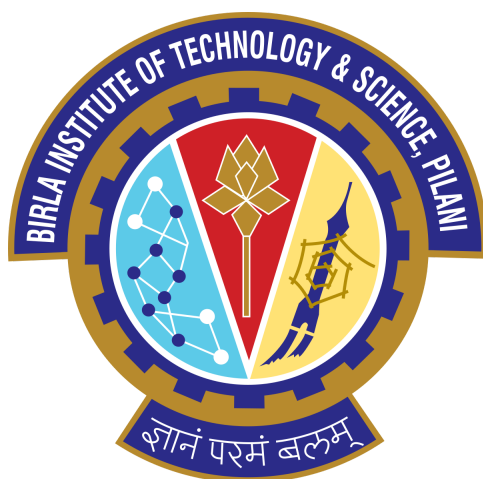


BITS PILANI HYDERABAD CAMPUS

**Submitted in the fulfillment of project as part of the course
ECON F354- Derivatives and Risk Management**

Financial Analysis of
CONCOR & PERSISTENT



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CONCOR

**Container Corporation of
India Limited**

1 Introduction

1.1 Nature of business

CONCOR is a government owned ancillary of the ministry of railways of India. It was set up in 1988 and now is the market leader of cargo transportation throughout India. It has played and will continue to play a part in promoting the use of containers in India thanks to its existing fleet of rail waggons, customer-friendly business practises, and extensive use of information technology. The business seeks to offer an effective logistic solution to all of India's freight transportation issues. In order to accommodate all forms of cargo delivery and storage, CONCOR is also trying to expand beyond rail transit.



Figure 1: Concor Logo

1.2 Ownership

CONCOR is a public sector Enterprise under the government of India who owns 54.8% of the company as promoter holdings. FIIs hold 24.06% of the company, 13.9% of the shares are in the form of mutual funds, the public holds 3.8% of the firm and the remaining 4.8% is held by others.

The following figure represents the data above:

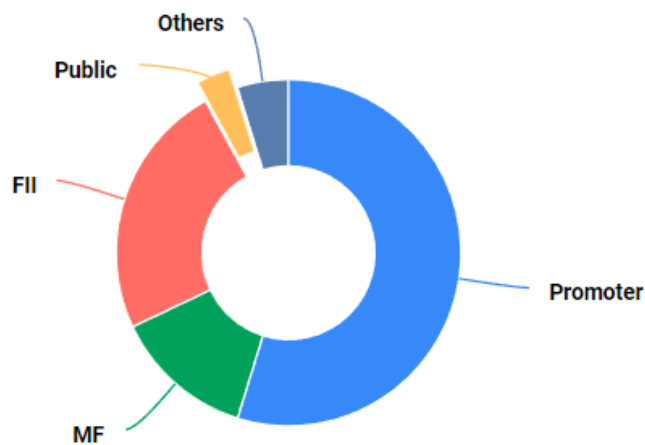


Figure 2 : Shareholding Pattern of Concor

1.3 Business commencement

CONCOR was created in March 1988 by the Indian railways under the Companies Act, it started its operations in November 1989 by consuming the network of existing inland container depots of the Indian railways. CONCOR was a goal set by the railway ministry in 1966 to introduce an effective, multi medium, container transportation service throughout India.

1.4 Industry parameters

CONCOR is a member of the transport sector, which is crucial to the Indian market. Almost all goods and services are dependent on the transportation sector, either directly or indirectly. Because of the great reliance on logistics, markets that operate more smoothly are healthier. On average, transportation costs account for between 10 and 20 percent of the cost of a good or service. Since Indian Railways is one of the biggest railway systems with a single management, CONCOR primarily engages in railway transportation, which also happens to be India's strong suit.

1.5 Overall Greatness

CONCOR is a Navratna company, which means it is a public sector firm but they can invest up to Rs 1000 Crs without needing direct government approval. The firm has also been showing constant profits throughout the

past decade even through recession and the COVID outbreak when the transportation industry was losing strength.

2 Underlying Stock Returns

As it can be noticed from the following Table 1, returns are negative for all the frequencies of data . But, we can still notice that the returns of monthly trading is comparatively higher than the returns of both weekly and daily trading.

Metric	Daily	Weekly	Monthly
Minimum	-5.5795	-9.9560	-8.6325
Maximum	10.986	14.7541	19.9310
Mean	0.1033	0.4093	2.0722
Standard Deviation	2.1946	5.1308	9.3755

Table 1: Comparison of the Daily, Weekly and Monthly risk-unadjusted returns(Returns in %)

3 Underlying Stock Risk Adjusted Returns

From Table 2, we can clearly see that the company stock has been leading to profits, with highest profits appearing in monthly returns of 1.7793%.

Metric	Daily	Weekly	Monthl y
Minimum	-5.6168	-9.9933	-8.6816
Maximum	10.6516	14.7053	19.8796
Mean	0.0893	0.3627	1.7793
Standard Deviation	2.2072	5.1296	8.9793

Table 2: Comparison of the Daily, Weekly and Monthly risk-adjusted returns(Returns in %)

4 Economic Interpretation of risk adjusted and risk unadjusted returns

The risk-adjusted return identifies the amount of risk taken to obtain an investment's return. An investor can compare the risk-adjusted returns of multiple securities, mutual funds, and even a portfolio using risk-adjusted returns. Therefore, it is essential for an investor to invest after inspecting the risk adjusted returns to ensure the reward to risk ratio is balanced. For portfolio managers who deal with diverse clients who expect different returns for a given amount of risk or vice versa, this ratio is also very important. According to Figures 3, 4 and 5, the underlying stock's daily, weekly, and monthly returns are plotted.

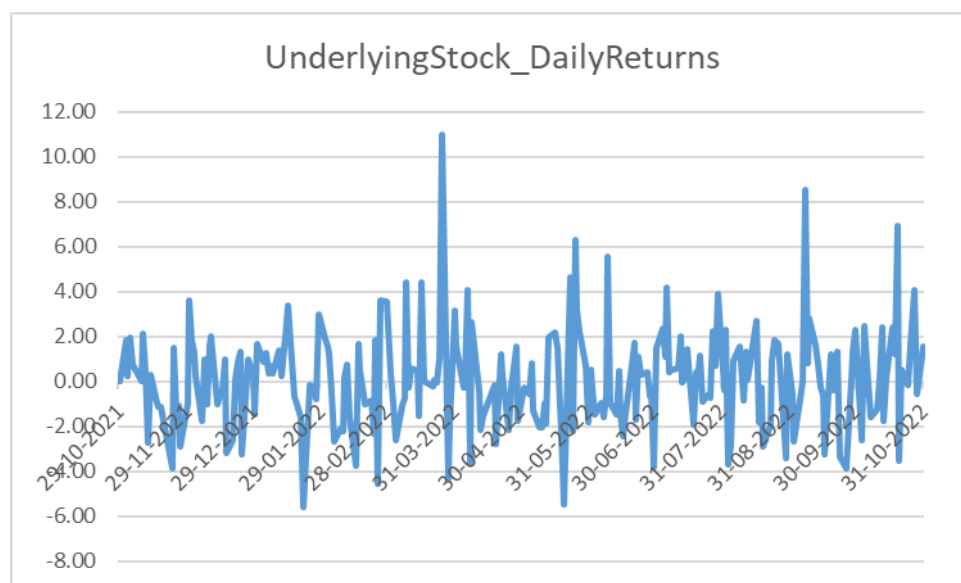


Figure 3: Daily Returns of Underlying Stock

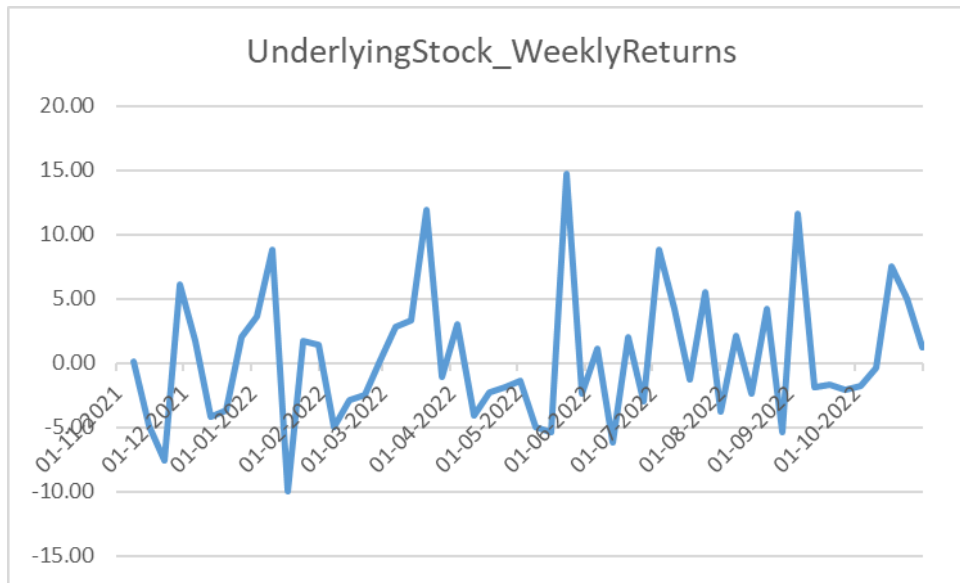


Figure 4: Weekly Returns of Underlying Stock

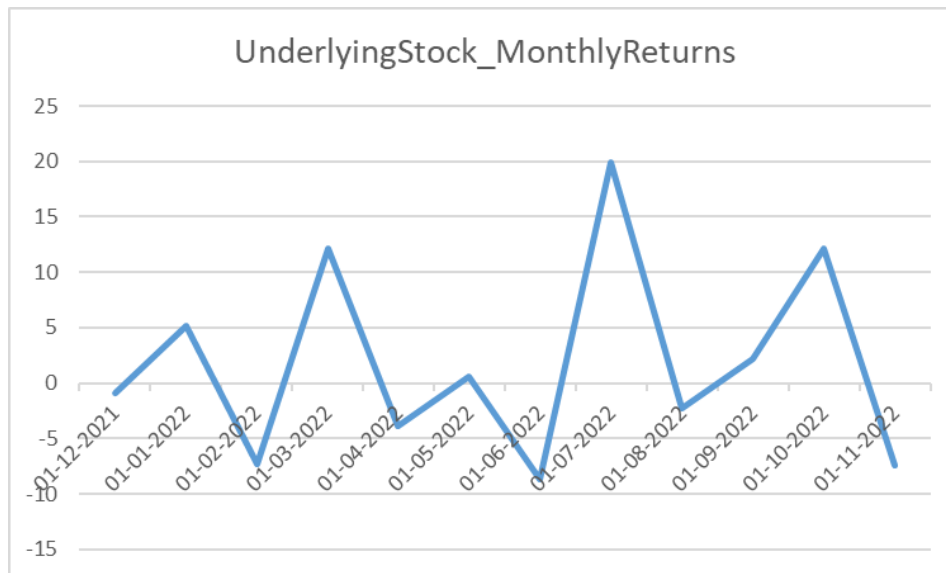


Figure 5: Monthly Returns of Underlying Stock

5 Equity Futures

5.1 Commencement of Equity Futures

CONCOR commenced its equity futures trading from November 1989.

5.2 Lot size and Contract Specifications

CONCOR is currently trading with a lot size of 1000 contracts.

5.3 Greatness of Equity Futures

CONCOR is currently participating in the futures market with 2,285 contracts in the near month, 62 in the next month, and finally 2 in the far month.

6 Near Month Returns

Near month is the current trading month, and contracts for near month typically expire on the last Thursday of the month. As can be seen from table 3, we can see that the daily, weekly and monthly near month returns are positive indicating profits in all trading frequencies. Hence, we can conclude from the risk unadjusted returns that monthly frequency is best for trading on near month futures as it has the highest value.

Metric	Daily	Weekly	Monthly
Minimum	-5.7391	-9.6278	-9.0268
Maximum	10.7761	14.3380	17.5184
Mean	0.1045	0.4596	1.8064
Standard Deviation	2.1919	4.8085	9.1345

7 Near Month Risk-adjusted Returns

Risk adjustment allows for a comparison of returns as mere numbers since excess returns to standard deviation are already accounted for. From Table 4, we can clearly see that the risk adjusted returns are lower than the risk unadjusted returns and all of them are positive, so for better profits the investor must choose monthly trading.

Metric	Daily	Weekly	Monthly
Minimum	-5.7764	-9.6654	-9.0641
Maximum	10.7382	14.2803	17.4624

Mean	0.0949	0.4130	1.7595
Standard Deviation	2.2059	5.3918	9.1305

8 Economic interpretation of risk adjusted and unadjusted near month returns

By giving an insight into how risk should be taken to gain the return calculated without considering risk earlier, risk-adjusted return always refines the ideal risk-unadjusted return. From the above sections it is evident that the returns have decreased significantly from risk unadjusted to risk adjusted case, hence, it is always a good practice to go through risk adjusted returns first and then make a decision. Figure 6,7 and 8 show the returns distribution over various frequencies of time.

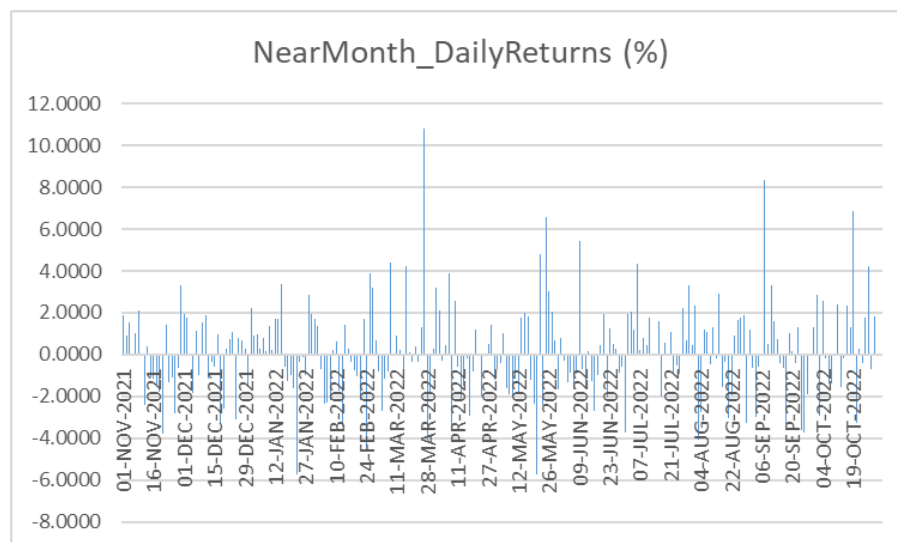


Figure 6: Near Month Returns in Daily Frequency

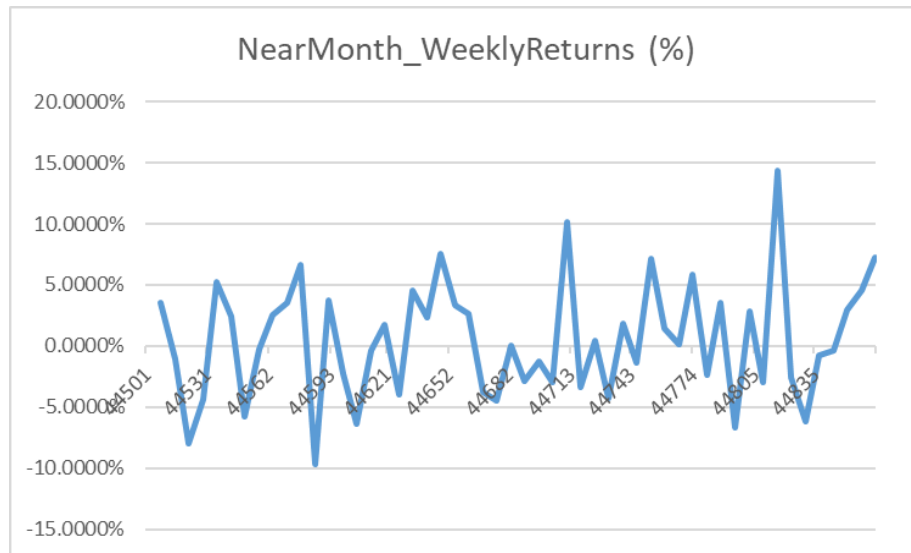


Figure 7: Near Returns in Weekly Frequency

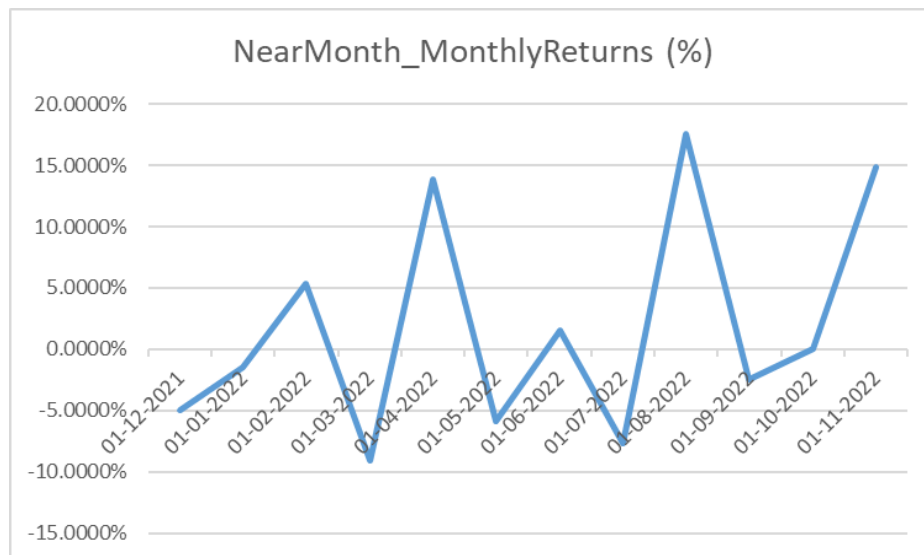


Figure 8: Near Month Returns in Monthly Frequency

9 Comparison of Returns

9.1 Comparison of Near, Next and Far month Risk Adjusted Returns

Table 5 shows the comparison between the daily risk-adjusted returns between near, next, and far months. It can be observed that all the returns are positive. Investors must choose near month for better profits.

Metric	Near	Next	Far
Minimum	-5.7764	-5.7264	-6.0208
Maximum	10.7382	10.7323	11.1194
Mean	0.0949	0.0915	0.0940
Standard Deviation	2.2059	2.1986	2.2084

Table 5: Comparison of the Daily risk-adjusted Near,Next and Far Month returns (Returns in %)

9.2 Comparison of Near Month and Underlying Stock returns

From Table 6, it is evident that the returns of near month futures prices for daily frequency is higher than the underlying stock prices for daily frequency, hence it is advisable to invest in near month futures contracts.

10 Comparison of Spot and Future Returns

10.1 Underlying Asset vs Near Month

10.1.1 Daily Frequency

As discussed in section 9.2, from table 6 we can see that the near month futures perform better than the underlying stock on a daily basis.

Metric	Underlying Stock	Near Month
Minimum	-5.6168	-5.7764
Maximum	10.6516	10.7382
Mean	0.0893	0.0949
Standard Deviation	2.2072	2.2059

Table 6: Comparison between risk adjusted daily returns of Underlying Stock and Near Month futures(Returns in %)

10.1.2 Weekly Frequency

From Table 7, we can notice that for weekly frequency the near month futures perform better than the underlying stock.

Metric	Underlying Stock	Near Month
Minimum	-9.9933	-9.6654
Maximum	14.7053	14.2803
Mean	0.3627	0.4130
Standard Deviation	5.1296	5.3918

Table 7: Comparison between risk adjusted weekly returns of Underlying Stock and Near Month futures(Returns in %)

10.1.3 Monthly Frequency

From Table 8, we can see that the monthly frequency of underlying stock performs better than the near month futures contracts for monthly frequency.

Metric	Underlying Stock	Near Month
Minimum	-8.6816	-9.0641
Maximum	19.8796	17.4624
Mean	1.7793	1.7595
Standard Deviation	8.9793	9.1305

Table 8: Comparison between risk adjusted monthly returns of Underlying Stock and Near Month futures(Returns in%)

10.2 Near Month vs Next Month vs Far Month

10.2.1 Daily Frequency

As it can be seen from Figure 9, the daily returns of near, next, and far month move with high synchronization with less to no deviation from each of its values.

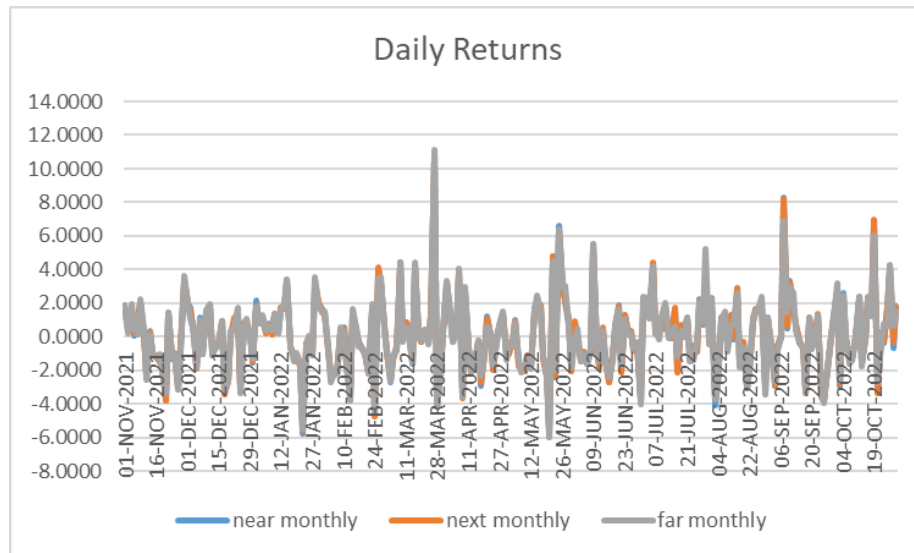


Figure 9: Daily returns of near, next, and far month

10.2.2 Weekly Frequency

From Figure 10, we can see that the weekly returns of all near, next, and far months move with high similarity with no deviation from any of its returns, thus showing the high correlation between their returns.

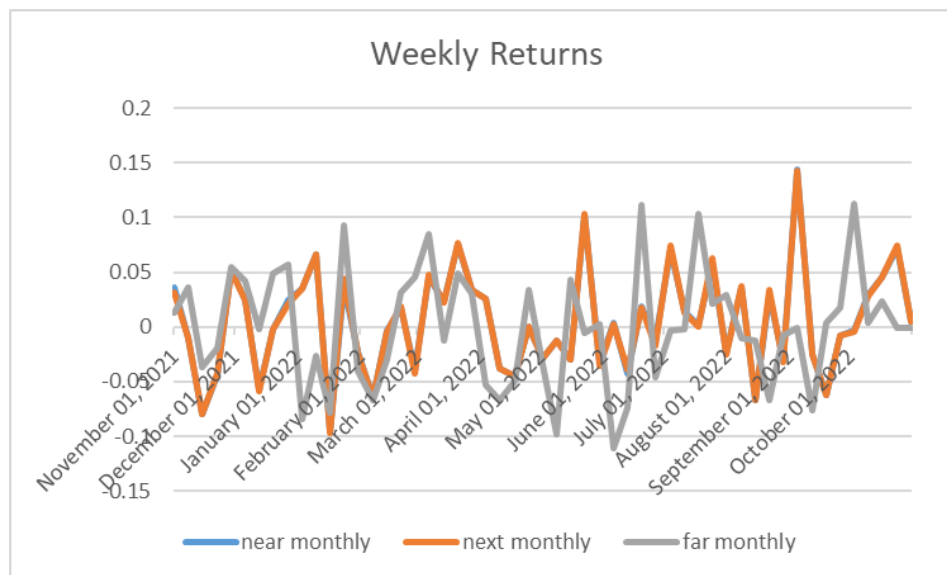


Figure 10: Weekly returns of near, next, and far month

10.2.3 Monthly Frequency

From Figure 11, we can see that the monthly frequency of near, next, and far month returns follow high synchronization, following more or less the same returns through the year in all the cases.

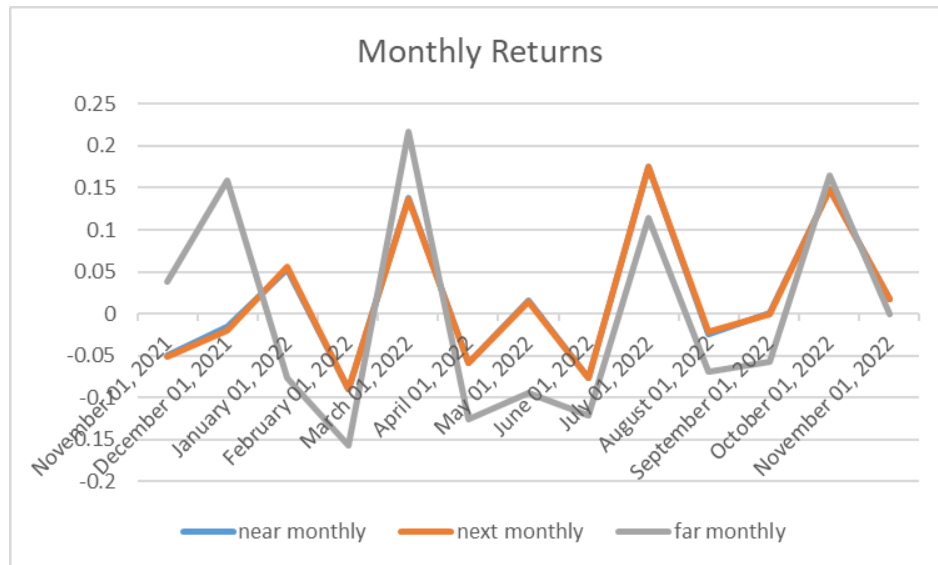


Figure 11: Monthly returns of near,next, and far month

11 Contango or Backwardation of futures Instrument

Futures markets use the terms "contango" and "backwardation" to describe the discrepancy between the spot price and the futures price of underlying assets or commodities. There is a state of contango when a commodity's futures price or underlying asset's spot price is higher than the other, i.e., futures price > spot price.

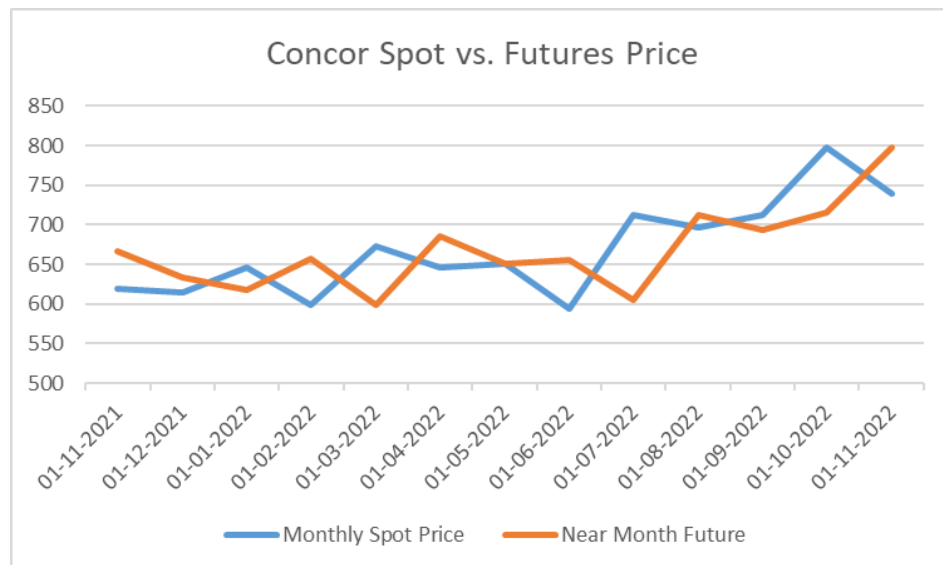
Stocks or commodities that display contango behavior will be more valuable to investors in the future. By purchasing more future contracts, speculators can lock in profits since futures prices that are higher than spot prices may be speculative about future prices.

There is backwardation when the futures price of a commodity or underlying asset is lower than its spot price, or when the futures price is higher than the spot price.

There can be backwardation when there is a greater demand for an asset now than there will be when futures contracts mature. If the current price is too high, an investor can short the asset and buy a futures contract for a profit.

From the below graph we can see that for the months of November 2021, some parts of December 2021, January 2022, some parts of February 2022, April to June 2022, the beginning of August 2022 and the later half of October 2022,

Concor was in Contango. Concor was in Backwardation for the remaining period.



12 Best frequency for Trading

We can conclude from the above analysis that both the underlying stocks and futures of Concor are profitable, and thus it is advisable for an investor to invest in underlying stocks on a daily basis to gain more profits. If he wants to mitigate his risk by investing in futures, it is suggested that he choose near month daily basis futures contracts.

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PERSISTENT

Persistent Systems

1 Introduction

1.1 Nature of Business

Persistent systems is an IT services company based in India. They specialize in solving Digital strategy & design, software product, cloud computing and CX transformation related problems of clients around the world. Persistent was founded by Anand Deshpande on 16 May 1990. It is one the biggest IT services companies in India generating Rs.5710 Cr



Figure 1: Persistent Systems Logo

1.2 Ownership

As it can be seen in the following pie chart, 31.6% of Persistent is owned by promoters, while 21.4% is diluted in the form of Mutual funds, 19.81% of the holdings are under FIIs, while 20.4% is publicly traded. The remaining 7.1% is held by others.

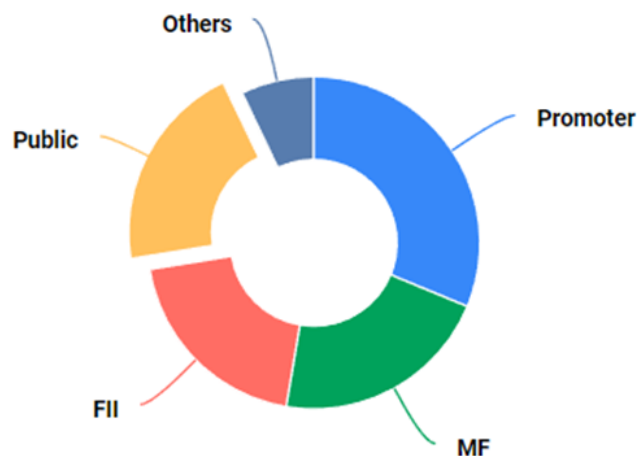


Figure 2 : Shareholding Pattern of Persistent Systems

1.3 Business Commencement

Persistent Systems was founded on 16th May 1990 by Anand Deshpande and the company went public on 17th September 2007 making them Persistent Systems Limited. Persistent Systems experienced humble beginnings, Anand had a loan of Rs.4 lacs approved from a bank but it never came through due to regulation changes, Anand then somehow managed to gather Rs.2 lacs with the help of his tax refunds in the US and gathered another Rs.2lacs from friends and families. All of Anand's hard work paid off when he started getting companies like HP as a client and Intel as an investor in 2000.

1.4 Industry Parameters

Persistent Systems belongs to the IT Industry. The IT industry is one of the biggest industries in India accounting for 8-10% of India's GDP. The IT industry now is also one of the biggest recruiters, creating jobs from young Indians Throughout the country. The Indian IT Industry relies heavily on Exports as 80% of the industry's revenue is derived from it.

1.5 Overall Greatness

Multinational company Persistent Systems has offices in the US, Canada, and India. For students and staff all throughout the world, Persistent hosts numerous hackathons. Additionally, Persistent takes pleasure in investing in start-ups and nurturing them with its \$10 million in venture capital. Anand Deshpande, the founder, devotes four hours every Saturday to new businesses.

2 Underlying Stock Returns

The following table shows that the mean monthly returns are negative and the annual converted returns for weekly and daily are, 0.66 and 2.55 percent respectively. But we need to analyse returns on the basis of risk, the reward to risk ratios are 0.2622 and 0.4568 for weekly and daily respectively. Thus we conclude that daily returns are superior.

Metric	Daily	Weekly	Monthly
Minimum	-7.5585	-11.4935	-12.9784
Maximum	7.6950	15.6245	21.0143
Mean	0.0070	0.0121	-1.8891
Standard Deviation	2.5116	5.5813	11.3061

Table 1: Comparison of the Daily, Weekly and Monthly risk-unadjusted returns(Returns in %)

3 Underlying Stock Risk Adjusted Returns

From the following data we can see that risk adjusted returns for all periods are negative, but the daily returns on an annual basis turn out to be the least at -4.161%.

Metric	Daily	Weekly	Monthly
Minimum	-7.6129	-11.5425	-13.0187
Maximum	7.6341	15.5700	20.9970
Mean	-0.0114	-0.0345	-0.2372
Standard Deviation	2.5255	5.5810	12.2811

Table 2: Comparison of the Daily, Weekly and Monthly risk-adjusted returns(Returns in %)

4 Economic Interpretation of risk adjusted and risk unadjusted returns

As we have seen above the unadjusted values of daily and weekly returns turned out to be positive and healthy , but after taking risk into account returns for all periods turned out to be negative, This indicated how important it is to factor in risk while evaluating returns. Risk adjusted return is basically the returns achieved when risk was taken into account. Risk adjusted returns allow investors to evaluate a stock without being fooled by numbers.

The following figures indicate Daily, weekly and monthly returns with time as horizontal axis.

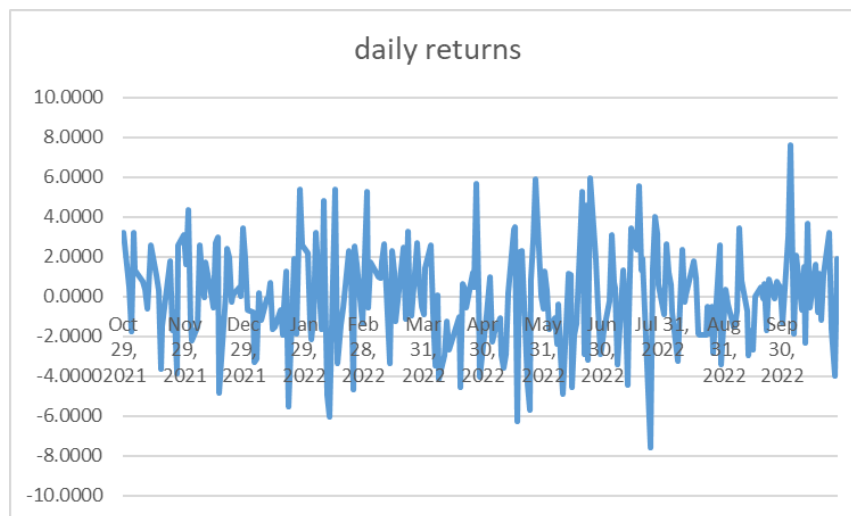


Figure 3: Daily Returns of Underlying Stock

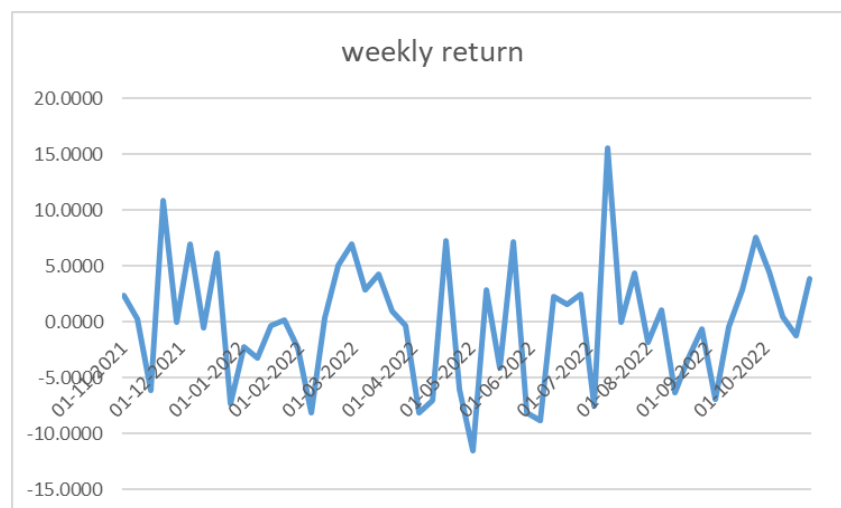


Figure 4: Weekly Returns of Underlying Stock

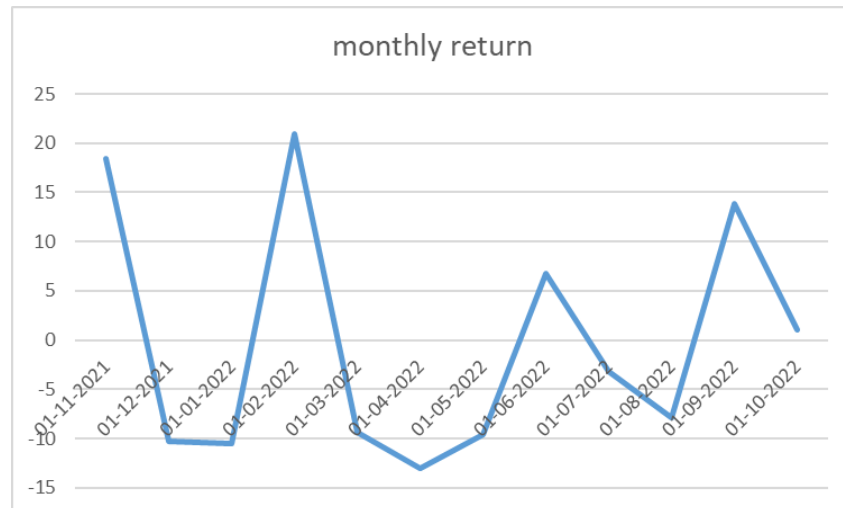


Figure 5: Monthly Returns of Underlying Stock

5 Equity Futures

5.1 Commencement of Equity Futures

Persistent systems was listed on the national stock exchange on 6th April 2010 and the IPO was released on 17th-19th March 2010, the lot size was 20 shares and the price was 290-300 Rs per share.

5.2 Lot size and Contract Specifications

The IPO had a lot size of 20 Shares and an issue size of 5,419,706 shares each of face value 10 Rs.

5.1 Greatness of Equity Futures

Persistent equity futures have had a relatively close movement with the underlying stock, which has been beneficial for investors to adopt suitable strategies for risky situations.

6 Near Month Returns

The ongoing month is called near trading month, and as it can be seen from the following table daily near month trading is the only one giving positive returns, but we need to keep in mind that these are unadjusted returns.

Metric	Daily	Weekly	Monthly
Minimum	-7.6233	-11.441	-15.7682
Maximum	7.7545	12.1691	21.8644
Mean	0.0070	-0.0562	-0.0212
Standard Deviation	2.5478	5.3921	13.4496

7 Near Month Risk-adjusted Returns

The following table displays the risk adjusted returns for near month futures. We can see that the positive returns on daily trading have now become negative.

Metric	Daily	Weekly	Monthly
Minimum	-7.6777	-11.4923	-15.8055
Maximum	7.6936	12.1058	21.8261
Mean	-0.0090	-0.1028	-0.0681
Standard Deviation	2.5619	5.3918	13.4489

8 Economic interpretation of risk adjusted and unadjusted near month returns

As explained before, risk adjusted returns help us to quantify returns without being fooled by numbers. It gives us a reliable number which does not contain the unusable excess returns due to standard deviation. From the data presented before we can see that near month trading is not very beneficial as for daily, weekly and monthly the risk adjusted returns are negative. If we were to compare the daily and monthly returns we can see that unadjusted returns indicated positive returns for daily trading, but on taking risk into account not only have daily returns become negative it also has turned out to be deeper in the negative region as compared to monthly returns. The following figures show the near month returns for daily, weekly and monthly periods.

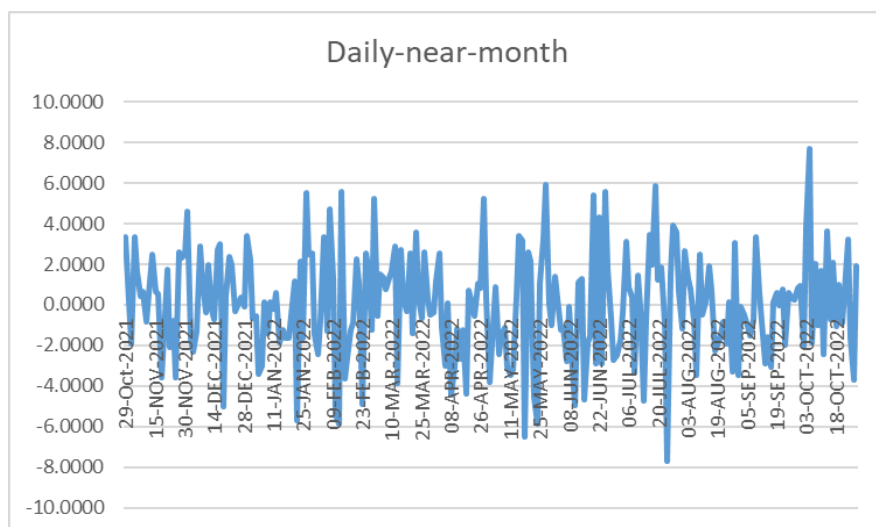


Figure 6: Near Month Returns in Daily Frequency

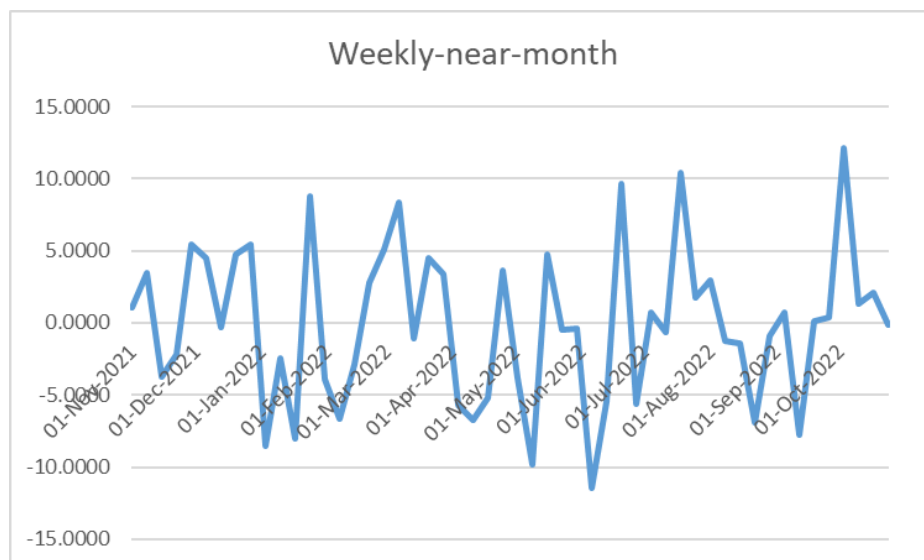


Figure 7: Near Returns in Weekly Frequency

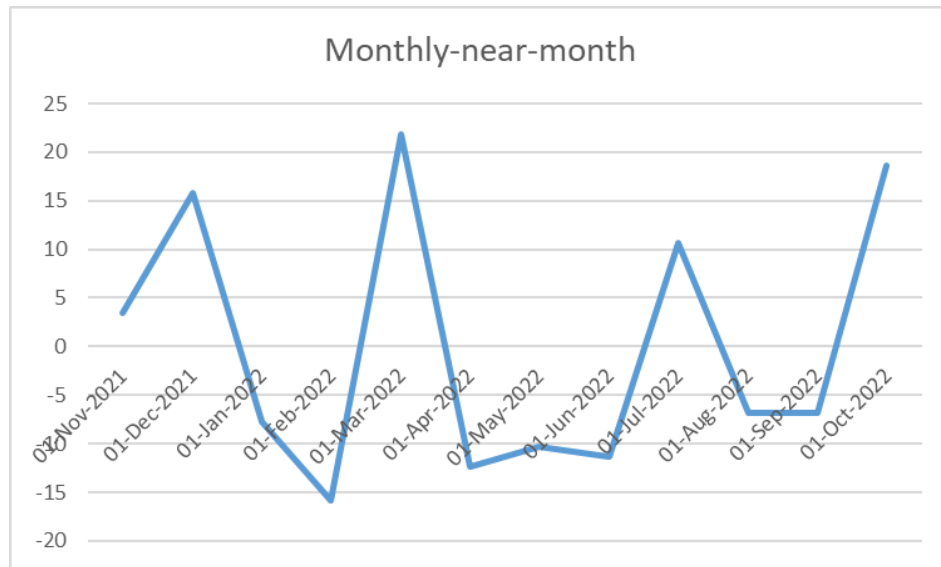


Figure 8: Near Month Returns in Monthly Frequency

9 Comparison of Returns

9.1 Comparison of Near, Next and Far month Risk Adjusted Returns

As we can see from the following table neither of near,next or far month returns are positive, but if we were to minimize losses going forward with far month futures investment would be a better choice as its mean daily returns are the least negative of the three.

Metric	Near	Next	Far
Minimum	-7.6777	-7.6775	-7.6206
Maximum	7.6936	7.6006	8.6451
Mean	-0.0090	-0.0097	-0.0088
Standard Deviation	2.5619	2.5665	2.6380

Daily risk adjusted Near, Next and far month returns

9.2 Comparison of Near Month and Underlying Stock returns

As calculated earlier we know that the mean daily risk adjusted returns for the underlying stock is -0.0114 and the daily mean near month futures return is -0.0090, percent. As we can see both of them bear negative returns but the near month futures seem like a better investment as its returns are higher.

10 Comparison of Unadjusted & Adjusted Returns

10.1 Unadjusted Returns

Metric	Equity Shares	Near	Next	Far
Daily	0.0070	0.0070	0.0064	0.0073
Weekly	0.0212	-0.0562	-0.0618	-0.0593
Monthly	-1.8891	-0.0212	-0.0575	-0.0792

10.2 Adjusted Returns

Metric	Equity Shares	Near	Next	Far
Daily	-0.0114	-0.0090	-0.0097	-0.0088
Weekly	-0.0345	-0.1028	-0.1084	-0.1059
Monthly	-0.2372	-0.0681	-0.1044	-0.1261

- The unadjusted returns for equity shares and futures in terms of daily frequency seem to be giving a wrong impression of the investment.
- Because we can clearly see that when we take risk into account daily returns for underlying stock and futures turns out to be negative.
- Talking about weekly returns when we take a look at unadjusted returns, equity shares seem to be a good investment, but this kind of decision can be detrimental because when we adjust the returns for risk, all the returns turn out to be negative.
- Whereas in the case of monthly frequency we see unadjusted and adjusted returns going hand in hand and indicating the same thing, which is that near month futures investment would be the best choice to minimize losses.
- Overall if we were to look at the investment choices available to us, all the returns seem to be negative and not worth investing, but to minimize losses monthly frequency near month futures contract creates 0.8172% of losses which is the least amongst our choices.

10.3 Liquidity Position

Month	Near	Next	Far
Avg. no. of Contracts	2370	117	6
Avg. Open Interest	453,000	47,425	4025

- As we can see the avg. no. of contracts for near month contracts is much greater than next and far month, this is because the open interest is way heavier towards near month as compared to next and far month.
- Thus we can conclude that near month contracts are preferred as it gives a better liquidity position.

11 Contango or Backwardation of futures Instrument

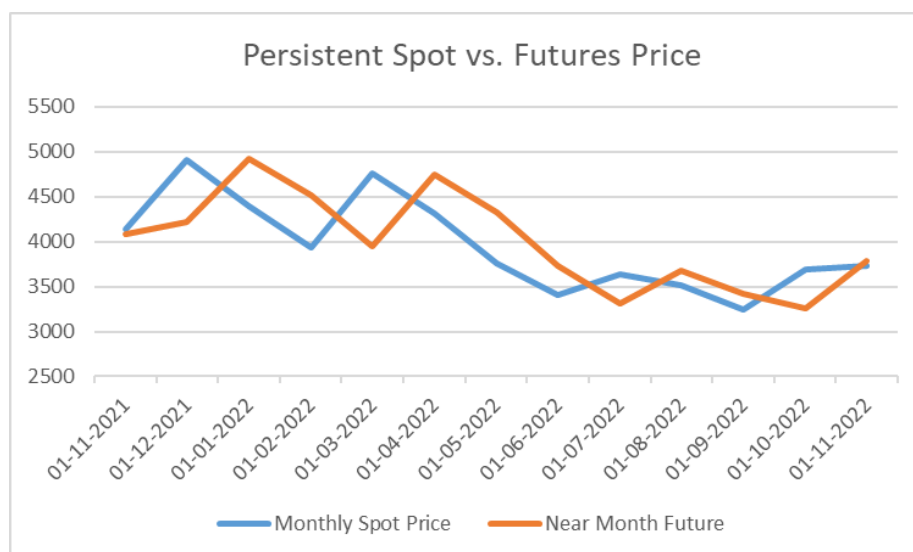
The phrases "contango" and "backwardation" are used to explain how the futures market is acting in relation to the discrepancy between the spot price and the futures price of a commodity or underlying asset. Contango is a state in which a commodity's futures price or underlying asset's spot price is higher than the other, i.e., futures price > spot price.

Investors will pay more for the stock or commodity in the future when the market or commodity displays a contango behaviour. A speculator may lock in a profit by purchasing more future contracts since futures prices that are higher than spot prices may be speculative about prices that will be higher in the future.

Backwardation occurs when a commodity's futures price or underlying asset's spot price is lower, or when the futures price is greater than the spot price.

Backwardation can happen when there is a greater demand for an asset right now than there will be when contracts through the futures market mature in the future. Investors can short the asset and purchase a futures contract to realise a profit if they believe the current price is too high.

From the graph below we can see that for November 2021, some parts of December 2021, some parts of February 2022, March 2022, some parts of June 2022, July and September to October 2022 Persistent was in Backwardation. Persistent was in Contango for the remaining period.



12 Best frequency for Trading

From the above analysis we can conclude that both the underlying stocks and futures of Persistent Systems are running in losses, thus for an investor to reduce his losses it is advisable for him to invest on a daily basis in underlying stocks. If he wants to mitigate his risk by investing in futures, it is suggested that he choose near month daily basis futures contracts.

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<https://trendlyne.com/equity/share-holding/1023/PERSISTENT/latest/persistent-systems-ltd/>

13 Conclusion

Based on the comparison of both the underlying stocks and futures instruments of the company, it is evident that Concor is far more profitable than Persistent Systems, as Persistent Systems has suffered losses throughout the year across all trading formats. To gain profits it is advisable for an investor to invest in underlying stocks of Concor in daily and monthly frequency, and in near month weekly frequency futures contracts. If the investor wants to invest in Persistent Systems then to minimize his losses it is advisable for him to invest in near month daily basis future contracts or in daily basis of underlying stocks.