis was between 3rd April to 28th March 2024, i.e., 12 months of data. The frequencies of trading considered were daily, weekly, and monthly and mean returns (adjusted and unadjusted), along with volatility and sharpe ratio, were considered to put into perspective the performance of the stock in both the spot and futures markets.

The mean returns for all three companies TATACONSUM ,TECHM and REC for both the asset itself and the futures segment always showed a trend where the returns were ranked in the order of Monthly>Weekly>Daily based on the frequency.

Regarding monthly and weekly returns of REC > TATA CONSUM > TECHM, by comparing the mean, and max returns for all three near, next, and far month.

Regarding daily returns REC > TATA CONSUM > TECHM, by comparing the mean, for all three near, next, and far month. In terms of max return percentage REC> TECHM > TATA CONSUM.

Overall**,** TATA and REC futures exhibit favorable trends and controlled volatility, making them **more attractive for long-term investors compared to TECHM**

REC, however, in all segments exhibited that hedging using REC stock as an underlying wasn't a good strategy for investors as monthly mean adjusted returns came out to be negative for this stock's futures derivative. The underlying always had better returns, and the monthly and daily frequency yielded the most for the investors. Hence, for an investor, it is advised to invest more in TATACONSUM AND TECHM as compared to REC.

Section-6 (References)

1. https://www.nseindia.com/
2. https://finance.yahoo.com/
3. https://www.tataconsumer.com/
4. https://www.moneycontrol.com/india/stockpricequote/plantations-teacoffee/tataconsumerproducts/TT
5. https://in.investing.com/equities/tech-mahindra
6. https://www.investopedia.com/terms/c/contango.asp
7. https://www.business-standard.com/markets/rec-ltd-share-price-18075.html
8. https://trendlyne.com/equity/1119/RECLTD/rec-ltd/
9. https://recindia.nic.in/
10. https://in.investing.com/equities/tech-mahindra